URS

DOCKET	
08-AFC-6	
DATE	MAY 27 2009
RECD.	MAY 28 2009

May 27, 2009

Dockets Unit
California Energy Commission
1516 Ninth Street, MS 4
Sacramento, CA 95814

RE: Willow Pass Generating Station
Application for Certification 08-AFC-6

On behalf of Mirant Willow Pass, LLC, the applicant for the above-referenced Willow Pass Generating Station (WPGS) AFC, we hereby submit the enclosed documents:

1. **Responses to Data Requests 58-75.** Twelve print copies and twelve CDs of the responses.

2. **Updated System Impact Study: Appendix 10 (Complete Version).** Three CDs of Appendix 10 (Transient Stability Analysis). This Appendix was previously docketed with the CEC on March 4, 2009, but it was subsequently discovered that a portion of the transient stability analysis was inadvertently not included in the version provided to the CEC. Therefore, the enclosed version replaces Appendix 10 previously docketed with the CEC on March 4, 2009. Selected plots printed in large size and in color from this appendix were previously docketed with the CEC on May 26, 2009.

Please include these documents in the AFC record.

URS Corporation

Kathy Rushmore

Kathy Rushmore
Project Manager

Enclosures

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BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
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APPLICATION FOR CERTIFICATION
FOR THE WILLOW PASS
GENERATING STATION

Docket No. 08-AFC-6

PROOF OF SERVICE
(Revised 4/14/2009)

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DECLARATION OF SERVICE

I, Kathy Rushmore, declare that on May 27, 2009, I served and filed copies of the attached (1) *Responses to CEC Data Requests (#58-75)* and (2) Appendix 10 (Complete Version) of the Updated System Impact Study. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/willowpass/index.html]**. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

___ sent electronically to all email addresses on the Proof of Service list;

_X_ by personal delivery or by depositing in the United States mail at San Francisco, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

___ **sending two original paper copies and one electronic copy, mailed to the address below:**

OR

__ X _ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
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I declare under penalty of perjury that the foregoing is true and correct.

Kathy Rushmore

Updated System Impact Study: Appendix 10 (Complete Version)

Application for Certification (08-AFC-6) for WILLOW PASS GENERATING STATION Pittsburg, California

May 2009

Prepared for:

MIRANT[SM]
WILLOW PASS, LLC

Prepared by:

URS

System Impact Study

Study Report

Mirant Willow Pass, LLC

Willow Pass Generating Station
Interconnection into PG&E's Pittsburg Substation

APPENDIX 10 – Results of Transient Stability Analysis

May 26 2009

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Introduction & Findings

Mirant Willow Pass, LLC (Willow Pass) has requested that a comprehensive third-party system interconnection study (SIS) be conducted for and submitted to the California Energy Commission (CEC). *This updated document is submitted under separate cover as Appendix 10 to the Updated SIS report submitted to the CEC in February 2009. This study incorporates the information requested by the CEC in their November 12, 2008 Data Request 38 (c) regarding transient stability analysis for selected critical Category B (N-1) and Category C (N-2 and B-1) contingencies of the PG&E bulk power transmission grid.*

The transient stability analysis concludes that the interconnection of the Willow Pass Generating Station (WPGS) to the PG&E power system grid will not degrade existing transient system performance, nor contribute to power system instability. All simulations performed exhibited positive damping and were within Western Electricity Coordinating Council (WECC) Disturbance Performance Criteria.

APPENDIX 10 – Results of Transient Stability Analysis

1. Summary of the Stability Studies

Transient stability studies were conducted using a 2013 Summer Peak Full-Loop Base Case, (developed from PG&E's 2008 Assessment base case series and reviewed by the CAISO) to determine if the addition of WPGS Interconnection into PG&E's Pittsburg 230 kV Substation would result in any adverse impact on the stable operation of the PG&E transmission system (i.e., a critical contingency does not result in excessive oscillations or system collapse as a result of a new generator interconnecting to the Grid).

Transient stability analysis was performed using the General Electric Positive Sequence Dynamics Simulation (PSDS) Program.

Transient stability analysis is a time-based simulation that assesses the performance of the power system during (and shortly following) a contingency. Transient stability studies were performed to ensure system stability following a critical fault on the system. Transient stability simulations were performed out to 20 seconds. Select N-1 (single contingencies), selected B-1 (bus section outages) and N-2 (double contingencies) received transient stability evaluation. This analysis simulated over 100 contingencies per scenario (pre-project and post-project).

Subsequent to a system disturbance, the power system exhibits an oscillatory response. Simulations must exhibit positive or marginal damping. In other words, system oscillations must not perpetually increase, causing a local or regional system collapse.

In addition to damping, the WECC requires that the following Disturbance Performance Criteria be met:

After a Category 'B' disturbance (N-1), the transmission system performance should meet the following criteria:

- Transient voltage dip should not be below 25 percent at load buses or 30 percent at non-load buses at any time.
- The duration of the transient voltage dip greater than 20 percent should not exceed 20 cycles at load buses.
- The minimum transient frequency should not fall below 59.6 Hz for more than 6 cycles at load buses.

After a Category 'C' disturbance (N-2), the transmission system performance should meet the following criteria:

- Transient voltage dip should not be below 30 percent at any bus at any time.
- The duration of a transient voltage dip greater than 20 percent should not exceed 40 cycles at load buses.
- The minimum transient frequency should not fall below 59.0 Hz for more than 6 cycles at load buses.

2. Details Regarding Reliability Criteria

A system reliability evaluation consists primarily of determining if there would be thermal overloads, that voltages are within criteria (not too high or low), and that the system is stable (the system should not oscillate excessively and generators should remain synchronized with one another). Additional criteria may include assurance that there is sufficient reactive power available. The evaluation of these criteria must be conducted for credible 'emergency' conditions that the system might sustain, such as the loss of a single or double circuit line, a transformer, or a combination of these facilities. Performance of the transmission system is measured against the following planning criteria: the California ISO Reliability Criteria, the Western Electricity Coordinating Council (WECC) Reliability Criteria, and the North American Electric Reliability Council (NERC) Planning Standards.

Table W-1 and Figure W-1, excerpts from the NERC/WECC Planning Standards, are transcribed below.

WECC Disturbance-Performance Table Of Allowable Effects On Other Systems[1]

NERC and WECC Categories	Outage Frequency Associated with the Performance Category (outage/year)	Transient Voltage Dip Standard	Minimum Transient Frequency Standard	Post Transient Voltage Deviation Standard (See Note 2)
A	Not Applicable	Nothing in addition to NERC		
B	≥ 0.33	Not to exceed 25% at load buses or 30% at non-load buses. Not to exceed 20% for more than 20 cycles at load buses.	Not below 59.6Hz for 6 cycles or more at a load bus.	Not to exceed 5% at any bus.
C	0.033 – 0.33	Not to exceed 30% at any bus. Not to exceed 20% for more than 40 cycles at load buses.	Not below 59.0Hz for 6 cycles or more at a load bus.	Not to exceed 10% at any bus.
D	< 0.033	Nothing in addition to NERC		

Notes:

1. The WECC Disturbance-Performance Table applies equally to either a system with all elements in service, or a system with one element removed and the system adjusted.

2. As an example in applying the WECC Disturbance-Performance Table, a Category B disturbance in one system shall not cause a transient voltage dip in another system that is greater than 20% for more than 20 cycles at load buses, or exceed 25% at load buses or 30% at non-load buses at any time other than during the fault.

3. Additional voltage requirements associated with voltage stability are specified in Standard ID. If it can be demonstrated that post transient voltage deviations that are less than the values in the table will result in voltage instability, the system in which the disturbance originated and the affected system(s) should cooperate in mutually resolving the problem.

4. Refer to Figure W-1 for voltage performance parameters.

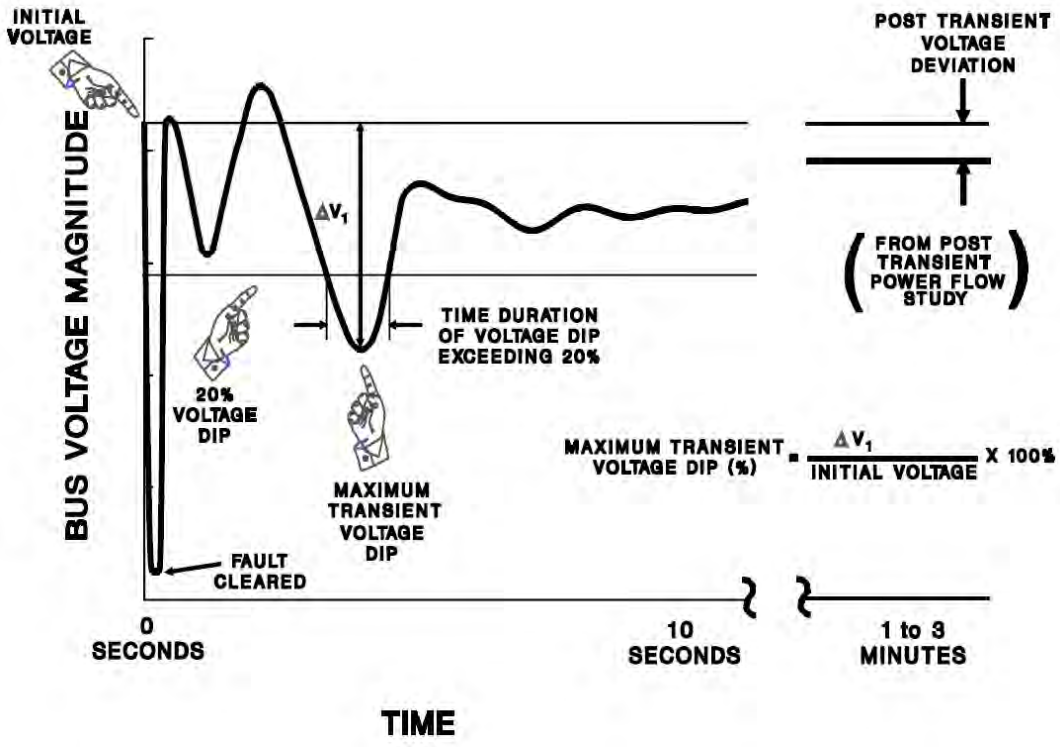
5. Load buses include generating unit auxiliary loads.

6. To reach the frequency categories shown in the WECC Disturbance-Performance Table for Category C disturbances, it is presumed that some planned and controlled islanding has occurred. Under-frequency load shedding is expected to arrest this frequency decline and assure continued operation within the resulting islands.

7. For simulation test cases, the interconnected transmission system steady state loading conditions prior to a disturbance should be appropriate to the case. Disturbances should be simulated at locations on the system that result in maximum stress on other systems. Relay action, fault clearing time, and re-closing practice should be represented in simulations according to the planning and operation of the actual or planned systems. When simulating post transient conditions, actions are limited to automatic devices and no manual action is to be assumed.

[1] Table W-1 taken from the NERC/WECC Planning Standards document approved by the Planning Coordination Committee (PCC) at its June 27-28, 2002 meeting. Approved by the Board Of Directors at its August 8-9, 2002 meeting.

NERC/WECC Voltage Performance Parameters[2]



3. Conclusions

The transient stability analysis concludes that the interconnection of the WPGS to the PG&E power system grid will not degrade existing transient system performance, nor contribute to power system instability. All simulations performed exhibited positive damping and were within WECC Disturbance-Performance Criteria.

For a listing of WECC/NERC Category 'B' and 'C' contingencies evaluated, please refer to **Attachment A**.

Transient stability simulations were run for a twenty-second duration, which was determined to be more than adequate to assess system performance and damping. **Attachment B** contains block-diagram illustrations of models assumed/developed for the Willow Pass project generator, governor, exciter, and power system stabilizer equipment. **Attachment C** contains the 'raw' dyd-format stability data.

Electronic copies of the transient stability plots, which include voltage, relative angle and frequency plots for the outages examined, are available in **Attachment D1-D3**.

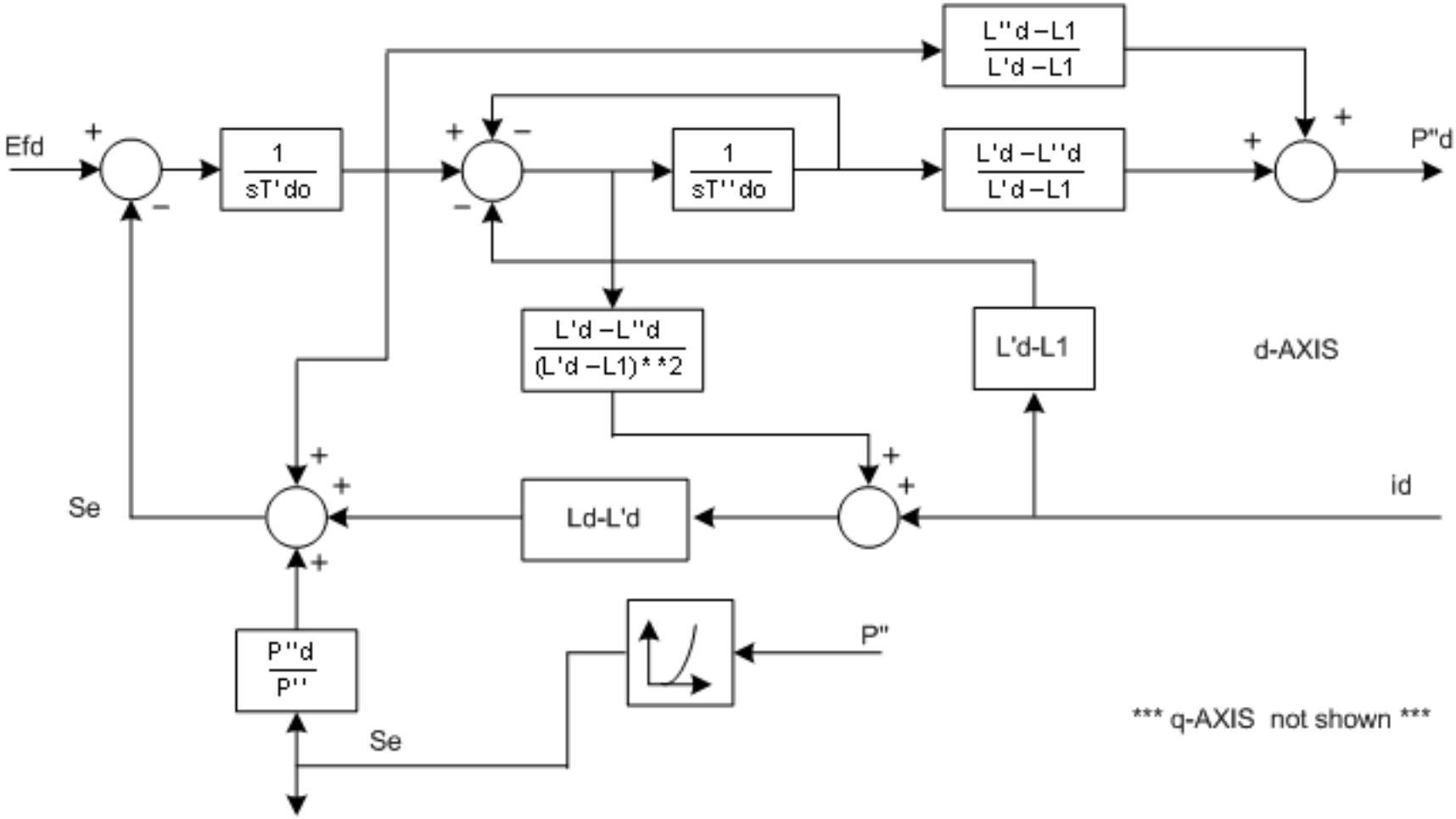
[2] Illustration taken from the NERC/WECC Planning Standards document approved by the Planning Coordination Committee (PCC) at its June 27-28, 2002 meeting. Approved by the Board Of Directors at its August 8-9, 2002 meeting.

ATTACHMENT A – WECC/NERC Category 'B' and 'C' Contingencies Evaluated

No.	Description
A-000	Flat Run
B-101	N-1 TABLE MT-VACA-DIX 500kV LINE
B-102	N-1 TABLE MT-TESLA 500kV LINE
B-103	N-1 VACA-DIX-TESLA 500kV LINE
B-104	N-1 MAXWELL-TRACY 500kV LINE
B-105	N-1 TRACY-LOSBANOS 500kV LINE
B-106	N-1 TRACY-TESLA 500kV LINE
B-107	N-1 TESLA-METCALF 500kV LINE
B-108	N-1 TESLA-LOSBANOS 500kV LINE
B-109	N-1 METCALF-MOSSLAND 500kV LINE
B-110	N-1 MOSSLAND-LOSBANOS 500kV LINE
B-128	N-1 CONTRA COSTA SUB - BIRDS LANDING 230kV LINE
B-129	N-1 CONTRA COSTA - CONTRA COSTA 8 230kV LINE
B-130	N-1 CONTRA COSTA SUB - CONTRA COSTA 230kV LINE
B-131	N-1 CONTRA COSTA - BIRDS LANDING 230kV LINE
B-132	N-1 CONTRA COSTA - MORAGA 230kV #1 LINE
B-133	N-1 CONTRA COSTA - MORAGA 230kV #2 LINE
B-134	N-1 C.COSTA - BRENTWOOD 230kV LINE
B-135	N-1 C.COSTA - DELTAPMP 230kV LINE
B-136	N-1 C.COSTA - LS PSTAS 230kV LINE
B-137	N-1 LONETREE-C.COSTA 230kV LINE
B-139	N-1 PITTSBURG - DEC PITTSBURG #1 230kV LINE
B-140	N-1 PITTSBURG - DEC PITTSBURG #2 230kV LINE
B-141	N-1 PITTSBURG - SAN RAMON 230kV LINE
B-142	N-1 PITTSBURG - TASSAJAR 230kV LINE
B-143	N-1 PITTSBURG - TIDEWATR 230kV LINE
B-144	N-1 PITTSBURG - TESORO 230kV LINE
B-145	N-1 PITTSBURG - EAST SHORE 230kV LINE
B-146	N-1 PITTSBURG - TESLA C 230kV #1 LINE
B-147	N-1 PITTSBURG - TESLA C 230kV #2 LINE
B-148	N-1 PITTSBURG - SAN MATEO 230kV LINE
B-154	N-1 PITTSBURG - POTRERO D.C. LINE
B-231	N-1 PITTSBURG - CLAYTON 115kV #1 LINE
B-232	N-1 PITTSBURG - CLAYTON 115kV #4 LINE
B-233	N-1 PITTSBURG - LMEC 115kV #1 LINE
B-234	N-1 PITTSBURG - LMEC 115kV #2 LINE
B-235	N-1 PITTSBURG - MARTINEZ 115kV #2 LINE & CCCSD LOAD & CCCSD GEN
B-236	N-1 PITTSBURG - MARTINEZ 115kV #1 LINE & WILLOW PASS BART LOAD & BOLLMAN LOAD
B-237	N-1 PITTSBURG - COLUMBIA STEEL 115kV LINE & GWF 2 LD/GN & PRAXAIR LD & DOW CHEM GN
B-238	N-1 PITTSBURG - CLAYTON 115kV #3 LINE & KIRKER LD RADIAL FROM PITTS-KIRKER-POSCO 115kV LINE
B-239	N-1 PITTSBURG - KIRKER-POSCO 115kV LINE & SHIFT KIRK LD TO PITT-CLAY 115kV LINE 3
B-247	N-1 CONTRA COSTA SUB - FIRBERBOARD - CROWN Z 115kV LINE
B-248	N-1 CONTRA COSTA SUB - FIRBERBOARD - REC 115kV LINE
B-367	N-1 CONTRA COSTA SUB - DUPONT 60kV LINE
B-368	N-1 CONTRA COSTA SUB - BALFOUR 60kV LINE
B-370	N-1 ANTIOCH - CONTRA COSTA SUB 60kV LINE
B-371	N-1 WILLOW PASS - CONTRA COSTA SUB 60kV BUS
B-403	T-1 VACA DIXION 500/230kV #11 XFMR BANK
B-404	T-1 VACA DIXION 500/230kV #12 XFMR BANK
B-405	T-1 TESLA 500/230kV #2 XFMR BANK
B-406	T-1 TESLA 500/230kV #6 XFMR BANK
B-407	T-1 TESLA 500/230kV #4 XFMR BANK
B-408	T-1 METCALF 500/230kV #11 XFMR BANK
B-409	T-1 METCALF 500/230kV #12 XFMR BANK

B-410	T-1 METCALF 500/230kV #13 XFMR BANK
B-411	T-1 TRACY 500/230kV #1 XFMR BANK
B-412	T-1 TRACY 500/230kV #1 XFMR BANK
B-413	T-1 CONTRA COSTA SUB 230/115kV #3 XFMR BANK
B-417	T-1 PITTSBURG 230/115kV #12 XFMR BANK
B-418	T-1 PITTSBURG 230/115kV #13 XFMR BANK
B-421	T-1 CONTRA COSTA SUB 230/115kV #3 XFMR BANK
B-454	T-1 CONTRA COSTA SUB 115/60kV #1 XFMR BANK
B-455	T-1 CONTRA COSTA SUB 115/60kV #2 XFMR BANK
B-498	G-1 DEC PLANT
B-502	G-1 LMEC PLANT
B-511	G-1 CONTRA COSTA #6
B-512	G-1 CONTRA COSTA #7
B-513	G-1 PITTSBURG #5
B-514	G-1 PITTSBURG #6
B-515	G-1 PITTSBURG #7
B-996	G-1 WILLOW PASS PLANT
C-111	N-2 COCO - BIRDS LANDING - CONTRA COSTA SUB - BIRDS LANDING 230kV LINES
C-112	N-2 CONTRA COSTA SUB - COCO&BIRDS LANDING - CONTRA COSTA SUB 230kV LINES
C-113	N-2 C.COSTA - MORAGA 230kV #1 & #2 LINES
C-114	N-2 CONTRA COSTA - LOS PSTAS & CONTRA COSTA - CAYETANO 230kV LINES
C-115	N-2 CAYETANO - NDUBLIN & CONTRA COSTA - CAYETANO 230kV LINES
C-116	N-2 PITTSBURG - TESORO & PITTSBURG - TIDEWATER 230kV LINES
C-118	N-2 PITTSBURG - SANMATEO & PITTSBURG - EAST SHORE 230kV LINES
C-119	N-2 PITTSBURG - TESLA #1 & #2 230kV LINES
C-120	N-2 PITTSBURG - TASSAJARA & PITTSBURG - SAN RAMON 230kV LINES
C-124	N-2 PITTSBURG - SAN MATEO & EAST SHORE - SAN MATEO 230kV LINES
C-128	N-2 NORTH DUBLIN - VINYARD & CONTRA COSTA - LOS PASITAS 230kV LINES
C-139	N-2 PITSBURG - SANRAMON&TASSAJAR - NEWARK 230kV LINES
C-158	N-2 PITTS - MARTZ 115kV #1 & #2 LINES, WP BART, BOLLMAN, CCCSD LD & CCCSD
C-159	N-2 PITTSBURG - CLAYTON 115kV #1 & #3 LINE & KIRKER LD RADIAL FROM PITTS-KIRKER-POSCO
C-210	B-1 CONTRA COSTA SUB 230kV BUS SECTION 1 OUTAGE
C-211	B-1 CONTRA COSTA SUB 230kV BUS SECTION 2 OUTAGE
C-212	B-1 CONTRA COSTA PP 230kV BUS SECTION 1 D OUTAGE
C-213	B-1 CONTRA COSTA PP 230kV BUS SECTION 2 D OUTAGE
C-214	B-1 CONTRA COSTA PP 230kV BUS SECTION 1 E OUTAGE
C-215	B-1 CONTRA COSTA PP 230kV BUS SECTION 2 E OUTAGE
C-216	B-1 CONTRA COSTA PP 230kV BUS SECTION 1 F OUTAGE
C-217	B-1 CONTRA COSTA PP 230kV BUS SECTION 2 F OUTAGE
C-219	B-1 PITSBURG 230kV BUS SECTION 1 D OUTAGE
C-220	B-1 PITSBURG 230kV BUS SECTION 2 D OUTAGE
C-221	B-1 PITSBURG 230kV BUS SECTION 1 E OUTAGE
C-222	B-1 PITSBURG 230kV BUS SECTION 2 E OUTAGE
C-232	B-1 PITSBURG 115kV BUS SECTION 1 OUTAGE
C-233	B-1 PITSBURG 115kV BUS SECTION 2 OUTAGE
C-242	B-1 CONTRA COSTA SUB 115kV BUS SECTION 1 OUTAGE
C-243	B-1 CONTRA COSTA SUB 115kV BUS SECTION 2 OUTAGE

ATTACHMENT B – Block-Diagram Illustrations of Models



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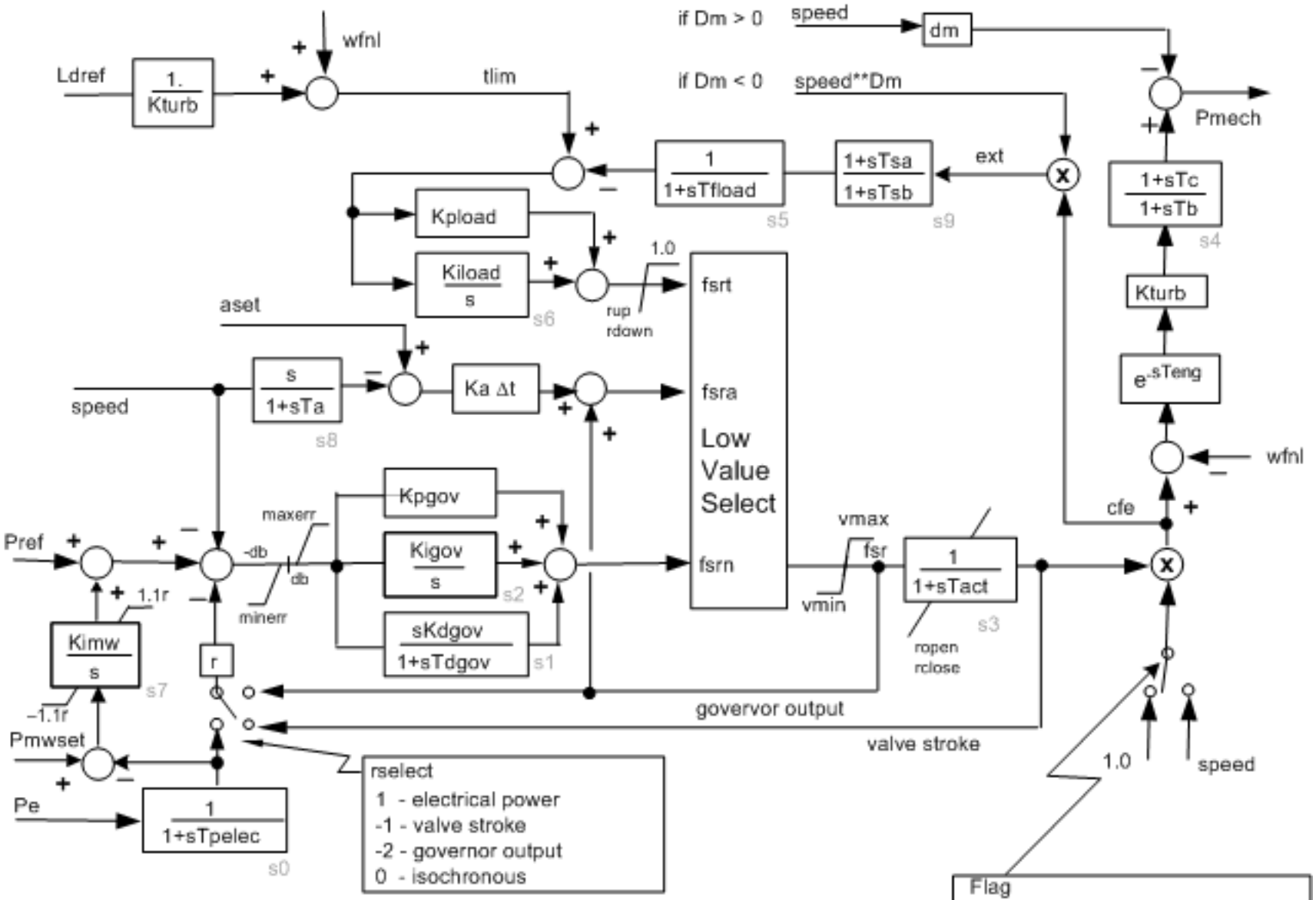
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



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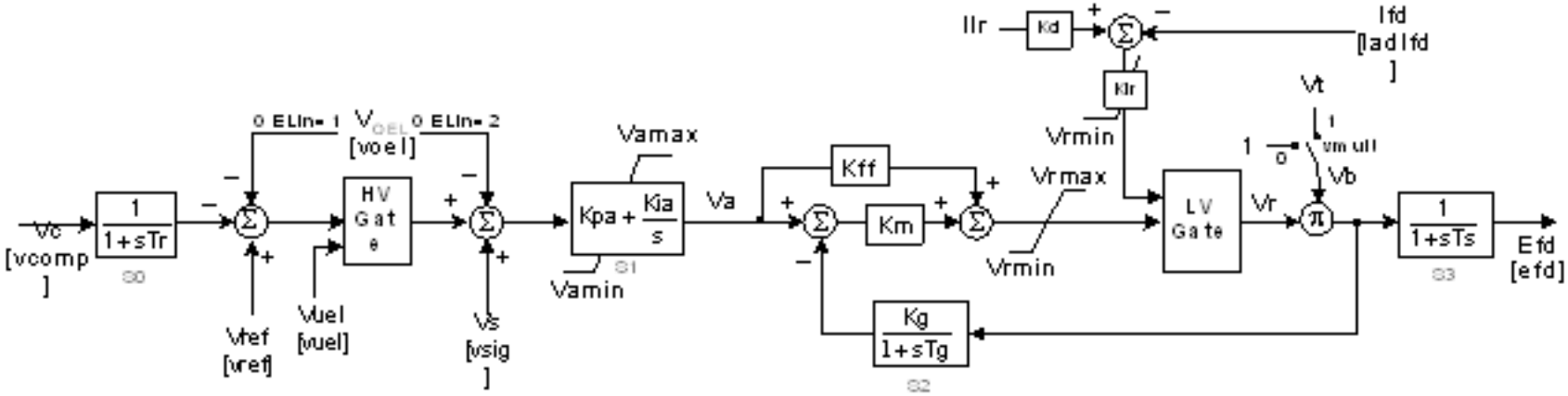
maxerr	0.0500	tdgov	1.0000	wfnl	0.1960	tfload	3.0000	ropen	0.1000	ka	100.0000	rup	-99.0000
minerr	-0.0500	vmax	1.0000	tb	0.5900	kpload	2.0000	rclose	-0.1000	ta	0.0000	rdown	-99.0000

Note: The Kpgov/Kigov and Kpload/Kiload controllers include tracking logic to ensure smooth transfer between active controllers. This logic is not shown.

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



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vamax	5.6000	tg	0.0400	ilr	3.7400		
vamin	-4.7000	vrmax	5.6000	kcl	1.0000		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
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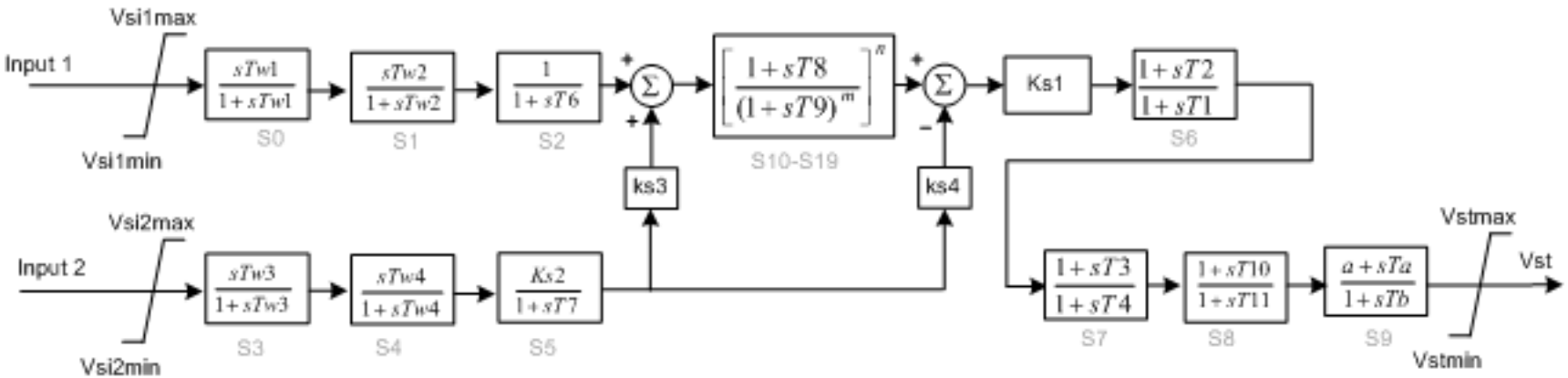

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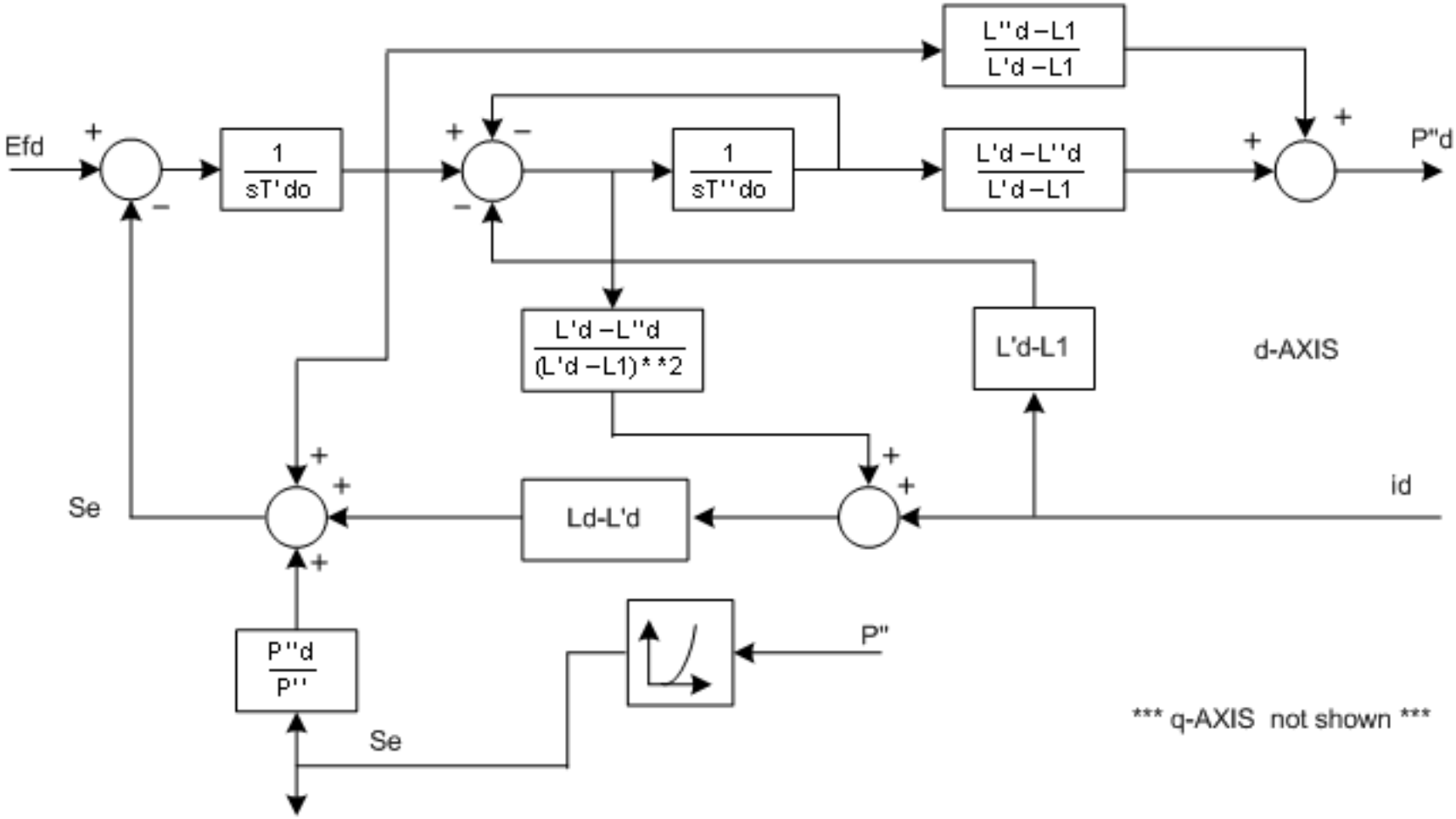
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

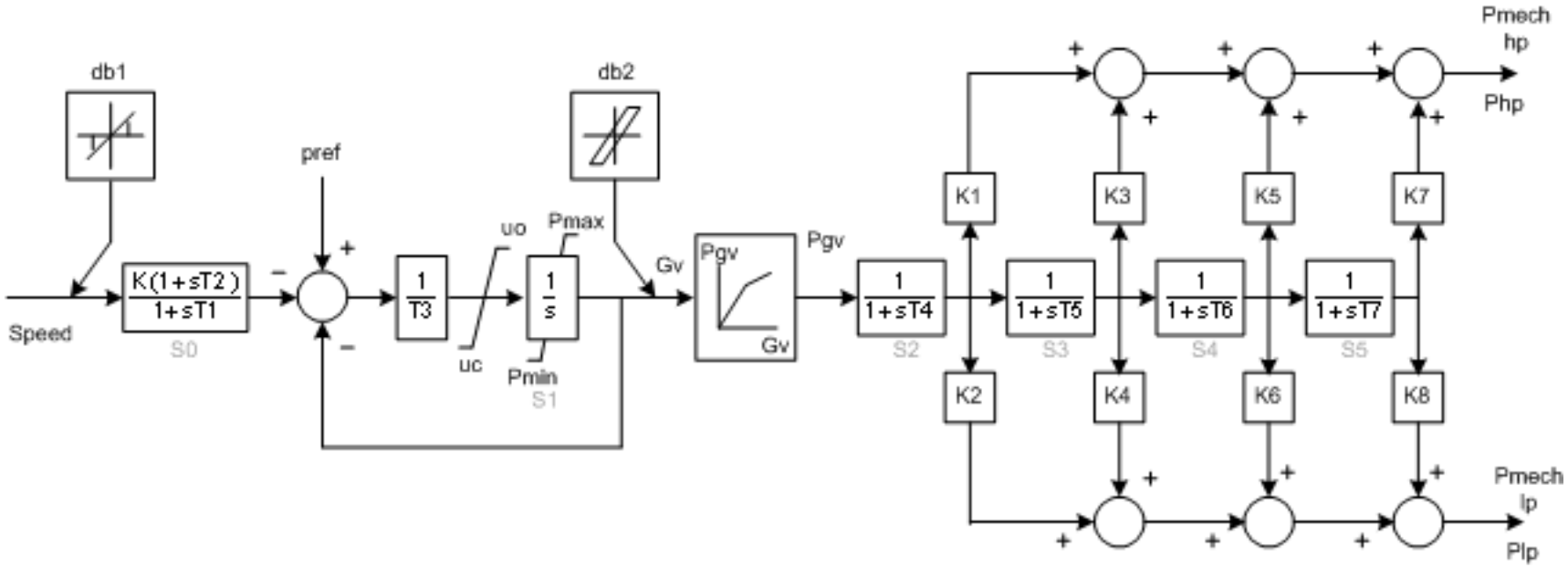
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



ld	2.7000	lppq	0.2090	tpqo	2.5000	d	1.0000
lpd	0.3010	ll	0.1660	tppqo	0.1500	rcomp	0.0000
lppd	0.2090	ra	0.0039	s1	0.0590	xcomp	0.0000
lq	2.5600	tpdo	6.7200	s12	0.2850	accel	0.0000
lpq	0.5410	tppdo	0.0430	h	2.3600		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

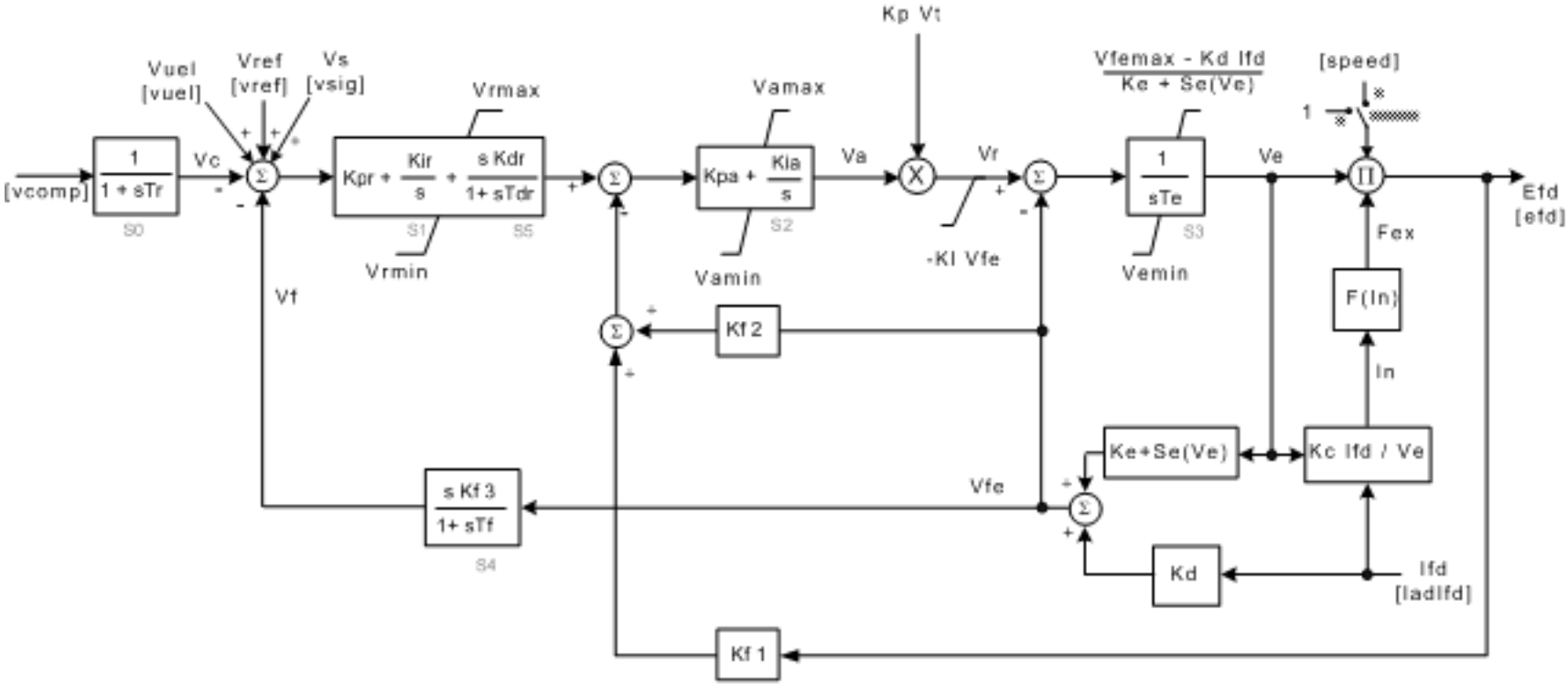
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



k	20.0000	uc	-0.1000	k2	0.0000	k5	0.0000	db1	0.0000	gv2	0.0000	pgv4	0.0000
t1	4.5000	pmax	1.0000	t5	0.1100	k6	0.0000	eps	0.0000	pgv2	0.0000	gv5	0.0000
t2	2.0000	pmin	0.0000	k3	0.4700	t7	0.0000	db2	0.0000	gv3	0.0000	pgv5	0.0000
t3	0.9390	t4	0.1000	k4	0.0000	k7	0.0000	gv1	0.0000	pgv3	0.0000	gv6	0.0000
uo	0.1000	k1	0.5300	t6	0.0000	k8	0.0000	pgv1	0.0000	gv4	0.0000	pgv6	0.0000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



tr	0.0000	vrmax	15.7500	vamin	-28.2000	vemin	0.0000	kf2	1.0000	e2	12.9000
kpr	33.3000	vrmin	-15.7500	kp	0.0000	ke	1.0000	kf3	0.0000	se2	0.0090
kir	66.6000	kpa	2.0000	kl	10.0000	kc	0.7100	tf	1.0000	spdmlt	0.0000
kdr	0.0000	kia	10.0000	te	0.9500	kd	1.7800	e1	14.8000		
tdr	1.0000	vamax	35.3000	vfemax	15.7500	kf1	0.0000	se1	0.0600		

General Electric International, Inc. PSLF Program Friday, 27 Jun 2008 10:15:34 AM resac7b mbase 0.0 mbaser 0.0 99992 MIR_ST1 13.8

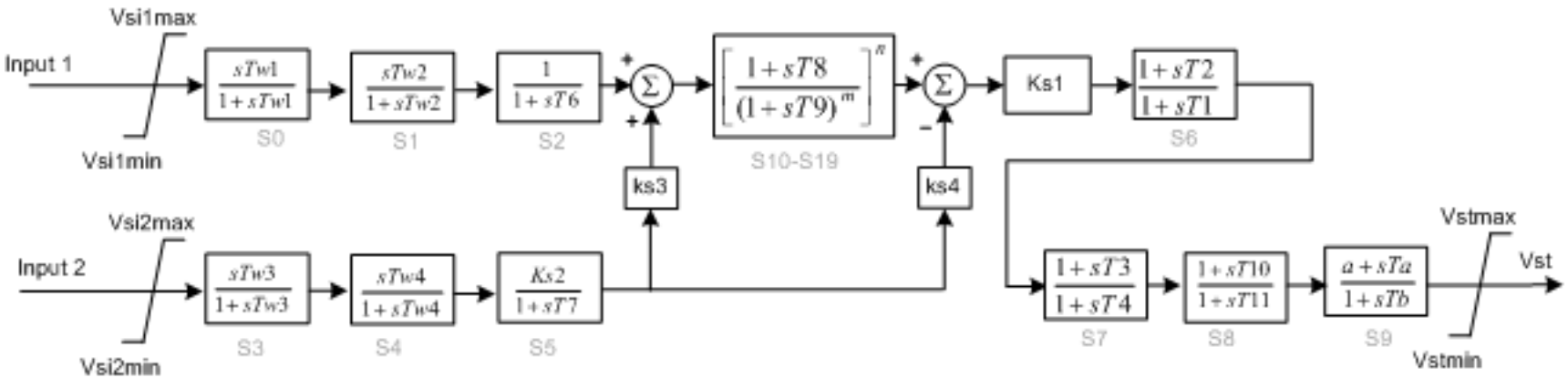
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT

2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)

COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08

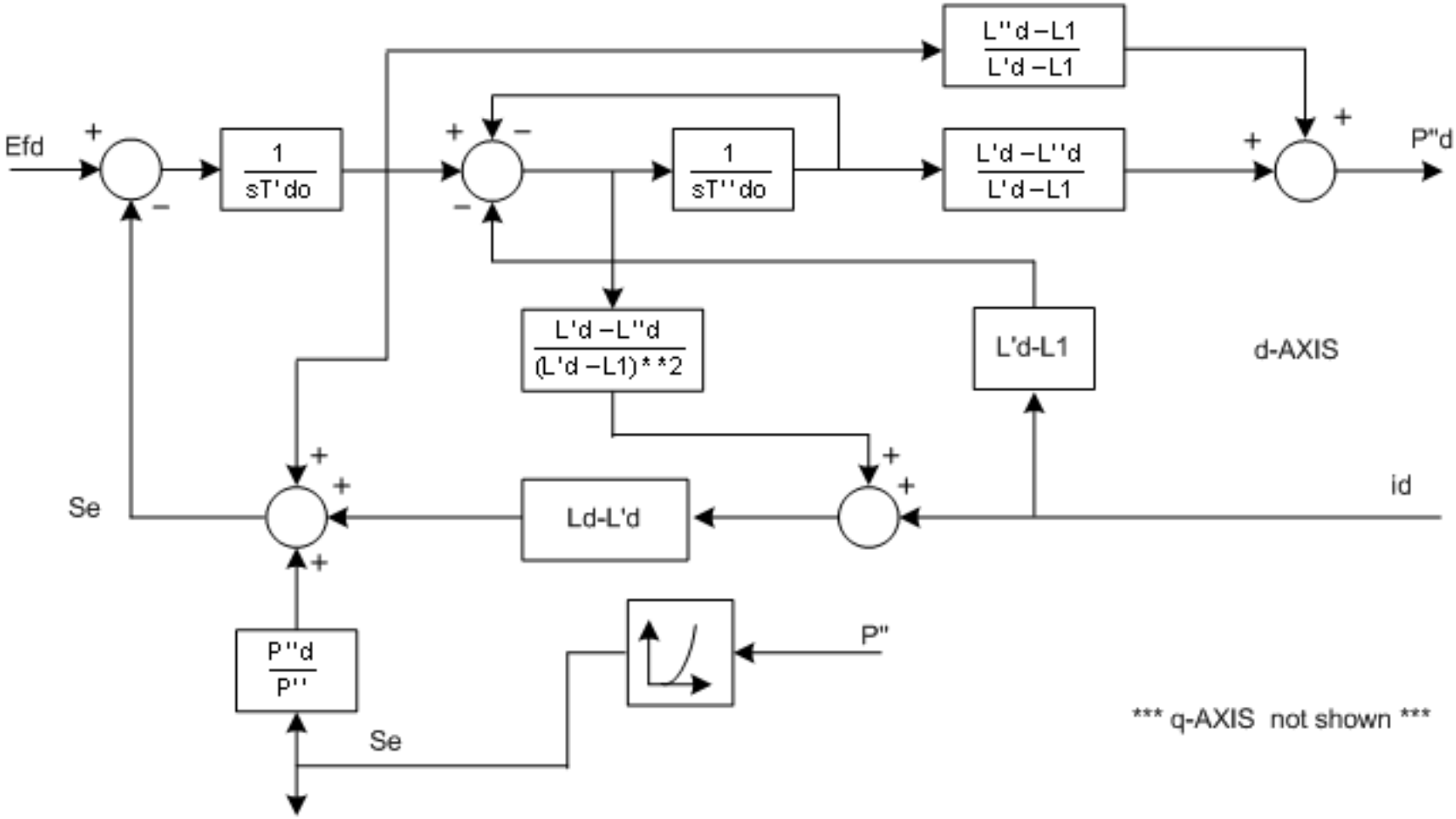
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



j1	1.0000	vsi1min	-0.5000	tw3	10.0000	ks3	1.0000	ks1	5.0000	t10	0.1800	ta	0.0000
k1	0.0000	tw1	10.0000	tw4	0.0000	t8	0.6000	t1	0.2500	t11	0.0300	tb	0.0000
j2	3.0000	tw2	10.0000	t6	0.0000	t9	0.1200	t2	0.0400	vstmax	0.1000	ks4	1.0000
k2	0.0000	vsi2max	2.0000	t7	10.0000	n	1.0000	t3	0.2500	vstmin	-0.1000		
vsi1max	0.5000	vsi2min	-2.0000	ks2	2.1200	m	5.0000	t4	0.0400	a	1.0000		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

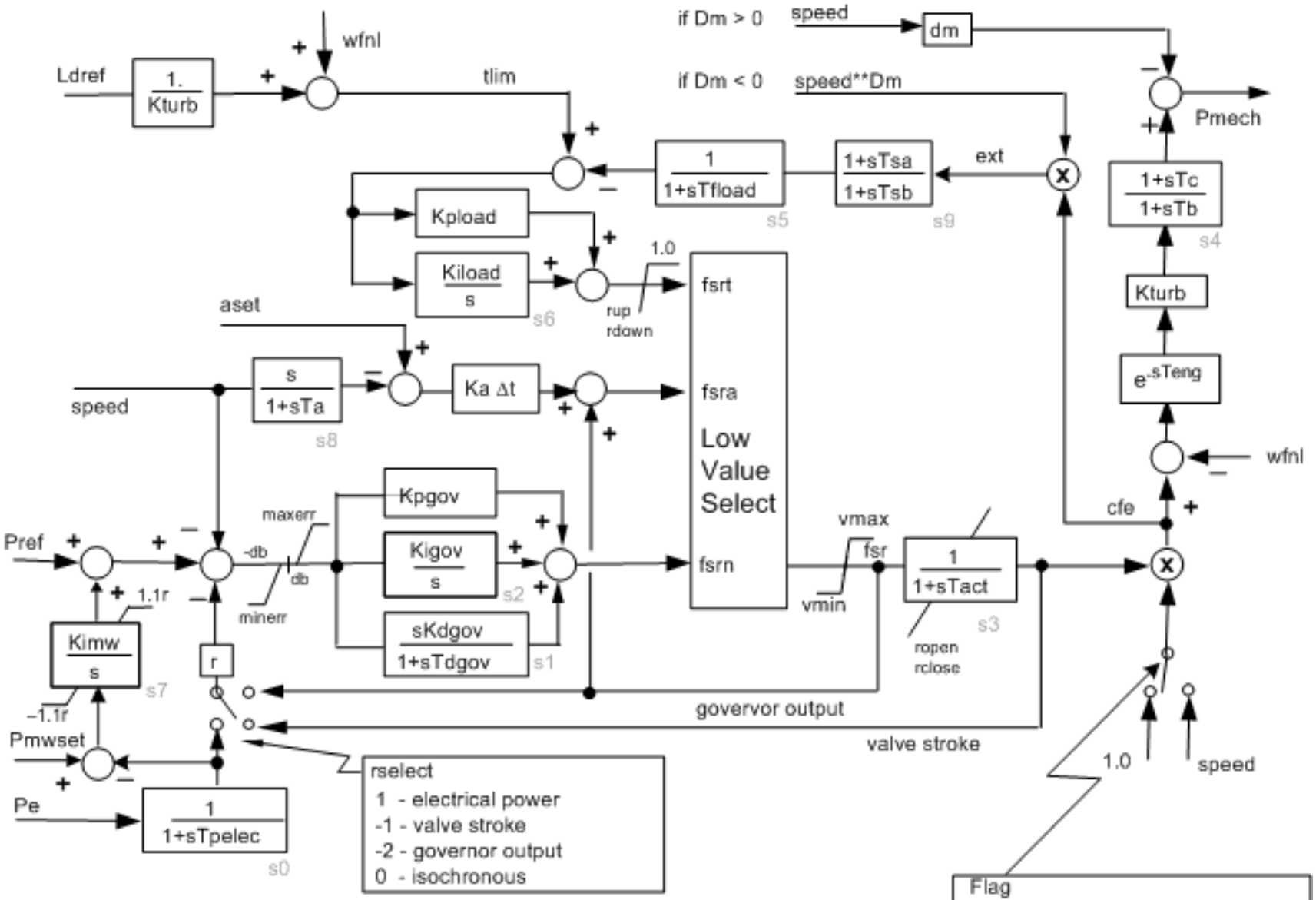
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



Id	2.3640	Ippq	0.2240	tpqo	1.1640	d	1.0000
Ipd	0.3000	Il	0.1920	tppqo	0.0790	rcomp	0.0000
Ippd	0.2240	ra	0.0022	s1	0.1140	xcomp	0.0000
Iq	2.3020	tpdo	10.4800	s12	0.4890	accel	0.0000
Ipq	0.4910	tppdo	0.0480	h	5.2100		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

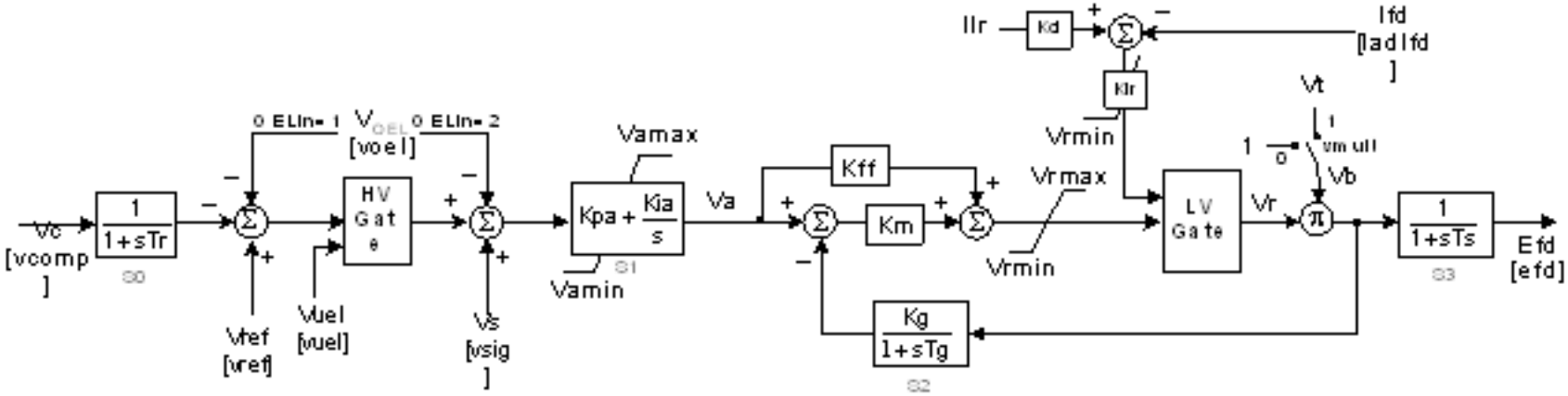


r	0.0040	kpgov	18.4000	vmin	0.1000	tc	0.0000	kiload	0.6700	kimw	0.0000	db	0.0000
rselect	1.0000	kigov	3.1000	tact	0.3000	flag	0.0000	ldref	10.0000	pmwset	0.0000	tsa	1.0000
tpelec	0.1000	kdgov	0.0000	kturb	1.2400	teng	0.0000	dm	0.0000	aset	9999.0000	tsb	1.0000
maxerr	0.0500	tdgov	1.0000	wfnl	0.1960	tfload	3.0000	ropen	0.1000	ka	100.0000	rup	-99.0000
minerr	-0.0500	vmax	1.0000	tb	0.5900	kpload	2.0000	rclose	-0.1000	ta	0.0000	rdown	-99.0000

Note: The Kpgov/Kigov and Kpload/Kiload controllers include tracking logic to ensure smooth transfer between active controllers. This logic is not shown.

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

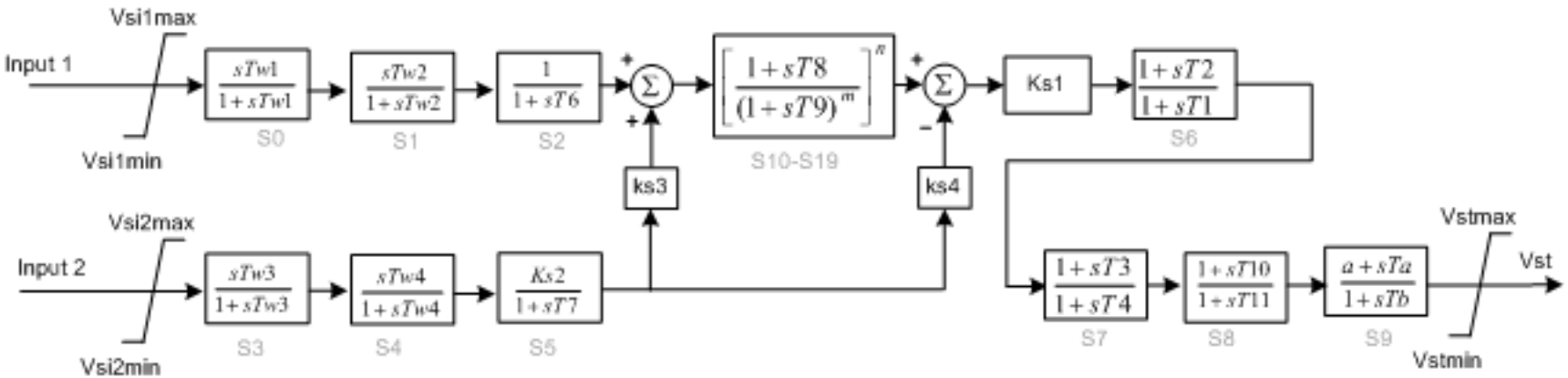
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



tr	0.0000	kff	1.0000	vrmin	-4.7000	klr	30.0000
kpa	20.9000	km	1.0000	vmult	1.0000	ts	0.0000
kia	53.2000	kg	1.0000	oelin	0.0000		
vamax	5.6000	tg	0.0400	ilr	3.7400		
vamin	-4.7000	vrmax	5.6000	kcl	1.0000		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

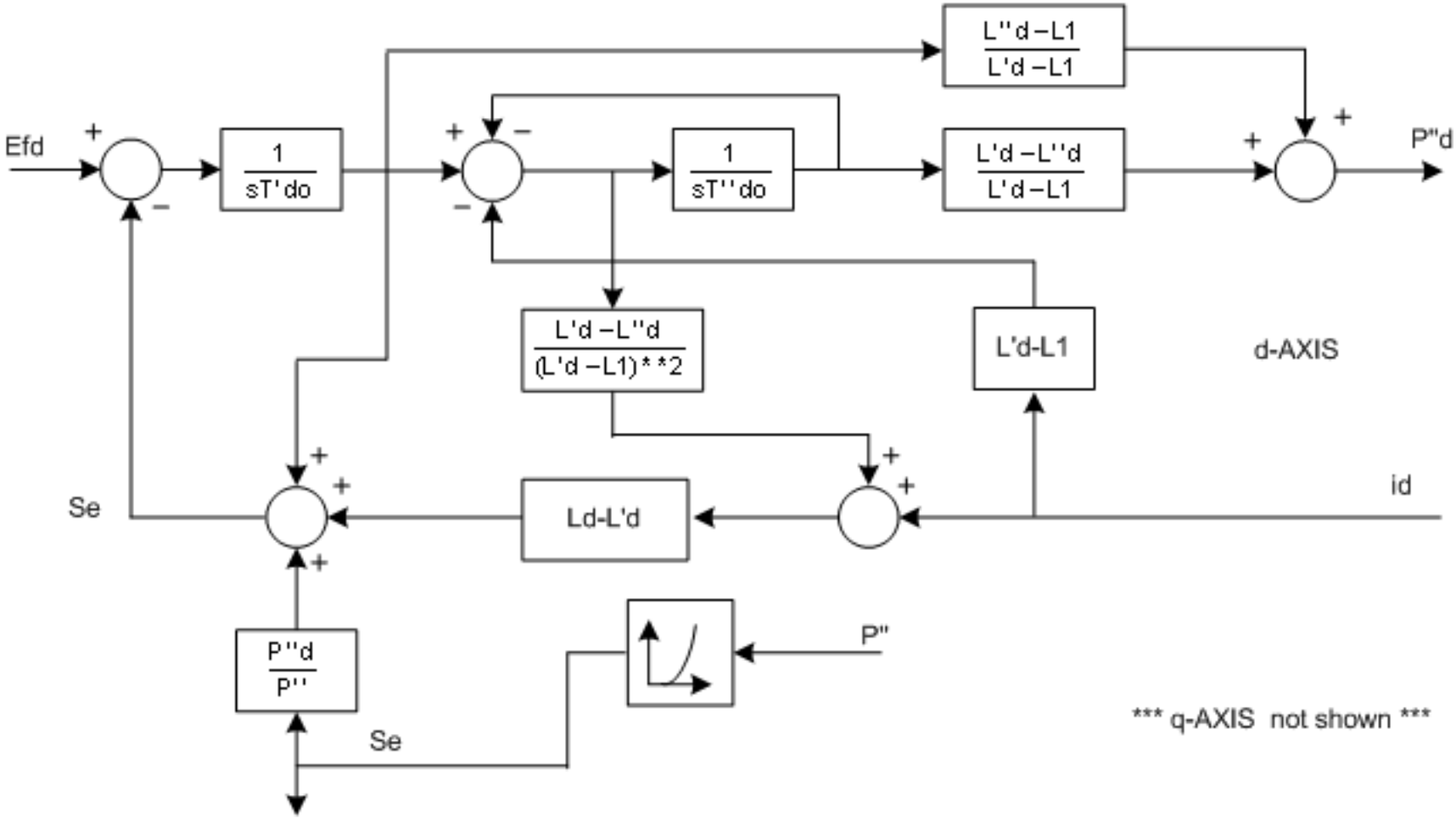
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



j1	1.0000	vsi1min	-0.5000	tw3	10.0000	ks3	1.0000	ks1	20.0000	t10	0.0000	ta	0.0000
k1	0.0000	tw1	10.0000	tw4	0.0000	t8	0.6000	t1	0.1400	t11	0.0000	tb	0.0000
j2	3.0000	tw2	10.0000	t6	0.0000	t9	0.1200	t2	0.0140	vstmax	0.1000	ks4	1.0000
k2	0.0000	vsi2max	2.0000	t7	10.0000	n	1.0000	t3	0.1400	vstmin	-0.1000		
vsi1max	0.5000	vsi2min	-2.0000	ks2	0.9600	m	5.0000	t4	0.0140	a	1.0000		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

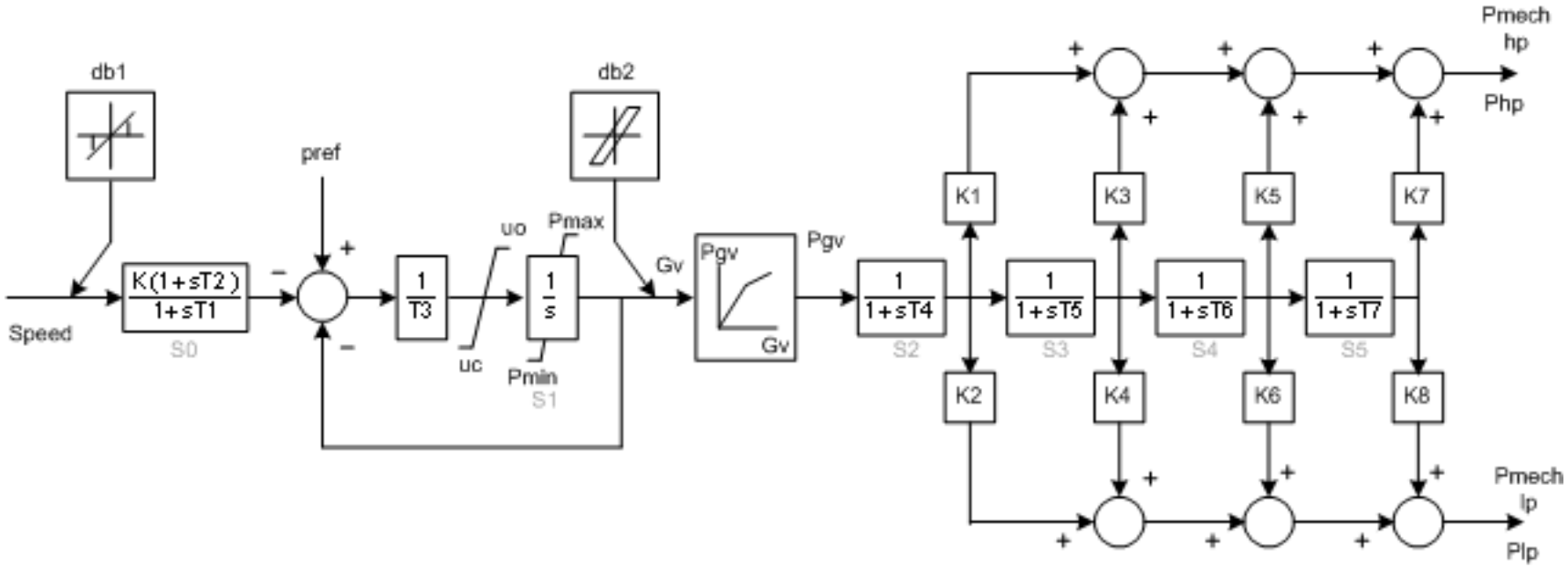
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



ld	2.7000	lppq	0.2090	tpqo	2.5000	d	1.0000
lpd	0.3010	ll	0.1660	tppqo	0.1500	rcomp	0.0000
lppd	0.2090	ra	0.0039	s1	0.0590	xcomp	0.0000
lq	2.5600	tpdo	6.7200	s12	0.2850	accel	0.0000
lpq	0.5410	tppdo	0.0430	h	2.3600		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

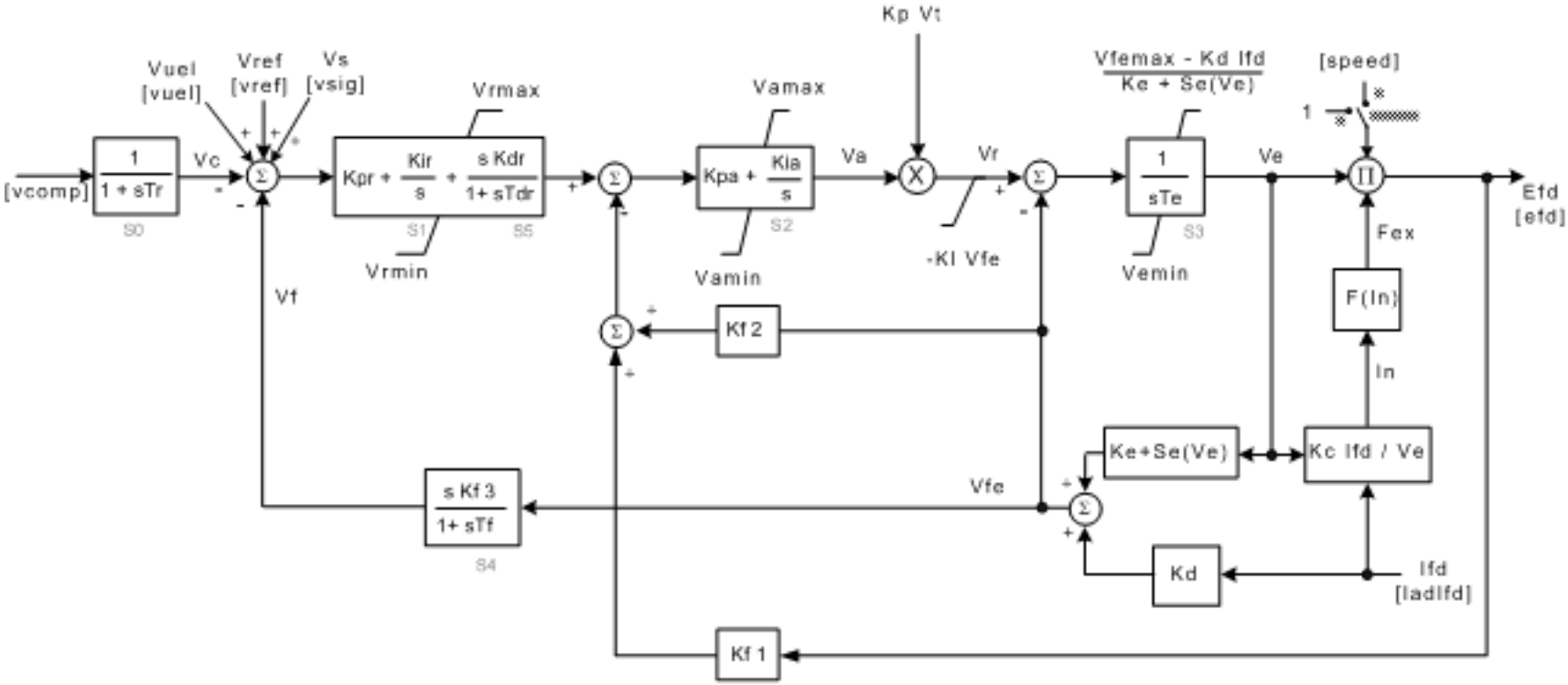
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



k	20.0000	uc	-0.1000	k2	0.0000	k5	0.0000	db1	0.0000	gv2	0.0000	pgv4	0.0000
t1	4.5000	pmax	1.0000	t5	0.1100	k6	0.0000	eps	0.0000	pgv2	0.0000	gv5	0.0000
t2	2.0000	pmin	0.0000	k3	0.4700	t7	0.0000	db2	0.0000	gv3	0.0000	pgv5	0.0000
t3	0.9390	t4	0.1000	k4	0.0000	k7	0.0000	gv1	0.0000	pgv3	0.0000	gv6	0.0000
uo	0.1000	k1	0.5300	t6	0.0000	k8	0.0000	pgv1	0.0000	gv4	0.0000	pgv6	0.0000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

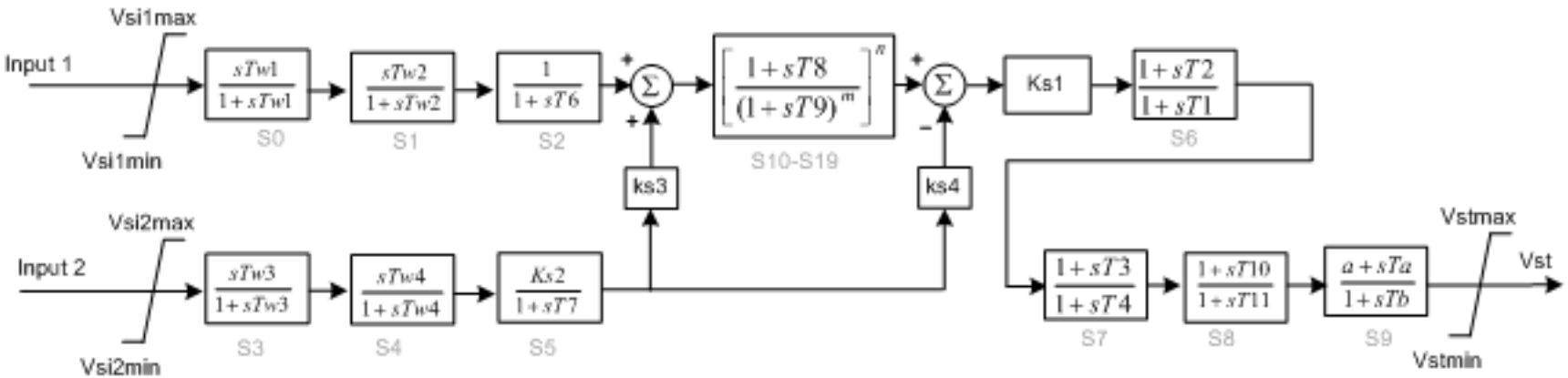
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



tr	0.0000	vrmax	15.7500	vamin	-28.2000	vemin	0.0000	kf2	1.0000	e2	12.9000
kpr	33.3000	vrmin	-15.7500	kp	0.0000	ke	1.0000	kf3	0.0000	se2	0.0090
kir	66.6000	kpa	2.0000	kl	10.0000	kc	0.7100	tf	1.0000	spdmlt	0.0000
kdr	0.0000	kia	10.0000	te	0.9500	kd	1.7800	e1	14.8000		
tdr	1.0000	vamax	35.3000	vfemax	15.7500	kf1	0.0000	se1	0.0600		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



j1	1.0000	vsi1min	-0.5000	tw3	10.0000	ks3	1.0000	ks1	5.0000	t10	0.1800	ta	0.0000
k1	0.0000	tw1	10.0000	tw4	0.0000	t8	0.6000	t1	0.2500	t11	0.0300	tb	0.0000
j2	3.0000	tw2	10.0000	t6	0.0000	t9	0.1200	t2	0.0400	vstmax	0.1000	ks4	1.0000
k2	0.0000	vsi2max	2.0000	t7	10.0000	n	1.0000	t3	0.2500	vstmin	-0.1000		
vsi1max	0.5000	vsi2min	-2.0000	ks2	2.1200	m	5.0000	t4	0.0400	a	1.0000		

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)

6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

ATTACHMENT C – Raw dyd-Format Dynamic Data

WILLOW PASS DYNAMIC DATA IN GE FORMAT

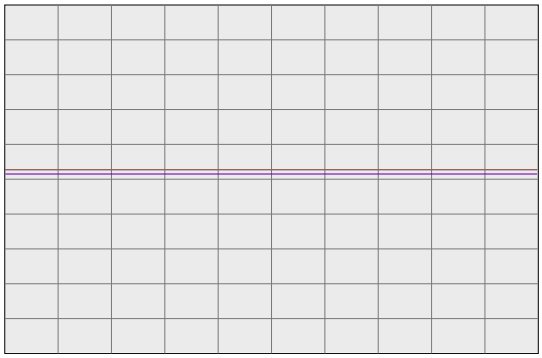
```
genrou   99991 "MIR_CT1 "  16.50 "1 " : #9 mva=285.0 10.48 0.048 1.164 0.079 5.21 1.0 2.364 2.302 0.3 0.491 0.224 0.192 0.114 0.489 0.00216 0 0
esst6b   99991 "MIR_CT1 "  16.50 "1 " : #9 0.0 20.9 53.2 5.6 -4.7 1 1 1 0.04 5.6 -4.7 1.0 0 3.74 1 30 0
pss2b    99991 "MIR_CT1 "  16.50 "1 " : #9 1 0 3 0 0.5 -0.5 10 10 2.0 -2.0 10 0 0 10 0.96 1.0 0.6 0.12 1 5 20 0.14 0.014 0.14 0.014 0 0 0.1 -0.1 1 0 0 1
ggov1    99991 "MIR_CT1 "  16.50 "1 " : #9 mwcap=242.0 0.004 1 0.10 0.05 -0.05 18.4 3.1 0 1.0 1.0 0.1 0.3 1.24 0.196 0.59 0 0 0 3.0 2.0 0.67 10 0 0.1 -0.1 0 0 9999 100 0 0 1.0 1.0 99 -99
#
genrou   99992 "MIR_ST1 "  13.80 "2 " : #9 mva=83.2 6.72 0.043 2.5 0.15 2.36 1.0 2.7 2.56 0.301 0.541 0.209 0.166 0.059 0.285 0.0039 0 0
esac7b   99992 "MIR_ST1 "  13.80 "2 " : #9 0.0 33.3 66.6 0 1.0 15.75 -15.75 2.0 10.0 35.3 -28.2 0 10.0 0.95 15.75 0 1.0 0.71 1.78 0 1.0 0 1.0 14.8 0.06 12.9 0.009
pss2b    99992 "MIR_ST1 "  13.80 "2 " : #9 1 0 3 0 0.5 -0.5 10 10 2.0 -2.0 10 0 0 10 2.12 1.0 0.6 0.12 1 5 5 0.25 0.04 0.25 0.04 0.18 0.03 0.1 -0.1 1 0 0 1
ieeeg1   99992 "MIR_ST1 "  13.80 "2 " : #9 mwcap=72 20.0 4.5 2.0 0.939 0.1 -0.1 1.0 0 0.1 0.53 0 0.11 0.47 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#
genrou   99993 "MIR_CT2 "  16.50 "3 " : #9 mva=285.0 10.48 0.048 1.164 0.079 5.21 1.0 2.364 2.302 0.3 0.491 0.224 0.192 0.114 0.489 0.00216 0 0
esst6b   99993 "MIR_CT2 "  16.50 "3 " : #9 0.0 20.9 53.2 5.6 -4.7 1 1 1 0.04 5.6 -4.7 1.0 0 3.74 1 30 0
pss2b    99993 "MIR_CT2 "  16.50 "3 " : #9 1 0 3 0 0.5 -0.5 10 10 2.0 -2.0 10 0 0 10 0.96 1.0 0.6 0.12 1 5 20 0.14 0.014 0.14 0.014 0 0 0.1 -0.1 1 0 0 1
ggov1    99993 "MIR_CT2 "  16.50 "3 " : #9 mwcap=242.0 0.004 1 0.10 0.05 -0.05 18.4 3.1 0 1.0 1.0 0.1 0.3 1.24 0.196 0.59 0 0 0 3.0 2.0 0.67 10 0 0.1 -0.1 0 0 9999 100 0 0 1.0 1.0 99 -99
#
genrou   99994 "MIR_ST2 "  13.80 "4 " : #9 mva=83.2 6.72 0.043 2.5 0.15 2.36 1.0 2.7 2.56 0.301 0.541 0.209 0.166 0.059 0.285 0.0039 0 0
esac7b   99994 "MIR_ST2 "  13.80 "4 " : #9 0.0 33.3 66.6 0 1.0 15.75 -15.75 2.0 10.0 35.3 -28.2 0 10.0 0.95 15.75 0 1.0 0.71 1.78 0 1.0 0 1.0 14.8 0.06 12.9 0.009
pss2b    99994 "MIR_ST2 "  13.80 "4 " : #9 1 0 3 0 0.5 -0.5 10 10 2.0 -2.0 10 0 0 10 2.12 1.0 0.6 0.12 1 5 5 0.25 0.04 0.25 0.04 0.18 0.03 0.1 -0.1 1 0 0 1
ieeeg1   99994 "MIR_ST2 "  13.80 "4 " : #9 mwcap=72 20.0 4.5 2.0 0.939 0.1 -0.1 1.0 0 0.1 0.53 0 0.11 0.47 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

ATTACHMENT D1 – Category A Transient Stability Plots

WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

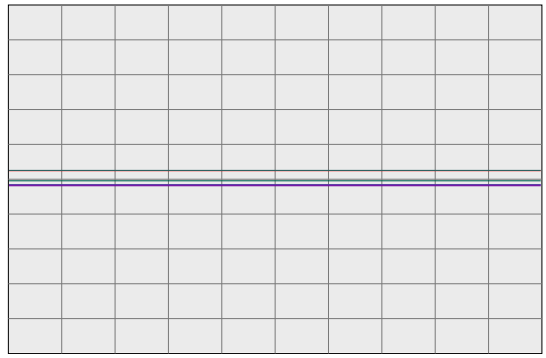
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

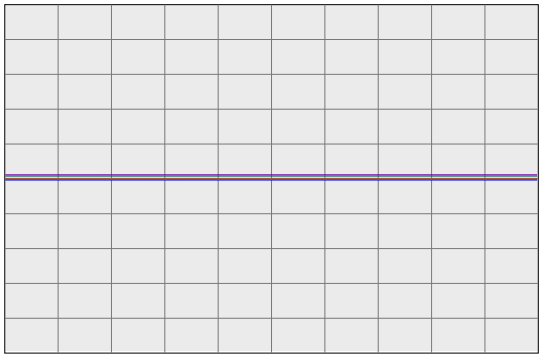
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

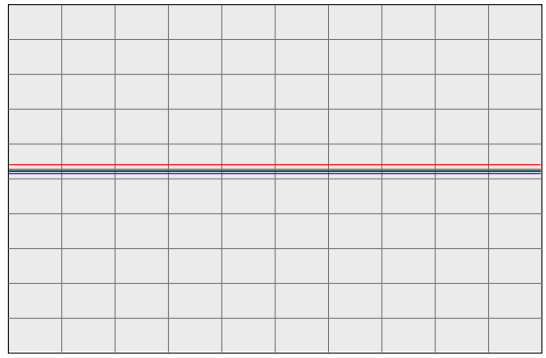
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

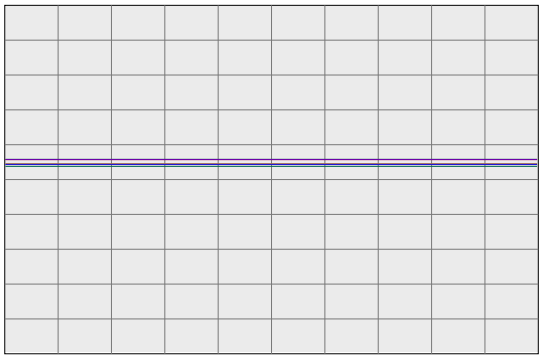
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

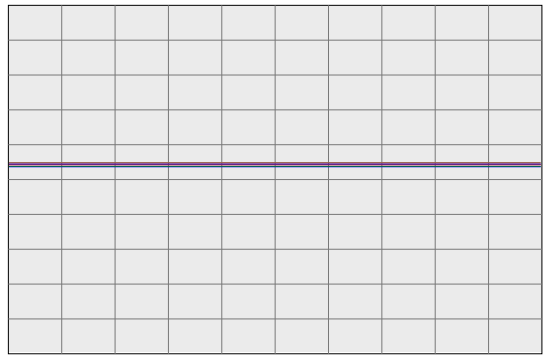
0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



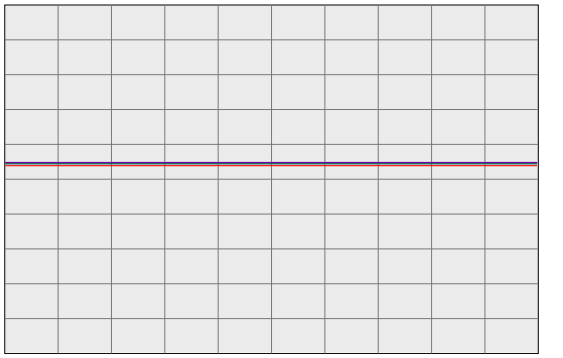
0.0 20.0

Time(sec)

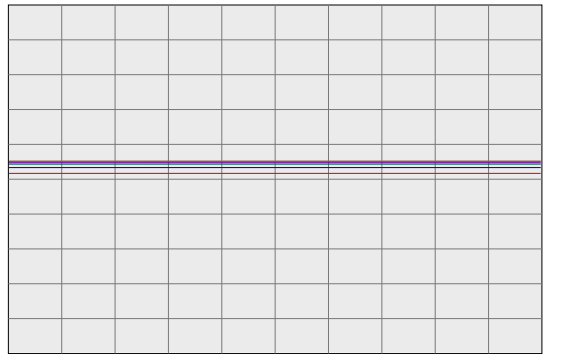
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

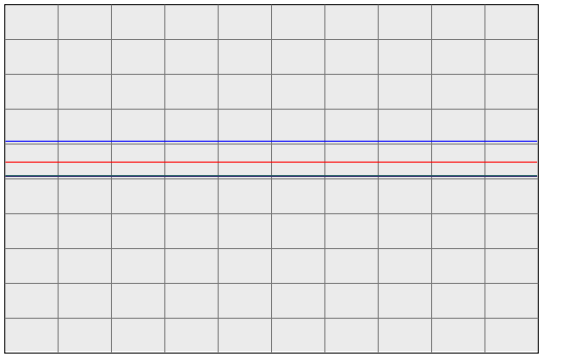
230-KV SYSTEM VOLTAGES



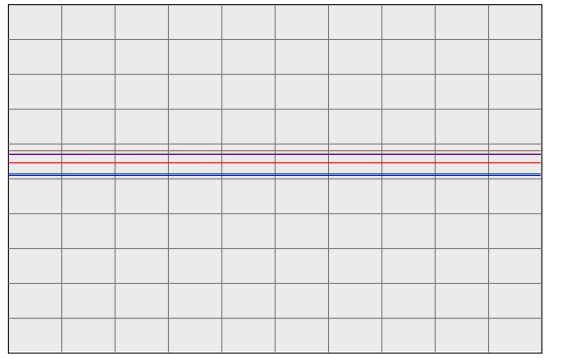
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



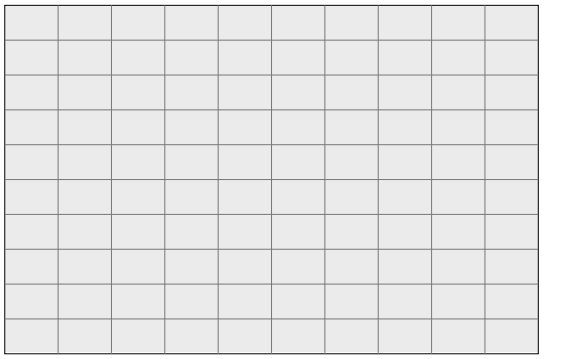
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

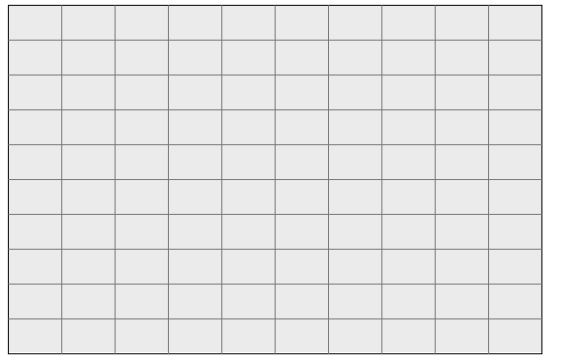


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



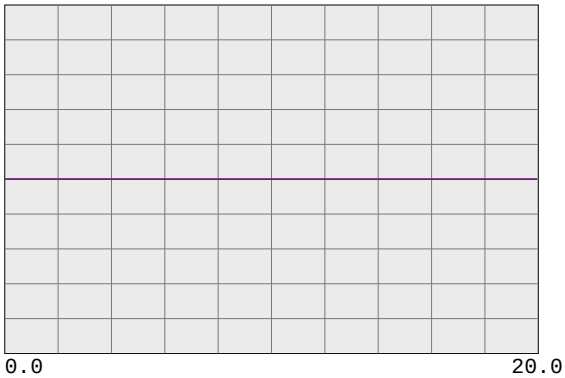
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



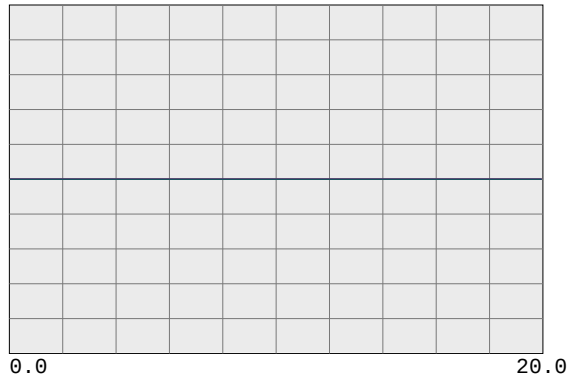


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

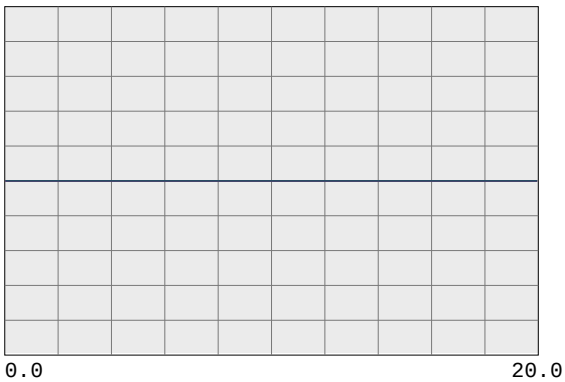
230-KV SYSTEM FREQUENCIES



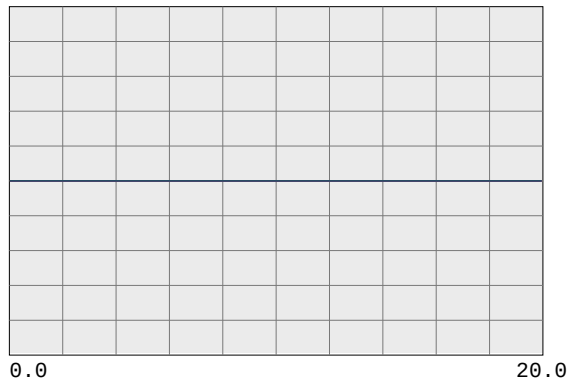
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



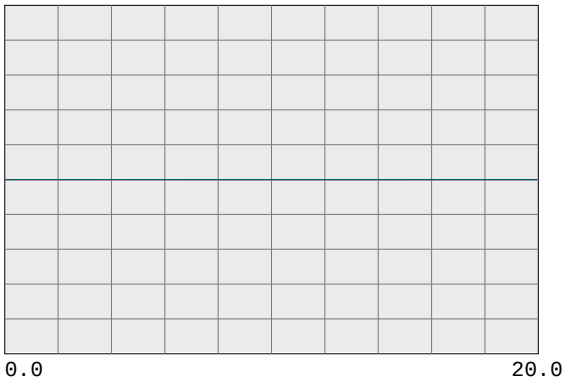
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



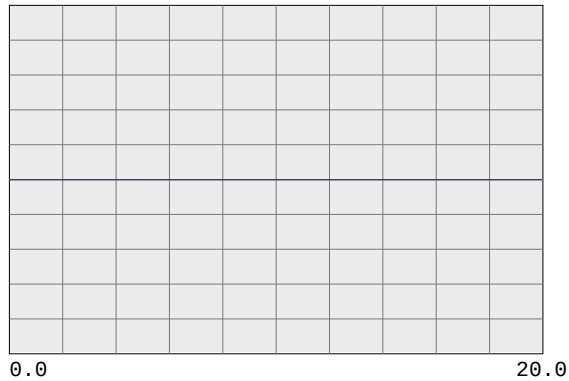
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



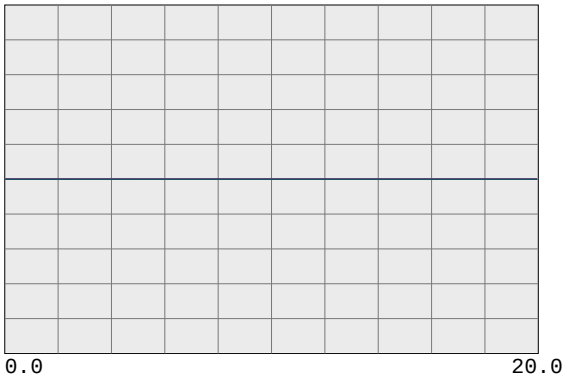
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



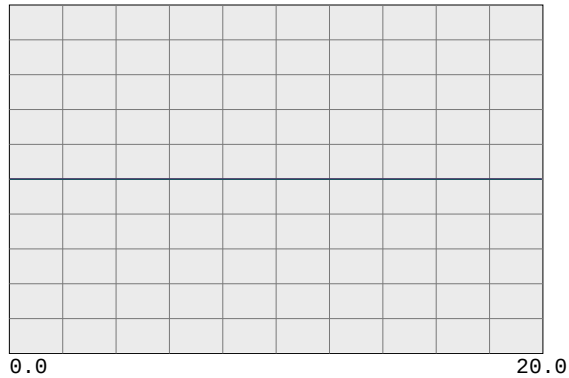
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

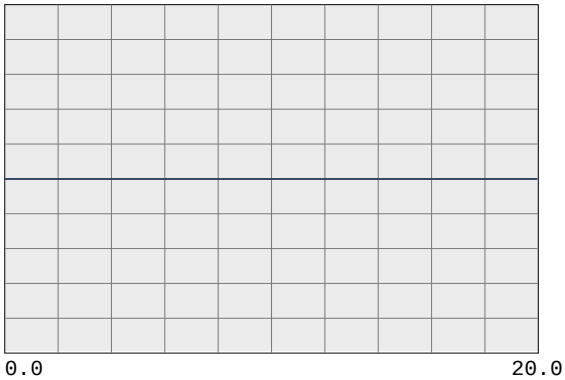
230-KV SYSTEM FREQUENCIES



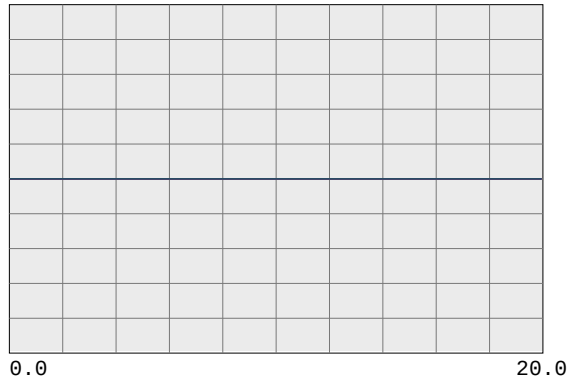
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



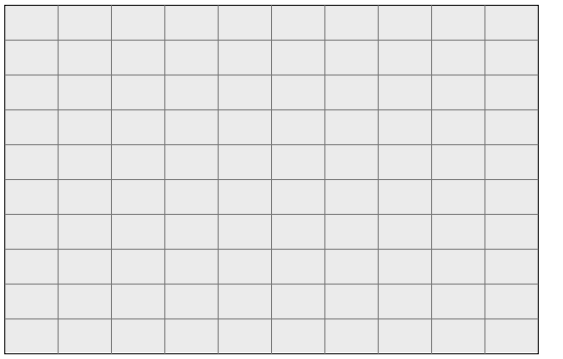
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

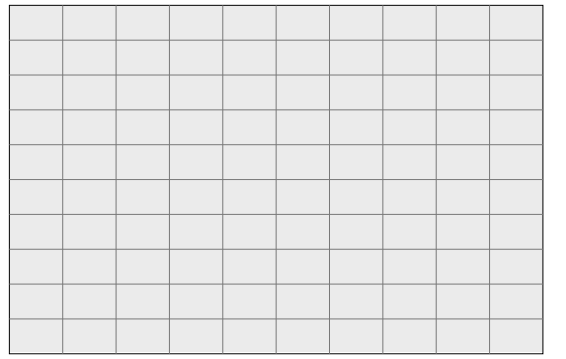


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



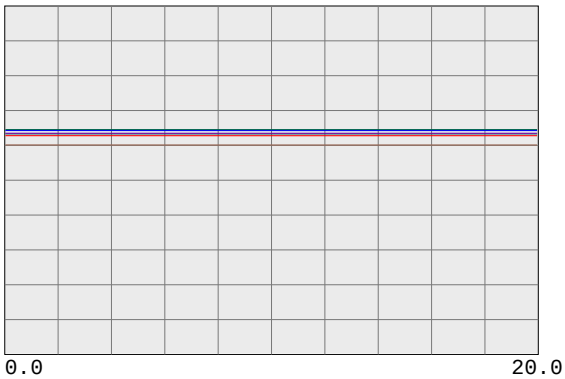
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



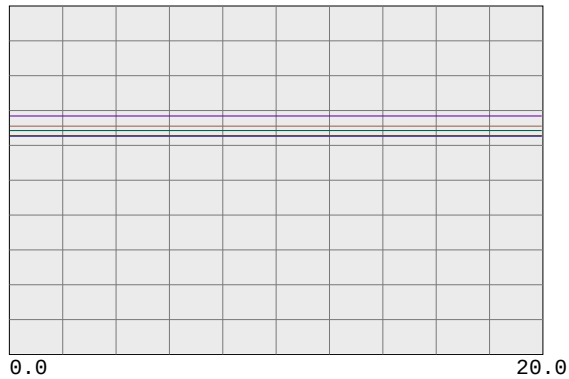


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

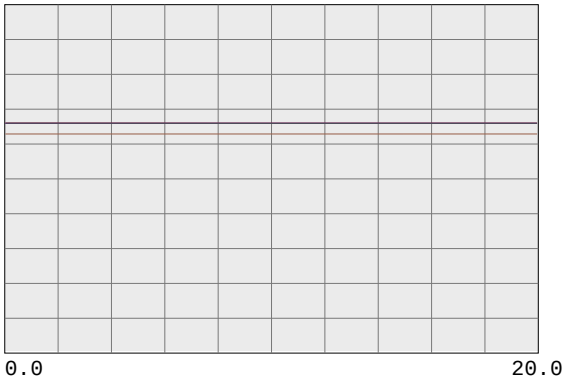
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



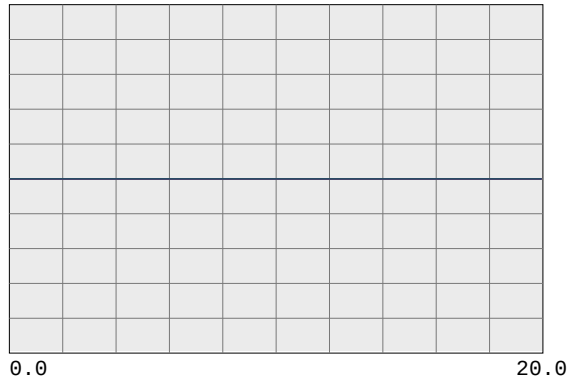
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



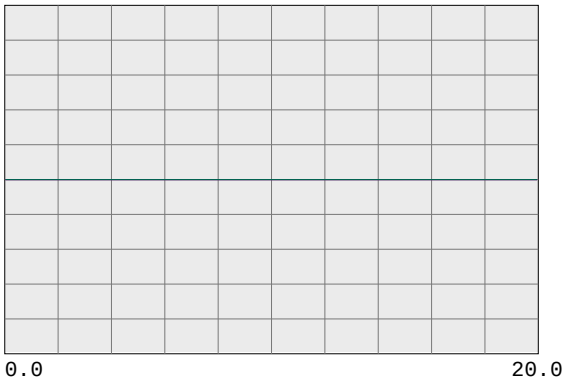
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



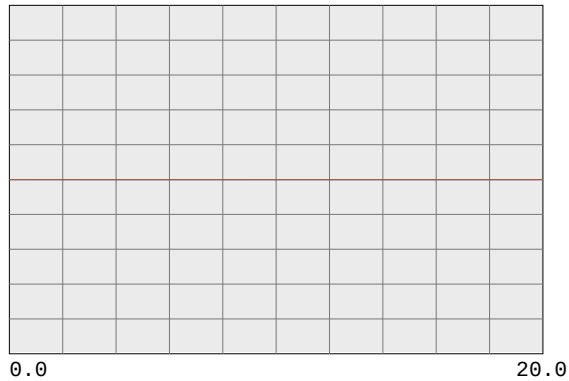
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



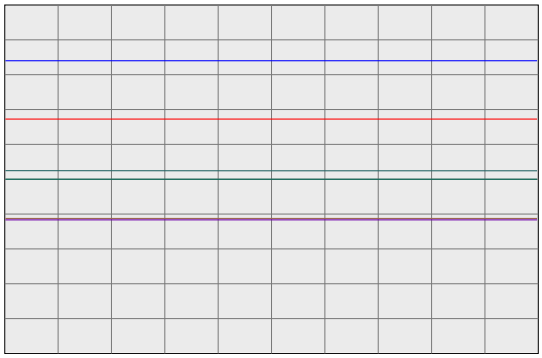
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



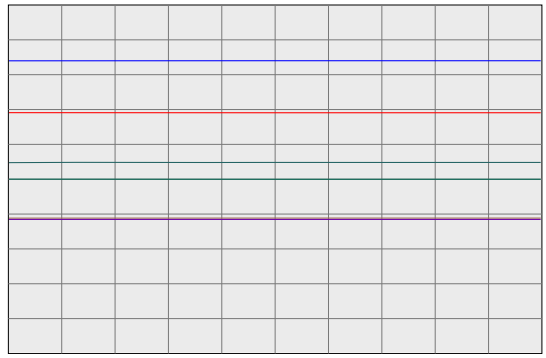
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

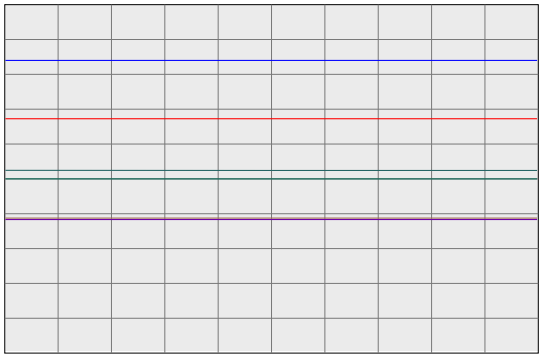
WILLOW PASS GENERATION PLANT



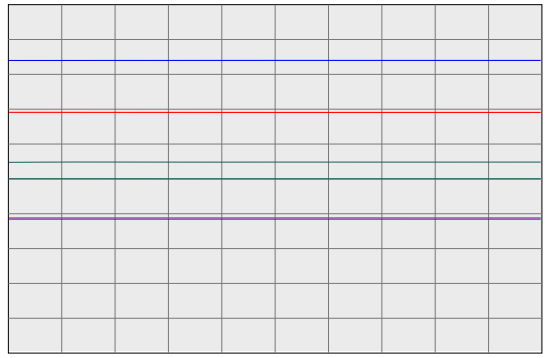
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



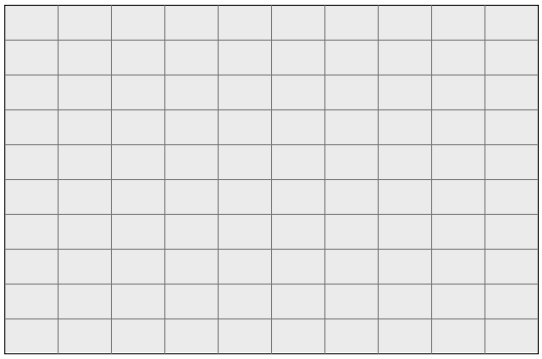
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

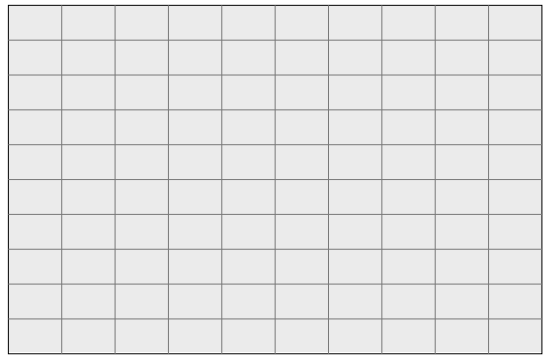


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100

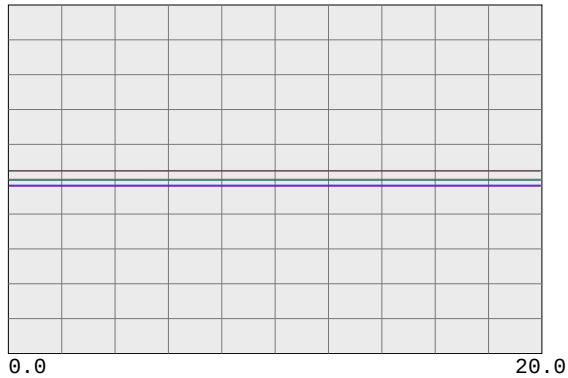




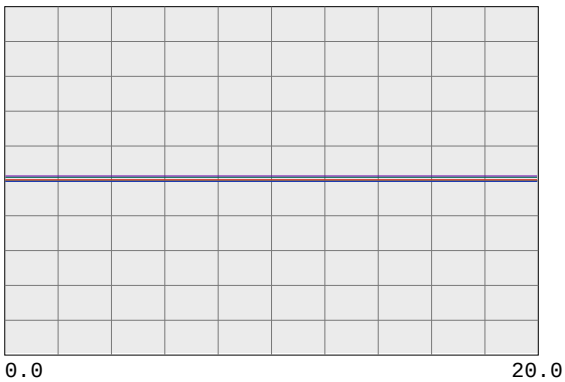
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM VOLTAGES

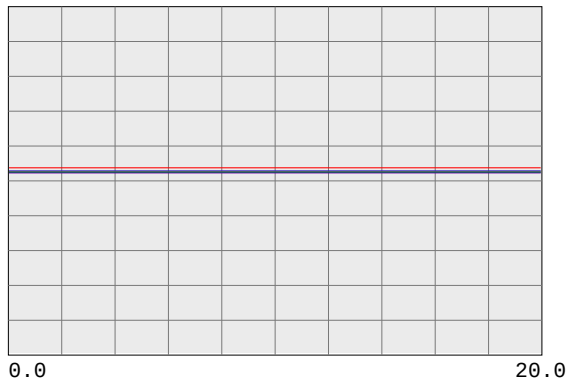
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



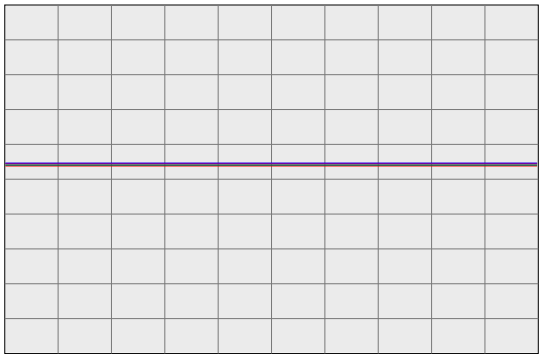
0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

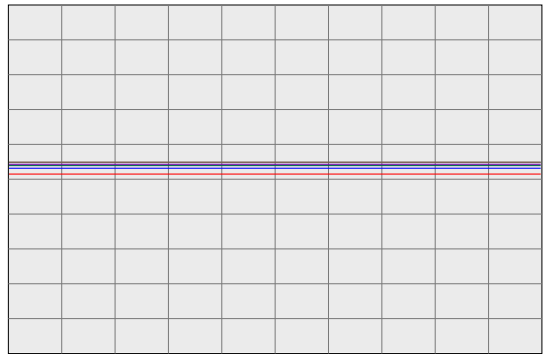
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

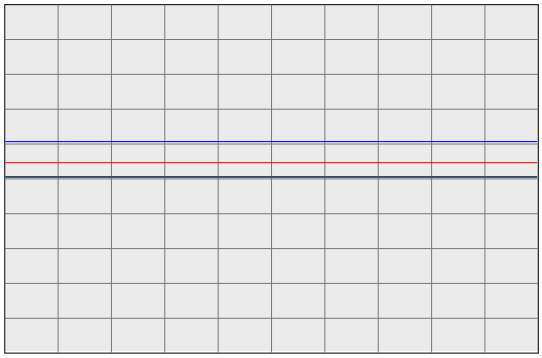
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

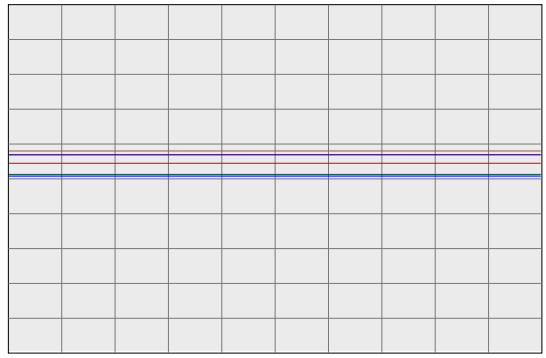
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

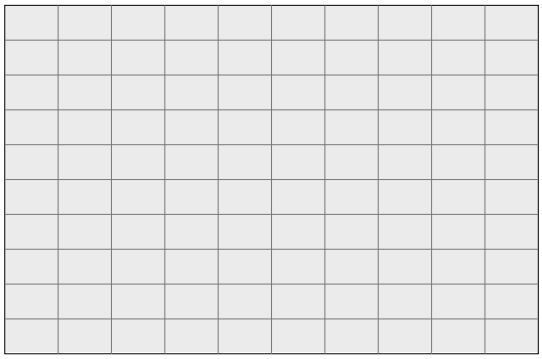
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

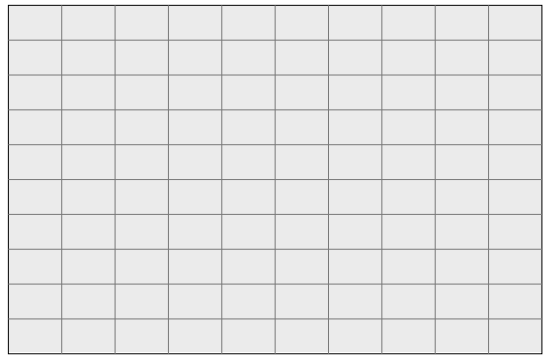


0.0 20.0

Time(sec)

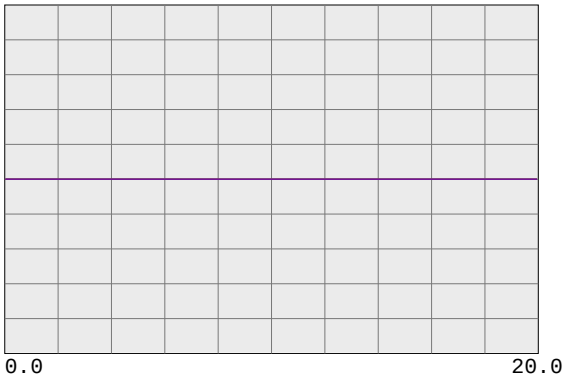
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



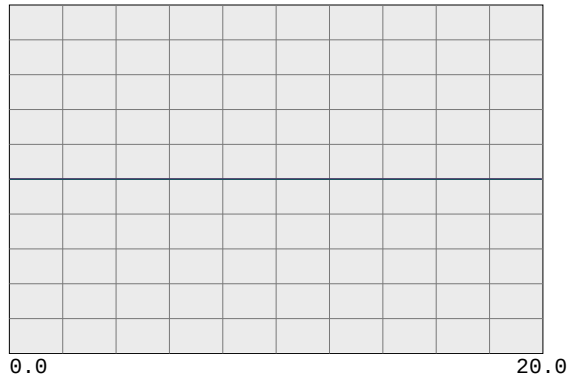


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

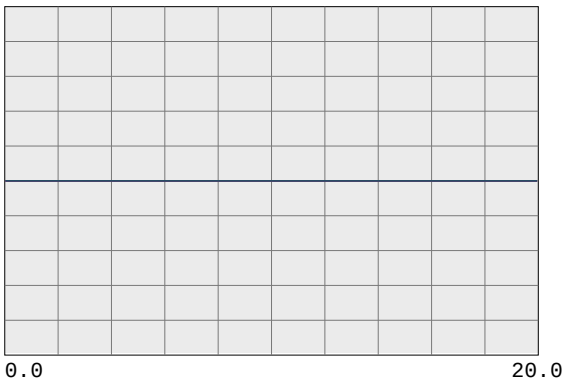
230-KV SYSTEM FREQUENCIES



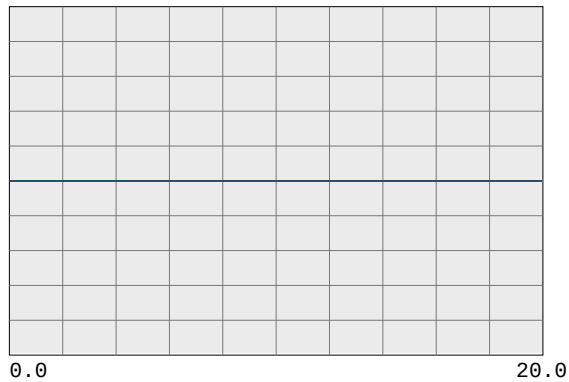
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



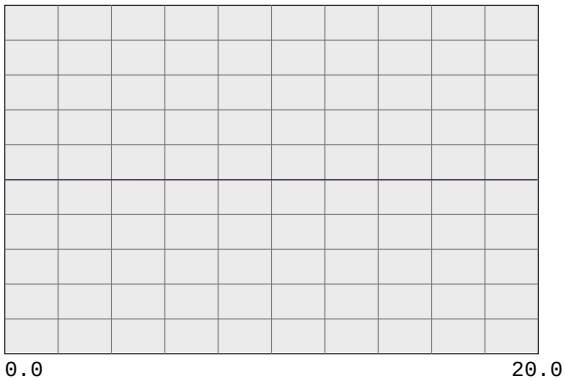
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



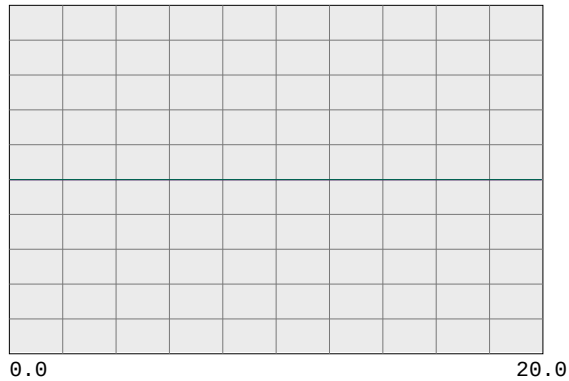
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

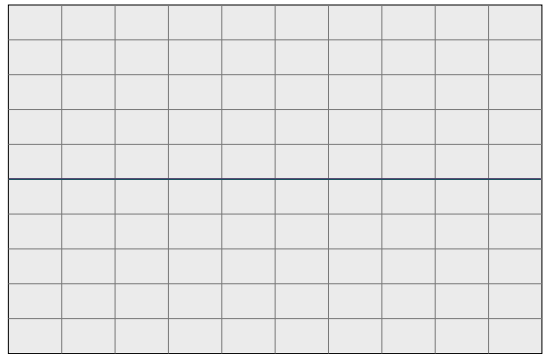
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

0.0 20.0

Time(sec)

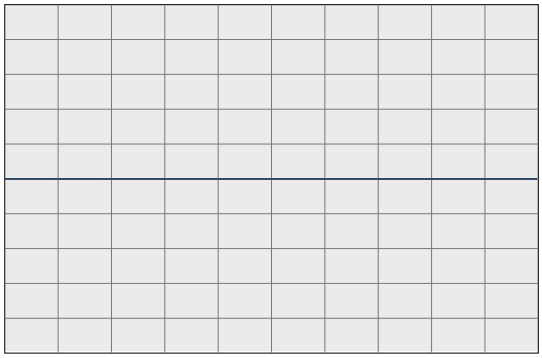
59.4000	fbus	30716	TRAN230A	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2	230.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

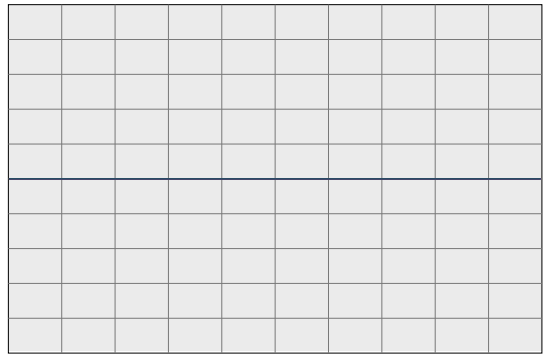
59.4000	fbul	30505	WEBER	230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC	230.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

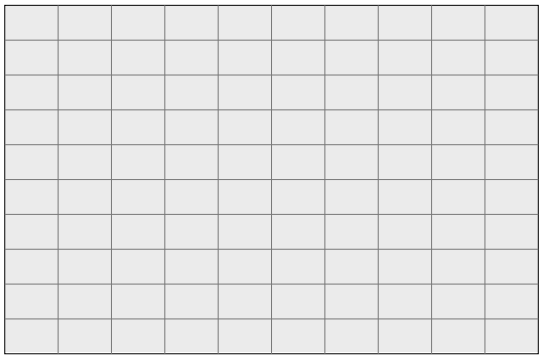
59.4000	fbus	30503	COLLERVL	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H	230.0	0	0.0	1	1	60.6000

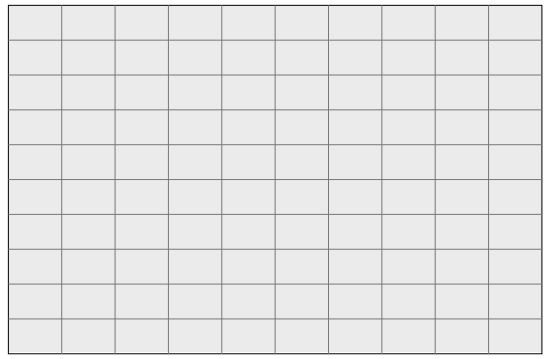


0.0 20.0

Time(sec)

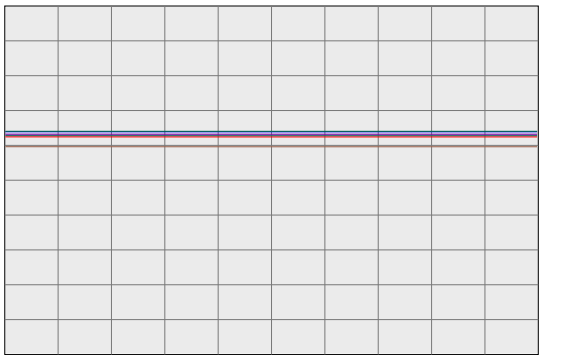
59.4000	fbus	30495	STAGG	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK	230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD	230.0	0	0.0	1	1	60.6000



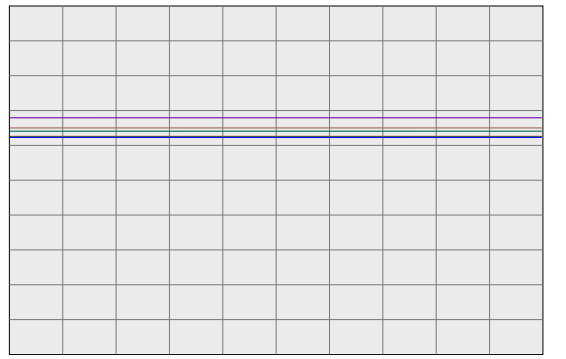


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

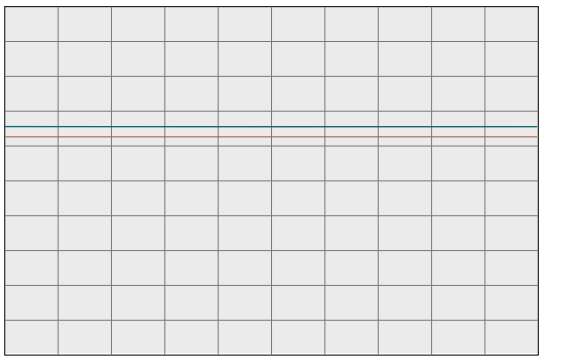
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



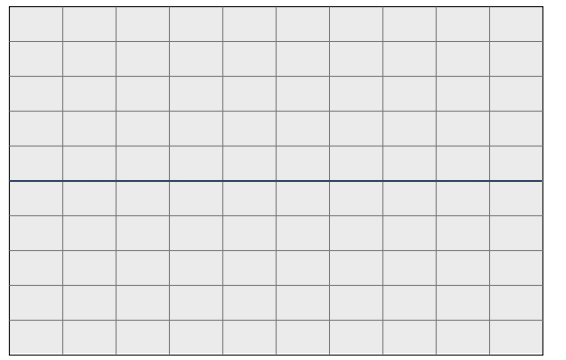
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



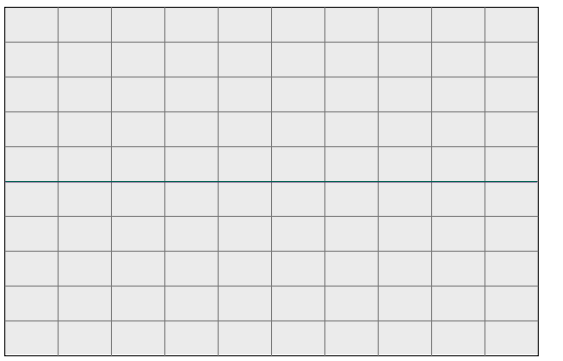
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

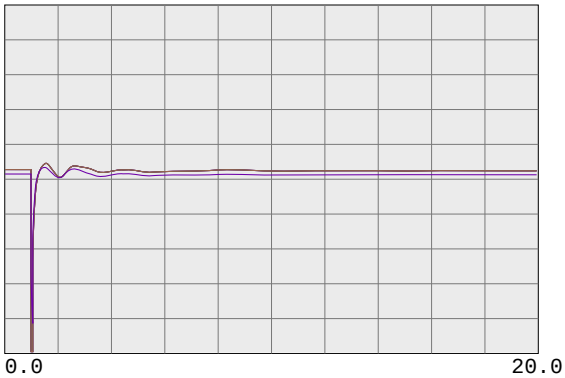
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

ATTACHMENT D2 – Category B Transient Stability Plots

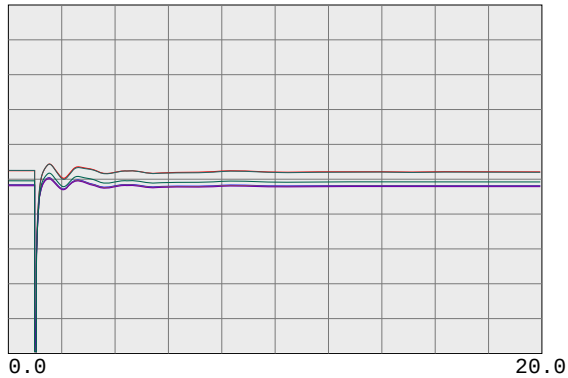
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

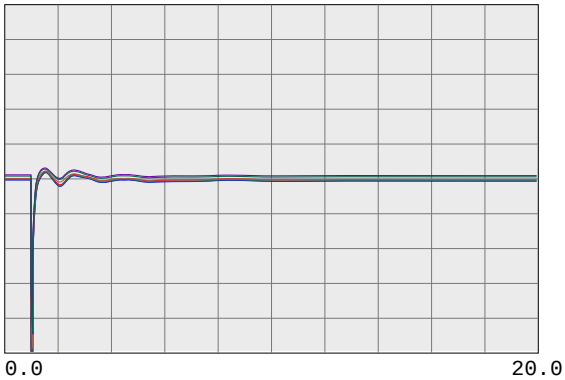
230-KV SYSTEM VOLTAGES



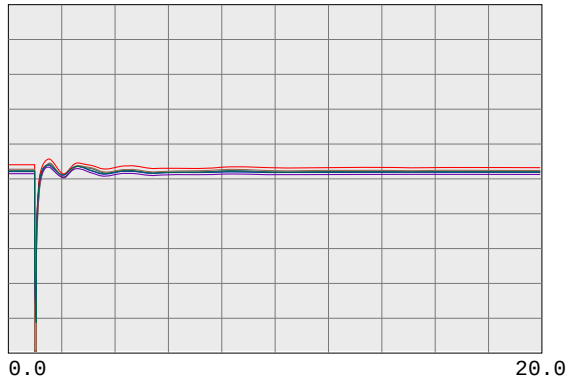
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



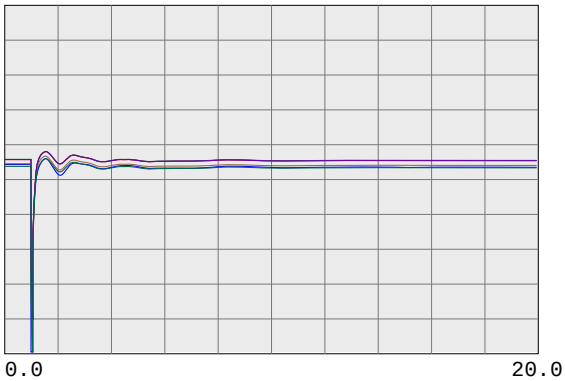
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



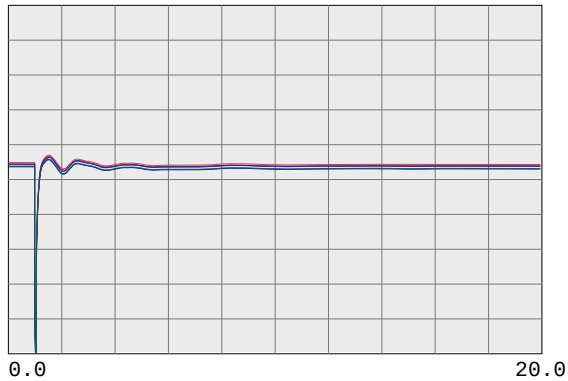
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



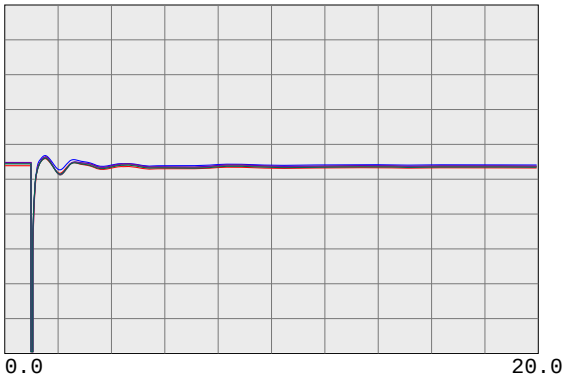
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



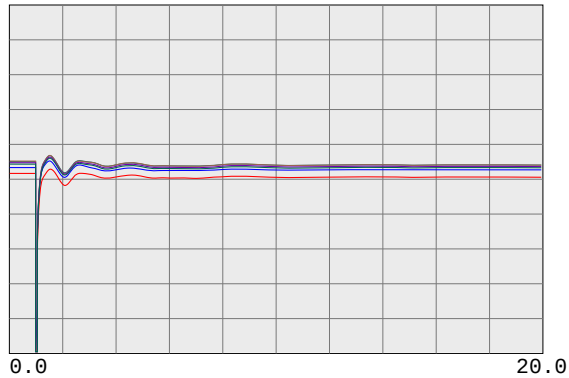
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

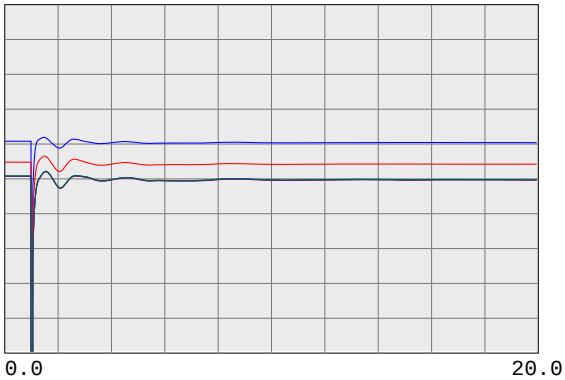
230-KV SYSTEM VOLTAGES



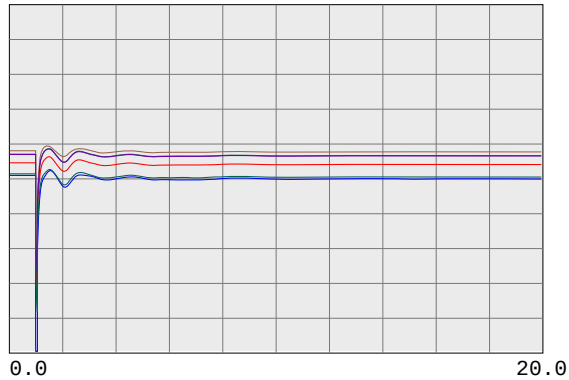
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



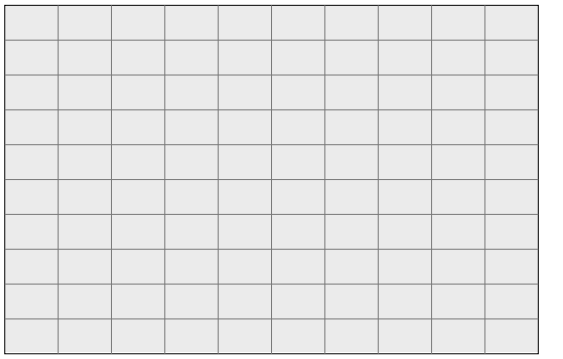
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

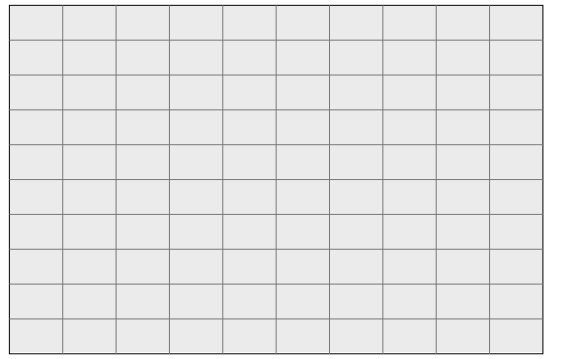


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



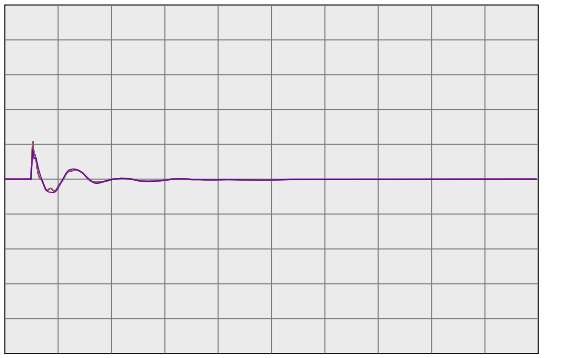
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



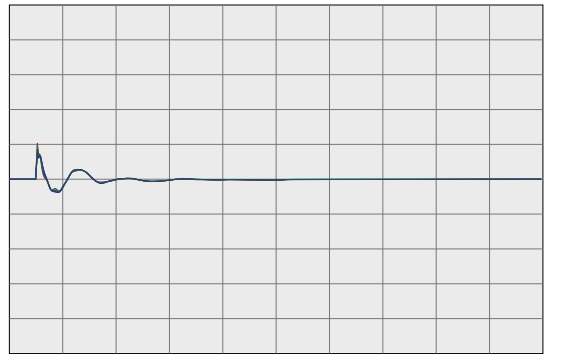


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

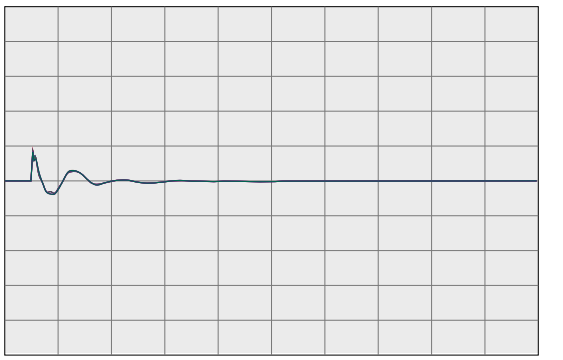
230-KV SYSTEM FREQUENCIES



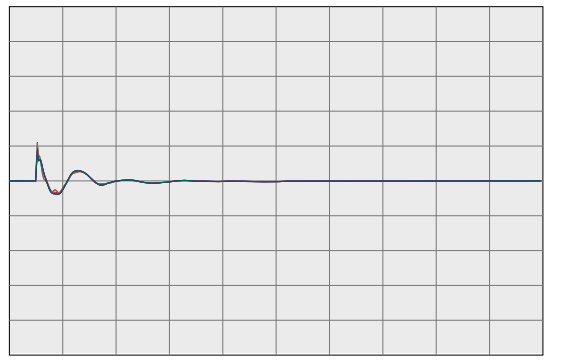
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



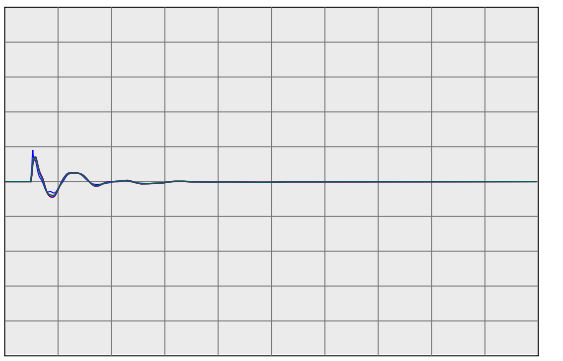
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



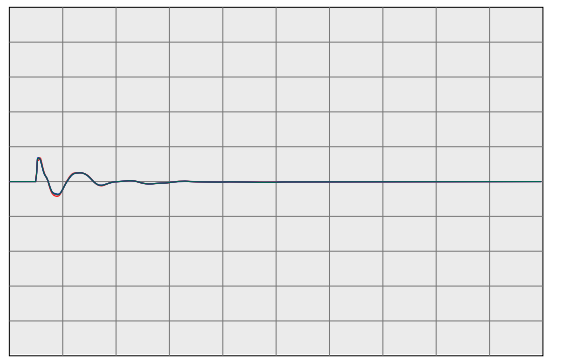
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



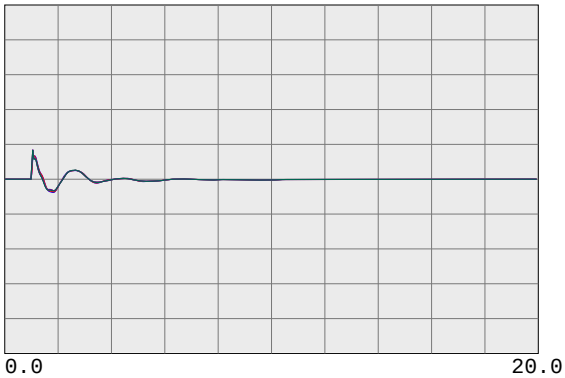
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



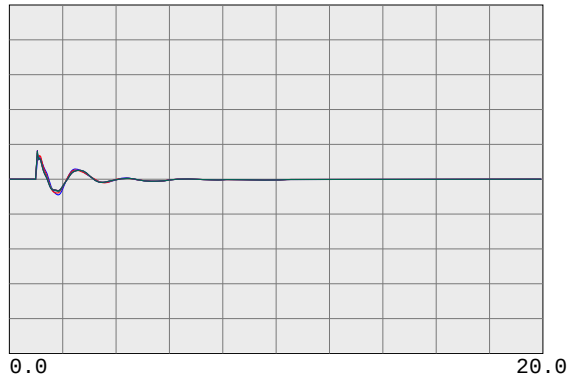
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

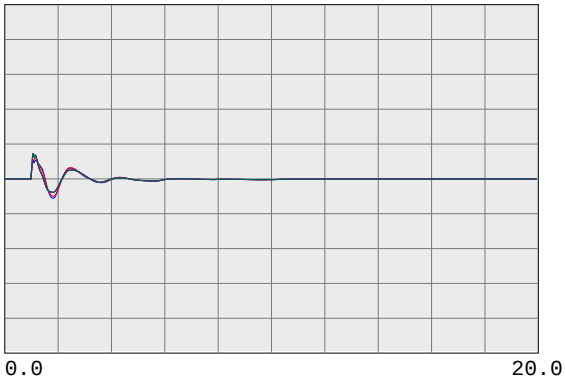
230-KV SYSTEM FREQUENCIES



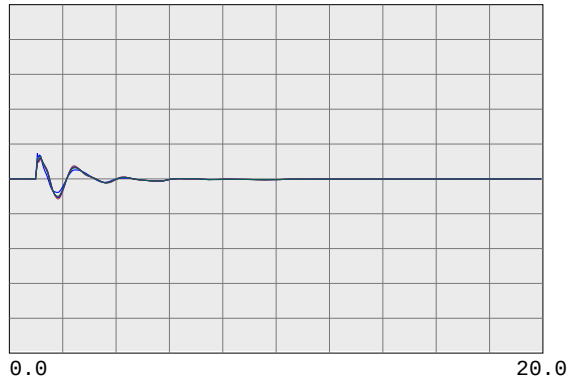
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



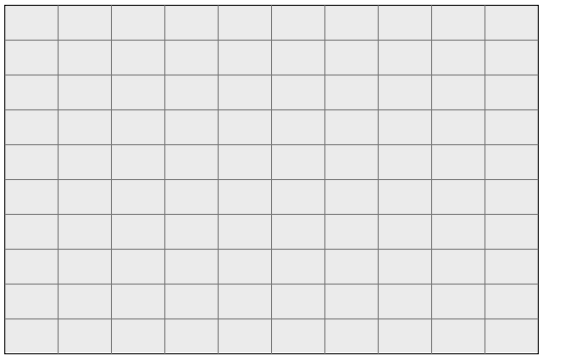
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

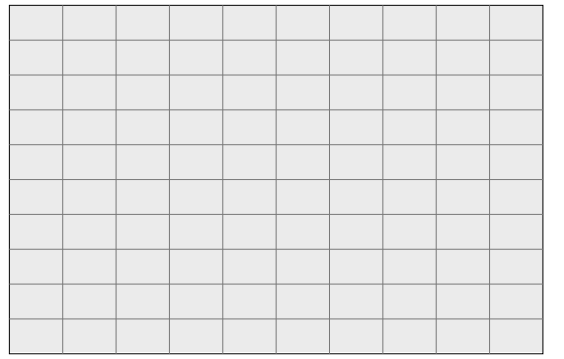


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



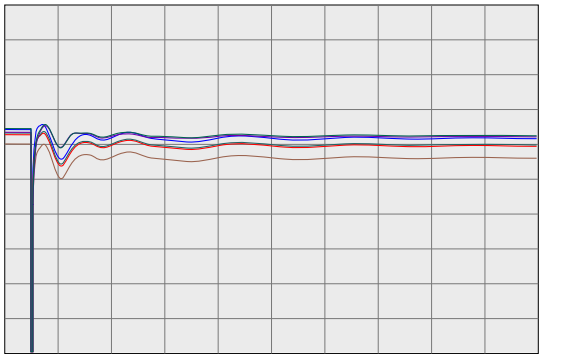
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



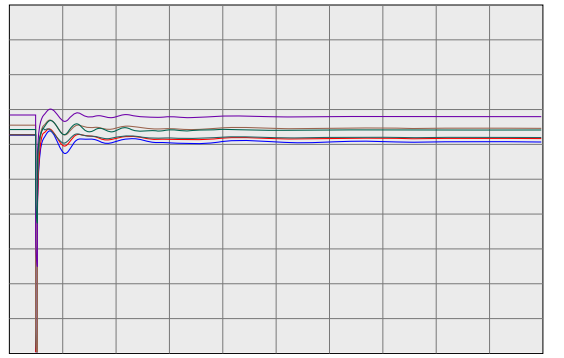


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

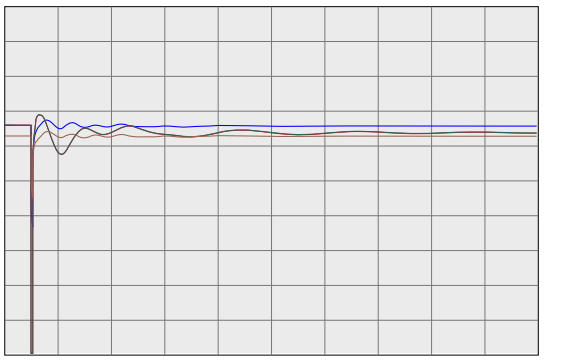
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



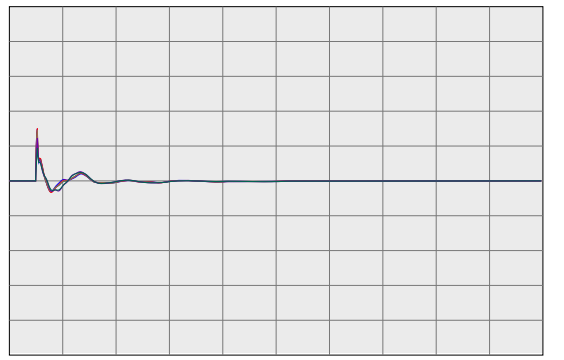
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



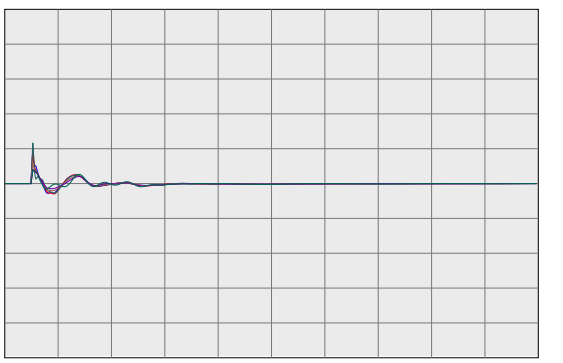
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



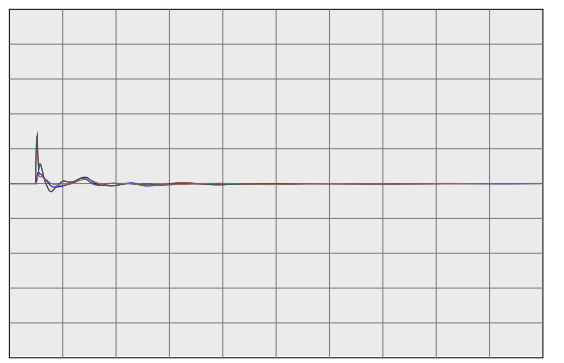
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



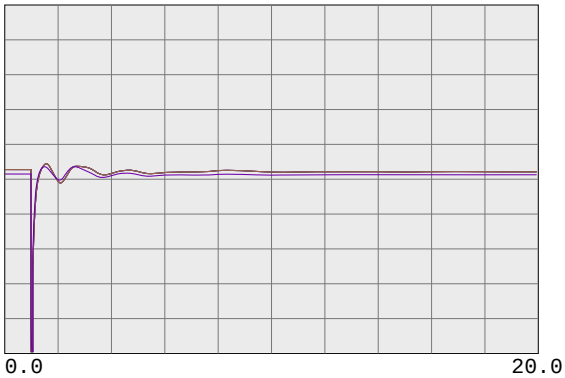
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

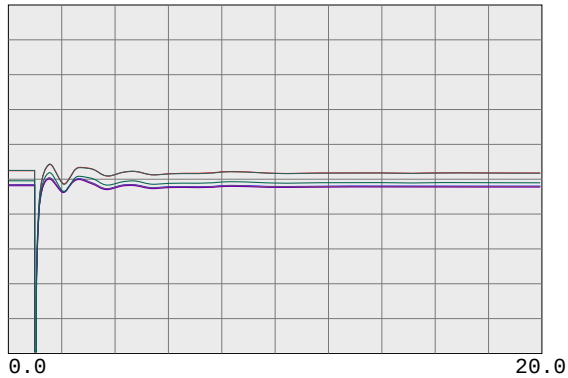
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

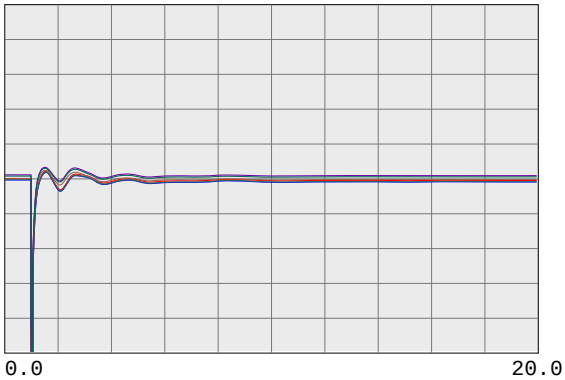
230-KV SYSTEM VOLTAGES



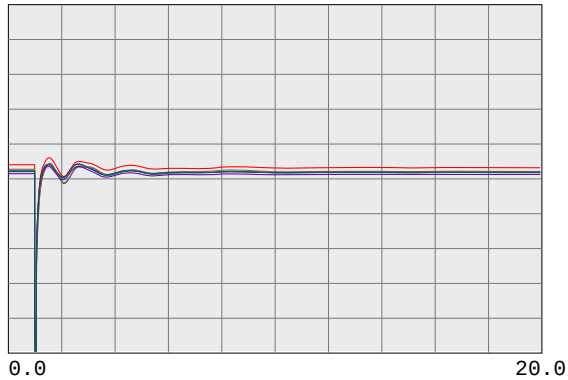
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



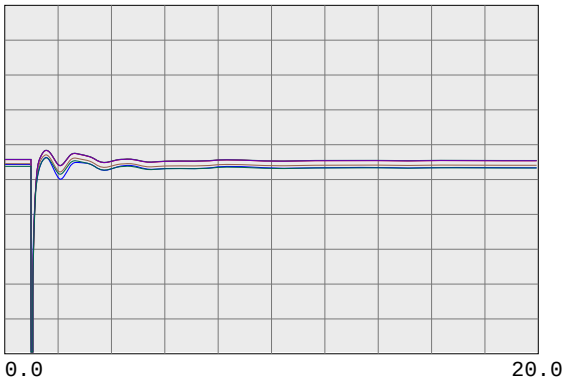
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



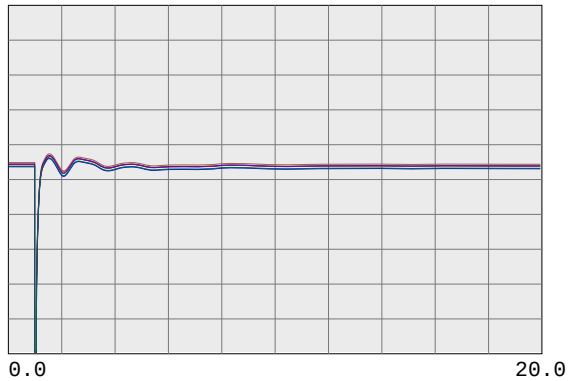
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



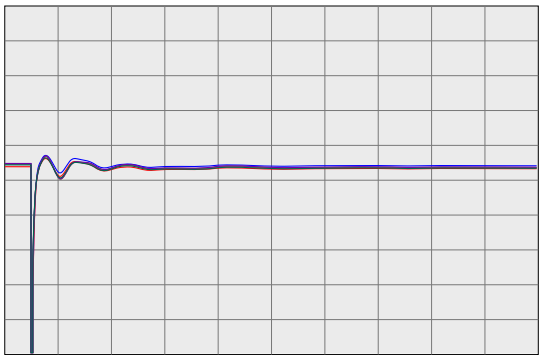
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

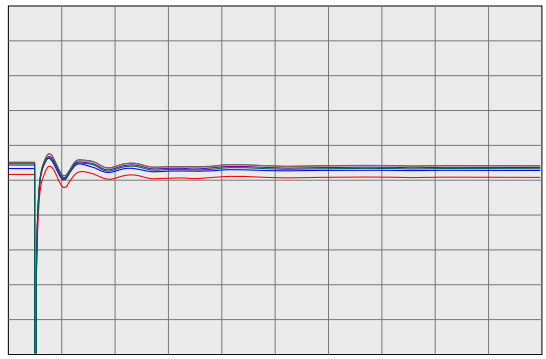
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

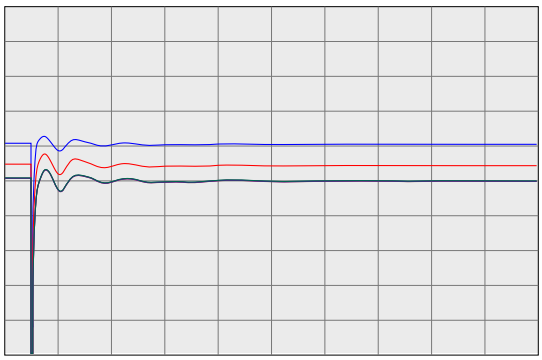
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

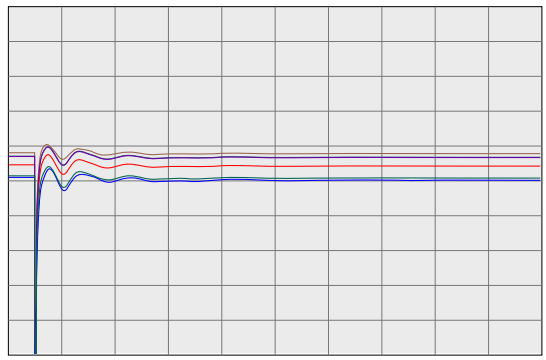
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

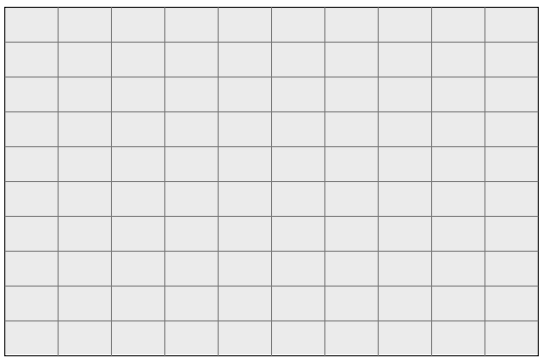
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

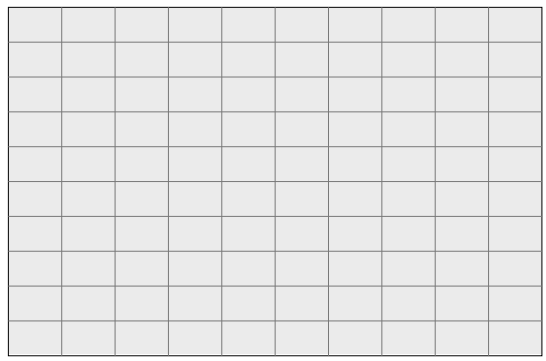


0.0 20.0

Time(sec)

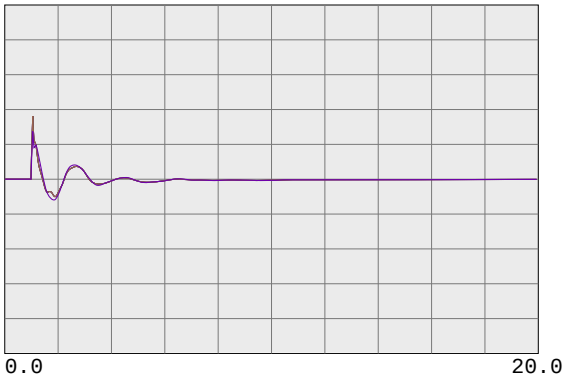
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



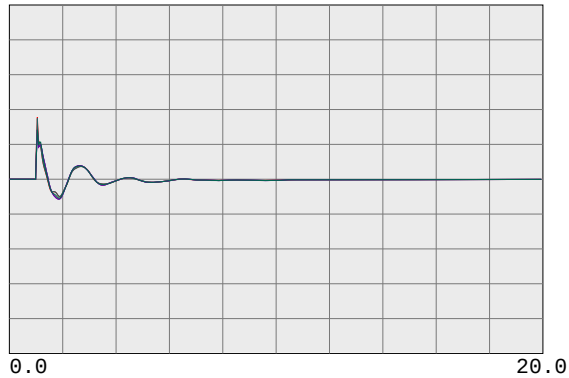


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

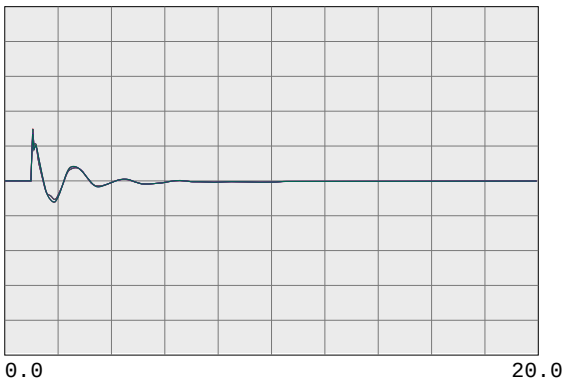
230-KV SYSTEM FREQUENCIES



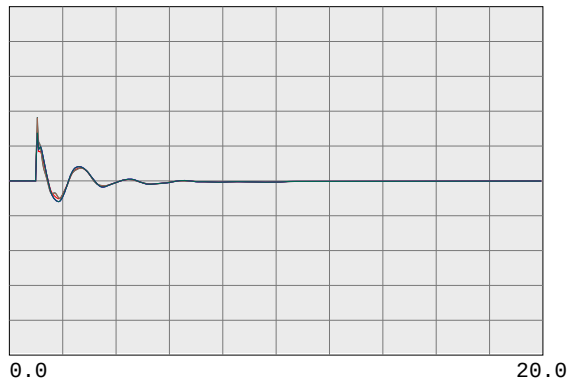
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



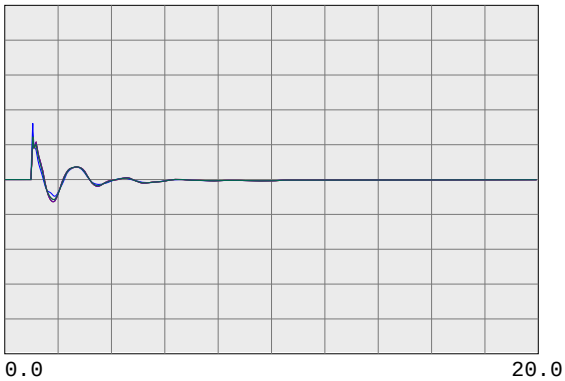
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



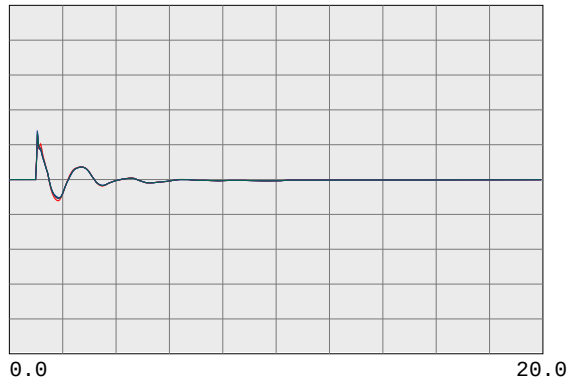
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



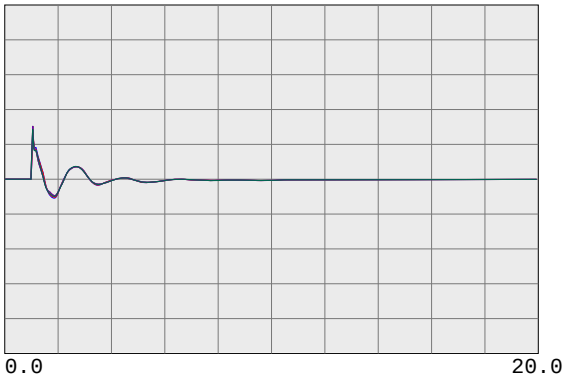
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



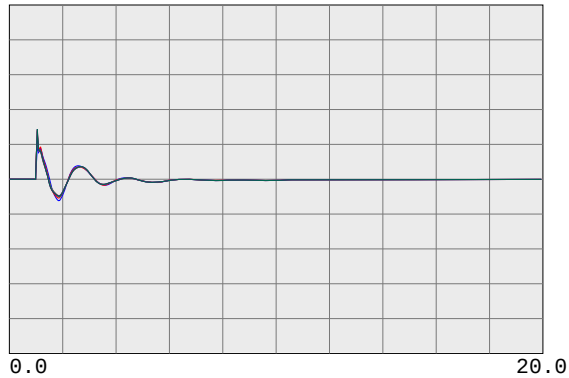
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

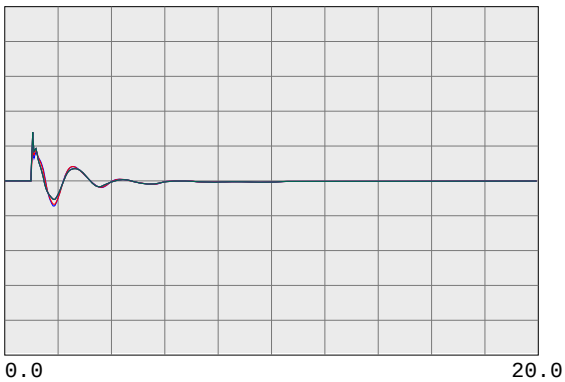
230-KV SYSTEM FREQUENCIES



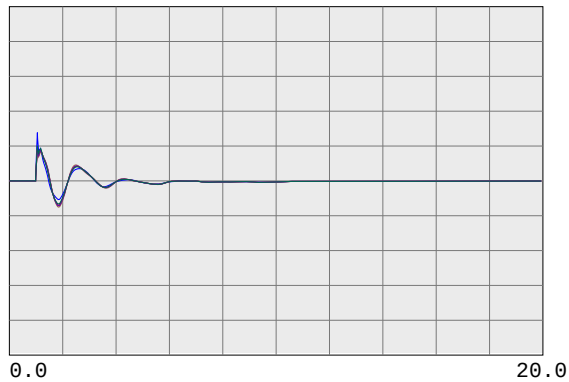
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



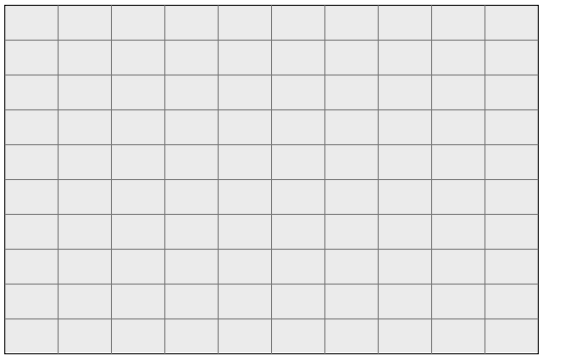
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

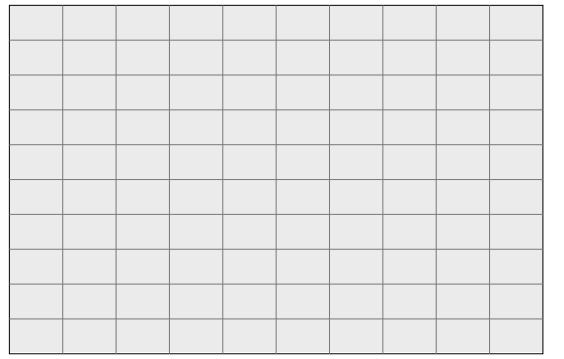


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



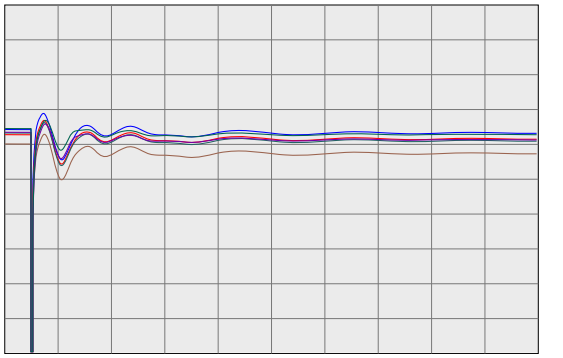
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



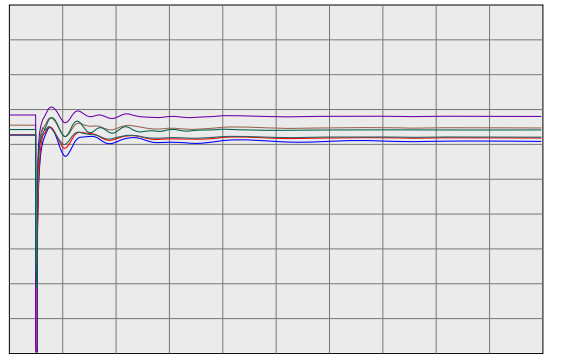


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

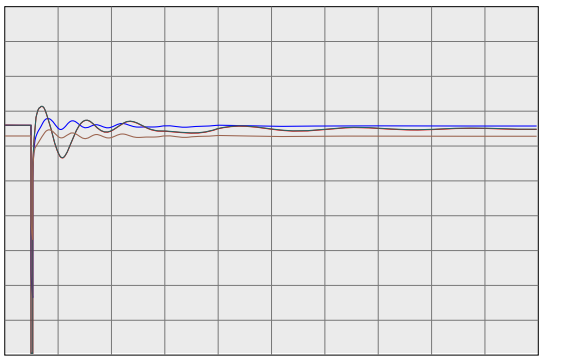
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



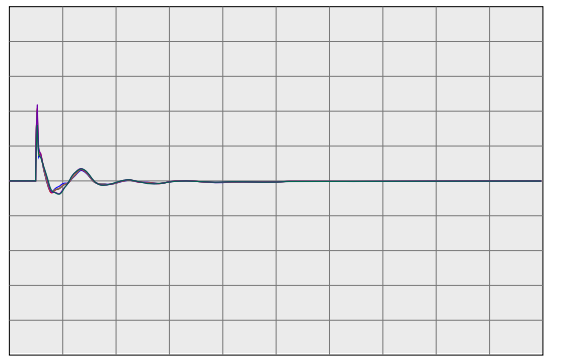
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



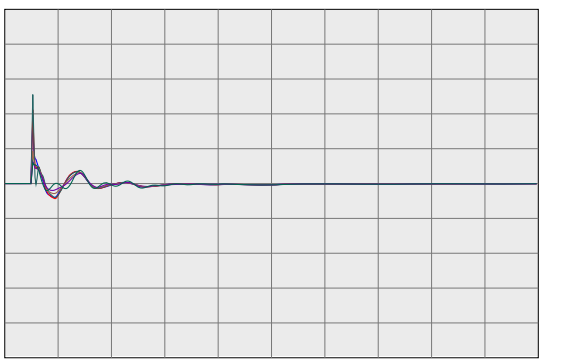
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



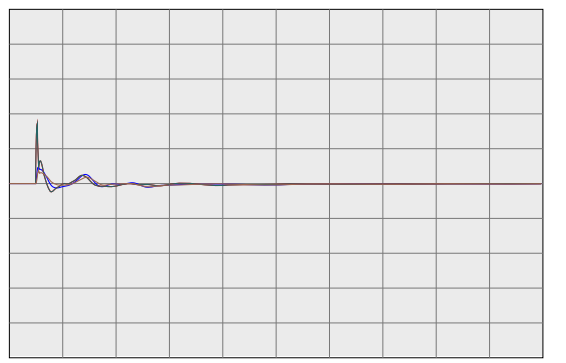
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



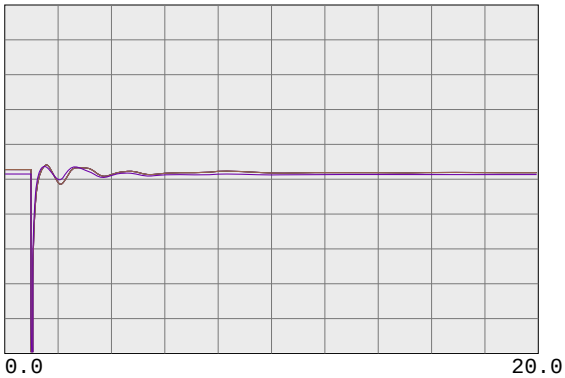
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

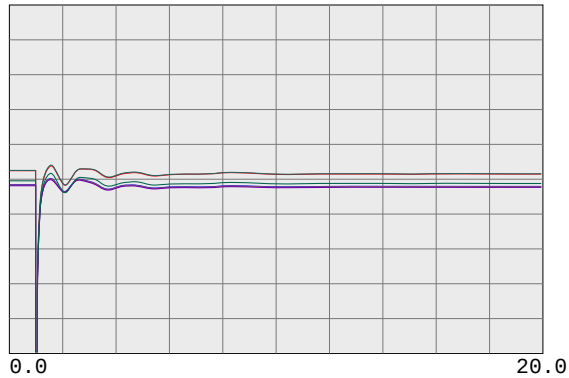
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

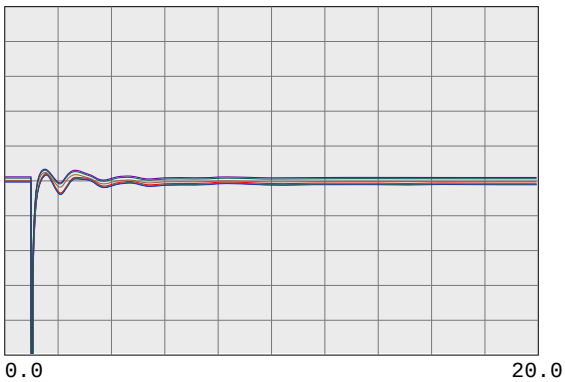
230-KV SYSTEM VOLTAGES



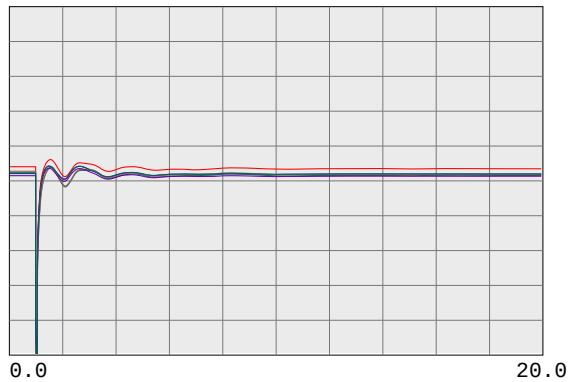
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



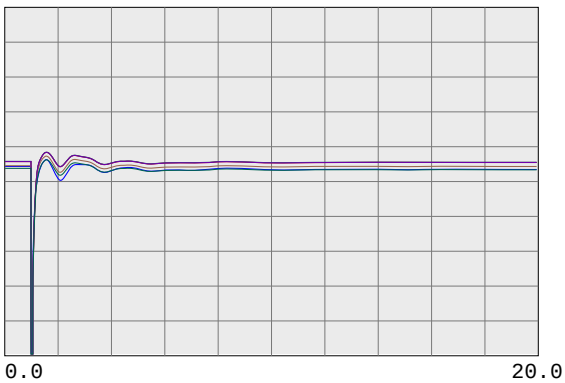
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



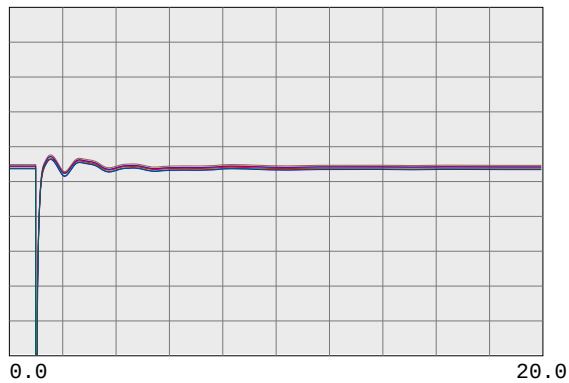
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



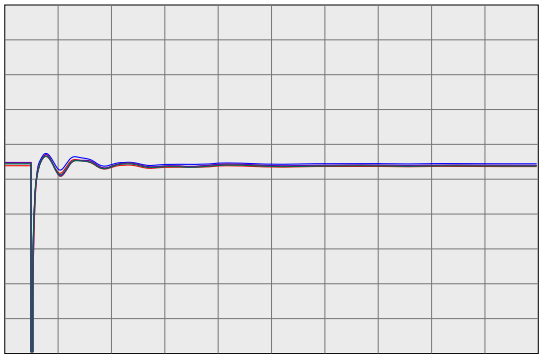
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

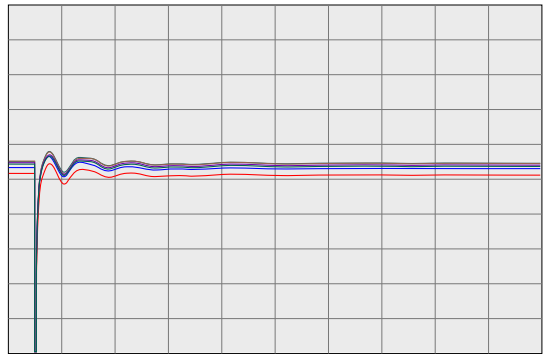
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

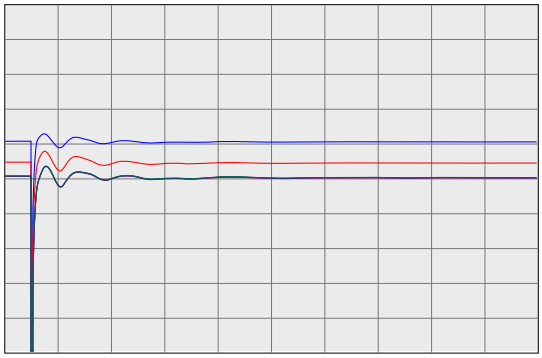
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

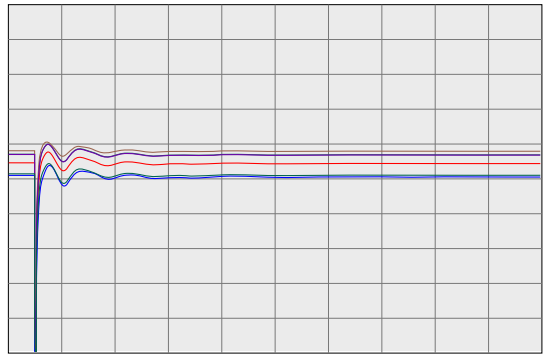
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

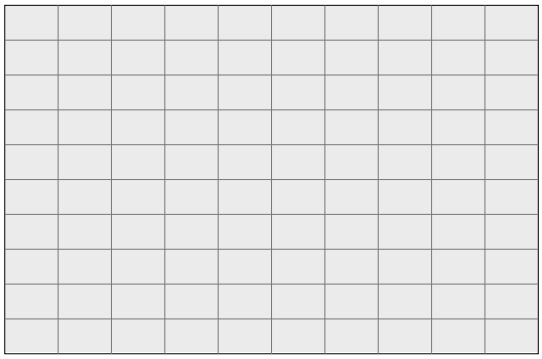
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

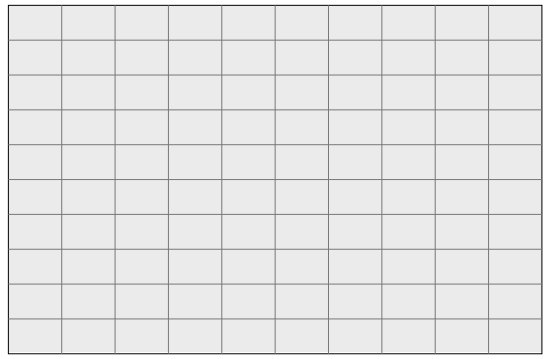


0.0 20.0

Time(sec)

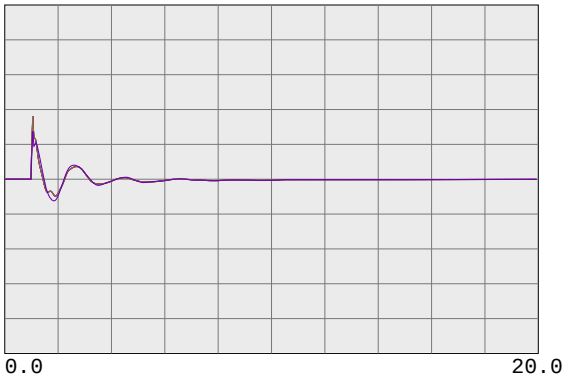
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



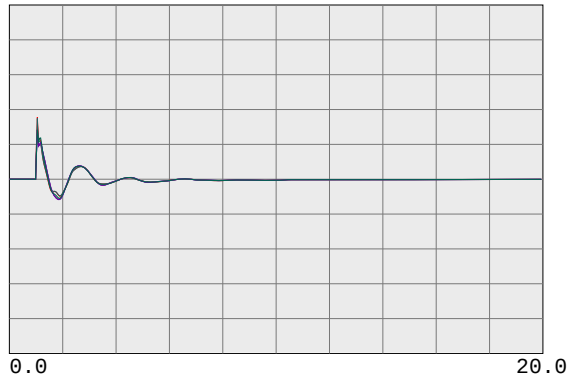


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

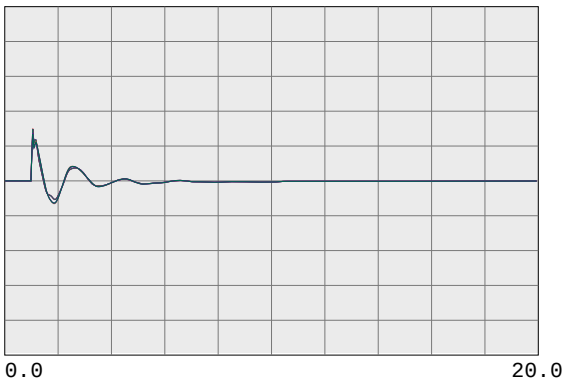
230-KV SYSTEM FREQUENCIES



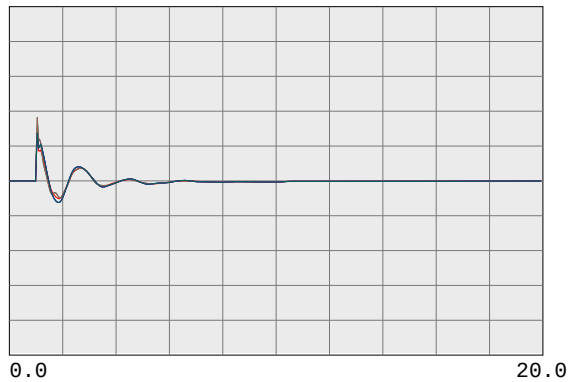
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



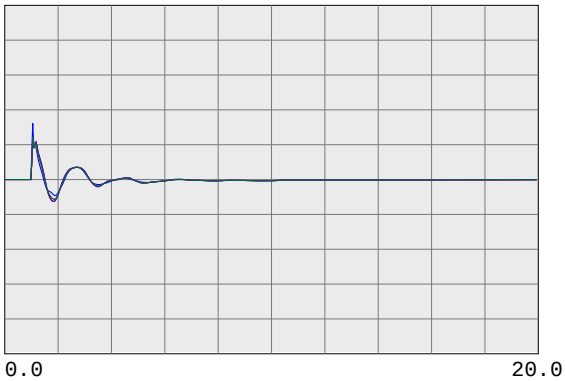
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



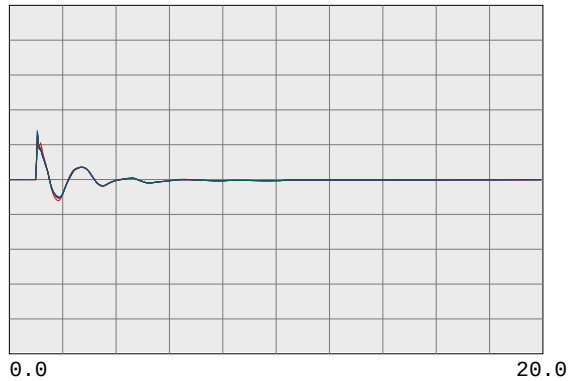
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



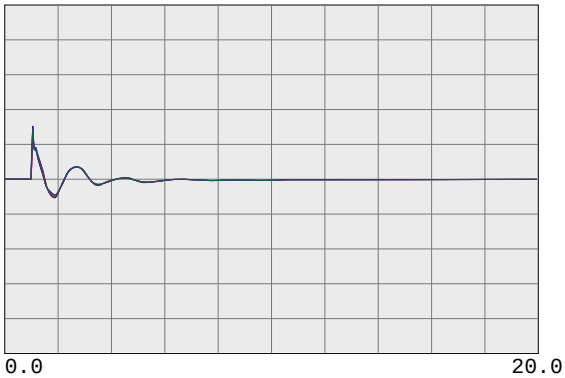
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



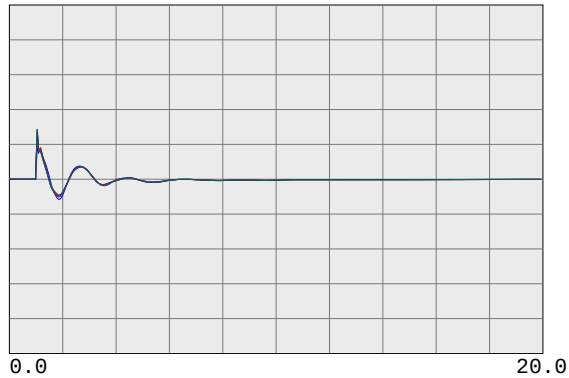
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

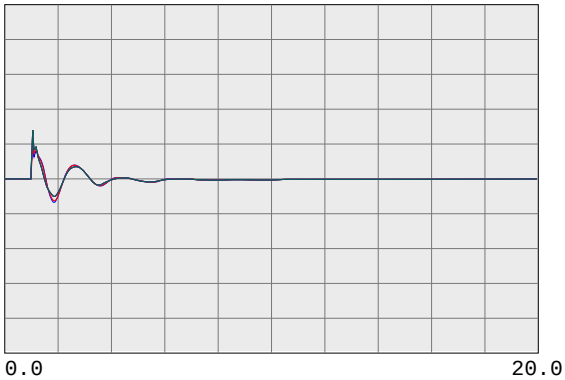
230-KV SYSTEM FREQUENCIES



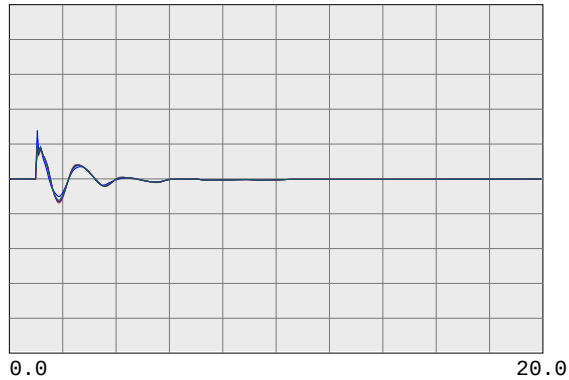
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



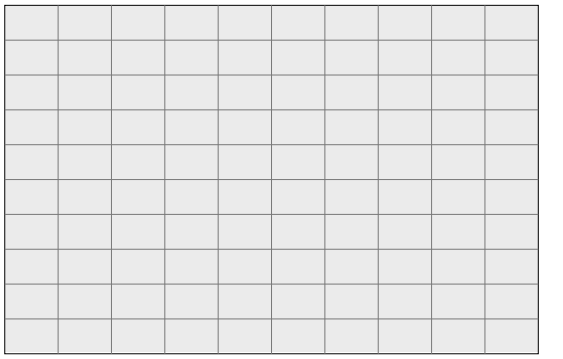
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

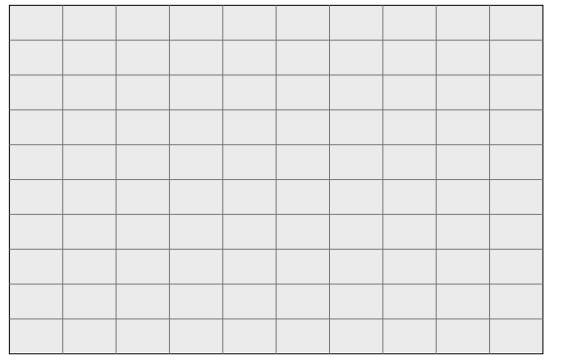


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



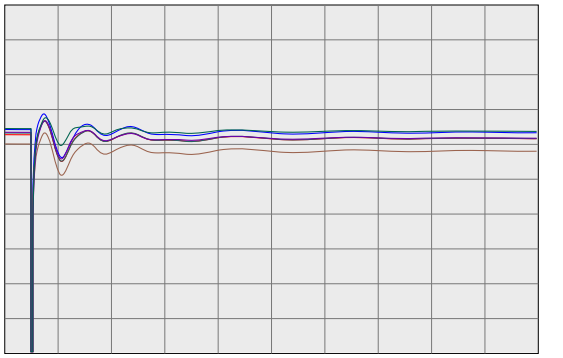
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



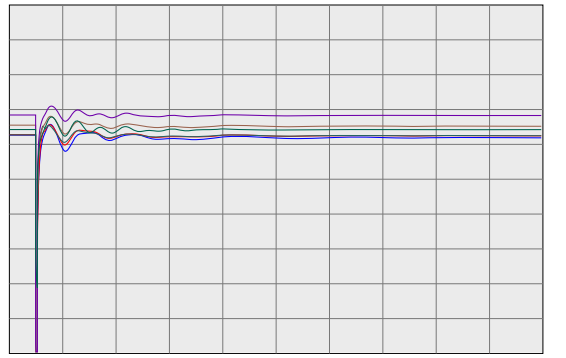


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

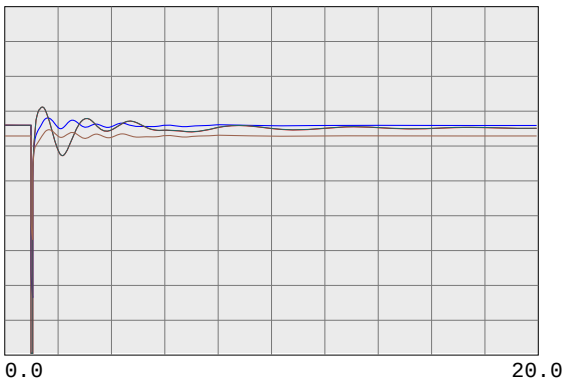
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



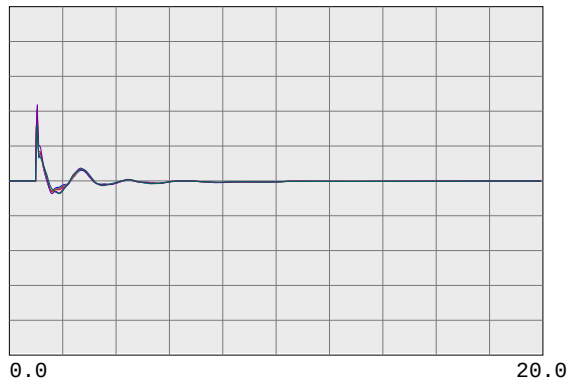
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



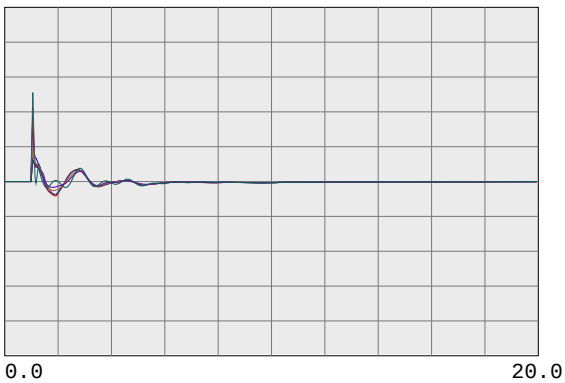
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



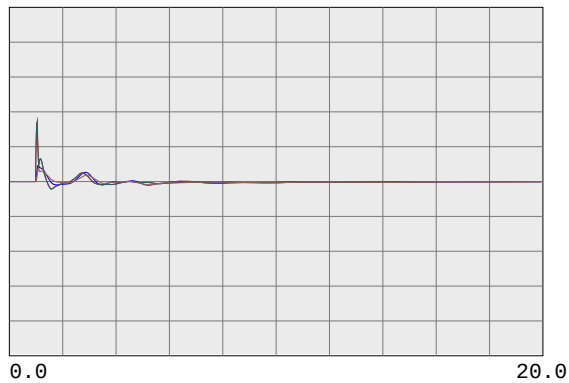
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



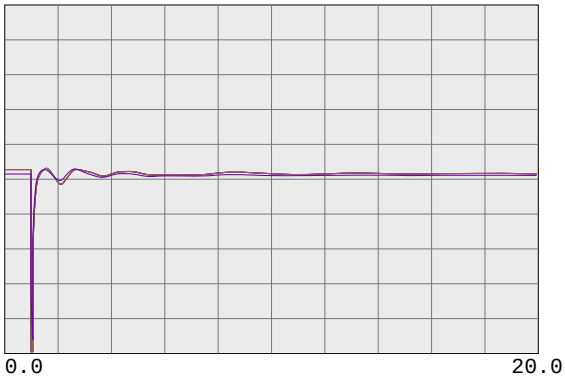
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

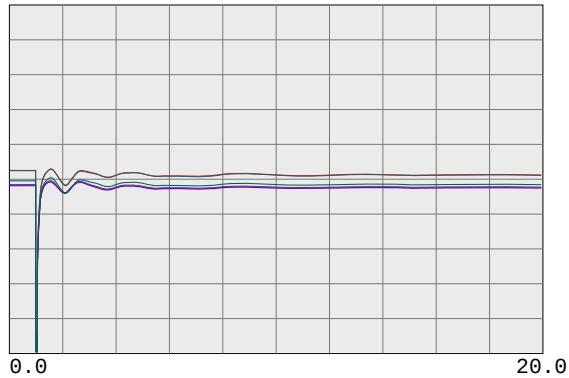
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

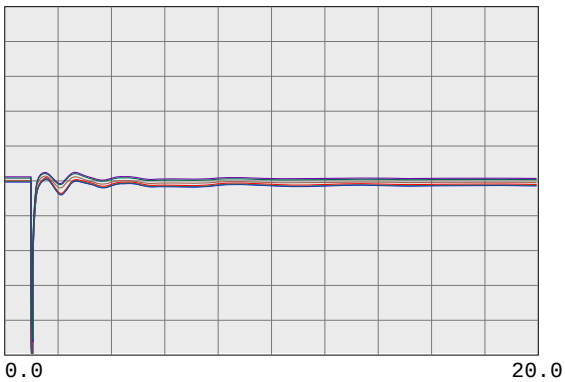
230-KV SYSTEM VOLTAGES



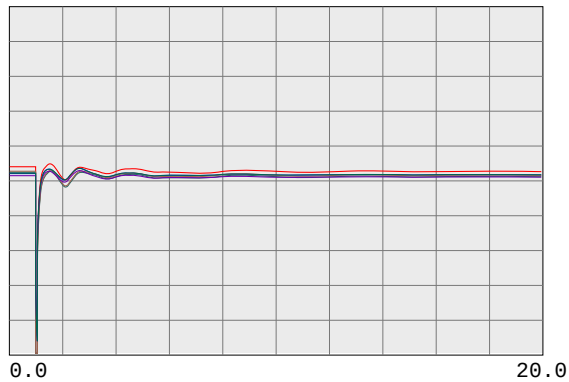
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



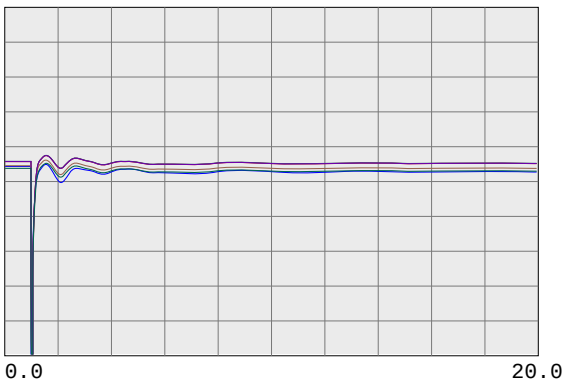
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



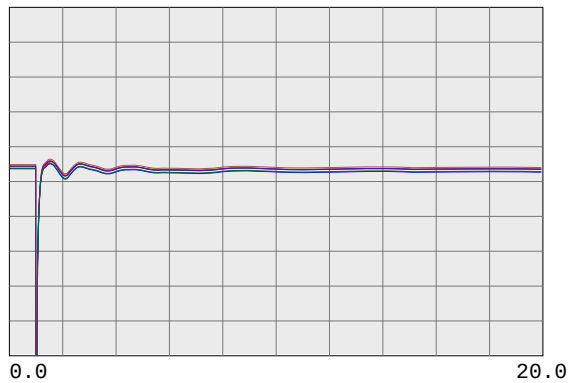
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



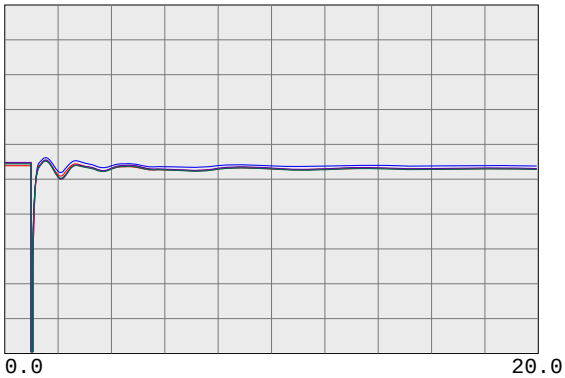
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



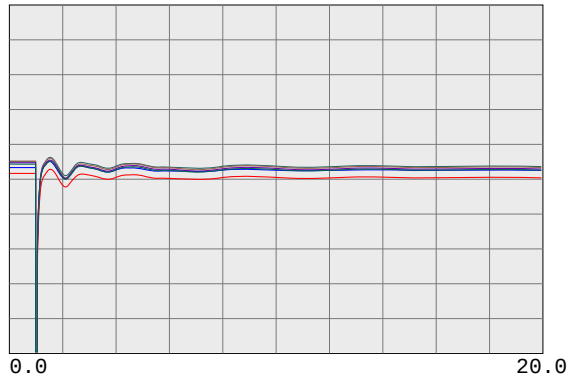
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

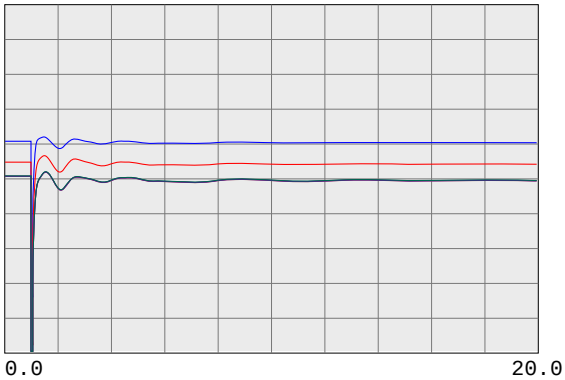
230-KV SYSTEM VOLTAGES



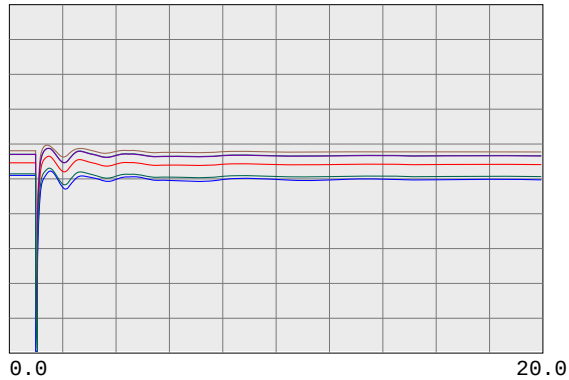
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



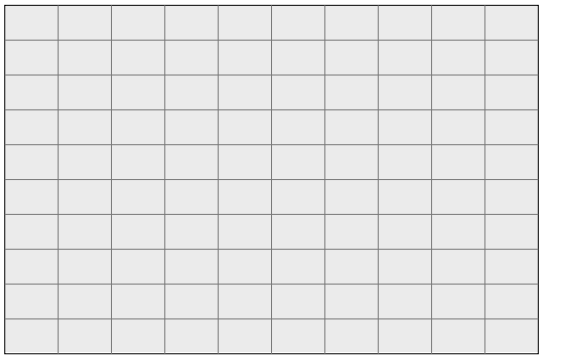
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

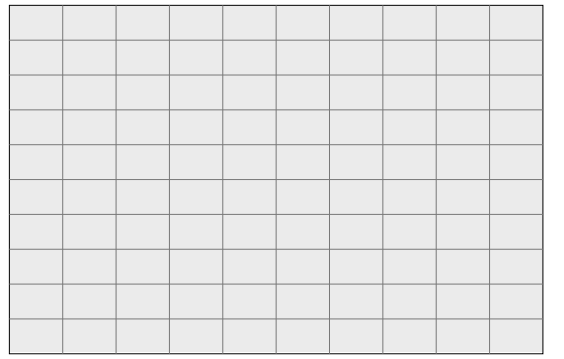


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



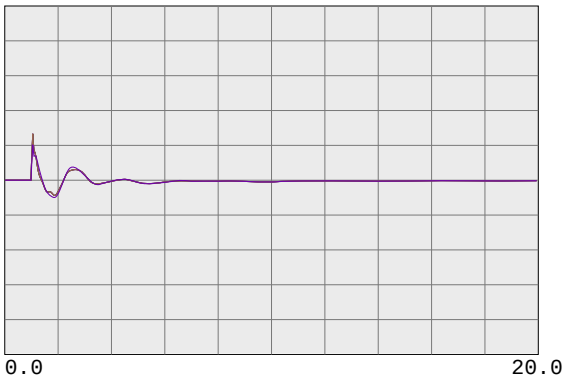
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



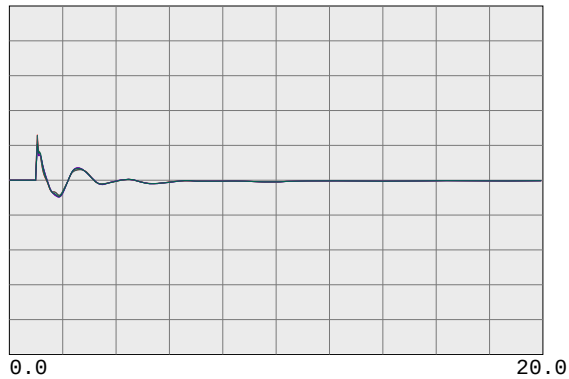


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

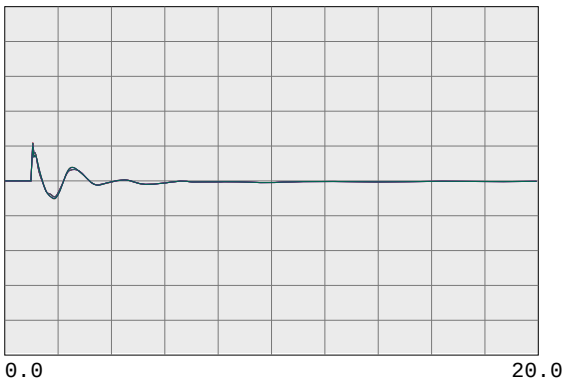
230-KV SYSTEM FREQUENCIES



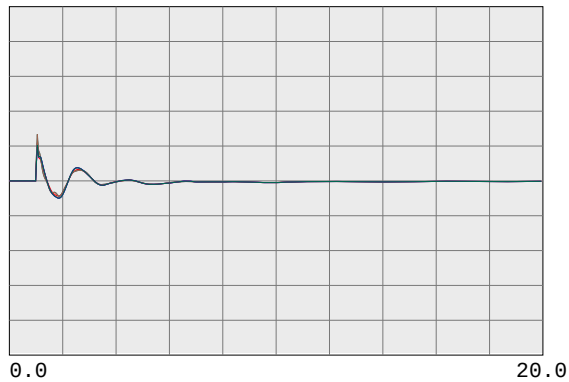
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



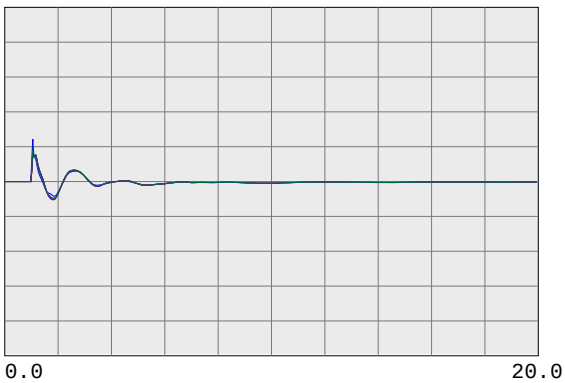
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



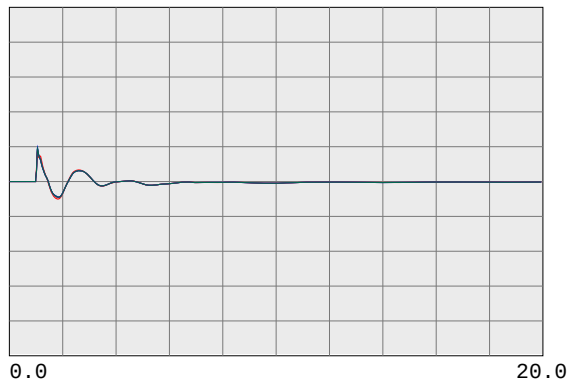
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



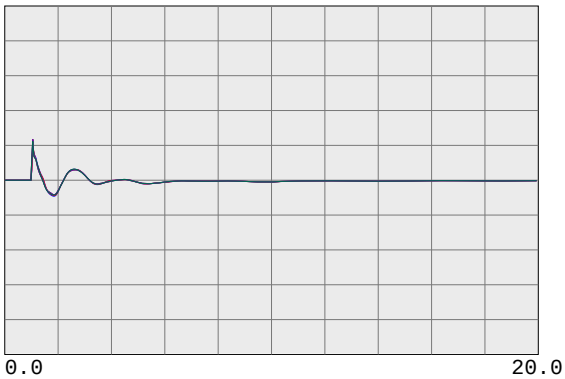
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



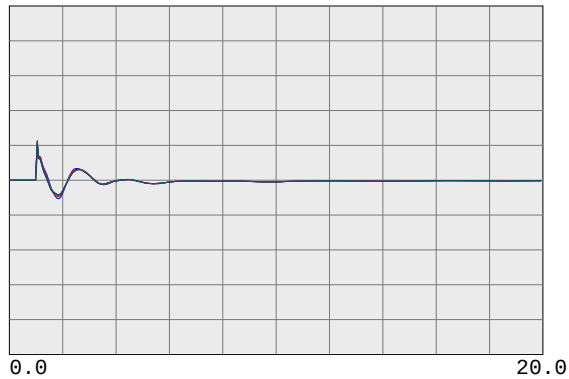
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

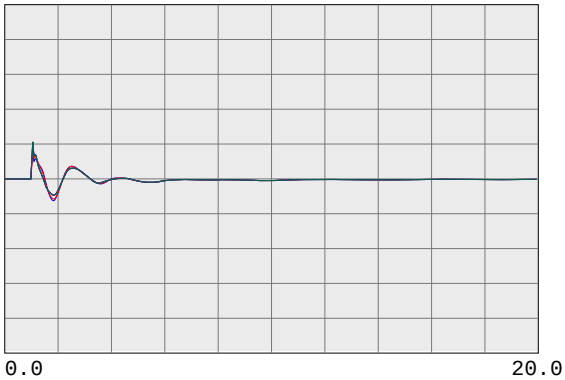
230-KV SYSTEM FREQUENCIES



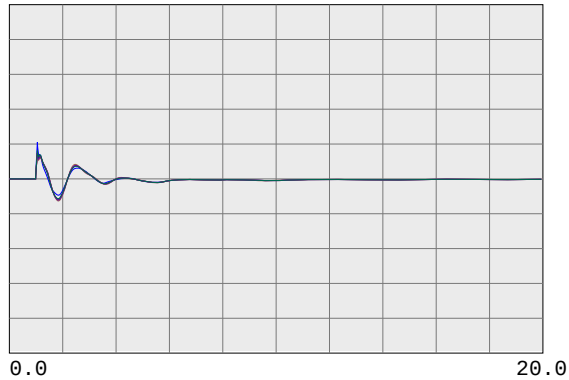
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



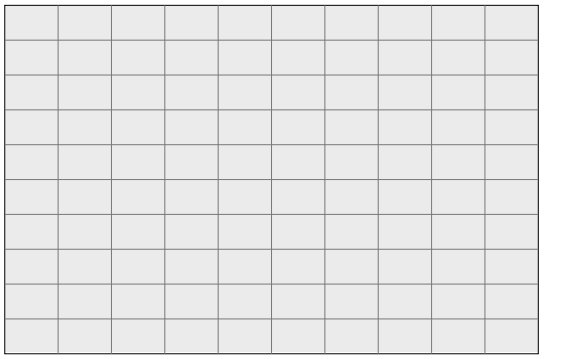
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

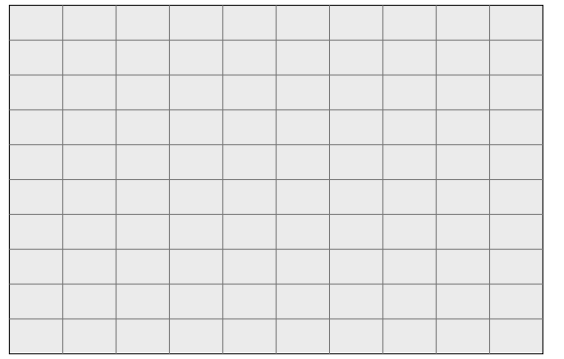


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



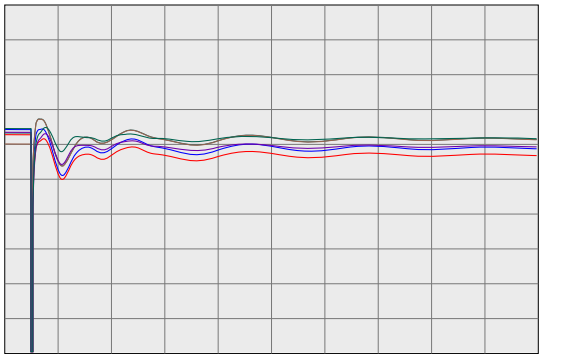
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



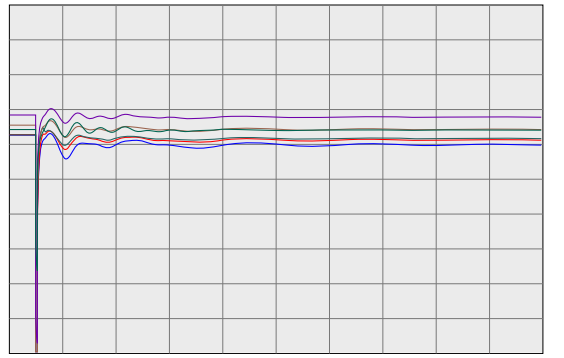


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

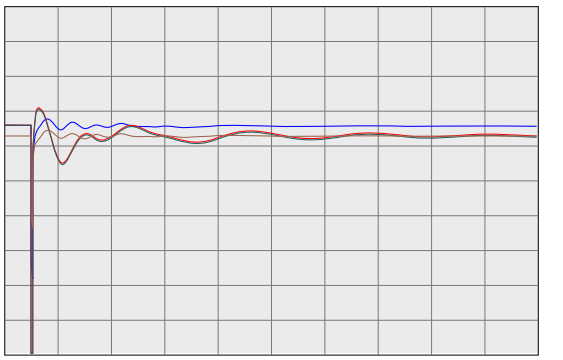
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



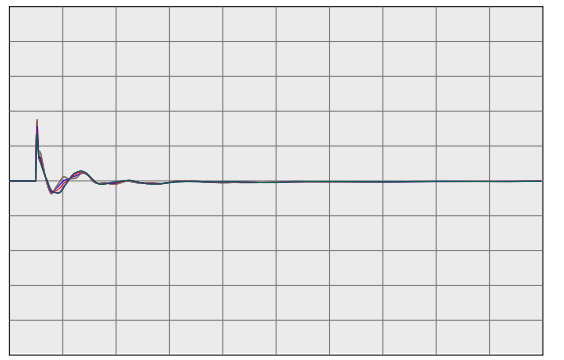
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



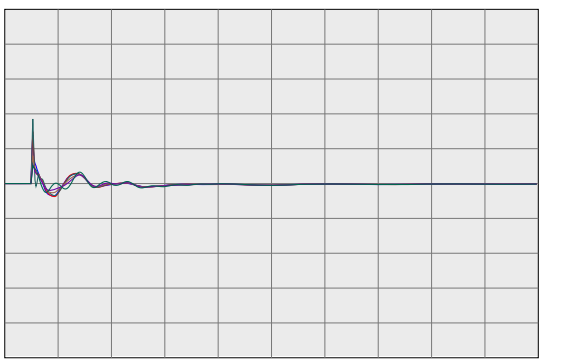
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



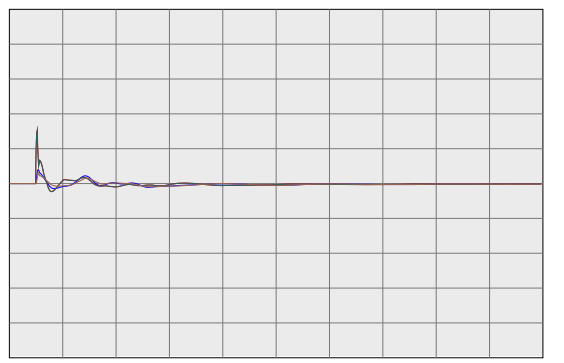
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



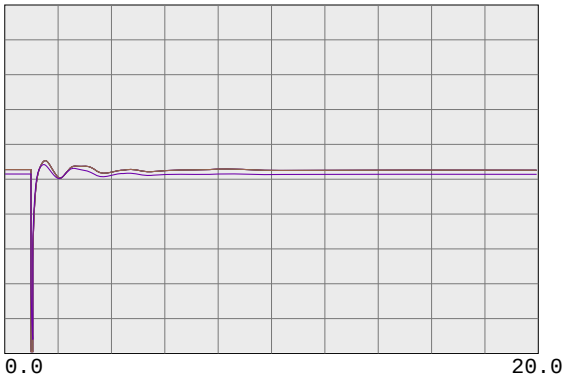
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

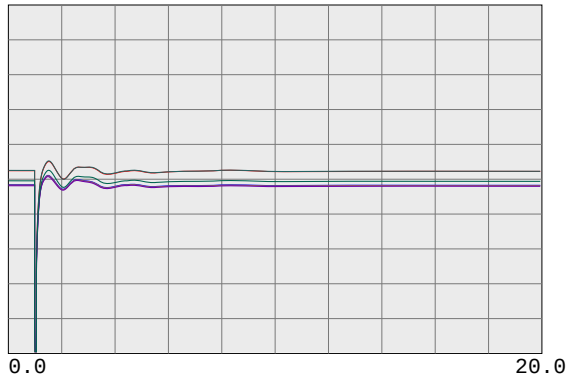
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

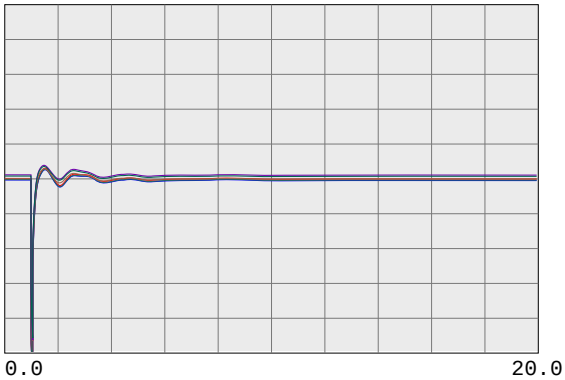
230-KV SYSTEM VOLTAGES



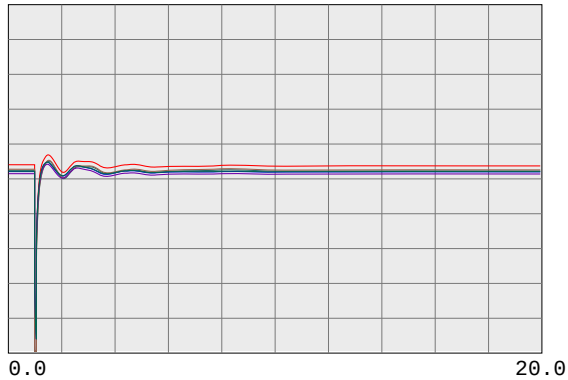
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



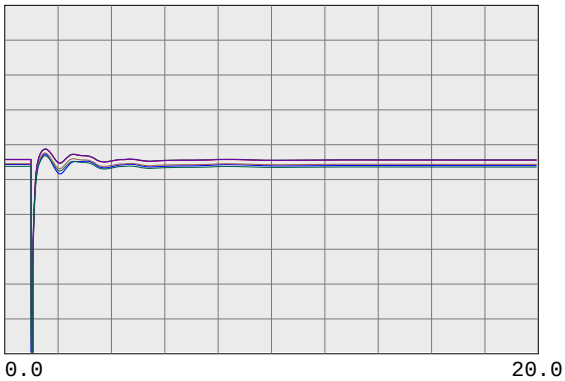
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



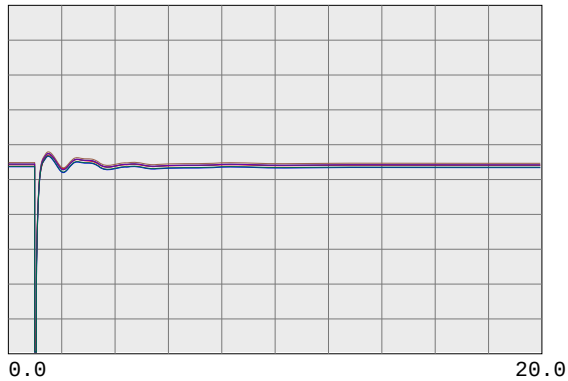
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



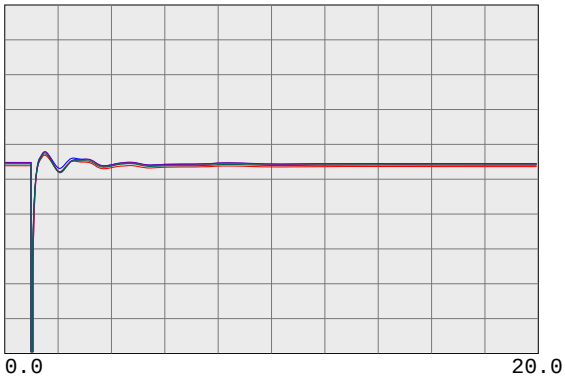
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



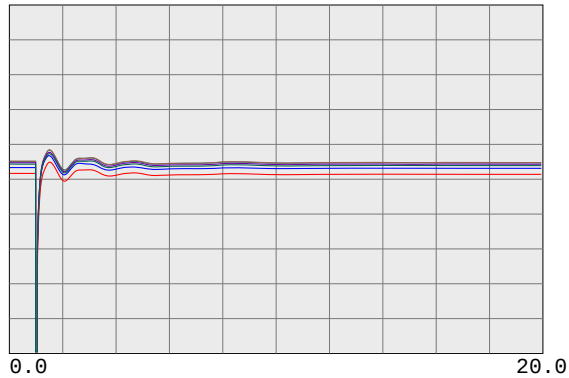
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

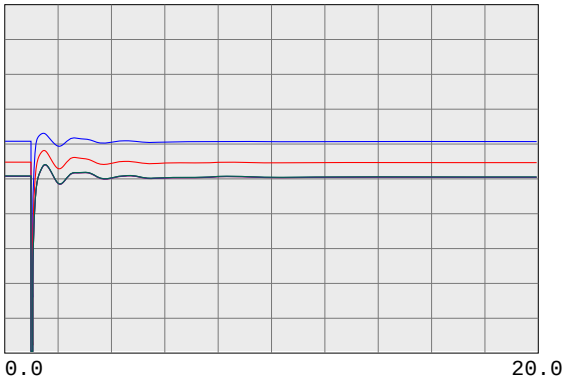
230-KV SYSTEM VOLTAGES



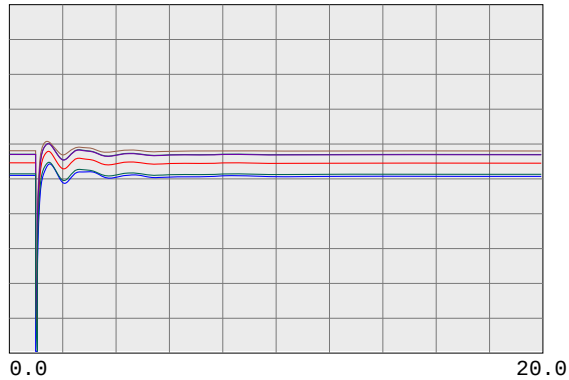
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



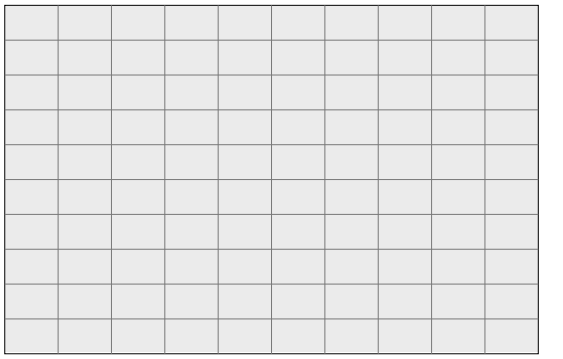
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

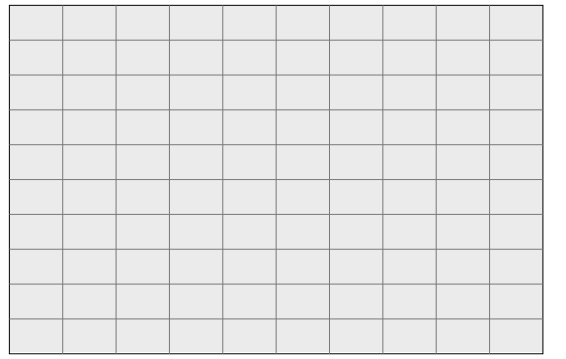


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



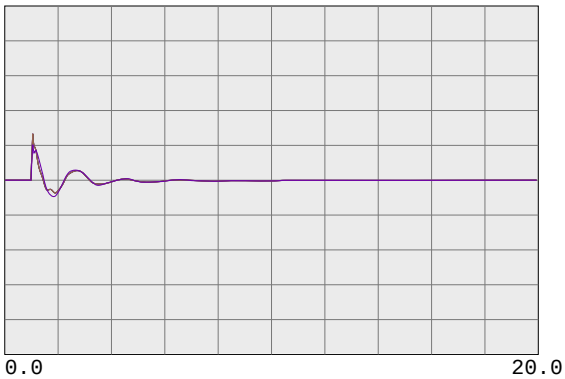
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



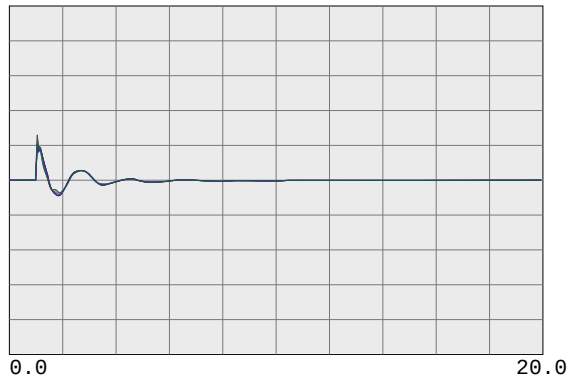


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

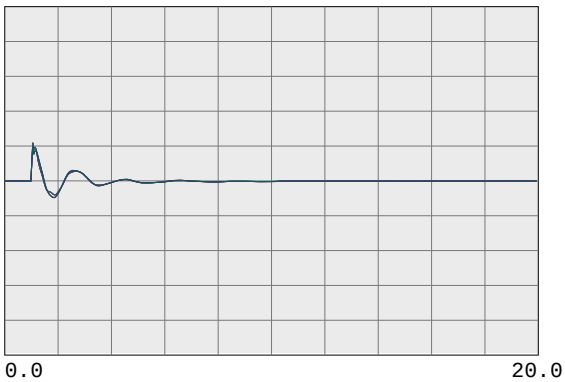
230-KV SYSTEM FREQUENCIES



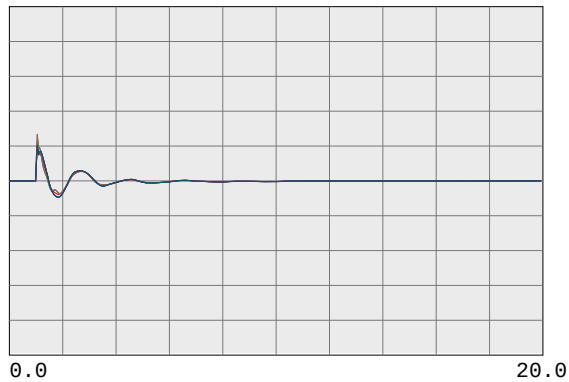
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



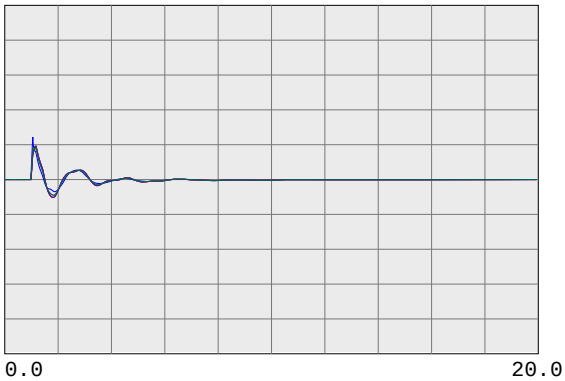
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



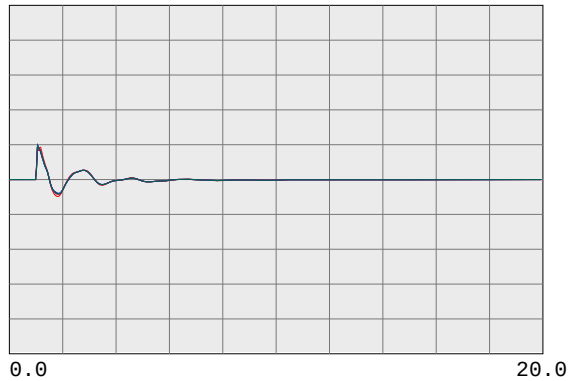
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



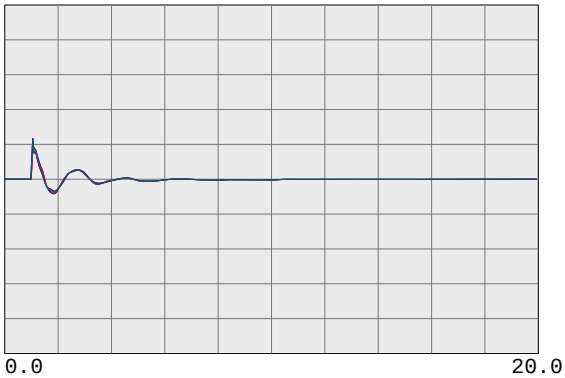
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



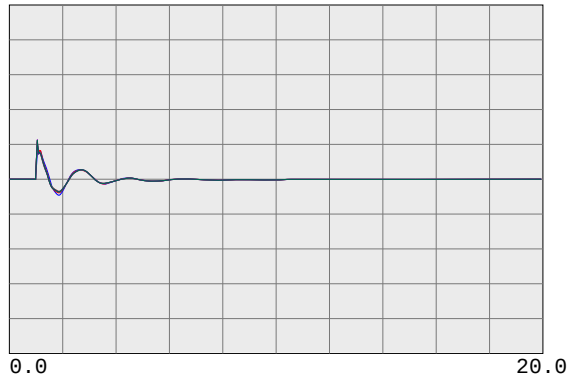
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

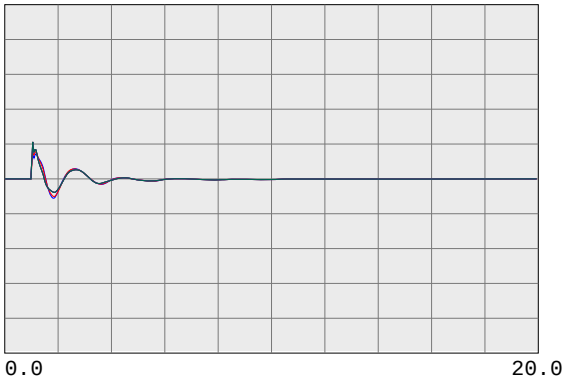
230-KV SYSTEM FREQUENCIES



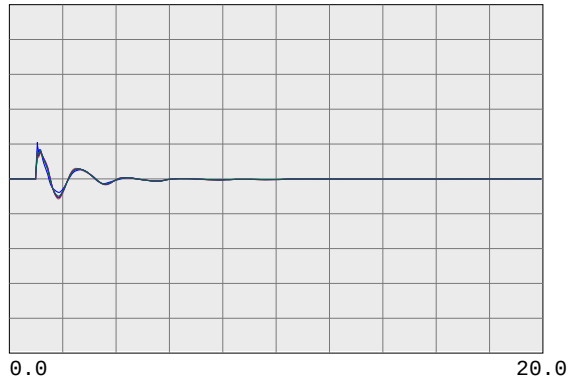
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



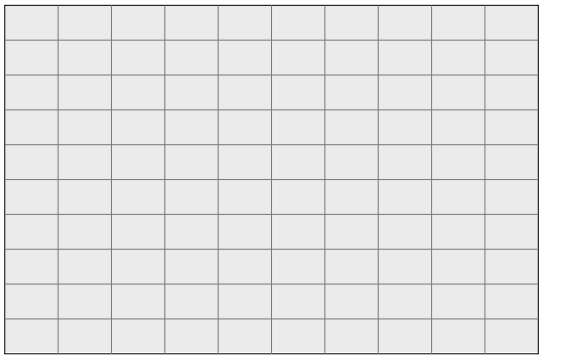
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

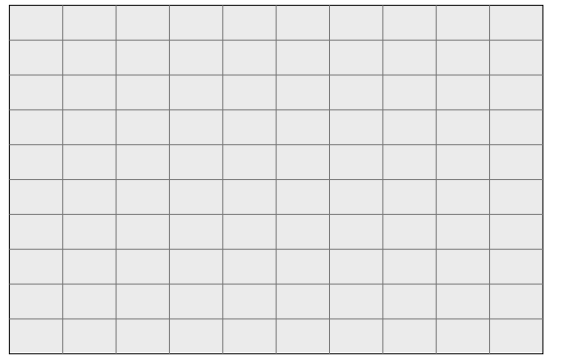


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



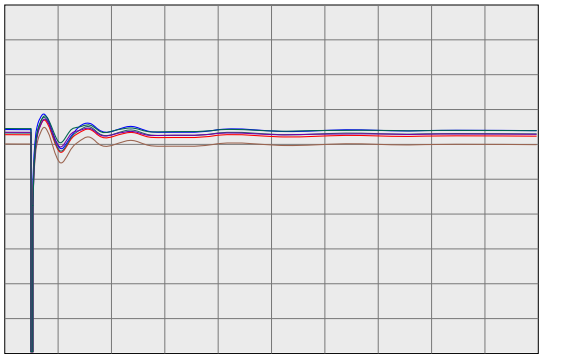
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



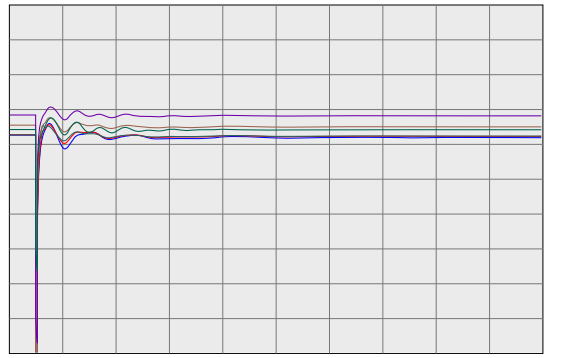


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

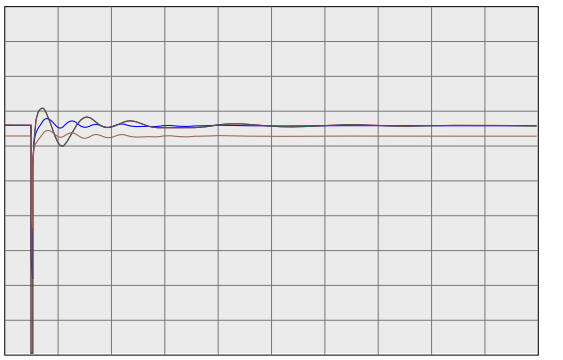
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



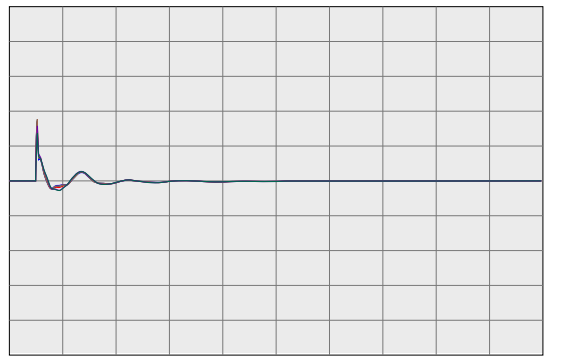
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



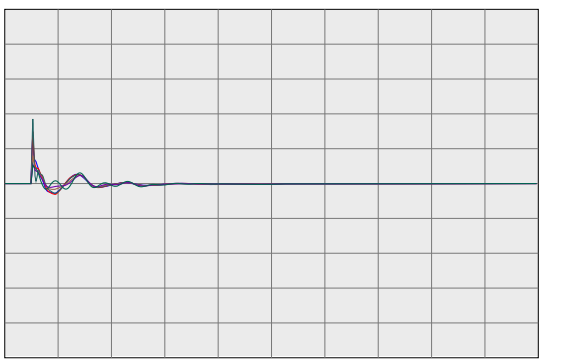
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



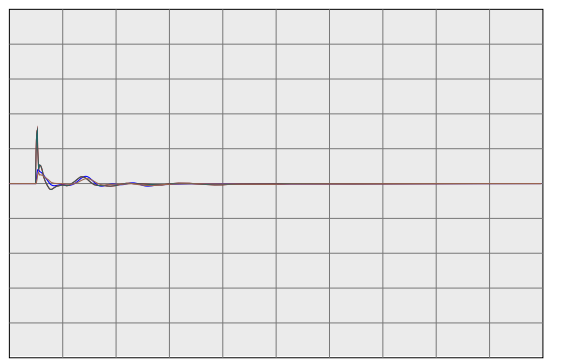
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



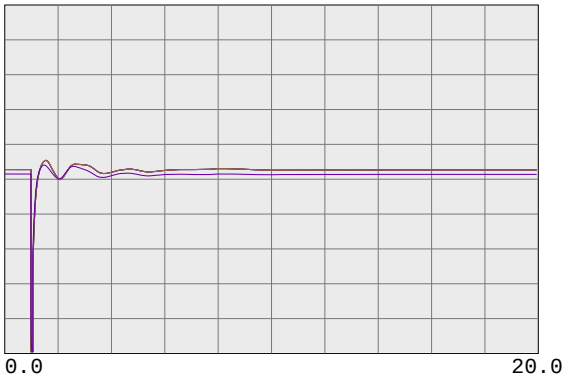
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

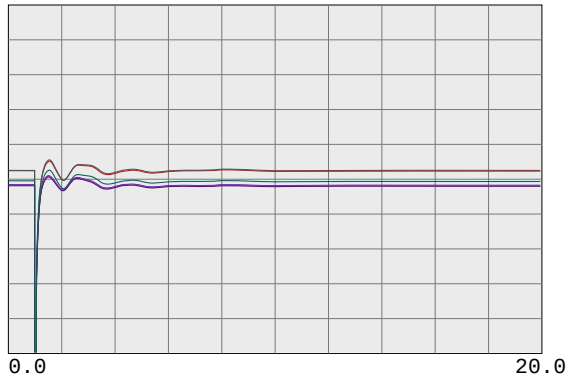
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

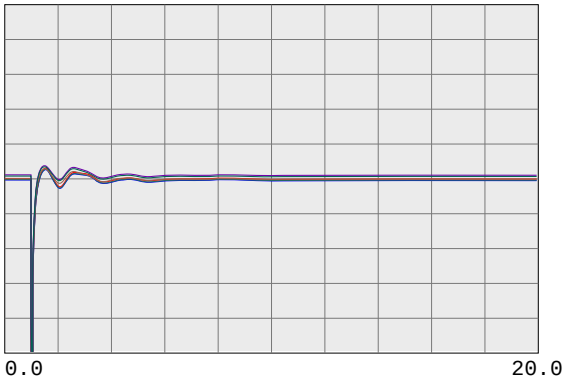
230-KV SYSTEM VOLTAGES



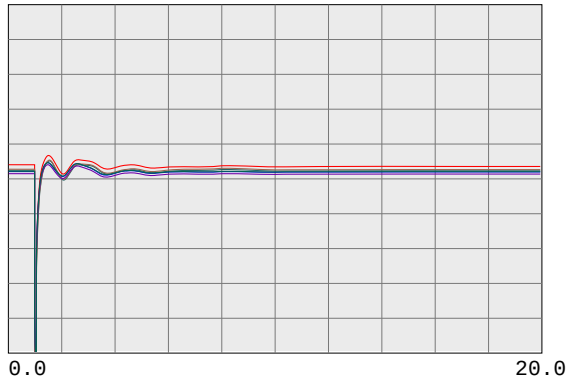
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



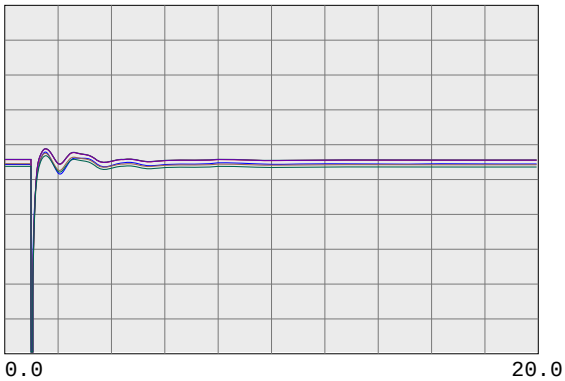
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



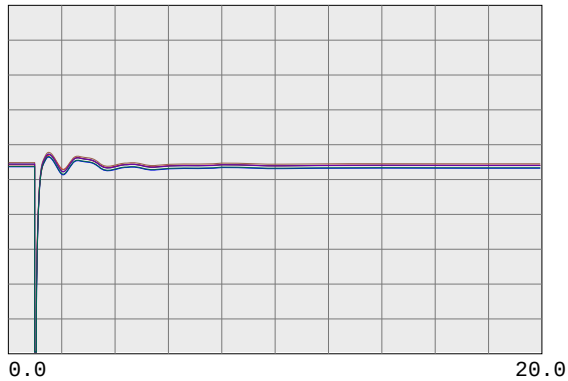
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



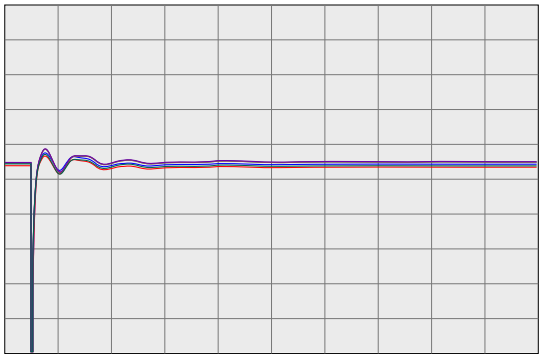
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

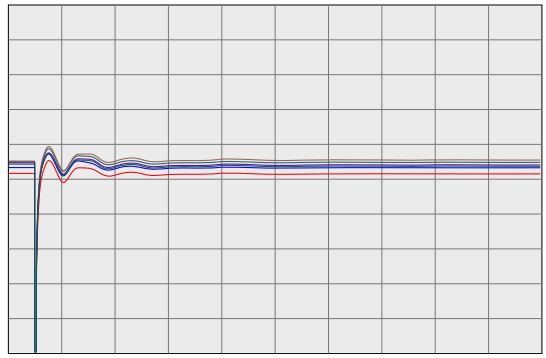
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

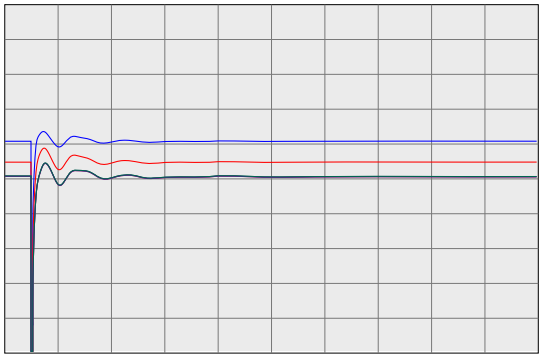
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

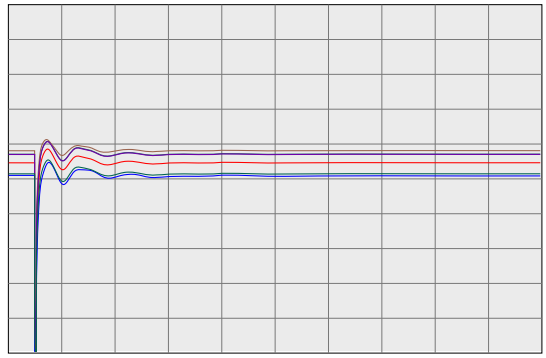
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

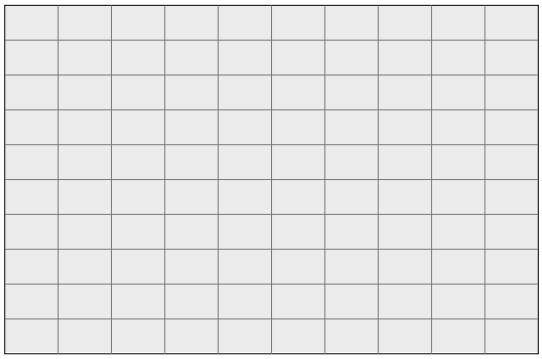
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

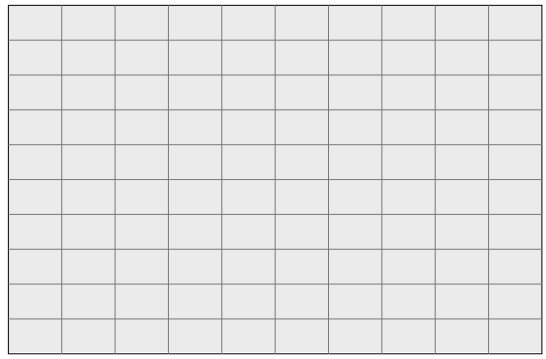


0.0 20.0

Time(sec)

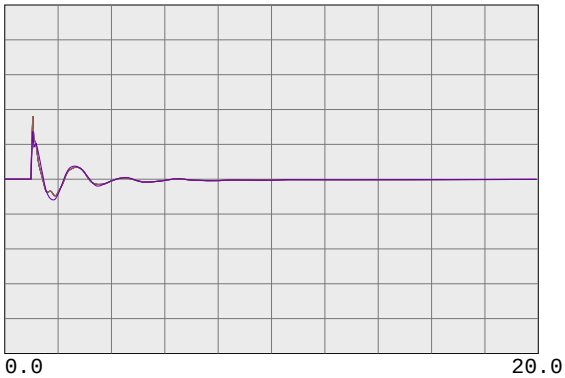
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



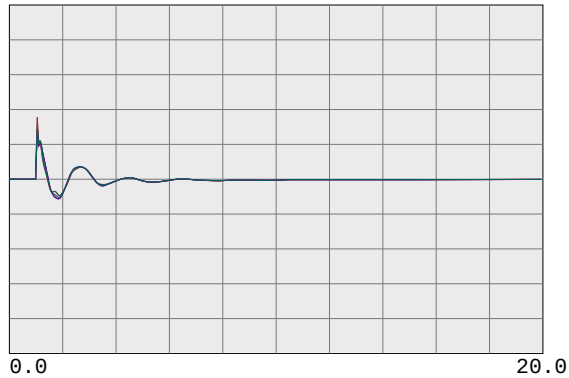


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

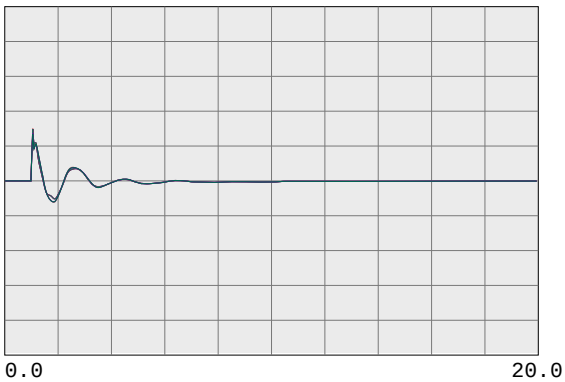
230-KV SYSTEM FREQUENCIES



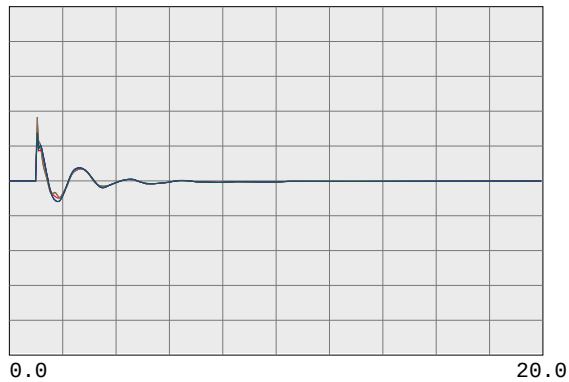
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



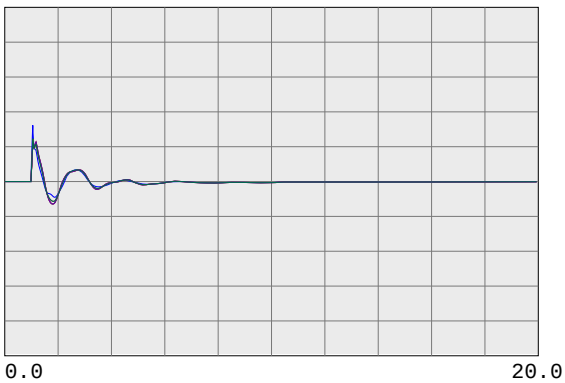
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



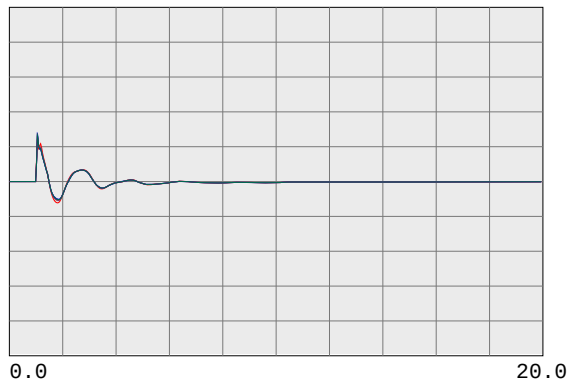
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



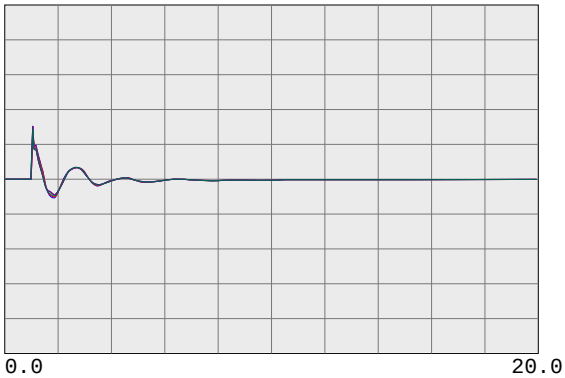
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



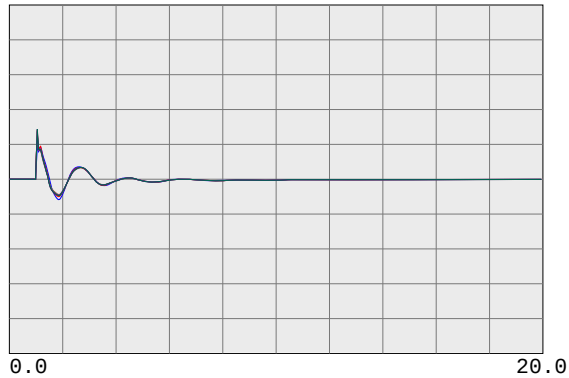
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

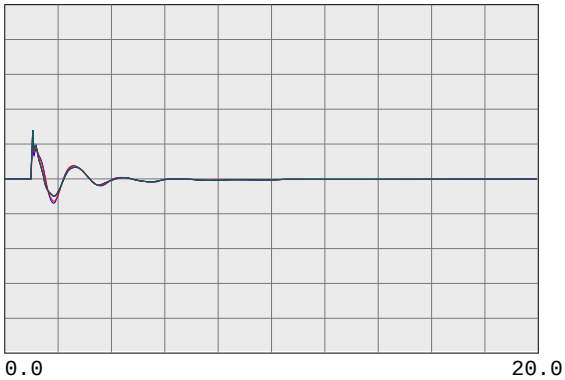
230-KV SYSTEM FREQUENCIES



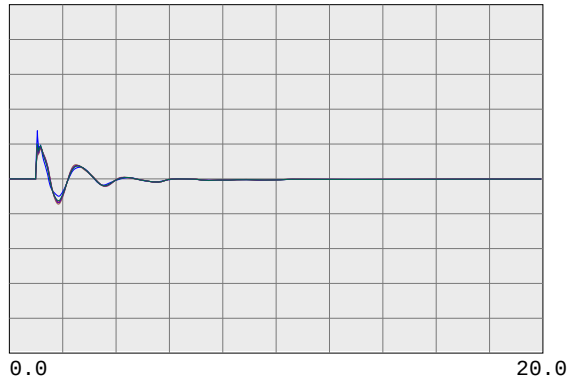
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



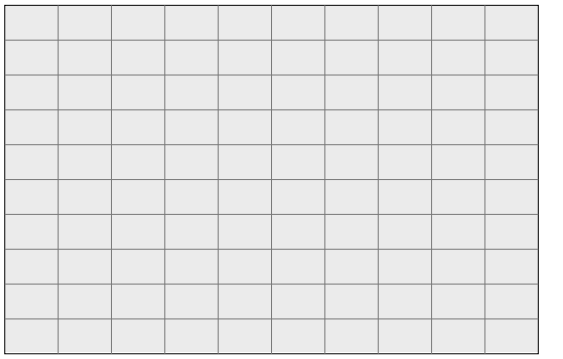
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

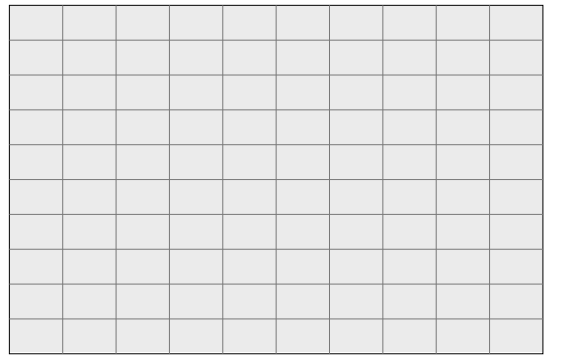


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



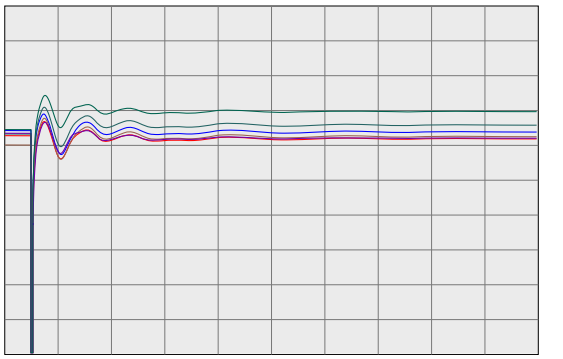
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



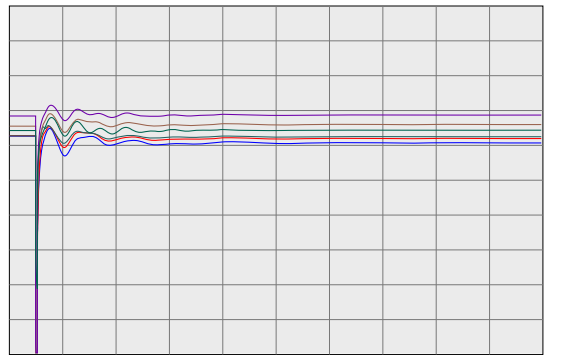


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

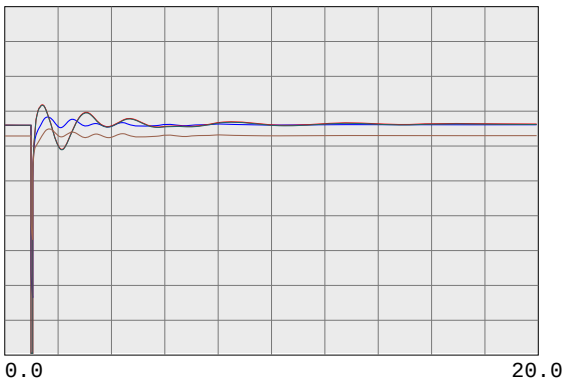
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



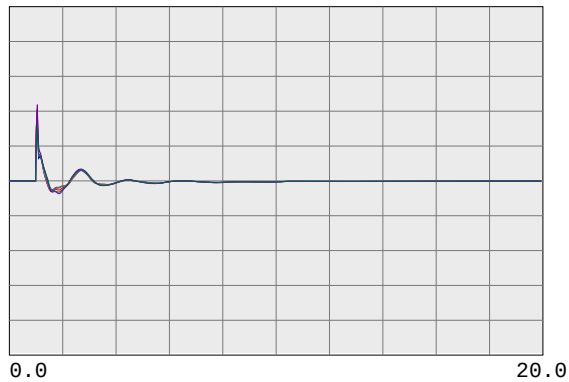
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



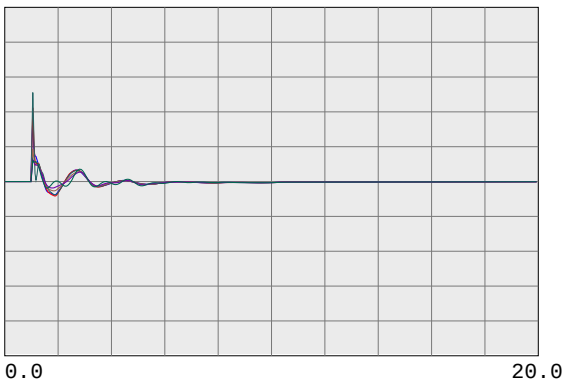
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



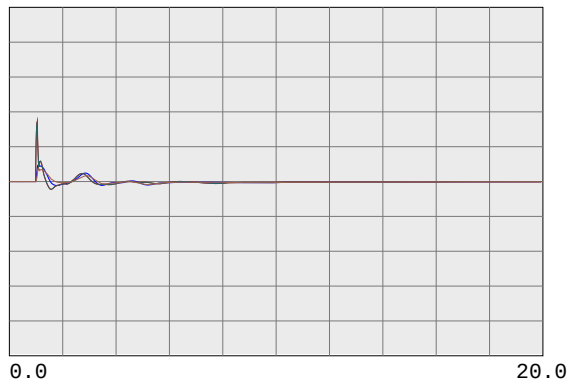
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



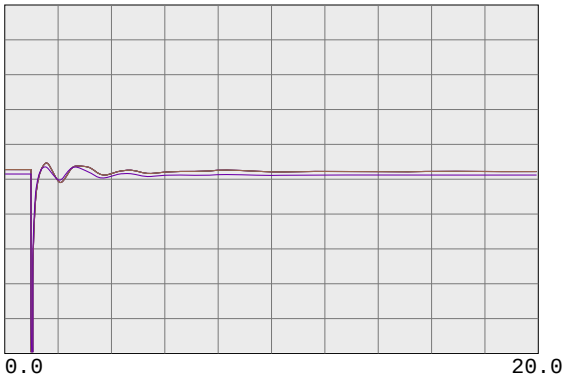
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

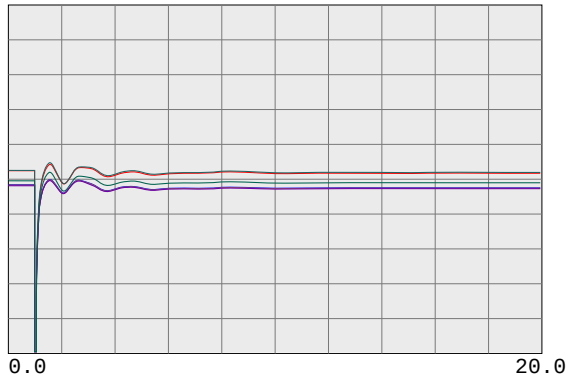
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

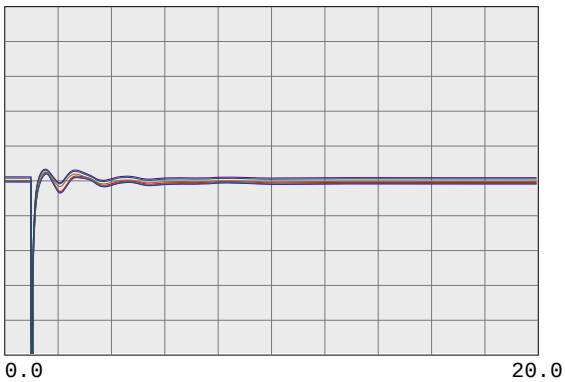
230-KV SYSTEM VOLTAGES



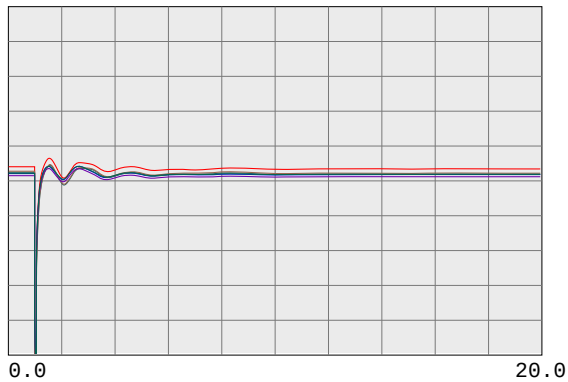
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



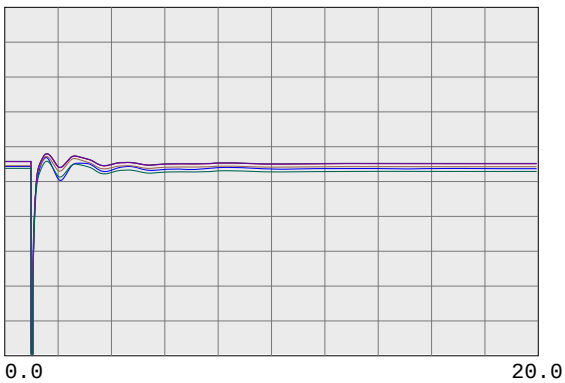
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



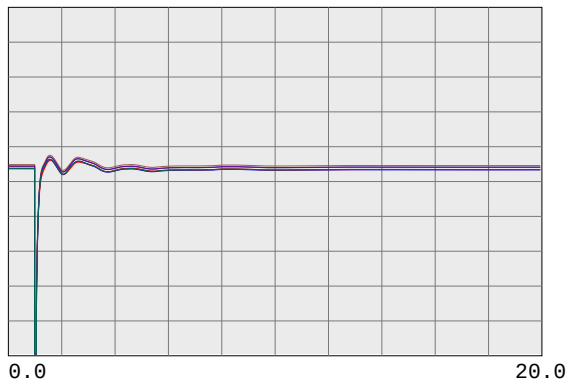
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



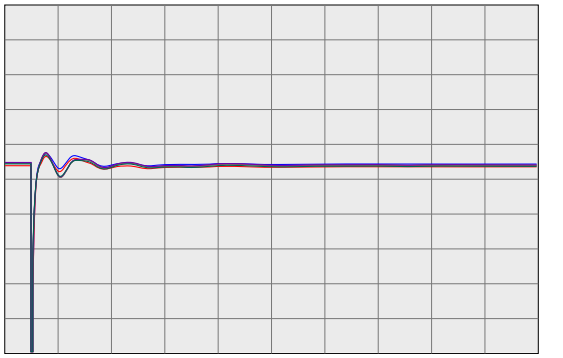
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



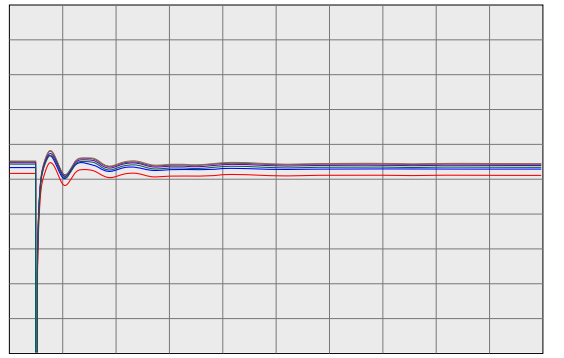
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

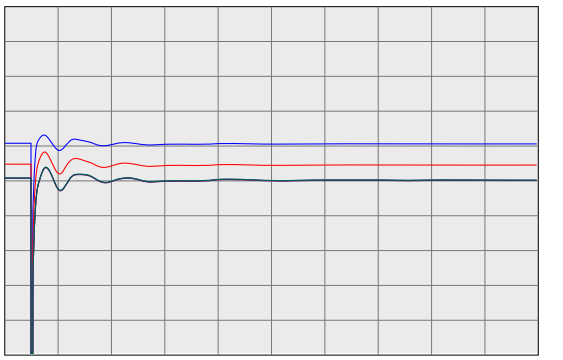
230-KV SYSTEM VOLTAGES



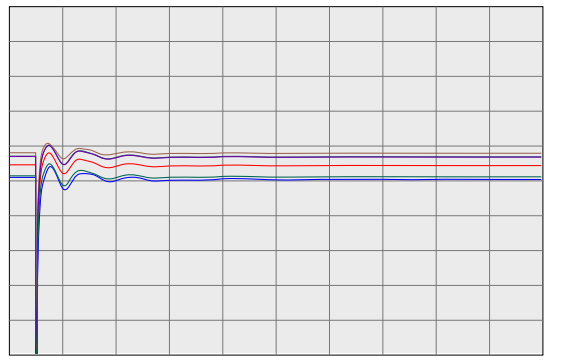
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



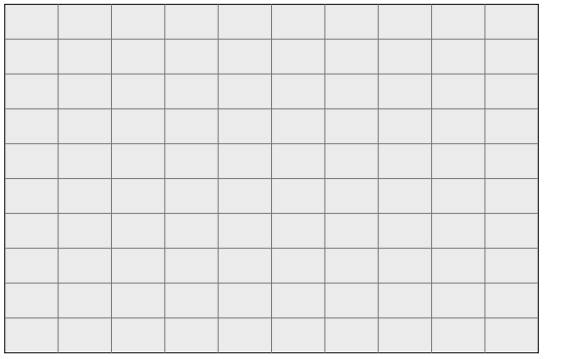
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

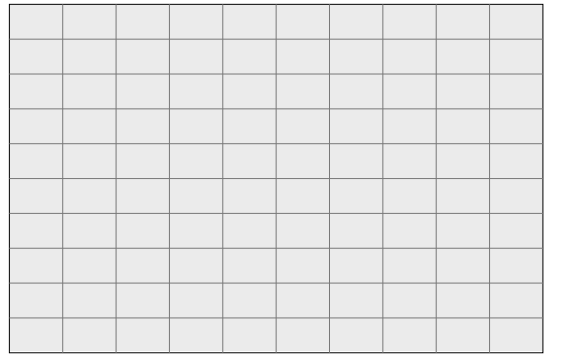


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



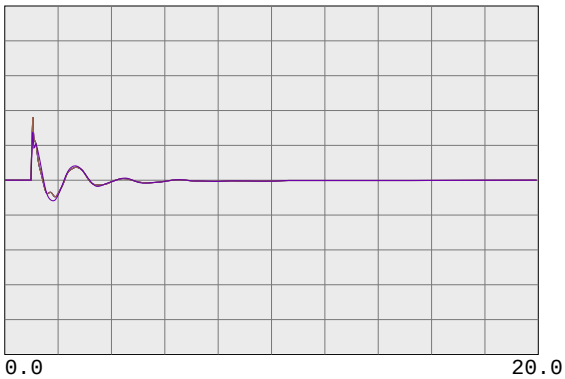
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



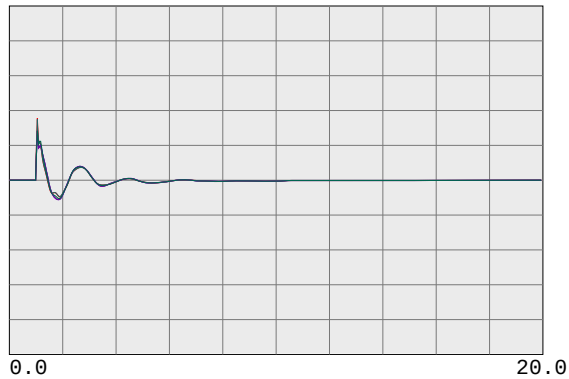


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

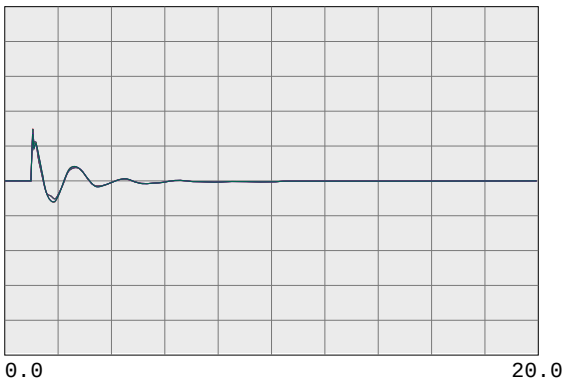
230-KV SYSTEM FREQUENCIES



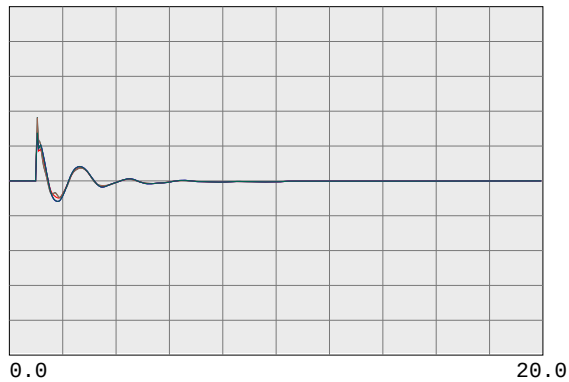
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



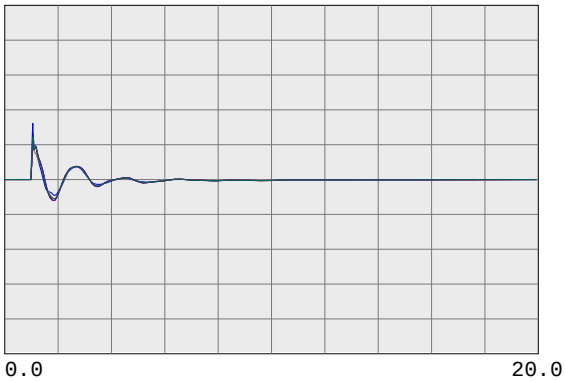
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



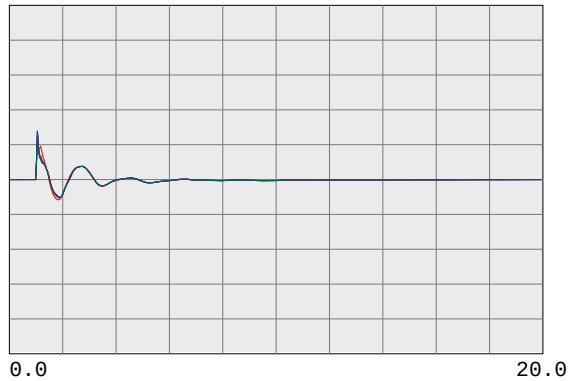
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



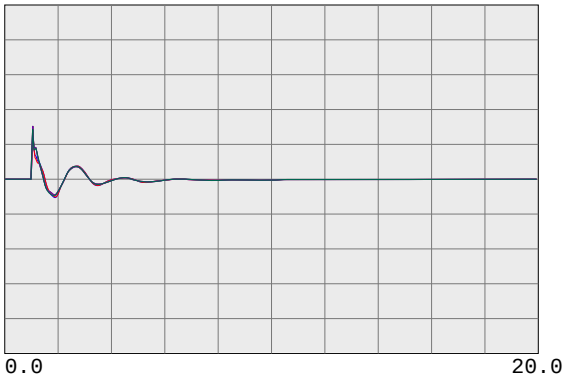
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



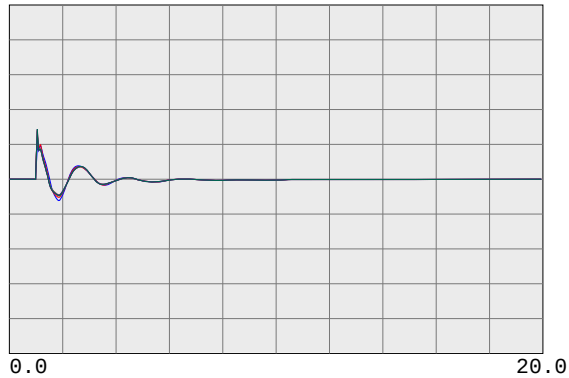
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

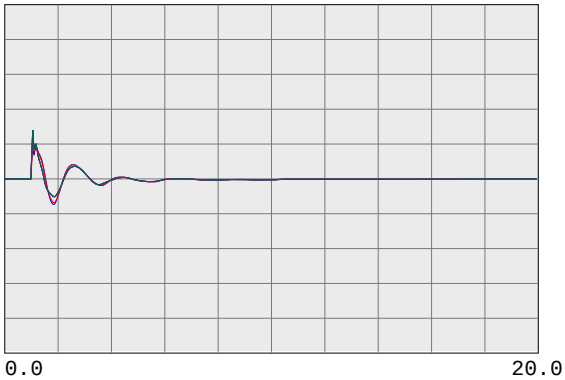
230-KV SYSTEM FREQUENCIES



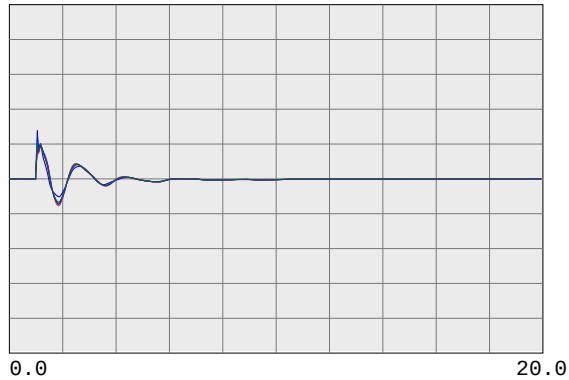
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



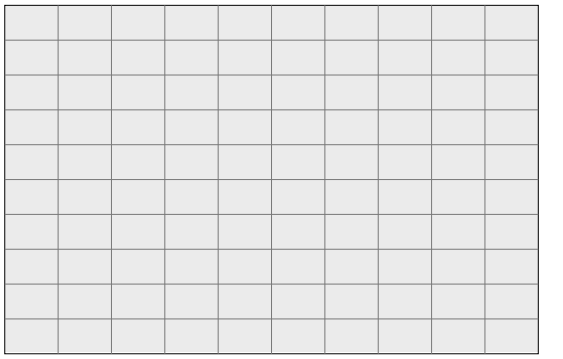
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

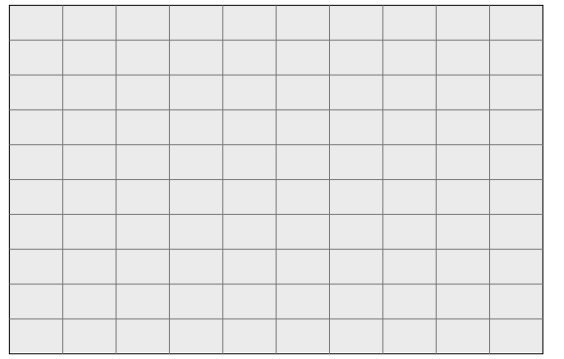


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



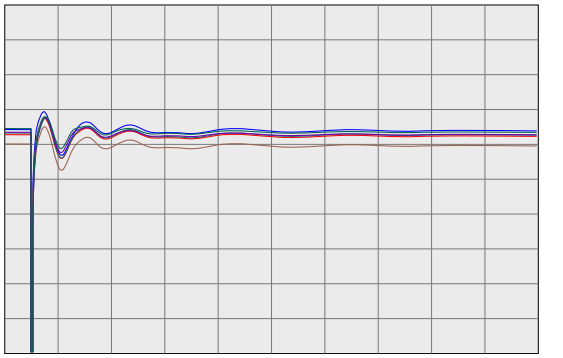
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



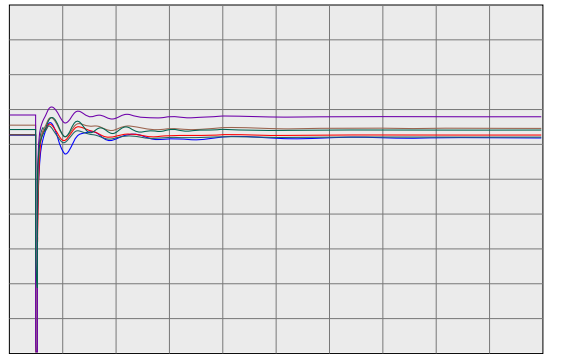


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

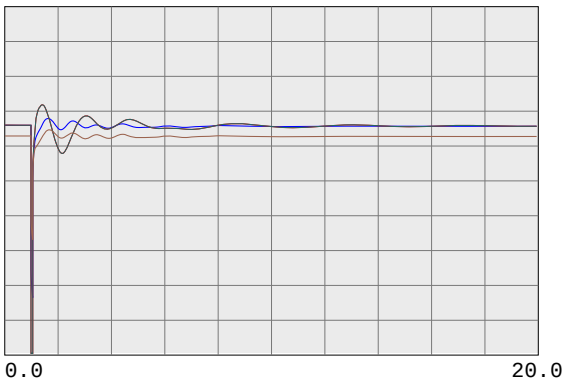
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



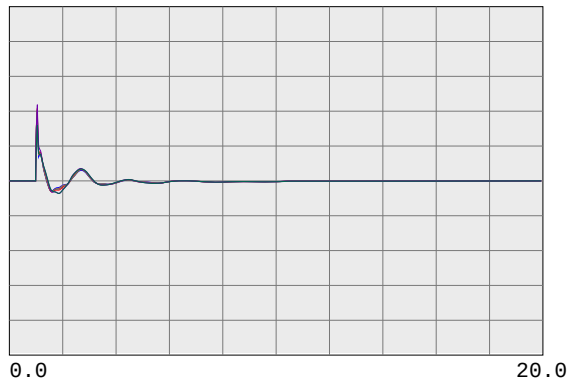
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



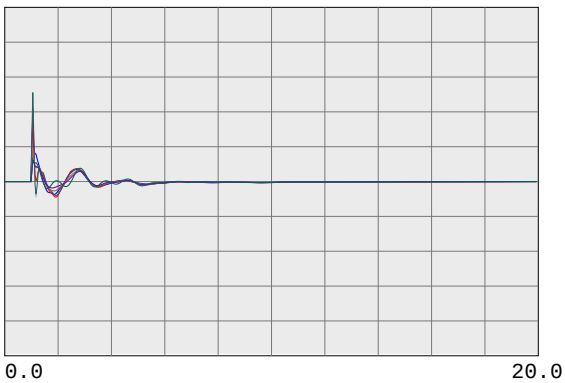
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



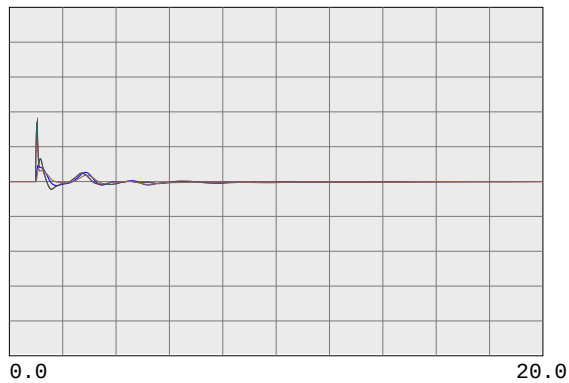
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



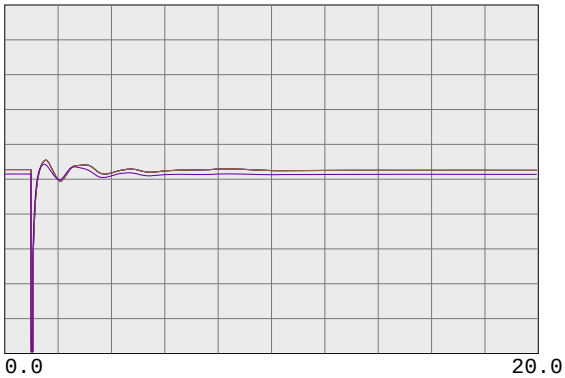
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

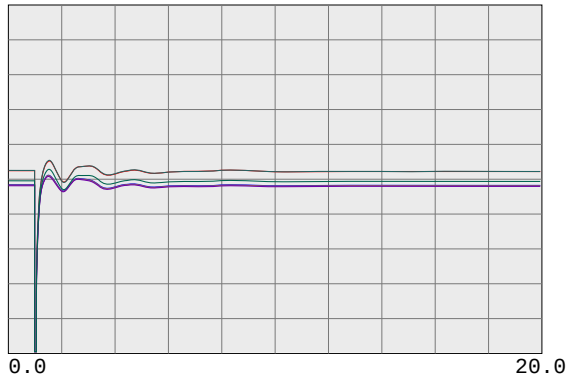
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

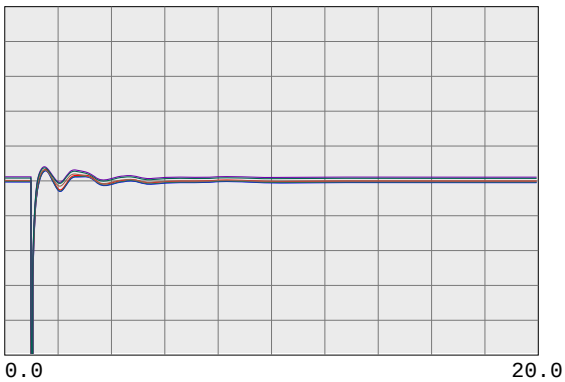
230-KV SYSTEM VOLTAGES



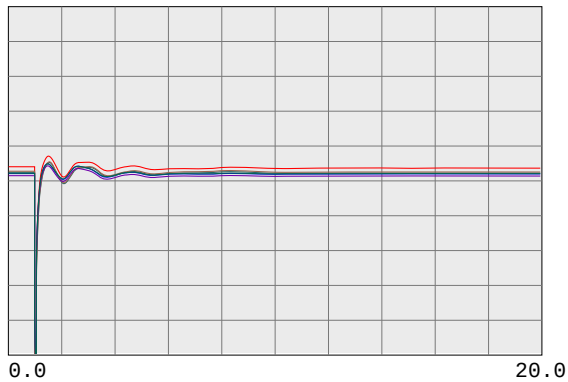
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



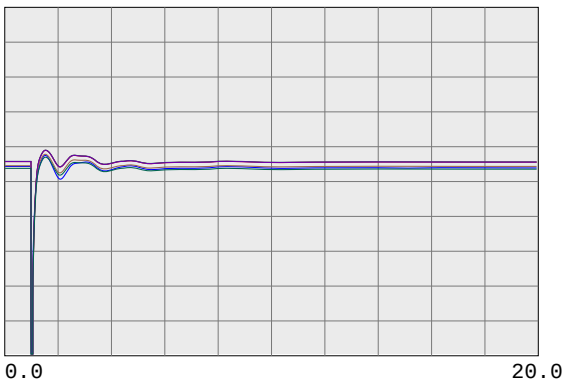
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



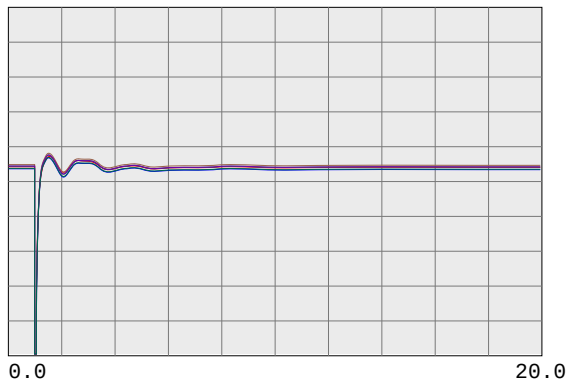
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



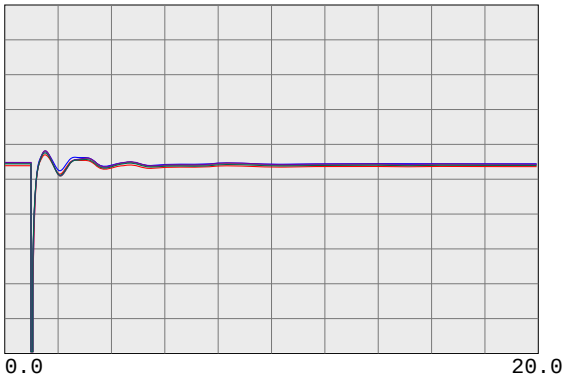
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



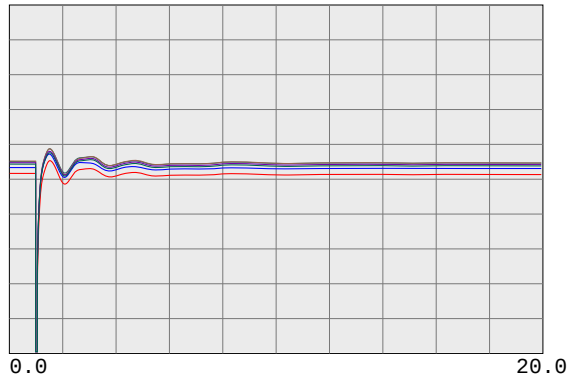
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

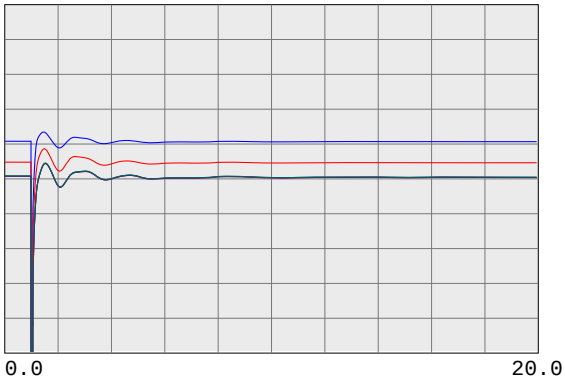
230-KV SYSTEM VOLTAGES



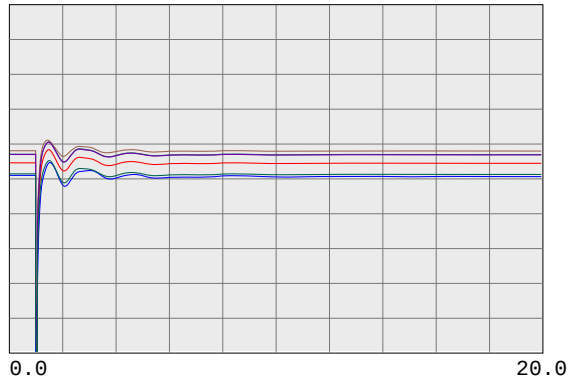
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



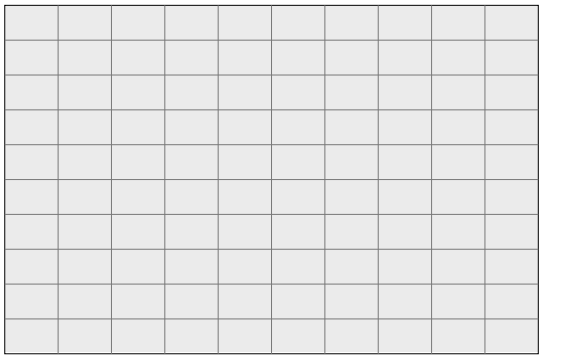
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

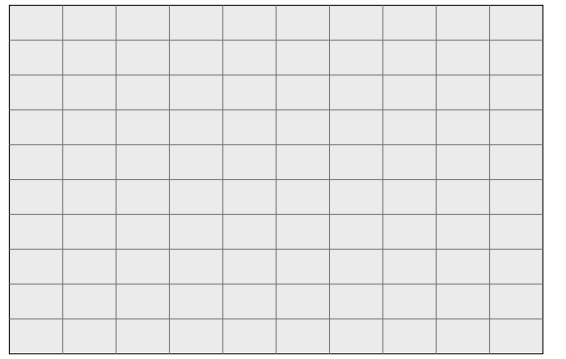


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



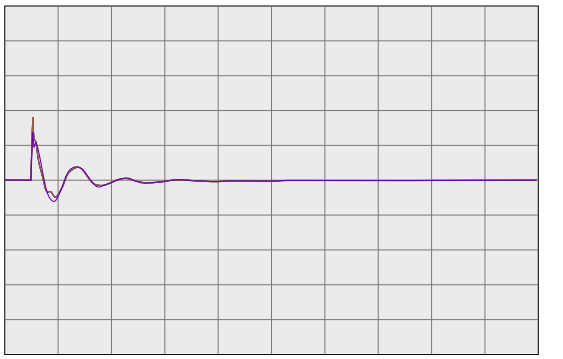
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



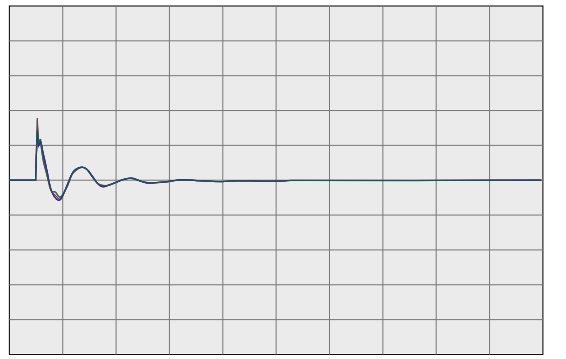


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

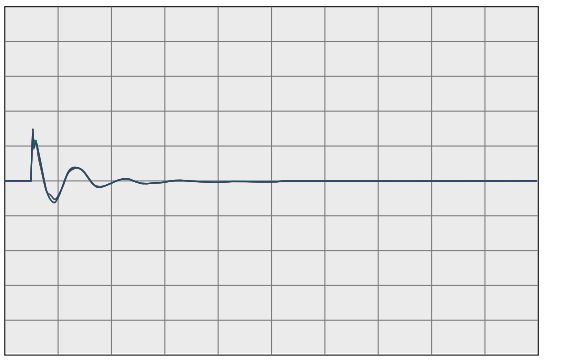
230-KV SYSTEM FREQUENCIES



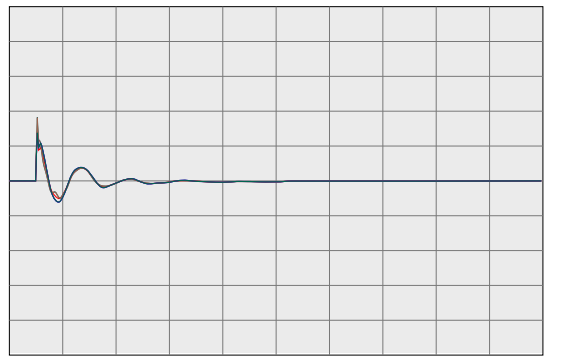
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



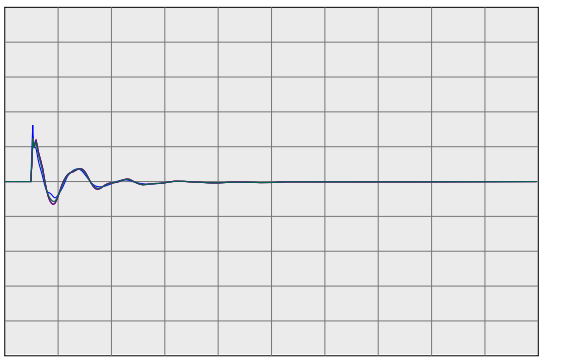
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



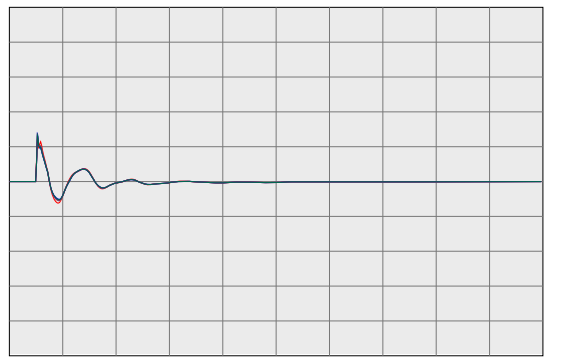
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



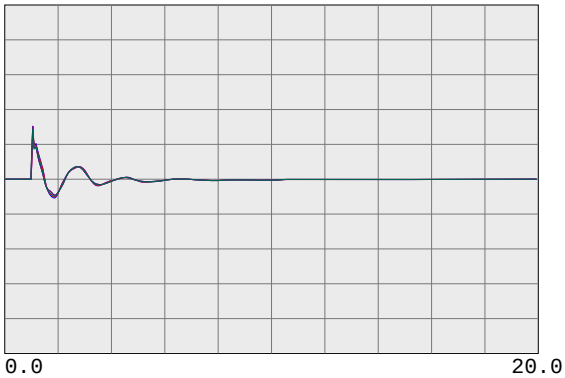
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



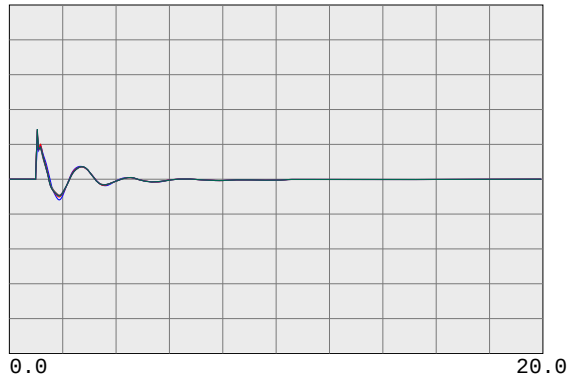
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

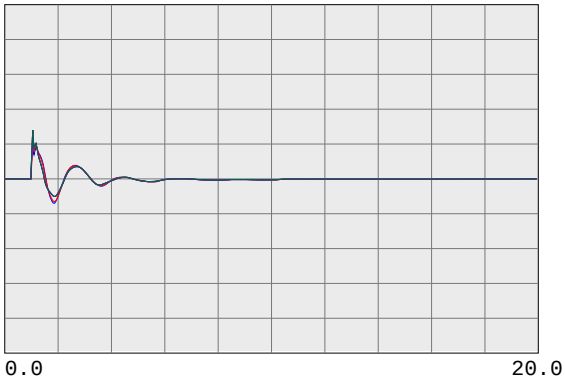
230-KV SYSTEM FREQUENCIES



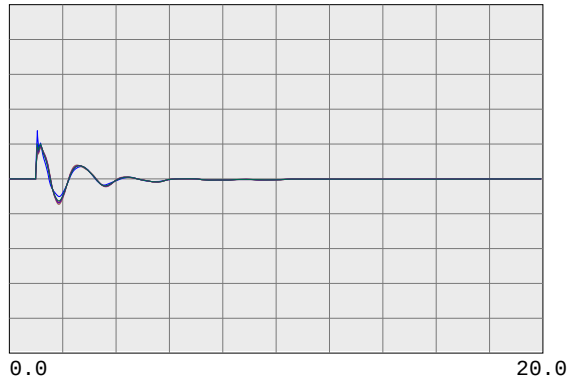
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



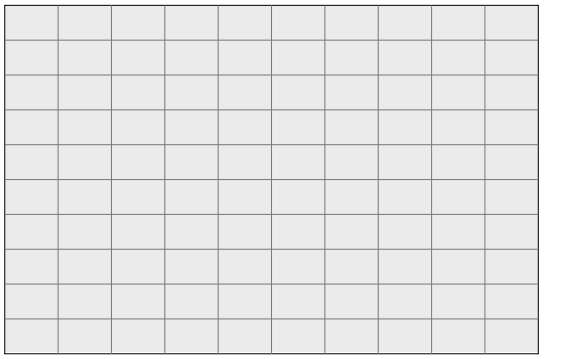
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

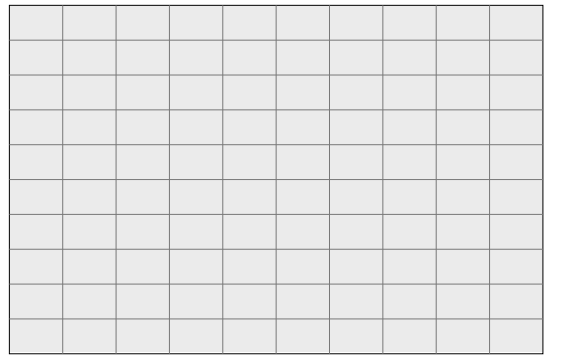


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



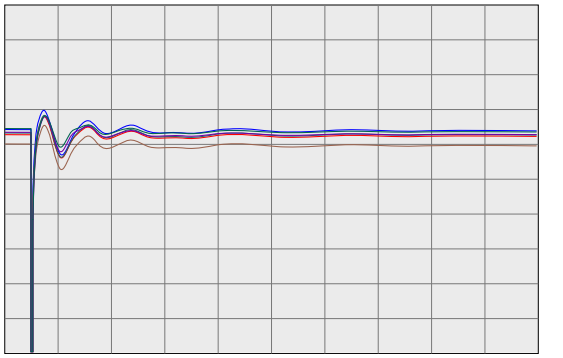
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



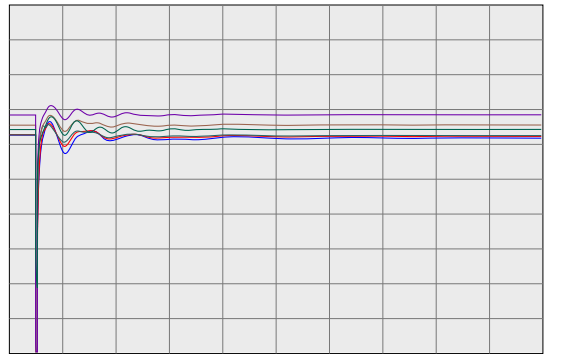


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

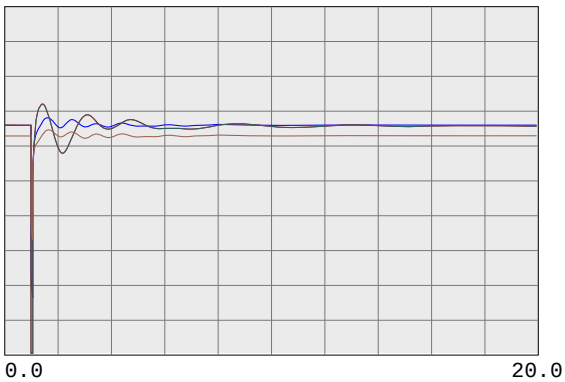
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



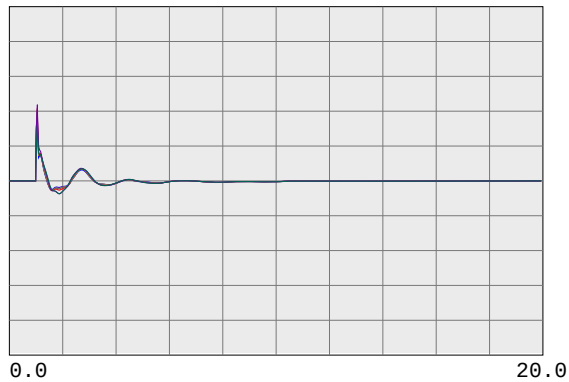
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



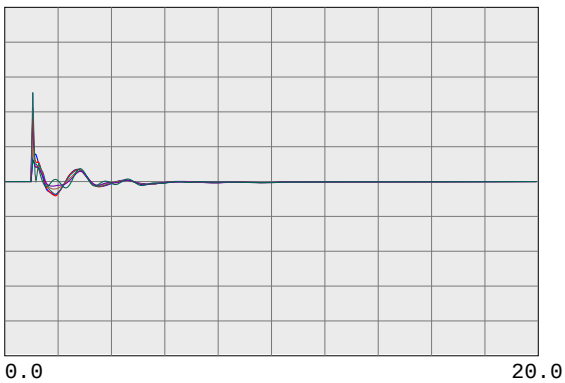
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



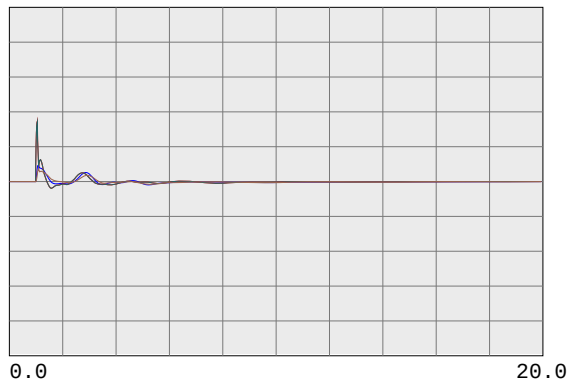
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



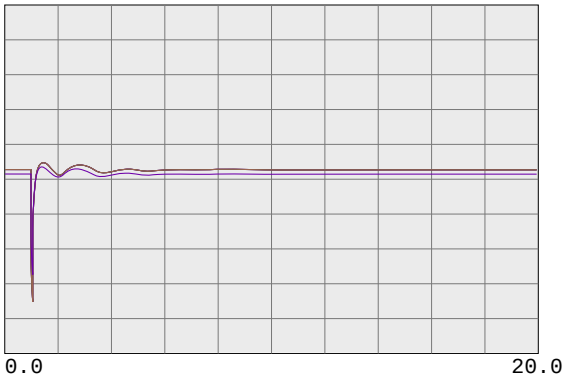
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

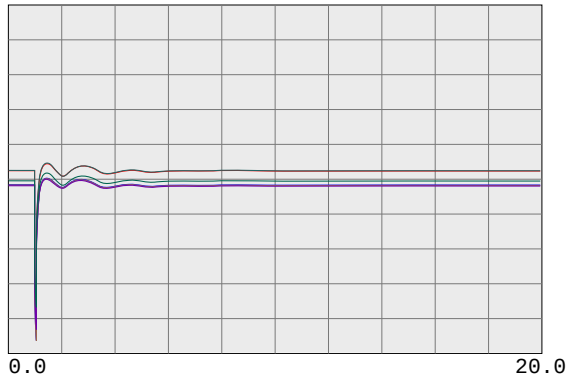
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

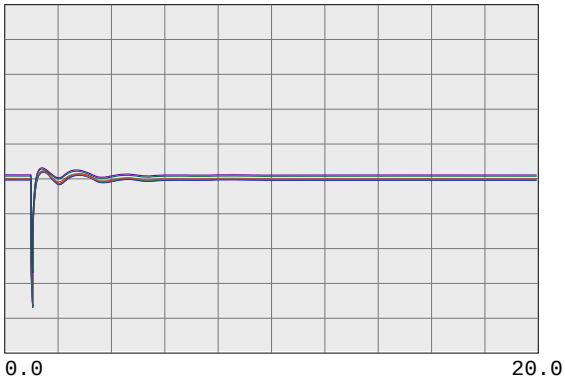
230-KV SYSTEM VOLTAGES



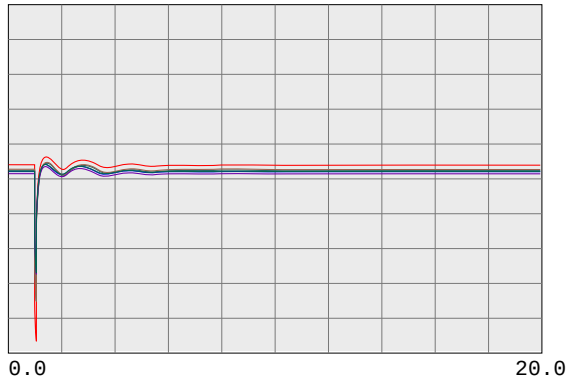
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



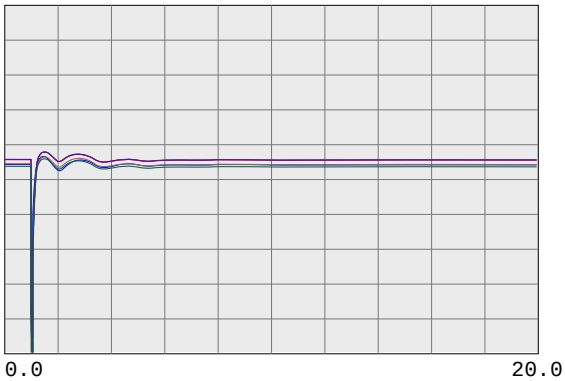
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



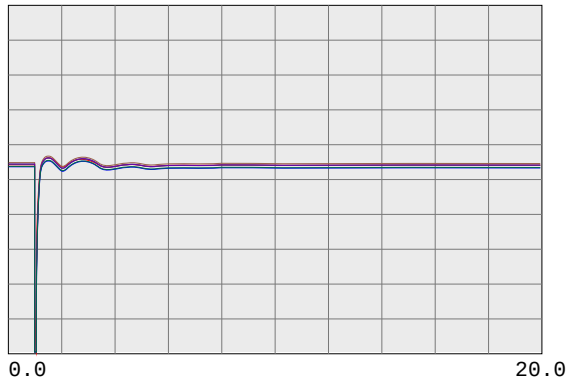
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



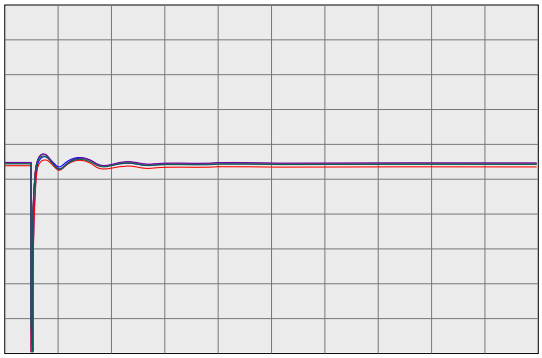
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

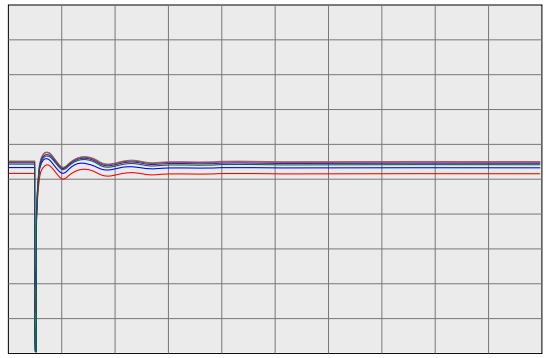
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

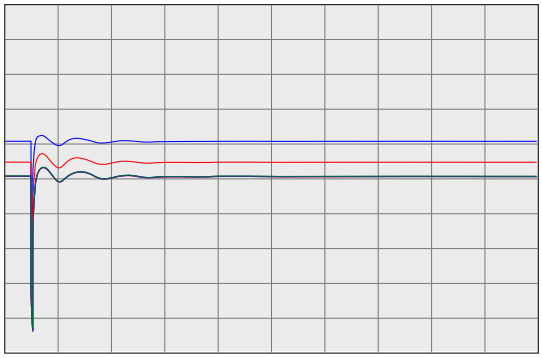
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

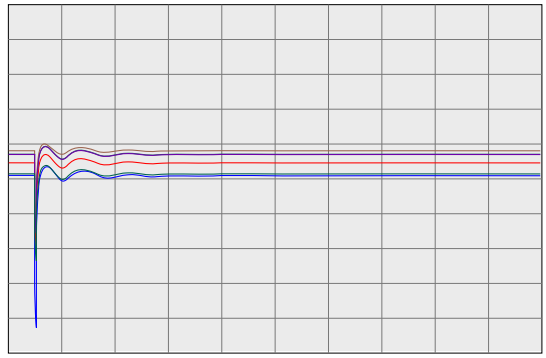
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

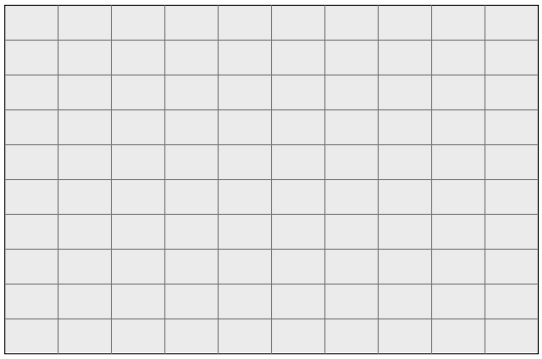
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

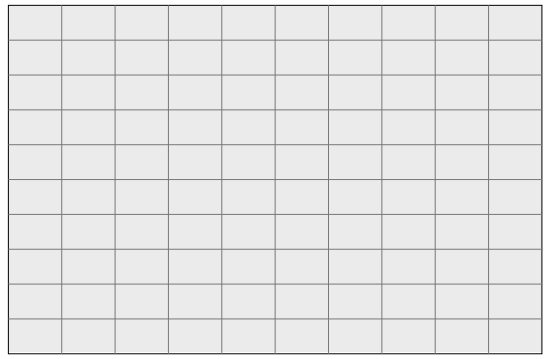


0.0 20.0

Time(sec)

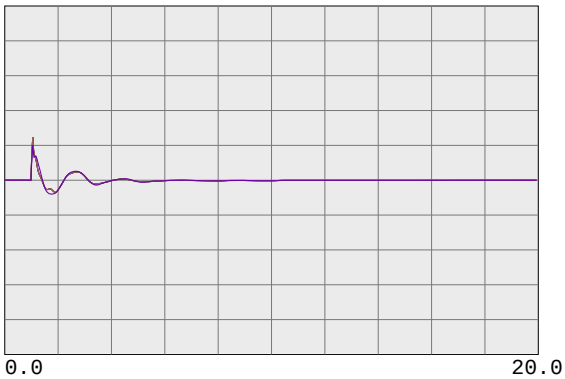
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



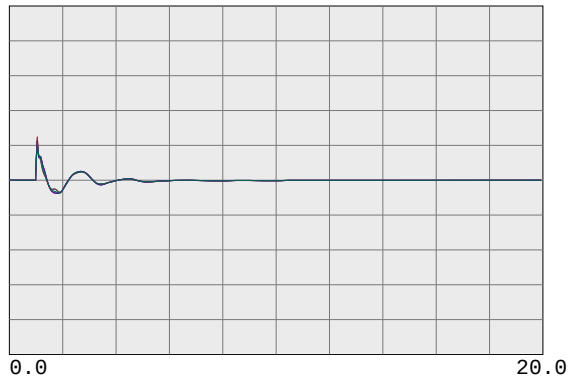


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

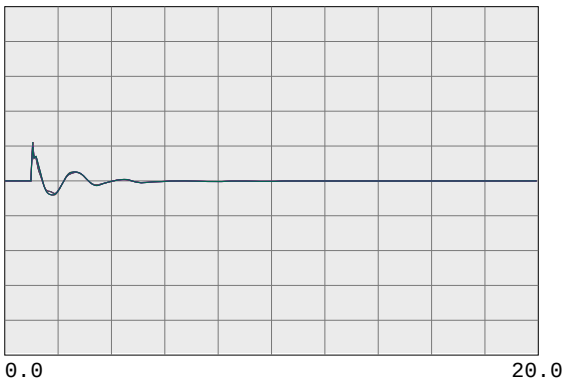
230-KV SYSTEM FREQUENCIES



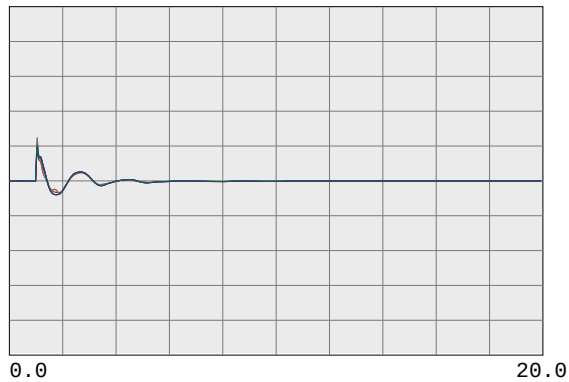
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



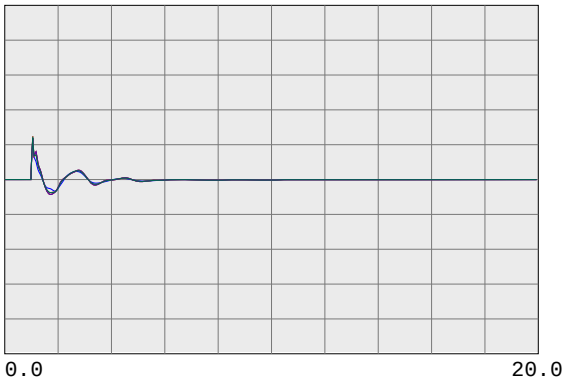
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



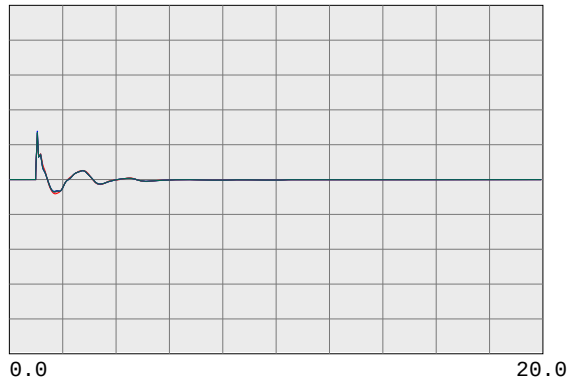
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



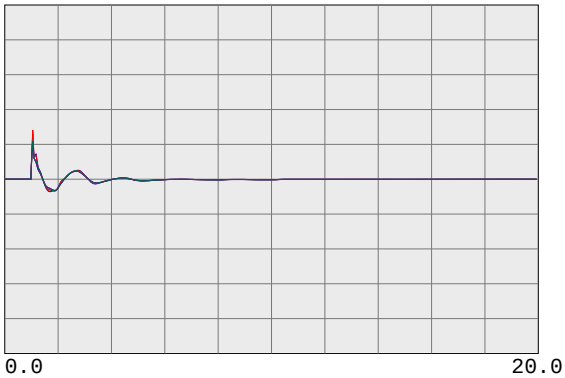
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



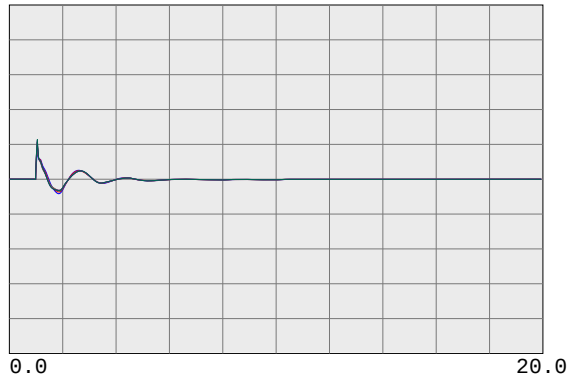
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

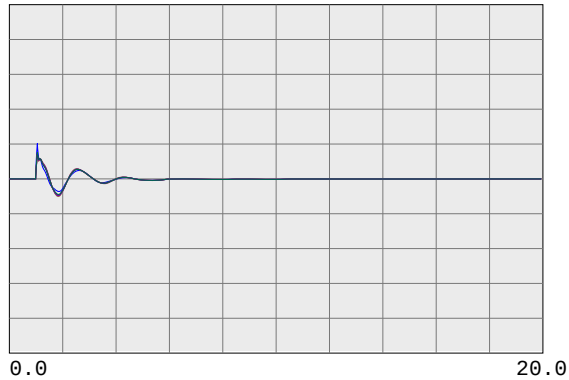


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

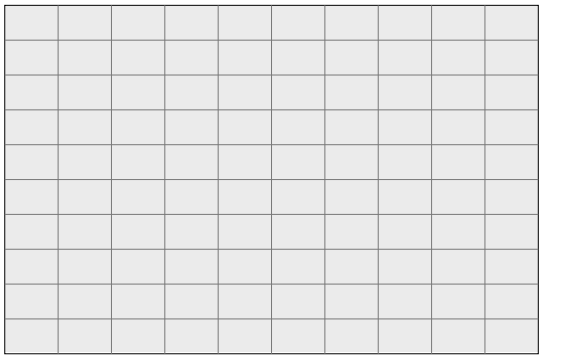


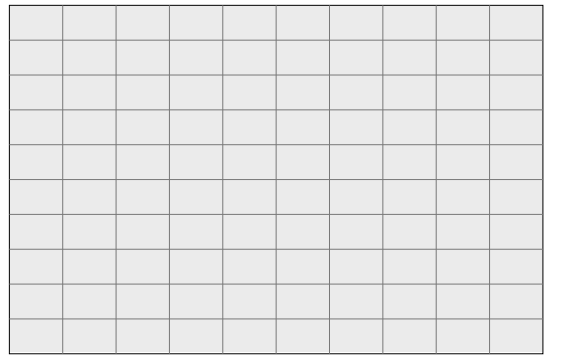
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



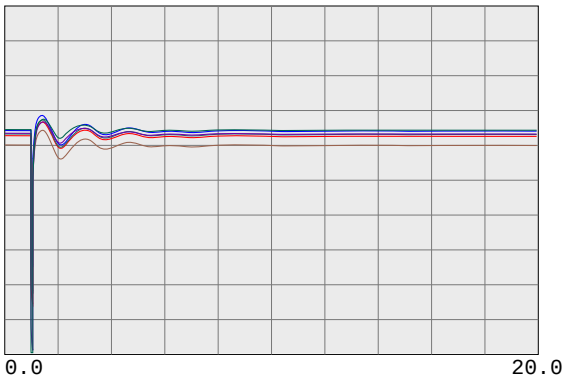
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



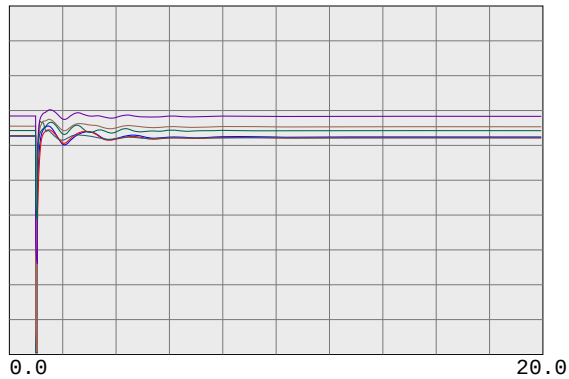


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

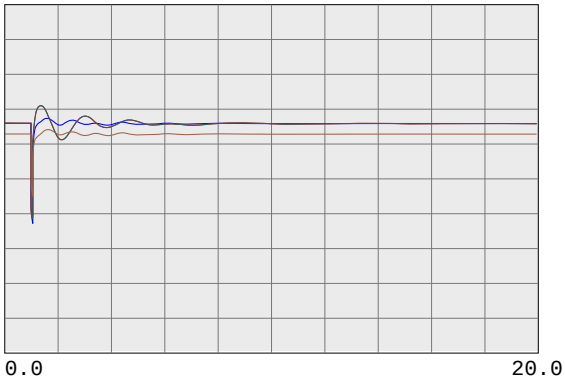
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



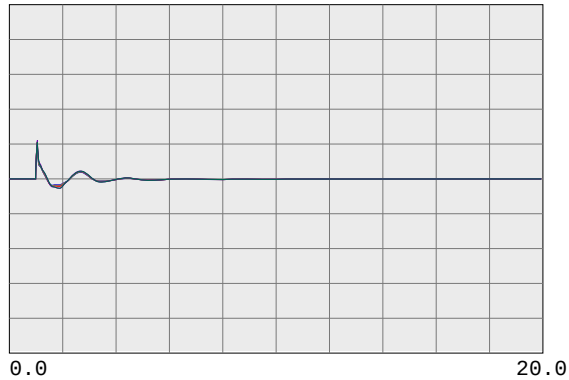
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



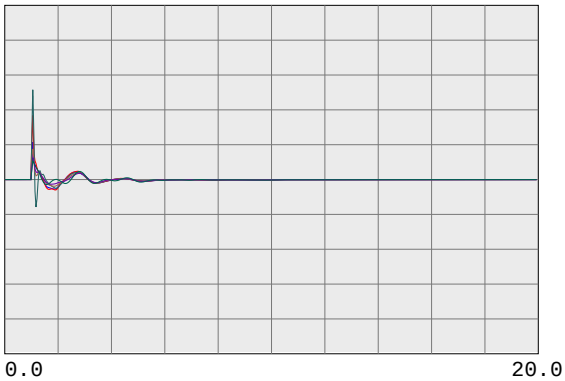
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



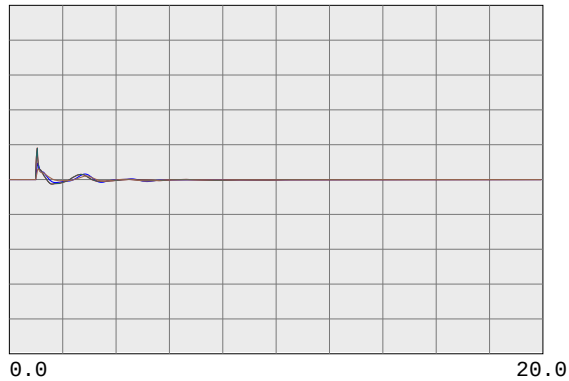
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



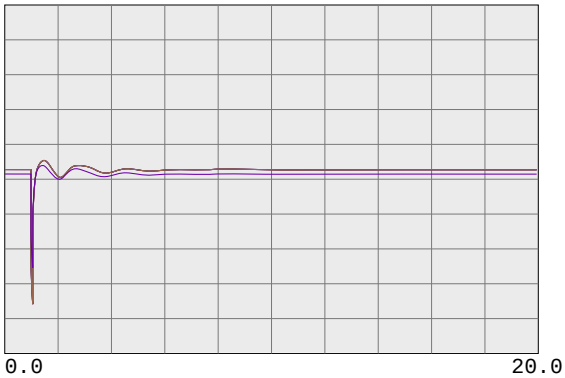
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

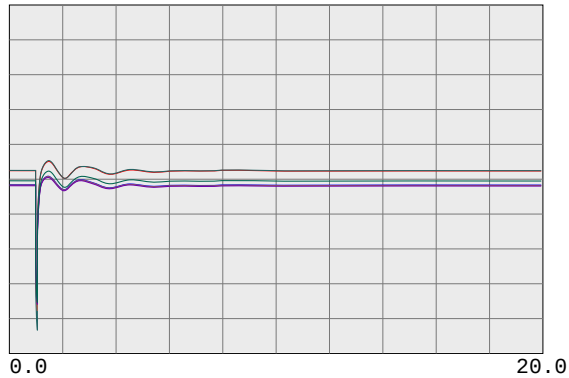
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

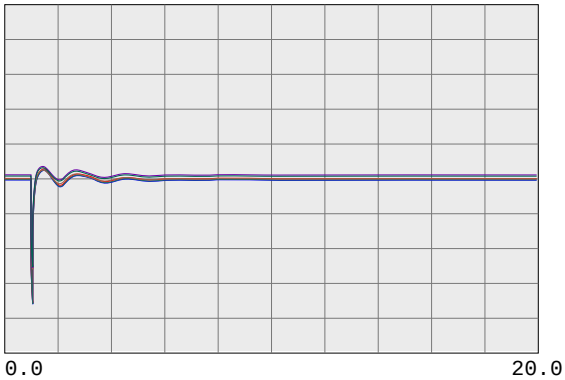
230-KV SYSTEM VOLTAGES



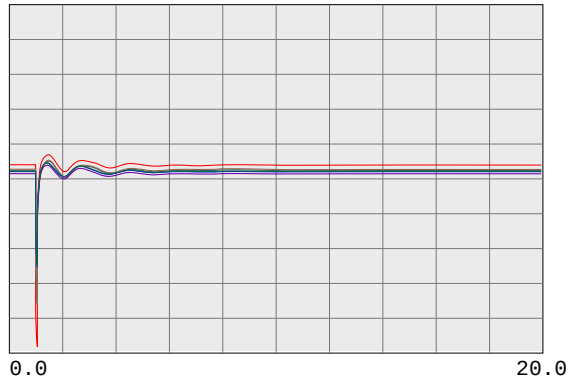
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



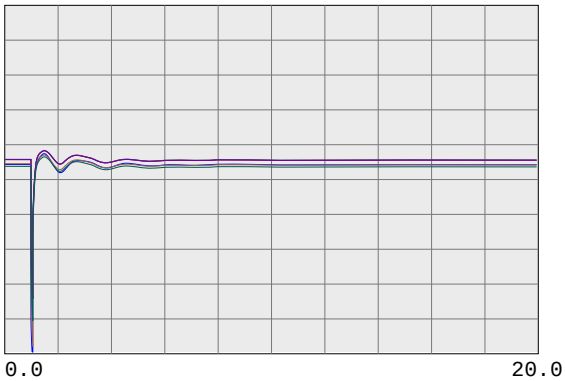
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



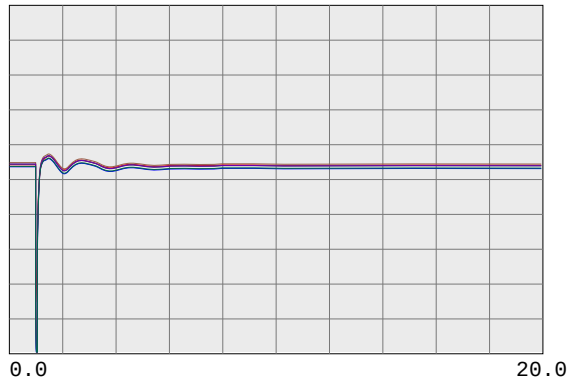
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



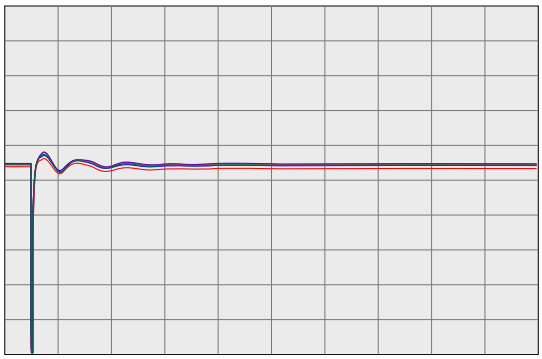
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



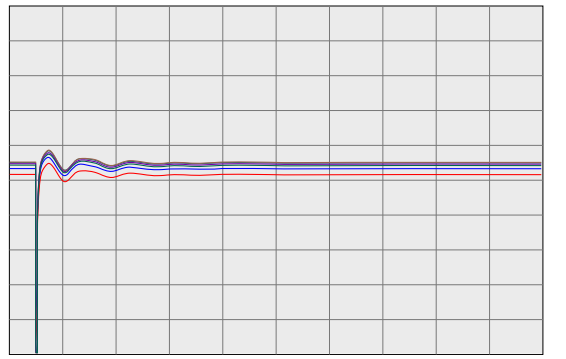
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

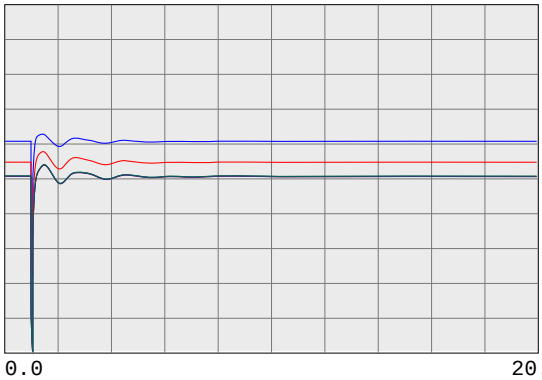
230-KV SYSTEM VOLTAGES



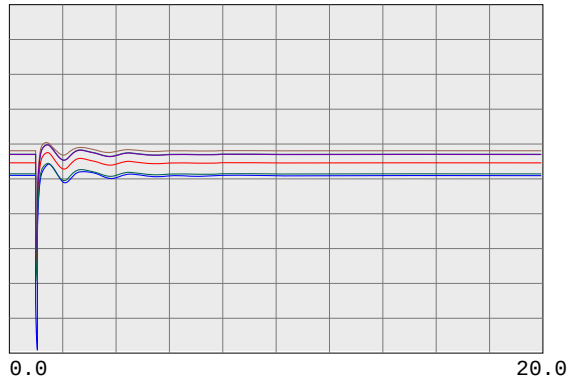
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



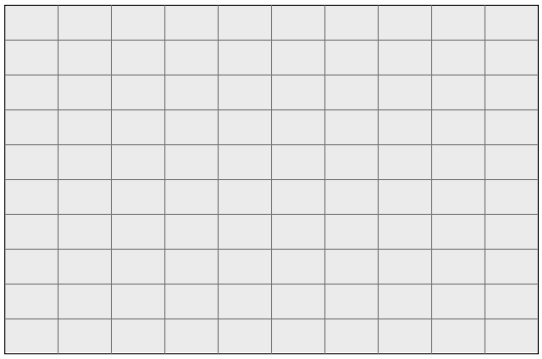
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

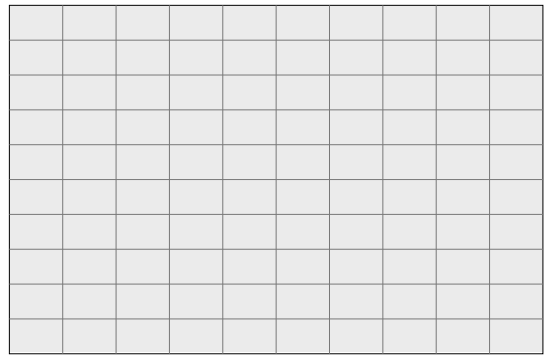


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



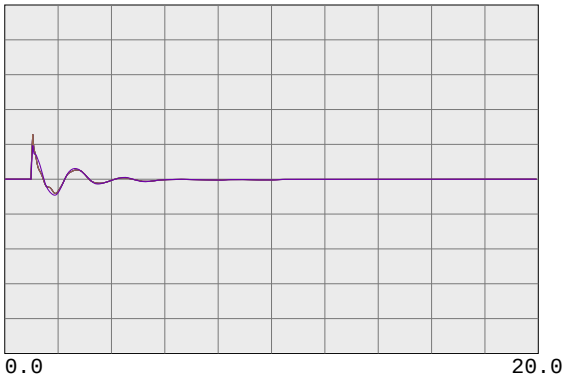
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



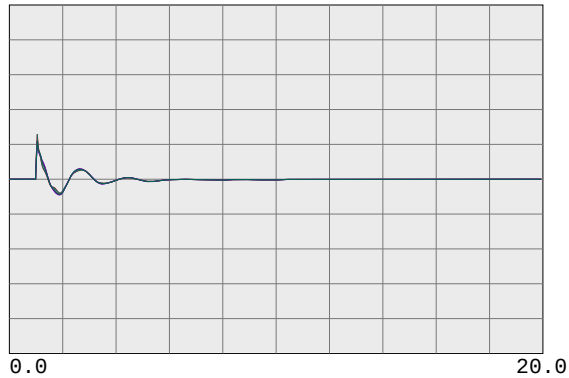


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

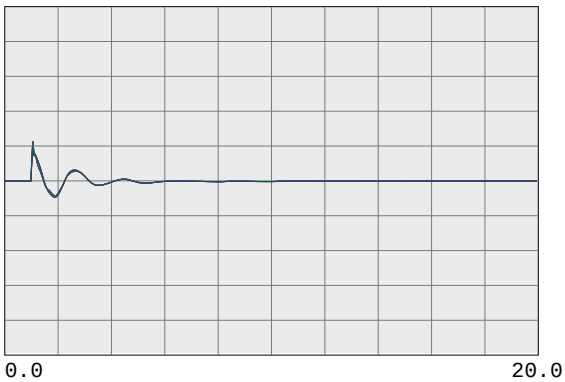
230-KV SYSTEM FREQUENCIES



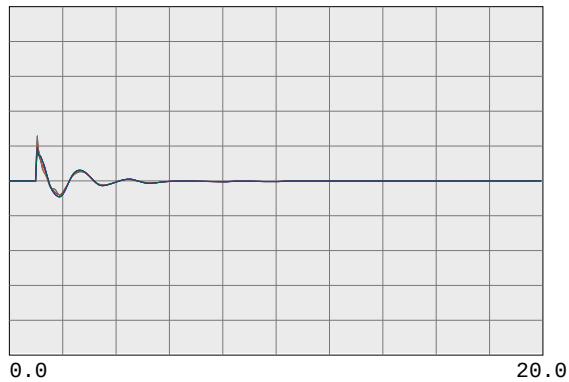
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



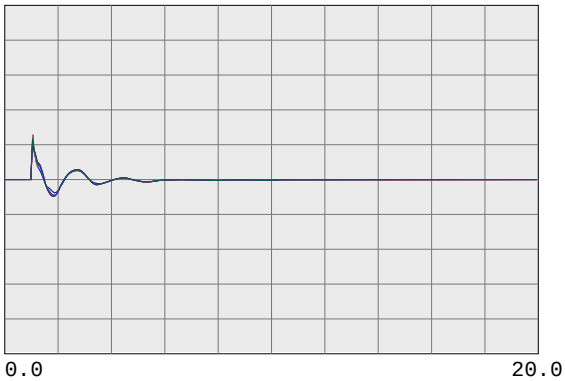
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



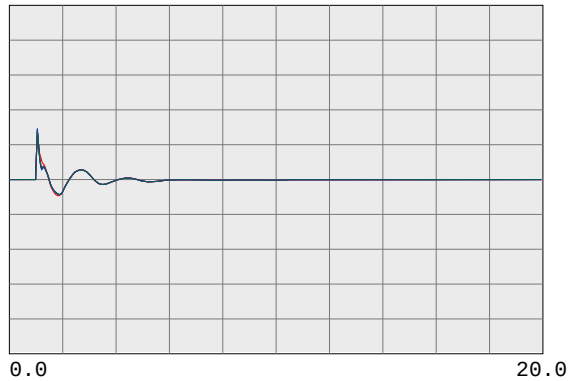
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



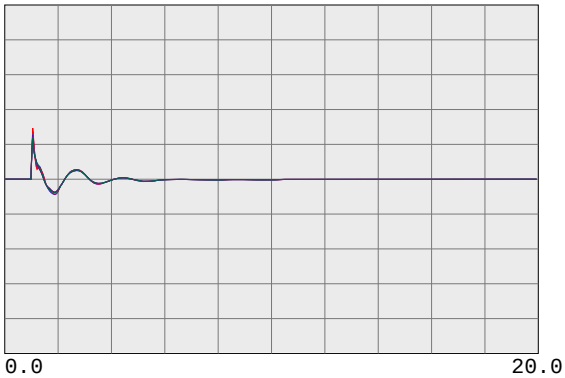
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



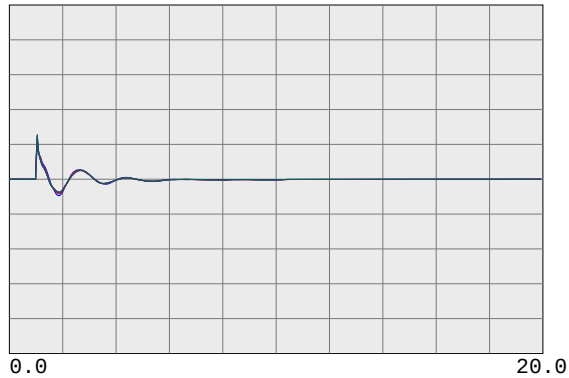
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

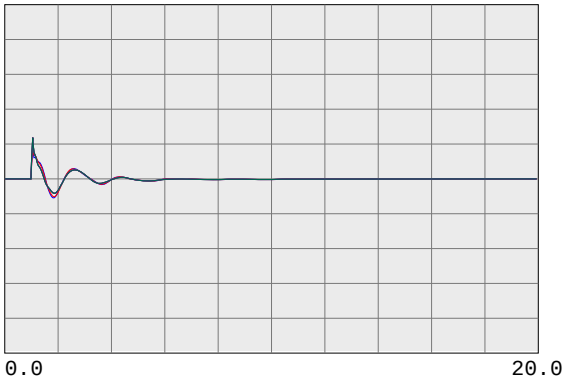
230-KV SYSTEM FREQUENCIES



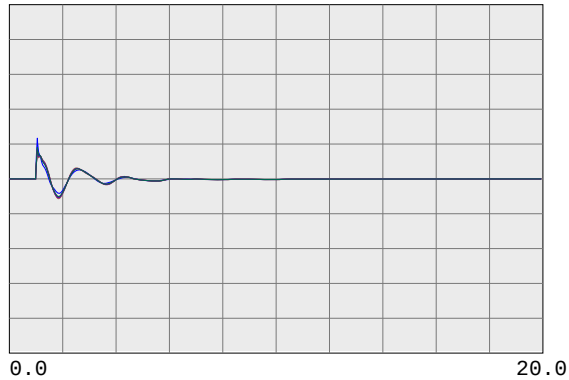
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



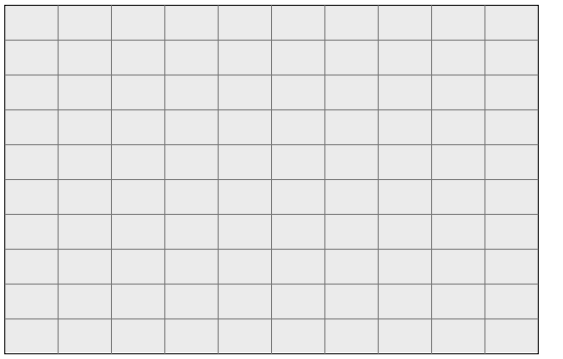
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

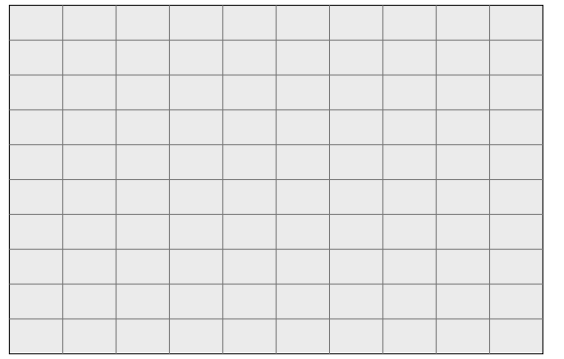


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



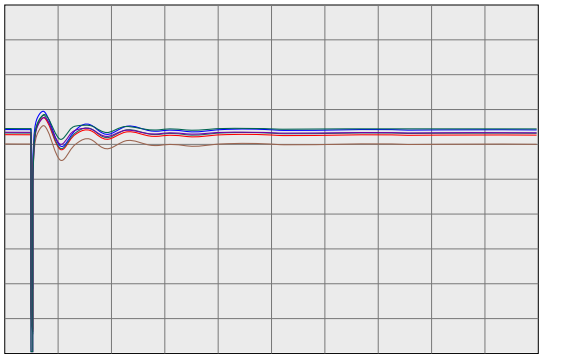
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



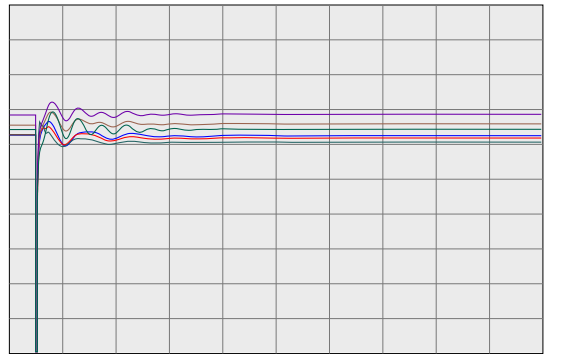


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

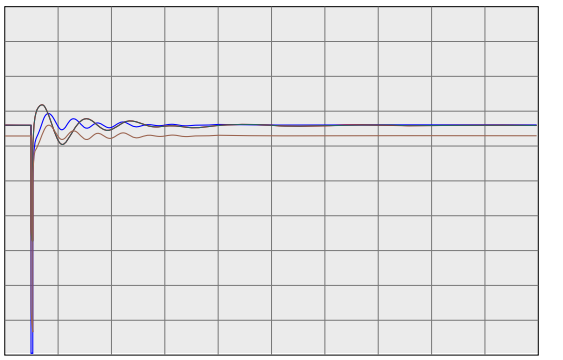
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



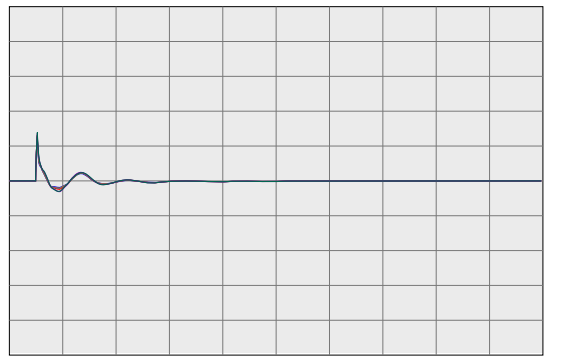
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



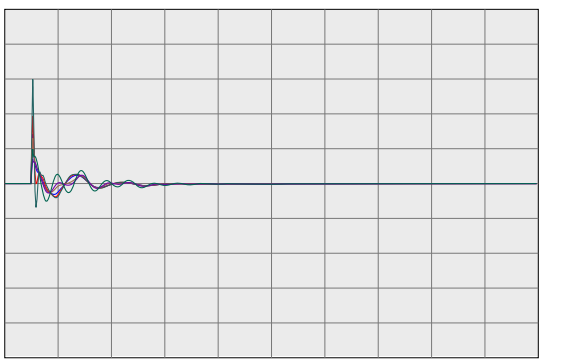
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



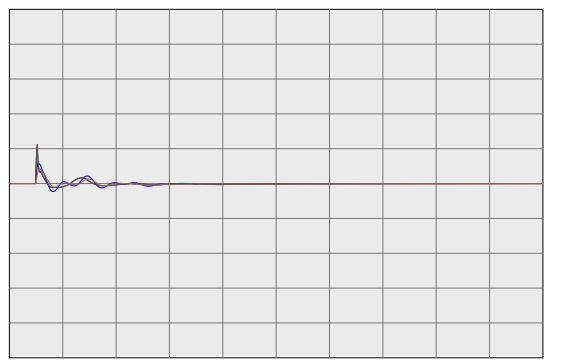
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



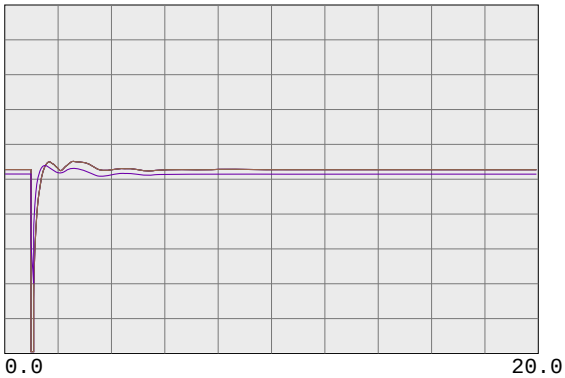
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

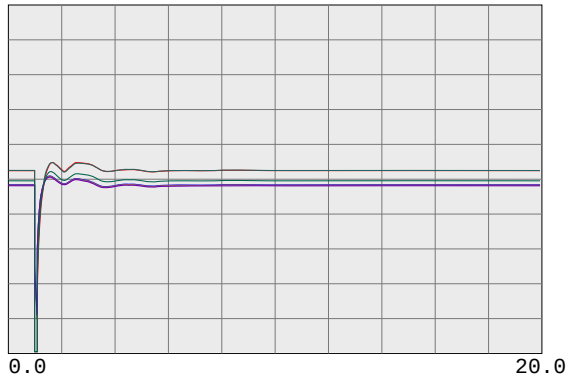
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

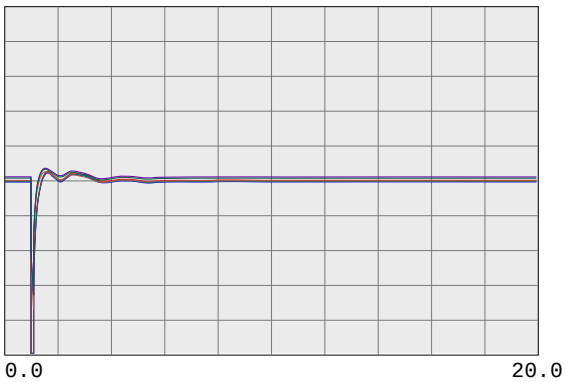
230-KV SYSTEM VOLTAGES



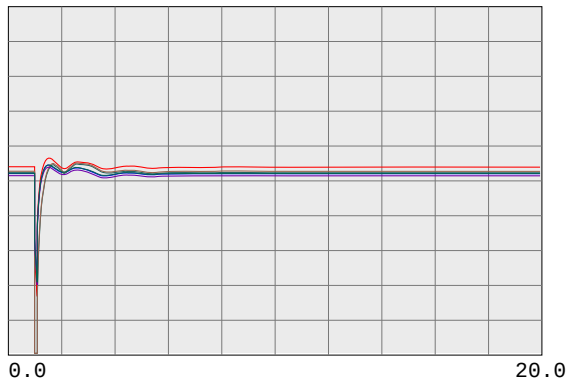
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



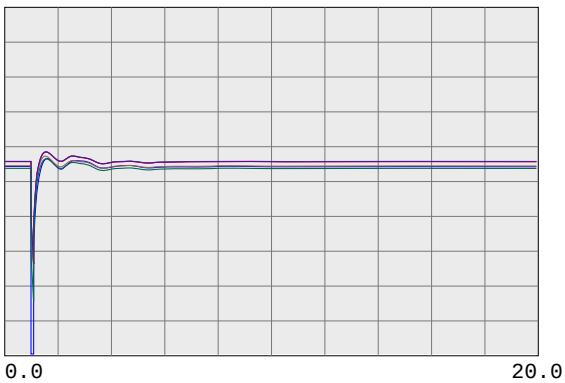
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



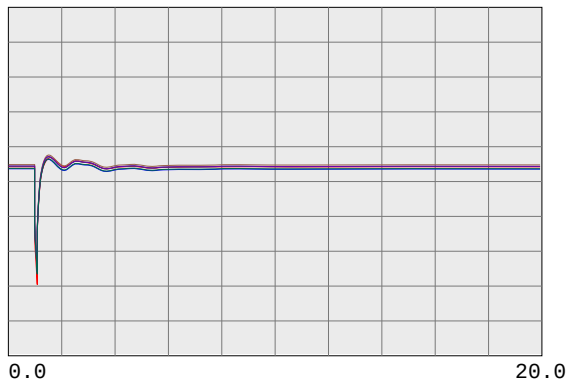
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



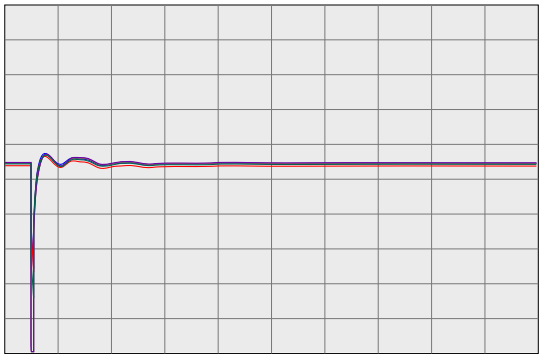
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

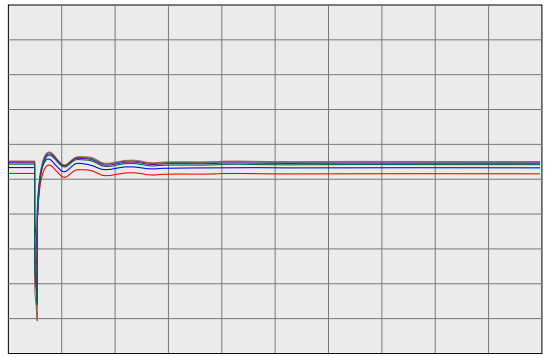
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

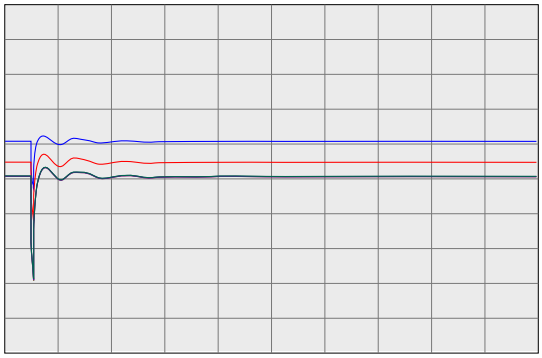
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

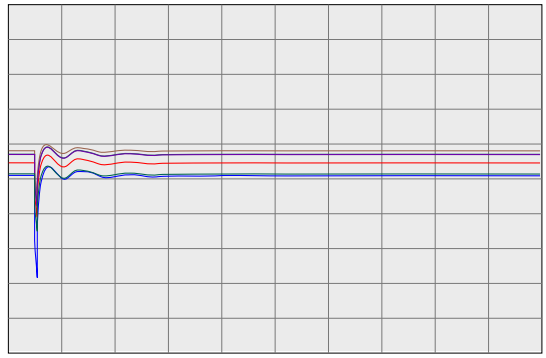
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

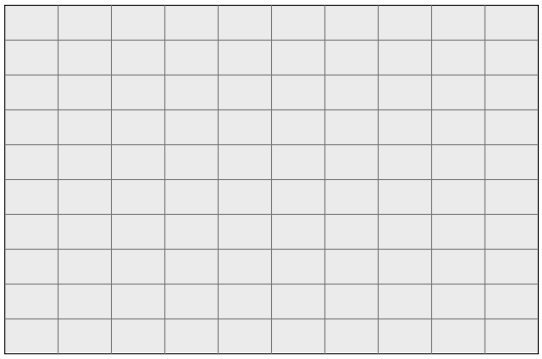
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

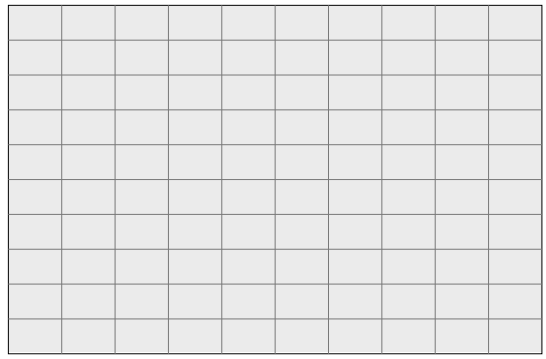


0.0 20.0

Time(sec)

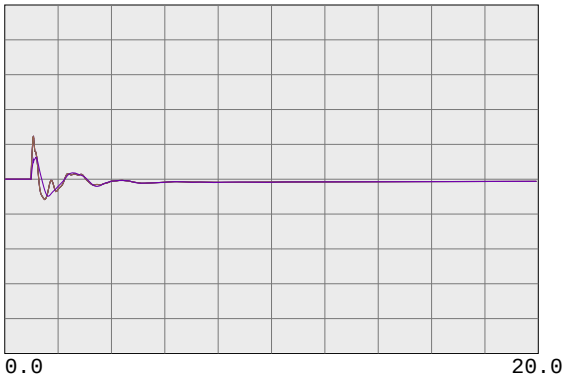
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



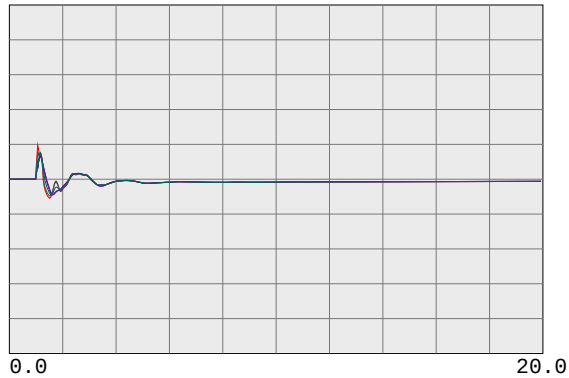


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

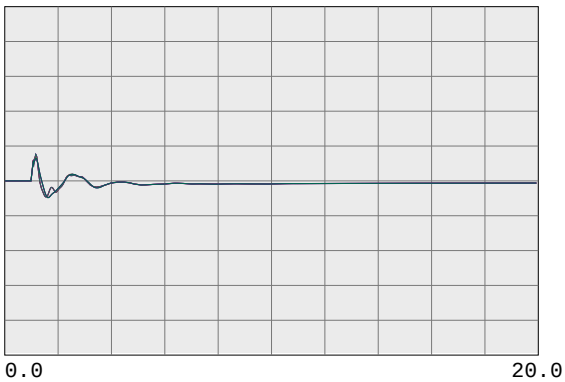
230-KV SYSTEM FREQUENCIES



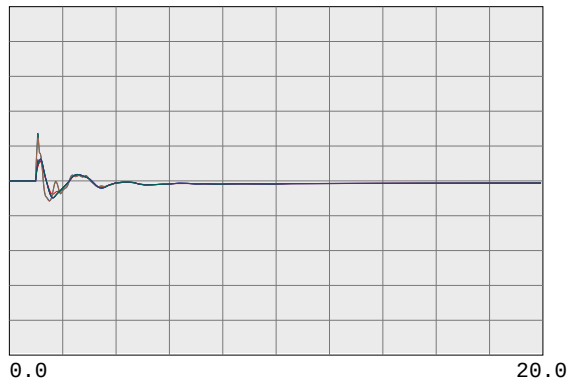
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



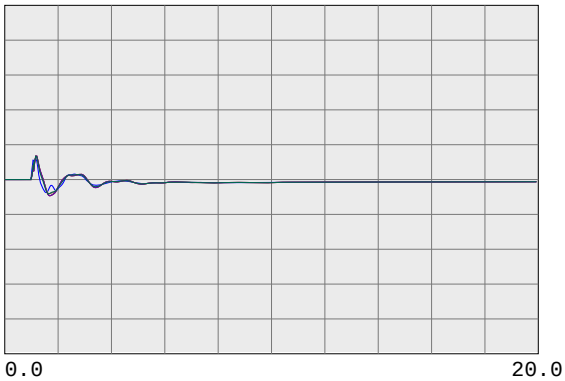
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



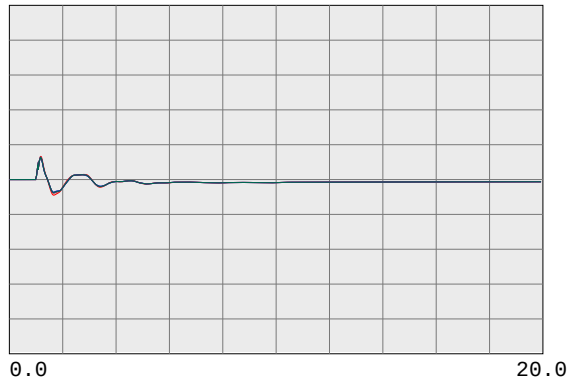
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



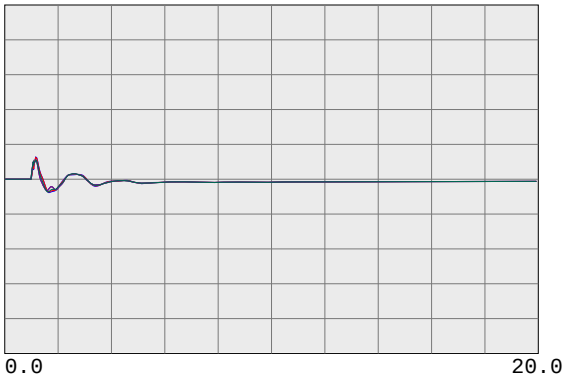
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



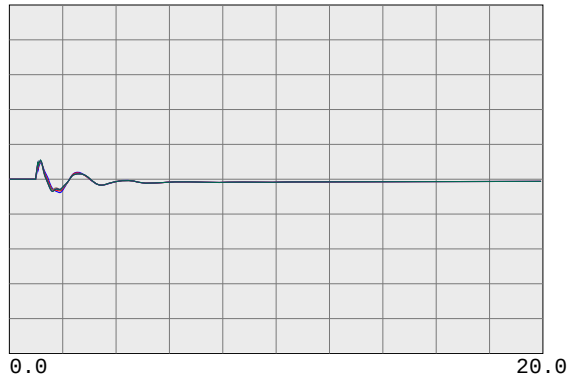
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

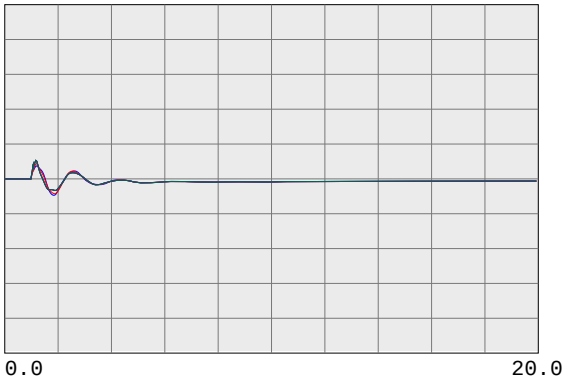
230-KV SYSTEM FREQUENCIES



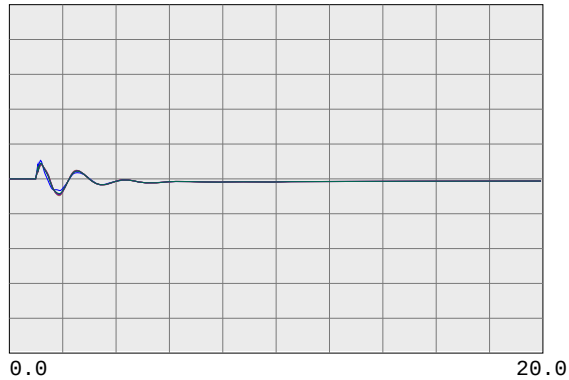
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



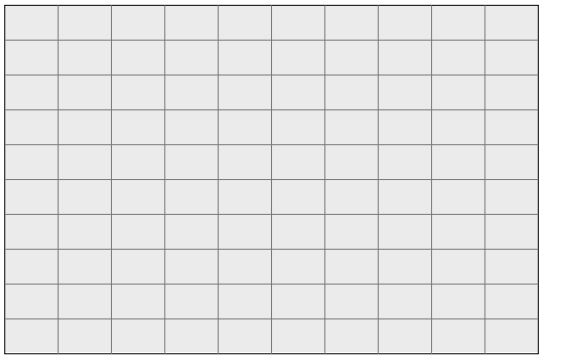
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

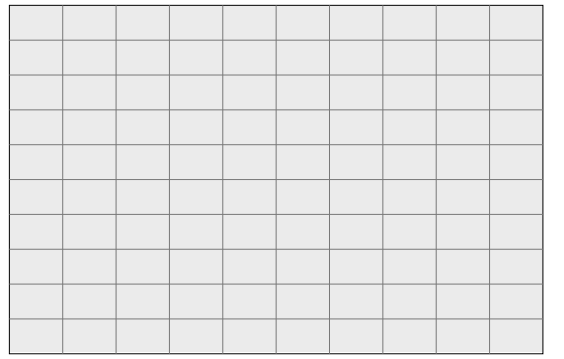


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



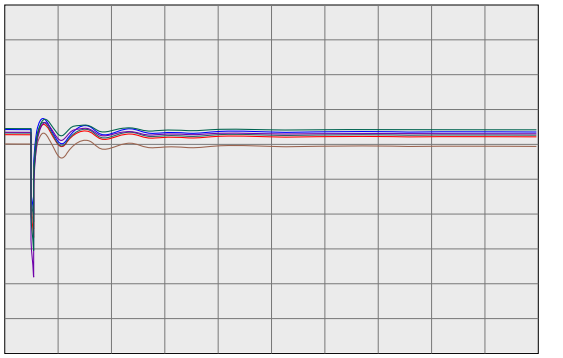
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



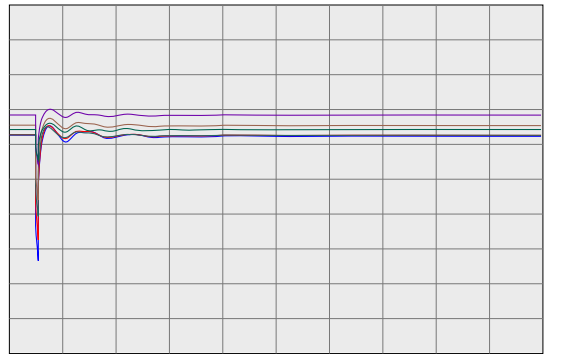


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

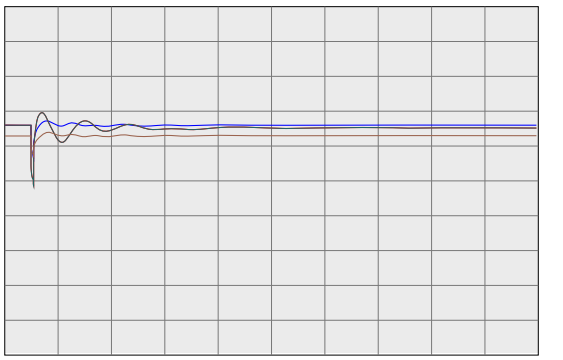
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



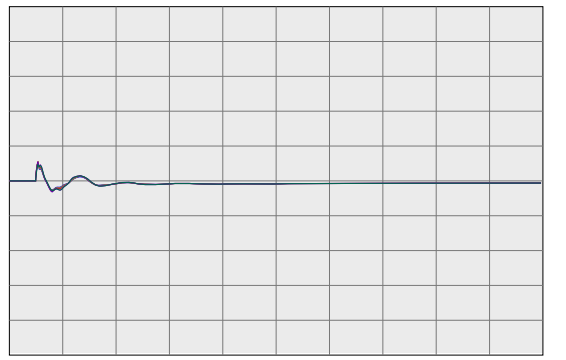
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



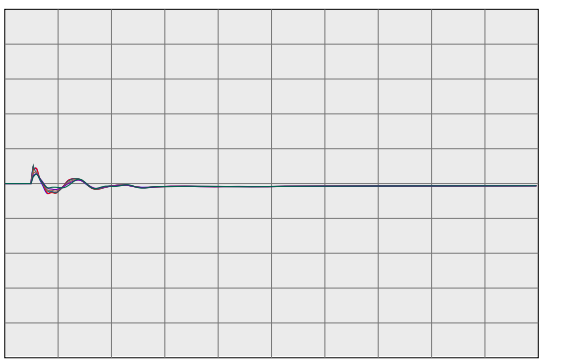
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



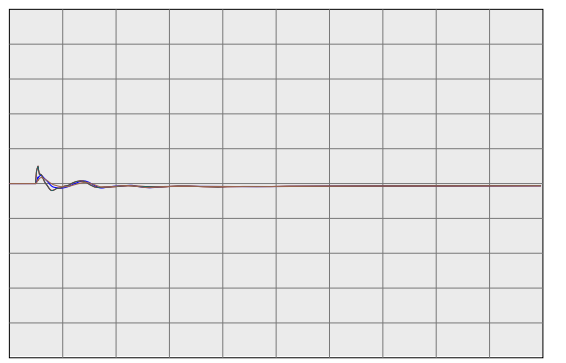
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



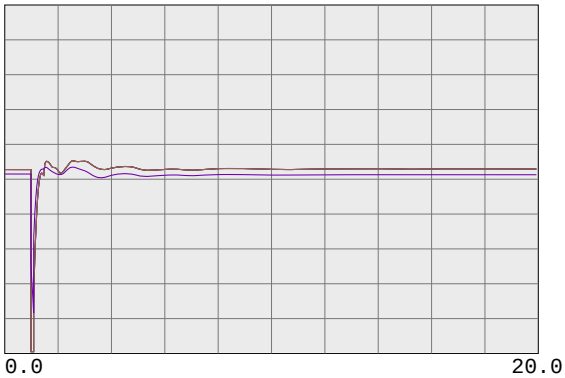
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

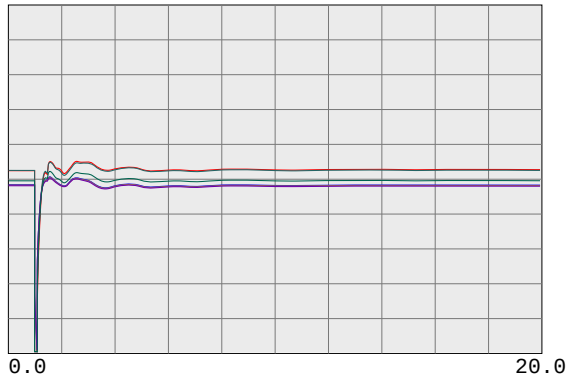
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

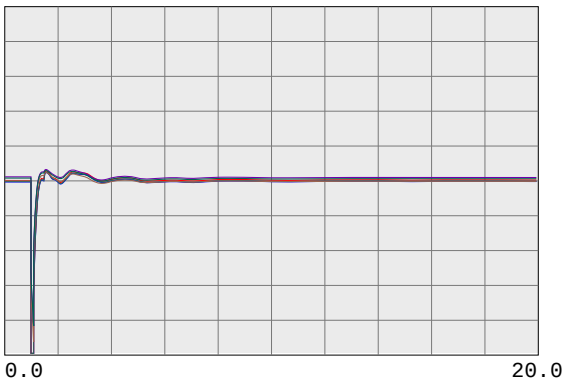
230-KV SYSTEM VOLTAGES



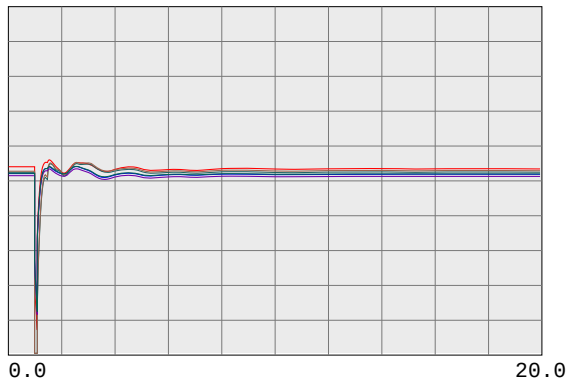
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



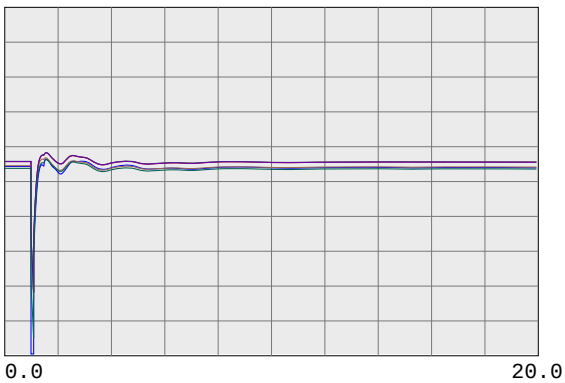
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



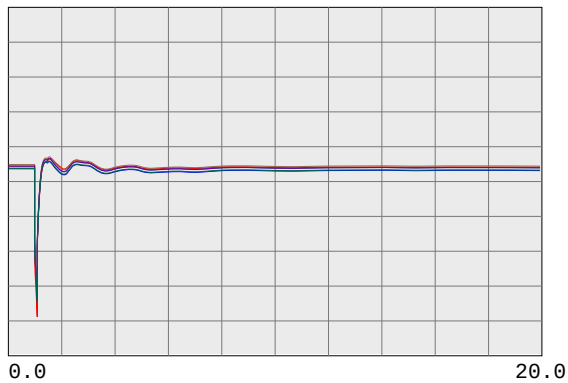
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



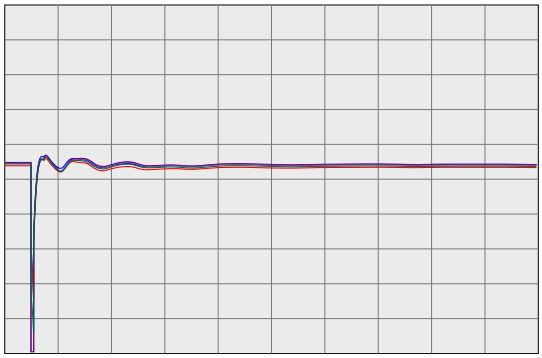
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

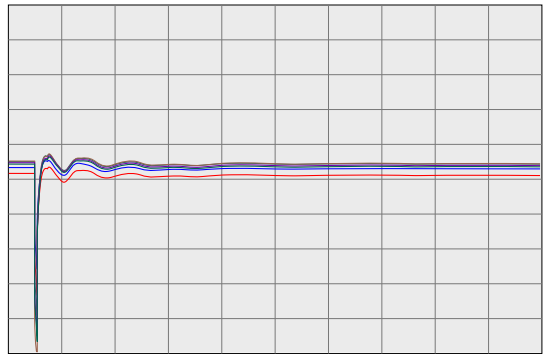
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

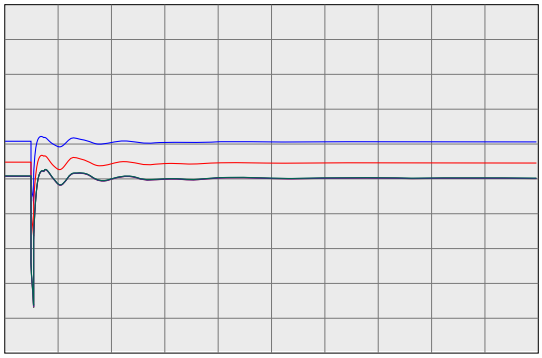
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

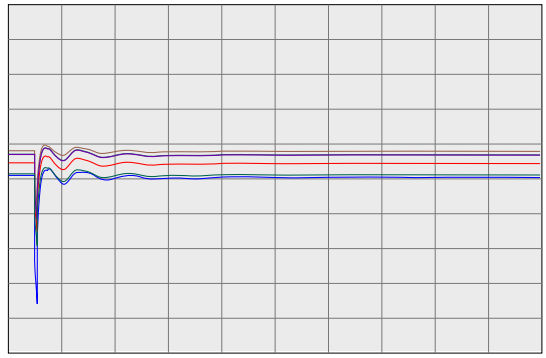
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

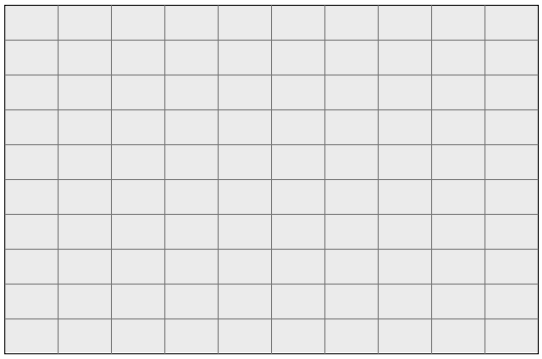
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

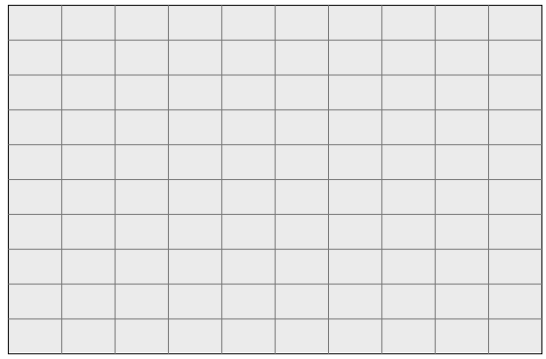


0.0 20.0

Time(sec)

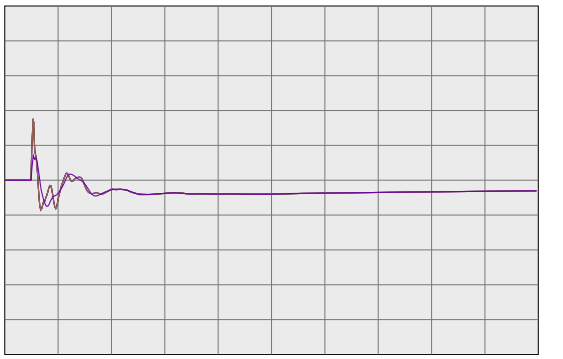
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



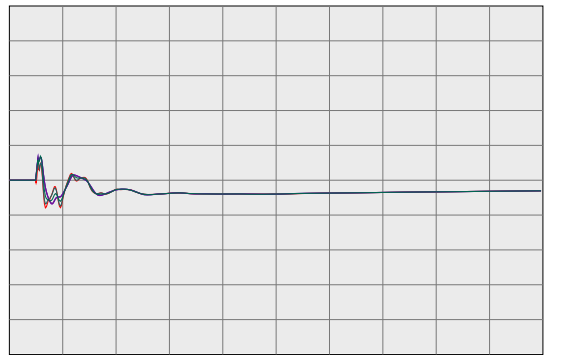


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

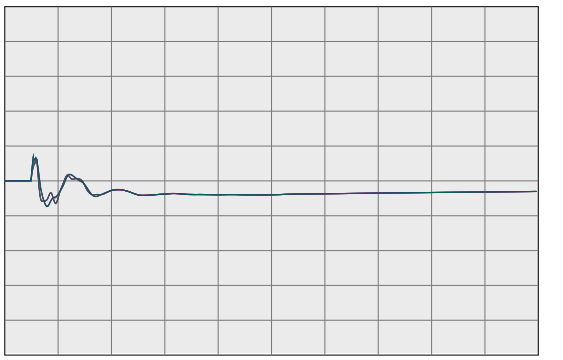
230-KV SYSTEM FREQUENCIES



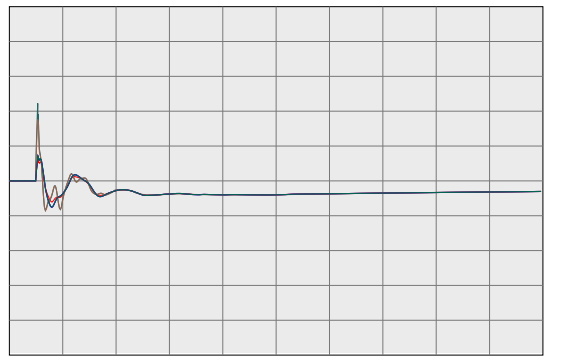
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



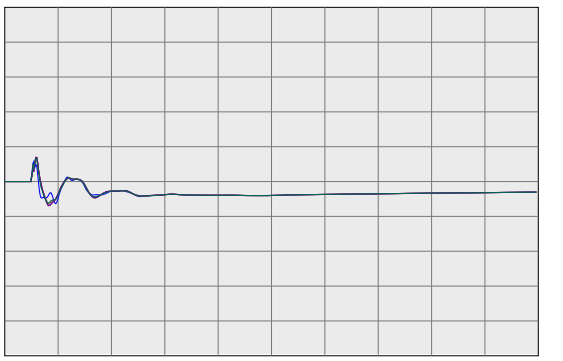
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



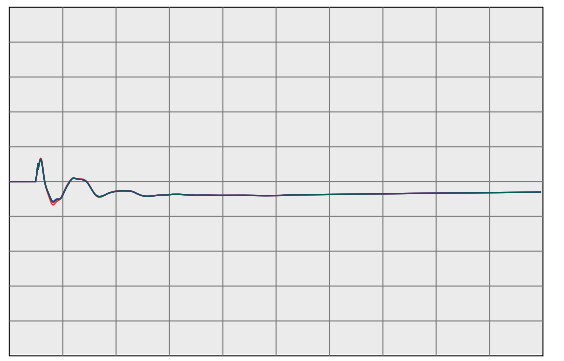
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



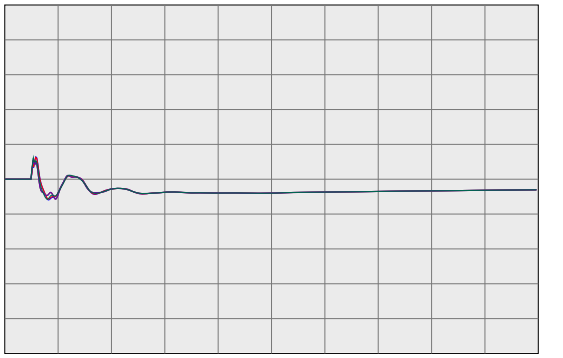
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



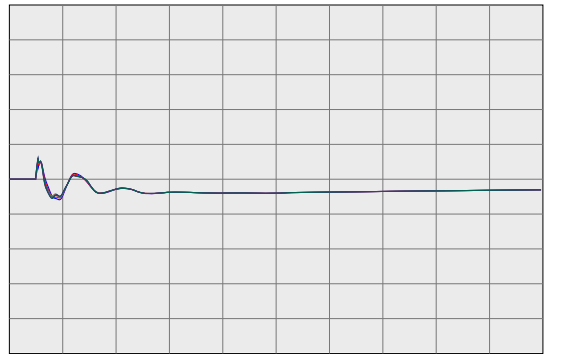
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

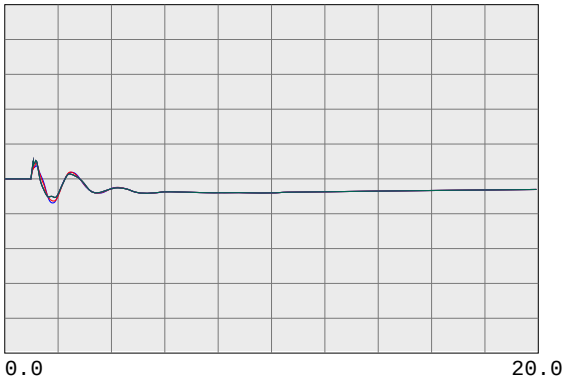
230-KV SYSTEM FREQUENCIES



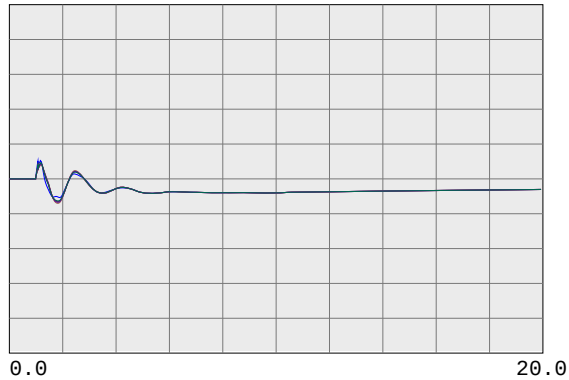
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



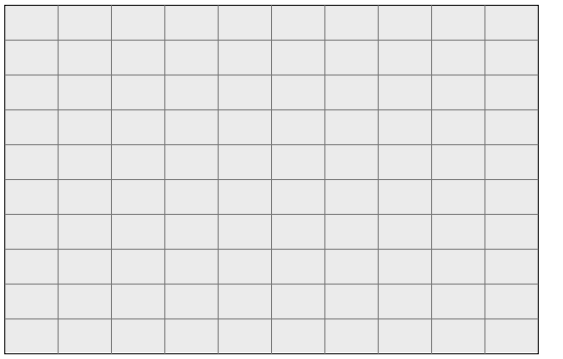
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

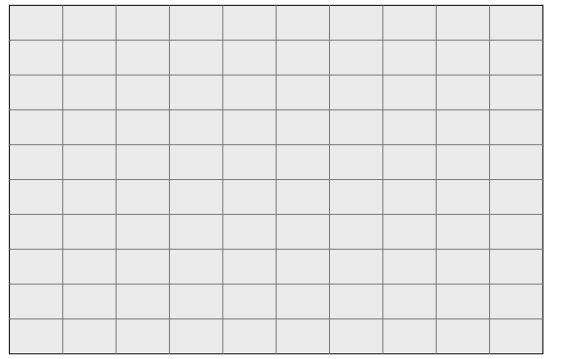


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



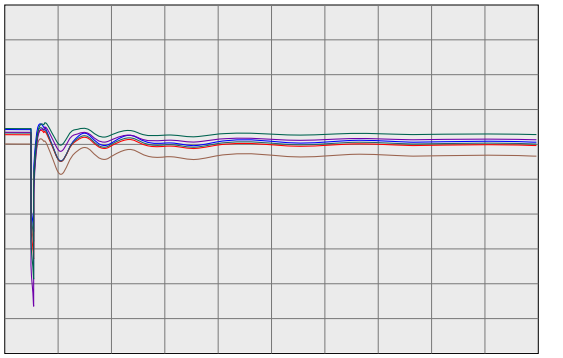
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



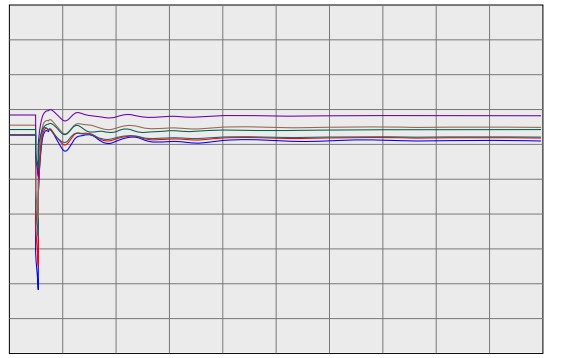


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

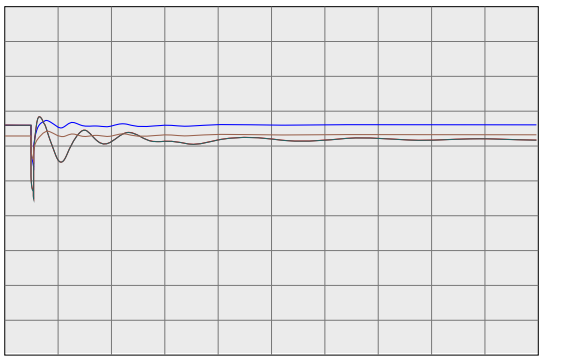
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



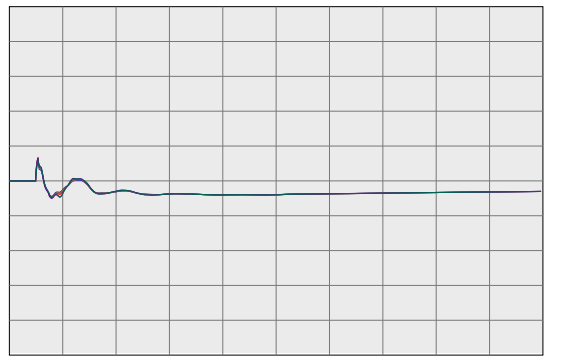
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



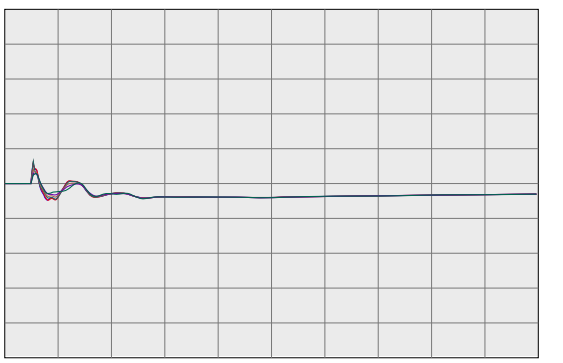
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



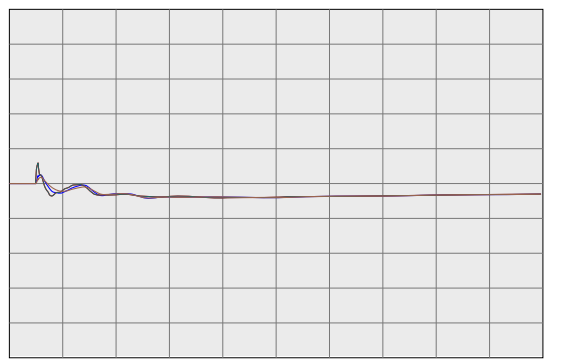
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



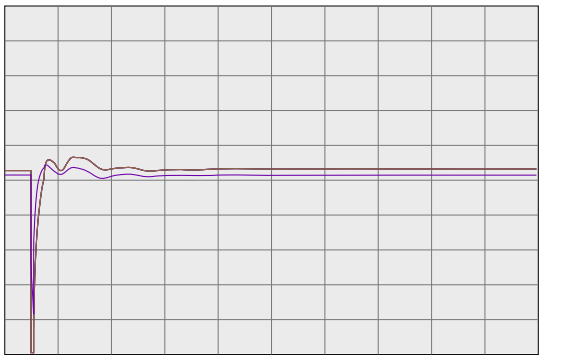
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

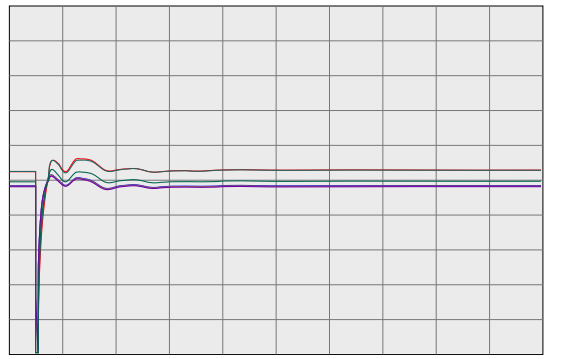
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

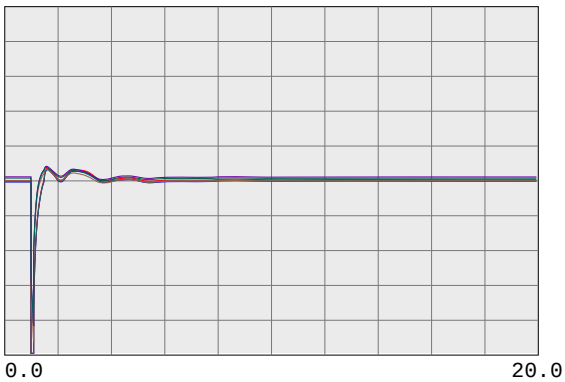
230-KV SYSTEM VOLTAGES



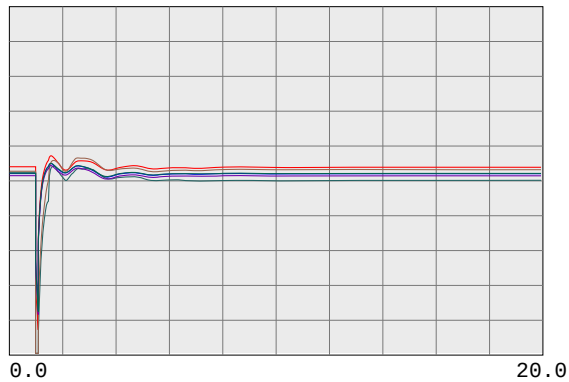
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



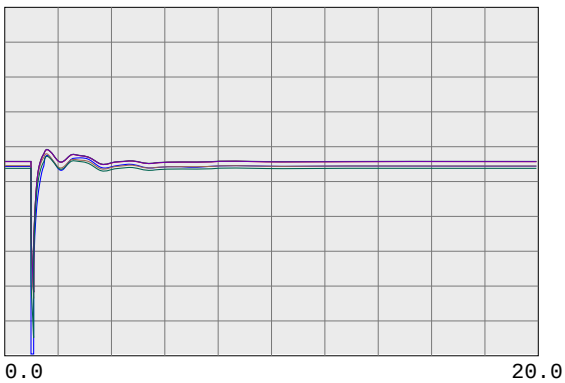
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



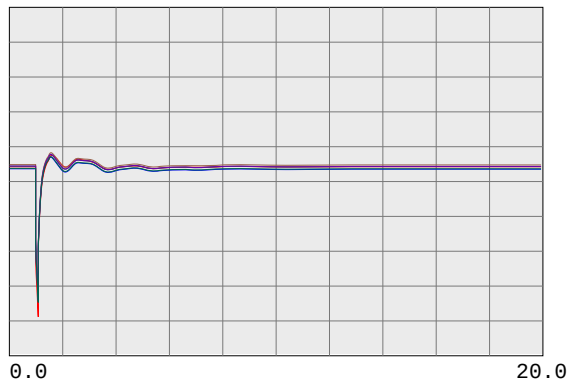
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



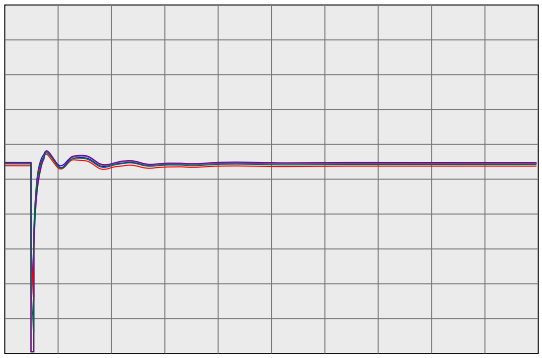
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

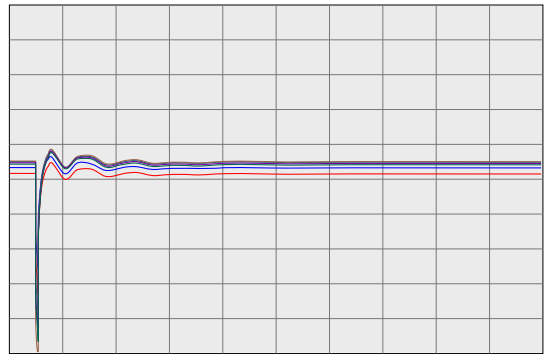
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

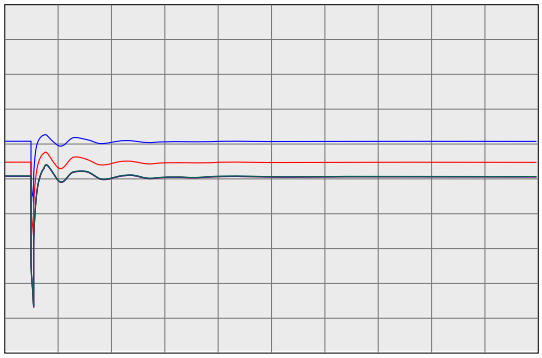
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

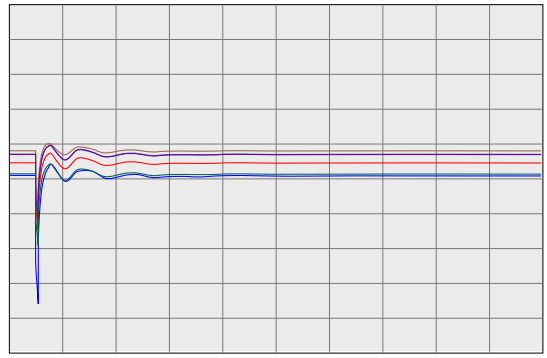
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

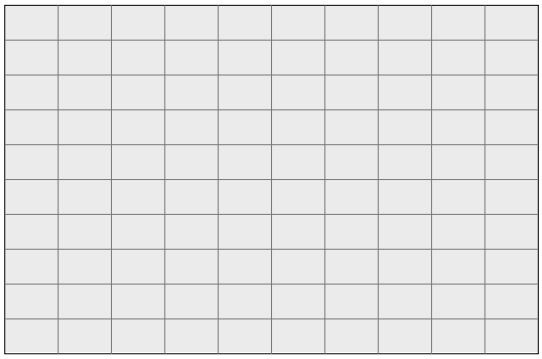
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

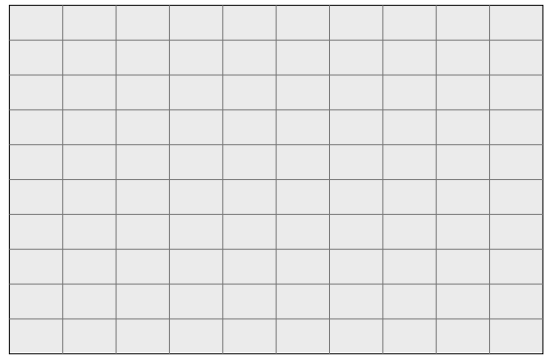


0.0 20.0

Time(sec)

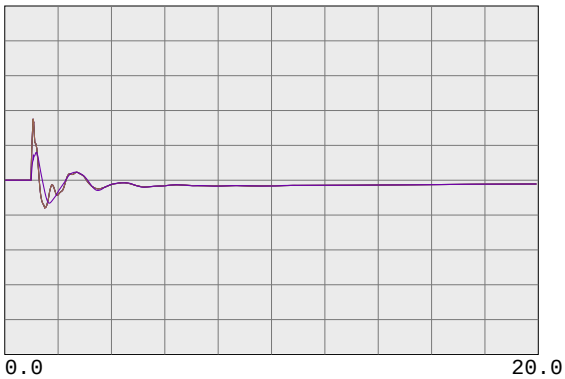
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



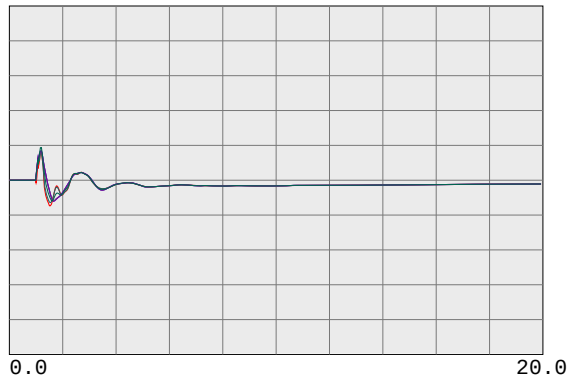


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

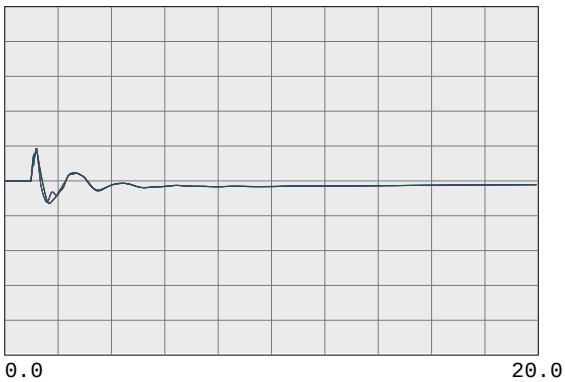
230-KV SYSTEM FREQUENCIES



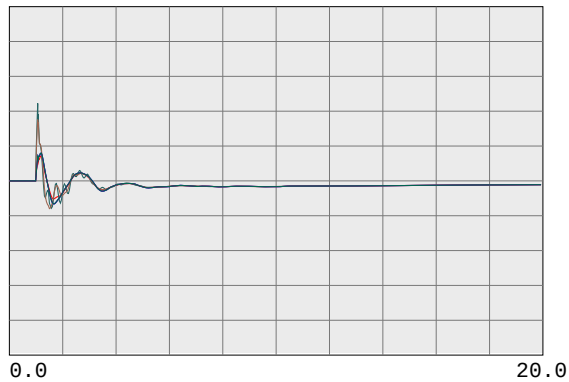
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



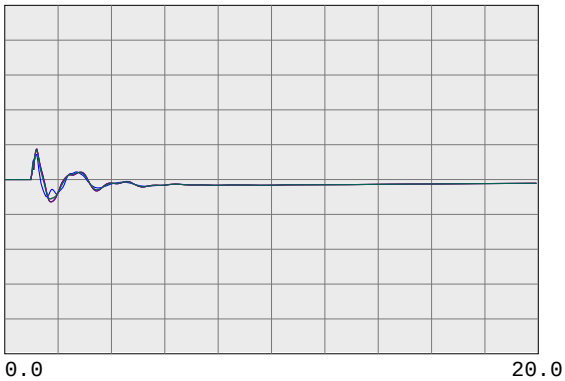
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



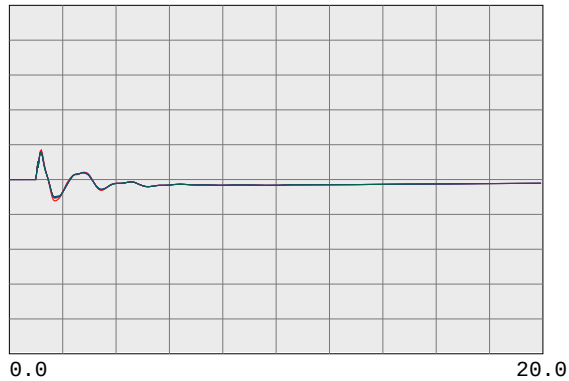
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



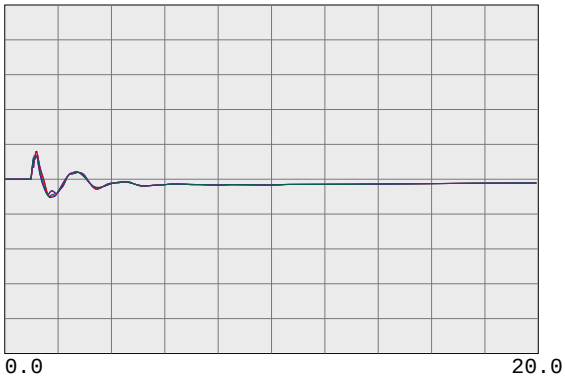
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



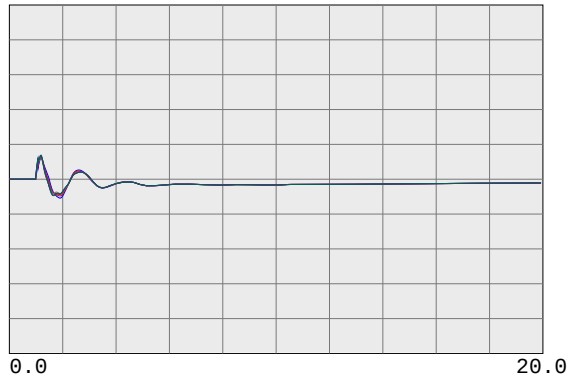
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

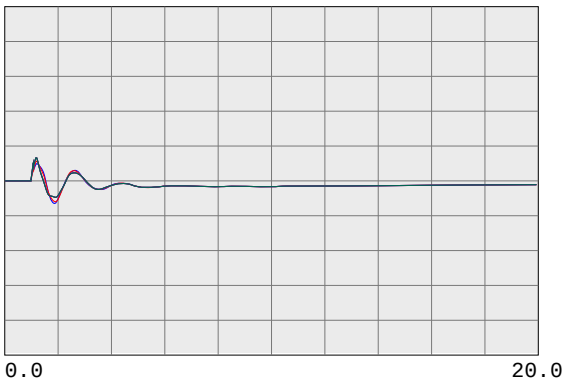
230-KV SYSTEM FREQUENCIES



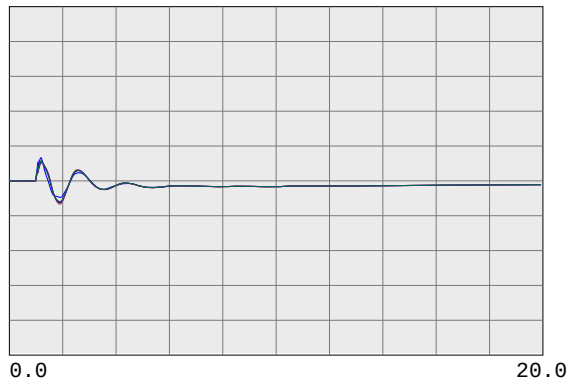
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



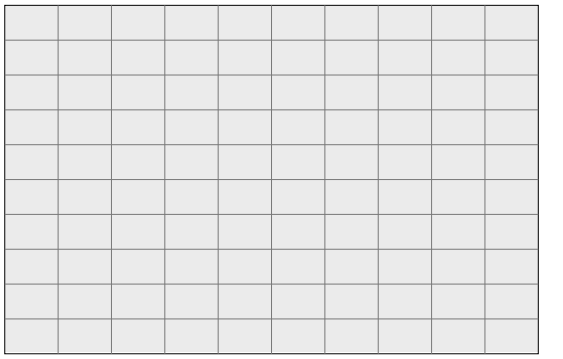
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

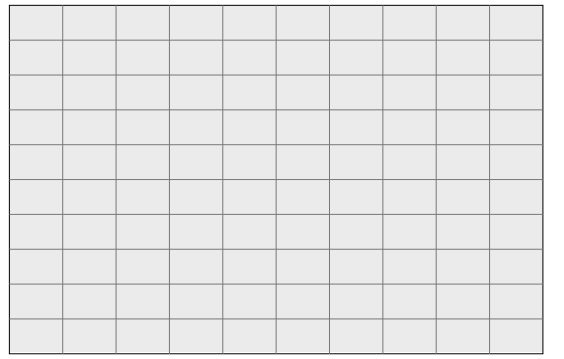


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



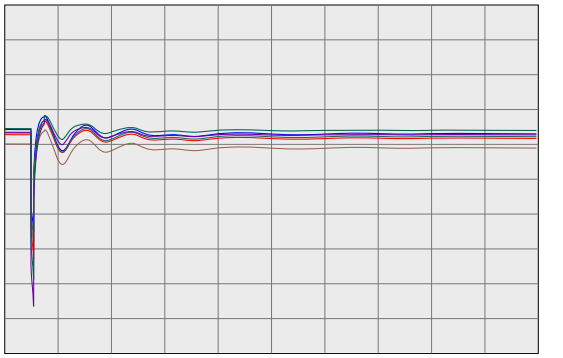
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



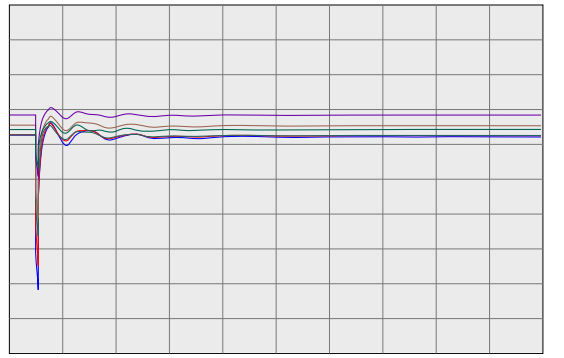


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

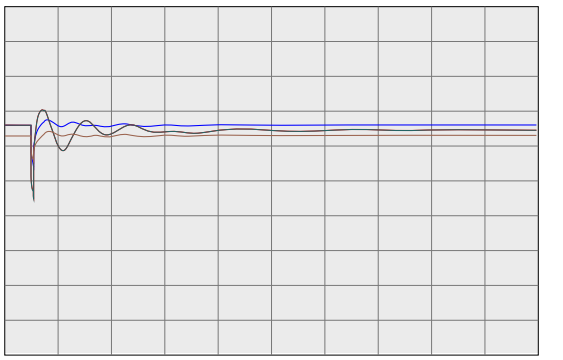
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



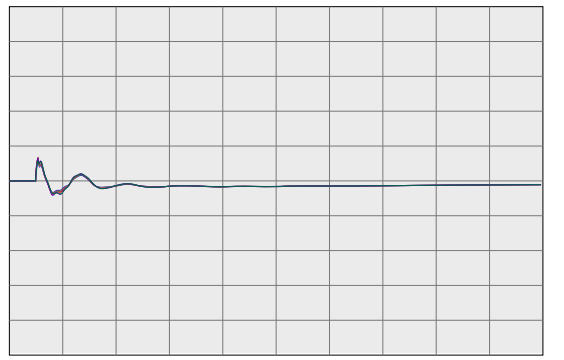
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



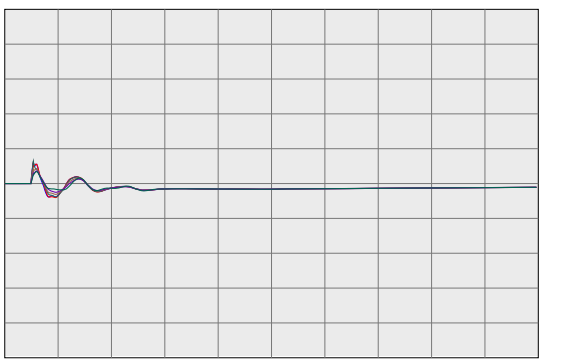
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



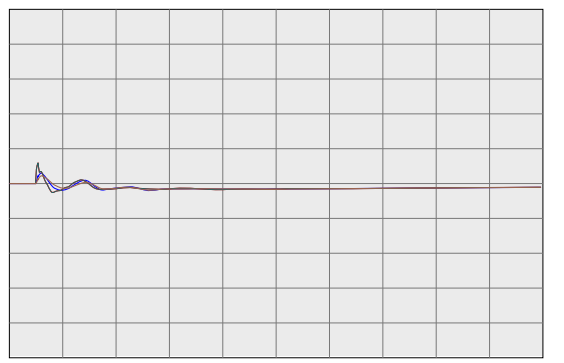
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



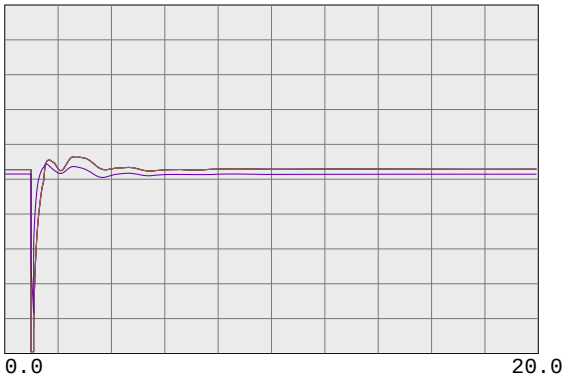
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

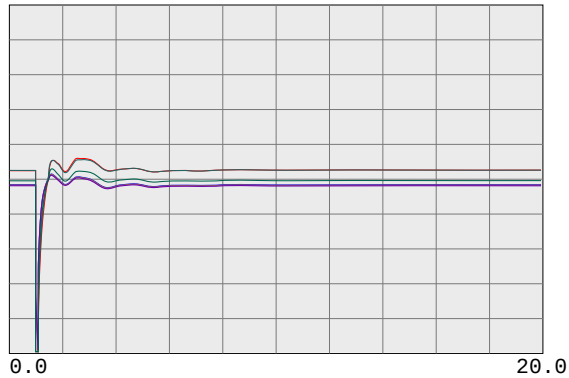
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

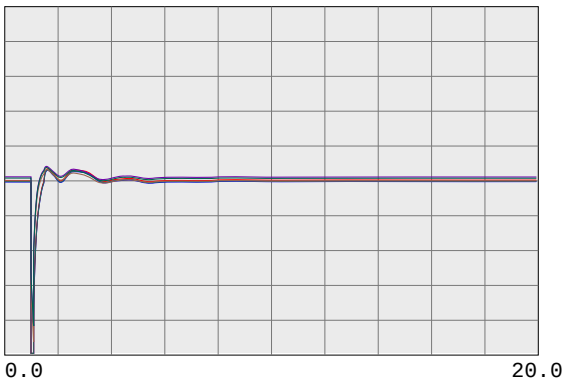
230-KV SYSTEM VOLTAGES



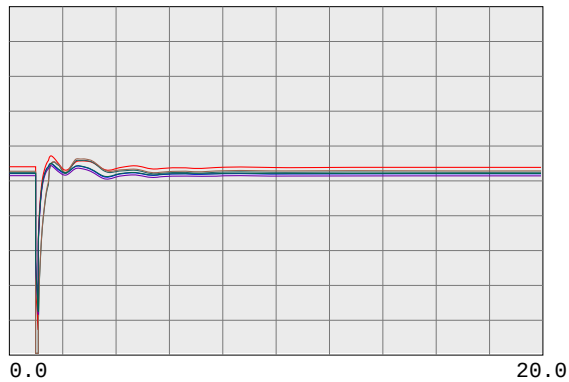
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



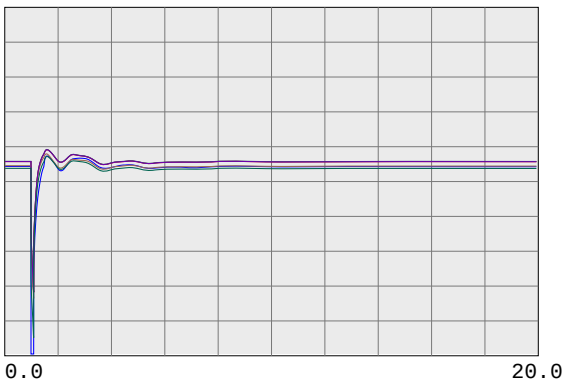
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



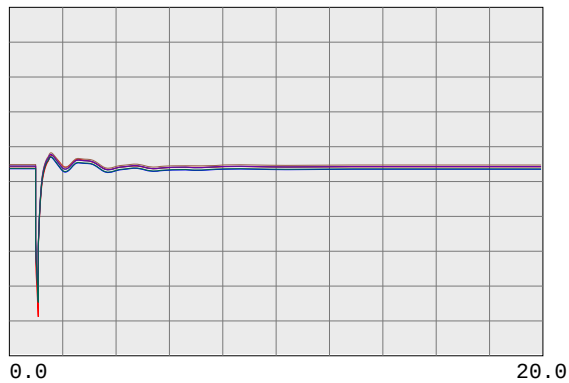
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



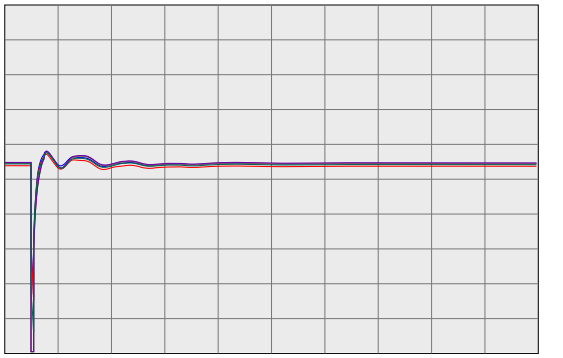
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



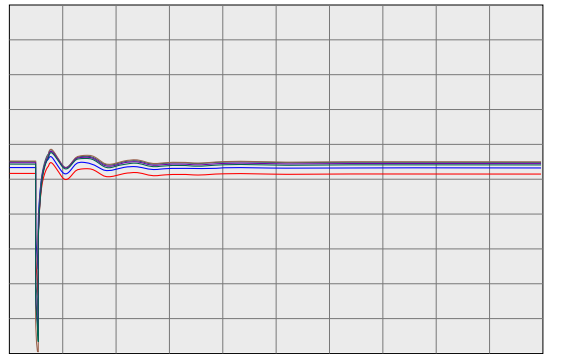
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

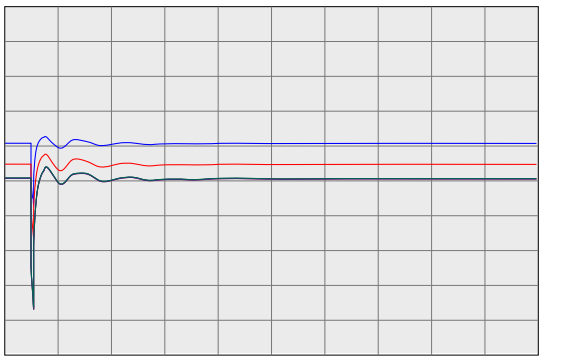
230-KV SYSTEM VOLTAGES



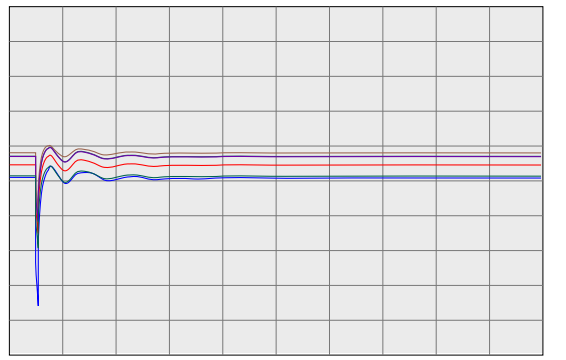
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



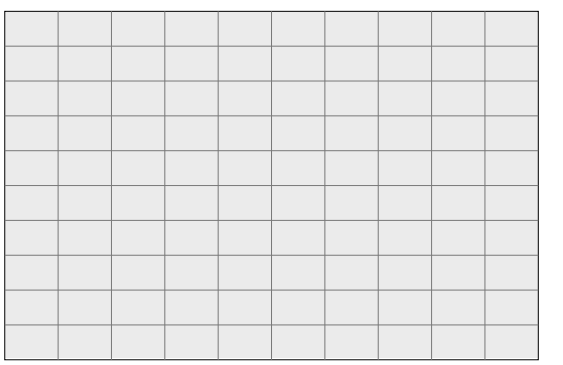
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

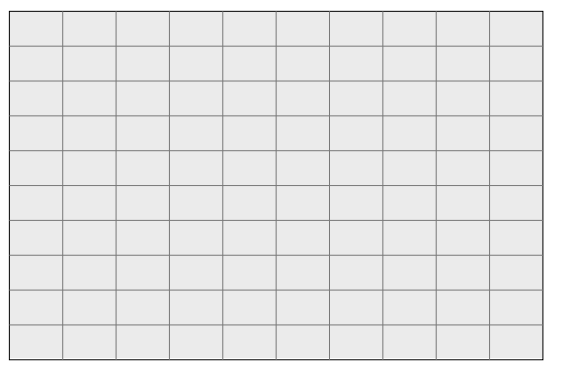


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



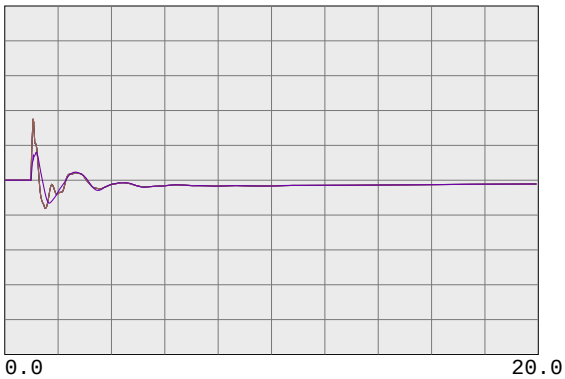
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



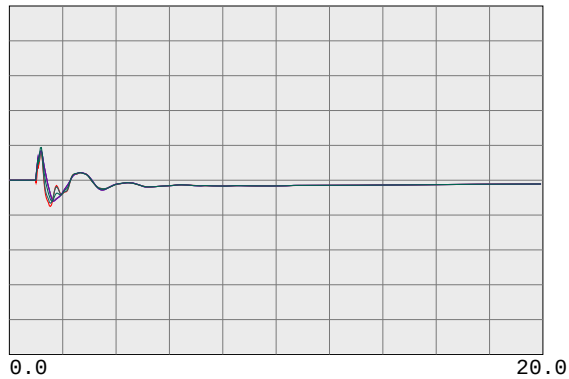


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

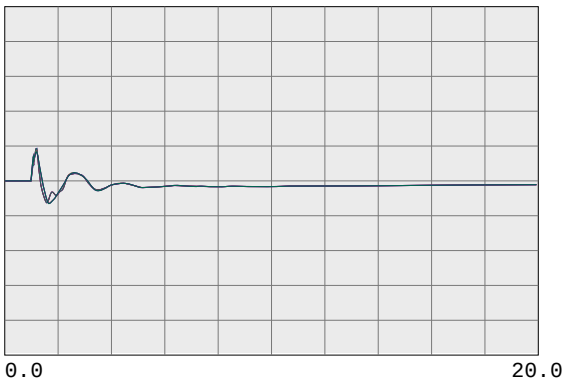
230-KV SYSTEM FREQUENCIES



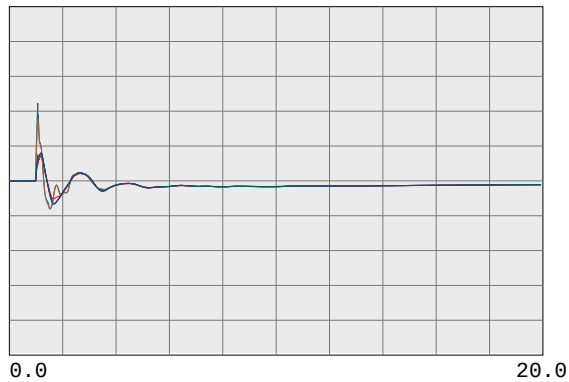
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



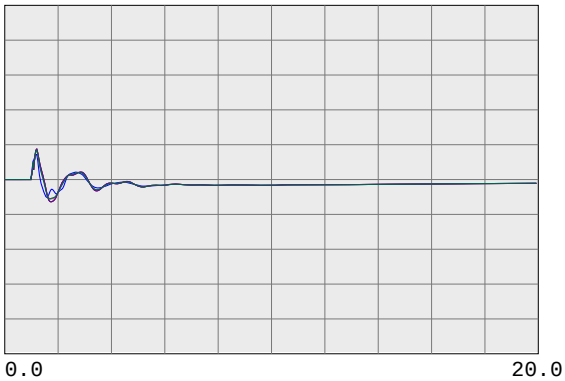
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



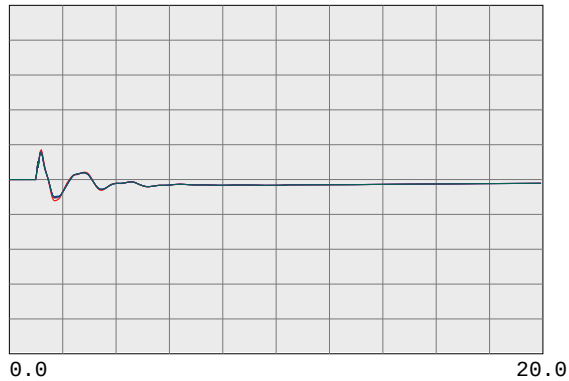
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



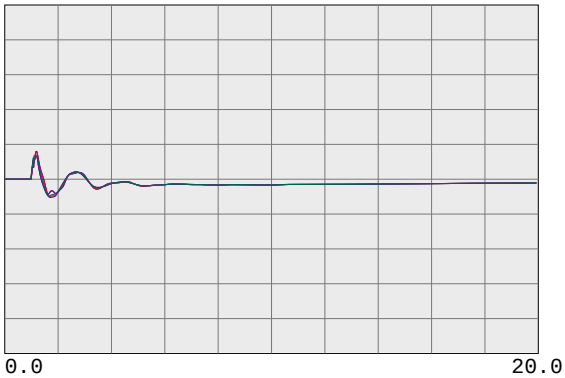
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



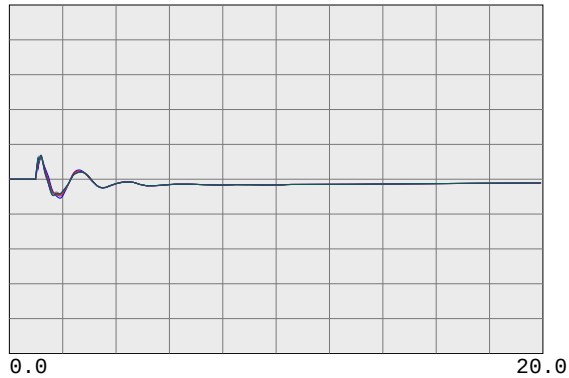
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

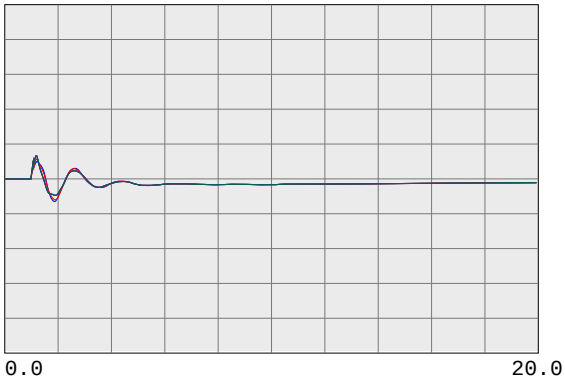
230-KV SYSTEM FREQUENCIES



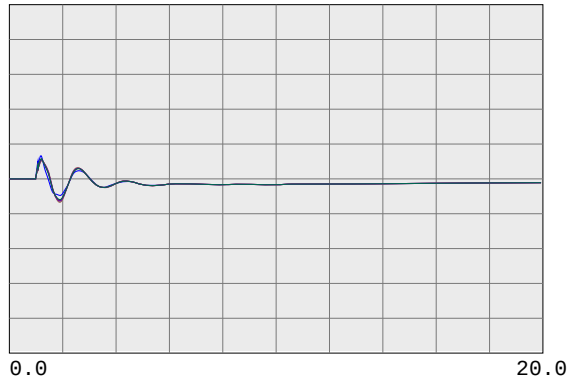
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



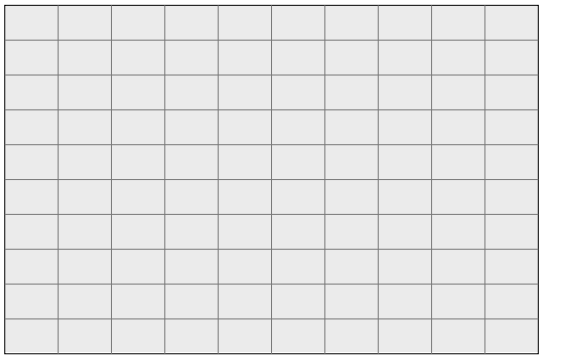
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

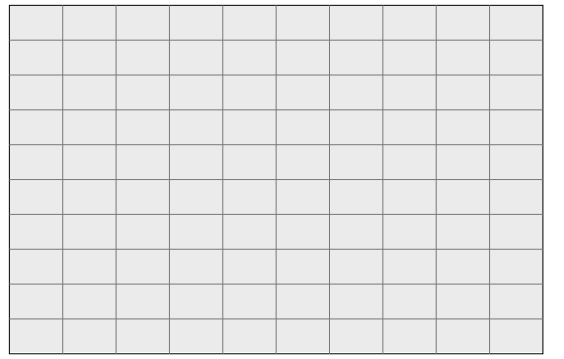


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



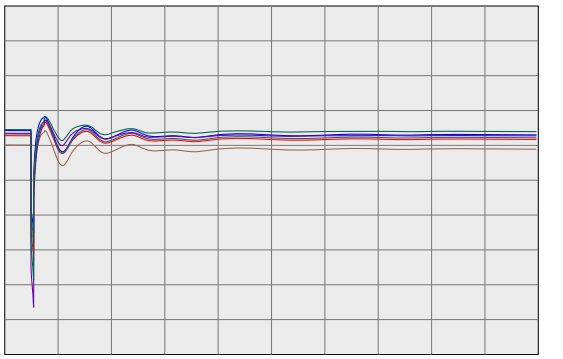
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



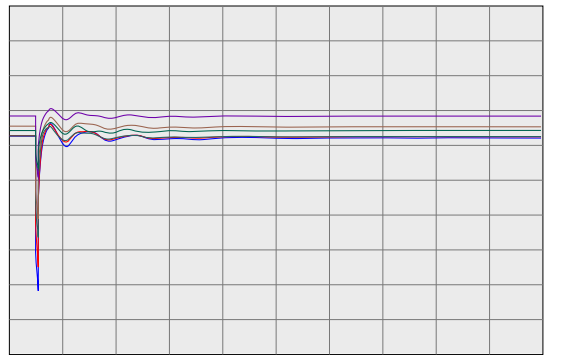


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

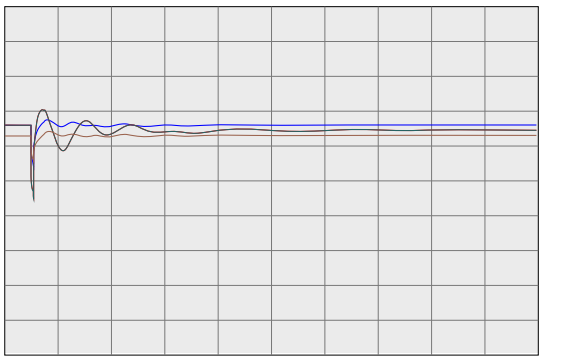
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



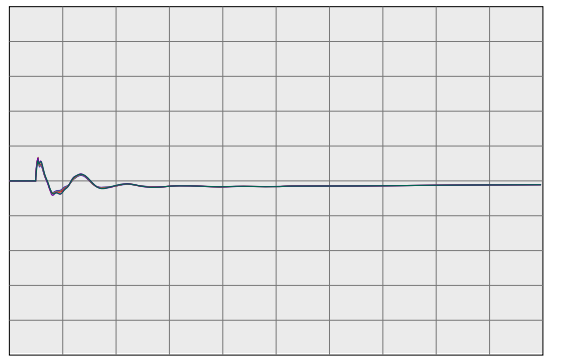
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



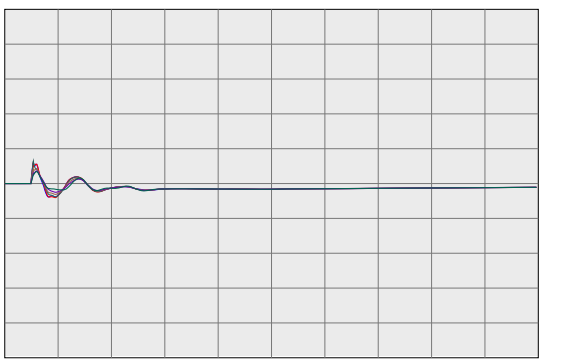
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



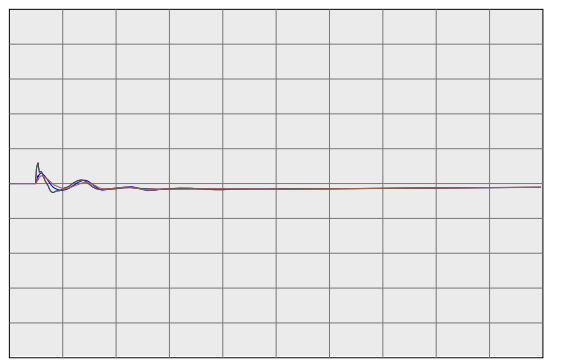
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



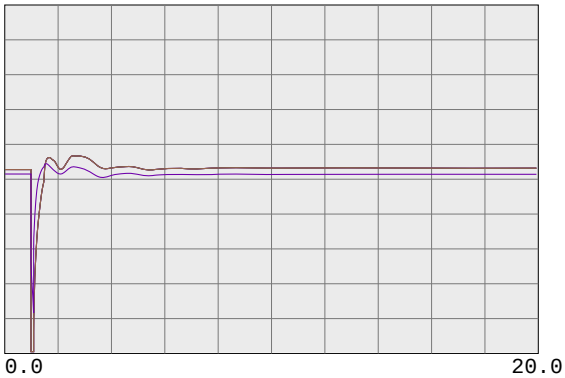
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

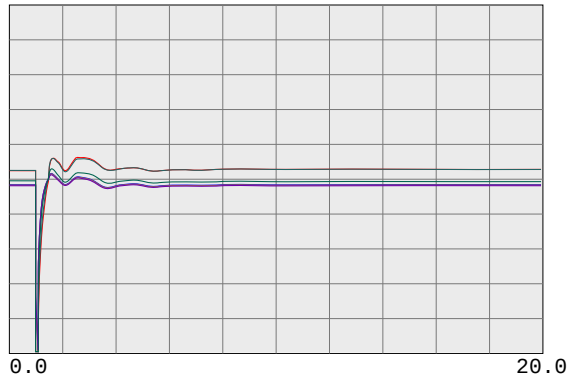
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

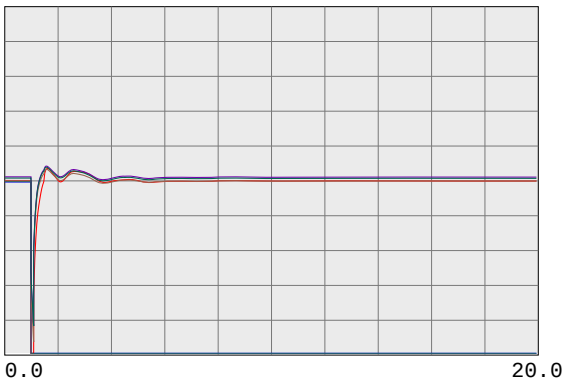
230-KV SYSTEM VOLTAGES



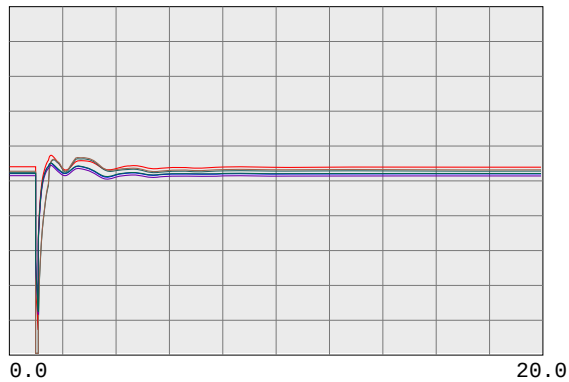
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



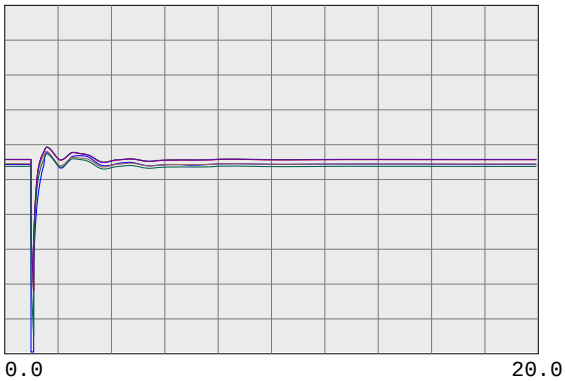
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



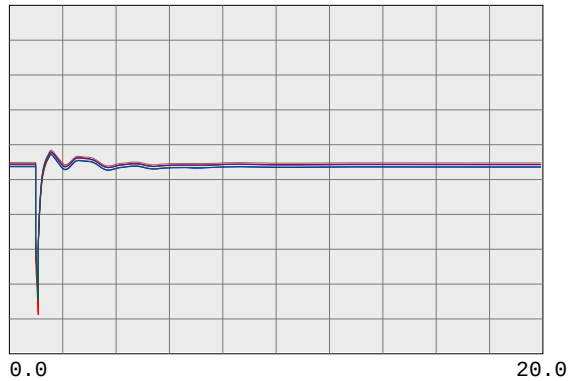
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



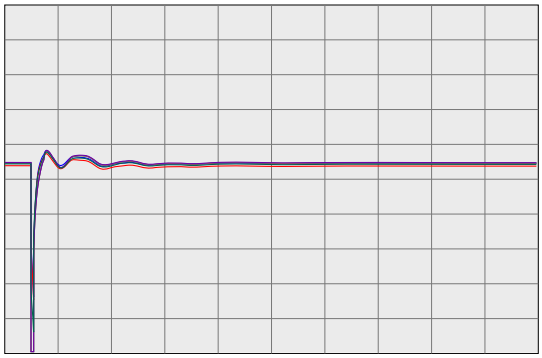
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

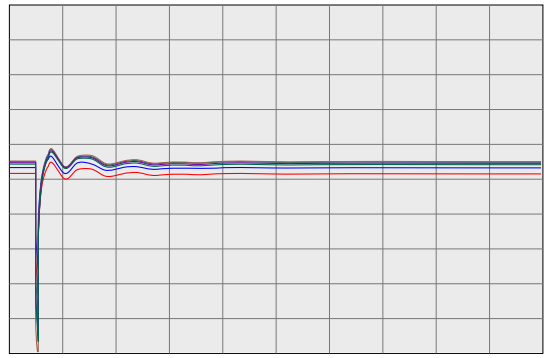
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

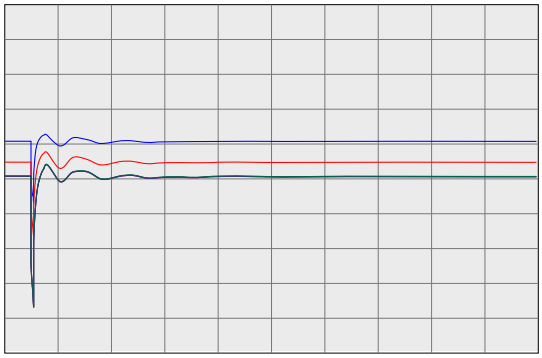
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

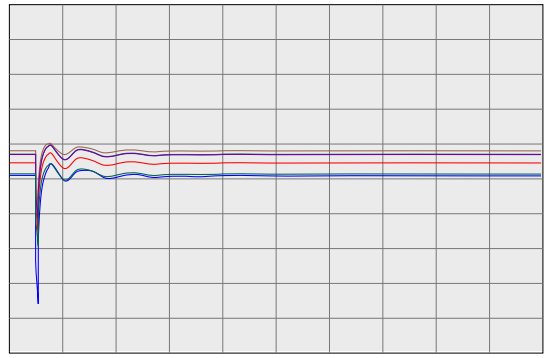
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

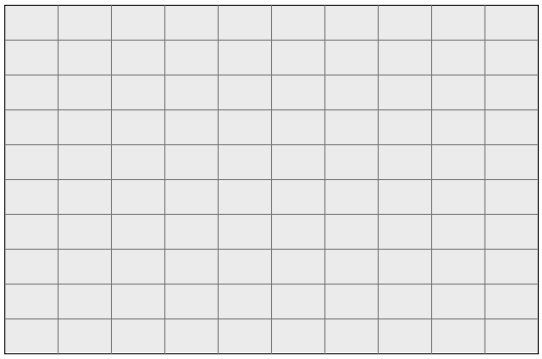
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

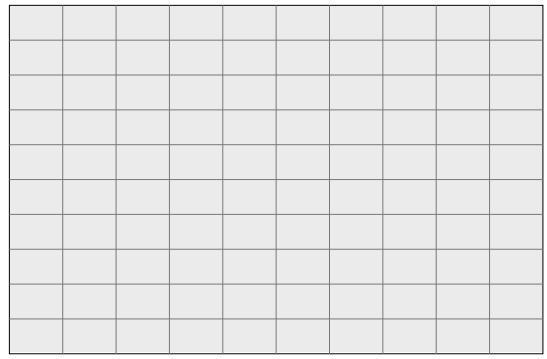


0.0 20.0

Time(sec)

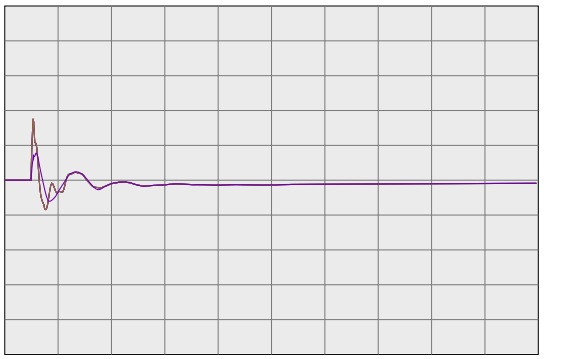
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



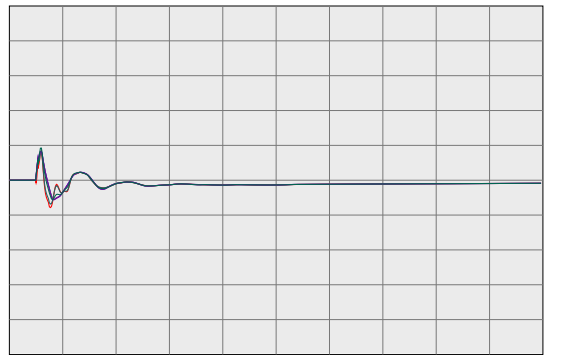


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

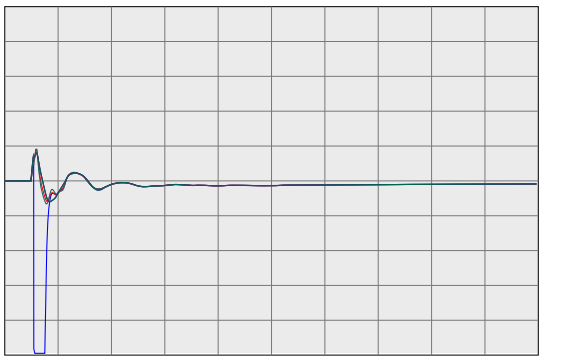
230-KV SYSTEM FREQUENCIES



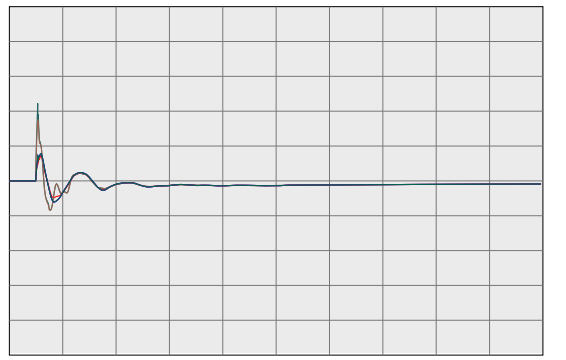
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



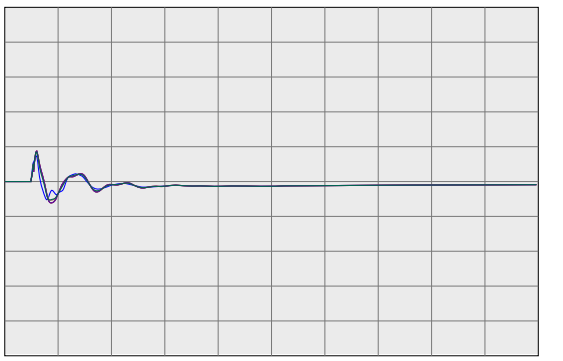
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



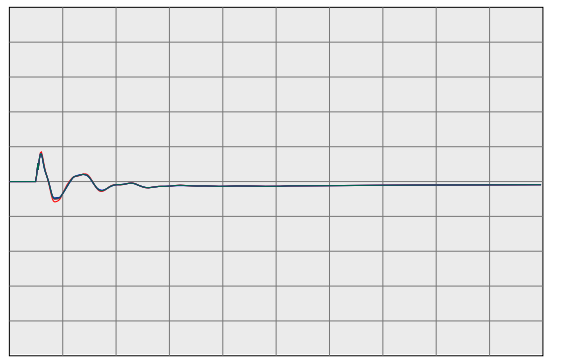
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



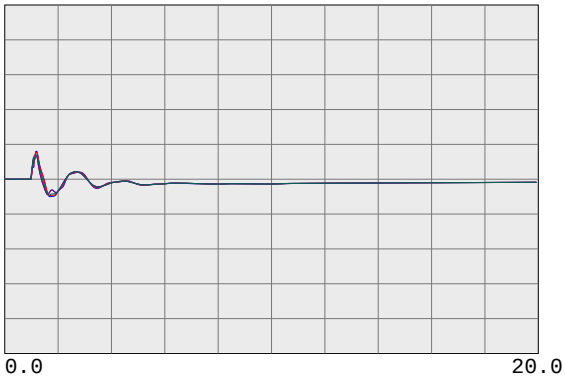
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



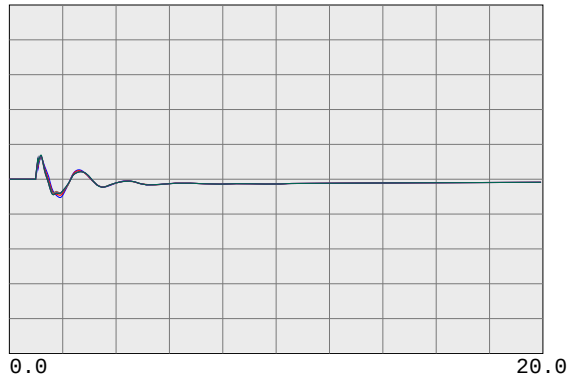
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

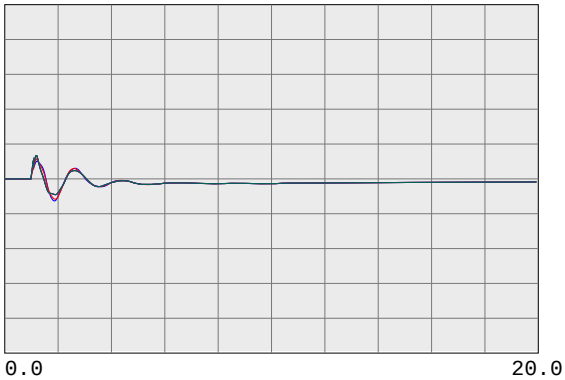
230-KV SYSTEM FREQUENCIES



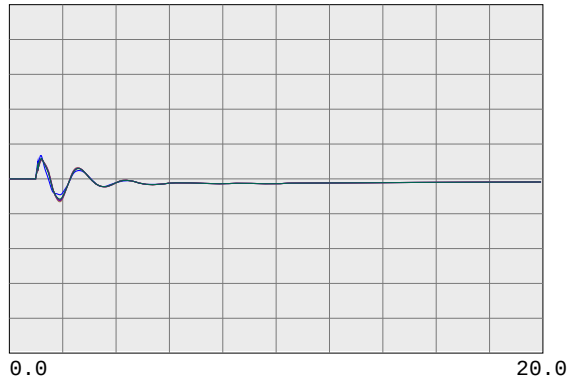
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



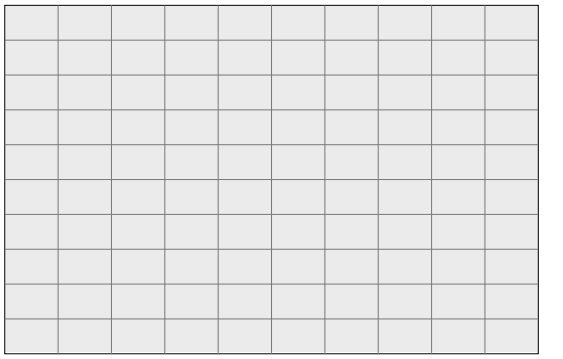
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

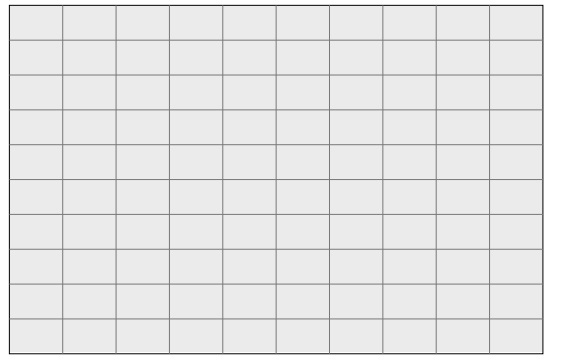


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



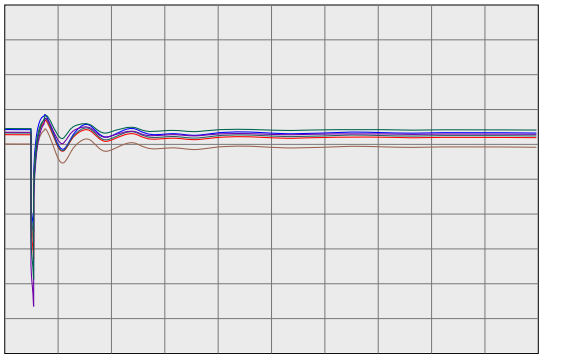
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



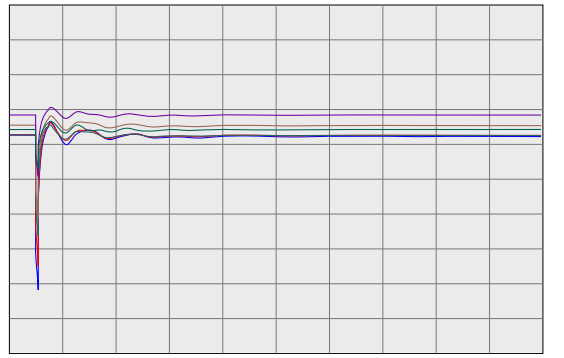


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

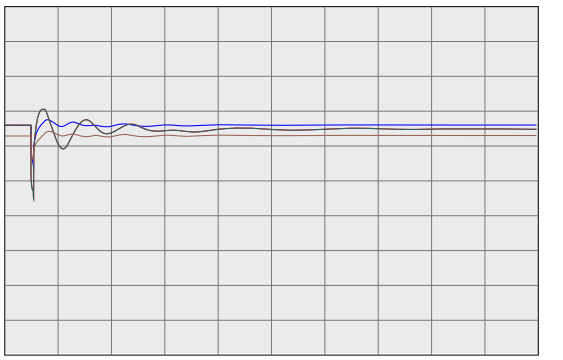
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



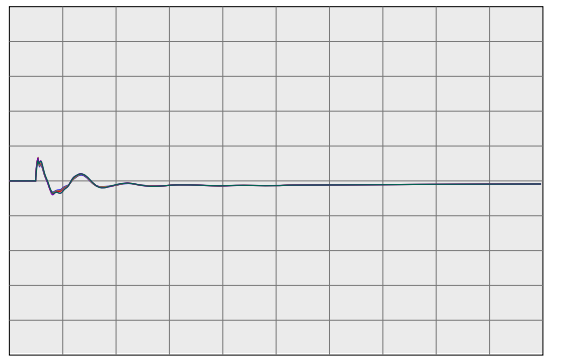
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



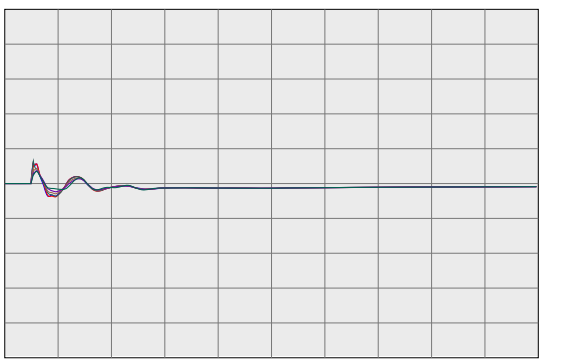
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



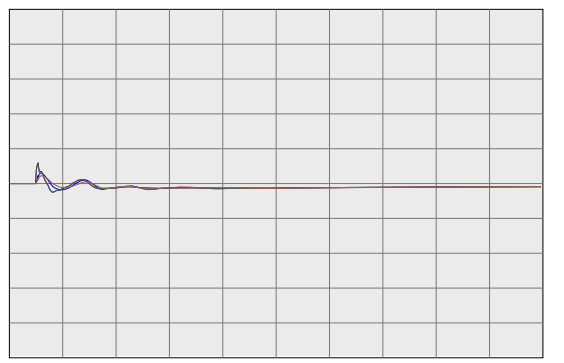
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



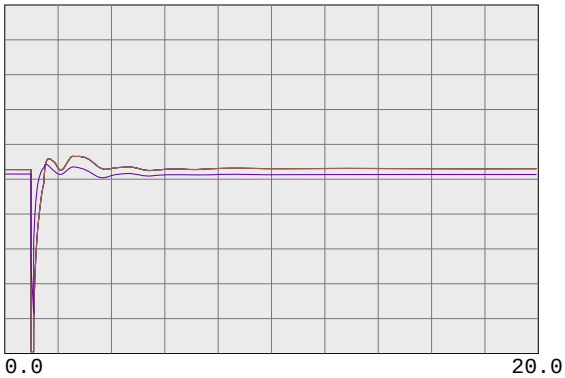
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

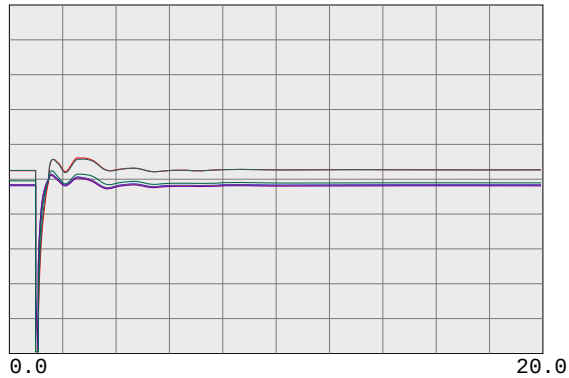
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

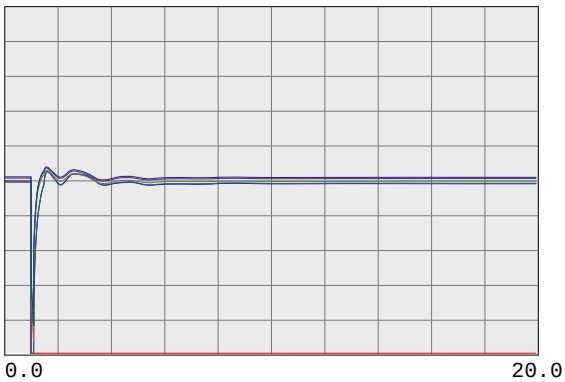
230-KV SYSTEM VOLTAGES



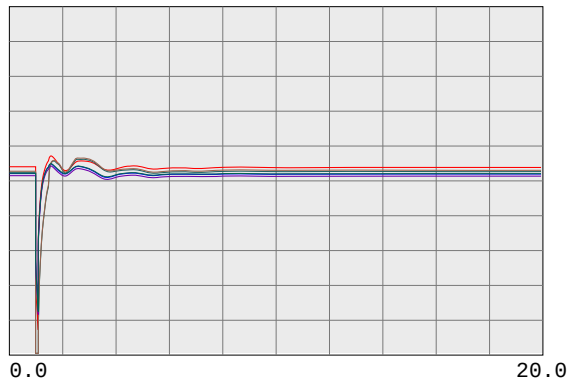
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



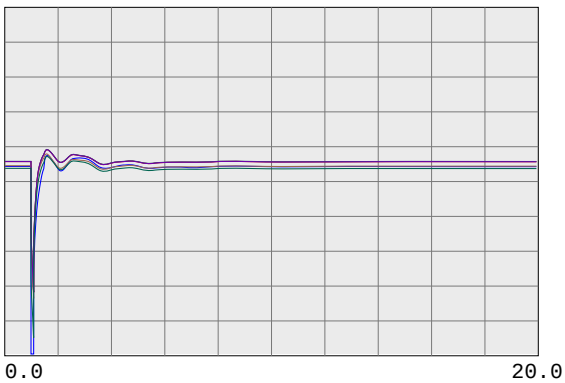
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



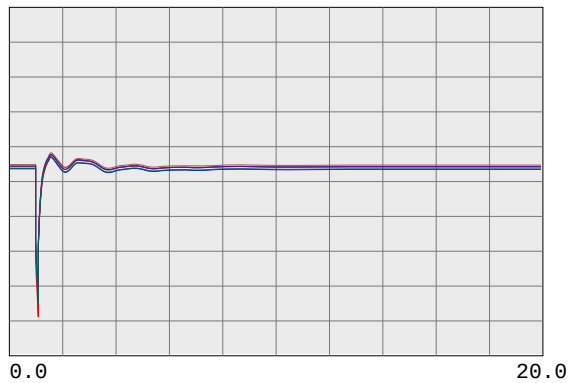
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



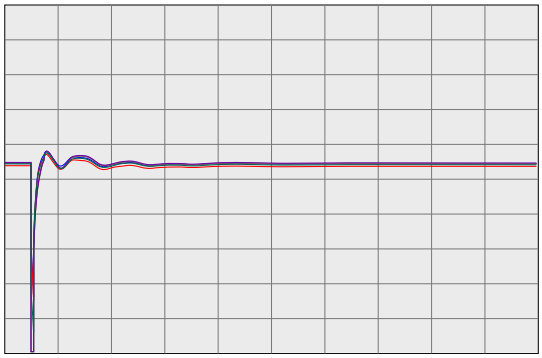
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

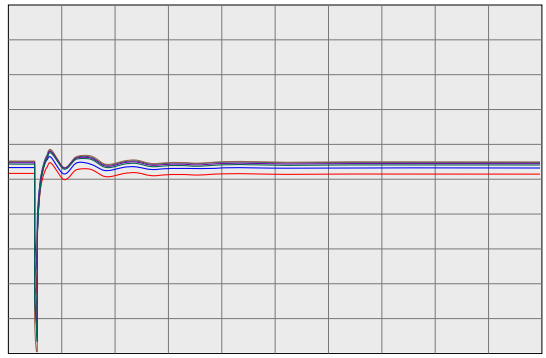
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

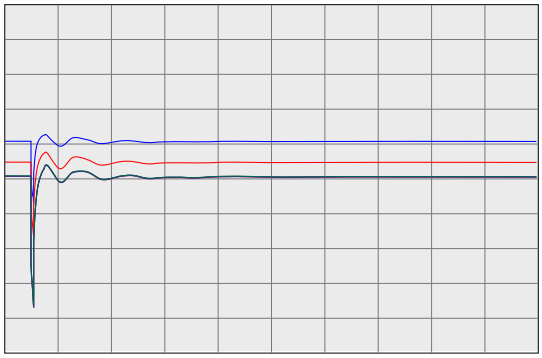
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

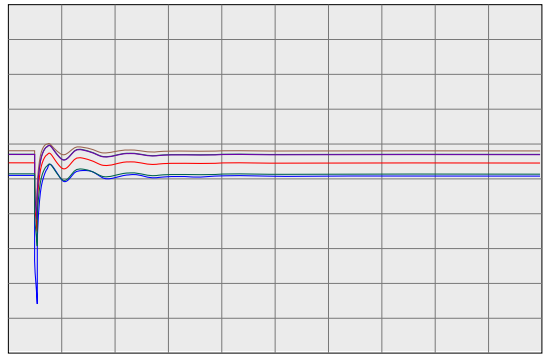
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

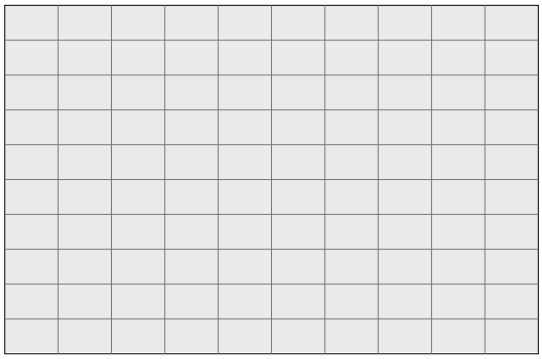
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

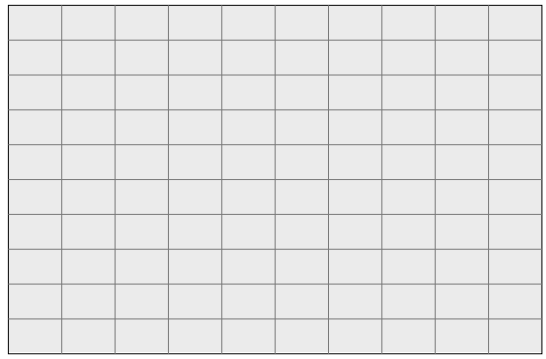


0.0 20.0

Time(sec)

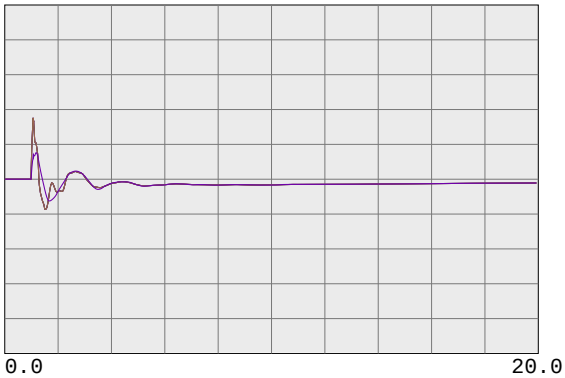
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



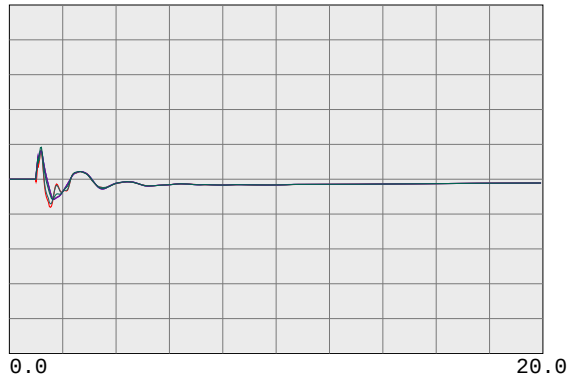


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

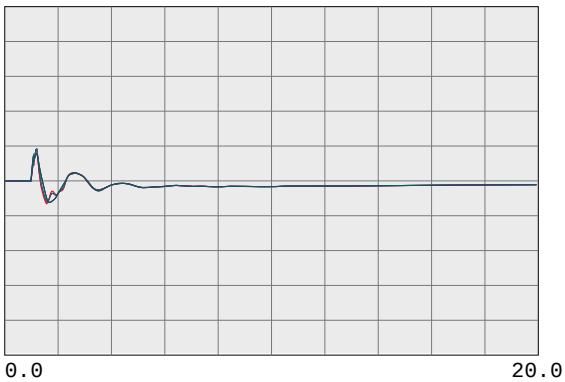
230-KV SYSTEM FREQUENCIES



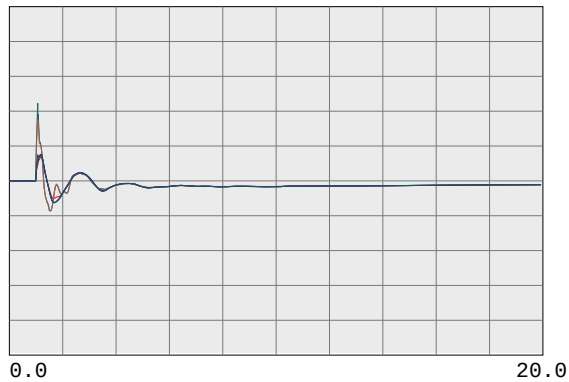
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



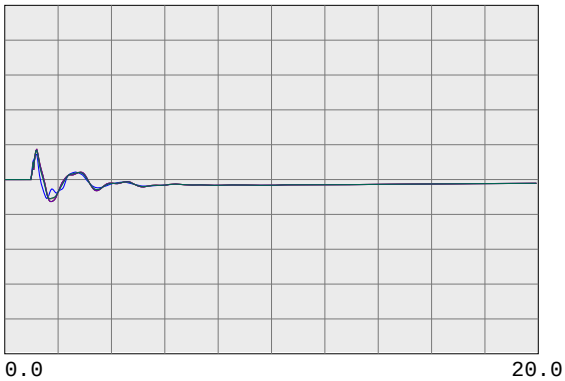
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



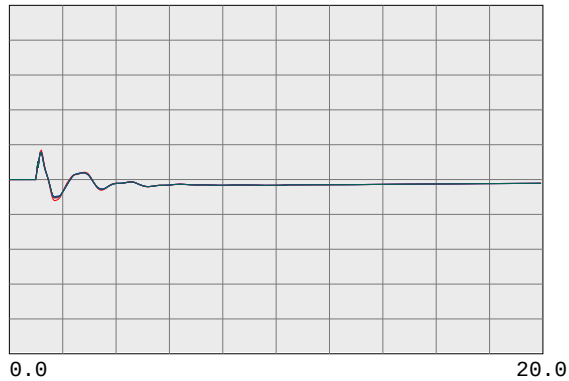
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



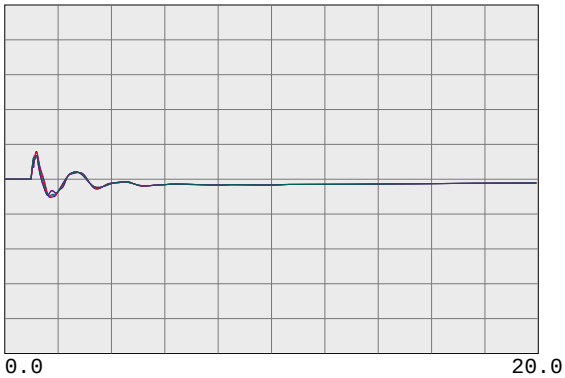
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



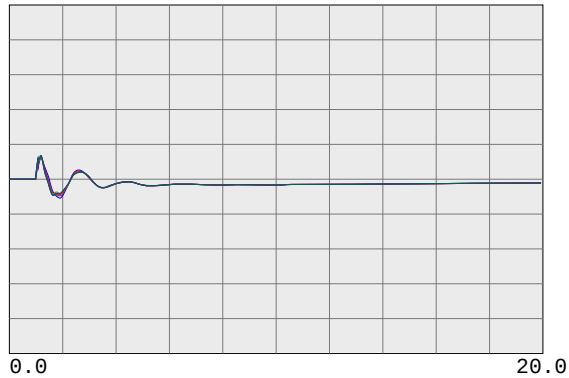
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

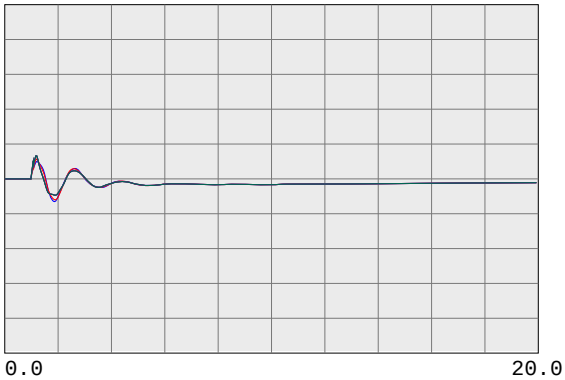
230-KV SYSTEM FREQUENCIES



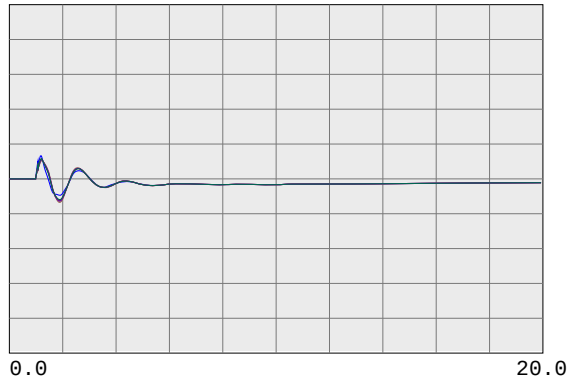
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



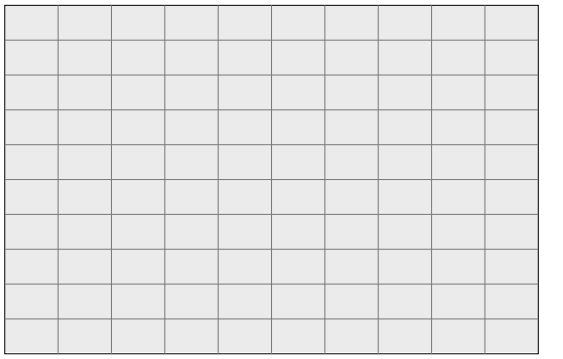
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

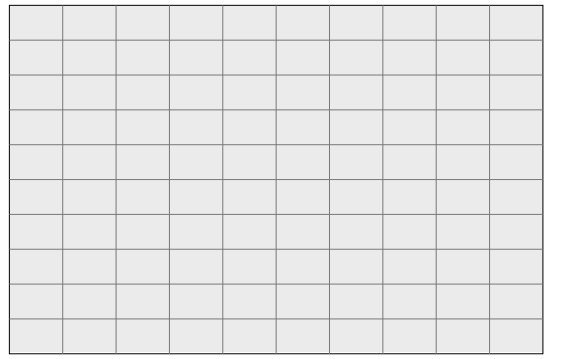


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



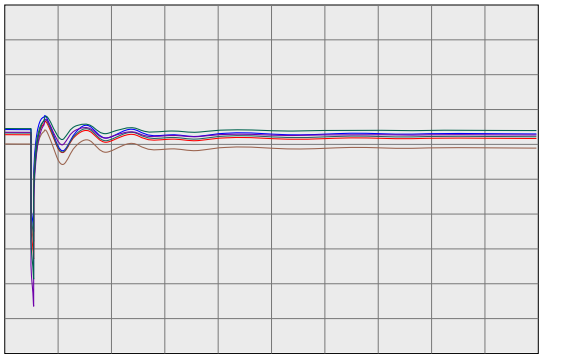
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



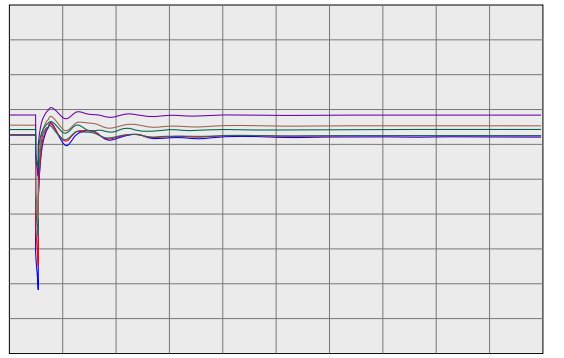


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

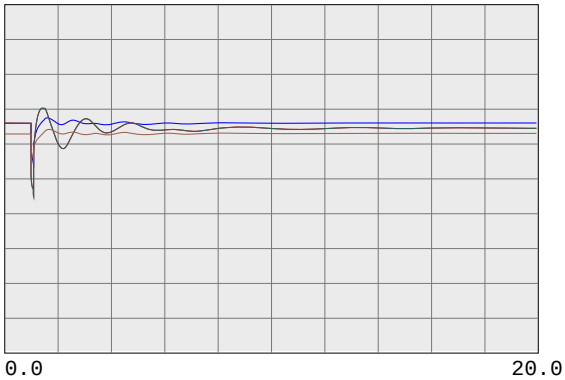
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



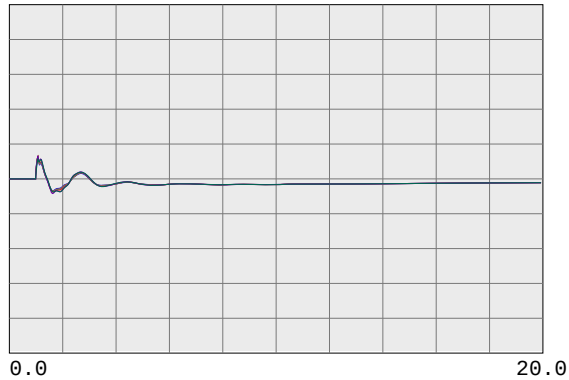
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



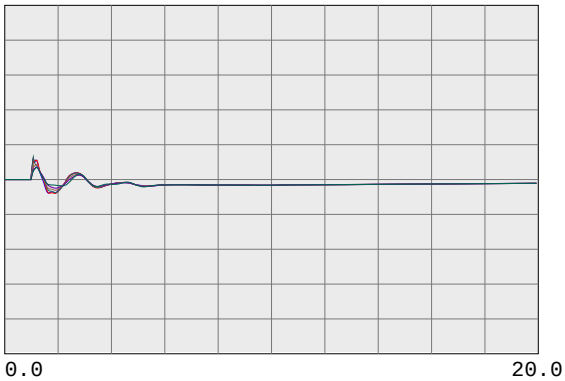
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



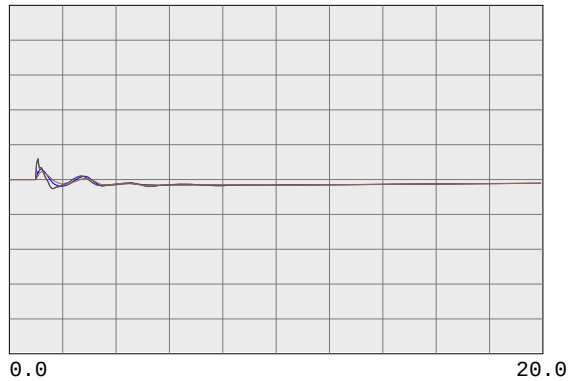
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



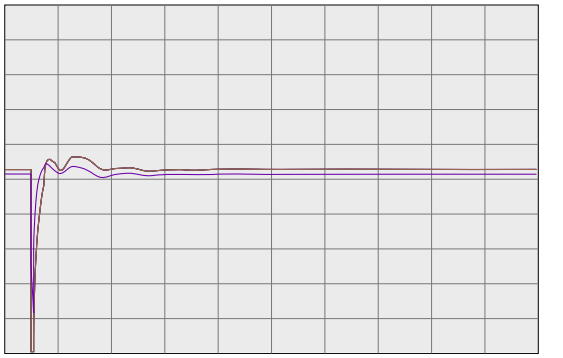
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

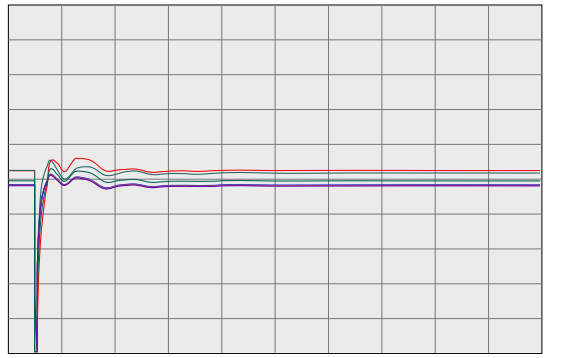
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

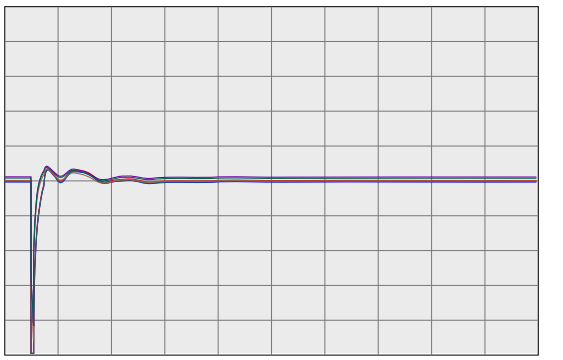
230-KV SYSTEM VOLTAGES



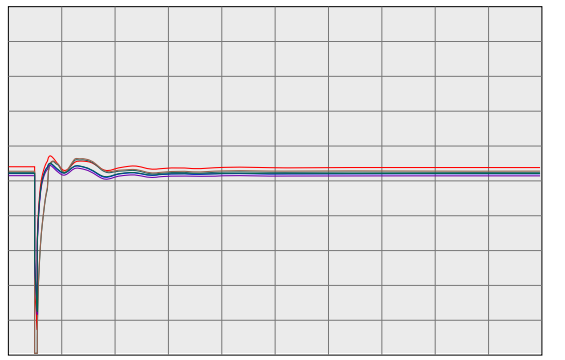
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



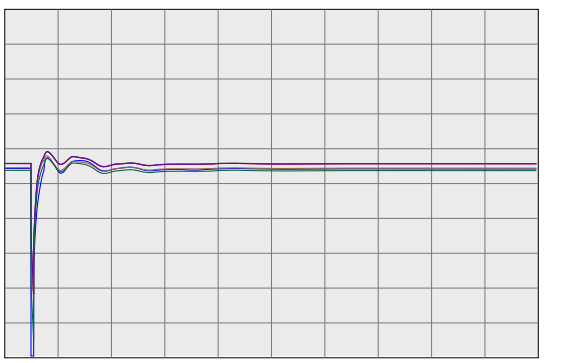
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



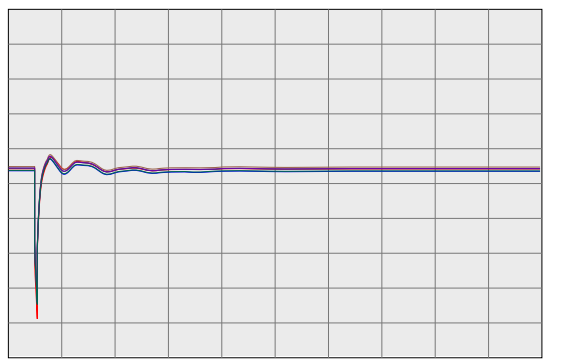
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



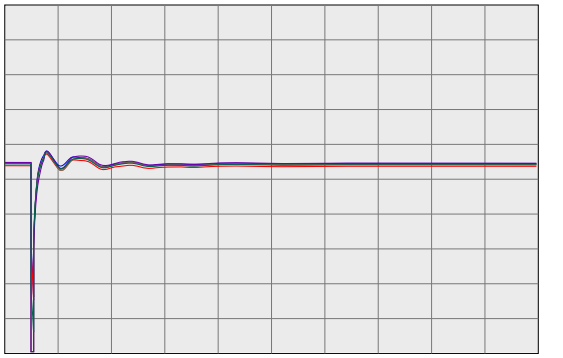
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



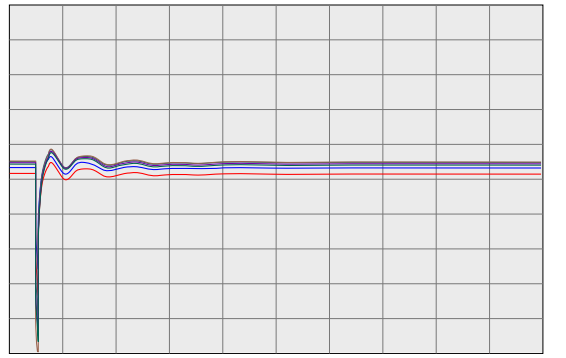
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

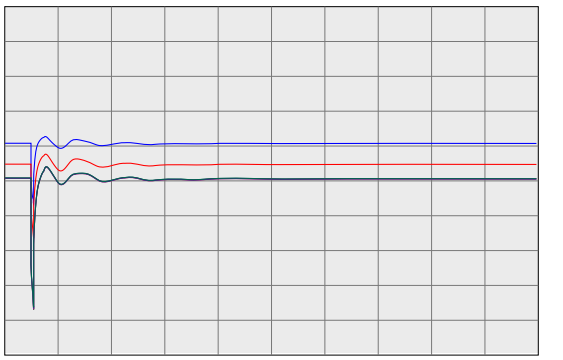
230-KV SYSTEM VOLTAGES



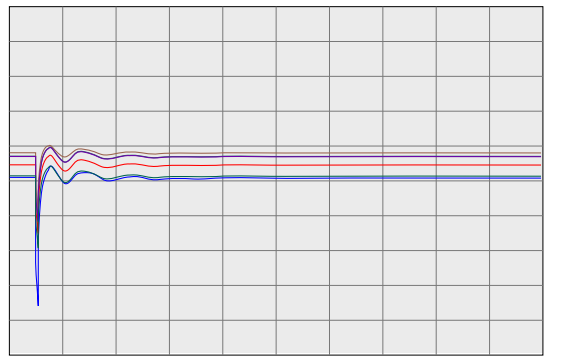
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



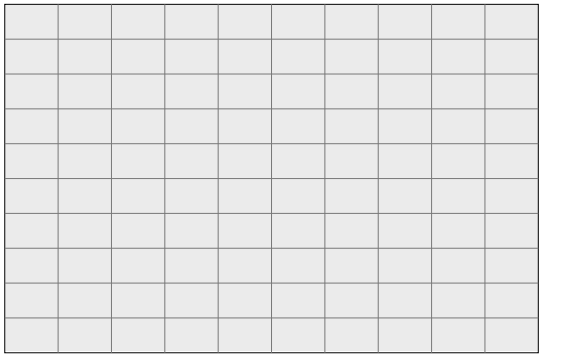
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

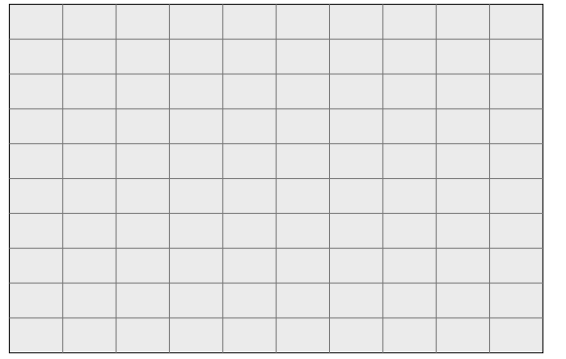


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



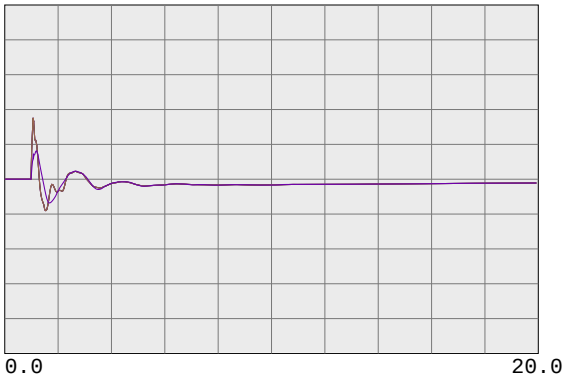
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



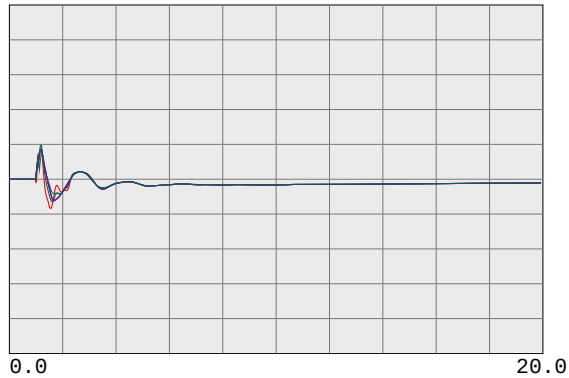


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

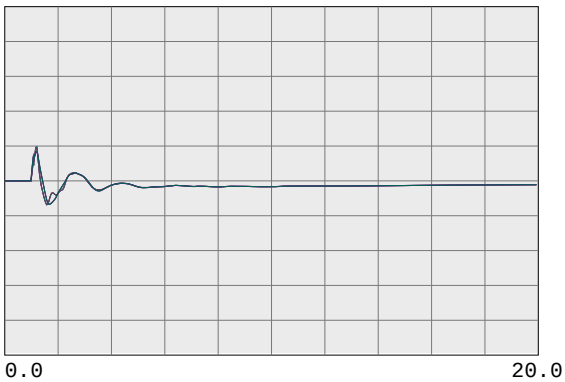
230-KV SYSTEM FREQUENCIES



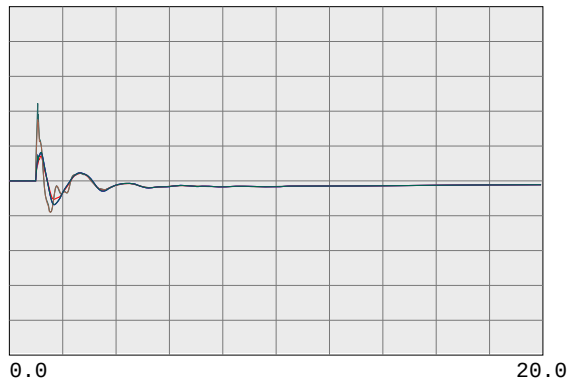
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



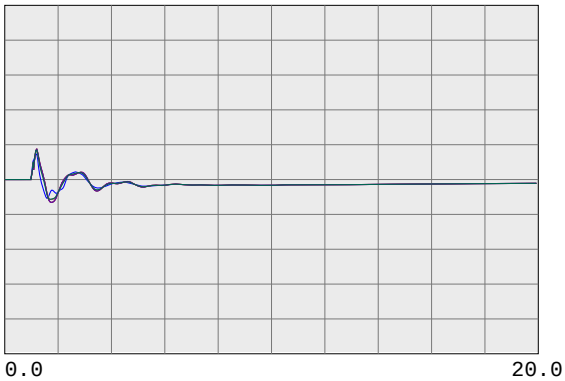
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



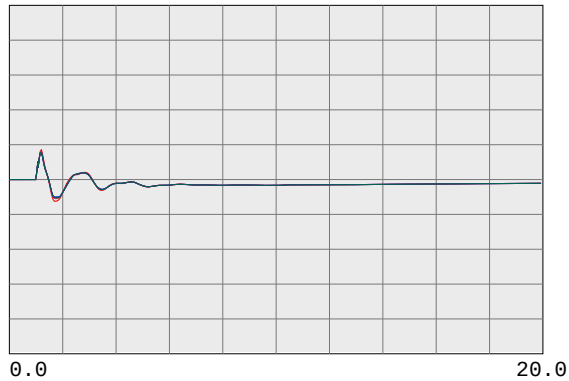
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



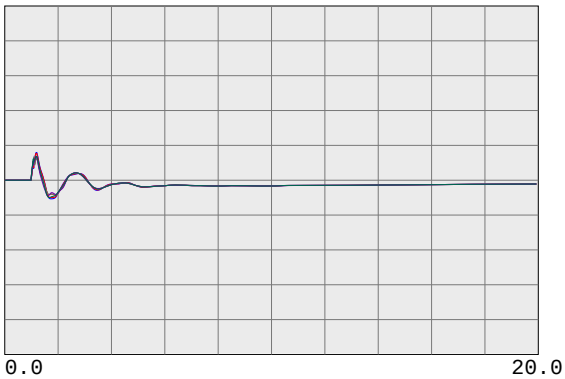
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



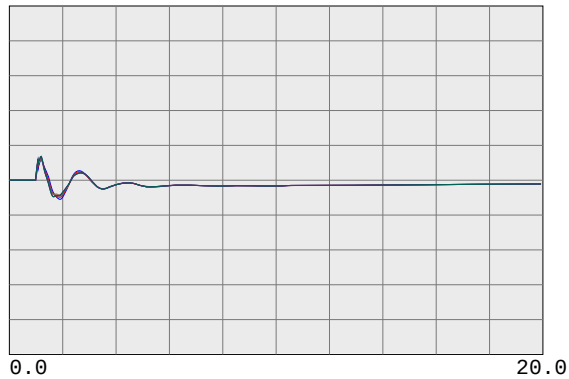
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

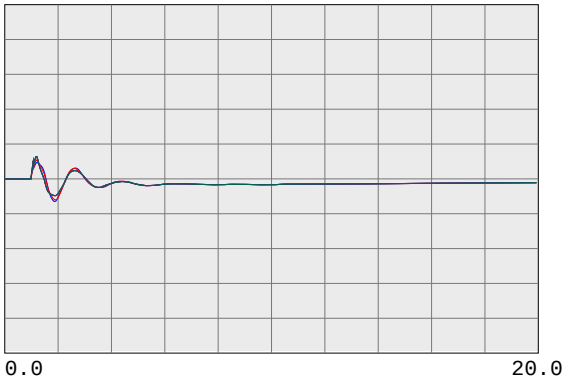
230-KV SYSTEM FREQUENCIES



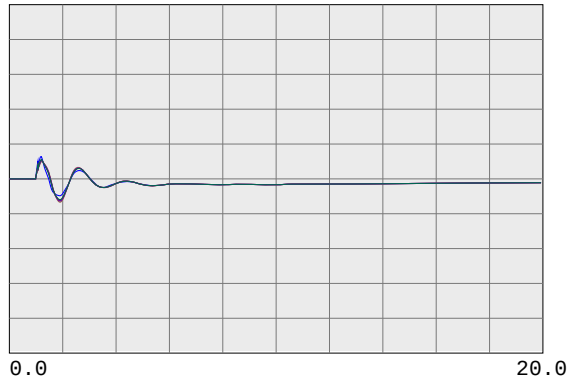
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



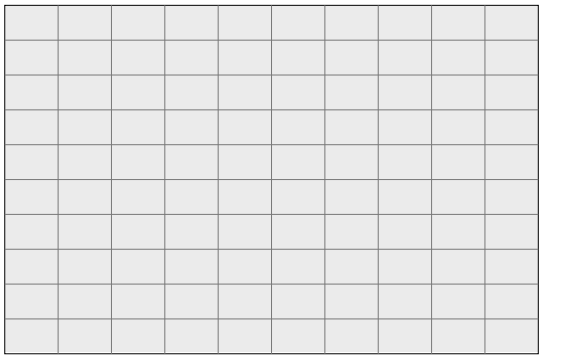
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

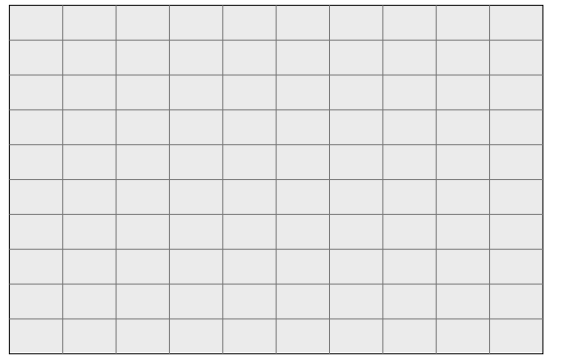


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



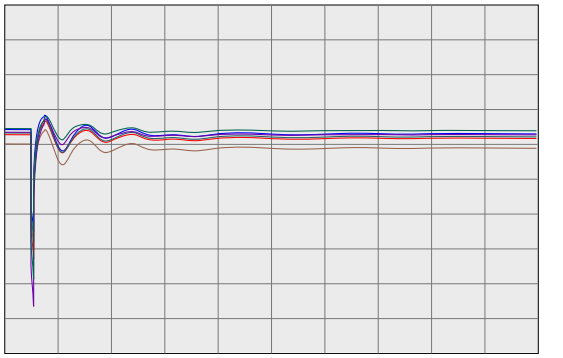
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



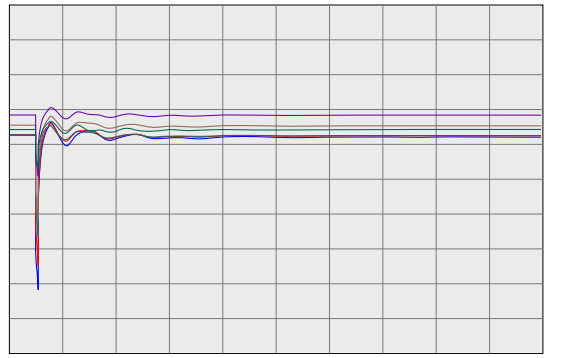


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

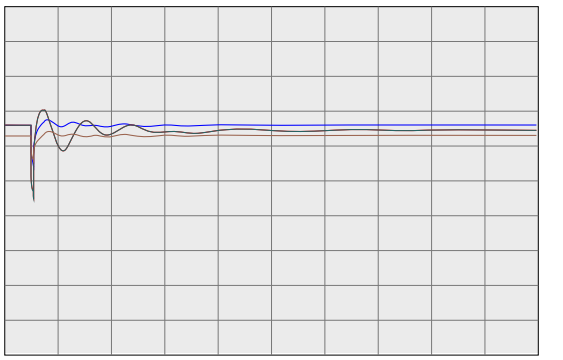
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



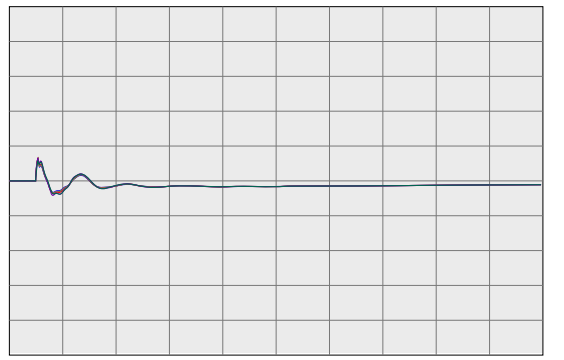
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



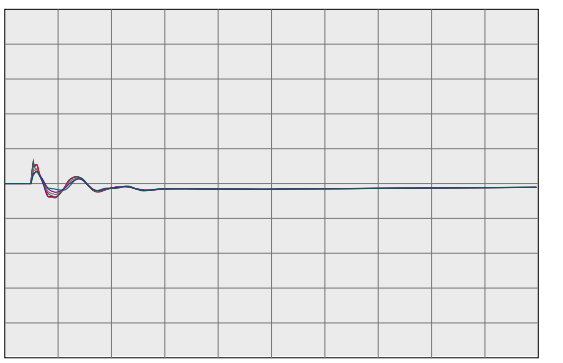
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



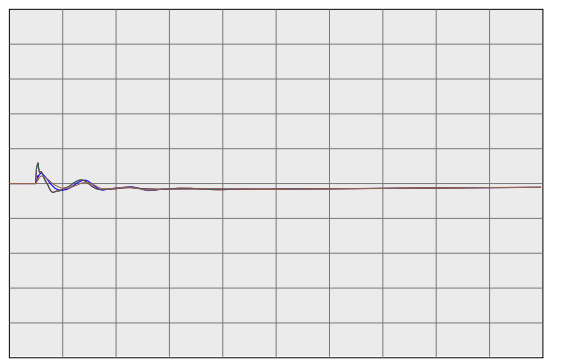
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



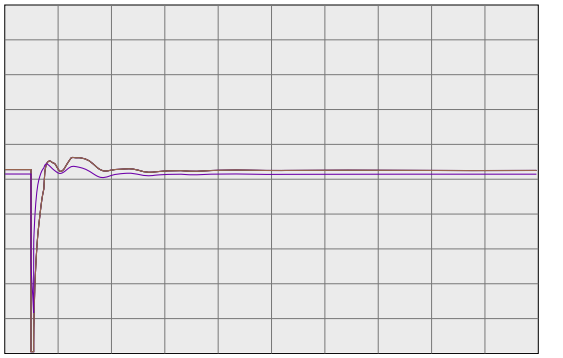
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

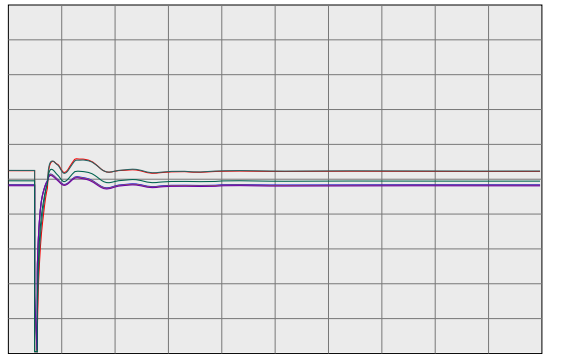
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

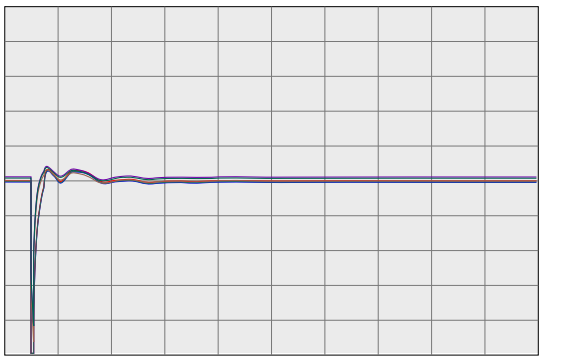
230-KV SYSTEM VOLTAGES



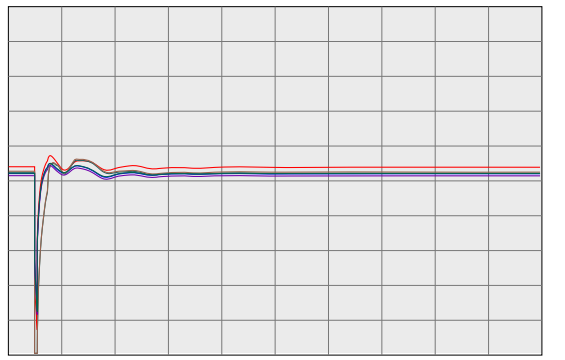
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



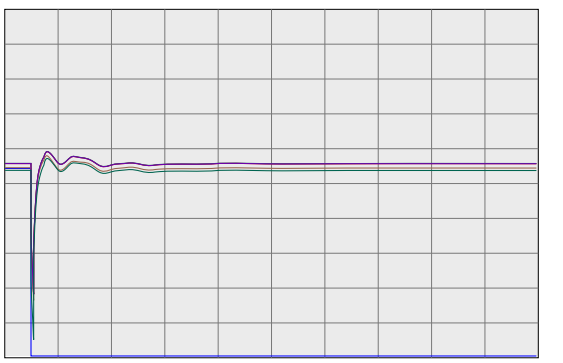
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



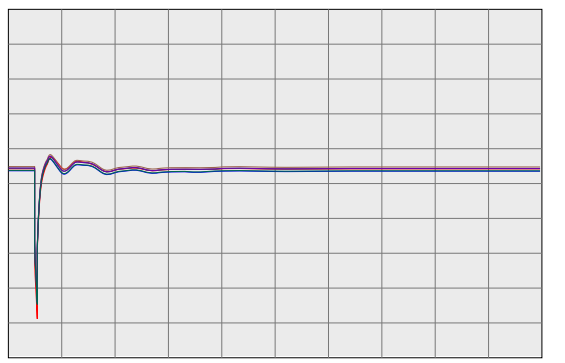
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



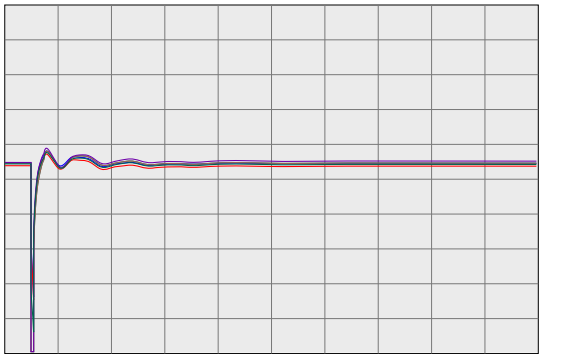
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



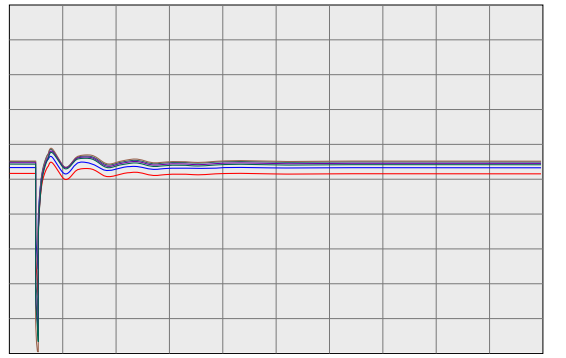
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

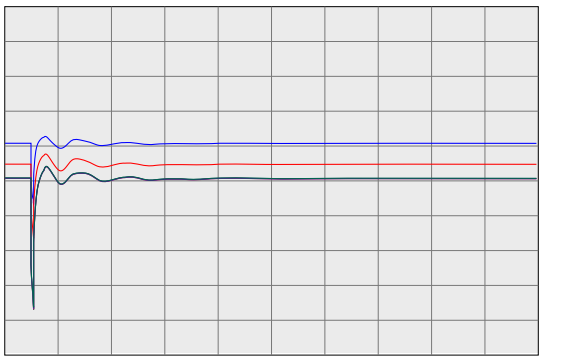
230-KV SYSTEM VOLTAGES



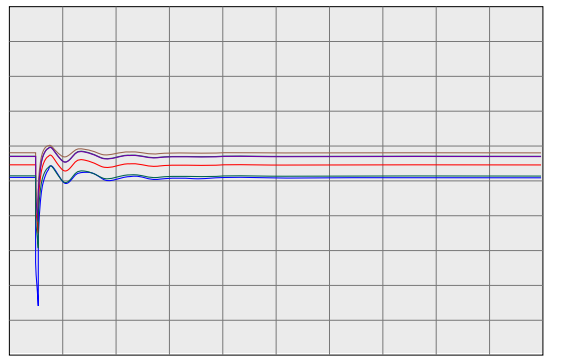
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



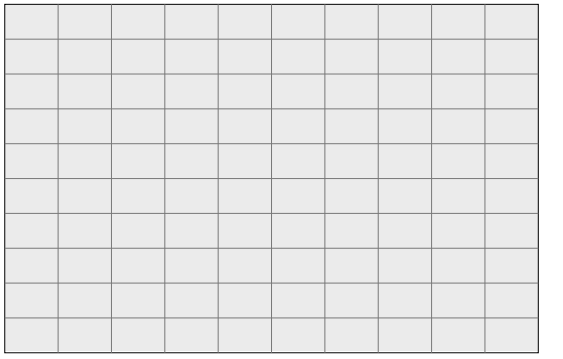
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

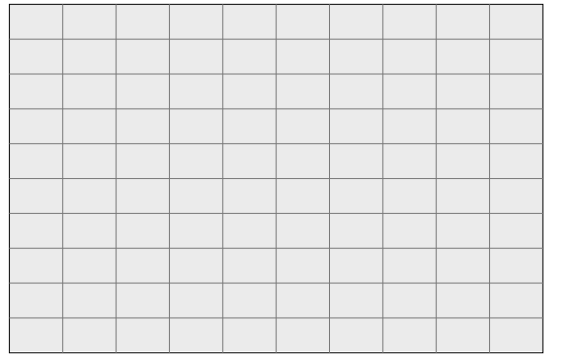


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



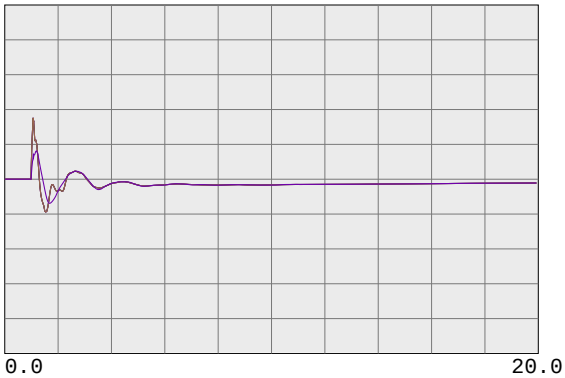
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



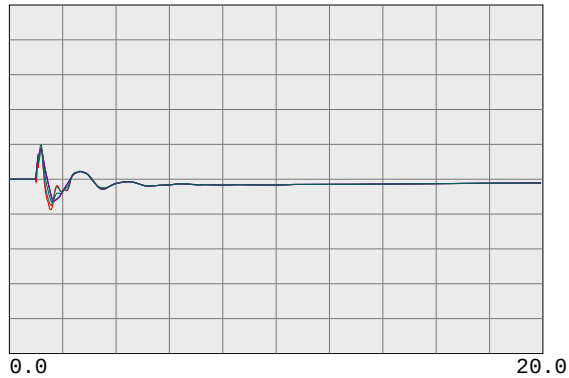


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

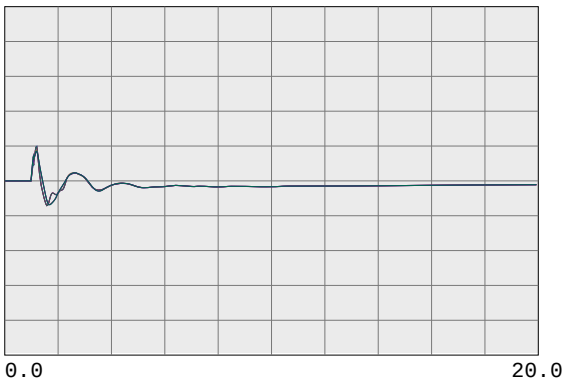
230-KV SYSTEM FREQUENCIES



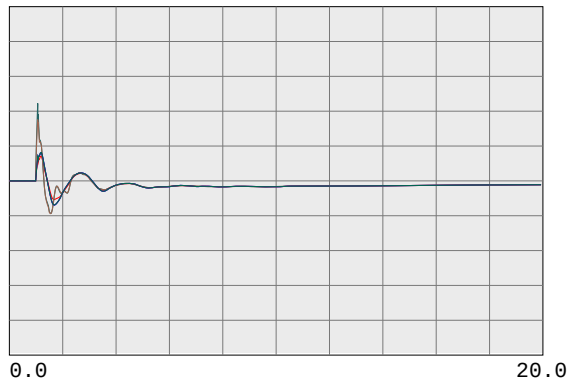
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



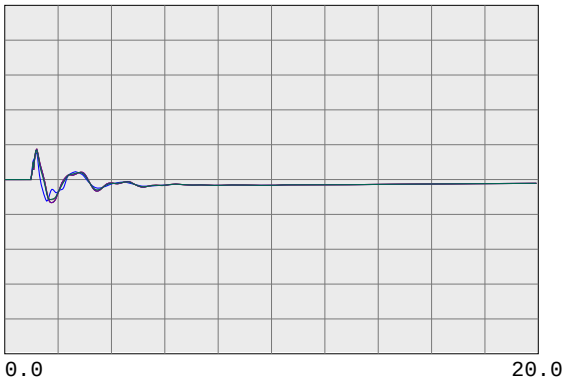
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



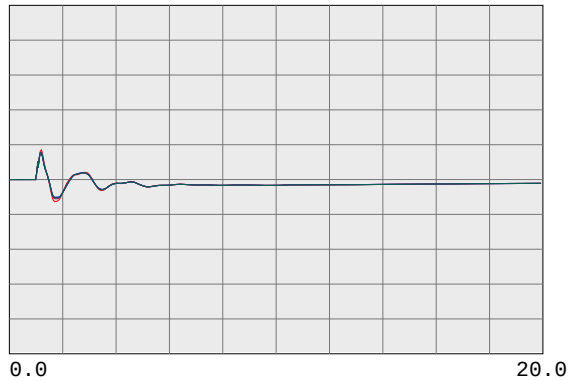
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



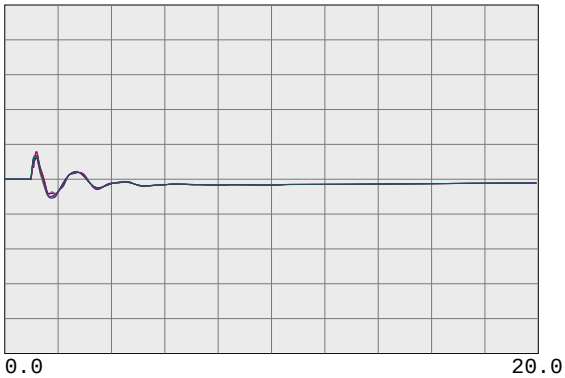
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



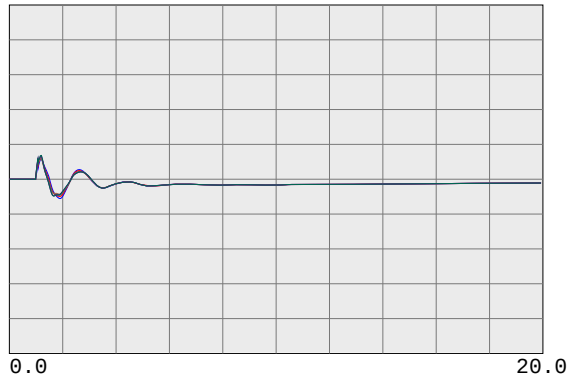
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

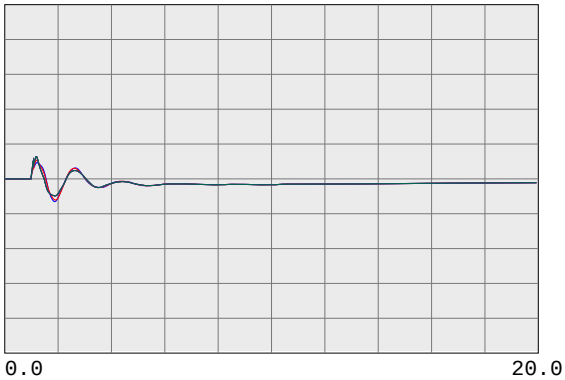
230-KV SYSTEM FREQUENCIES



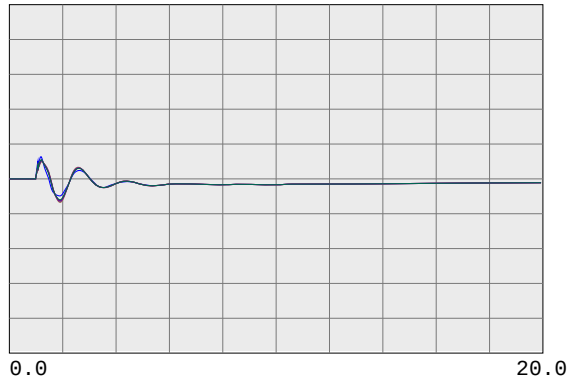
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



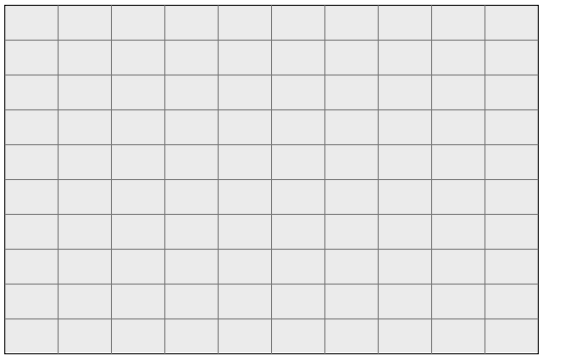
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

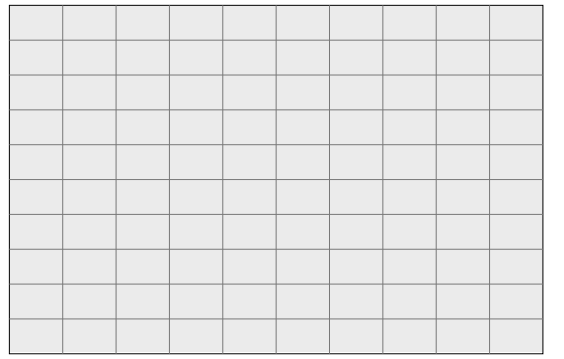


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



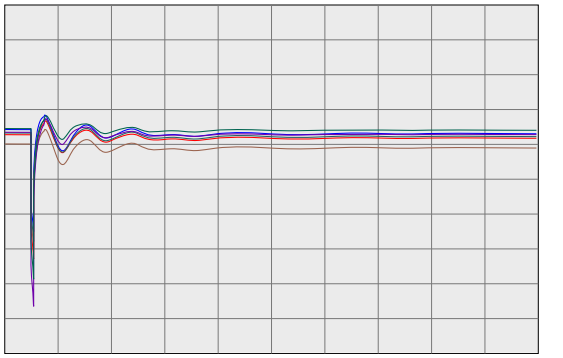
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



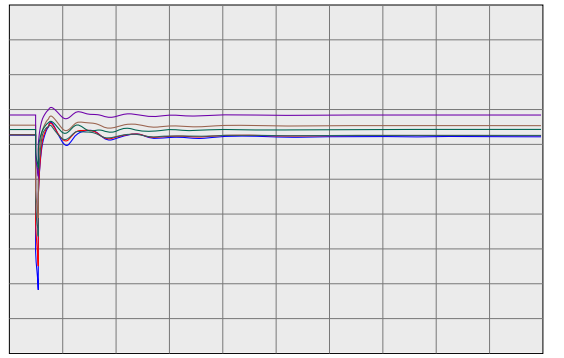


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

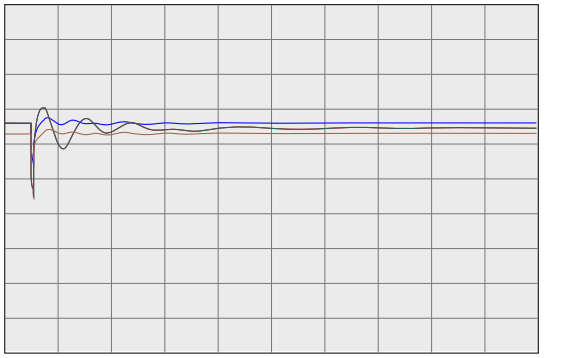
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



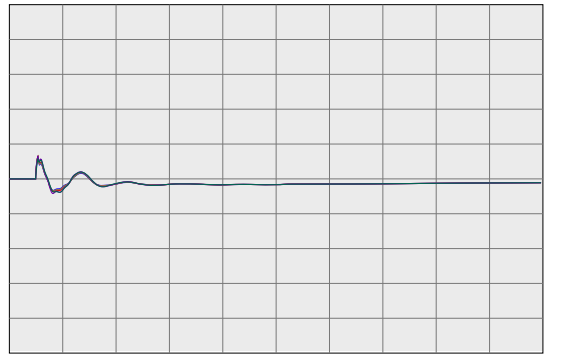
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



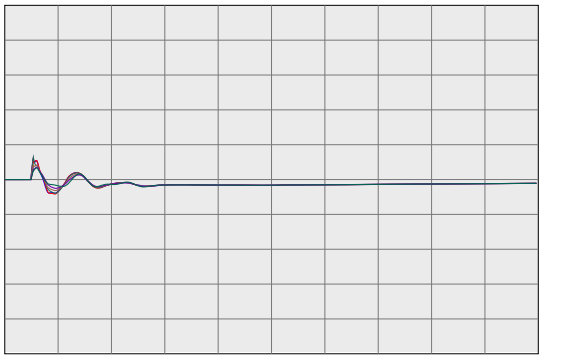
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



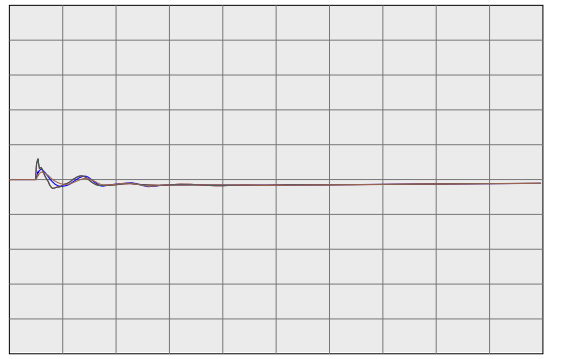
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



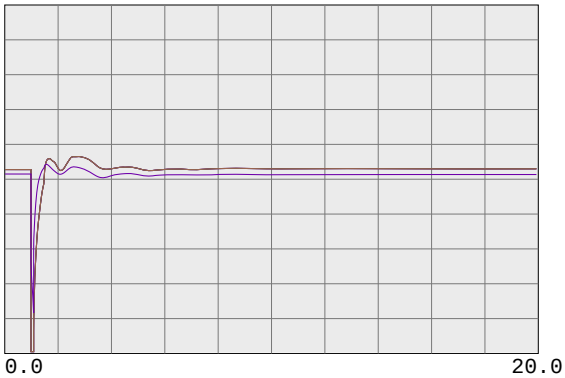
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

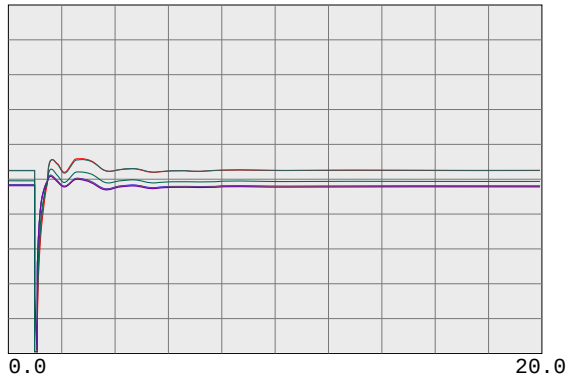
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

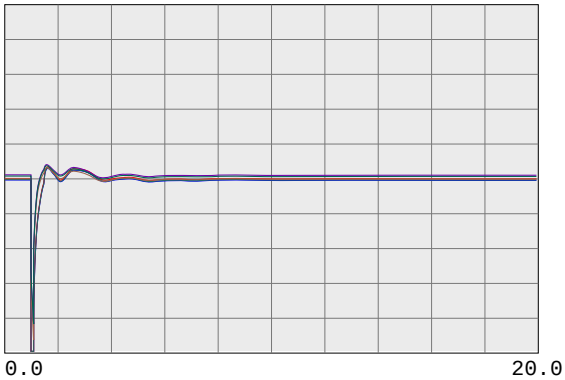
230-KV SYSTEM VOLTAGES



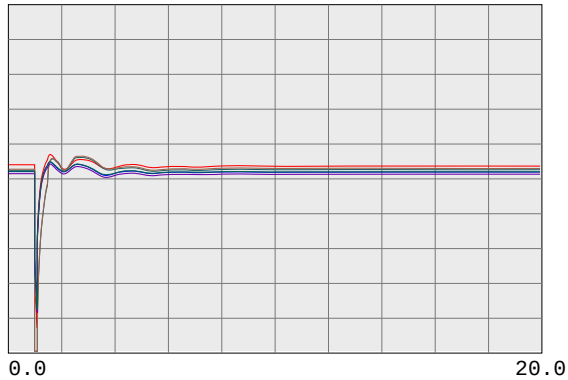
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



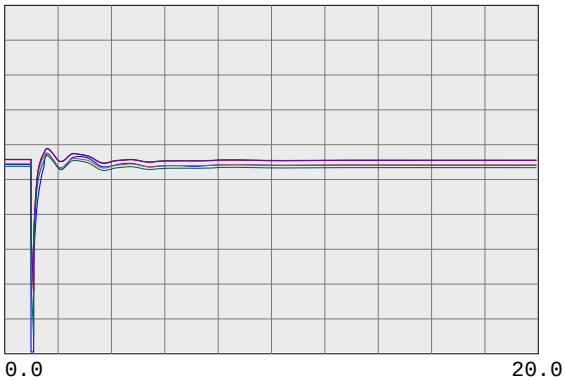
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



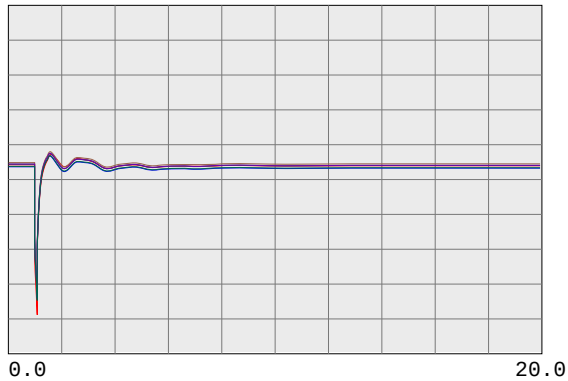
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



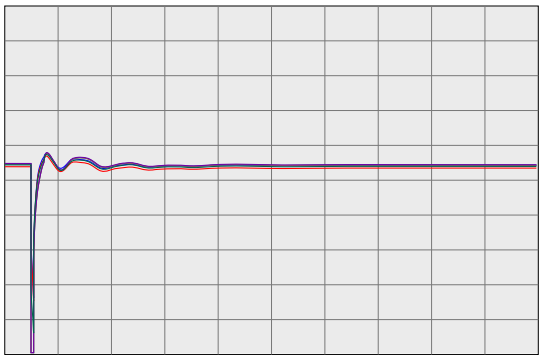
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



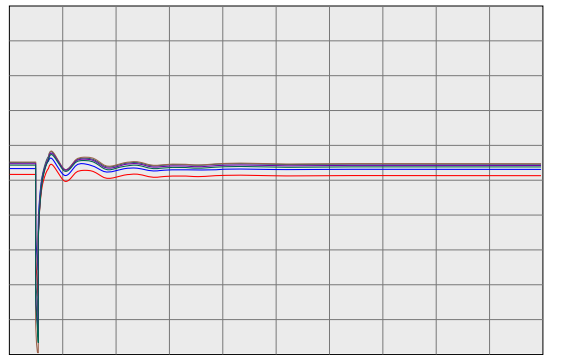
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

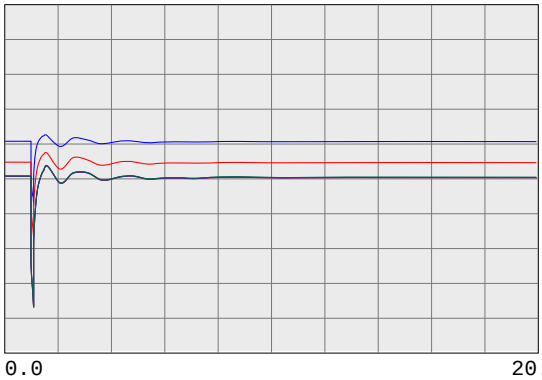
230-KV SYSTEM VOLTAGES



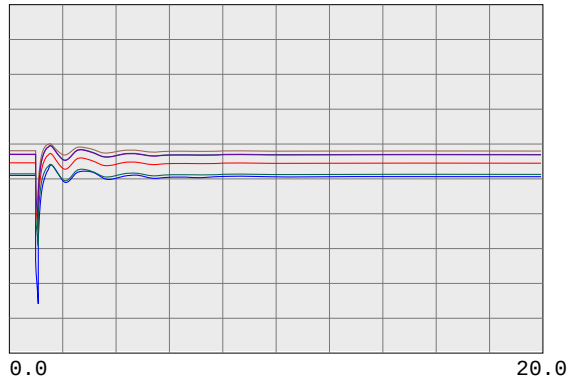
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



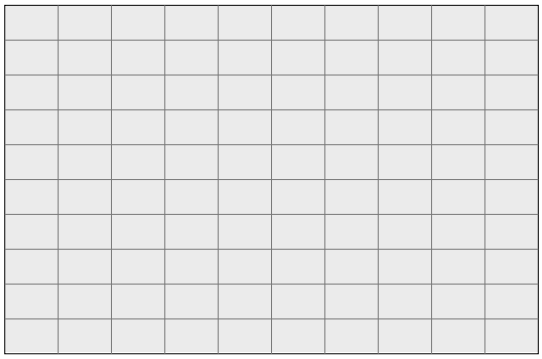
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

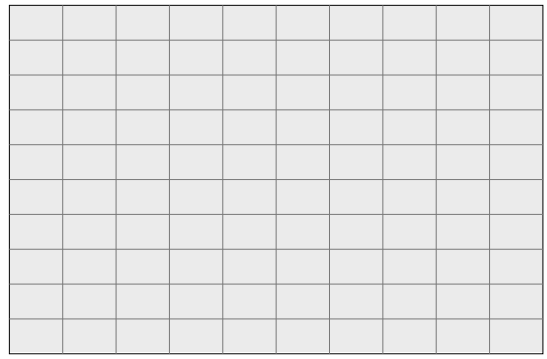


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



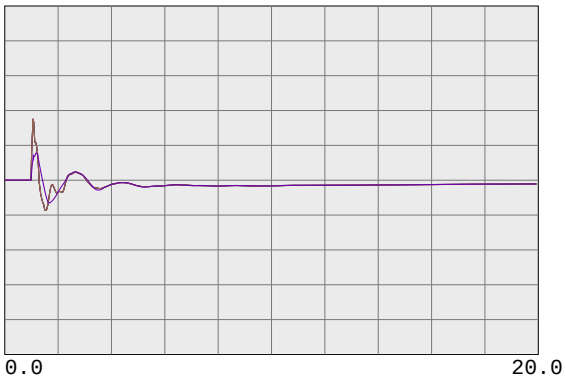
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



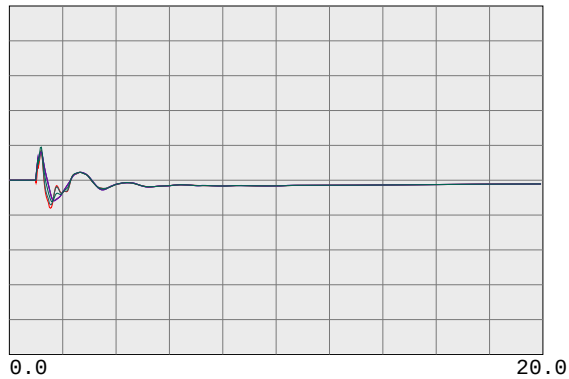


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

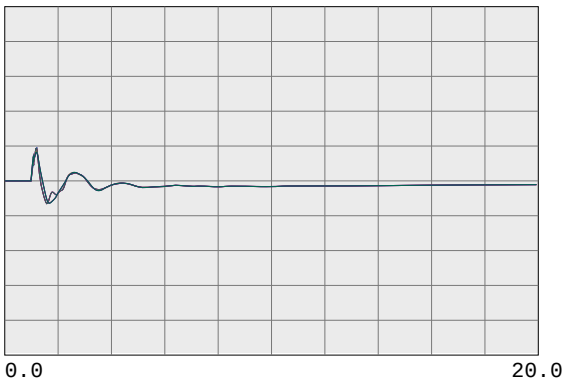
230-KV SYSTEM FREQUENCIES



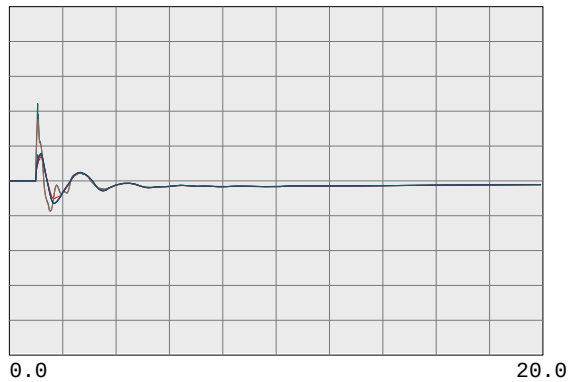
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



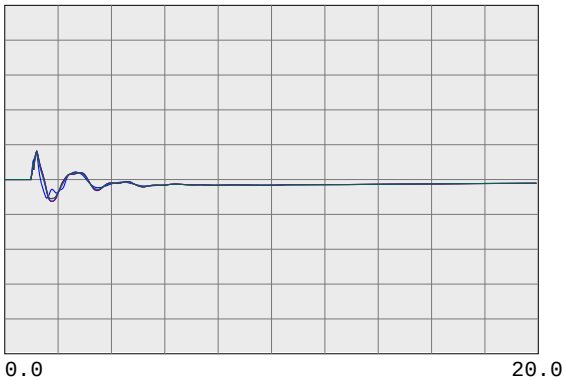
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



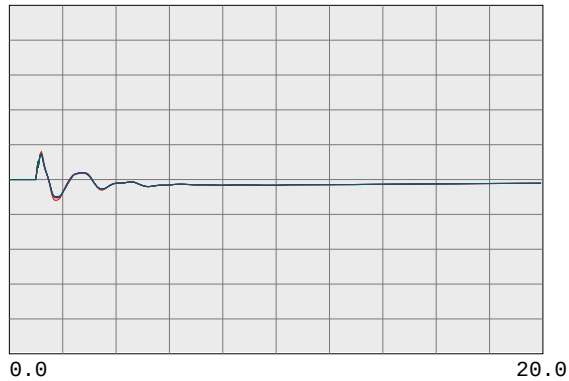
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



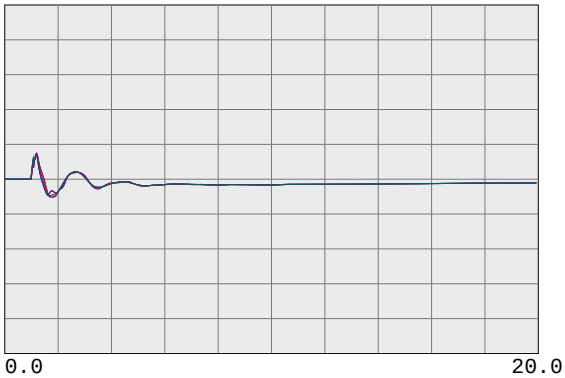
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



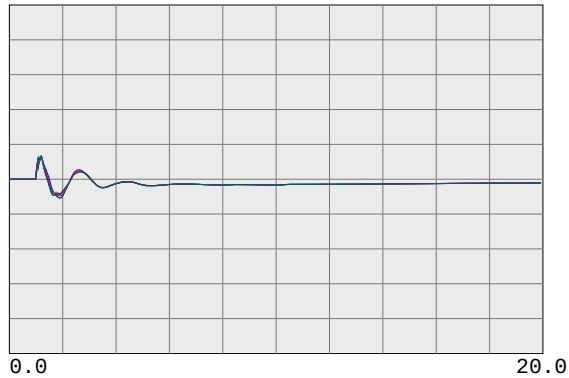
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

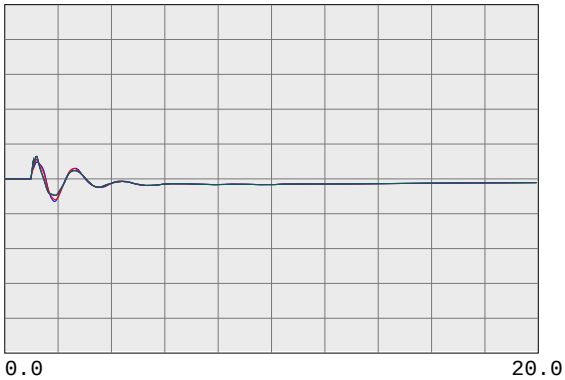
230-KV SYSTEM FREQUENCIES



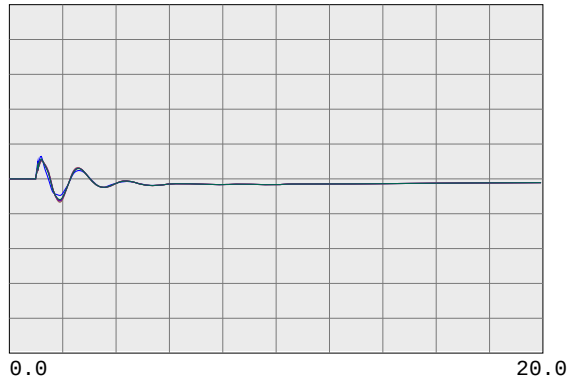
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



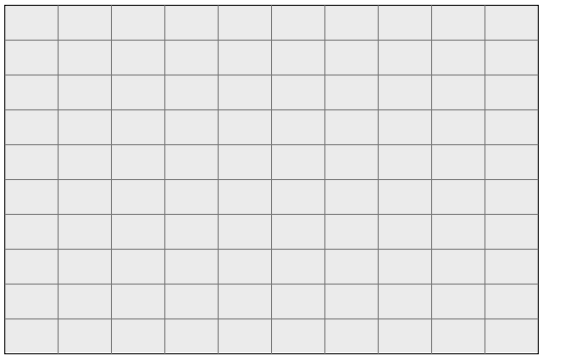
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

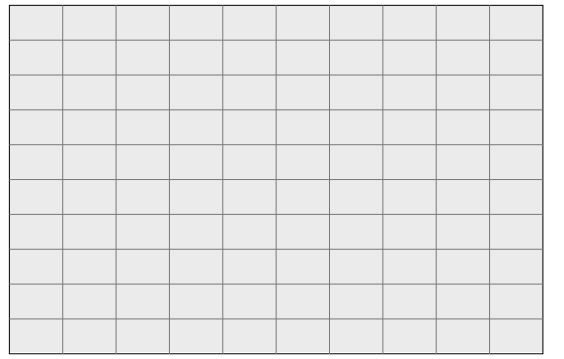


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



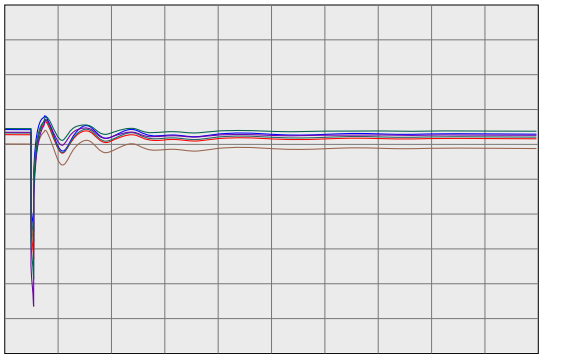
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



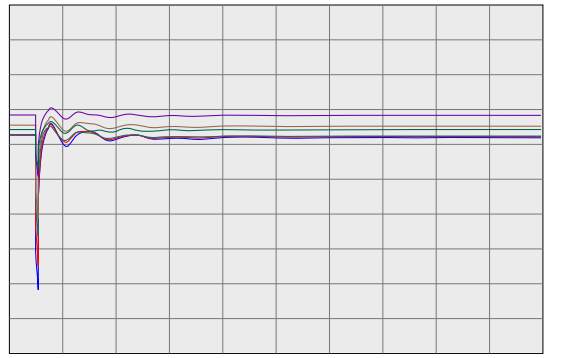


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

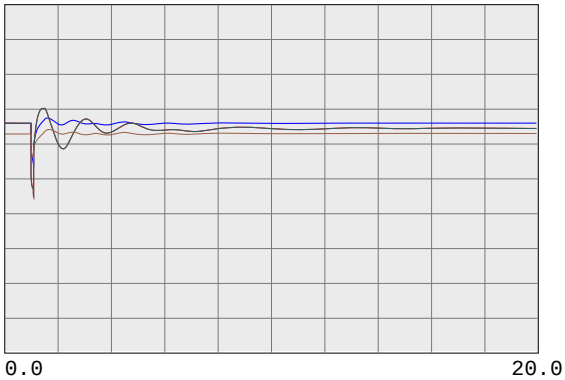
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



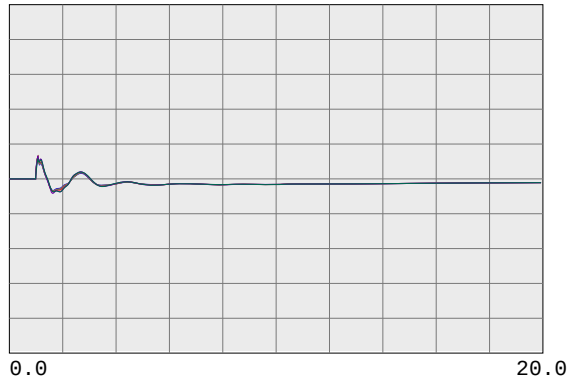
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



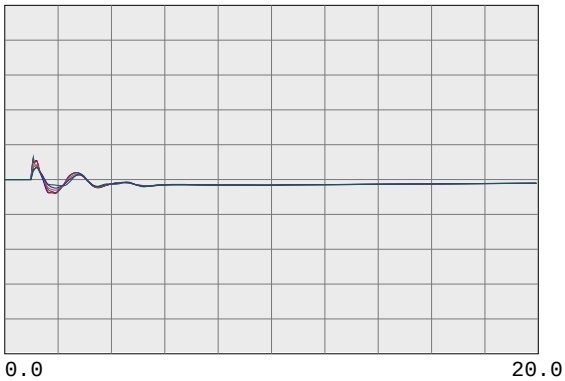
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



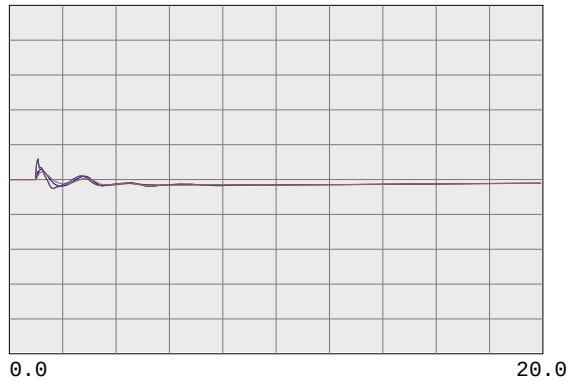
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



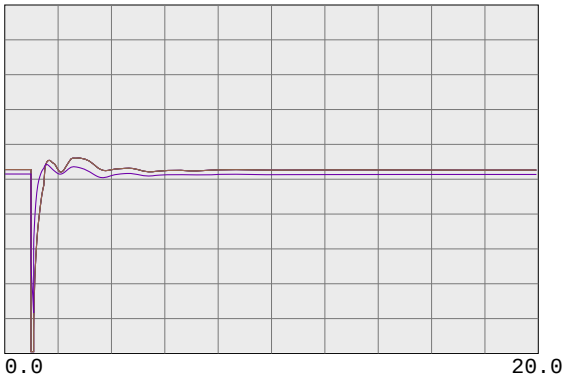
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

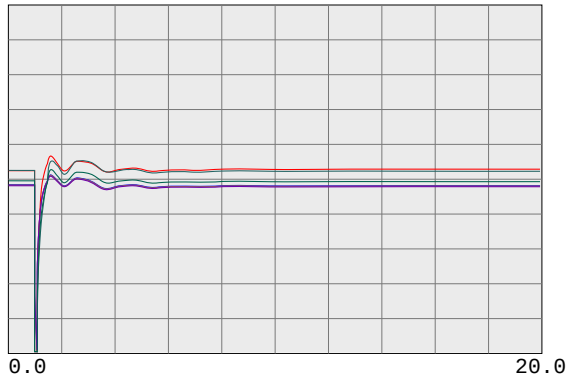
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

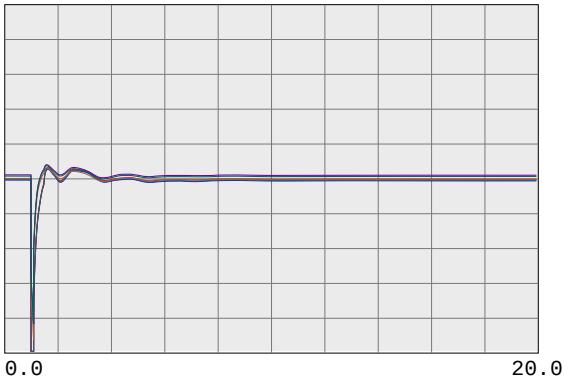
230-KV SYSTEM VOLTAGES



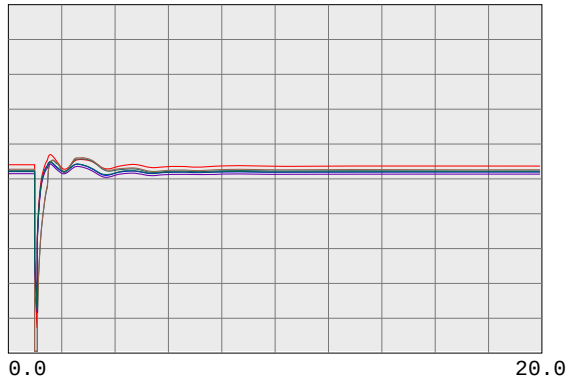
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



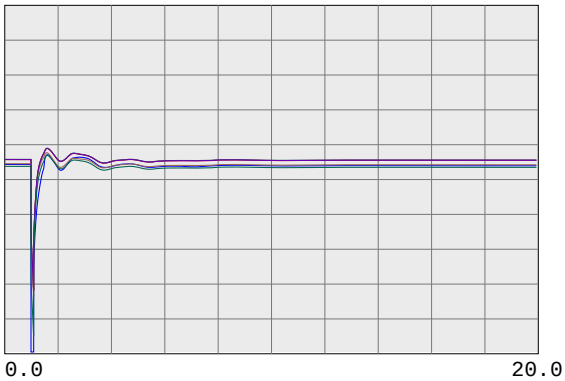
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



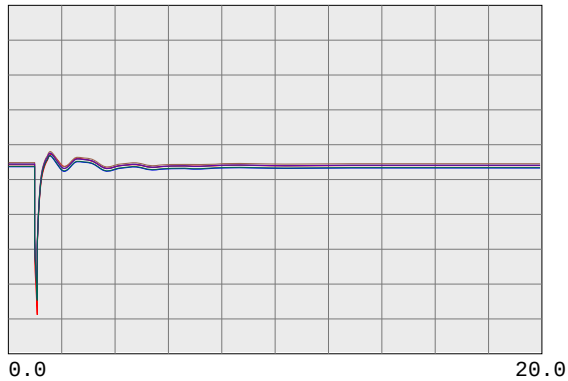
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



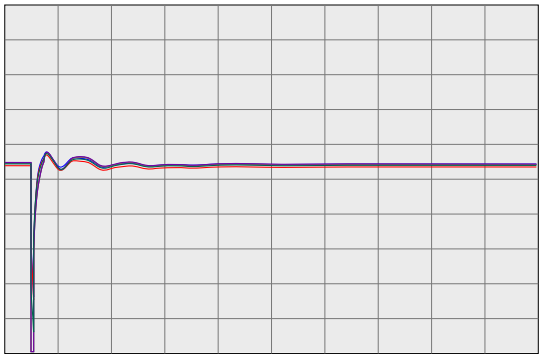
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

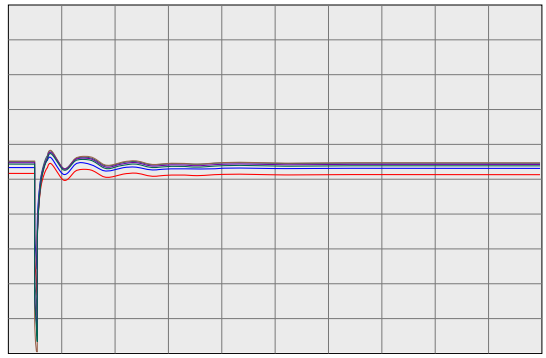
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

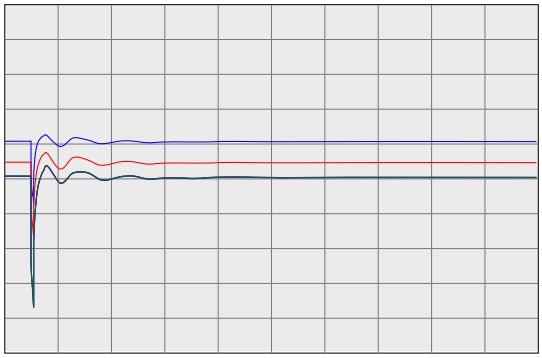
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

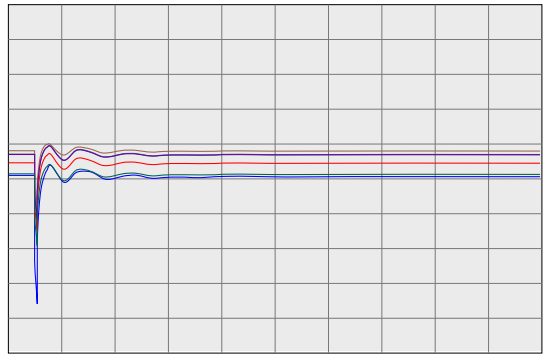
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

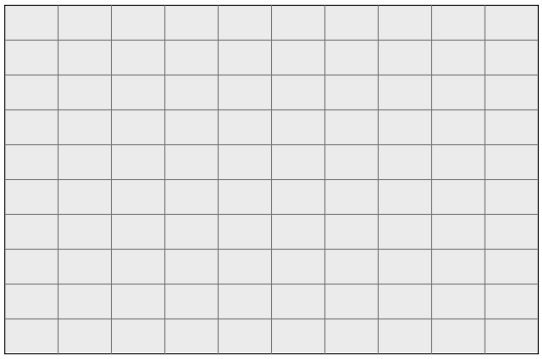
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

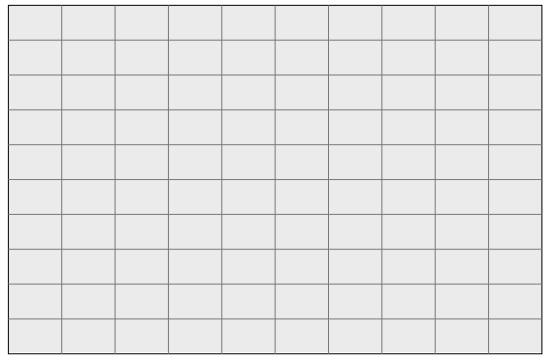


0.0 20.0

Time(sec)

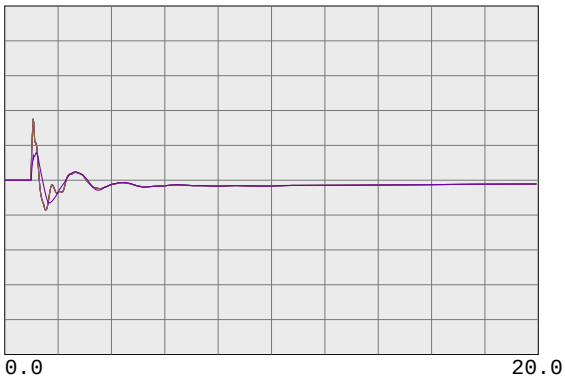
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



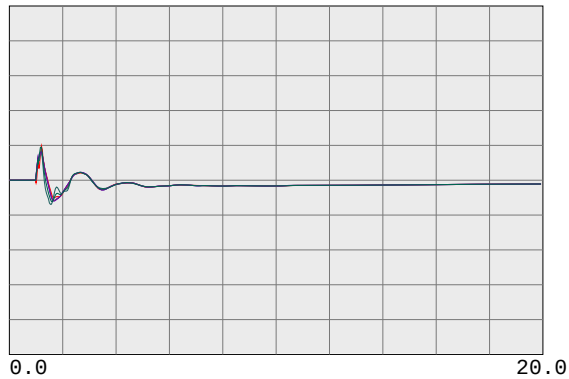


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

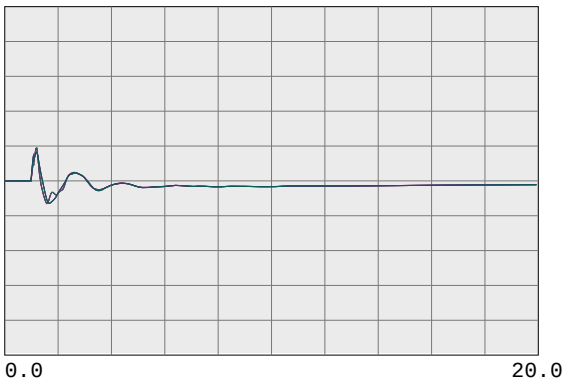
230-KV SYSTEM FREQUENCIES



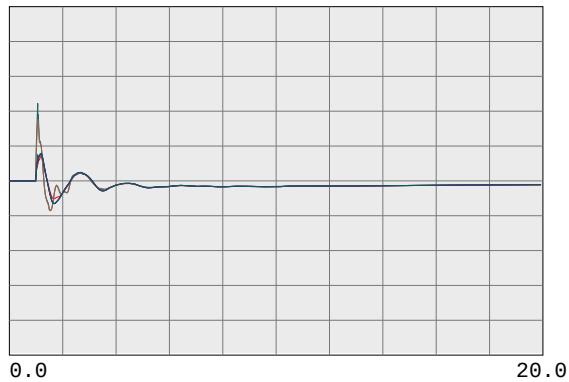
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



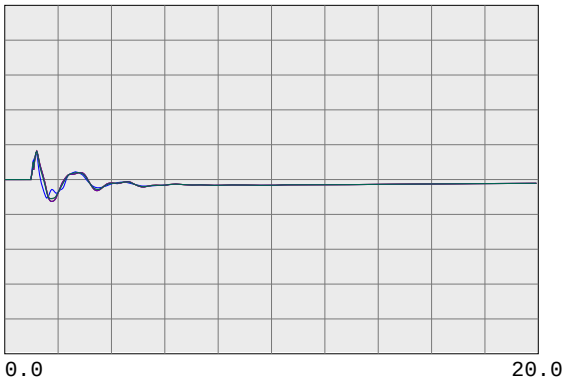
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



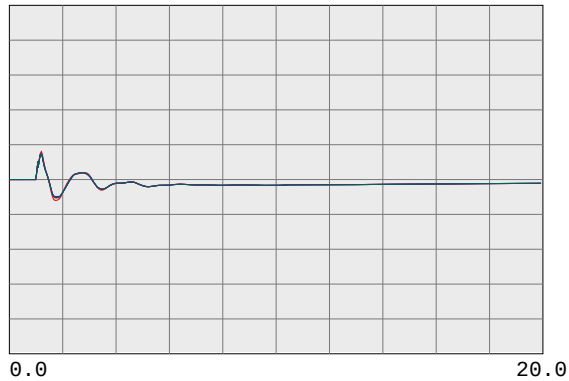
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



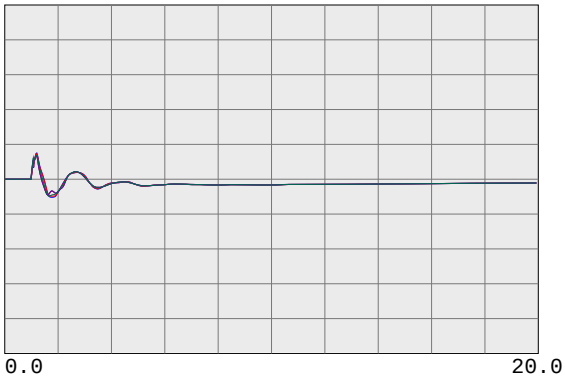
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



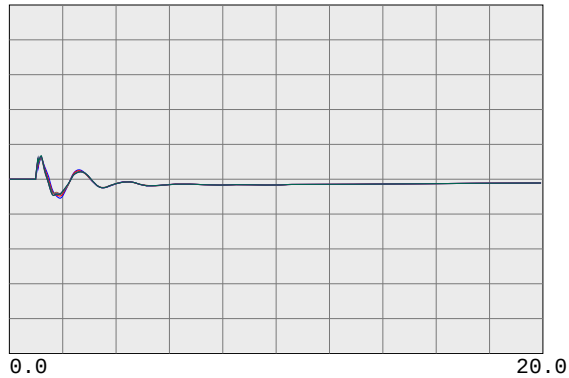
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

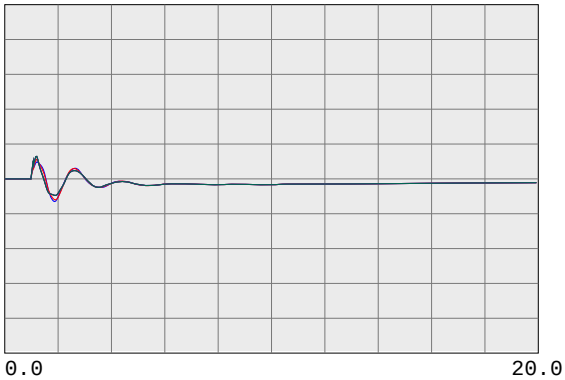
230-KV SYSTEM FREQUENCIES



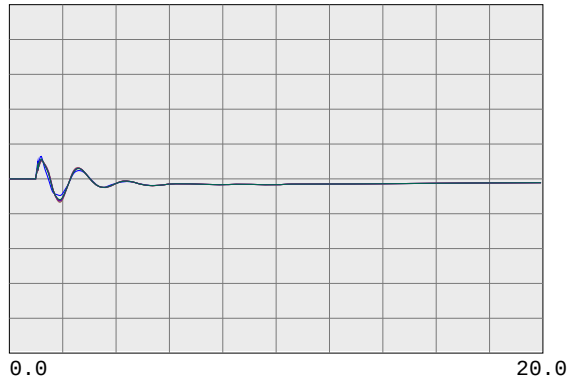
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



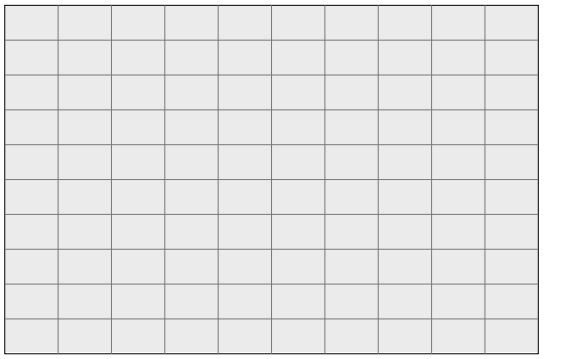
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

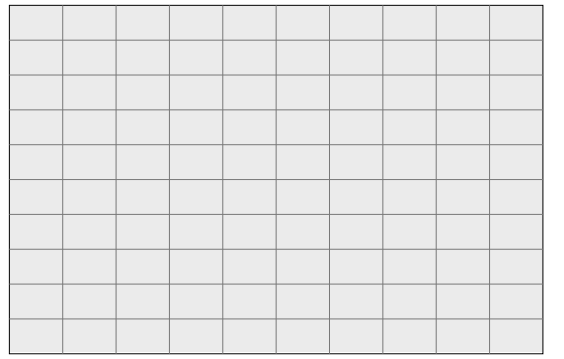


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



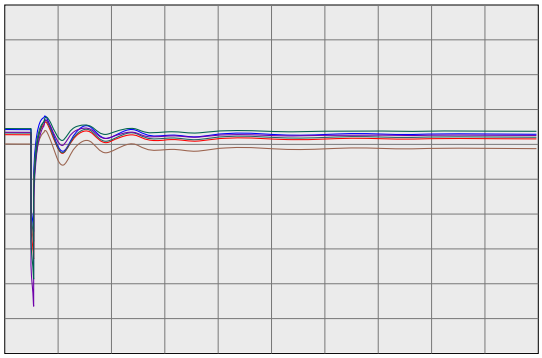
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

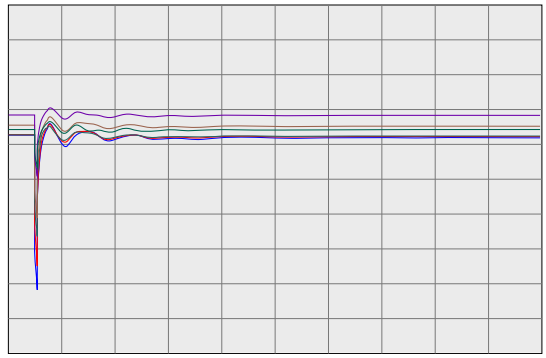
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.0 20.0

Time(sec)

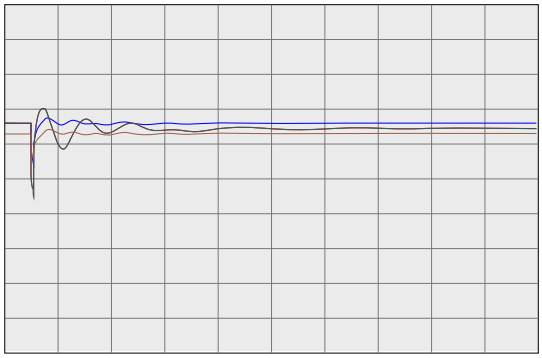
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

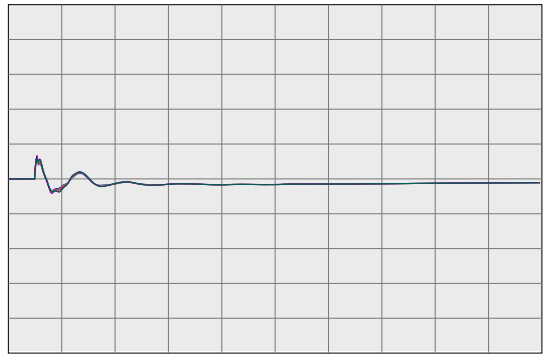
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

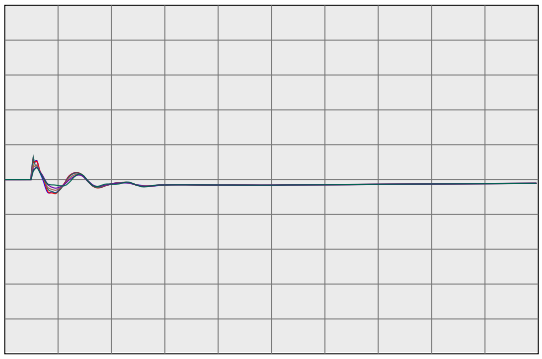
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

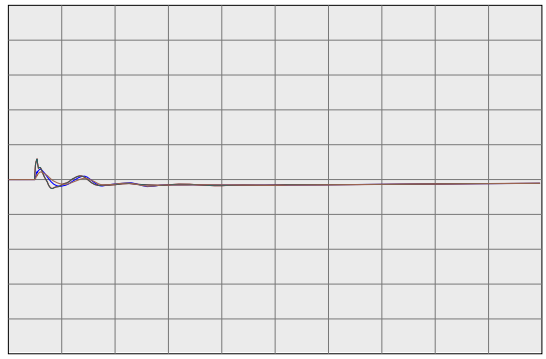
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

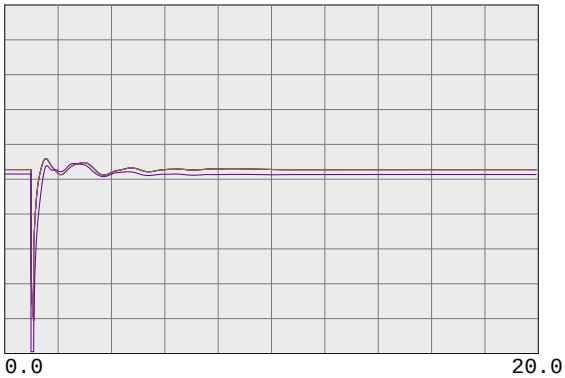
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

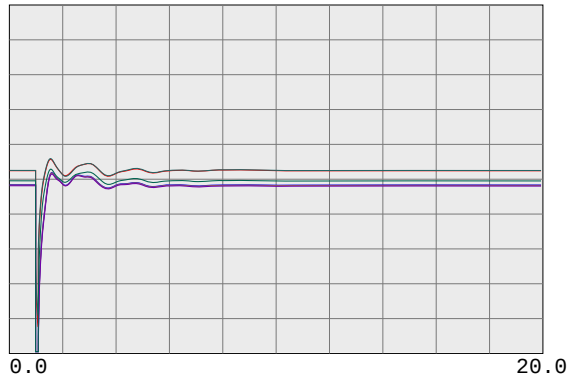
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

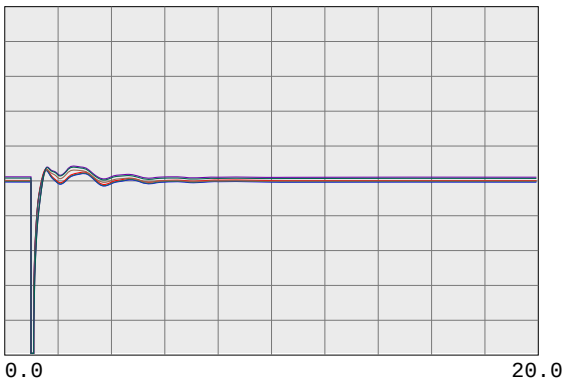
230-KV SYSTEM VOLTAGES



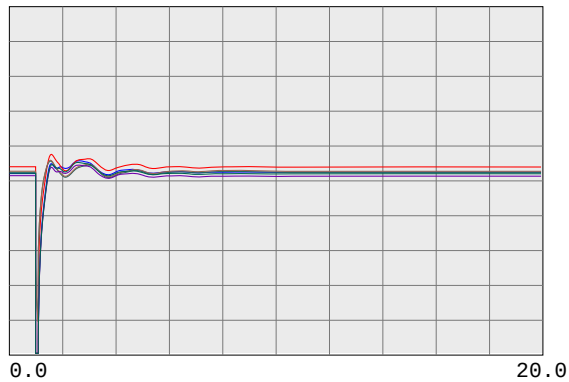
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



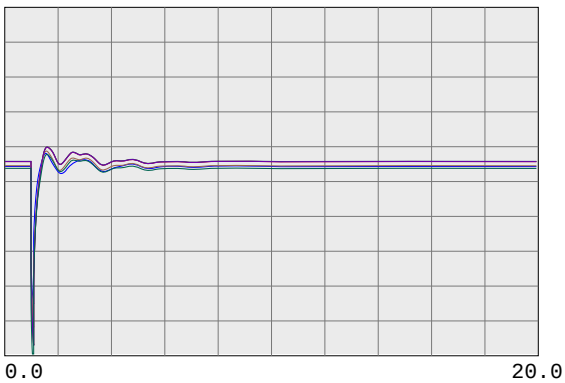
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



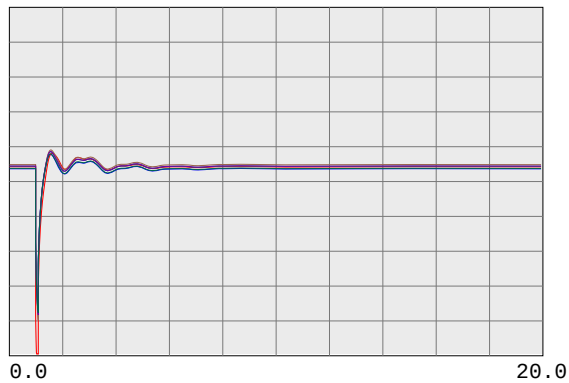
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



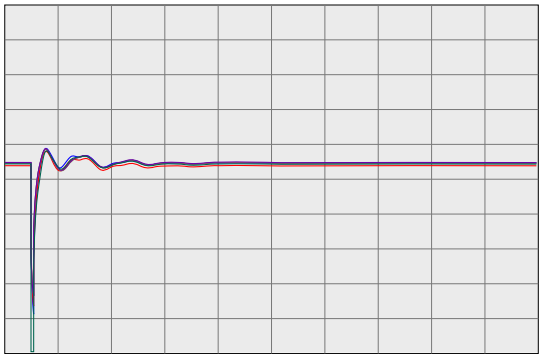
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

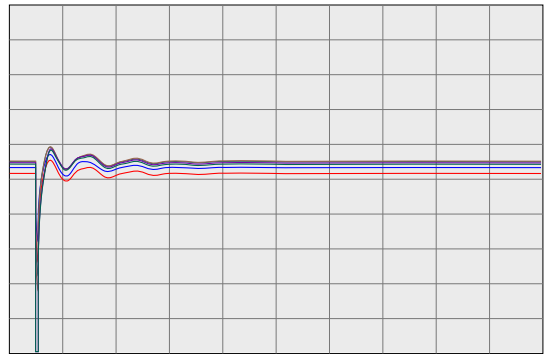
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

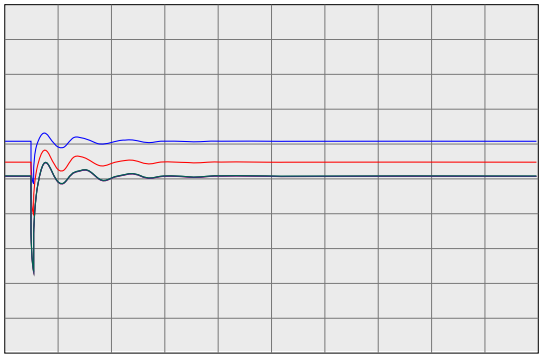
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

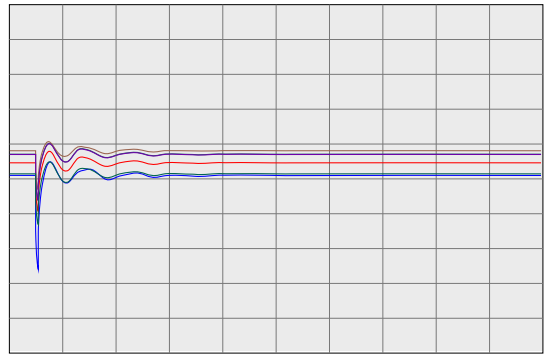
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

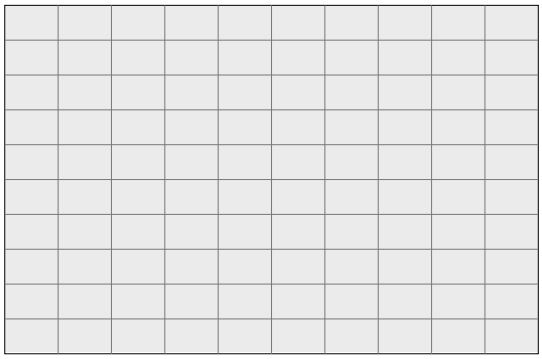
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

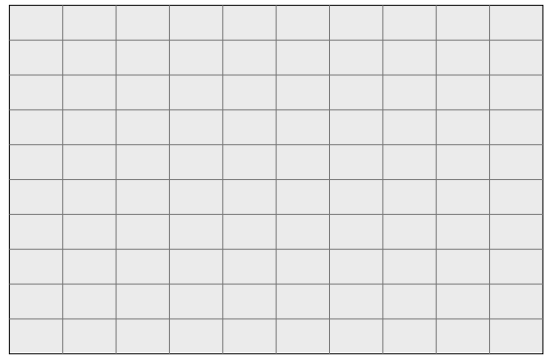


0.0 20.0

Time(sec)

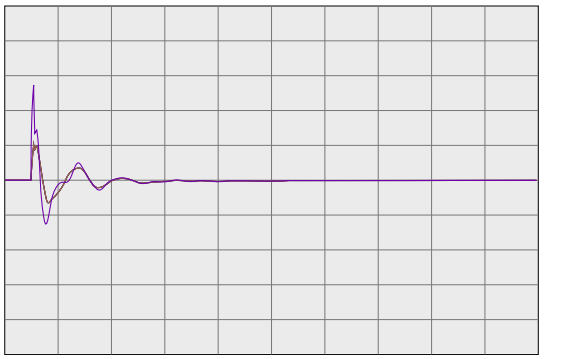
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



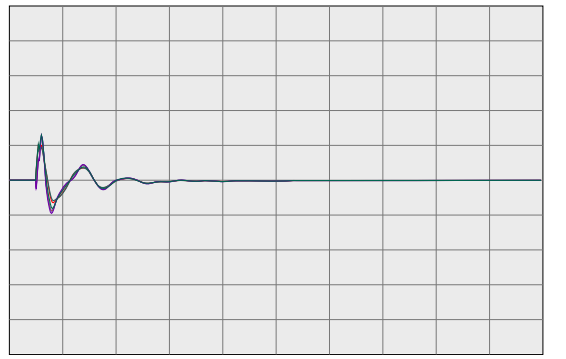


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

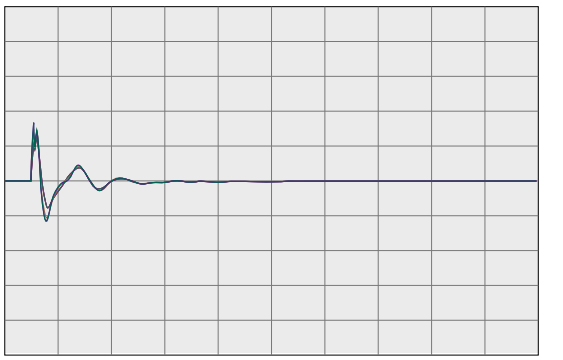
230-KV SYSTEM FREQUENCIES



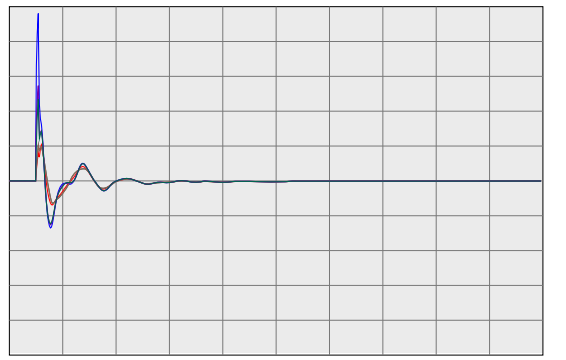
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



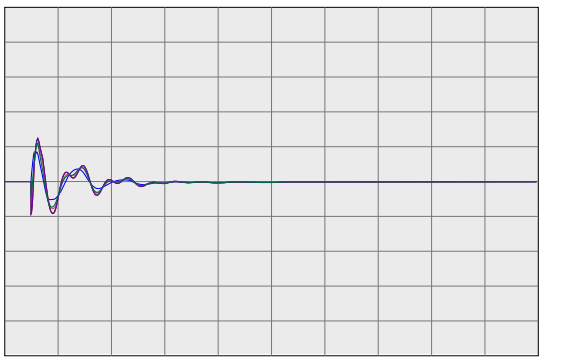
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



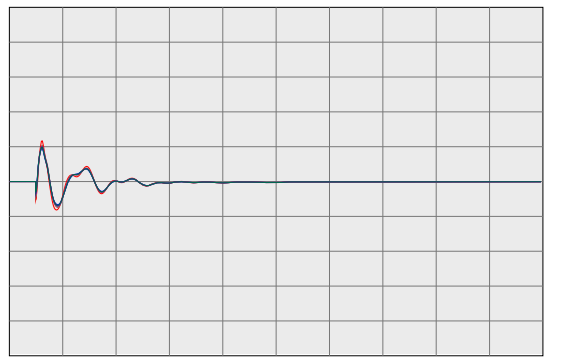
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



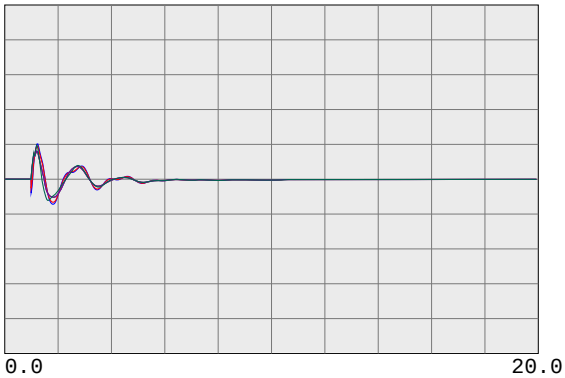
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



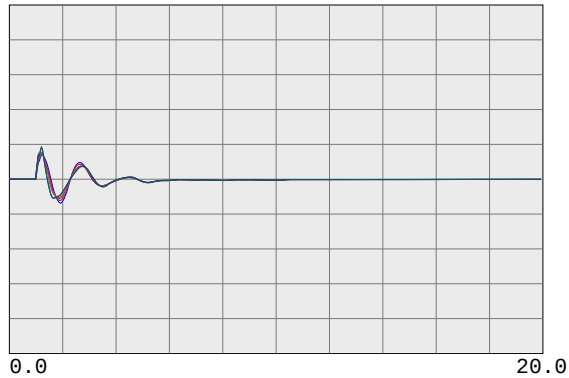
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

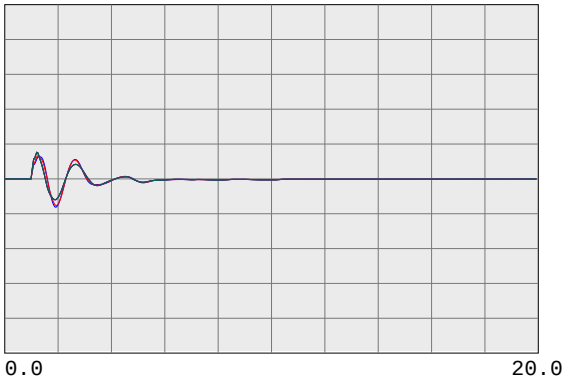
230-KV SYSTEM FREQUENCIES



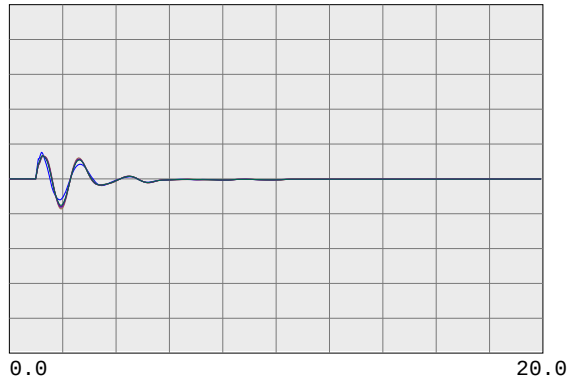
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



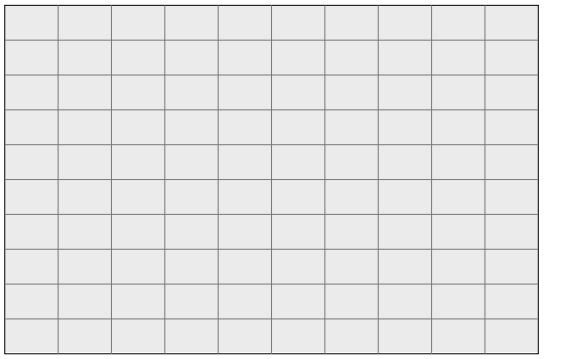
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

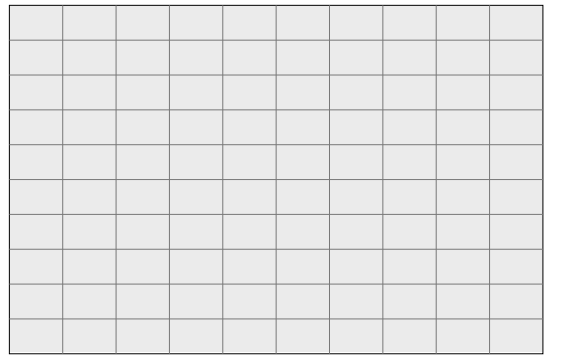


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



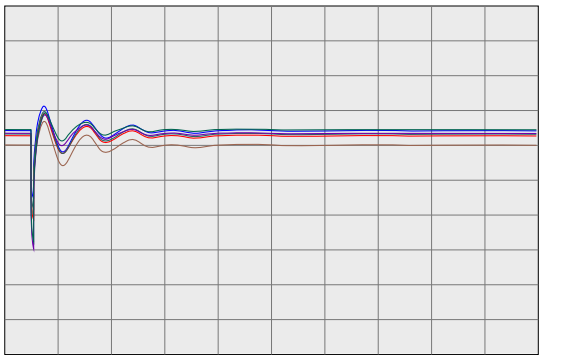
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



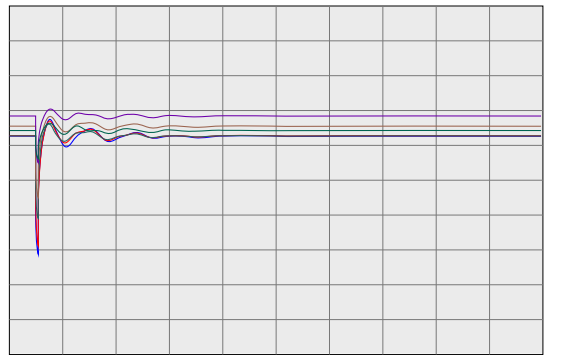


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

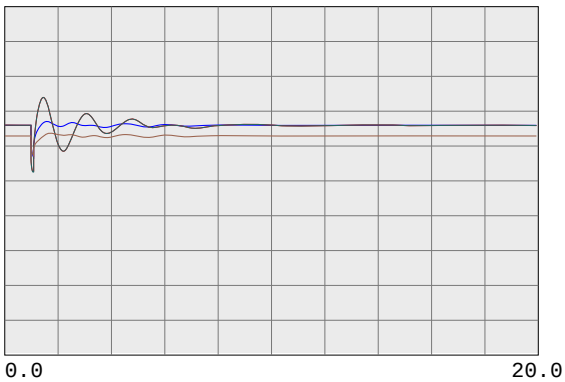
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



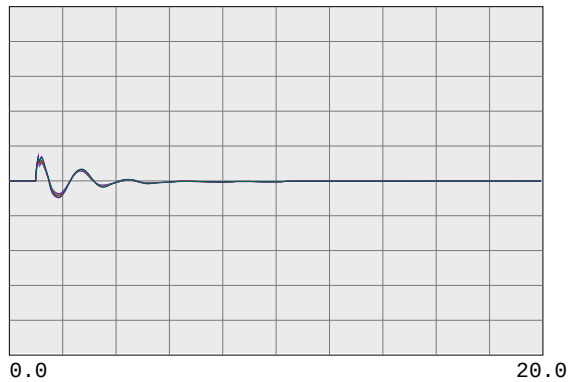
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



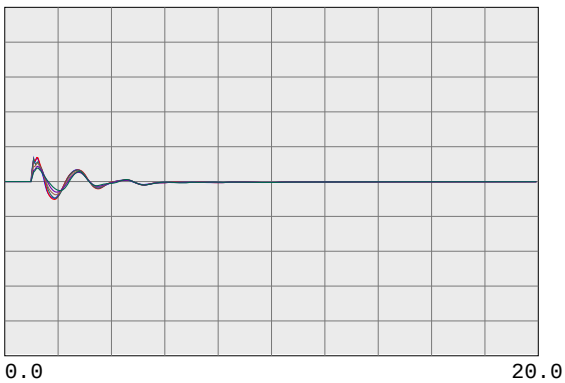
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



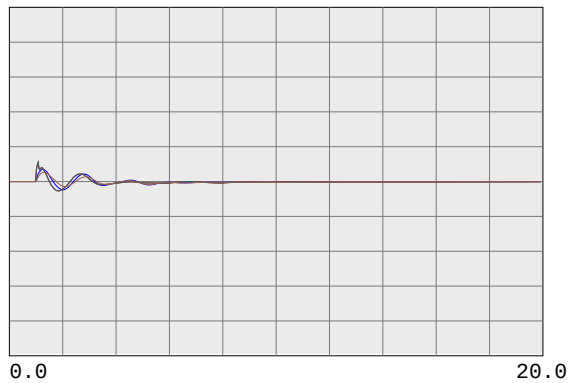
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



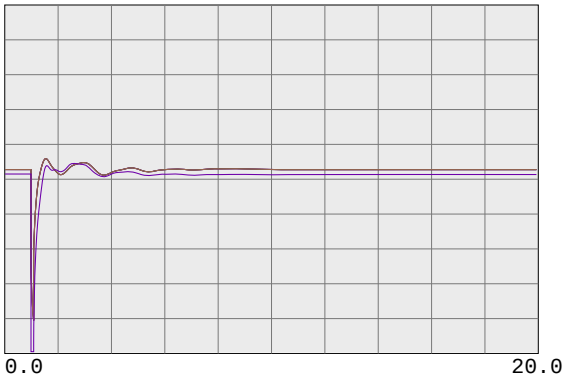
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

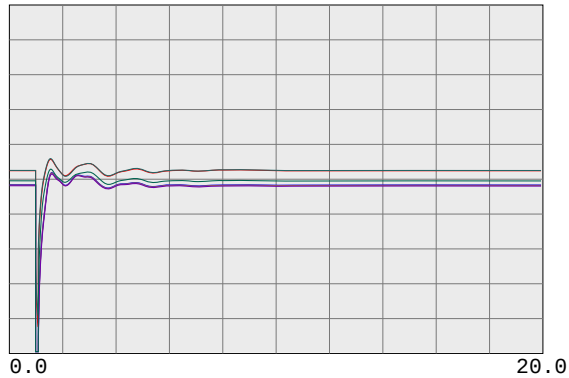
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

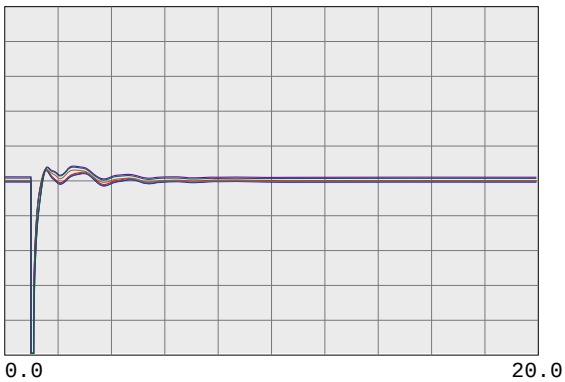
230-KV SYSTEM VOLTAGES



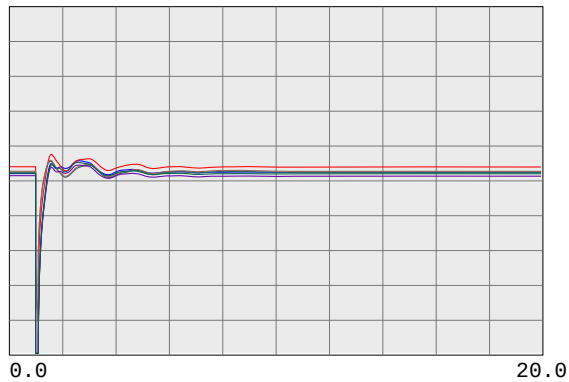
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



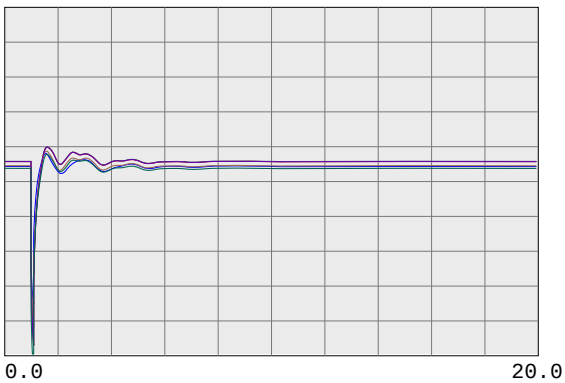
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



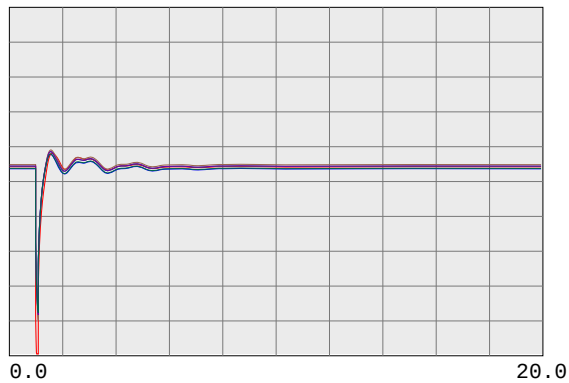
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



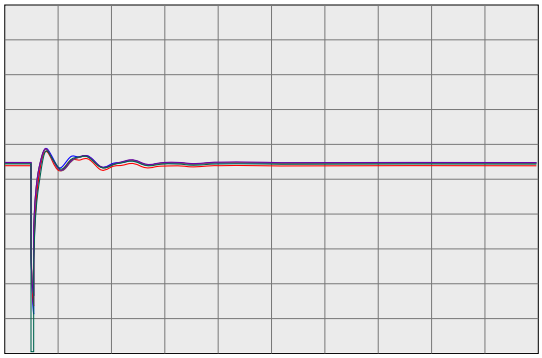
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

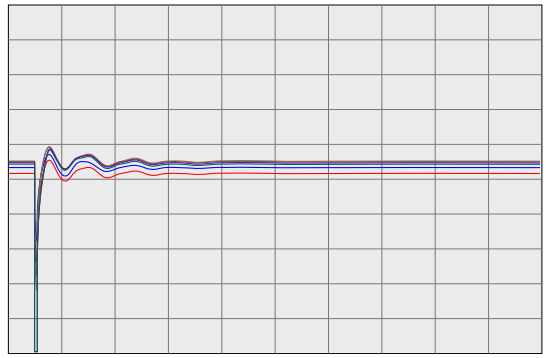
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

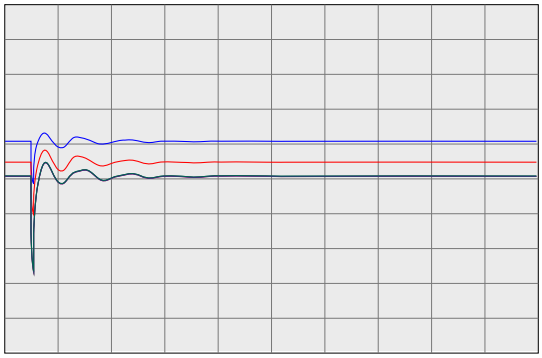
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

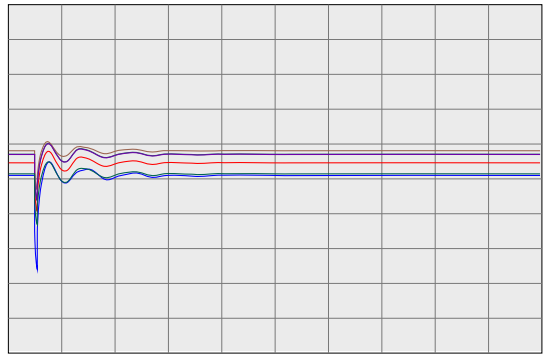
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

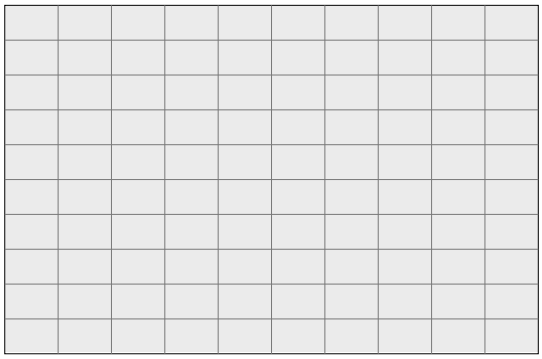
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

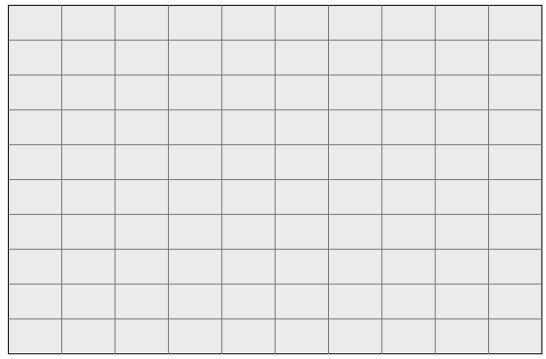


0.0 20.0

Time(sec)

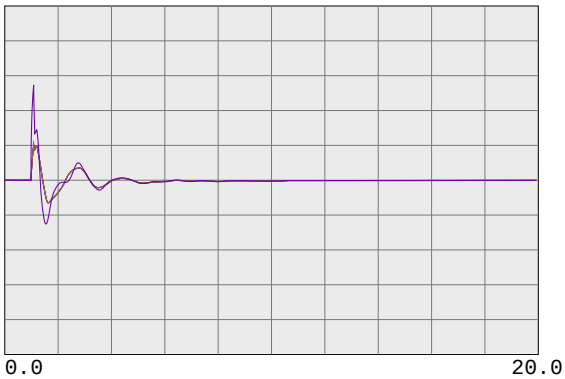
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



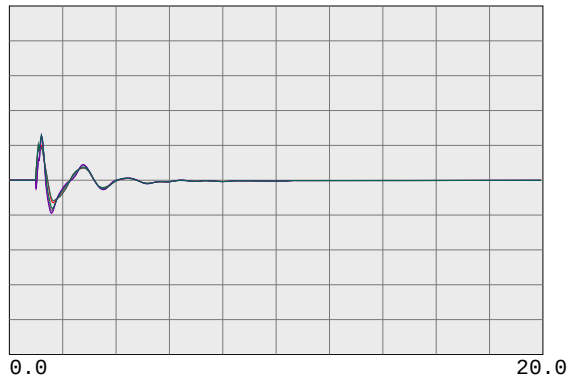


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

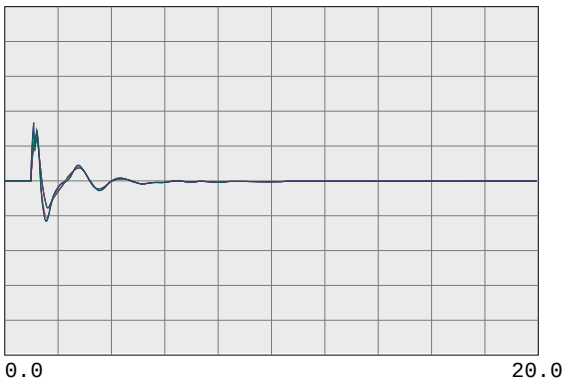
230-KV SYSTEM FREQUENCIES



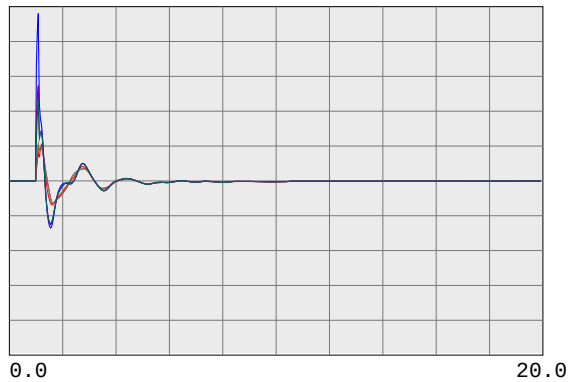
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



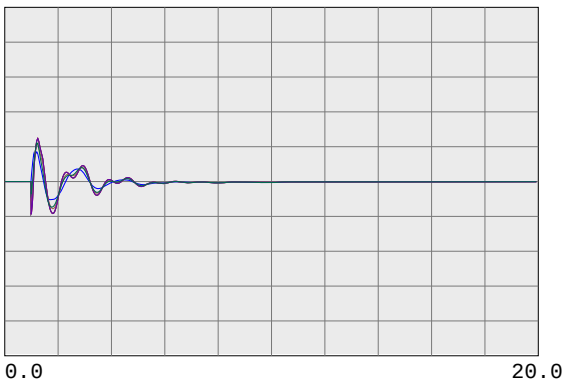
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



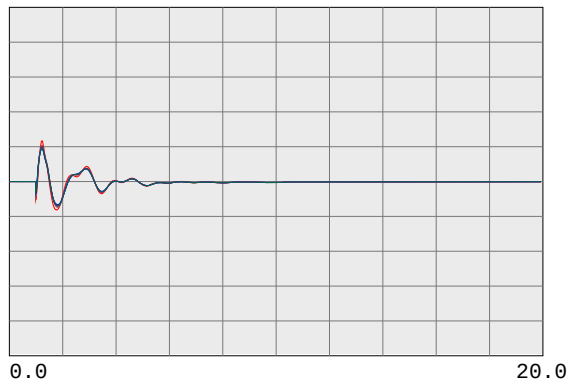
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



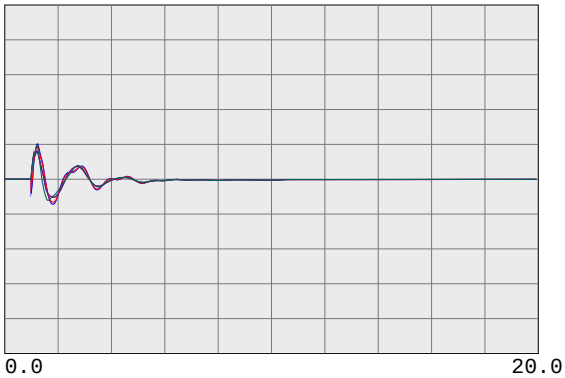
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



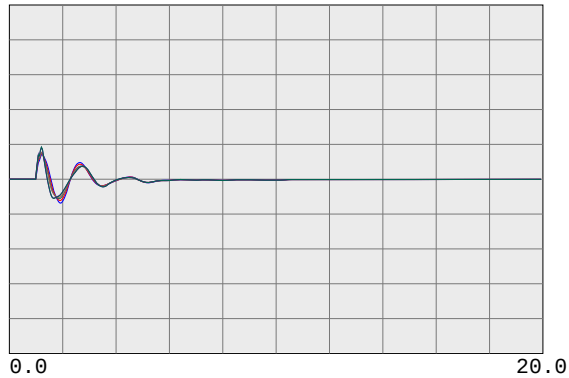
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

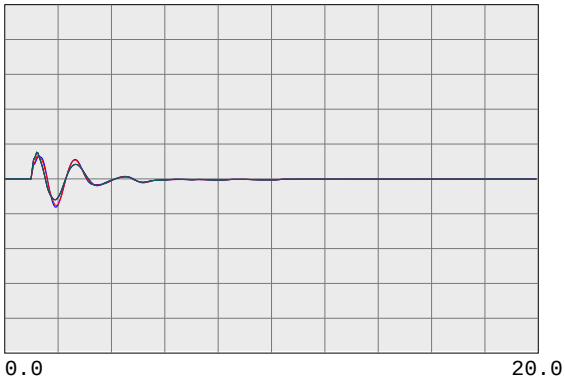
230-KV SYSTEM FREQUENCIES



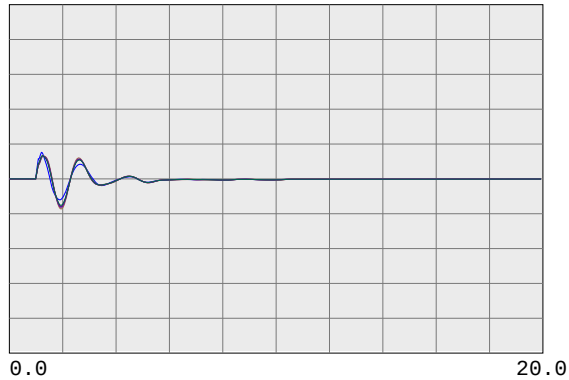
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



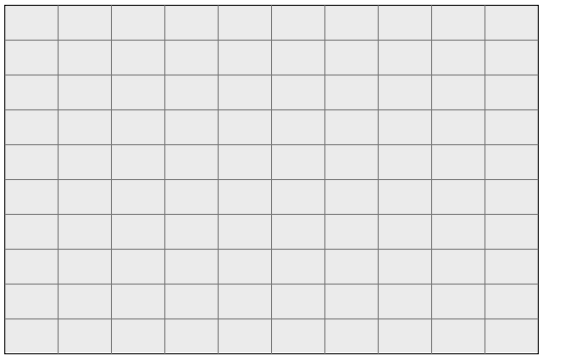
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

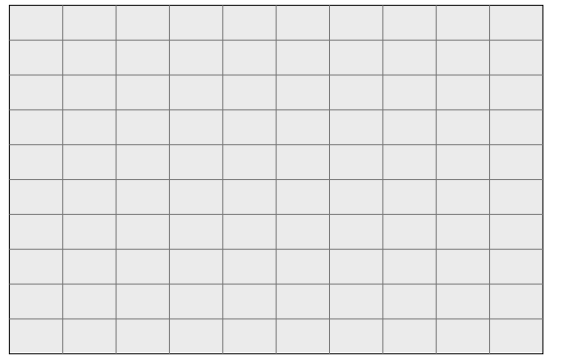


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



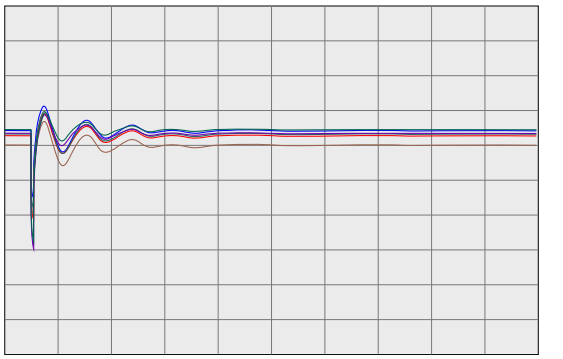
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



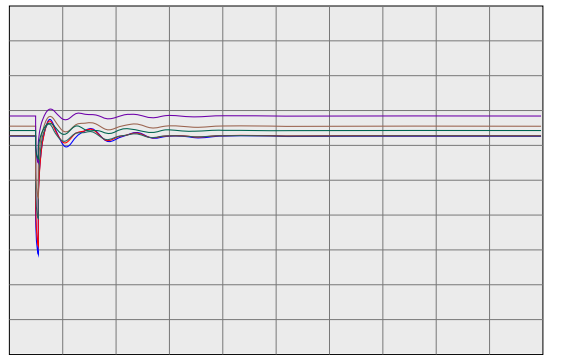


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

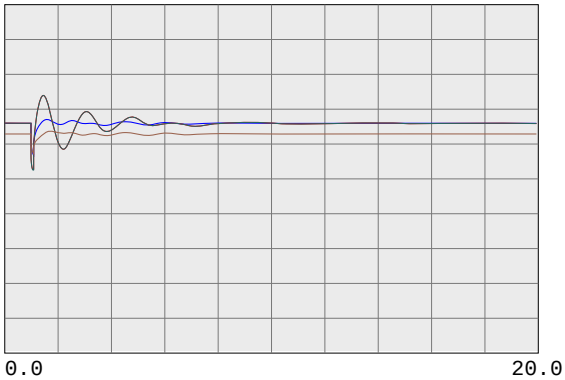
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



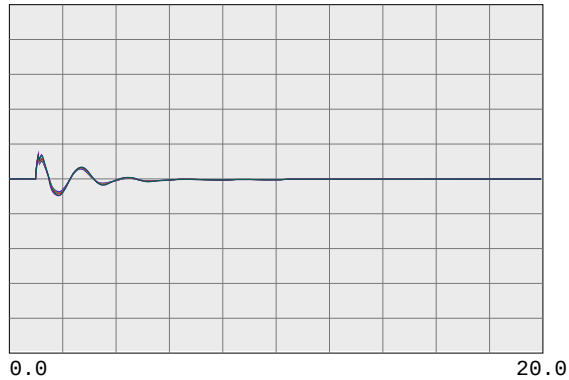
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



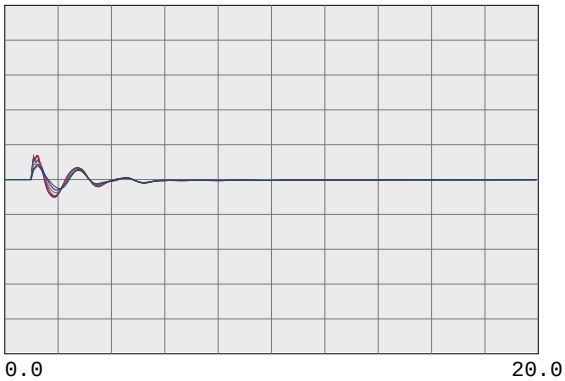
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



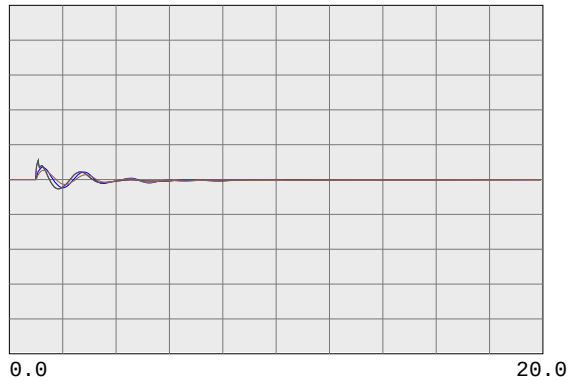
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



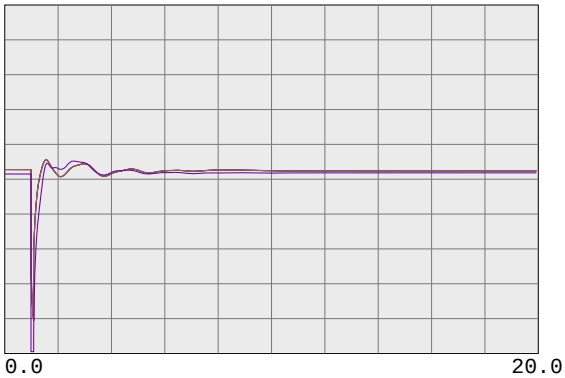
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

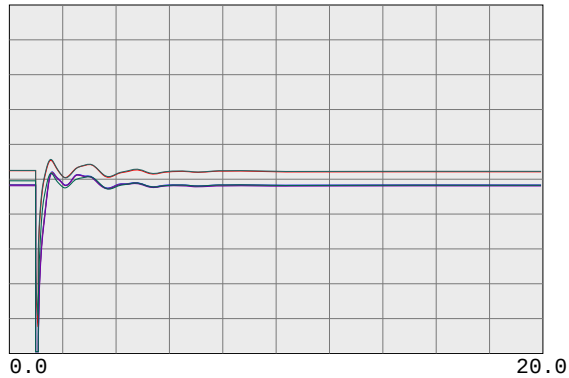
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

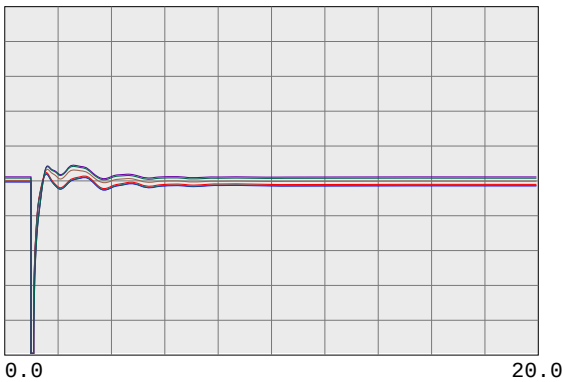
230-KV SYSTEM VOLTAGES



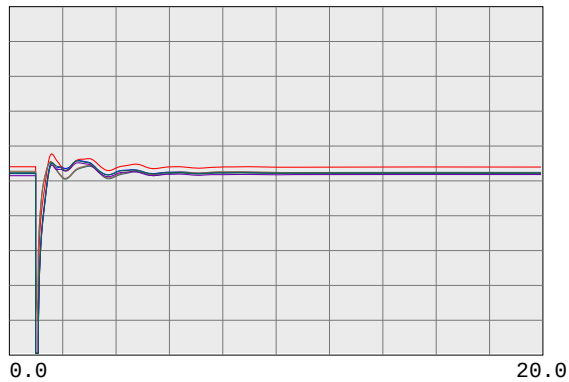
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



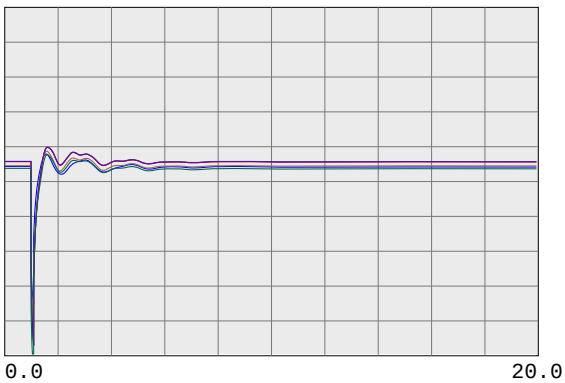
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



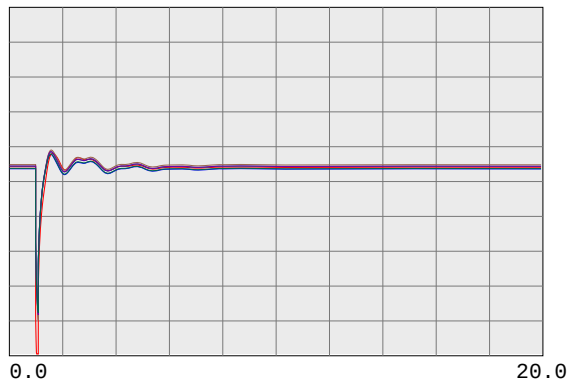
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



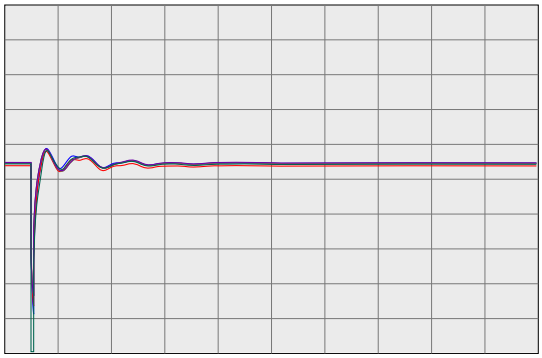
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

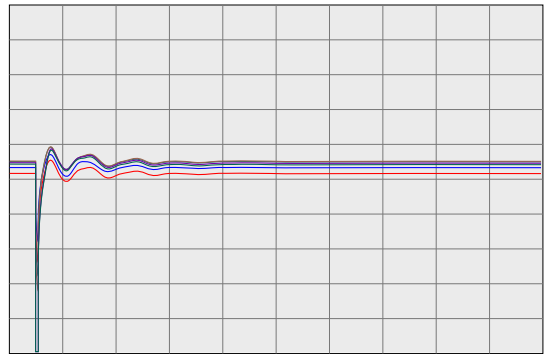
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

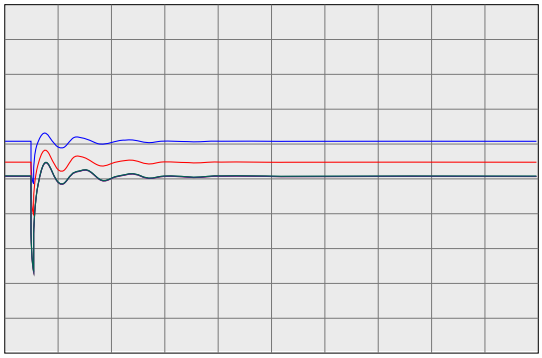
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

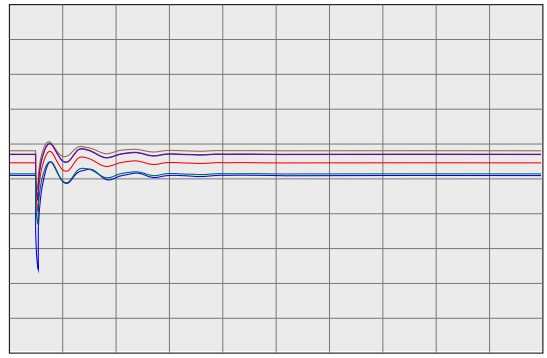
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

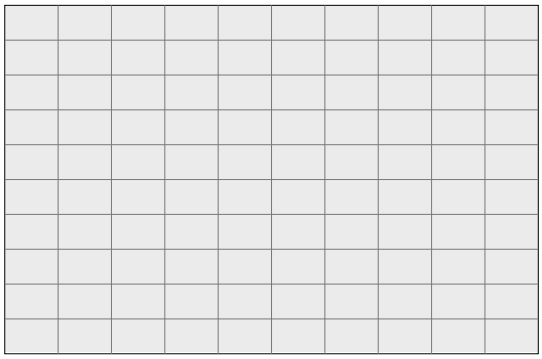
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

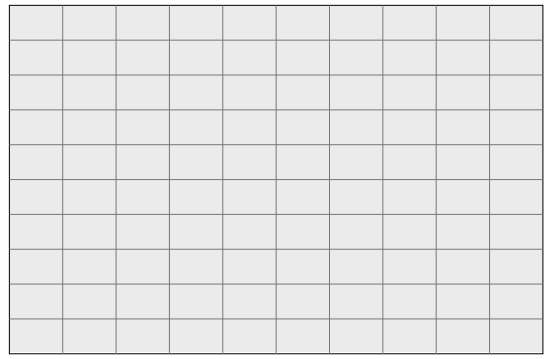


0.0 20.0

Time(sec)

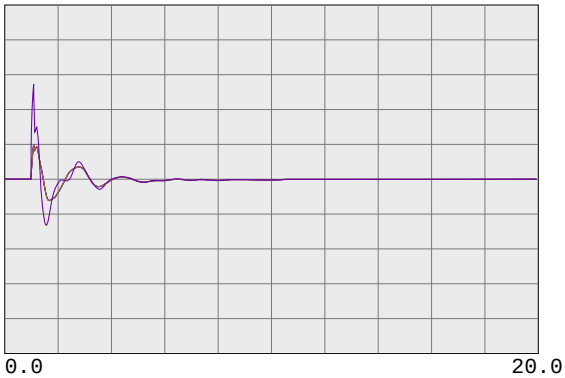
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



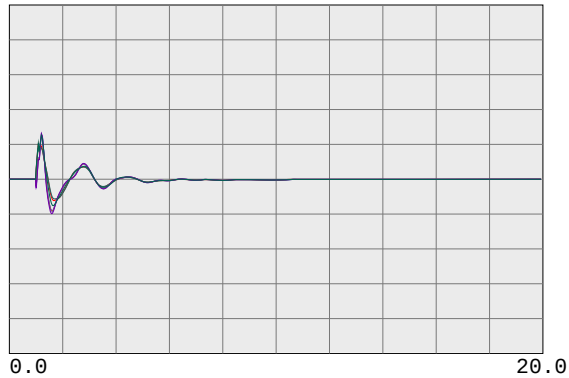


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

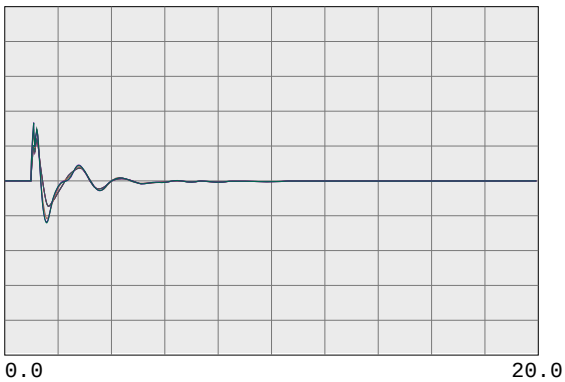
230-KV SYSTEM FREQUENCIES



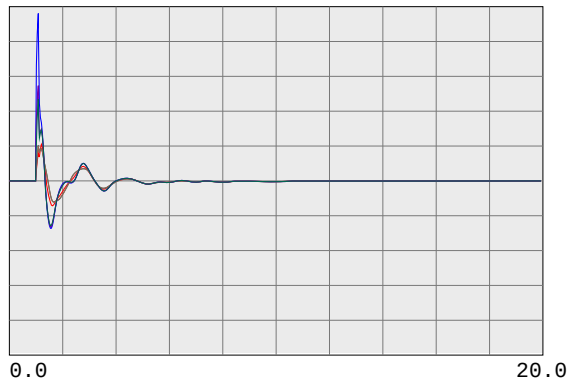
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



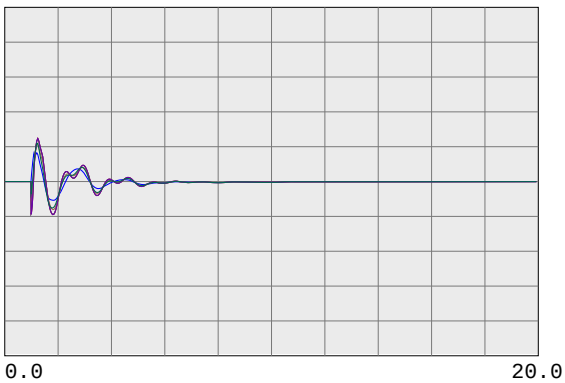
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



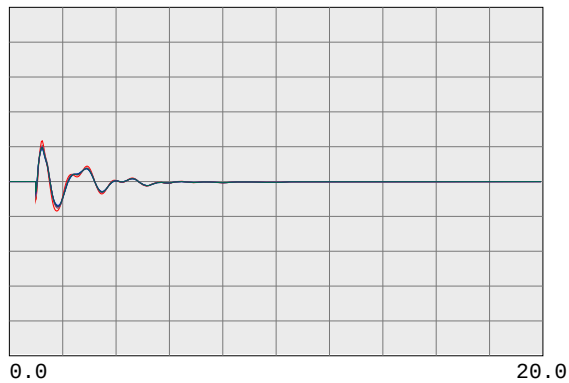
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



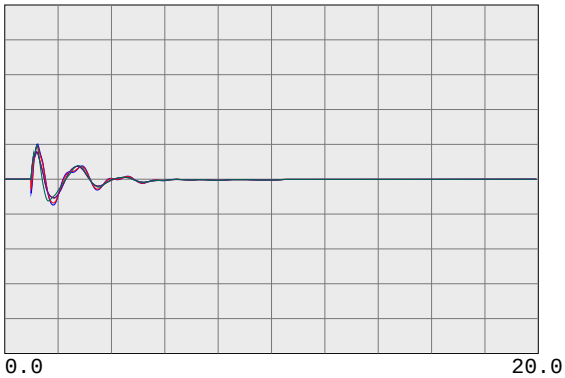
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



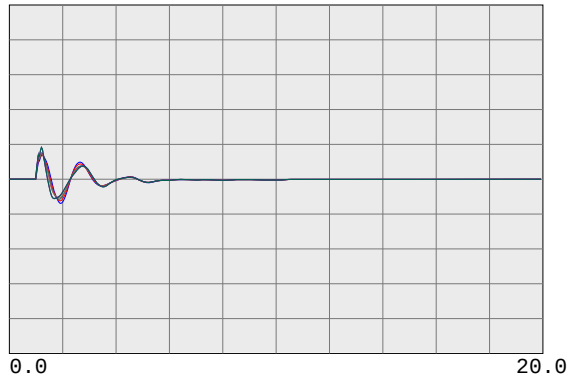
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

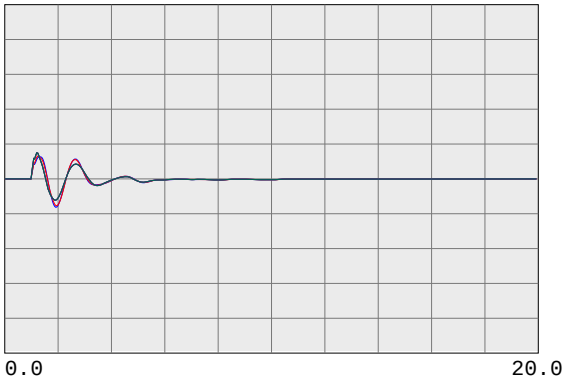
230-KV SYSTEM FREQUENCIES



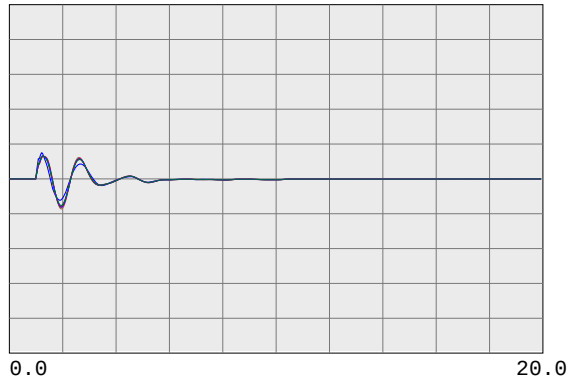
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



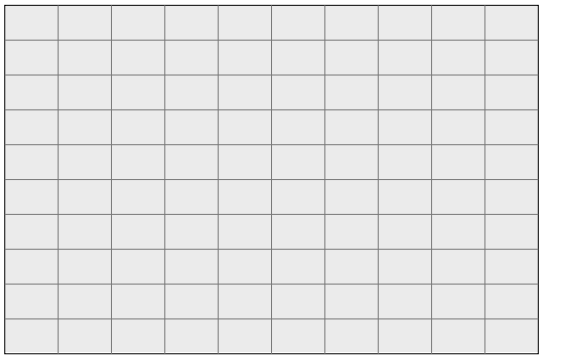
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

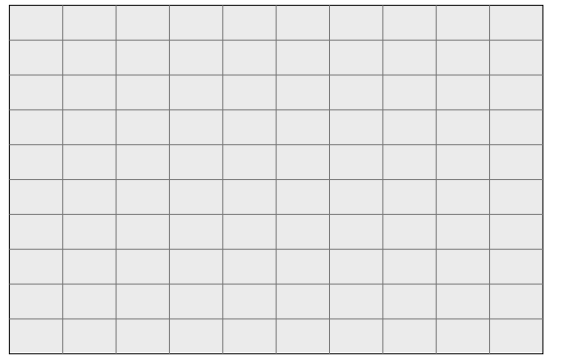


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



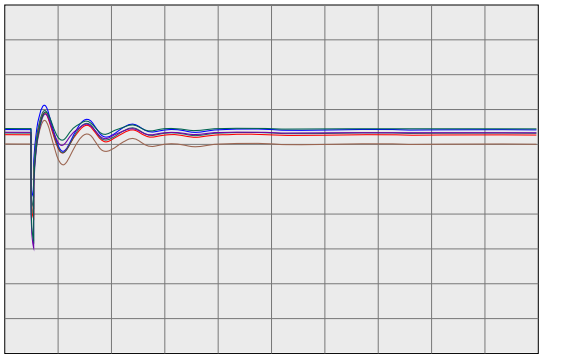
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



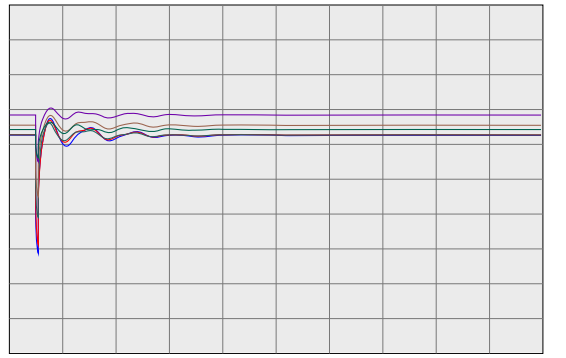


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

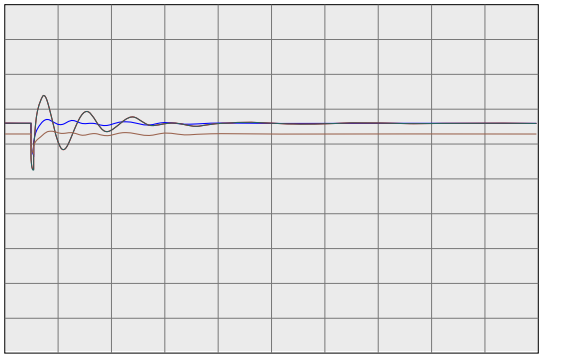
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



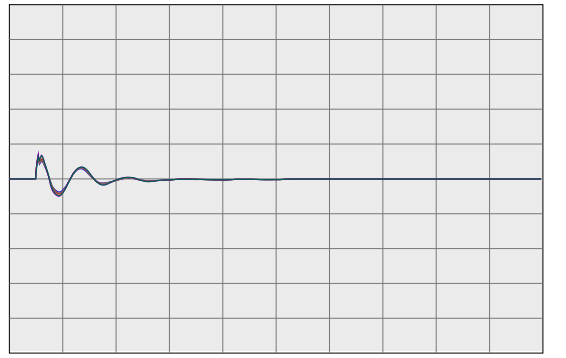
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



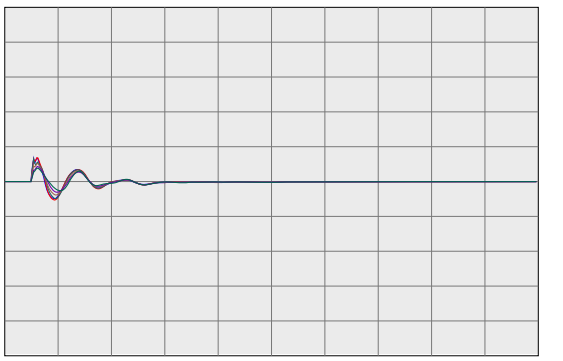
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



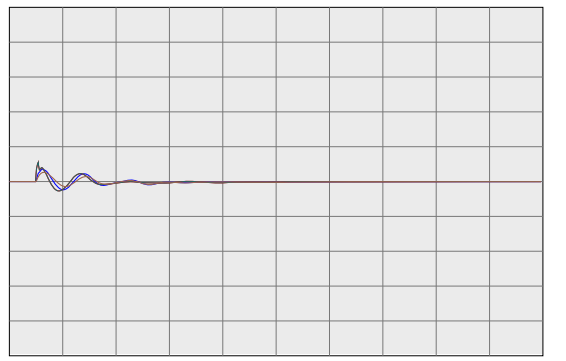
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



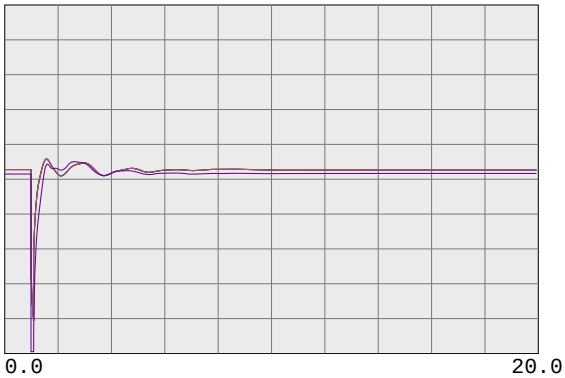
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

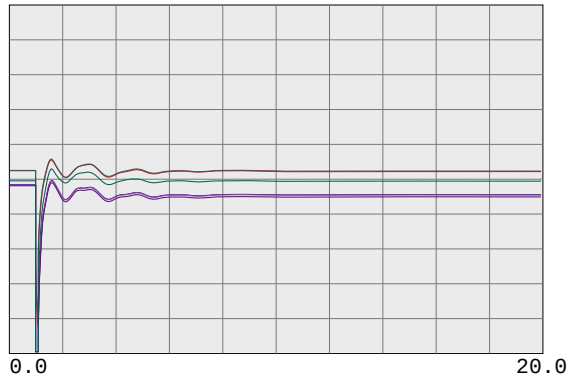
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

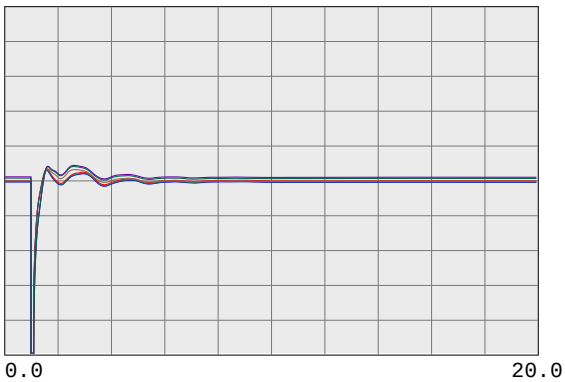
230-KV SYSTEM VOLTAGES



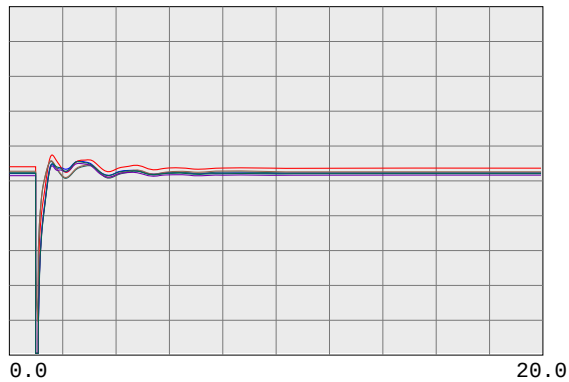
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



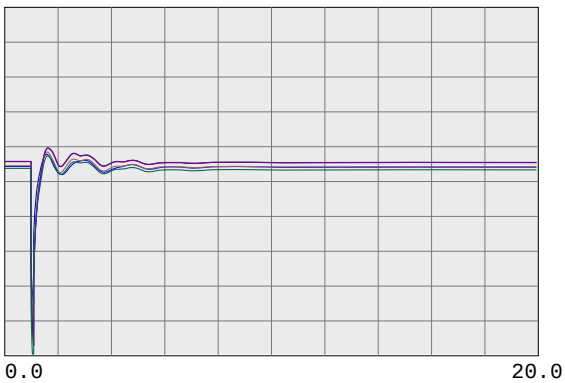
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



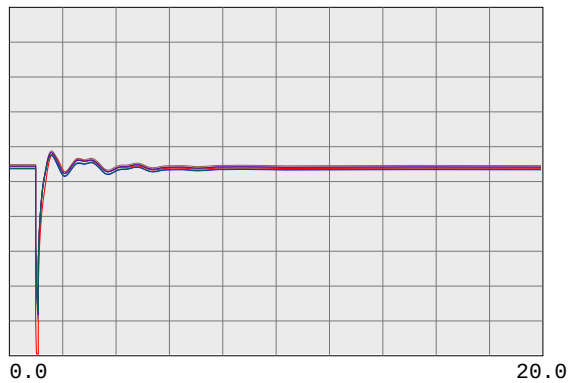
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



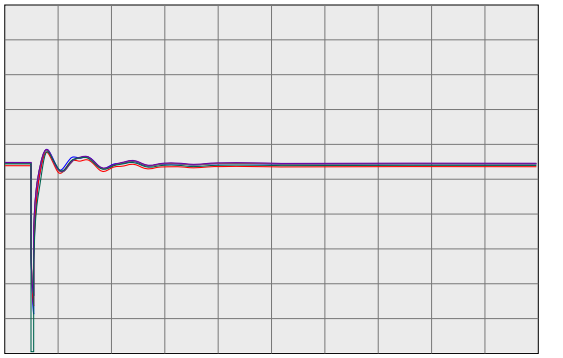
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



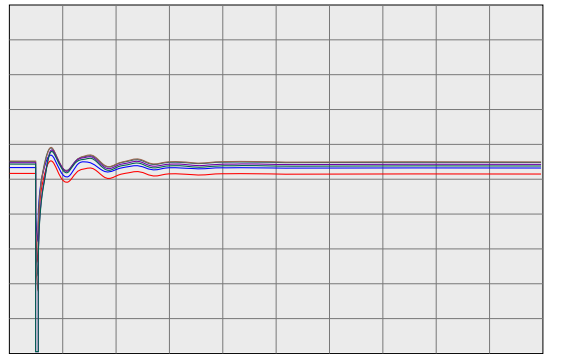
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

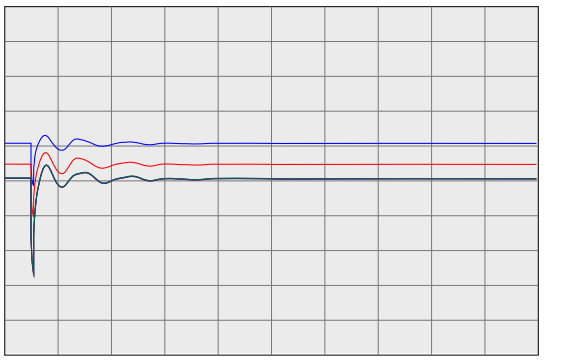
230-KV SYSTEM VOLTAGES



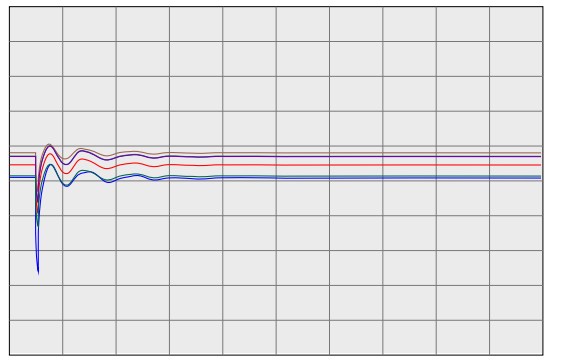
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



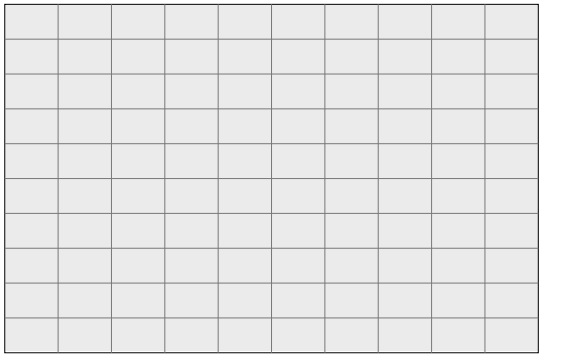
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

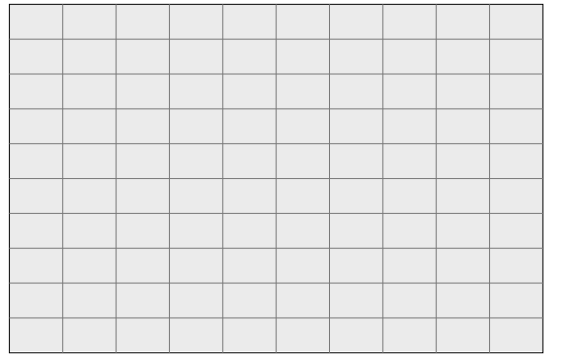


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



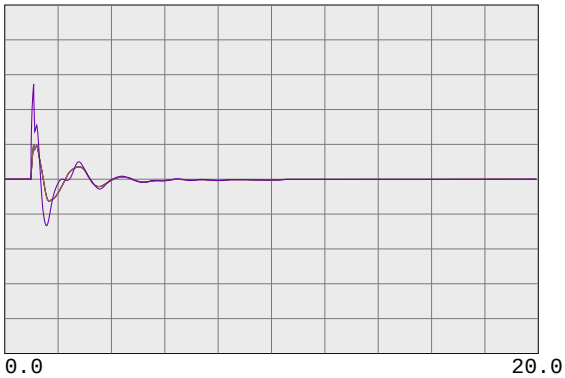
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



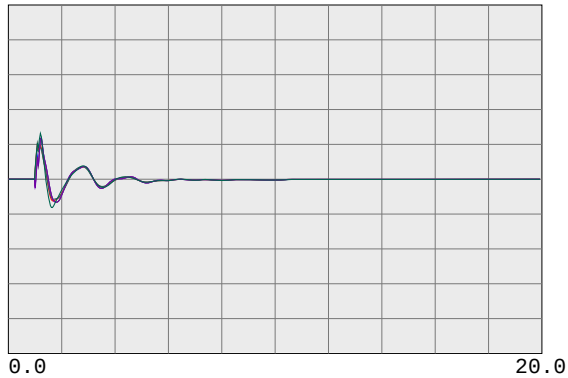


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

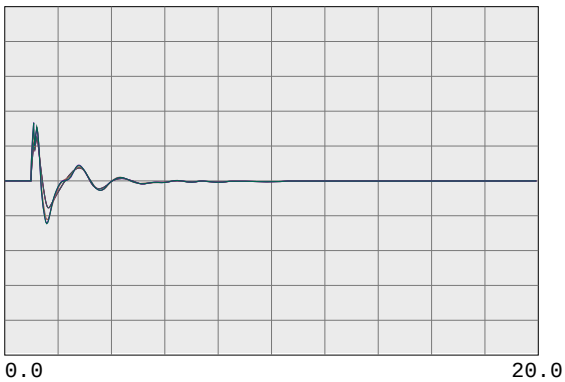
230-KV SYSTEM FREQUENCIES



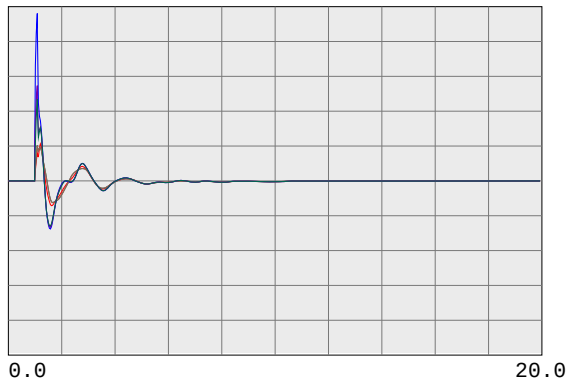
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



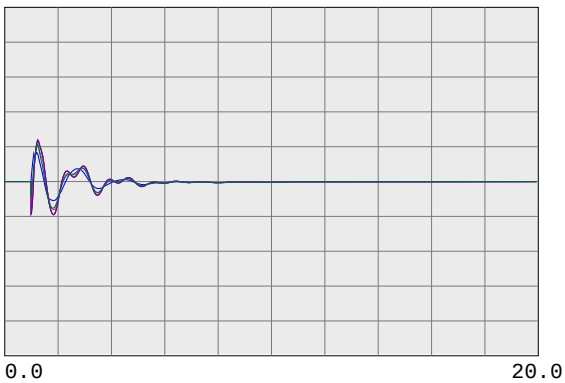
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



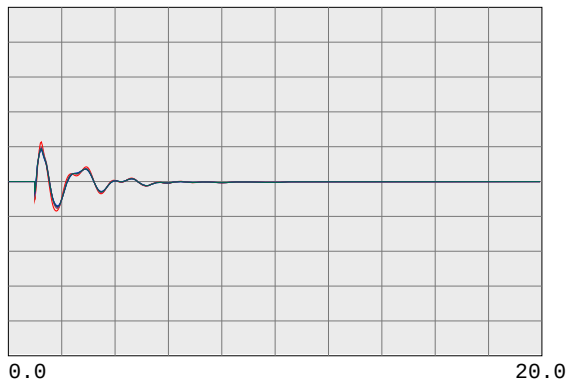
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



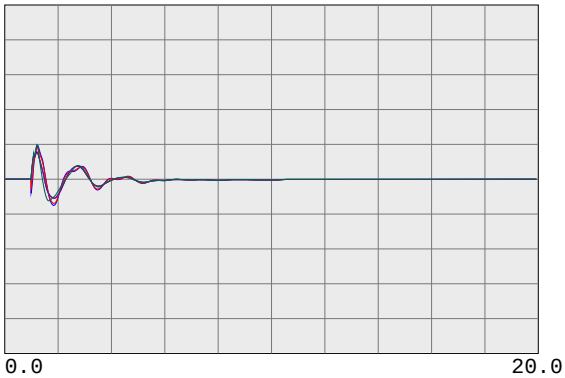
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



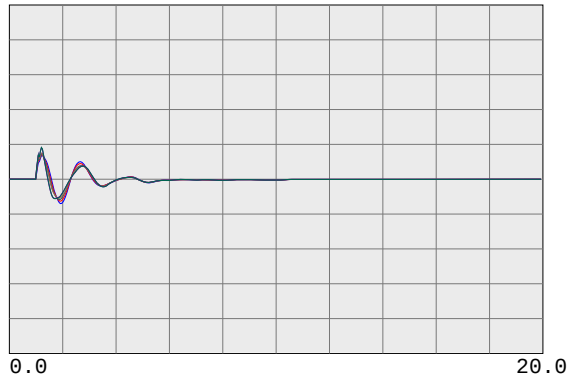
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

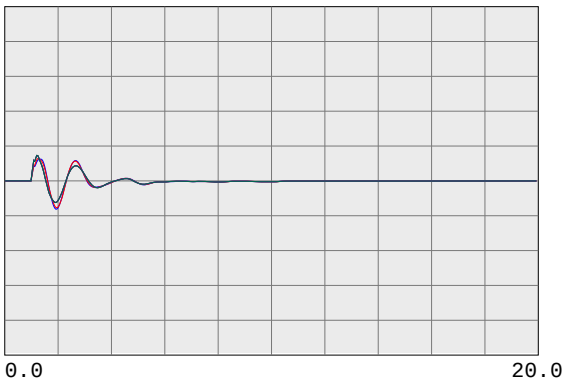
230-KV SYSTEM FREQUENCIES



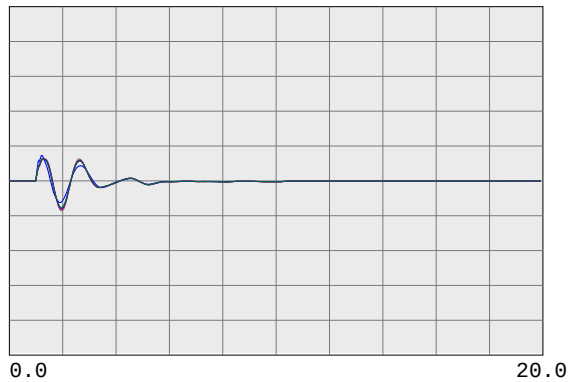
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



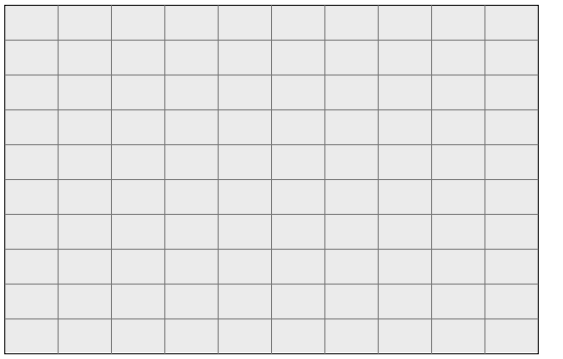
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

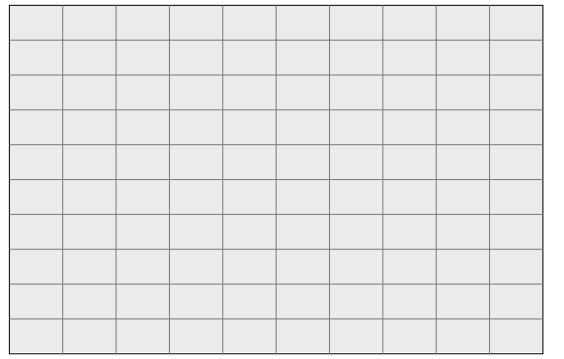


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



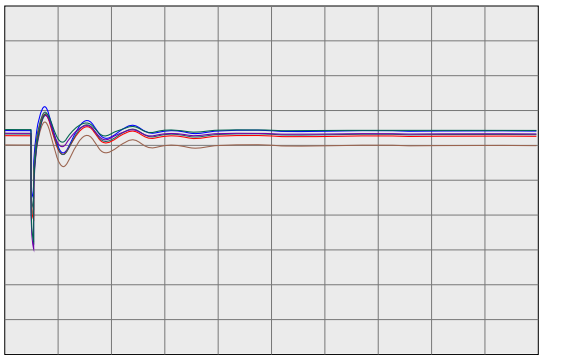
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



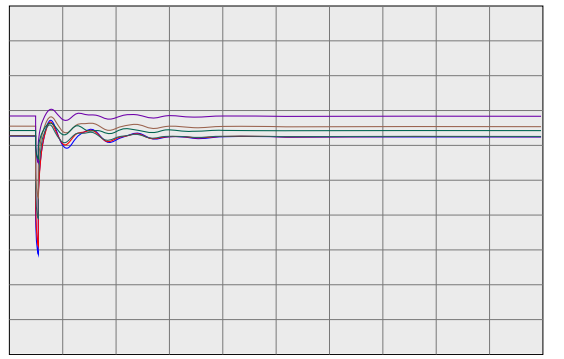


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

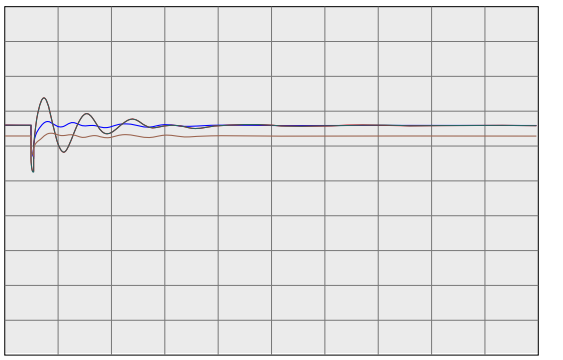
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



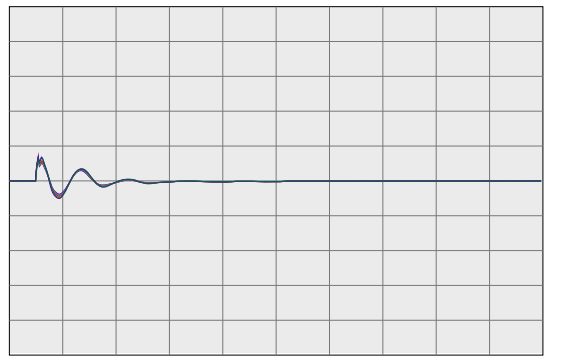
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



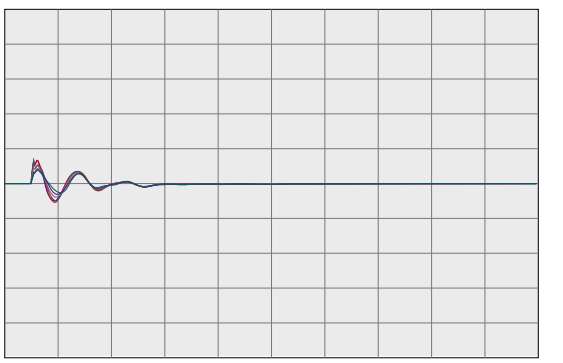
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



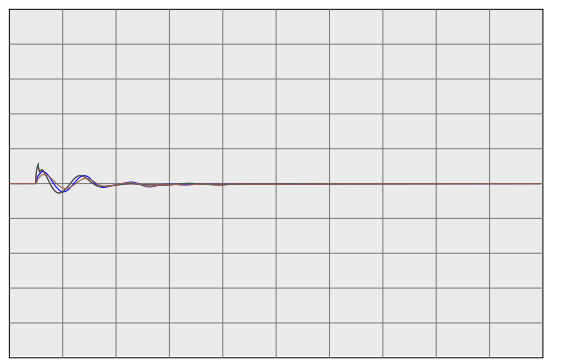
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

HS13_PRE_WLLW_PSS_B-142_N-1_PITSBRG_D-TASSAJAR_230.chf

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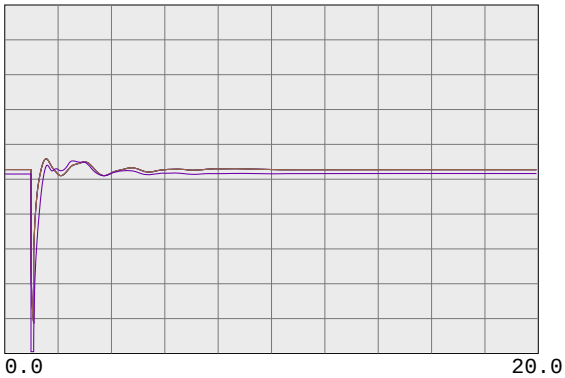
Thu Feb 26 20:14:50 2009

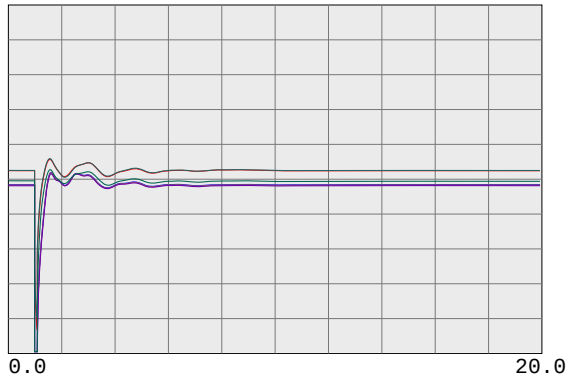
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

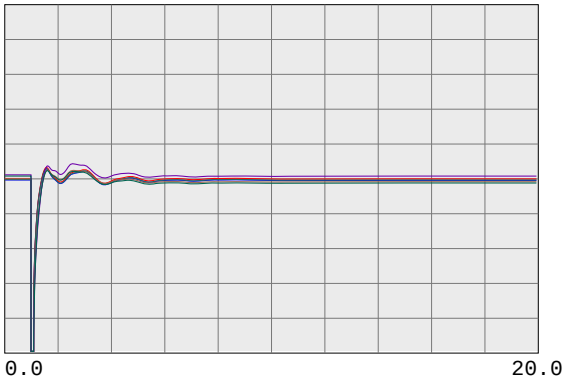
230-KV SYSTEM VOLTAGES



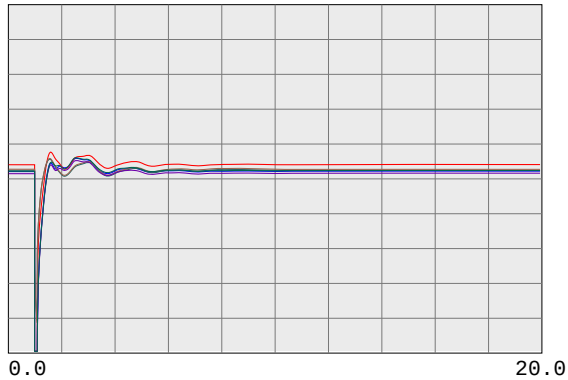
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



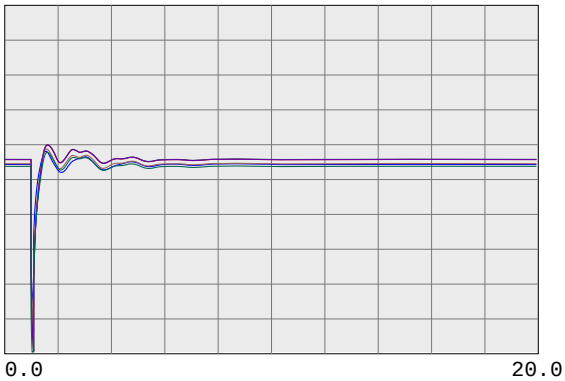
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



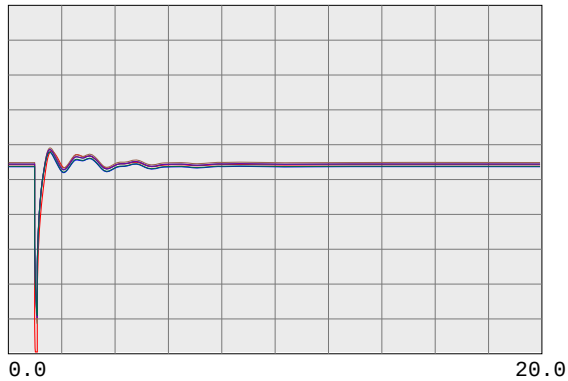
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



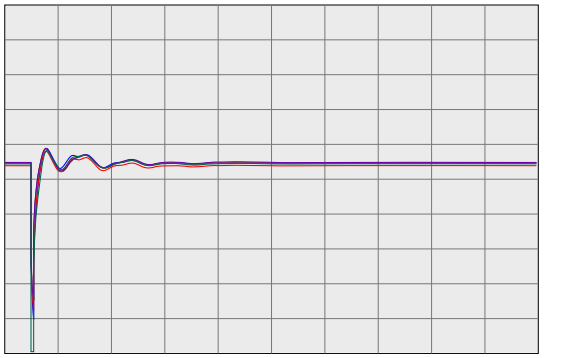
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



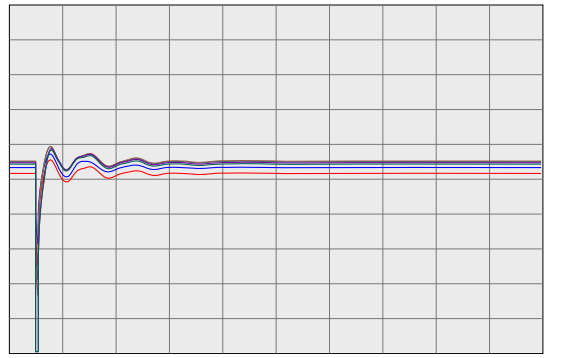
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

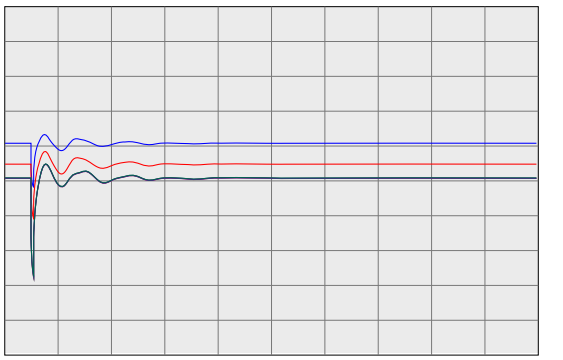
230-KV SYSTEM VOLTAGES



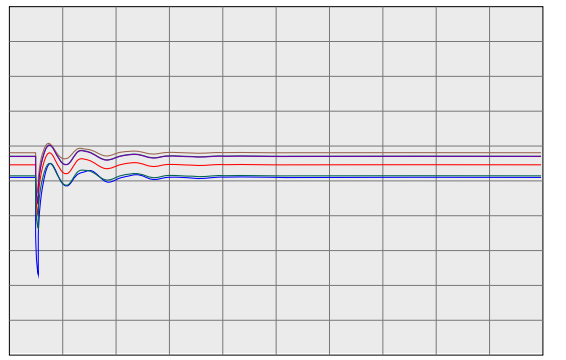
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



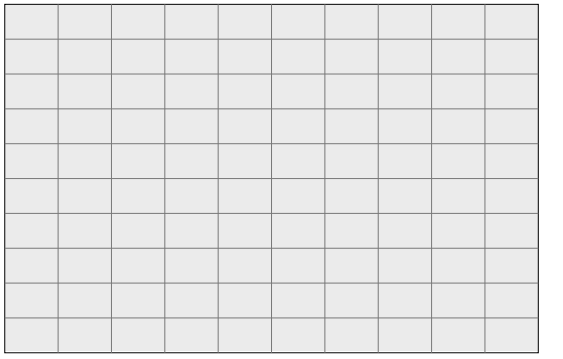
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

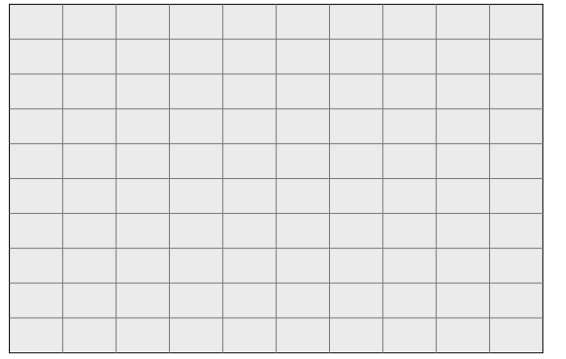


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



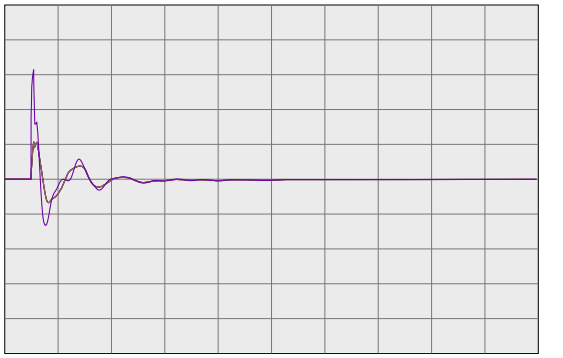
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



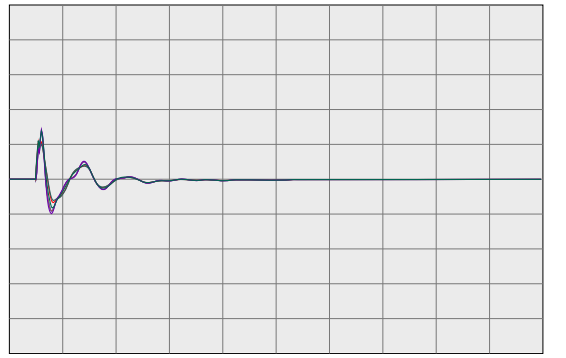


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

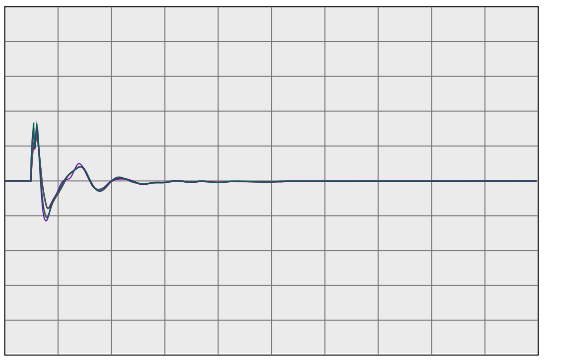
230-KV SYSTEM FREQUENCIES



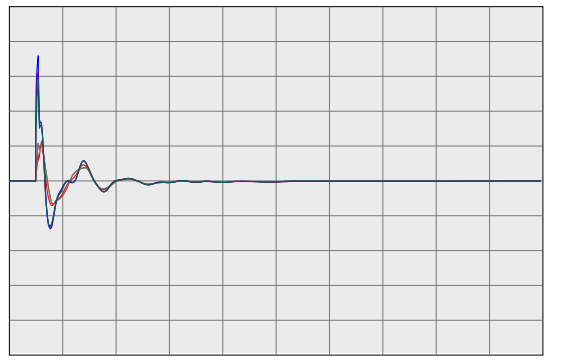
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



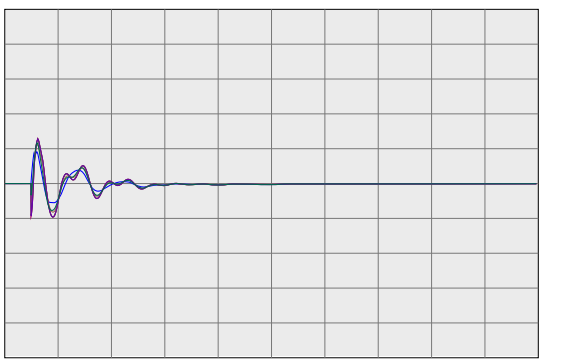
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



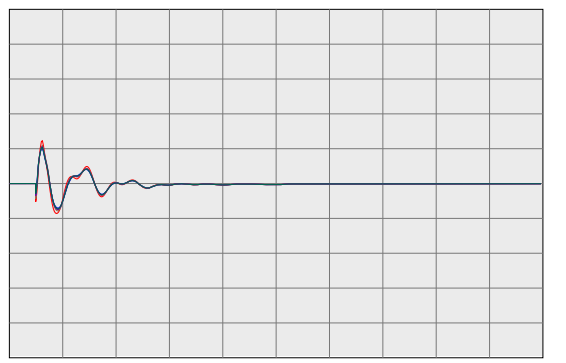
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



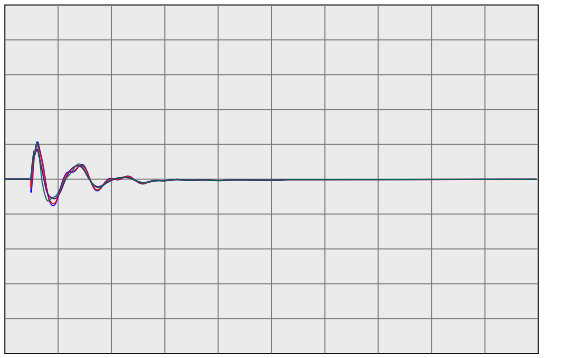
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



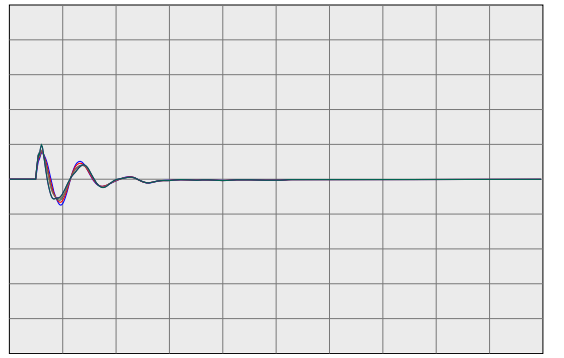
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

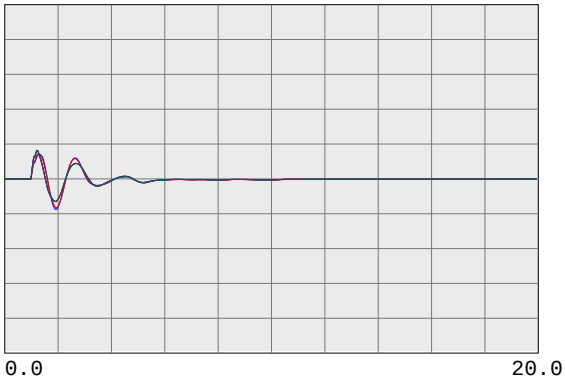
230-KV SYSTEM FREQUENCIES



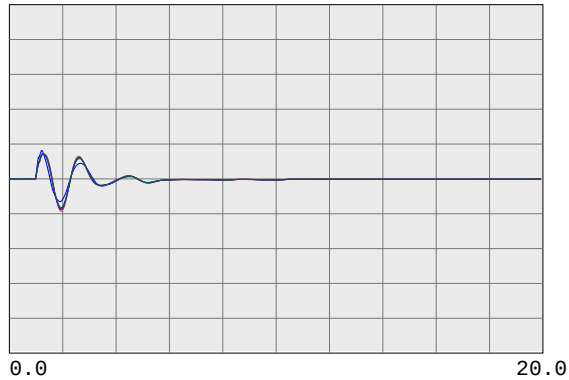
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



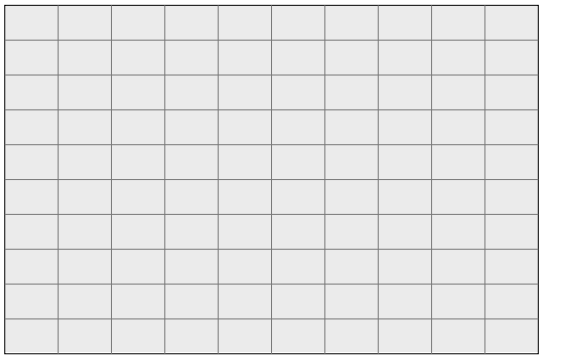
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

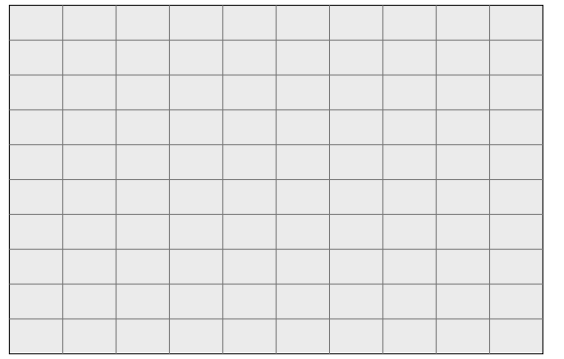


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



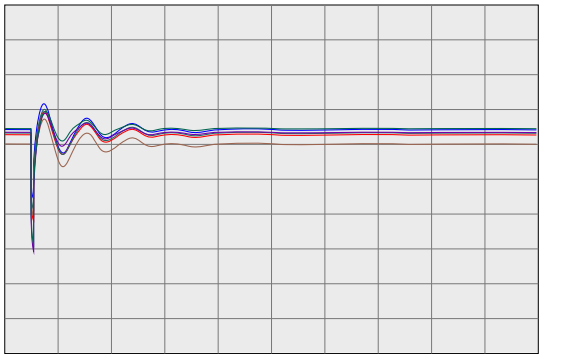
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



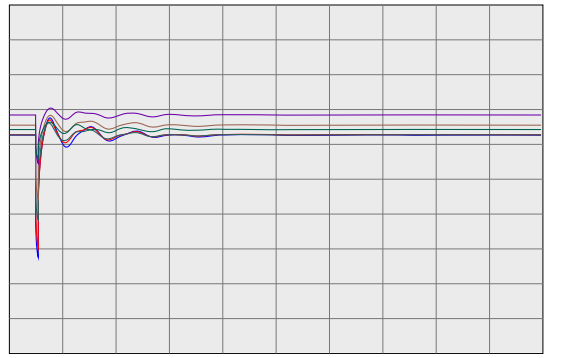


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

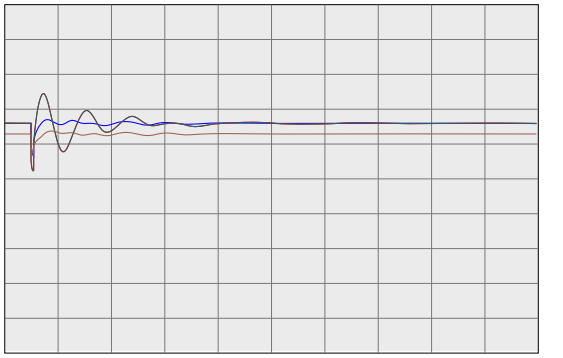
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



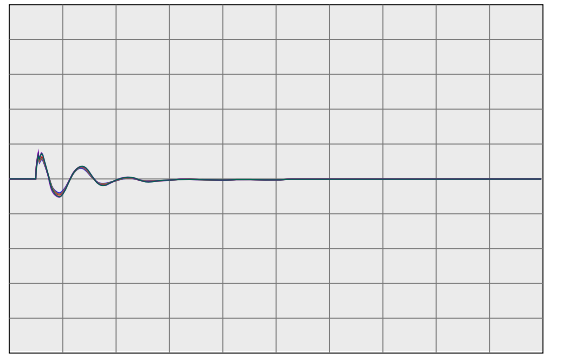
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



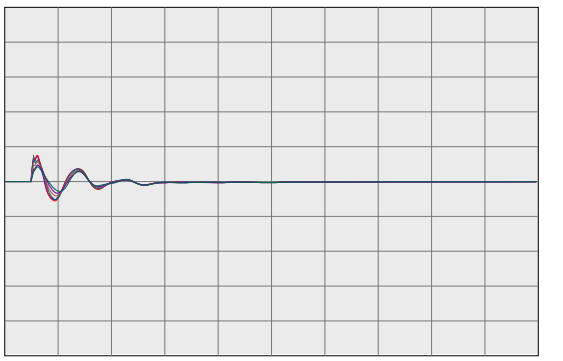
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



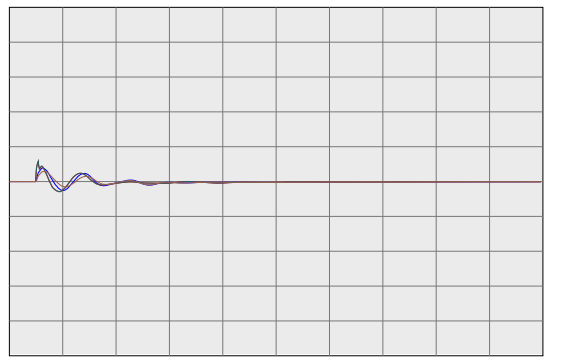
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



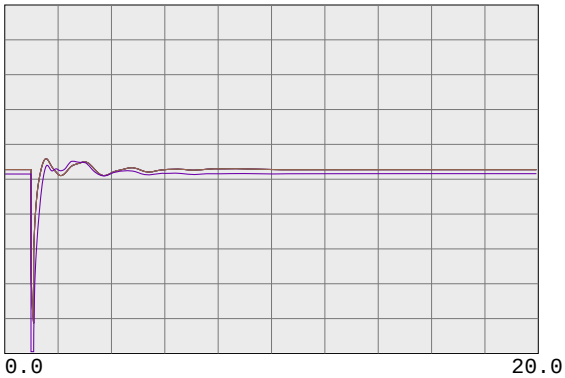
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

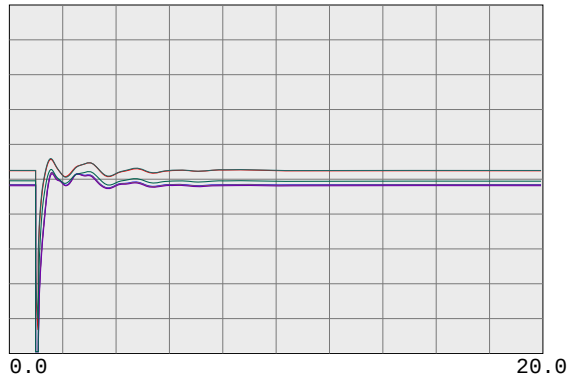
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

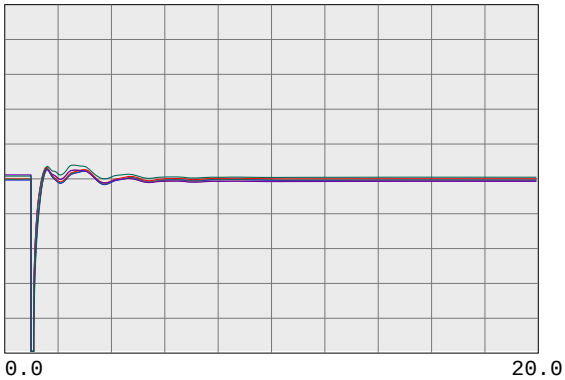
230-KV SYSTEM VOLTAGES



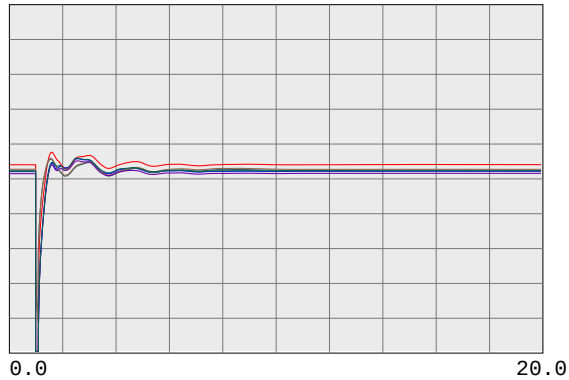
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



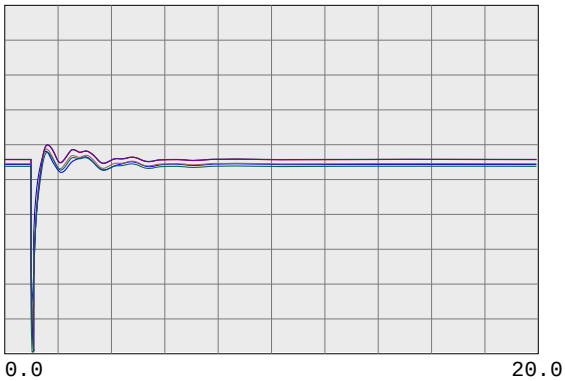
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



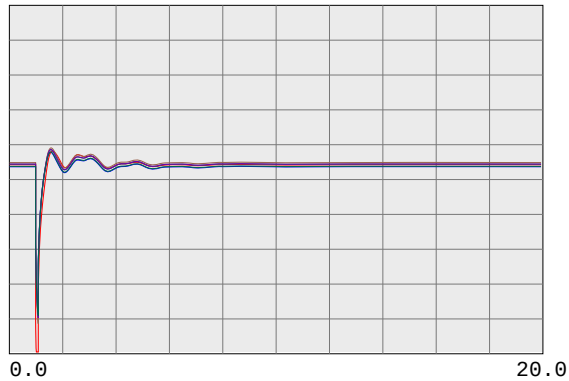
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



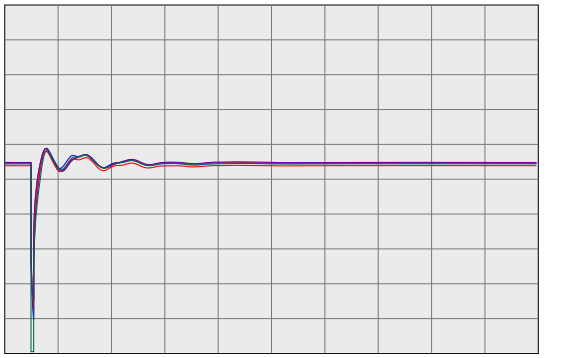
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



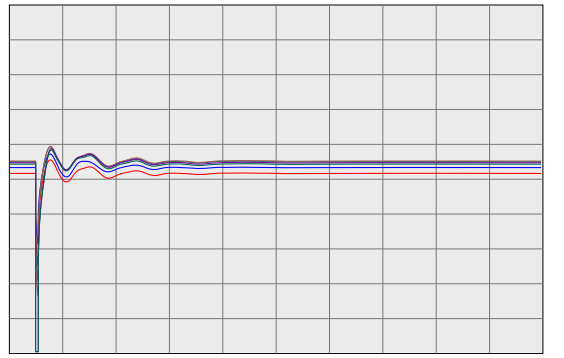
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

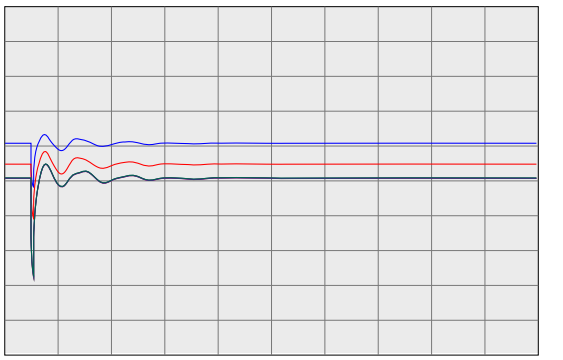
230-KV SYSTEM VOLTAGES



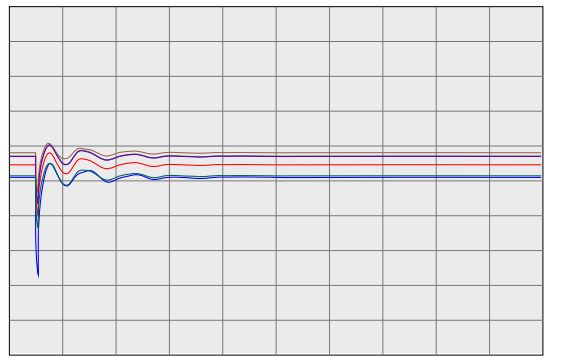
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



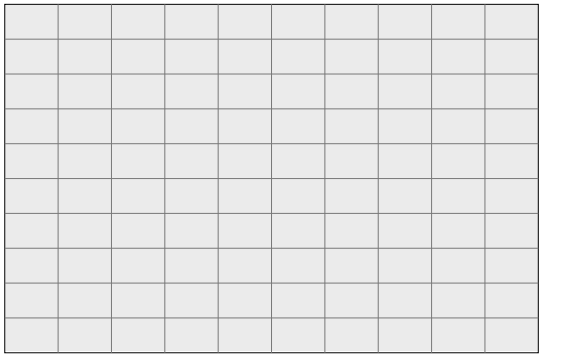
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

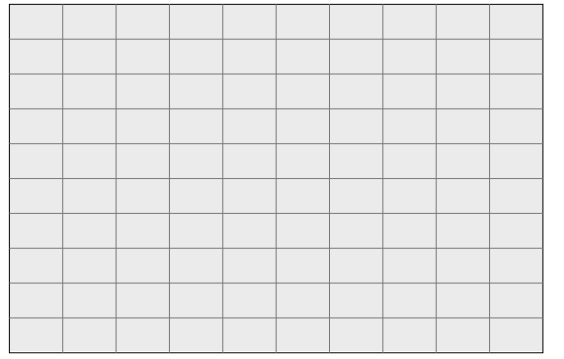


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



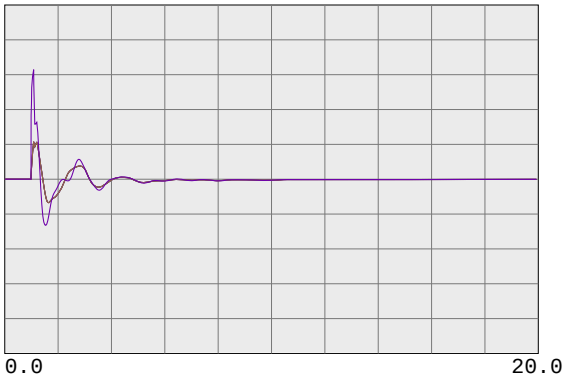
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



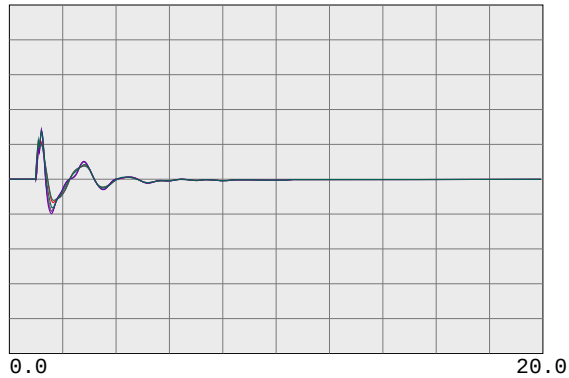


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

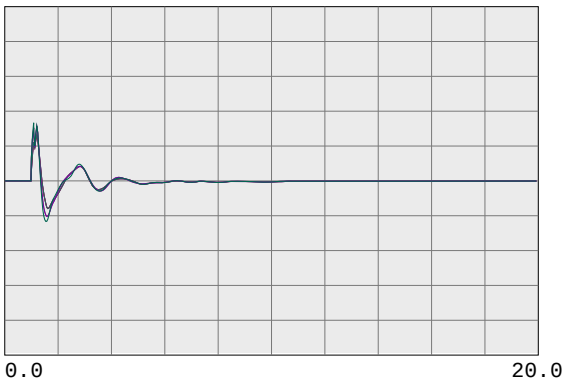
230-KV SYSTEM FREQUENCIES



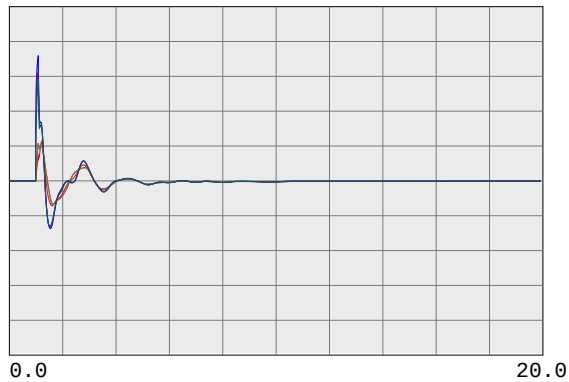
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



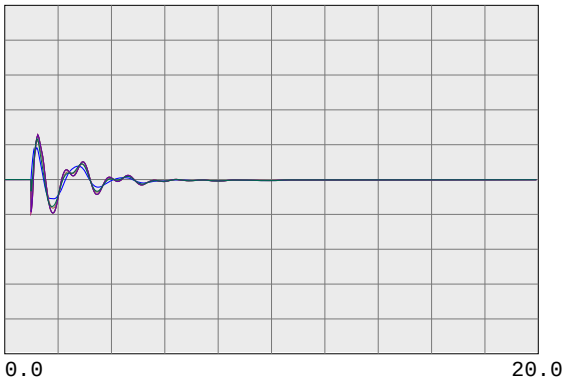
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



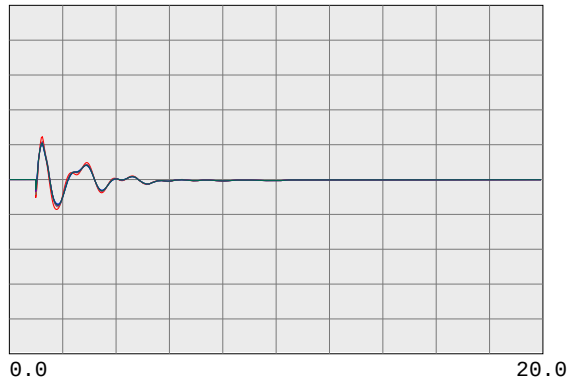
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



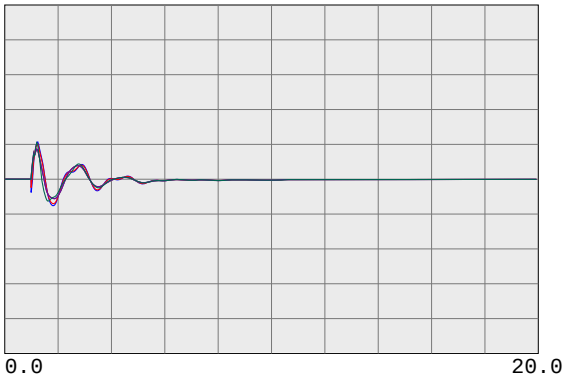
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



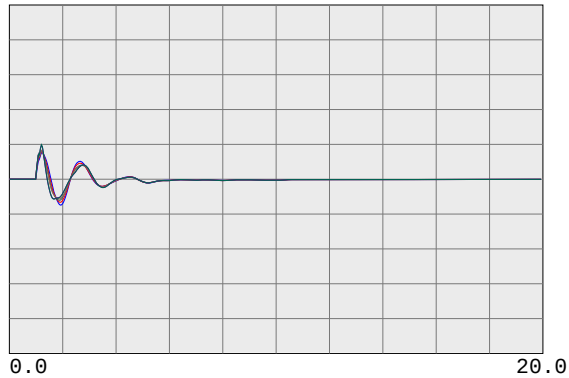
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

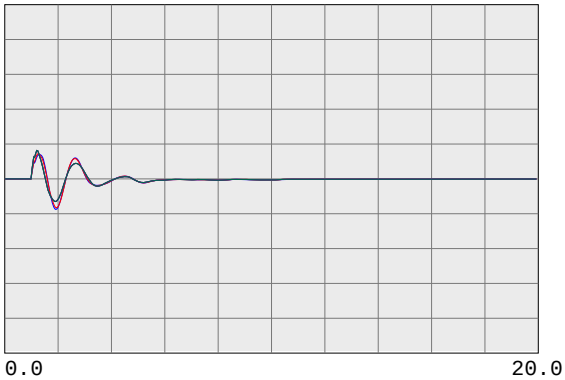
230-KV SYSTEM FREQUENCIES



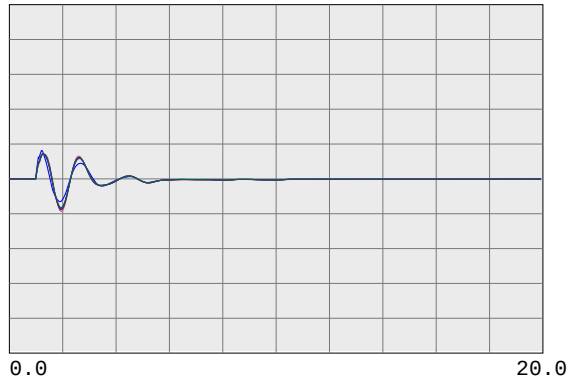
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



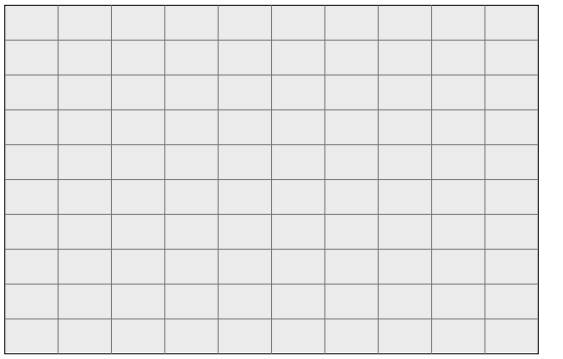
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

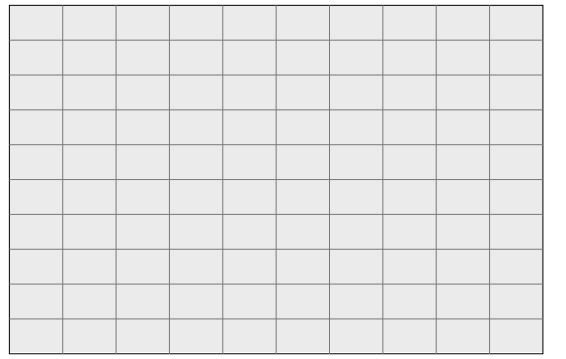


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



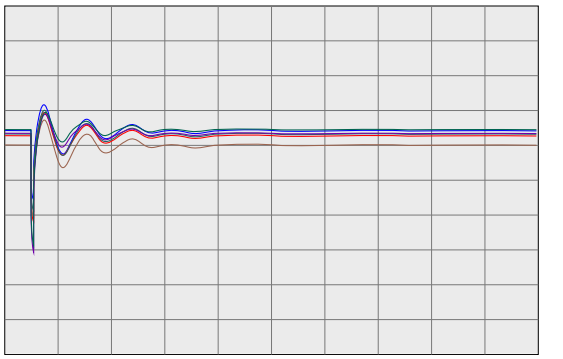
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



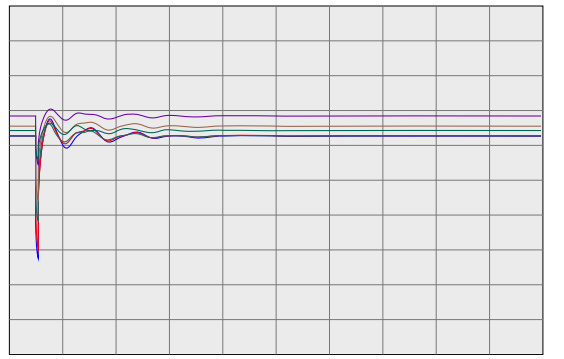


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

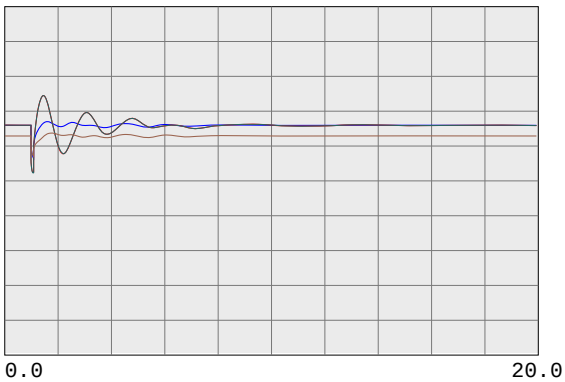
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



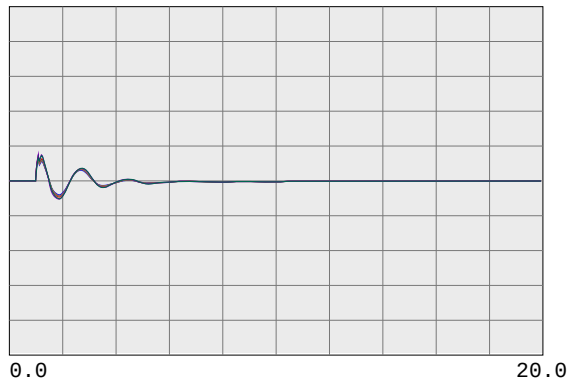
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



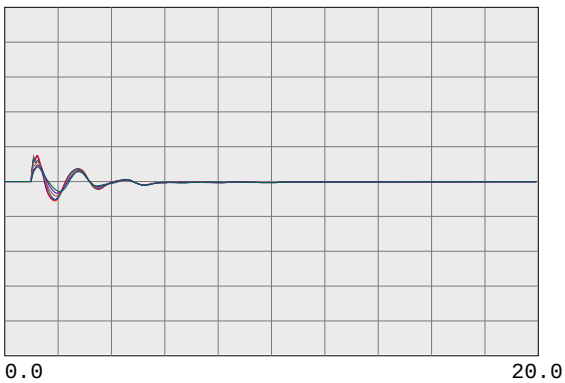
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



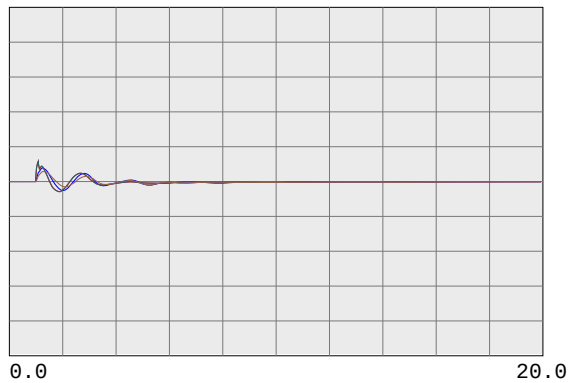
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



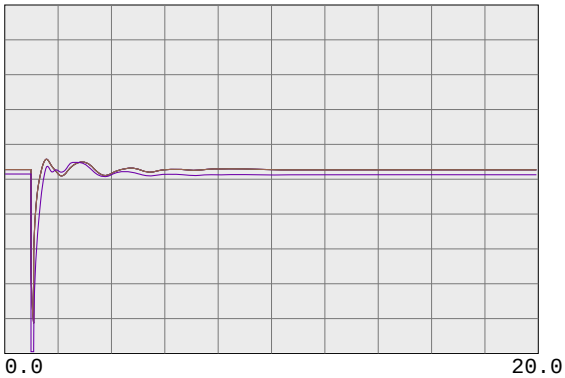
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

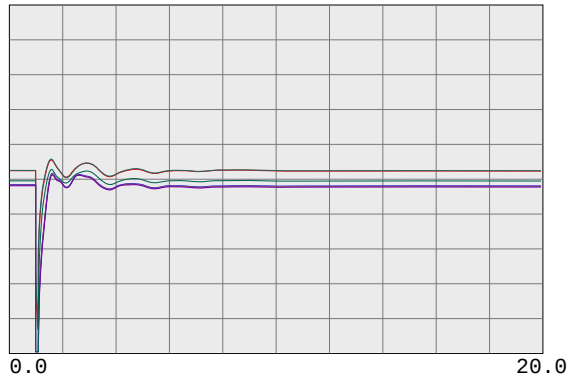
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

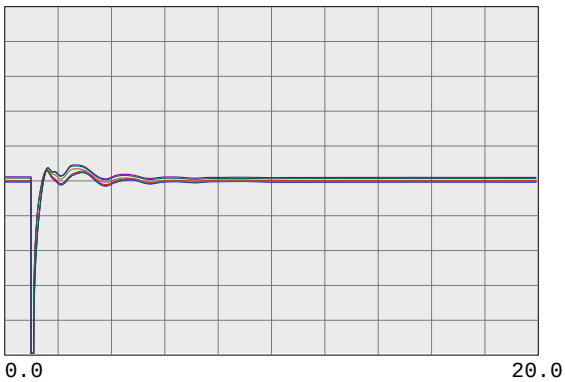
230-KV SYSTEM VOLTAGES



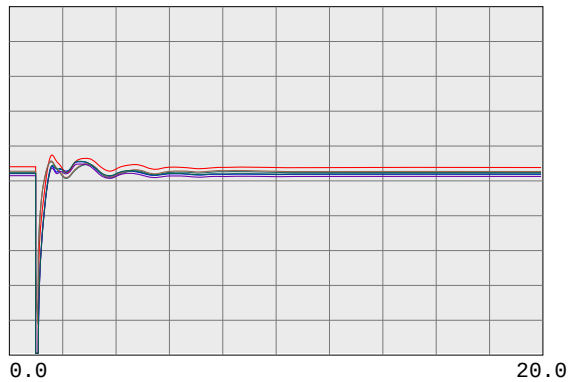
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



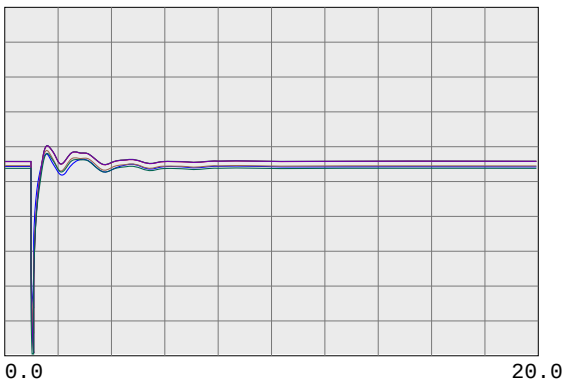
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



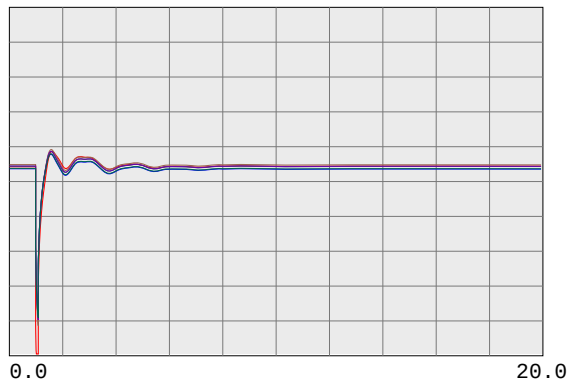
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



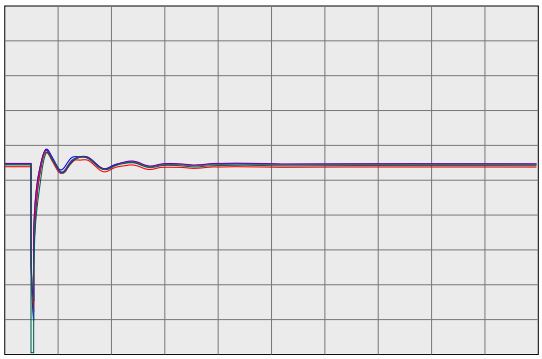
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

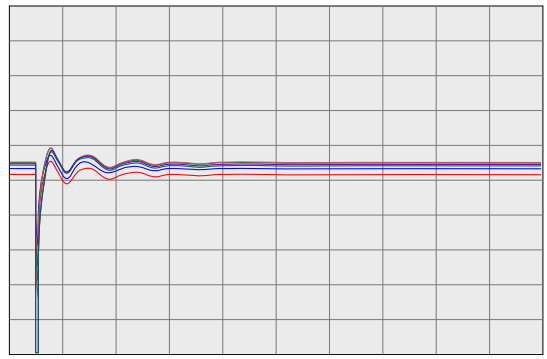
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

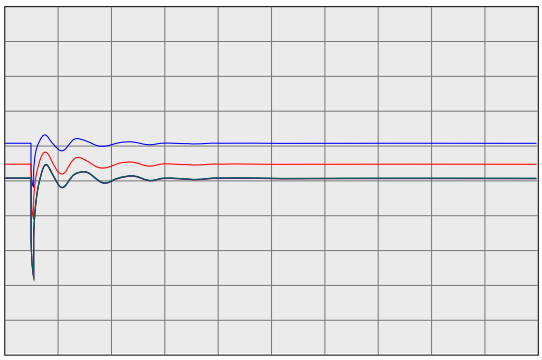
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

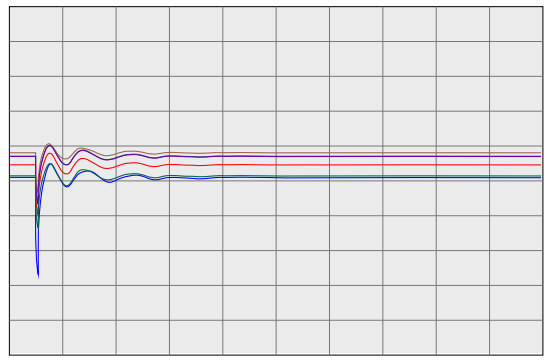
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

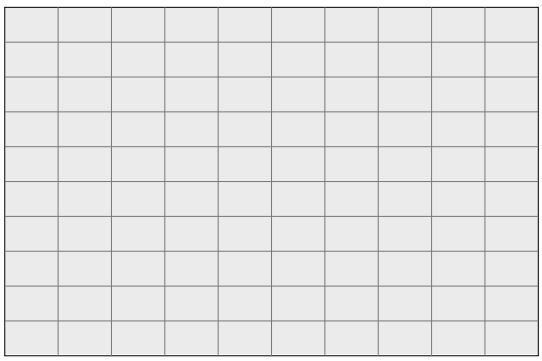
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

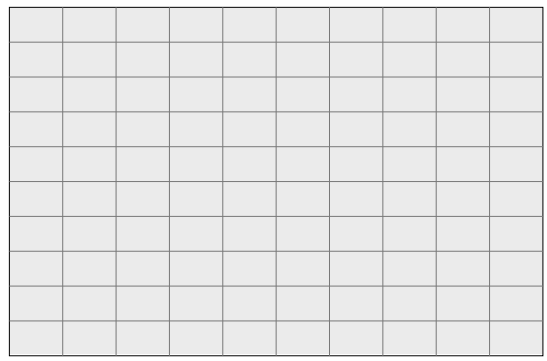


0.0 20.0

Time(sec)

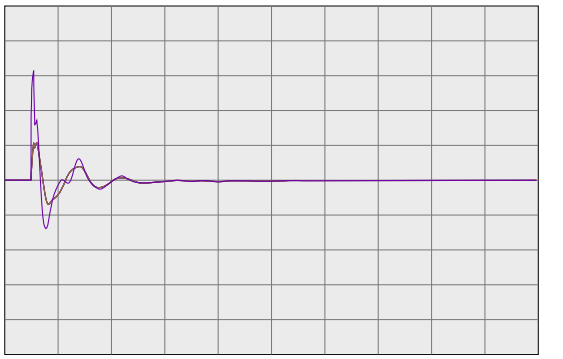
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



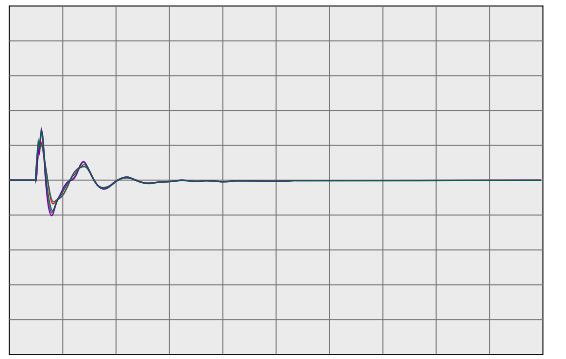


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

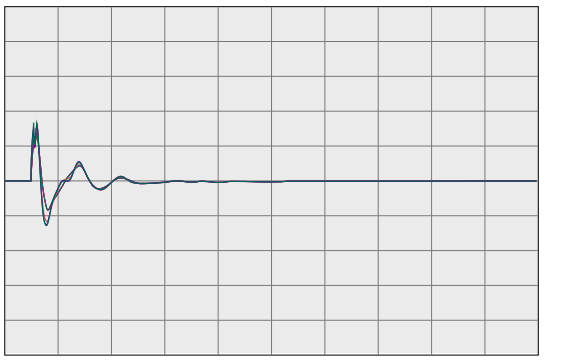
230-KV SYSTEM FREQUENCIES



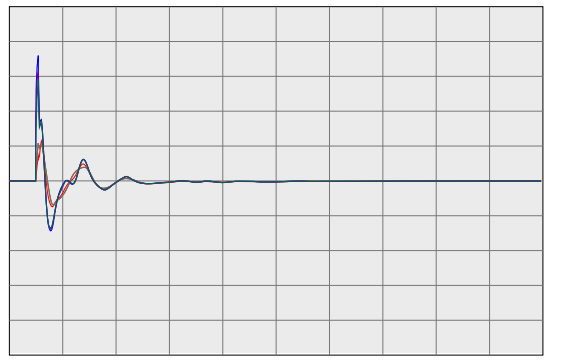
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



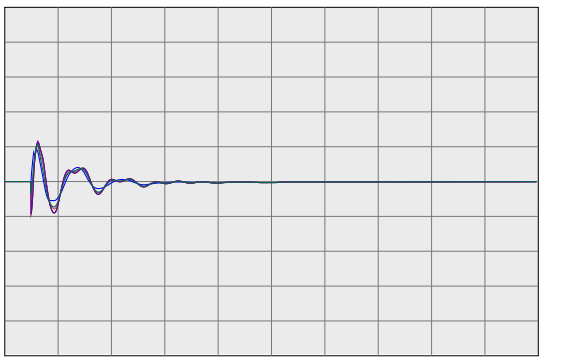
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



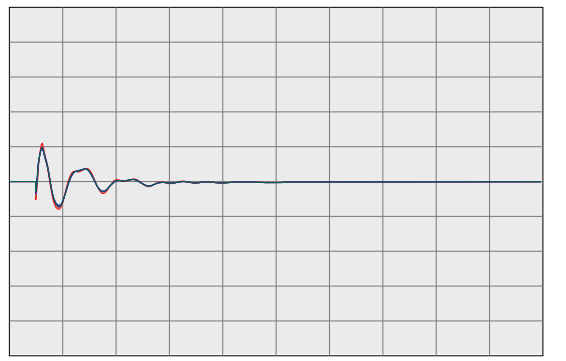
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



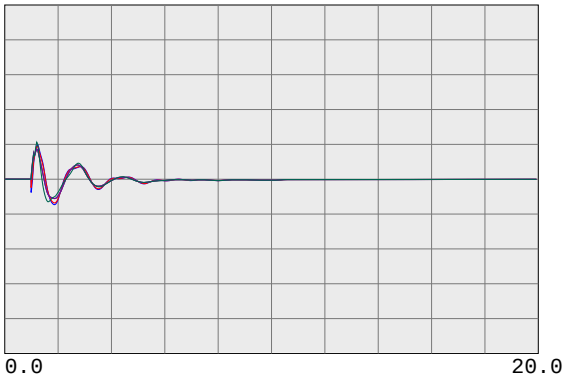
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



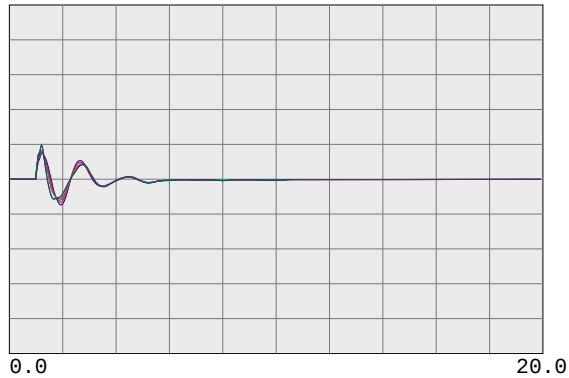
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

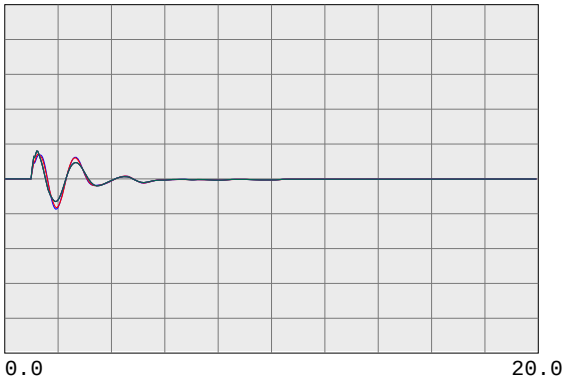
230-KV SYSTEM FREQUENCIES



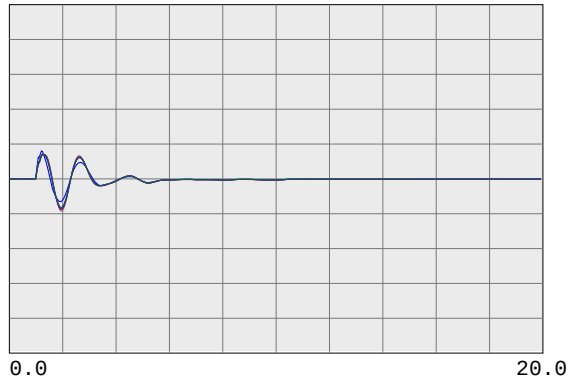
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



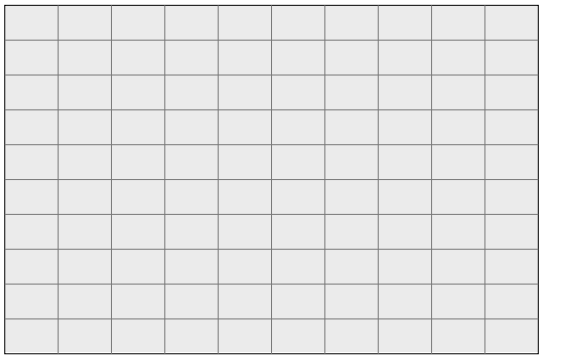
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

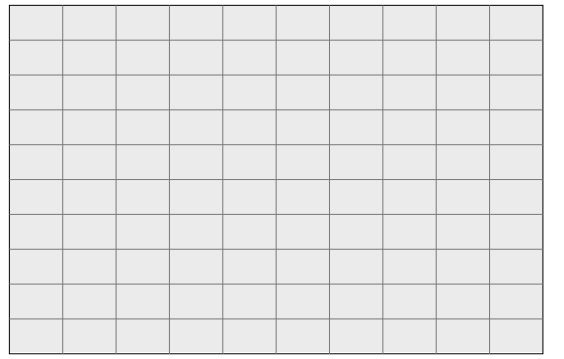


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



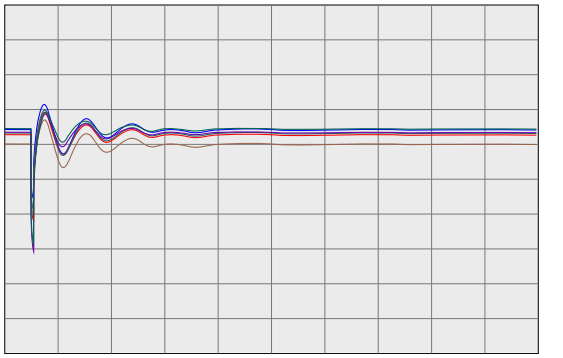
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



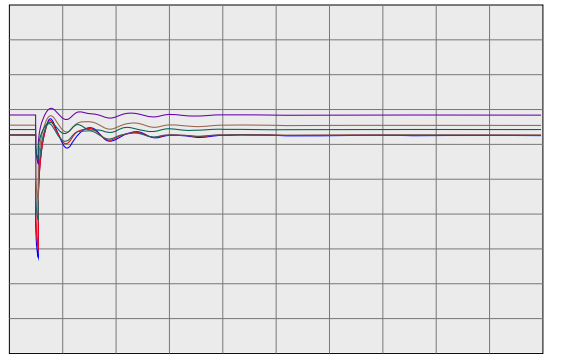


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

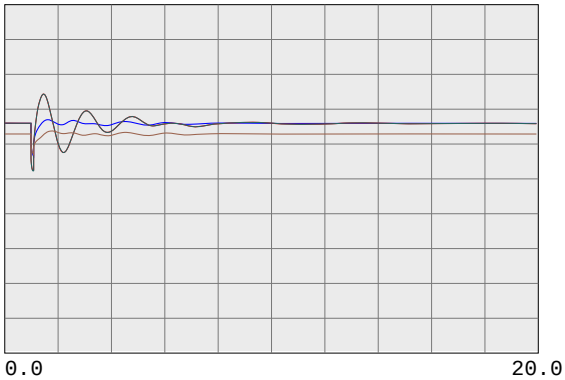
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



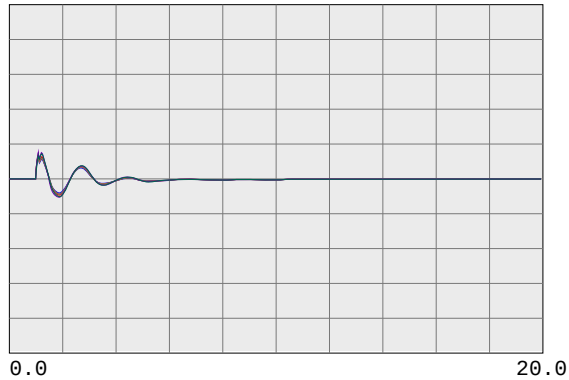
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



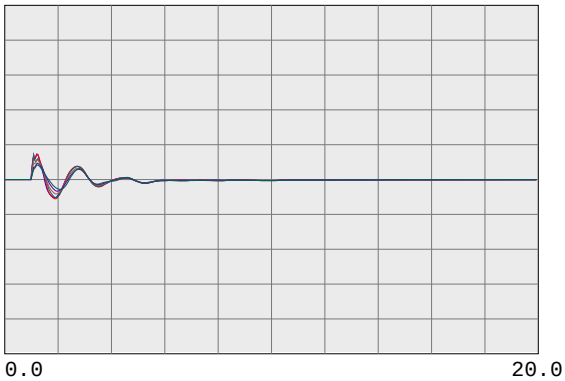
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



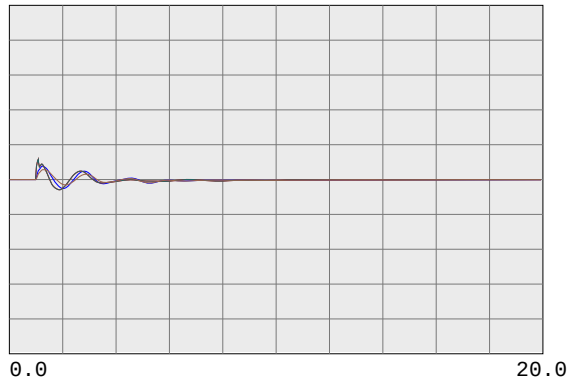
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



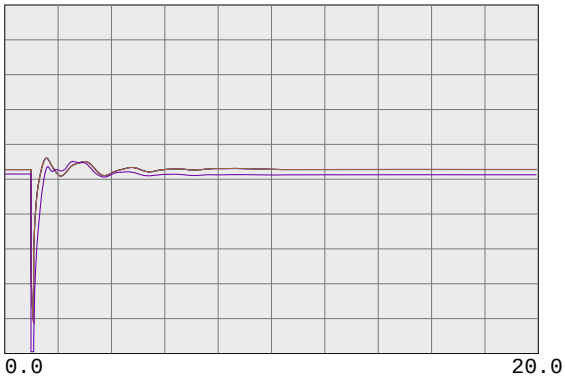
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

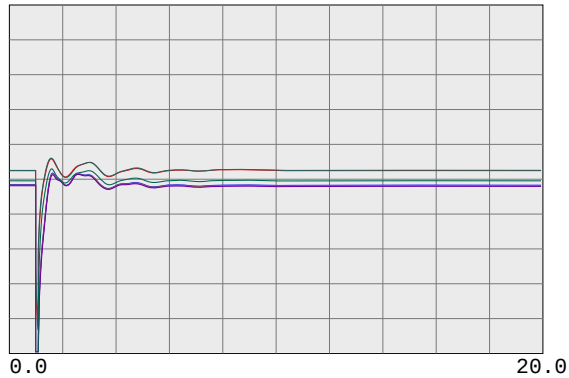
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

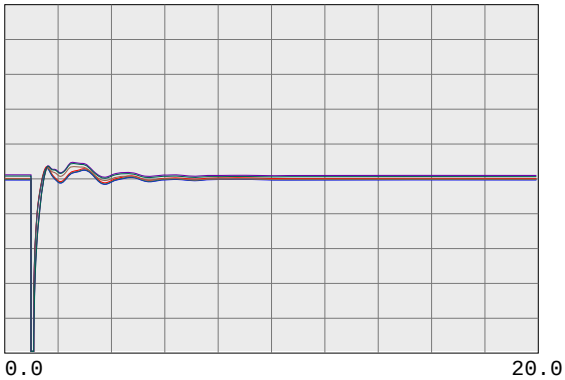
230-KV SYSTEM VOLTAGES



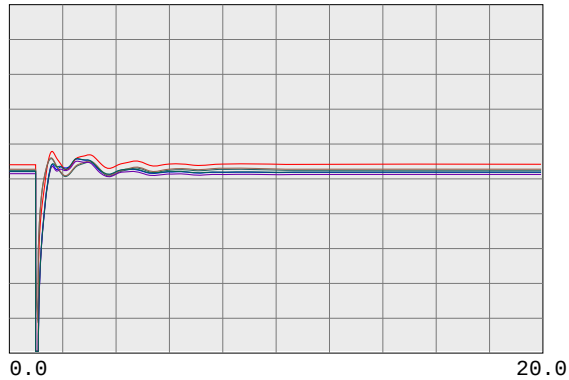
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



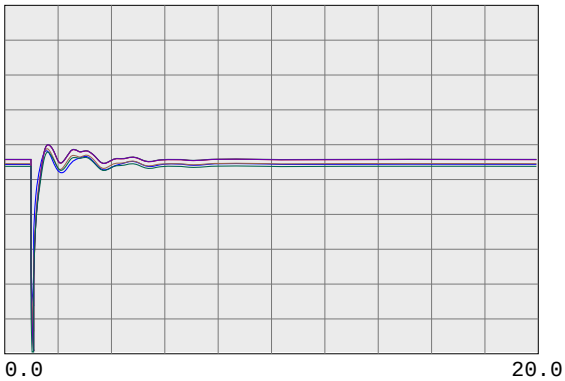
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



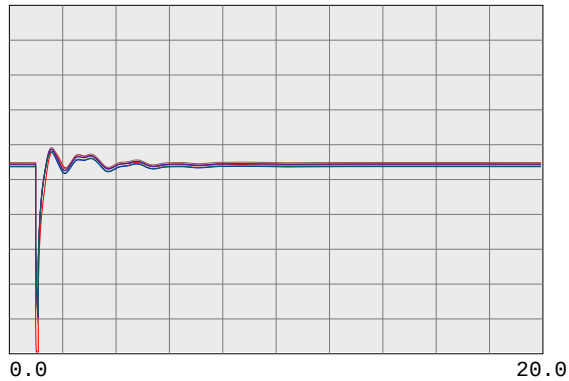
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



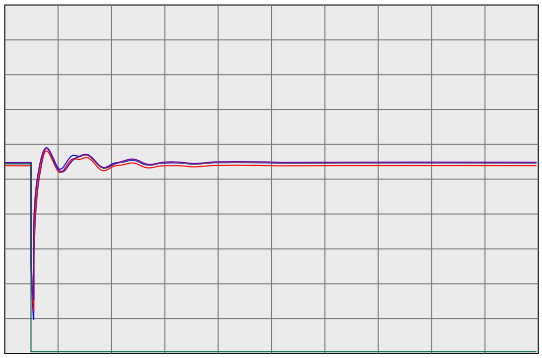
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

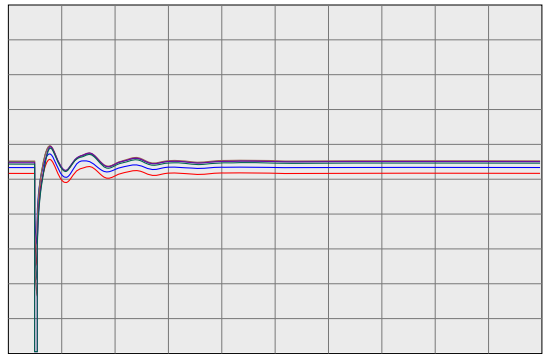
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

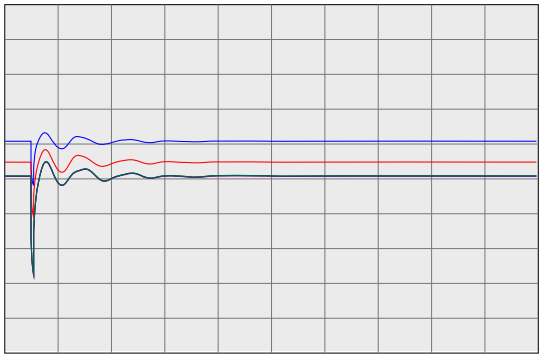
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

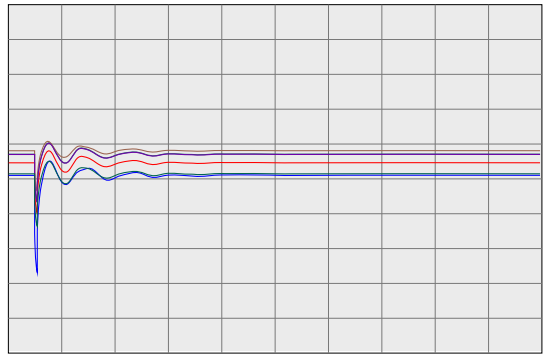
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

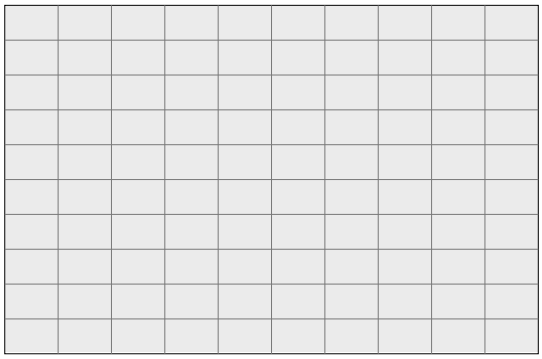
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

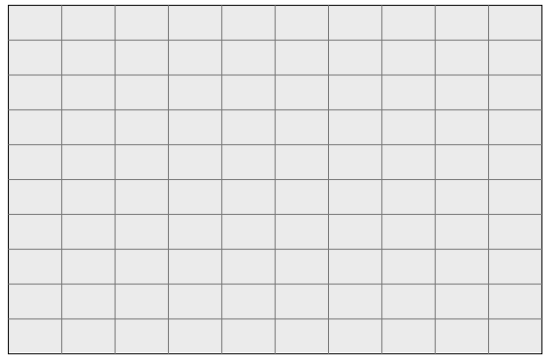


0.0 20.0

Time(sec)

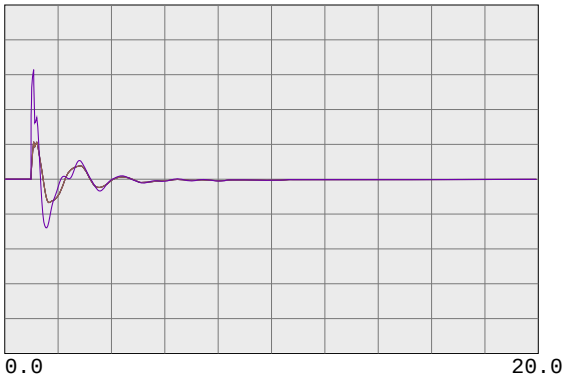
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



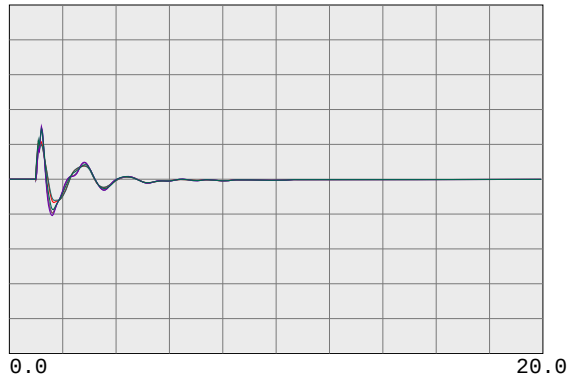


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

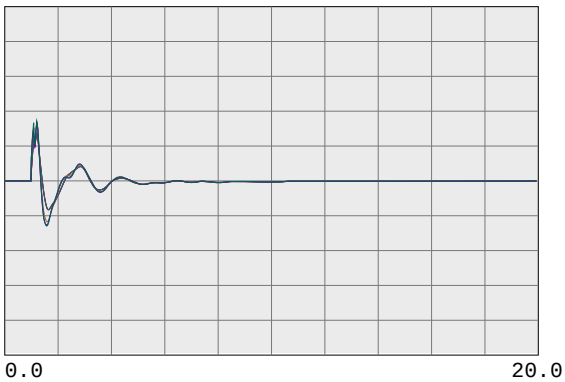
230-KV SYSTEM FREQUENCIES



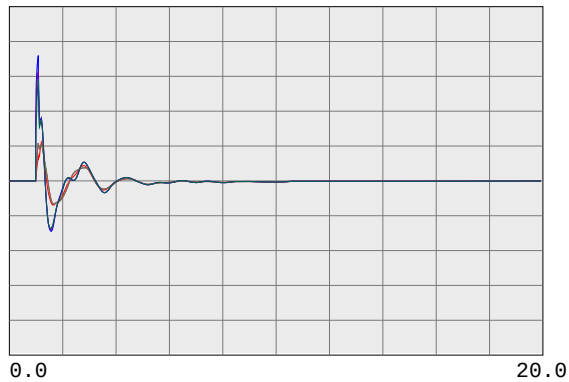
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



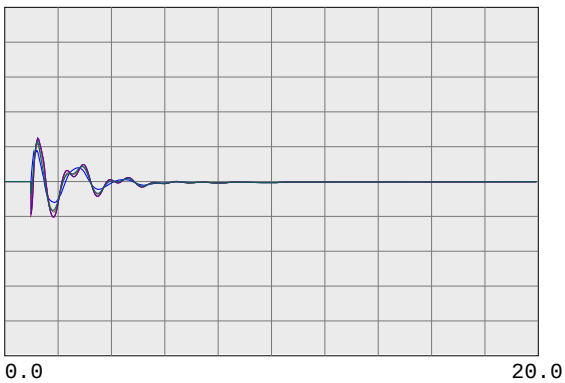
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



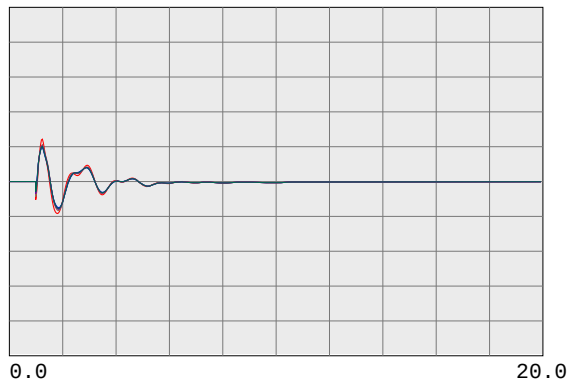
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



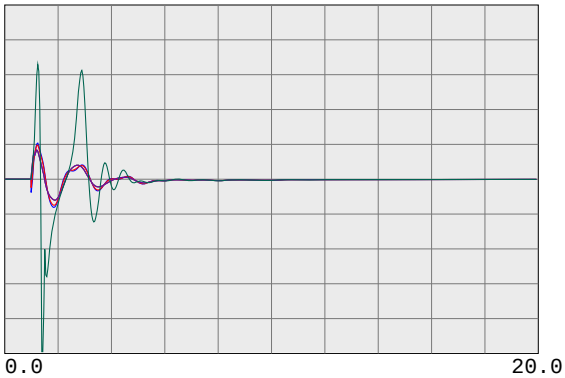
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



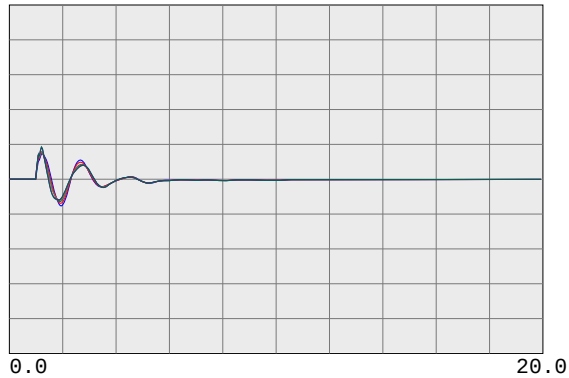
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

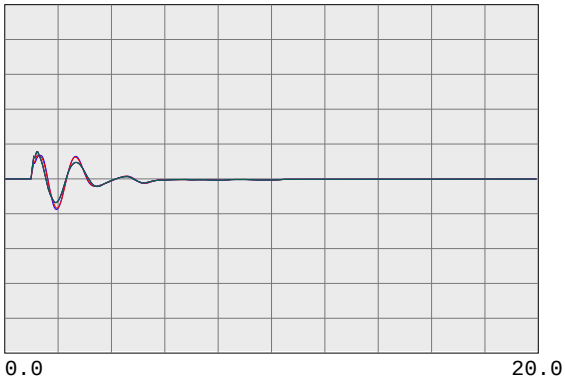
230-KV SYSTEM FREQUENCIES



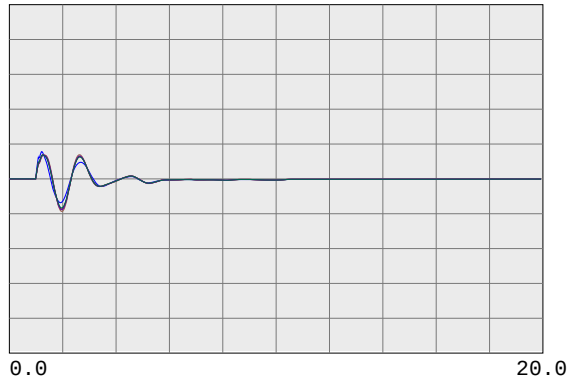
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



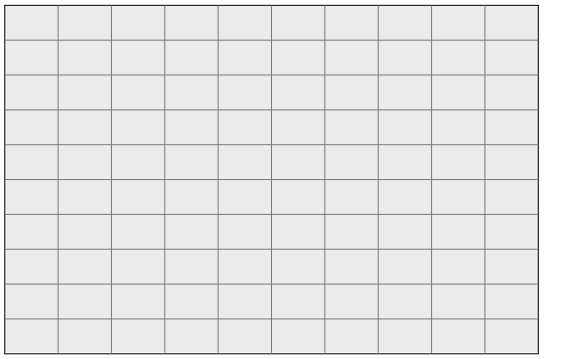
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

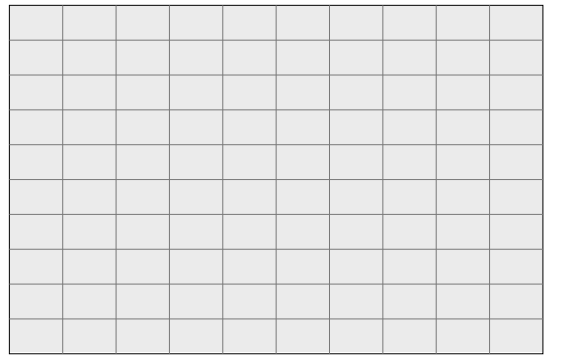


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



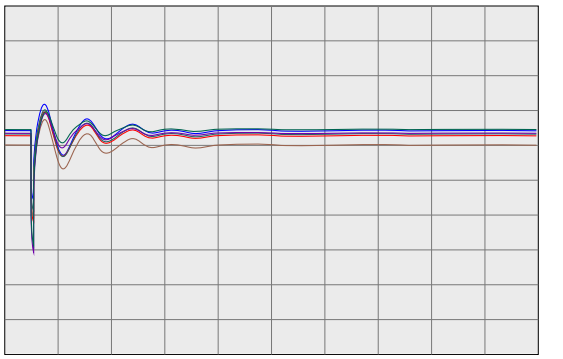
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



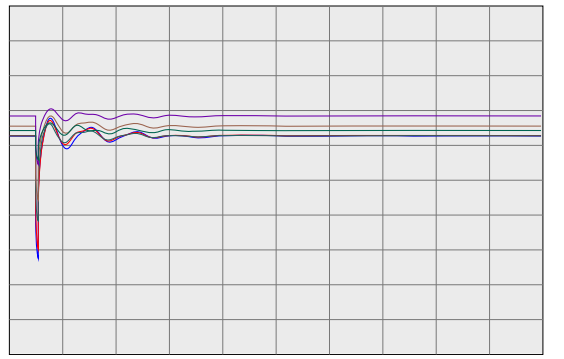


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

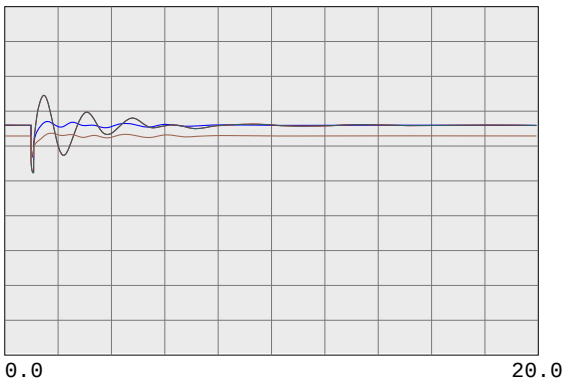
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



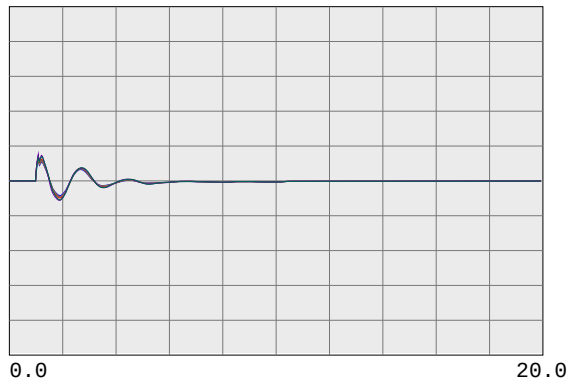
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



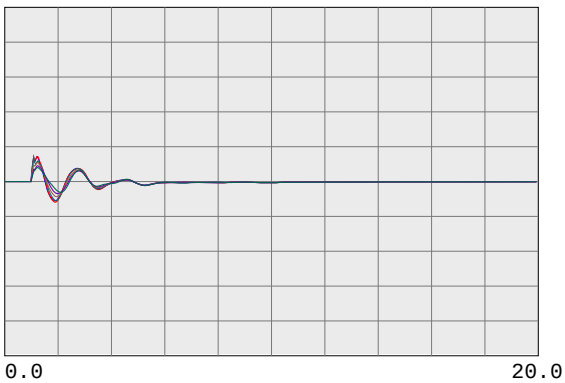
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



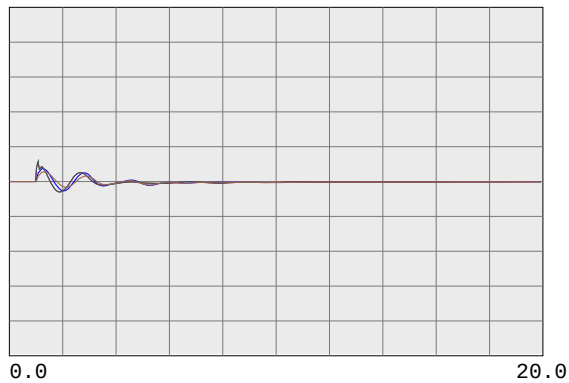
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



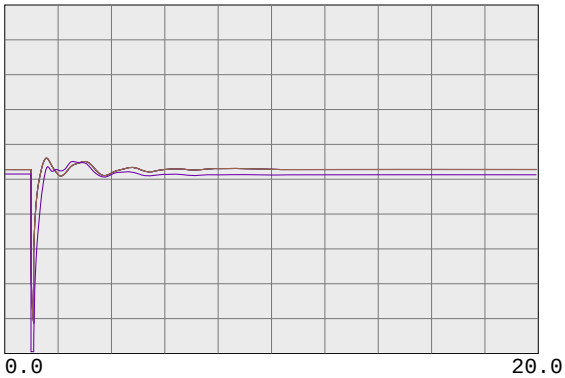
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

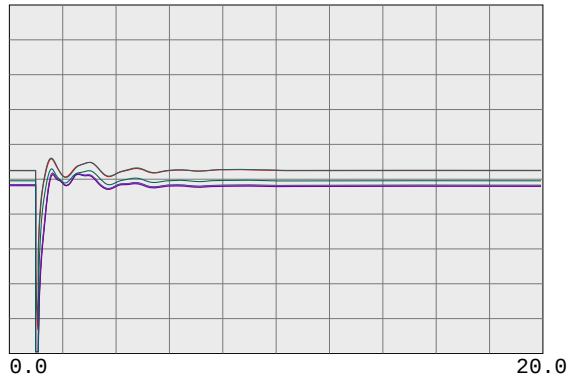
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

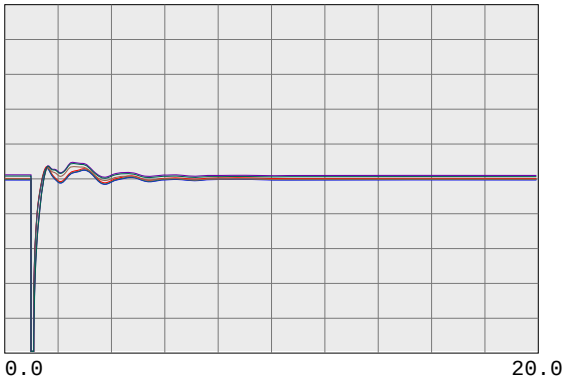
230-KV SYSTEM VOLTAGES



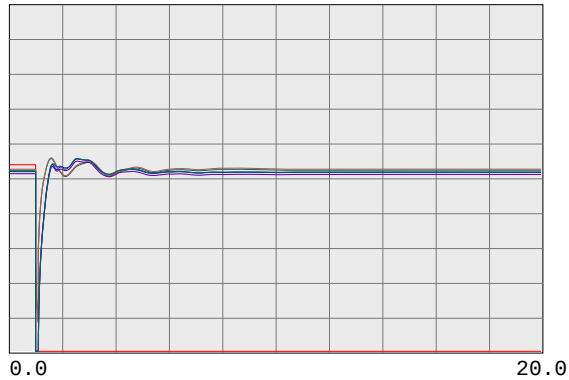
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



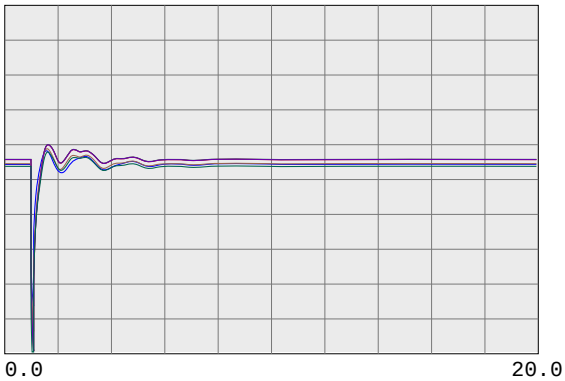
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



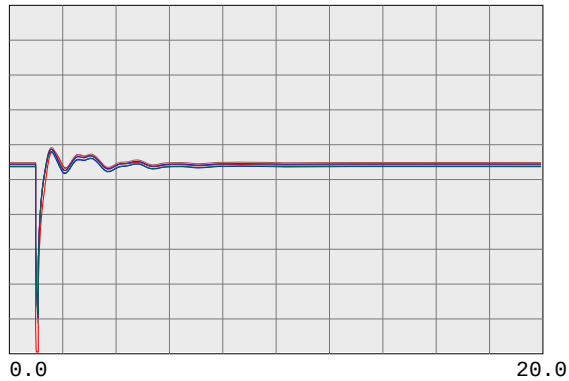
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



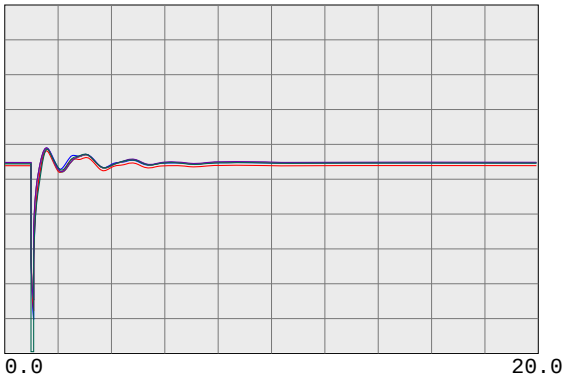
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



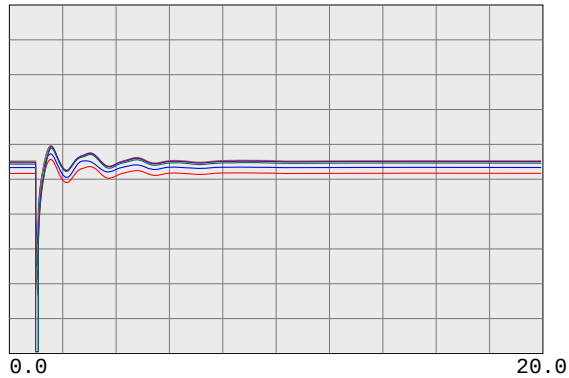
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

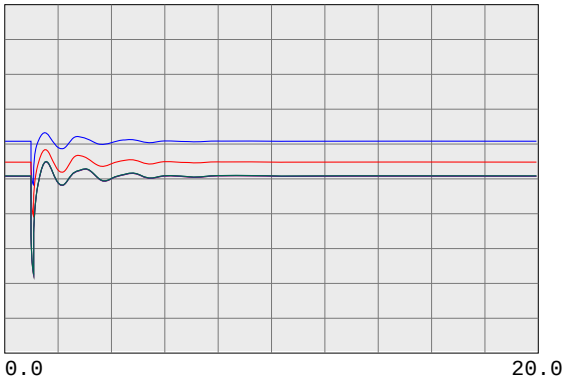
230-KV SYSTEM VOLTAGES



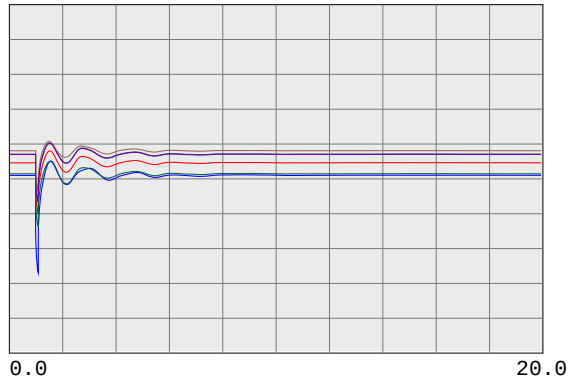
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



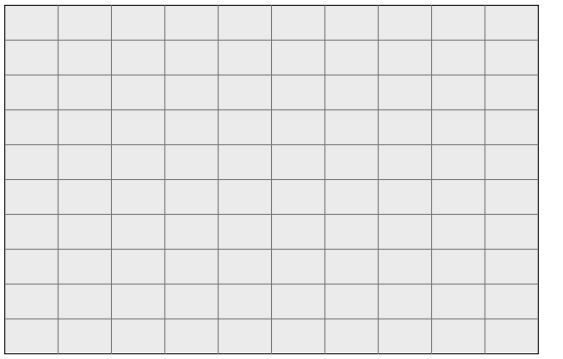
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

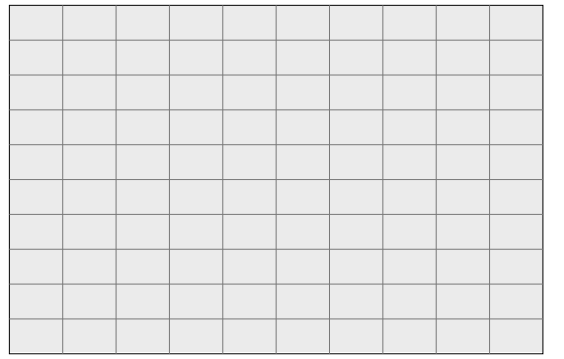


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



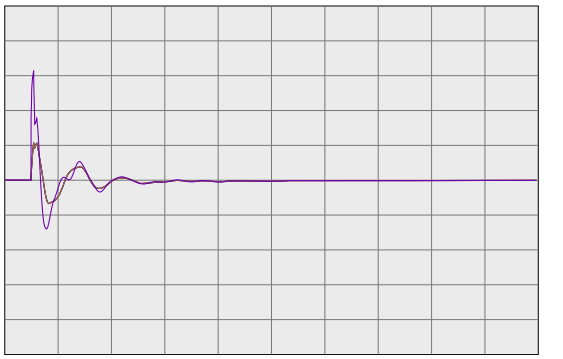
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



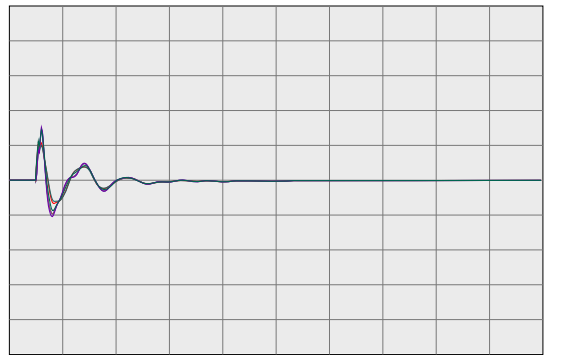


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

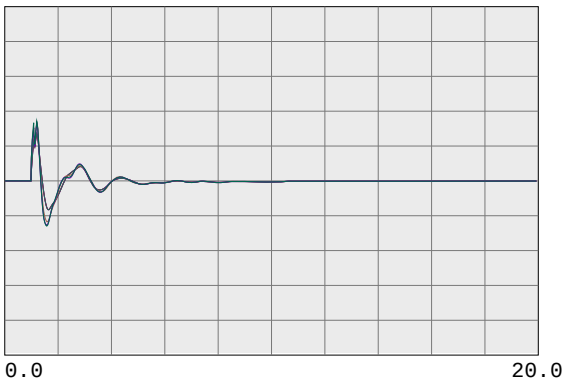
230-KV SYSTEM FREQUENCIES



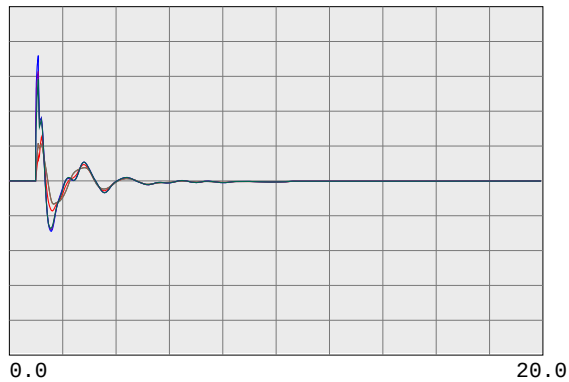
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



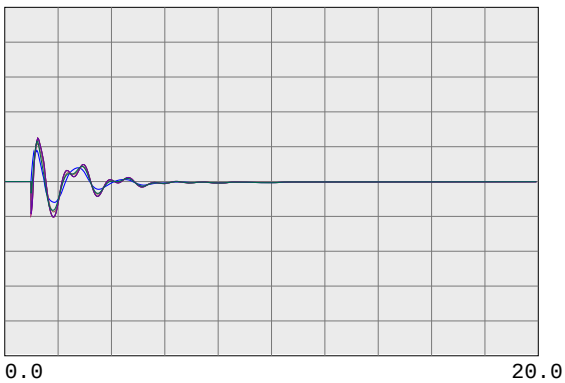
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



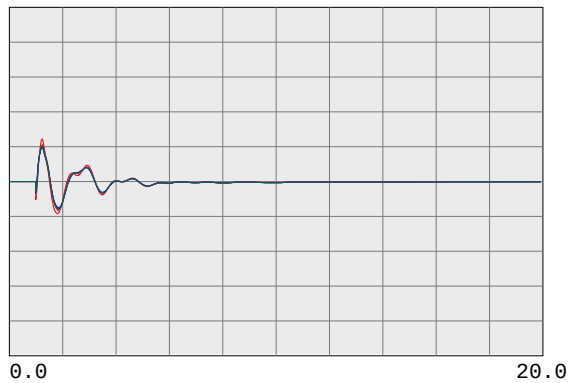
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



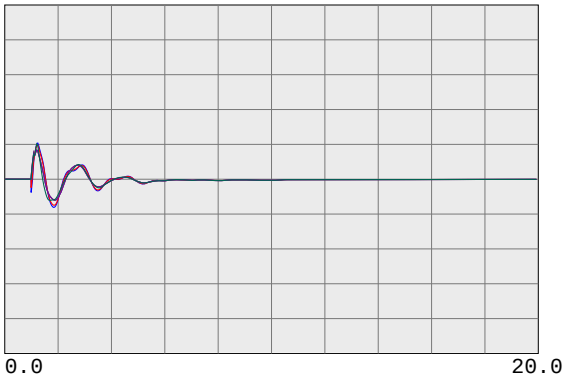
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



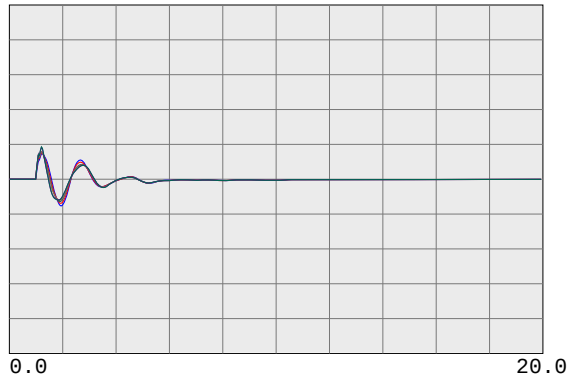
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

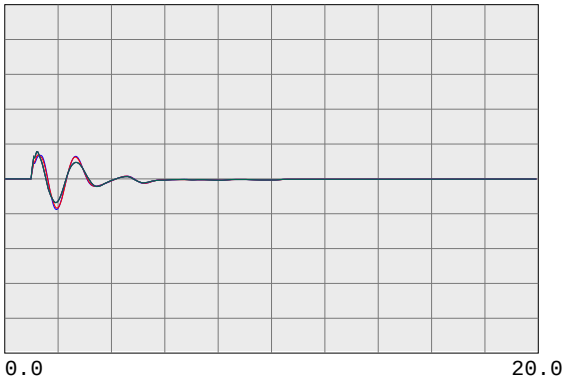
230-KV SYSTEM FREQUENCIES



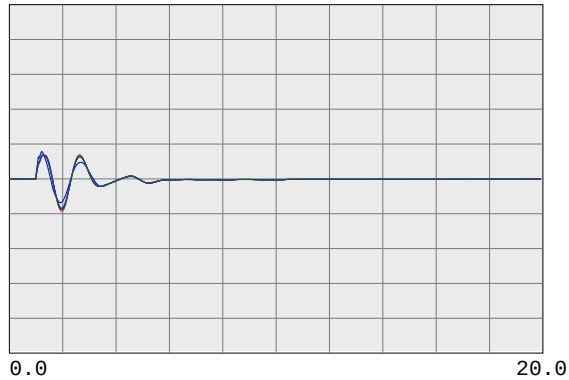
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



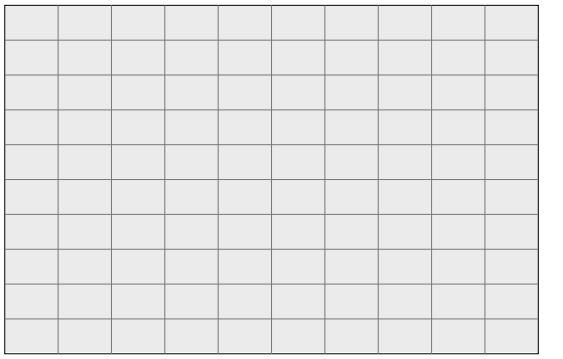
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

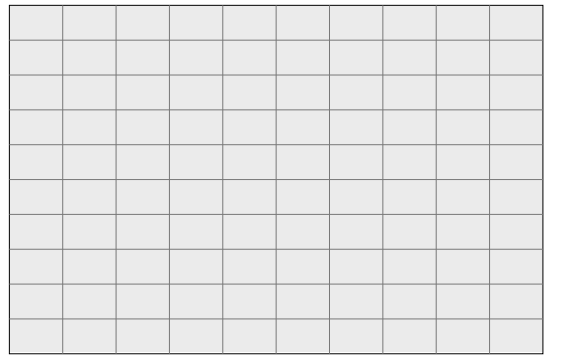


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



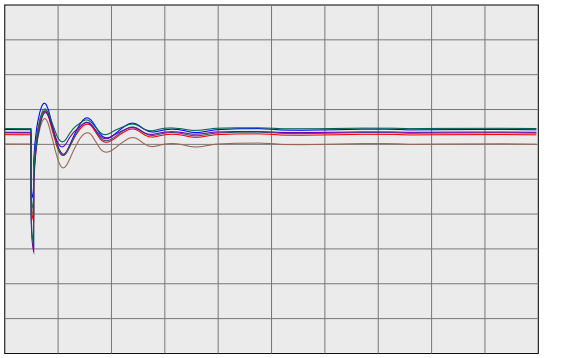
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



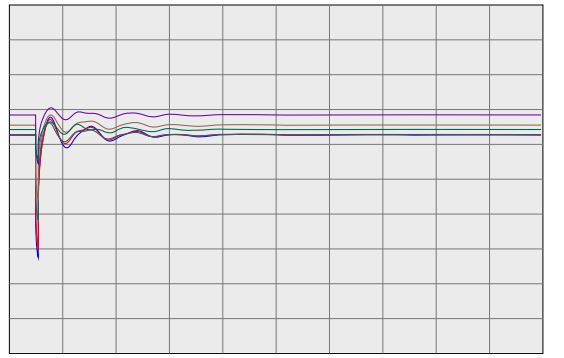


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

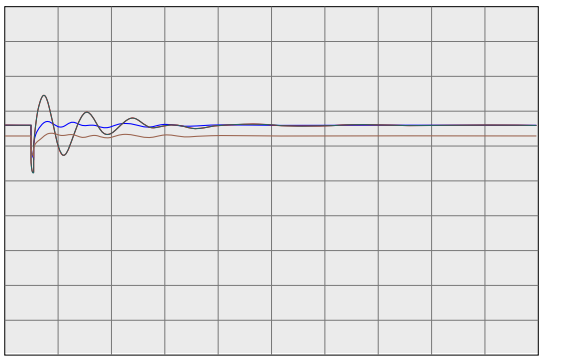
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



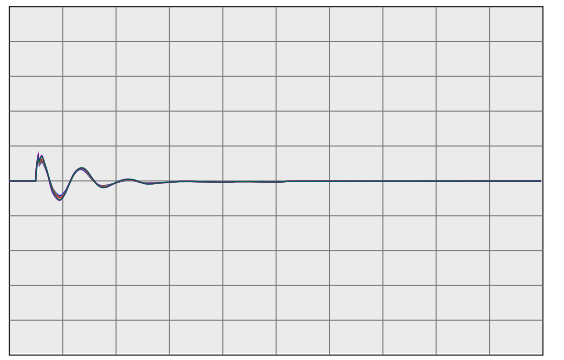
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



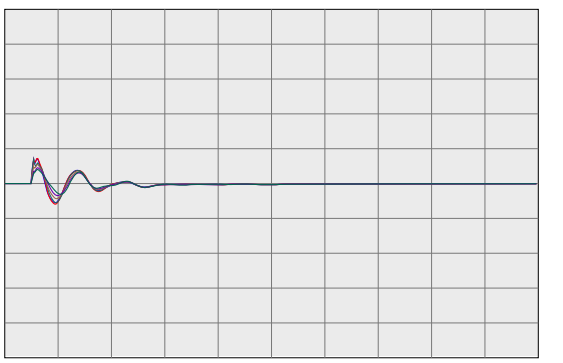
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



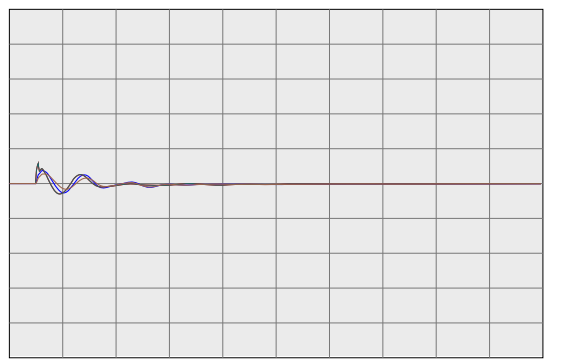
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



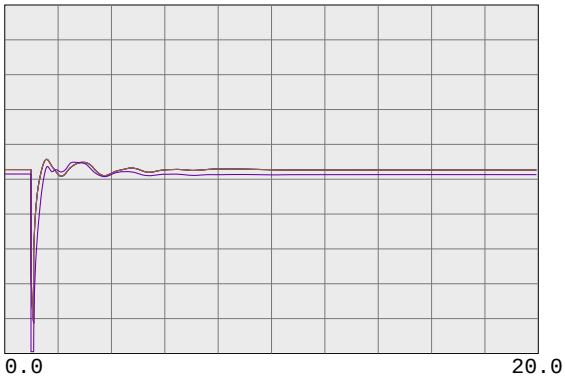
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

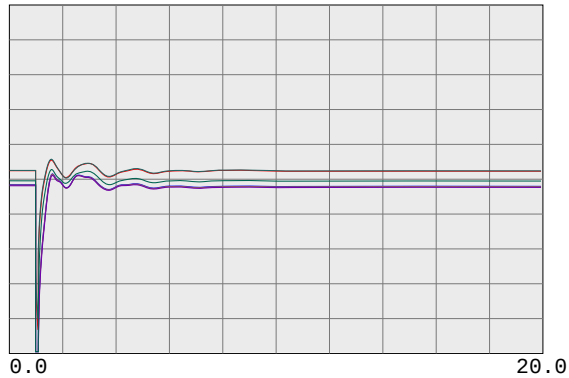
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

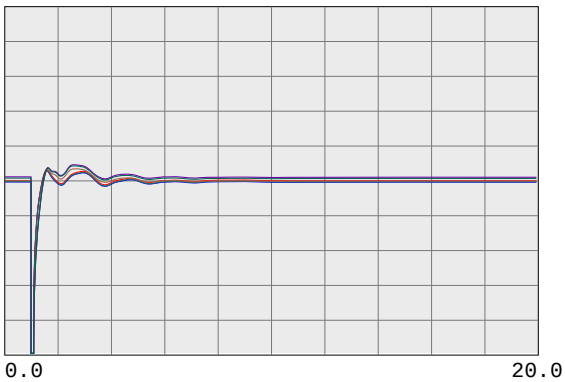
230-KV SYSTEM VOLTAGES



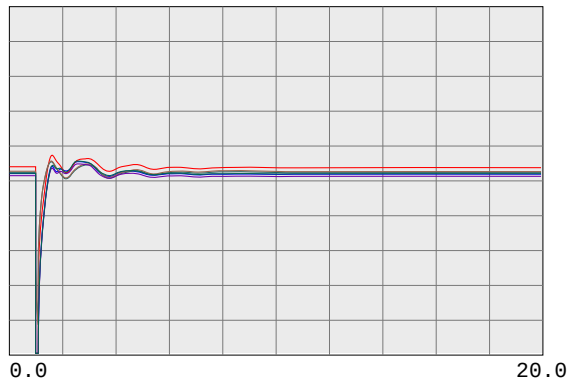
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



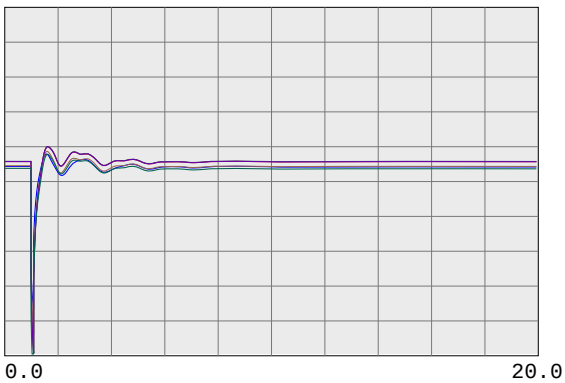
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



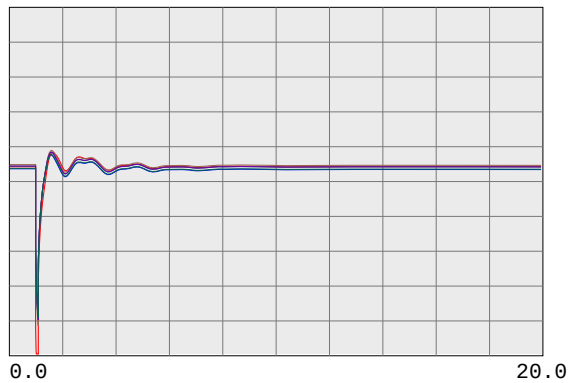
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



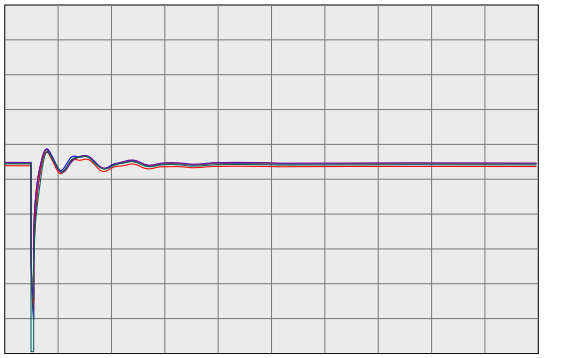
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



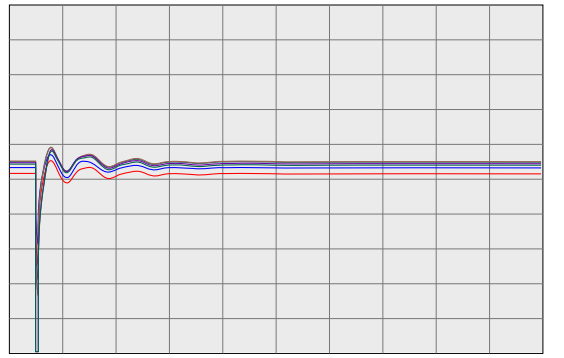
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

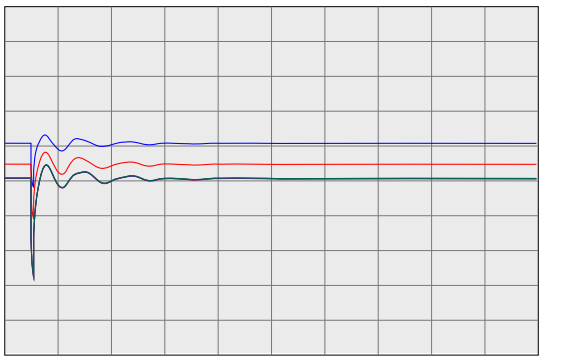
230-KV SYSTEM VOLTAGES



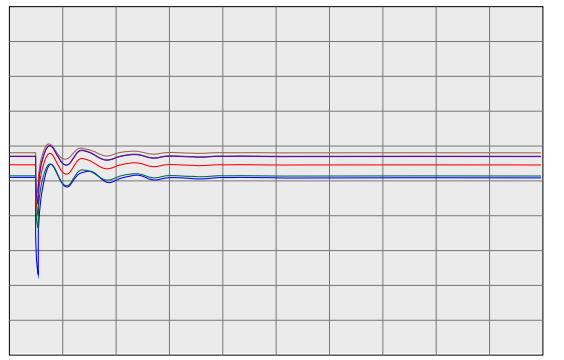
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



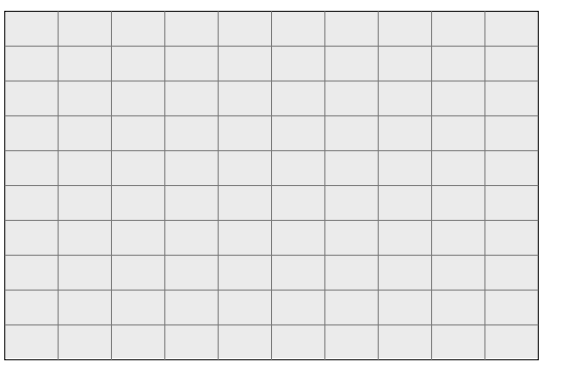
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

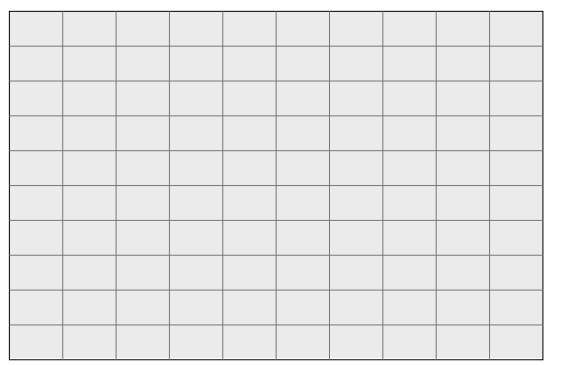


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



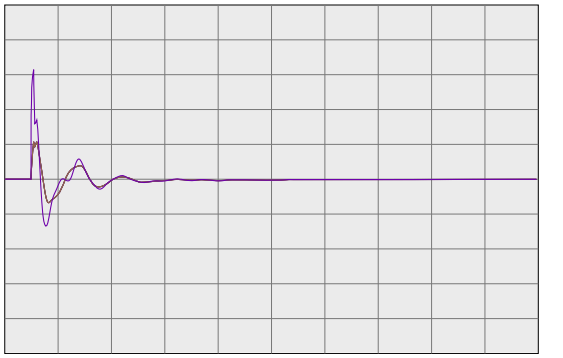
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



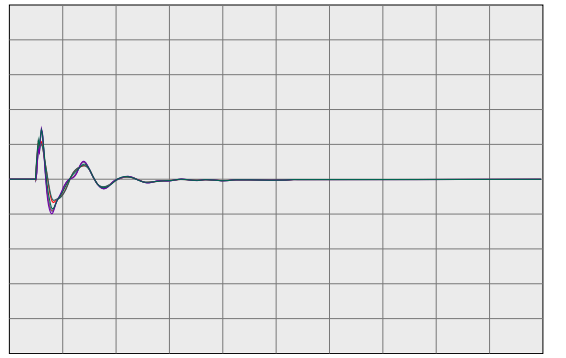


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

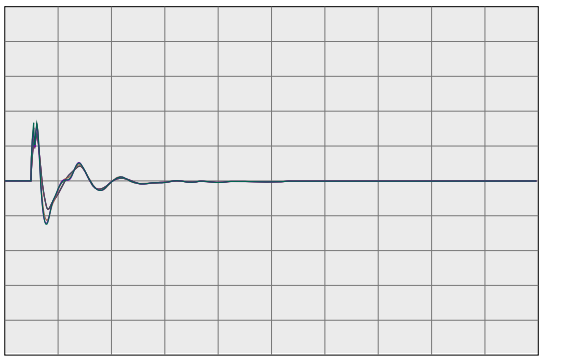
230-KV SYSTEM FREQUENCIES



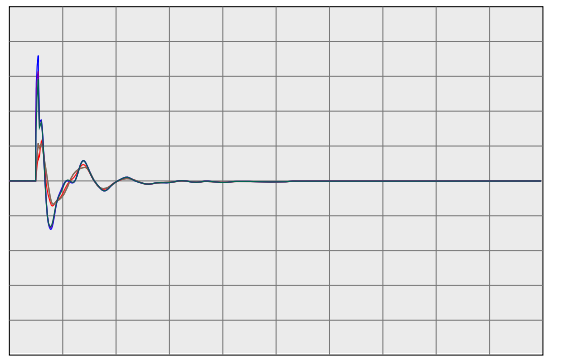
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



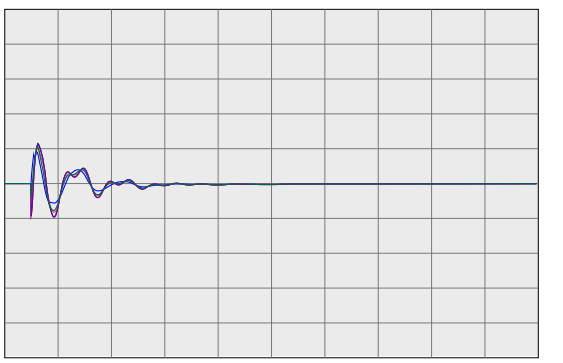
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



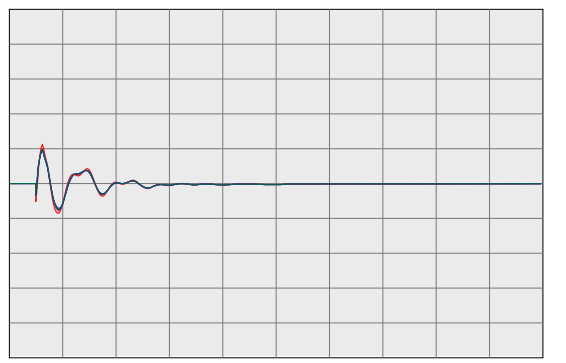
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



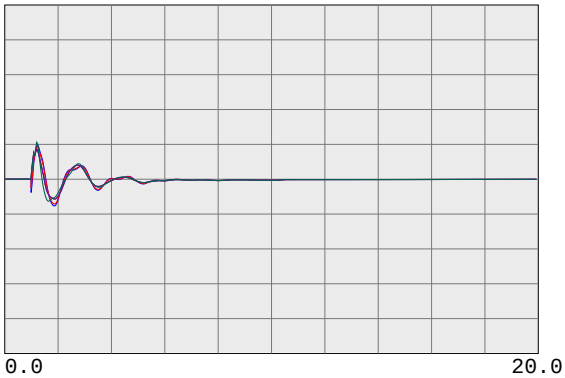
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



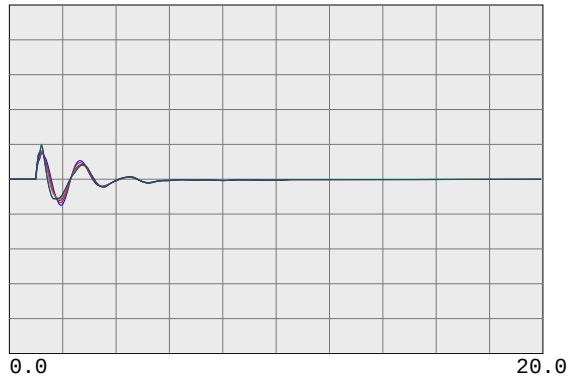
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

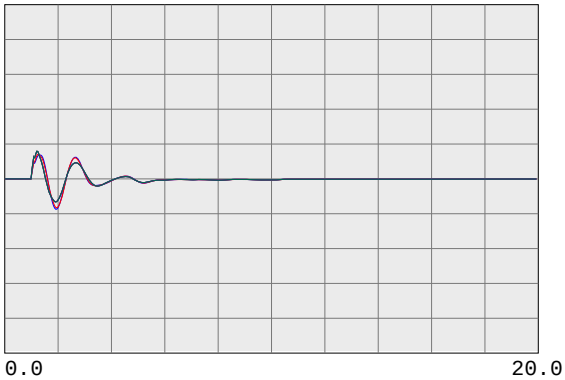
230-KV SYSTEM FREQUENCIES



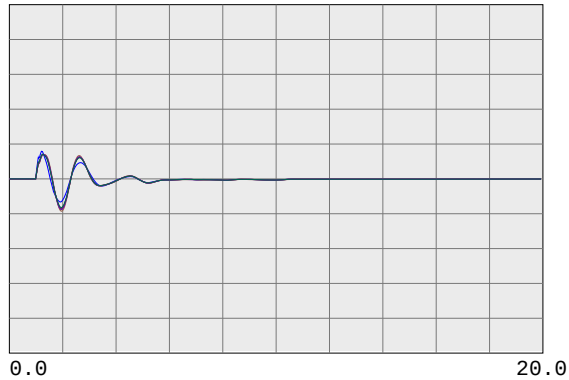
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



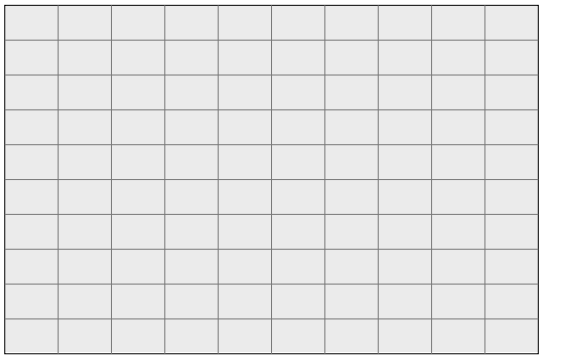
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

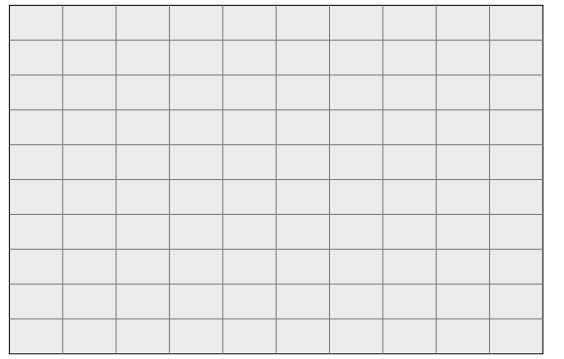


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



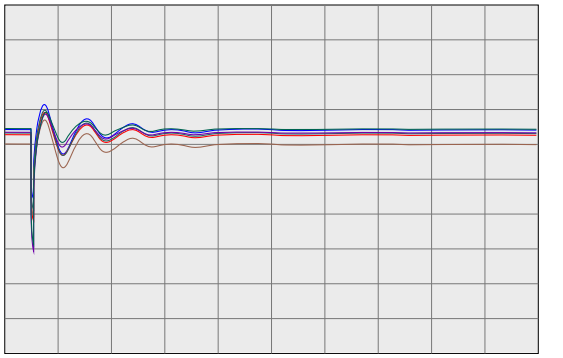
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



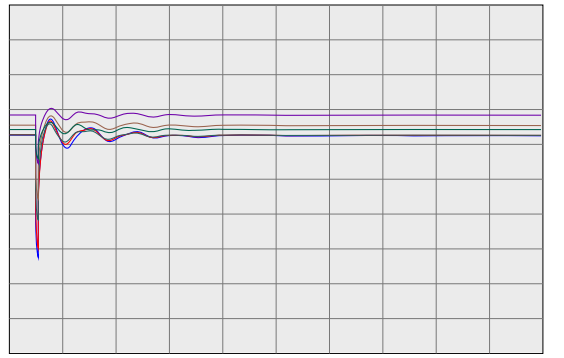


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

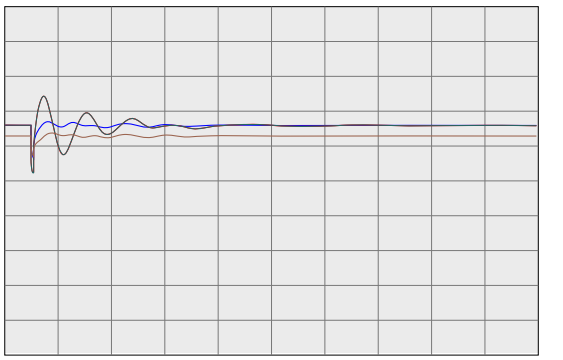
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



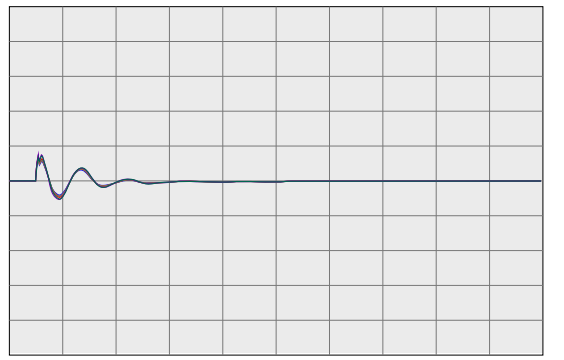
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



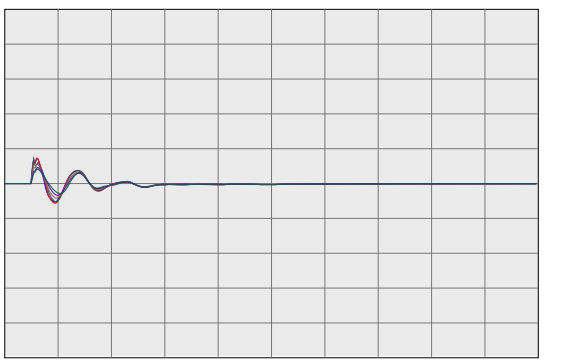
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



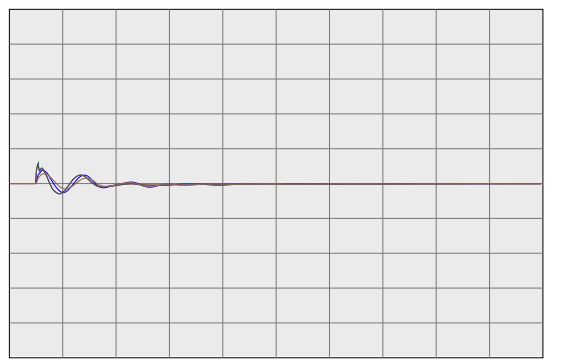
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



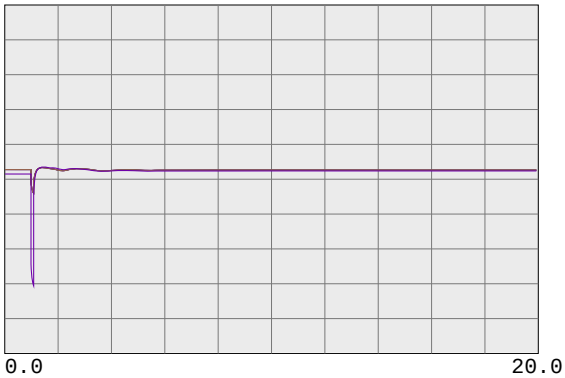
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

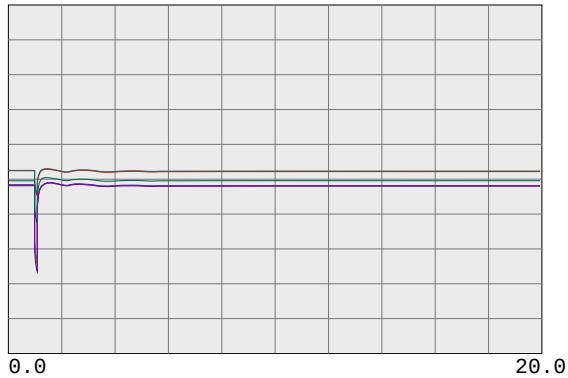
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

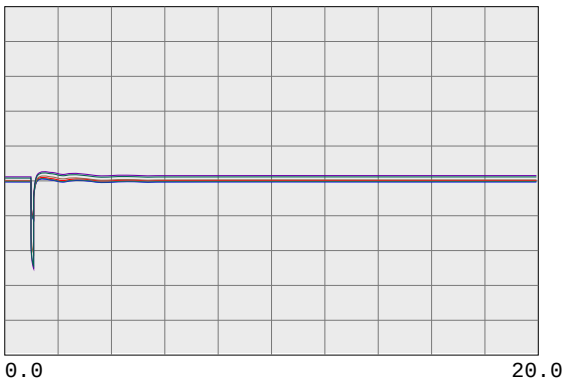
230-KV SYSTEM VOLTAGES



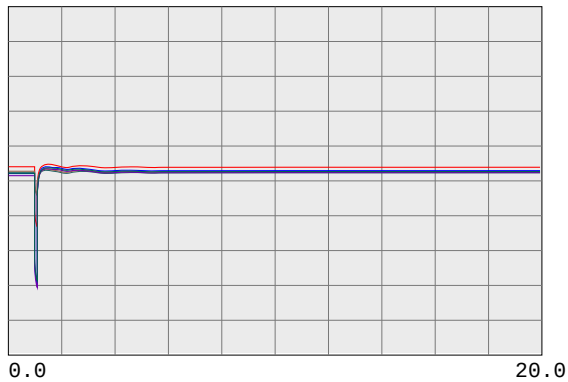
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



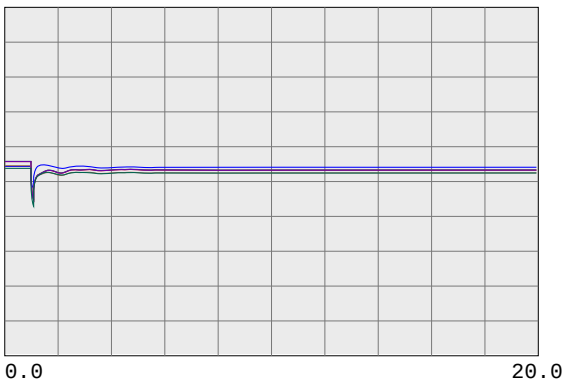
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



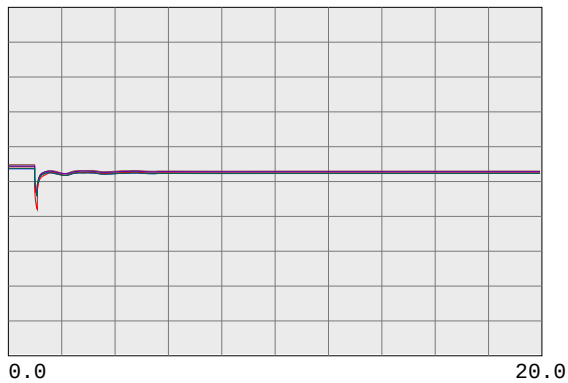
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



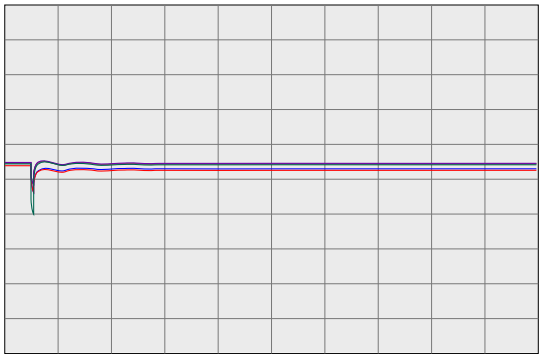
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

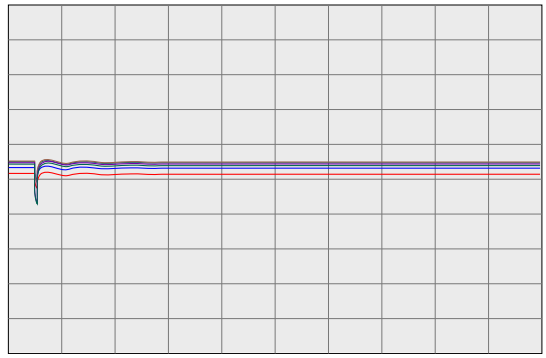
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

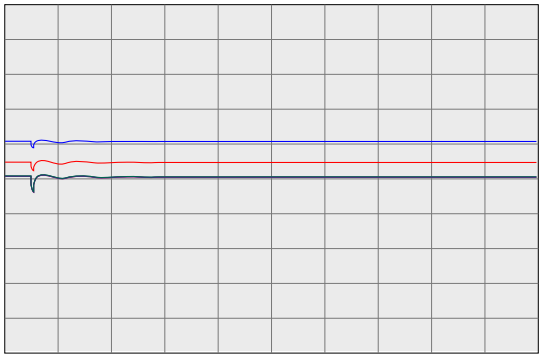
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

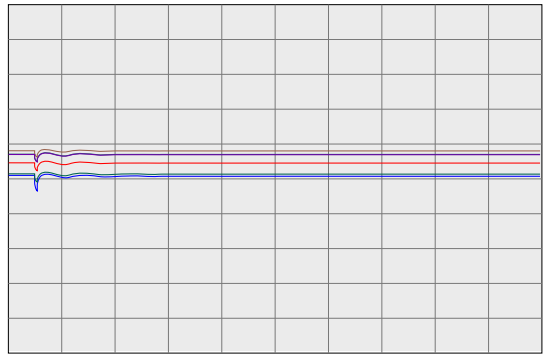
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

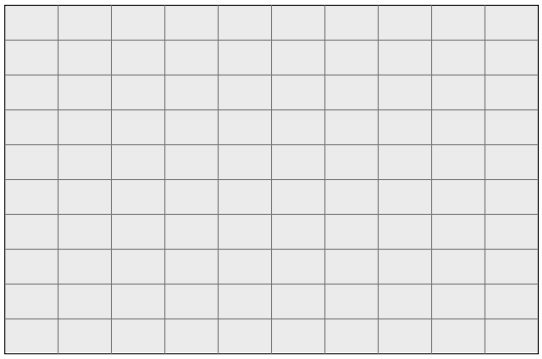
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

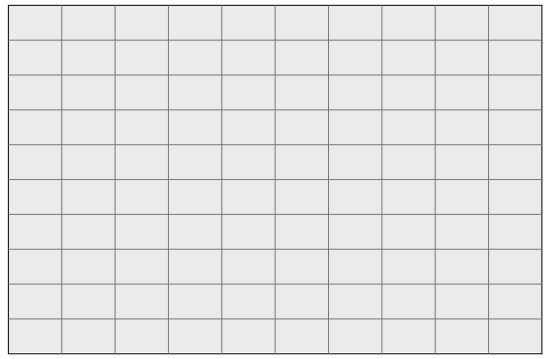


0.0 20.0

Time(sec)

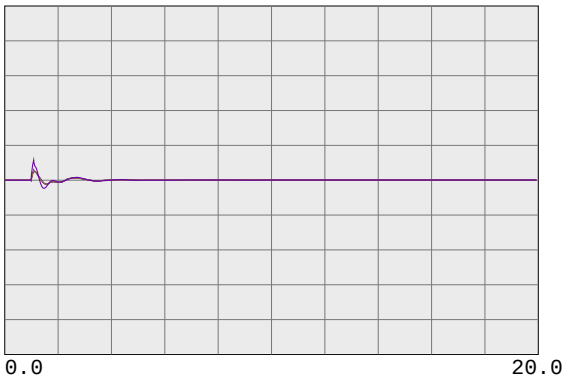
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





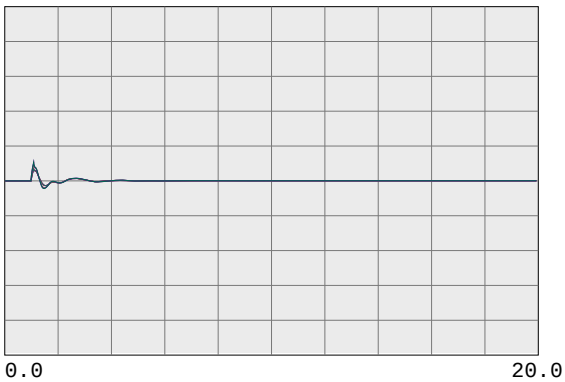
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

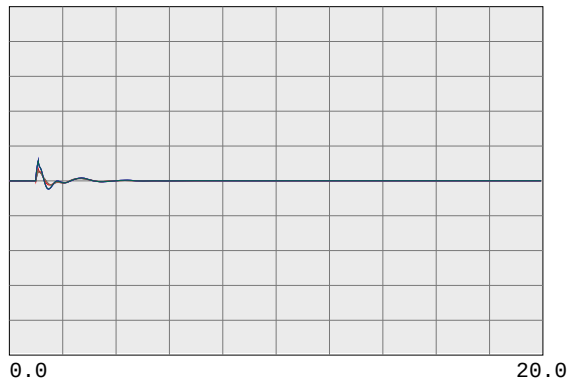


59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

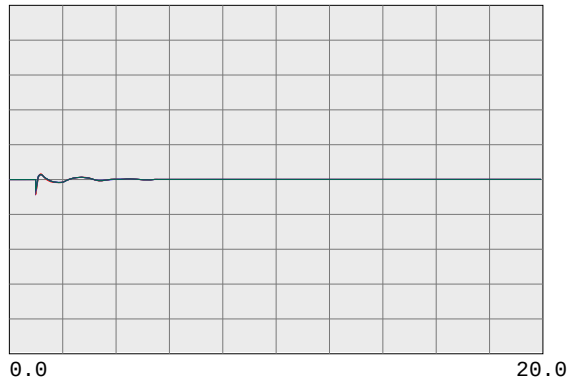


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



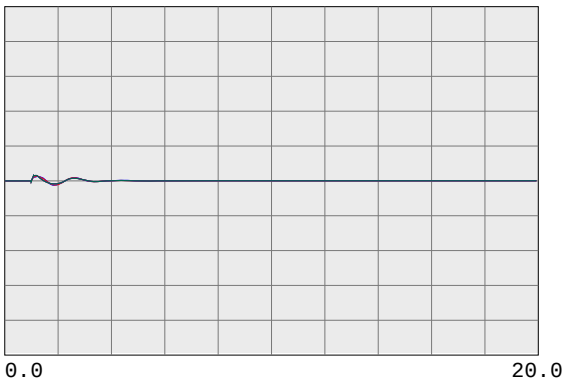
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

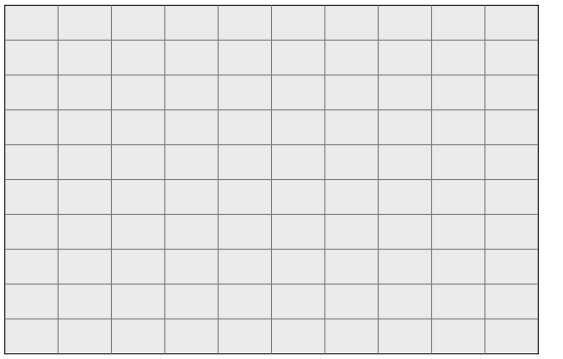
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

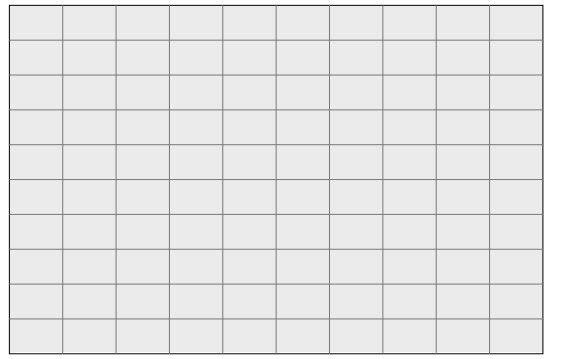
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

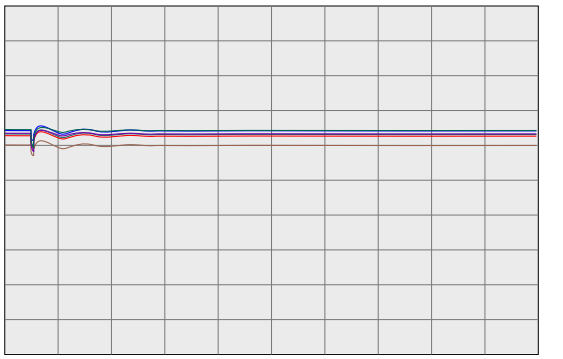
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



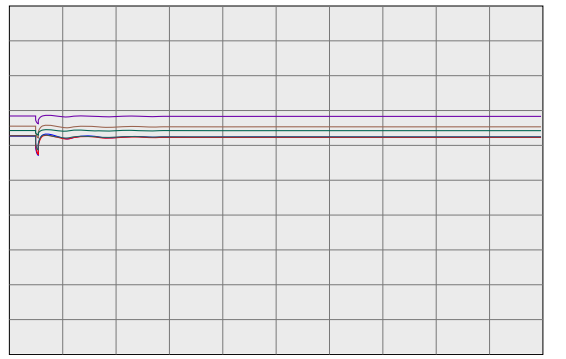


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

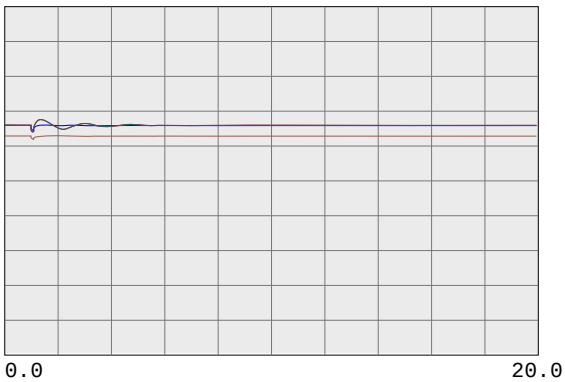
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



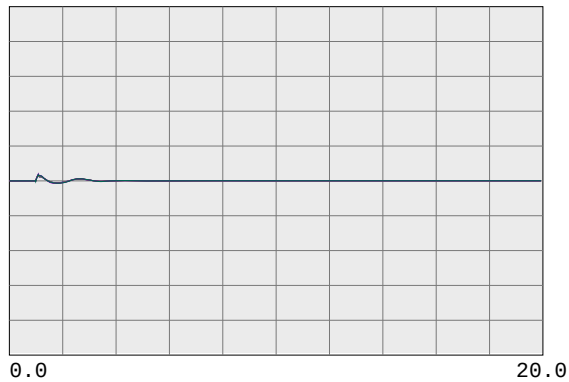
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

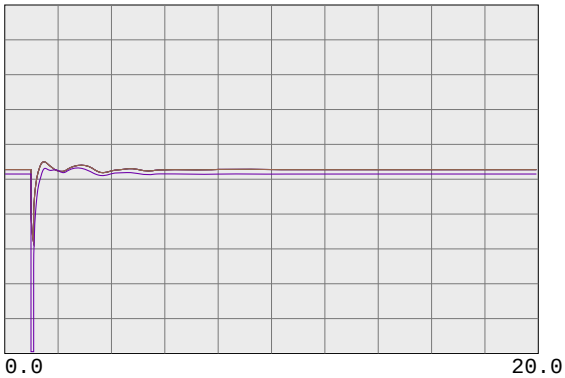
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

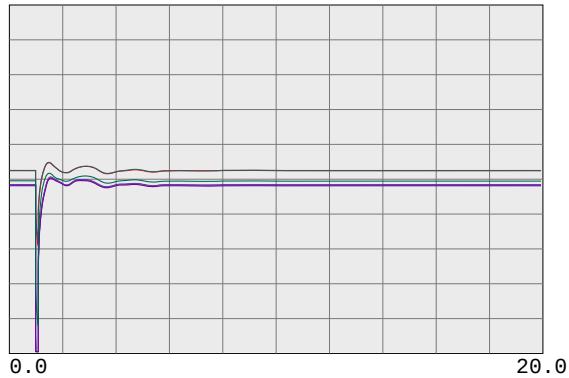
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

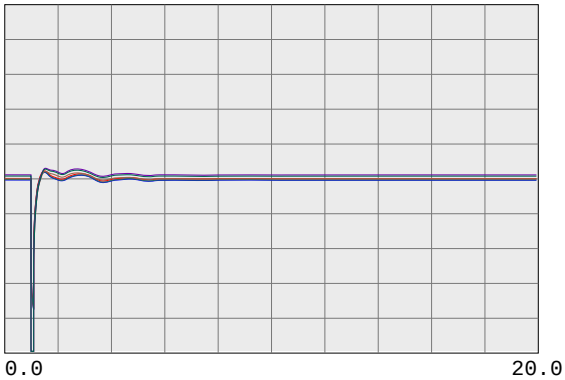
230-KV SYSTEM VOLTAGES



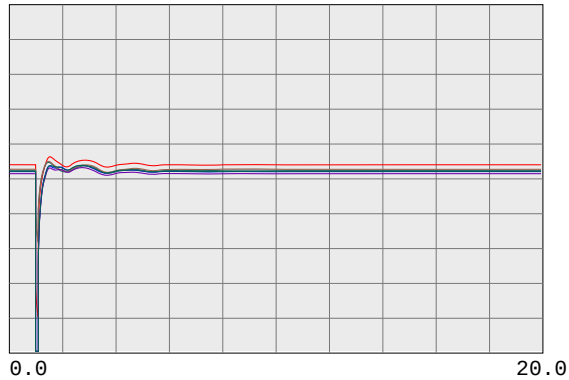
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



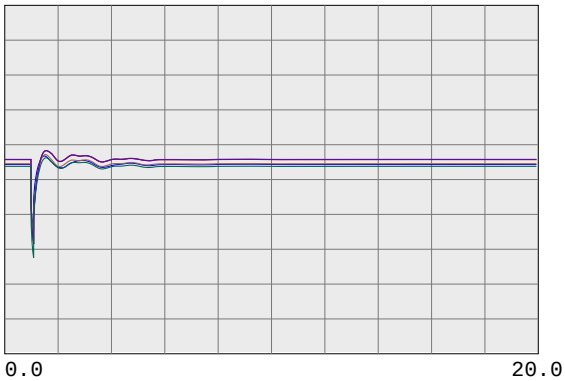
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



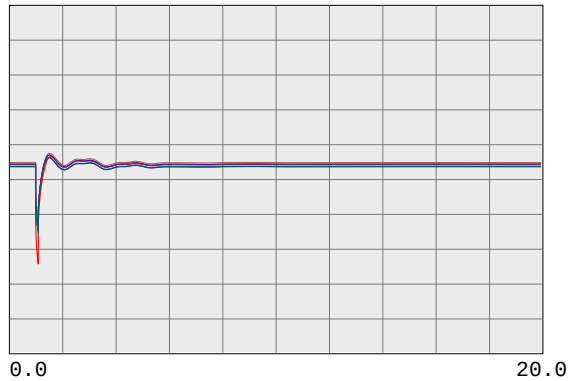
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



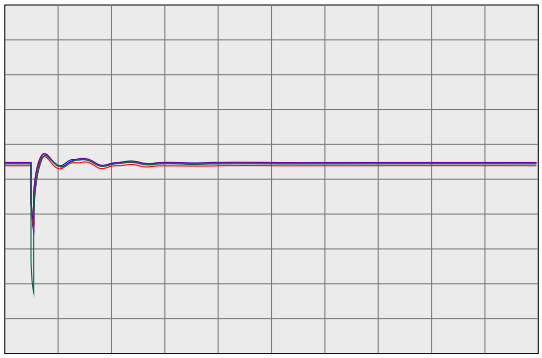
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

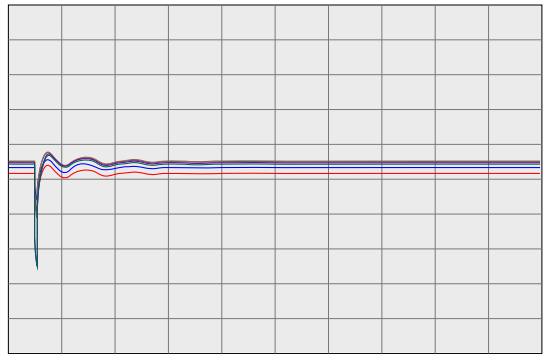
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

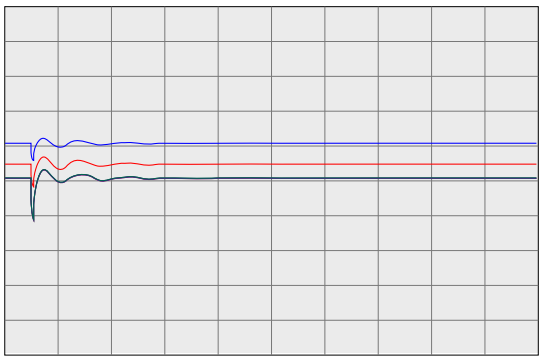
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

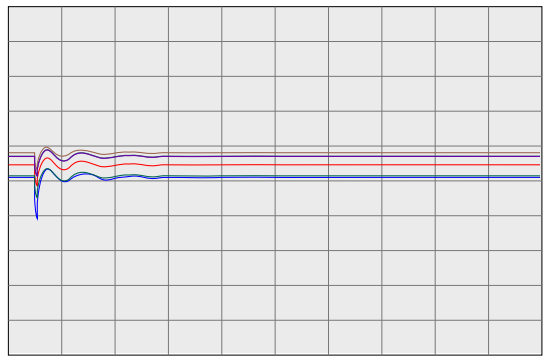
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

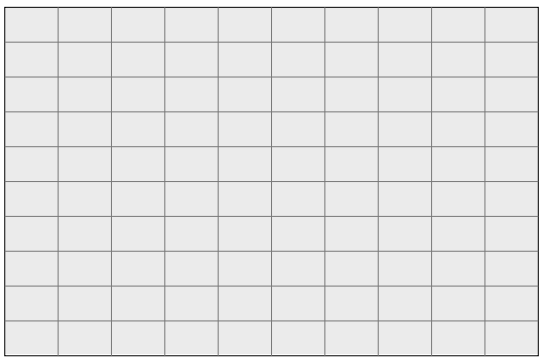
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

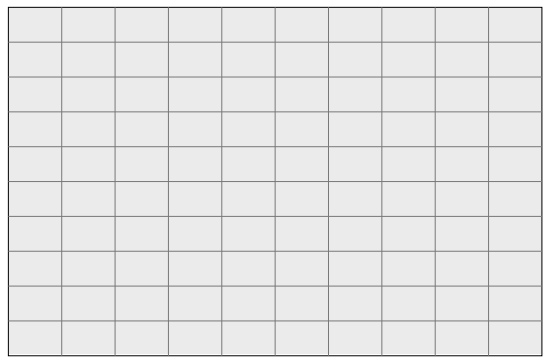


0.0 20.0

Time(sec)

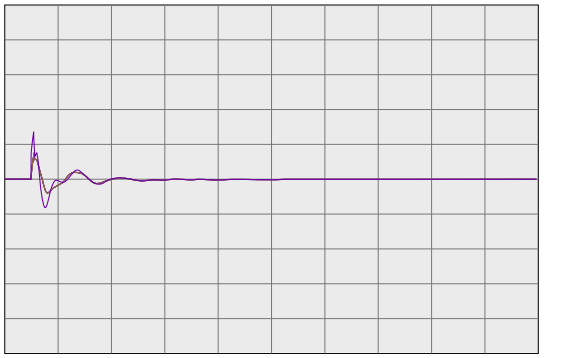
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



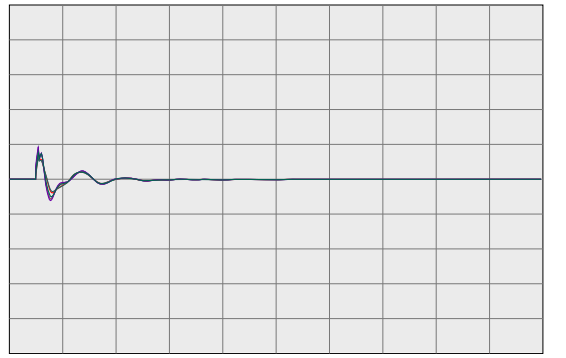


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

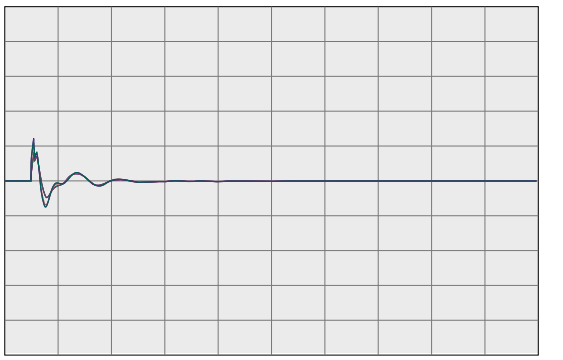
230-KV SYSTEM FREQUENCIES



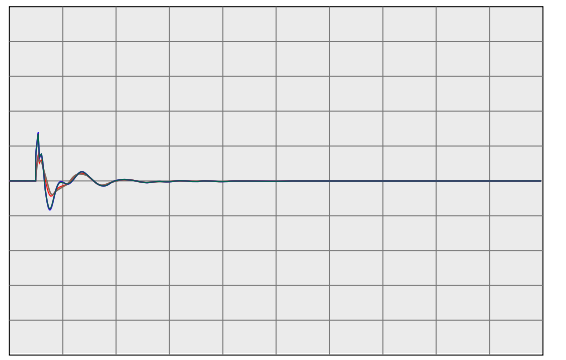
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



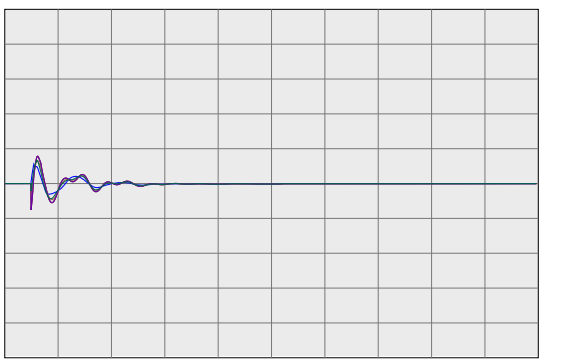
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



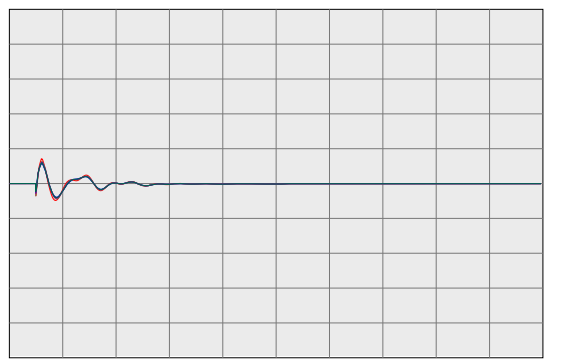
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



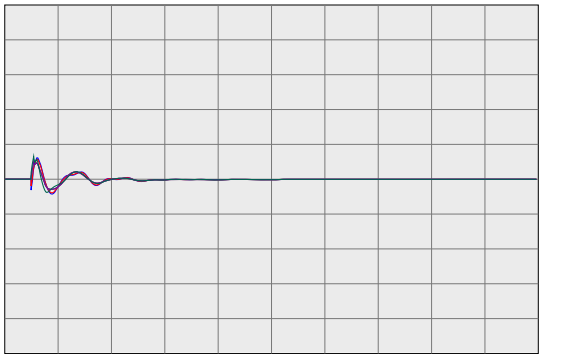
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



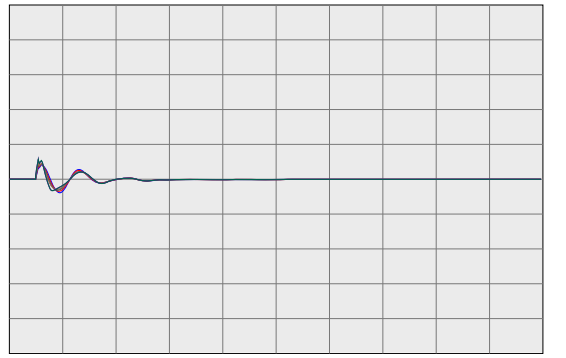
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

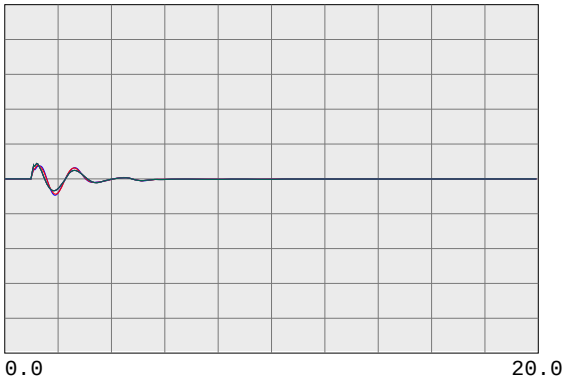
230-KV SYSTEM FREQUENCIES



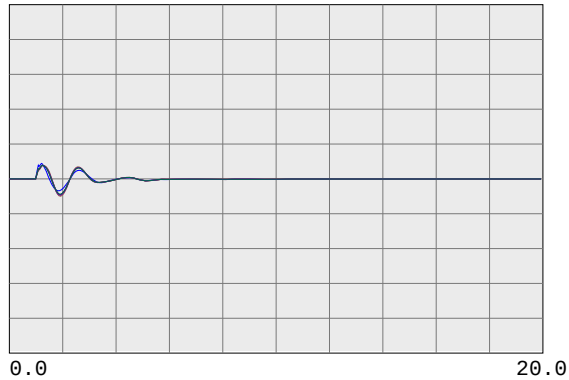
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



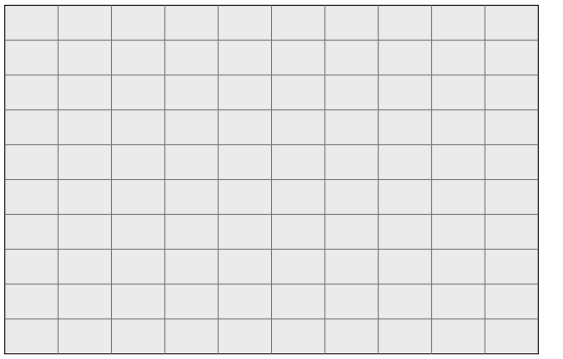
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

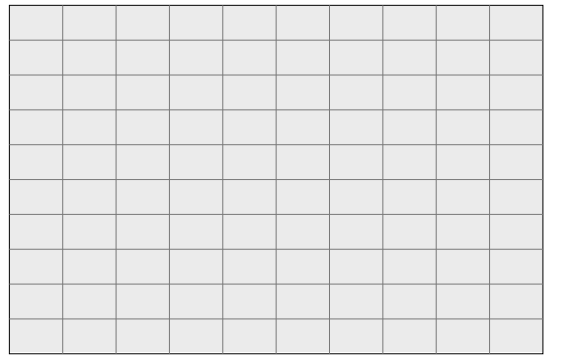


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



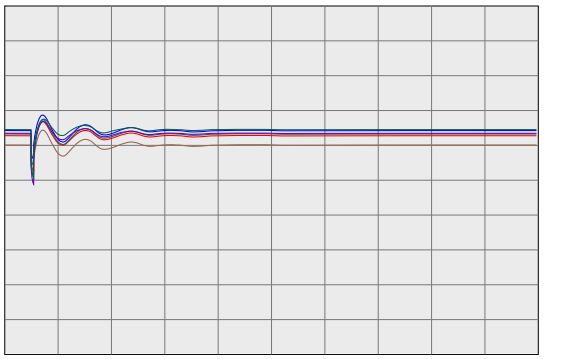
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



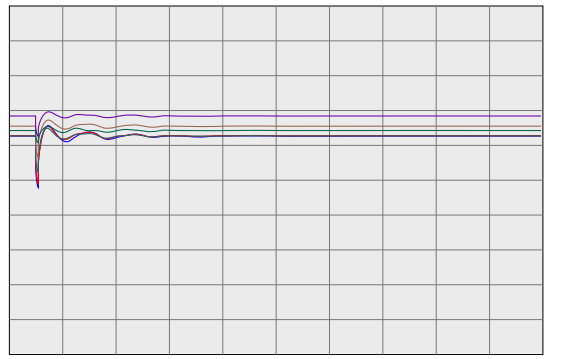


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

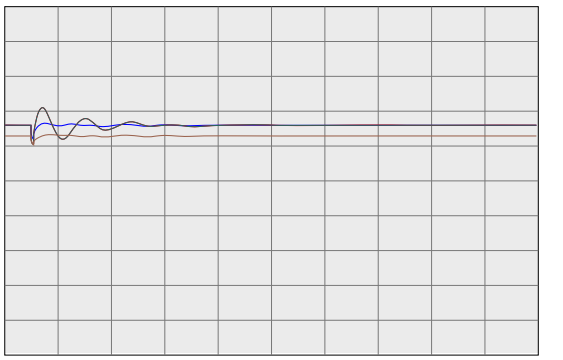
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



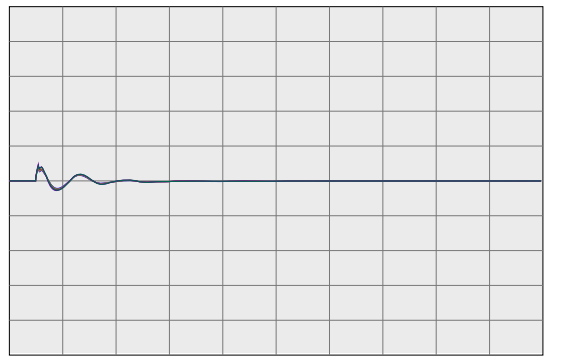
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



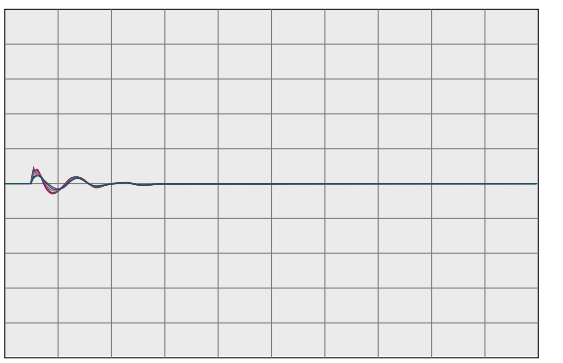
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



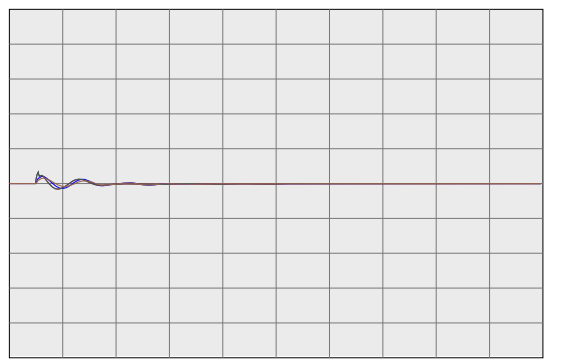
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



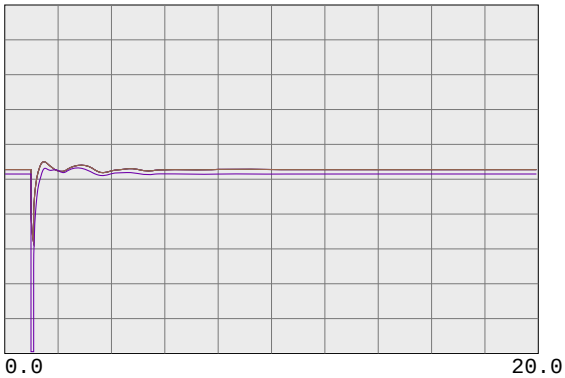
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

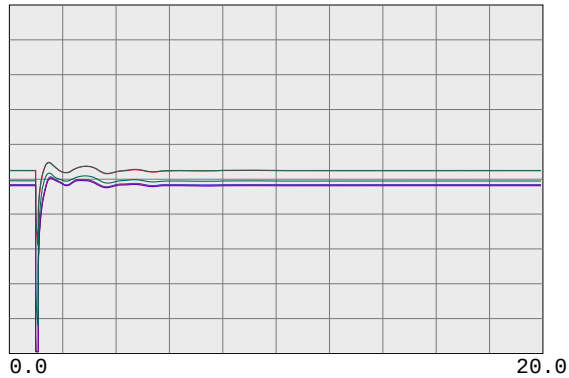
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

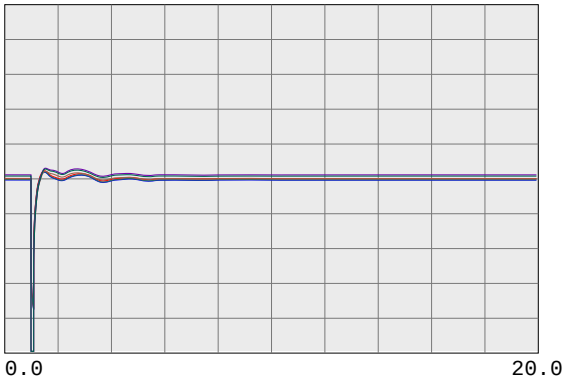
230-KV SYSTEM VOLTAGES



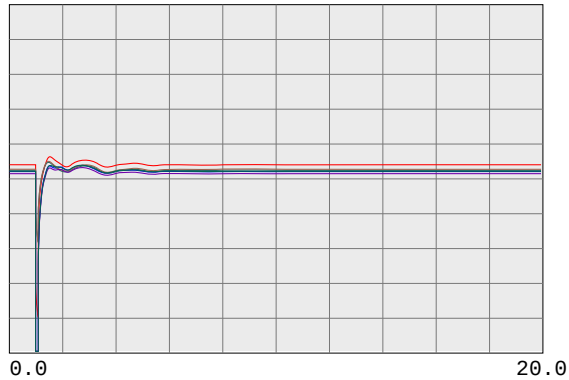
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



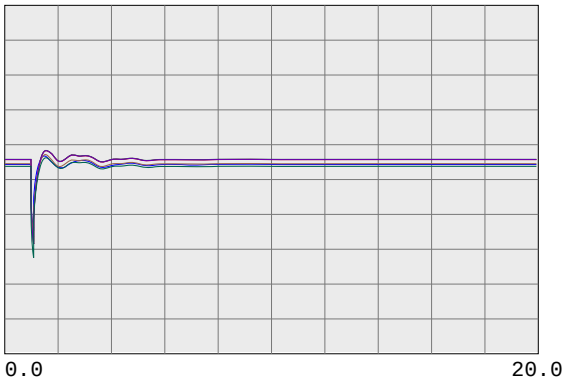
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



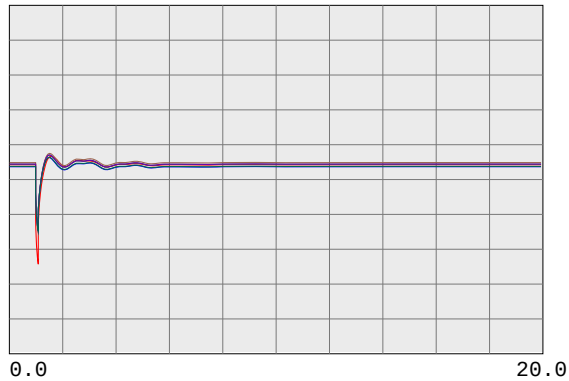
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



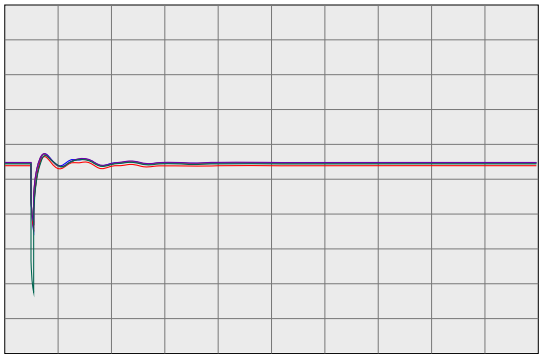
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

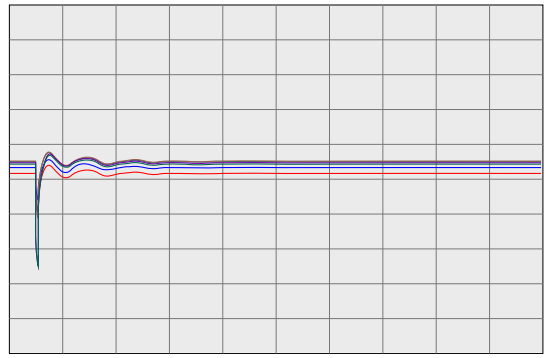
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

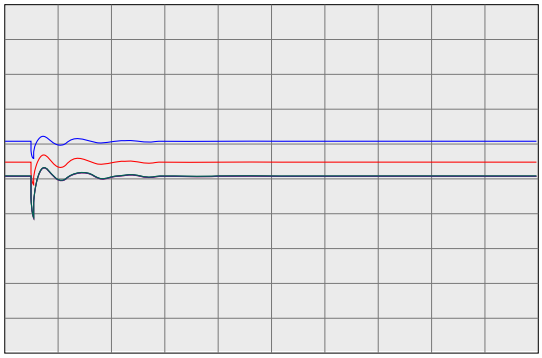
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

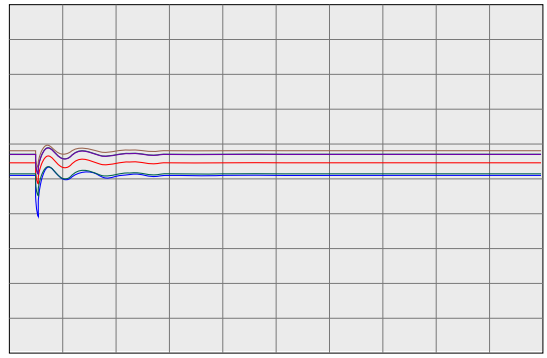
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

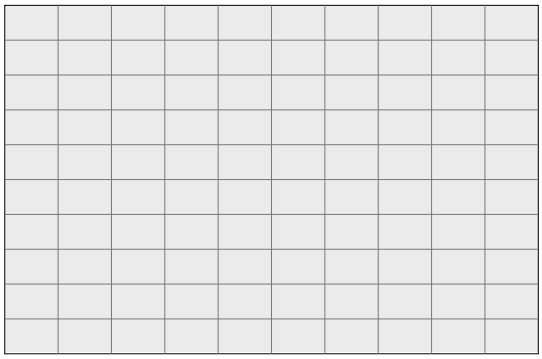
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

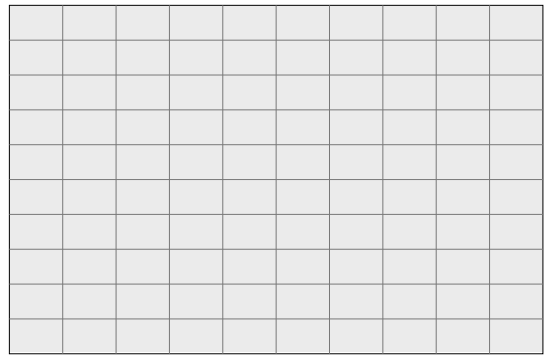


0.0 20.0

Time(sec)

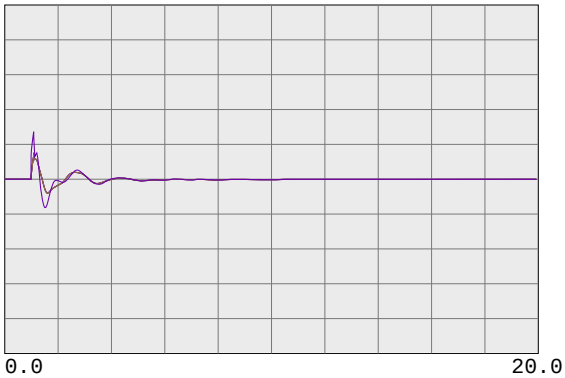
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



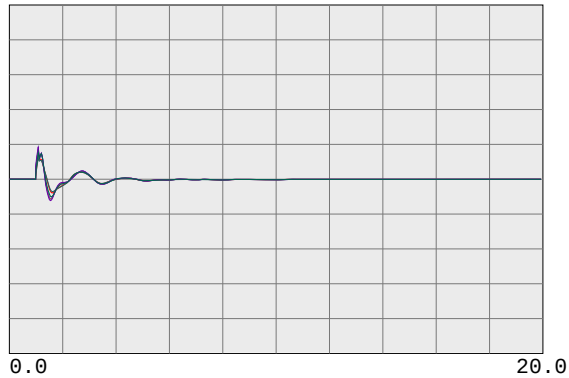


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

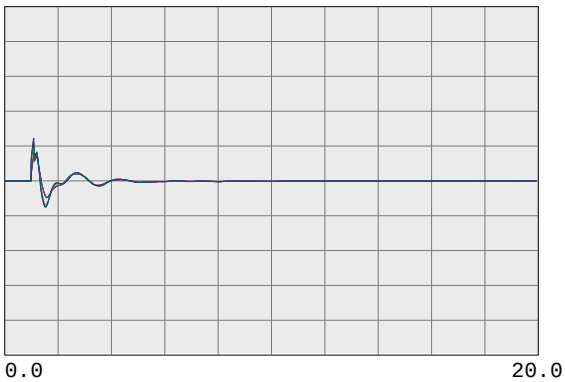
230-KV SYSTEM FREQUENCIES



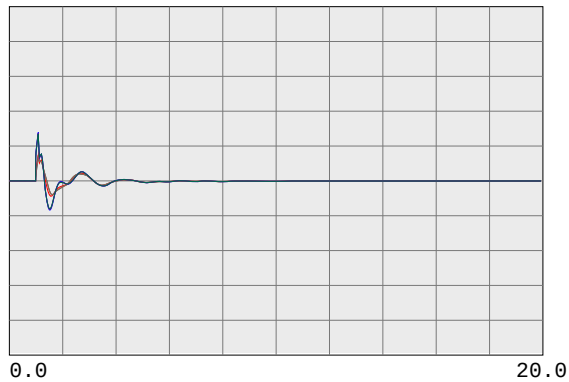
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



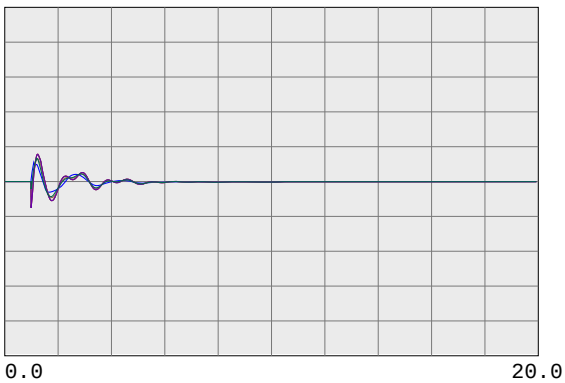
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



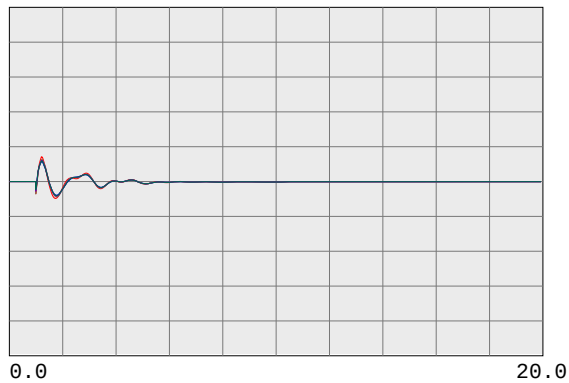
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



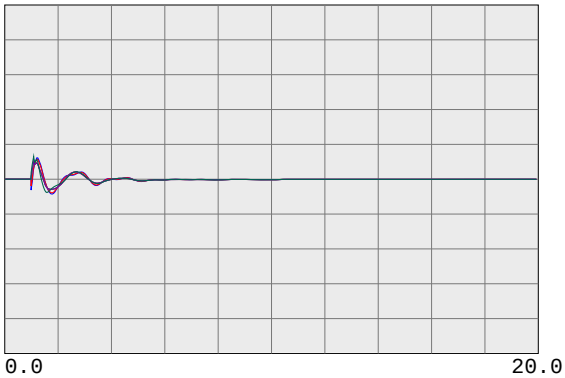
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



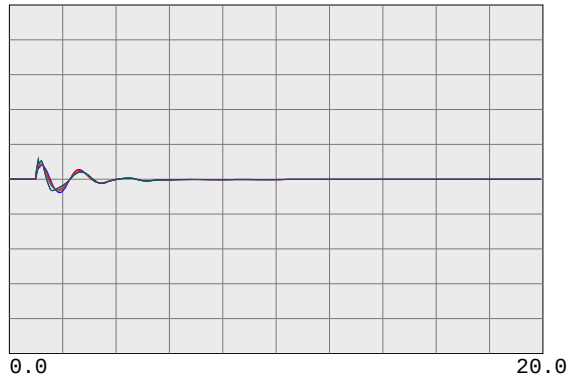
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

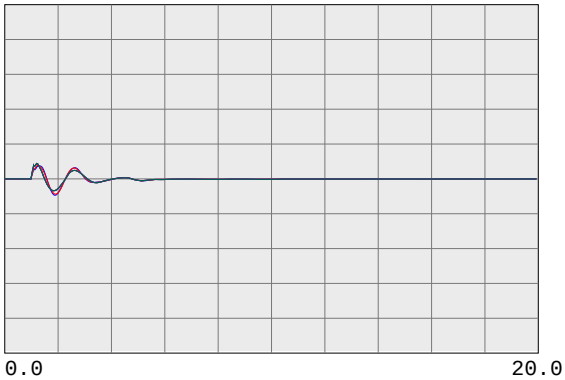
230-KV SYSTEM FREQUENCIES



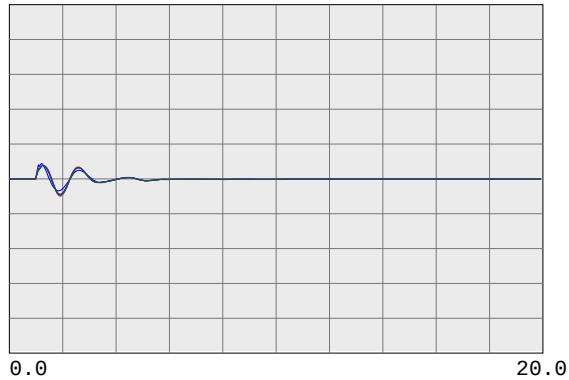
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



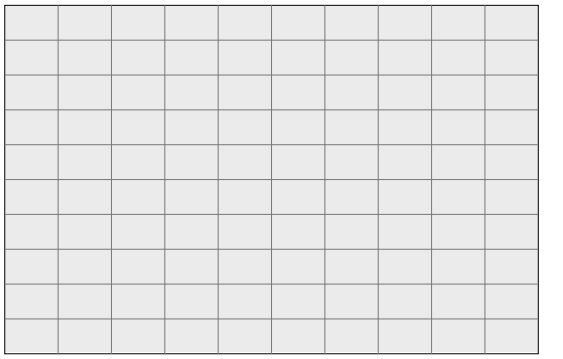
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

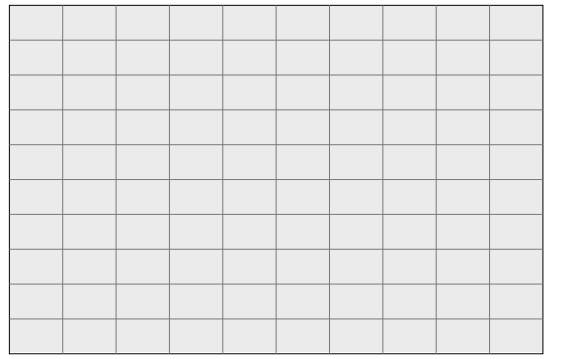


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



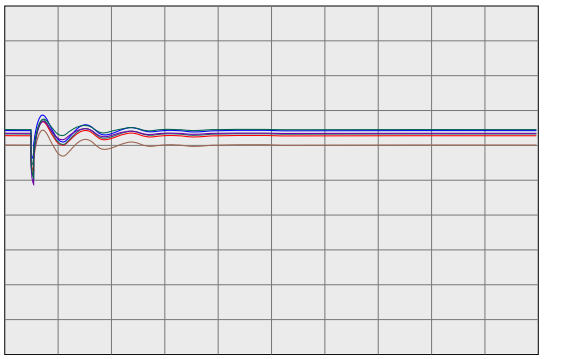
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



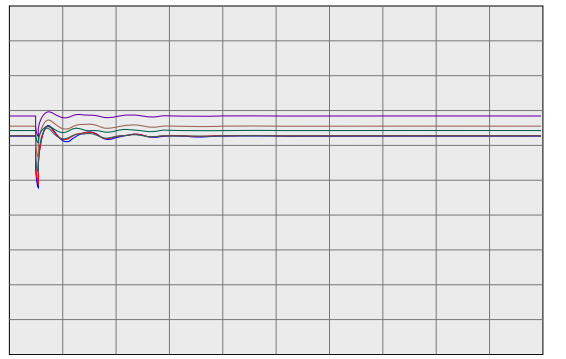


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

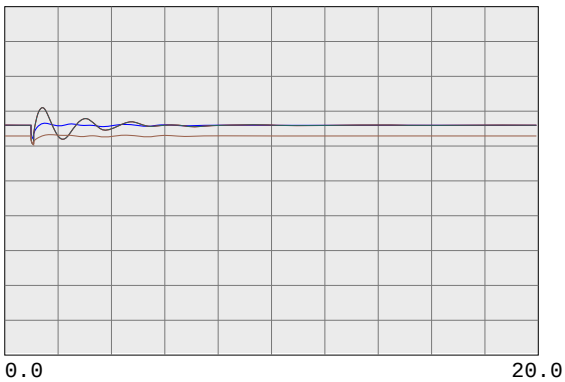
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



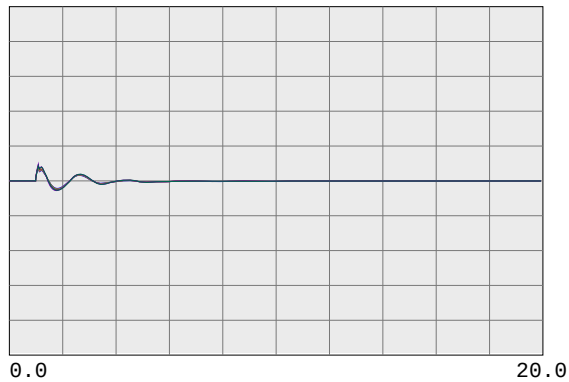
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



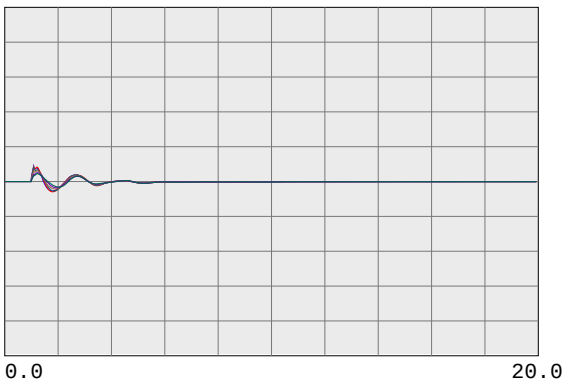
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



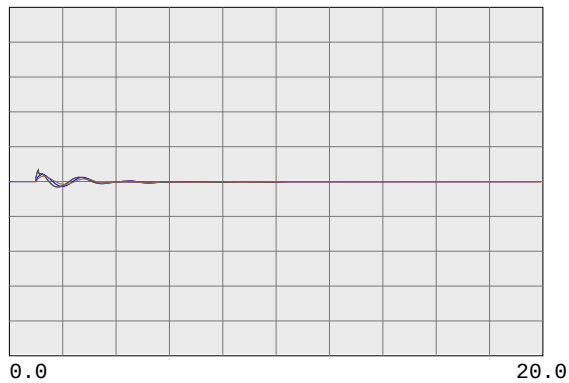
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



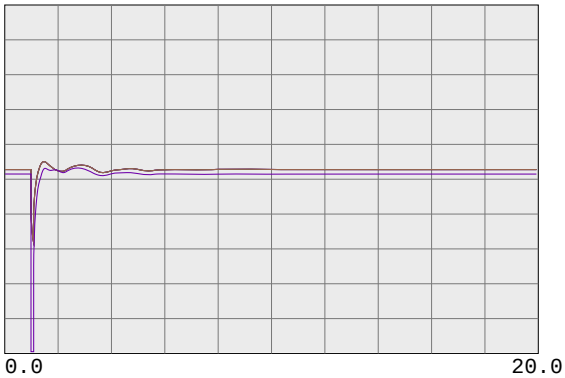
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

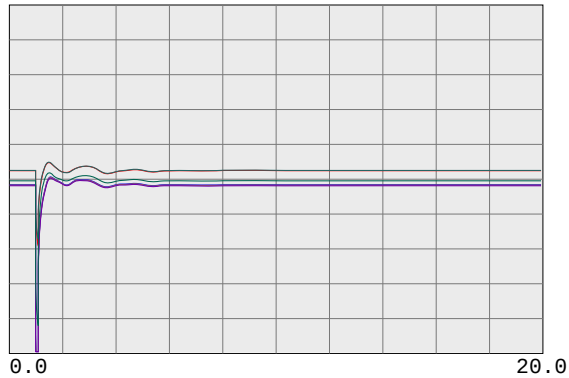
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

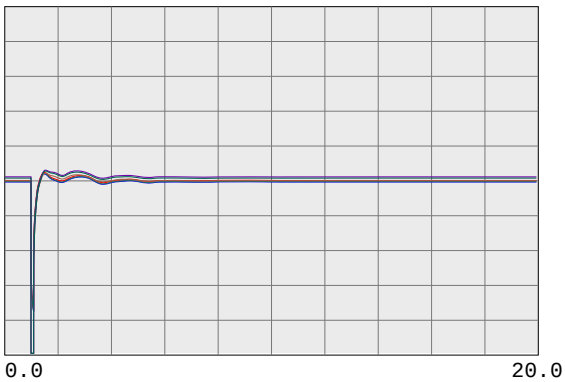
230-KV SYSTEM VOLTAGES



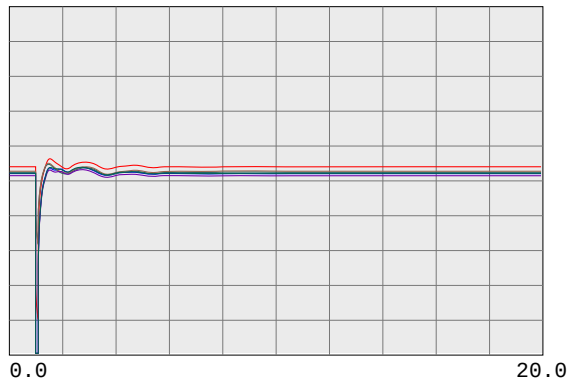
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



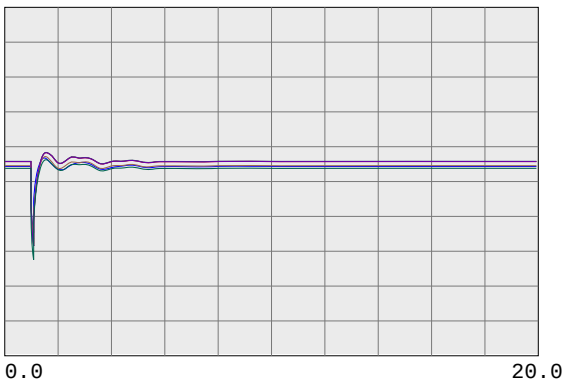
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



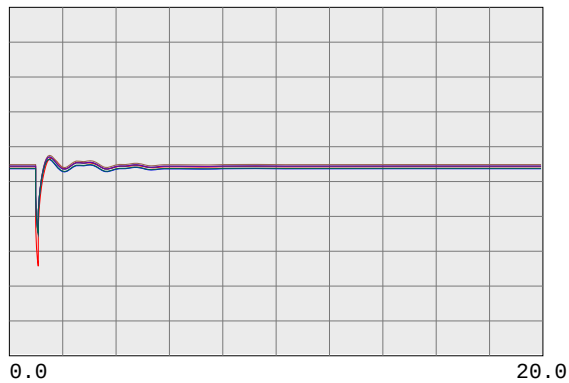
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



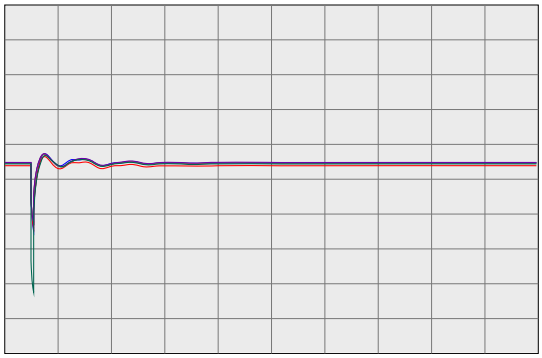
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

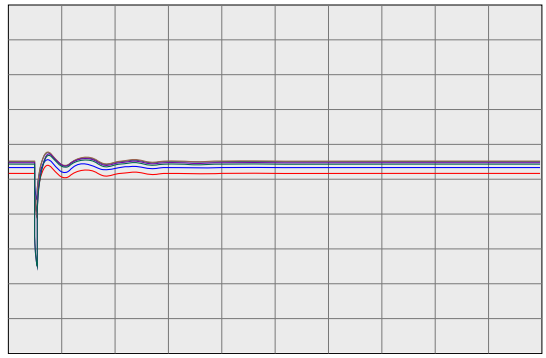
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

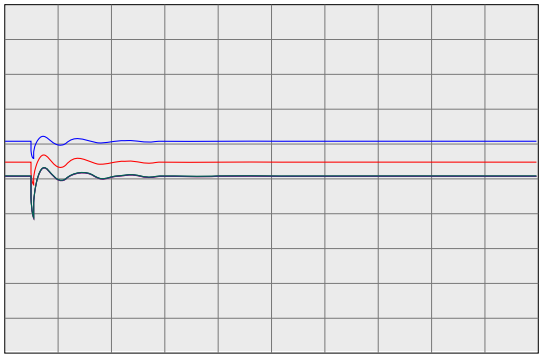
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

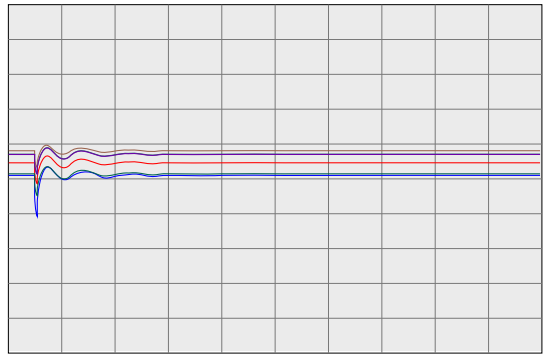
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

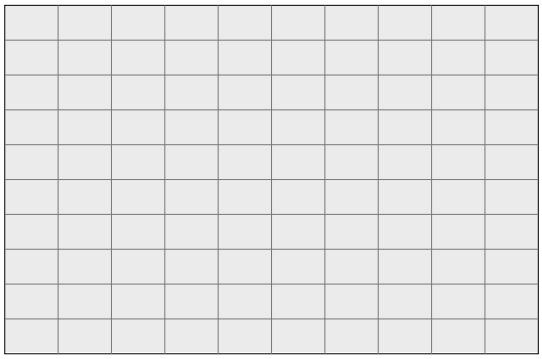
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

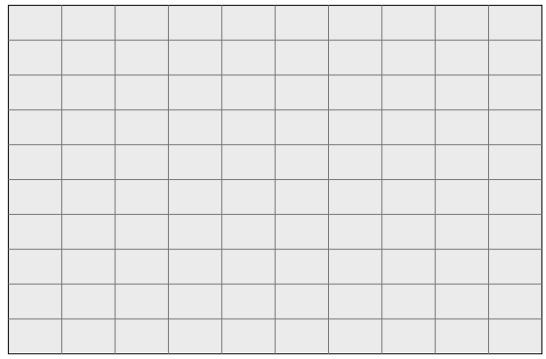


0.0 20.0

Time(sec)

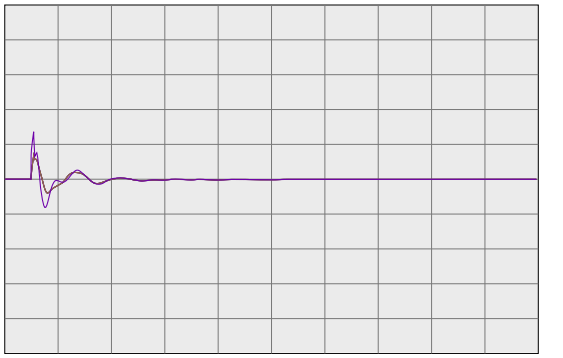
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



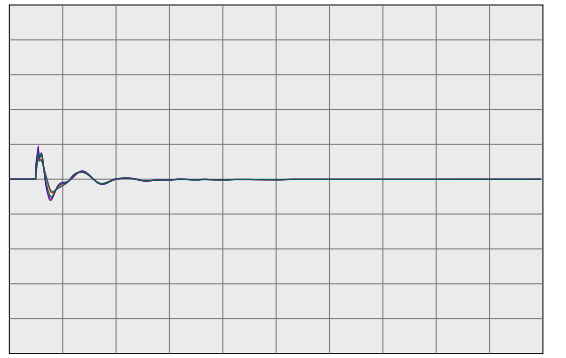


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

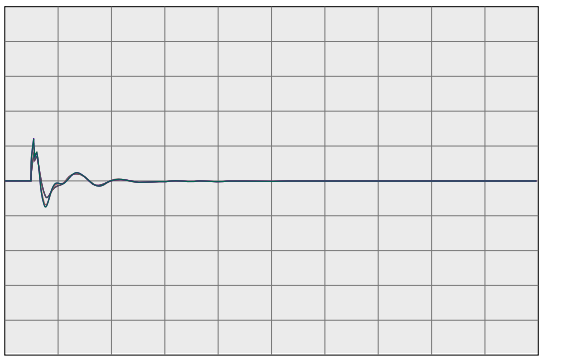
230-KV SYSTEM FREQUENCIES



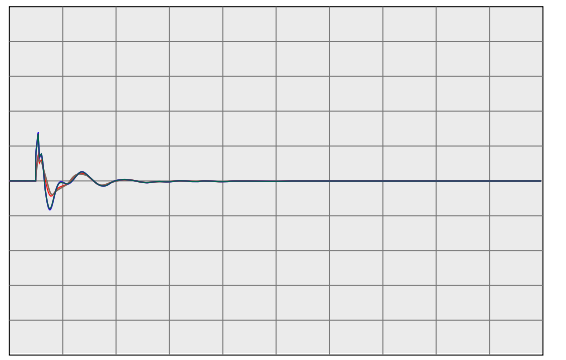
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



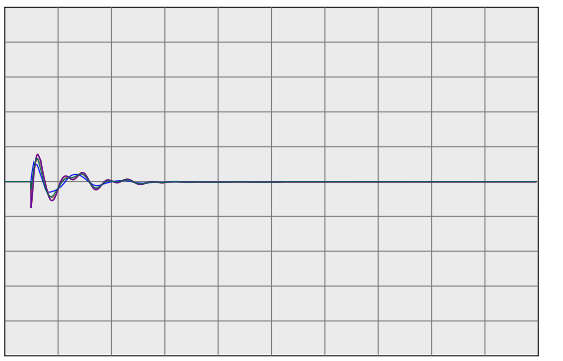
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



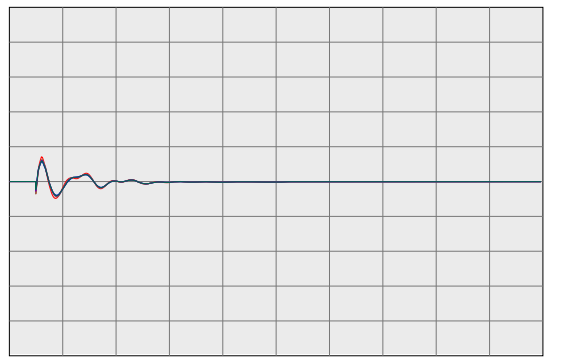
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



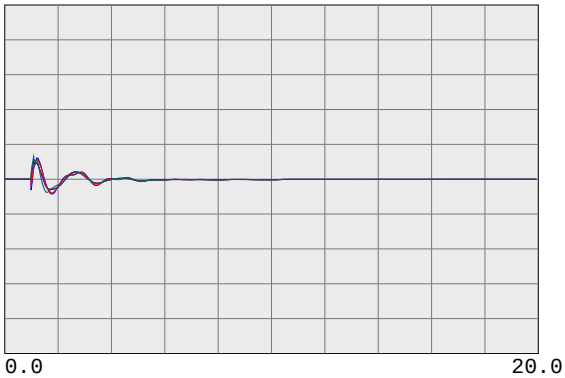
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



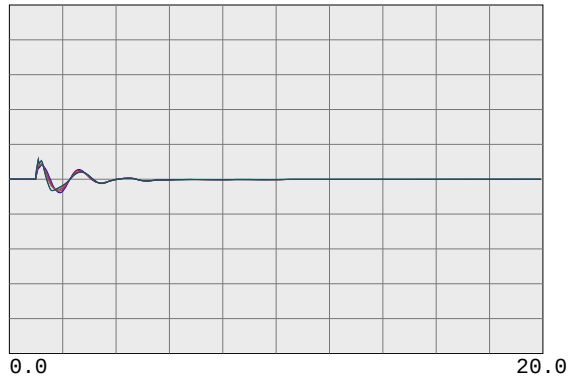
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

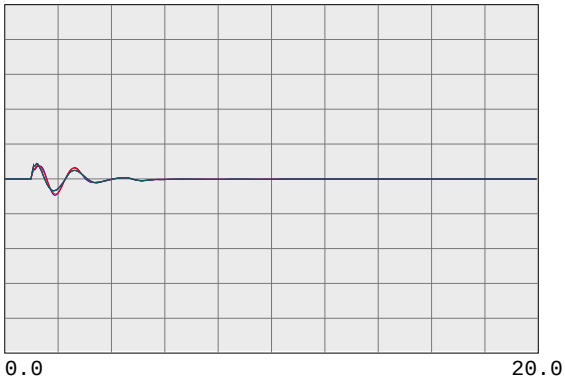
230-KV SYSTEM FREQUENCIES



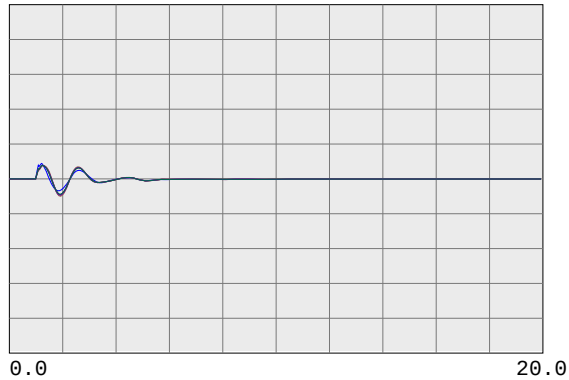
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



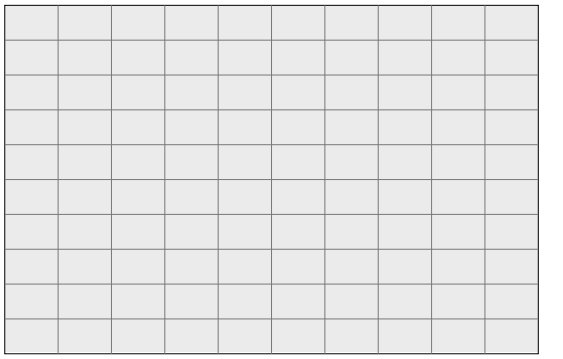
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

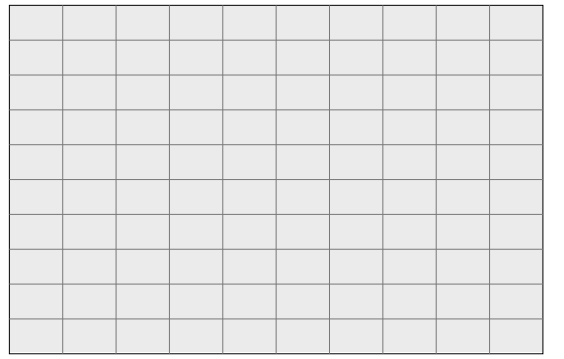


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



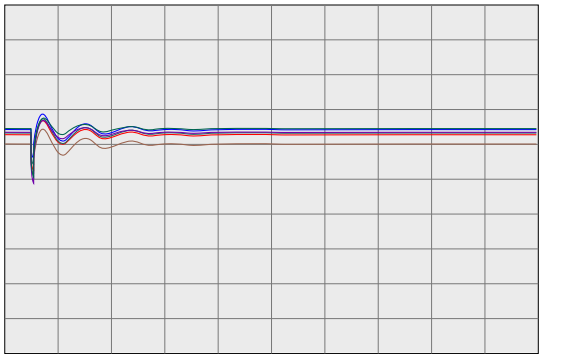
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



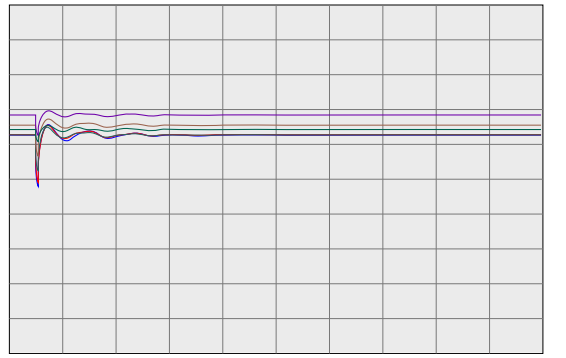


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

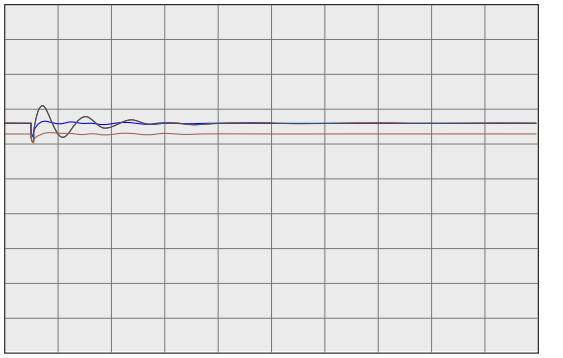
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



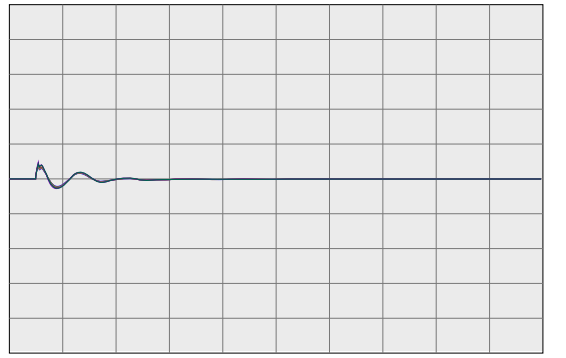
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



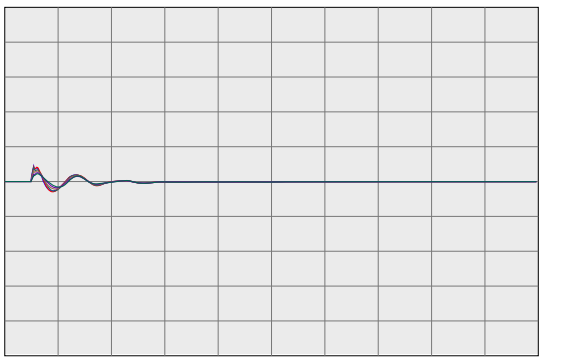
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



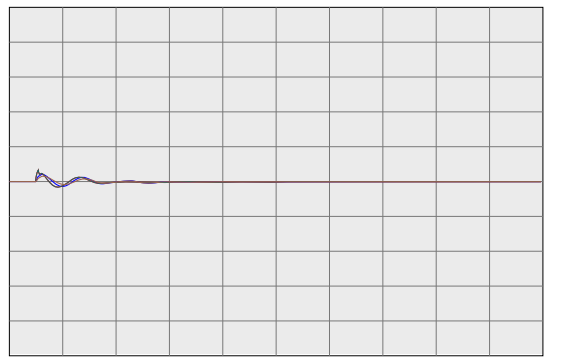
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



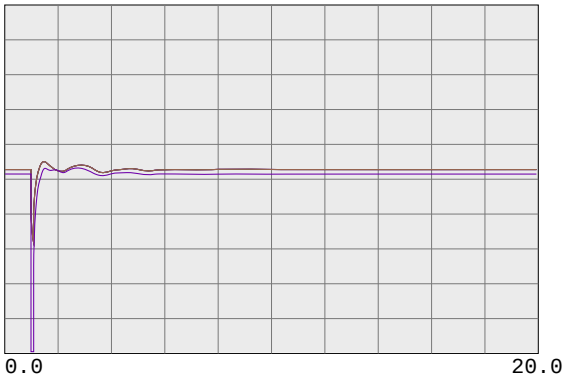
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

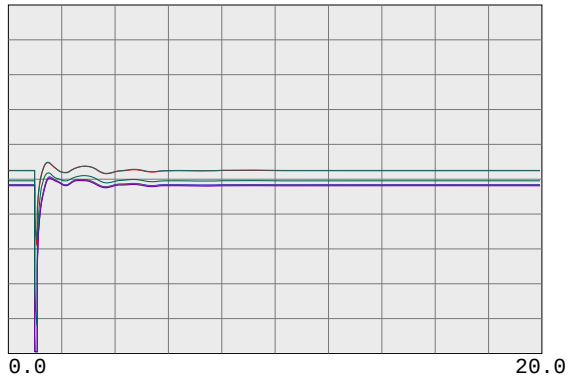
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

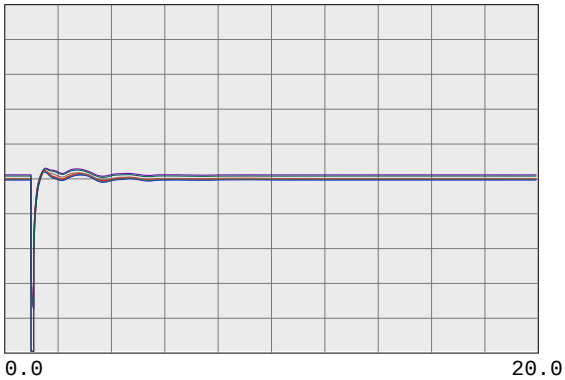
230-KV SYSTEM VOLTAGES



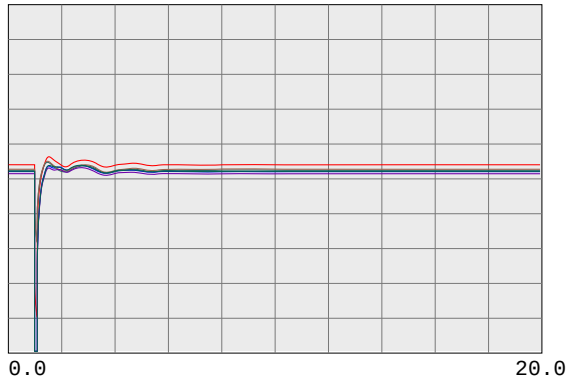
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



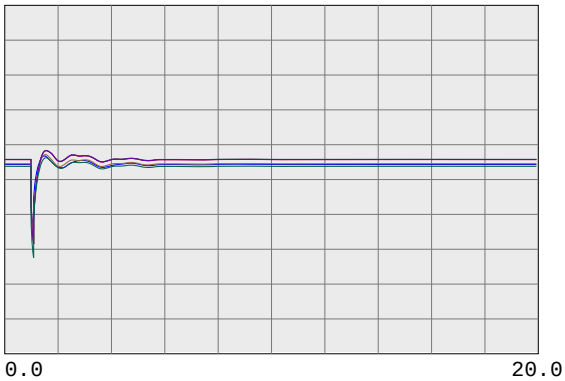
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



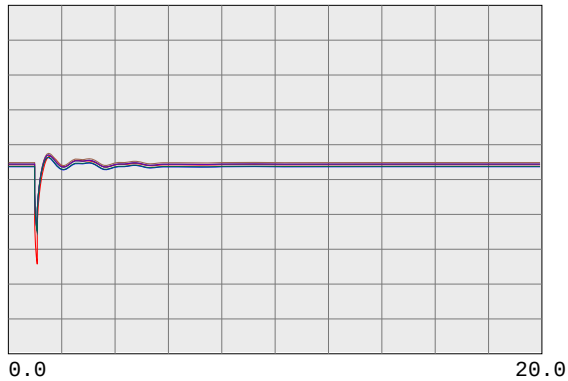
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



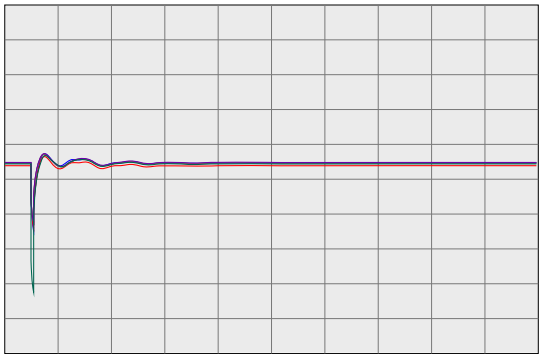
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

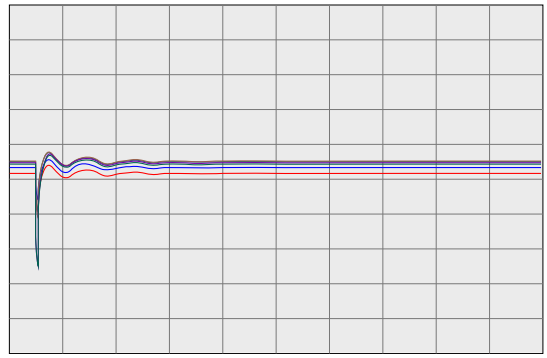
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

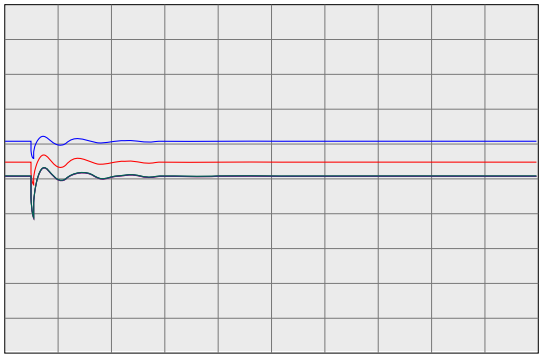
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

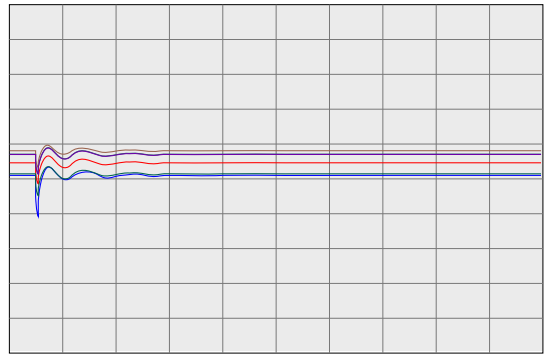
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

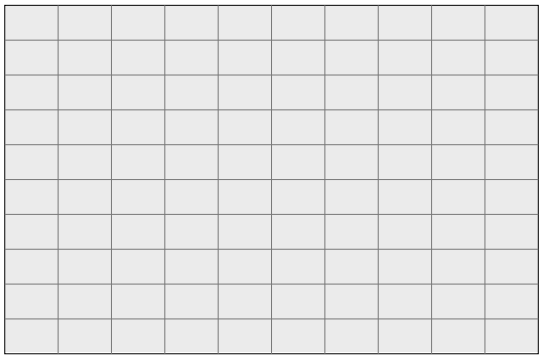
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

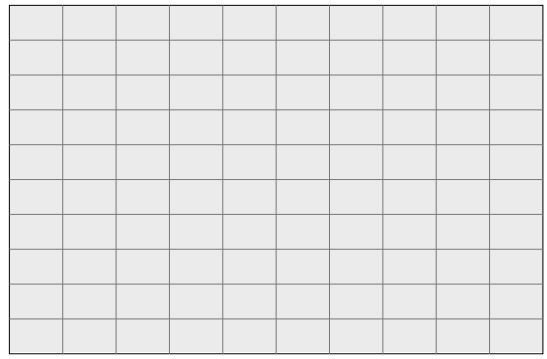


0.0 20.0

Time(sec)

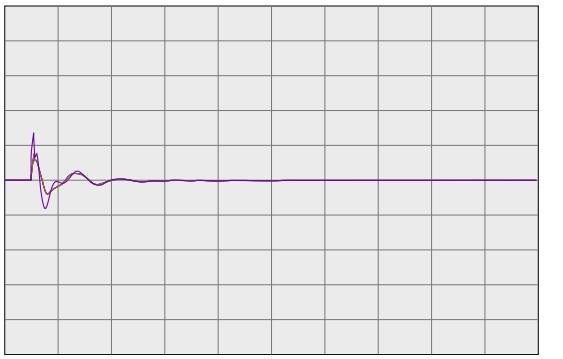
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



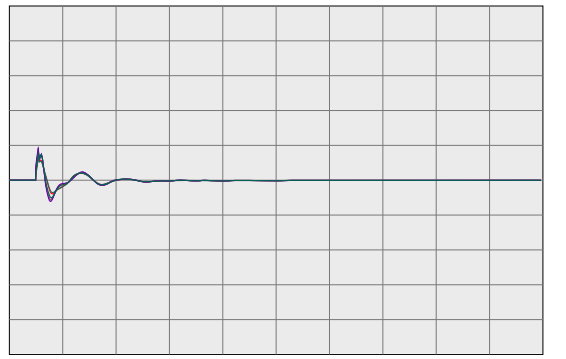


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

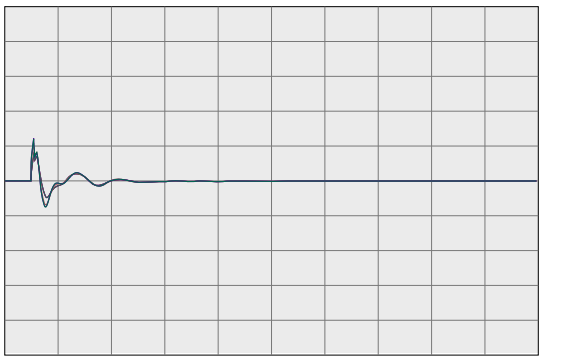
230-KV SYSTEM FREQUENCIES



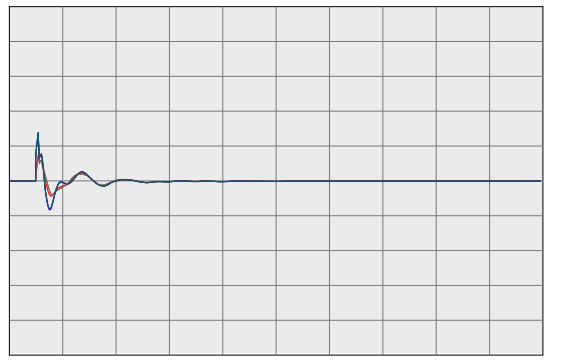
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



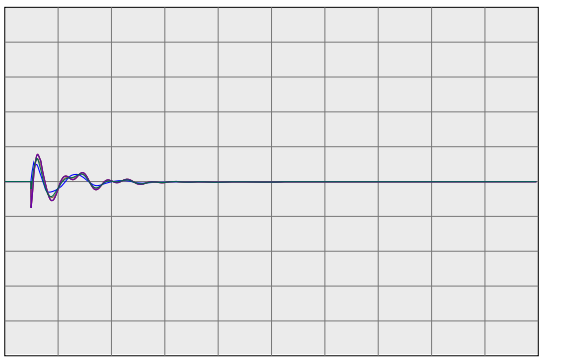
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



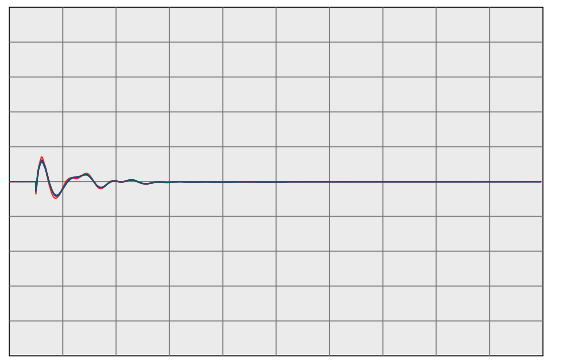
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



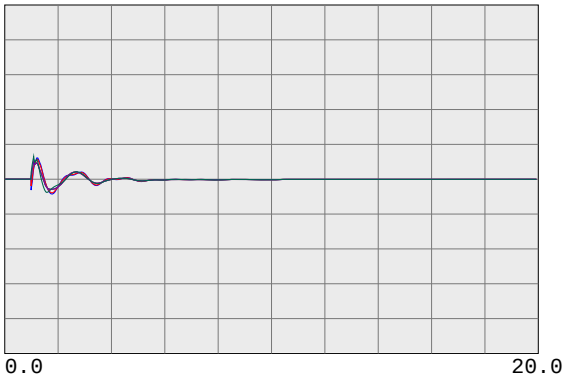
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



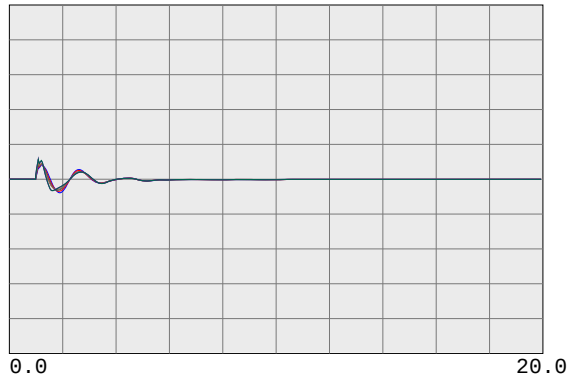
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

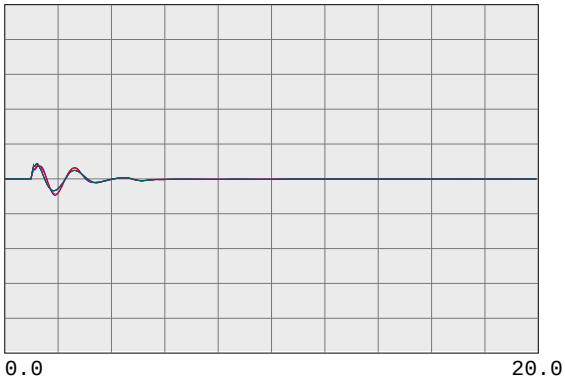
230-KV SYSTEM FREQUENCIES



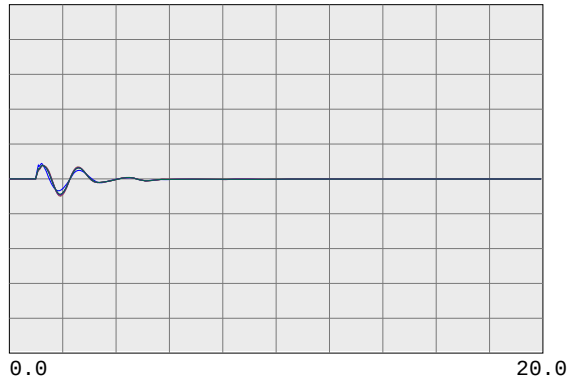
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



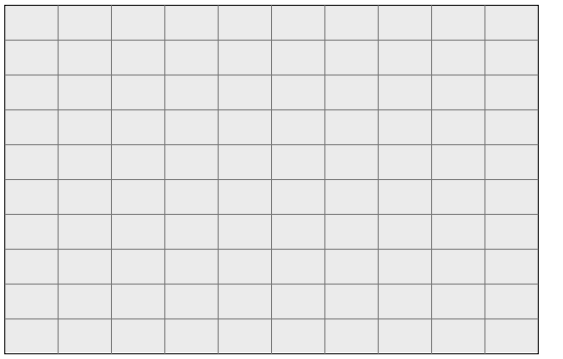
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

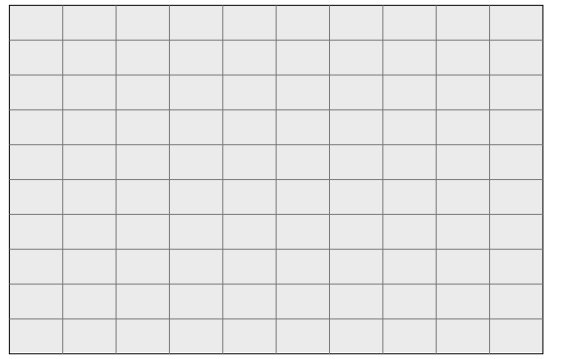


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



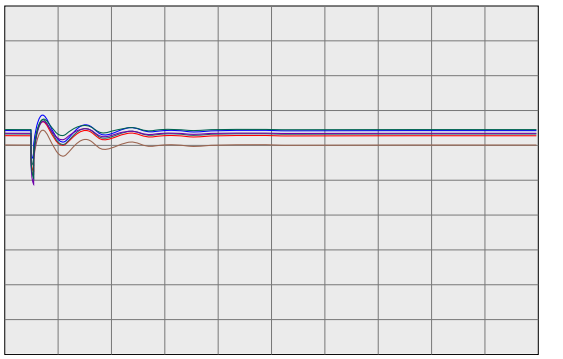
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



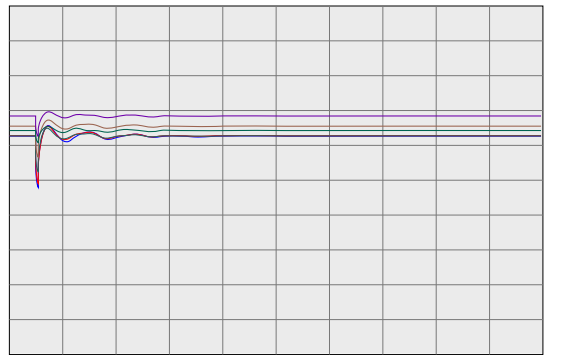


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

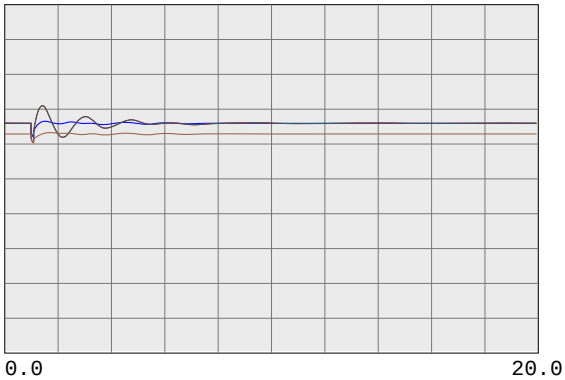
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



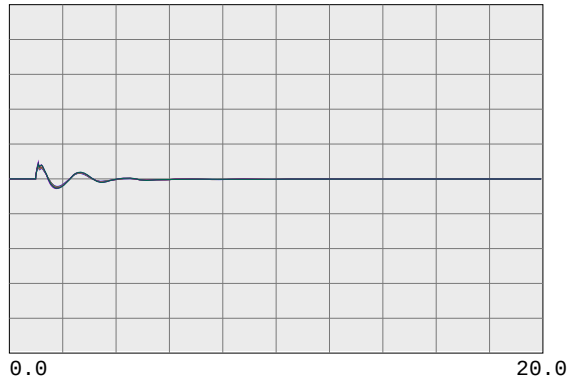
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



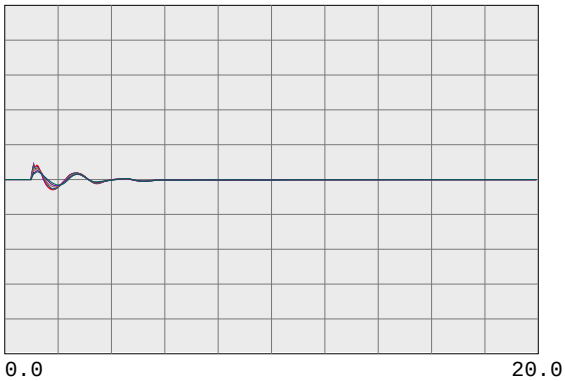
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

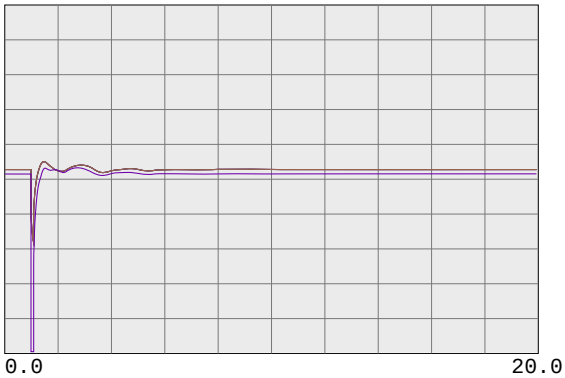
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

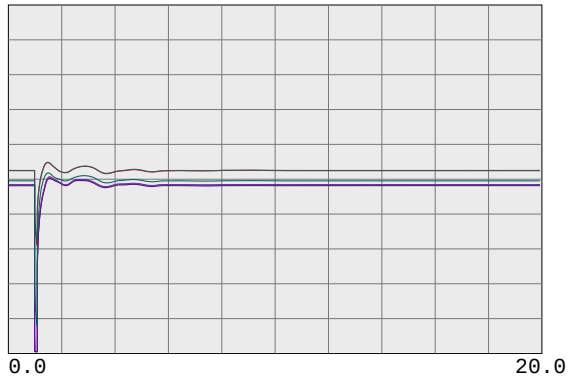
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

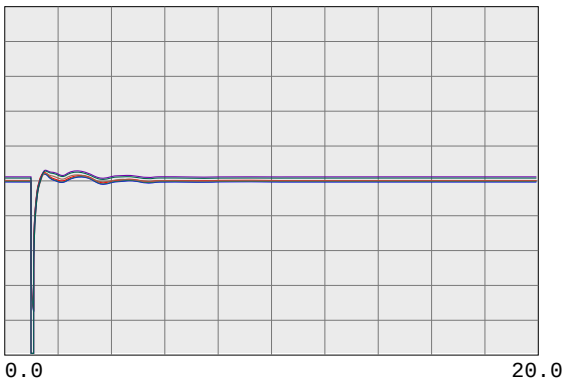
230-KV SYSTEM VOLTAGES



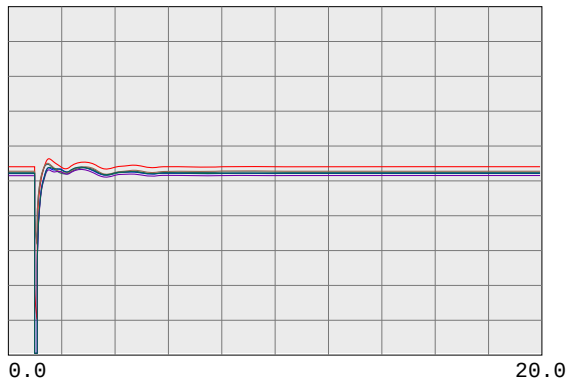
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



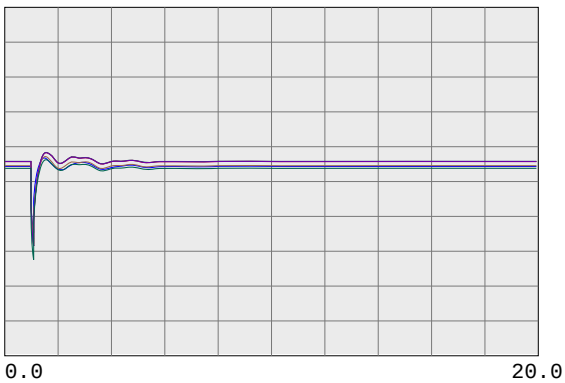
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



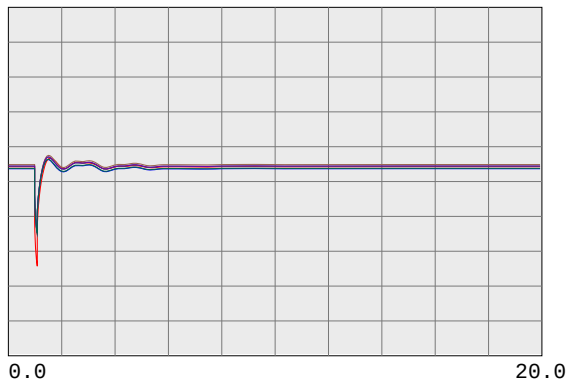
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



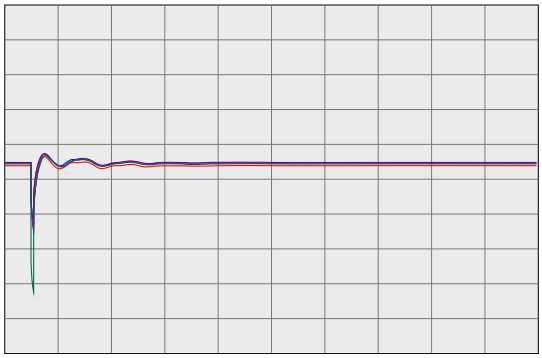
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

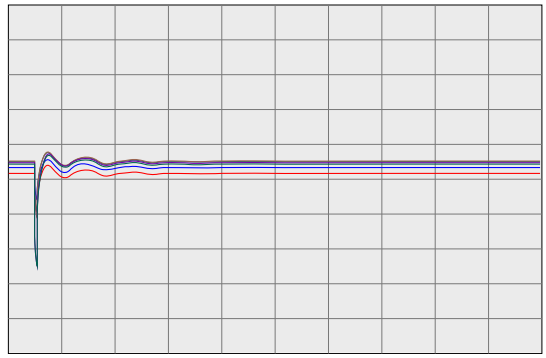
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

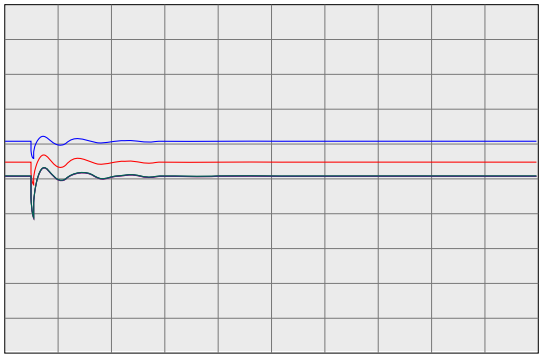
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

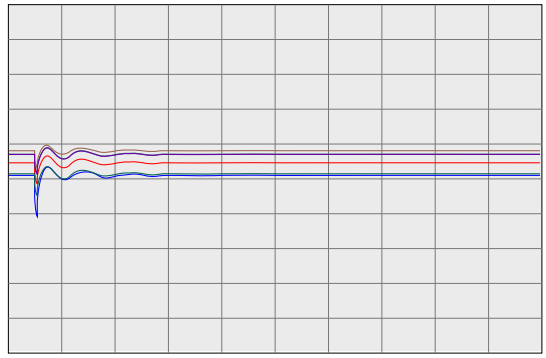
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

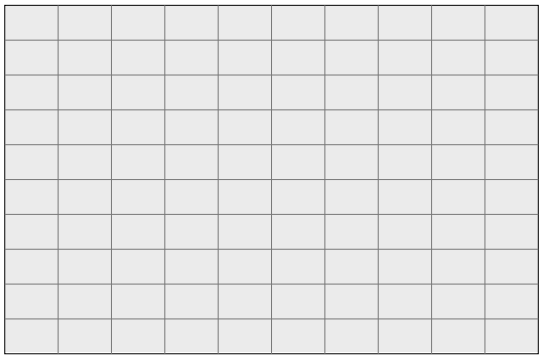
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

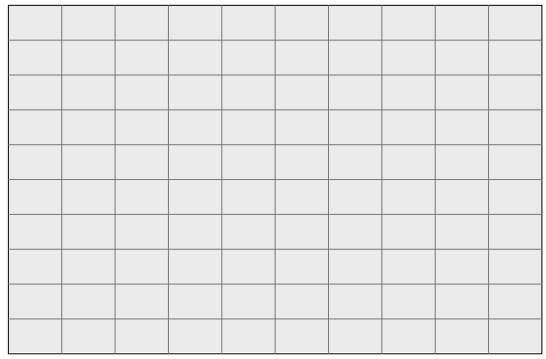


0.0 20.0

Time(sec)

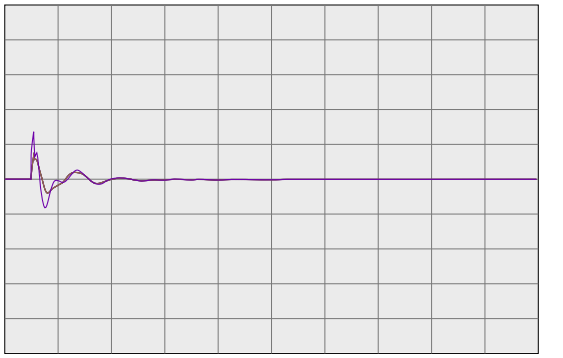
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



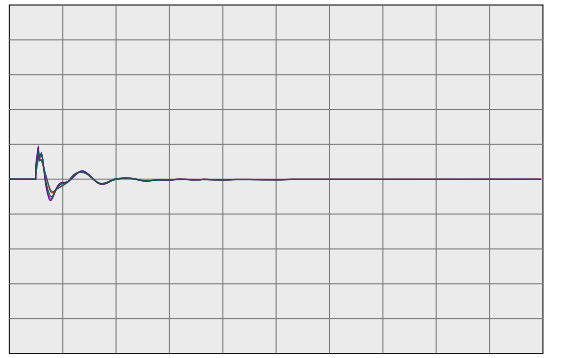


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

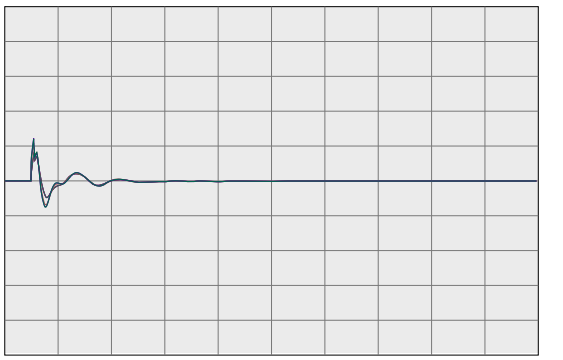
230-KV SYSTEM FREQUENCIES



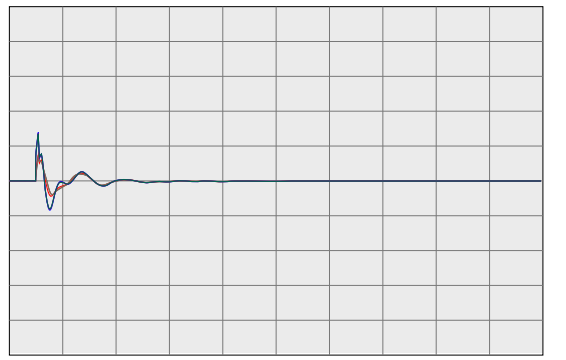
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



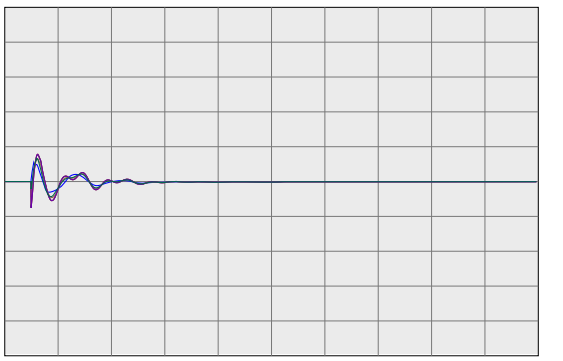
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



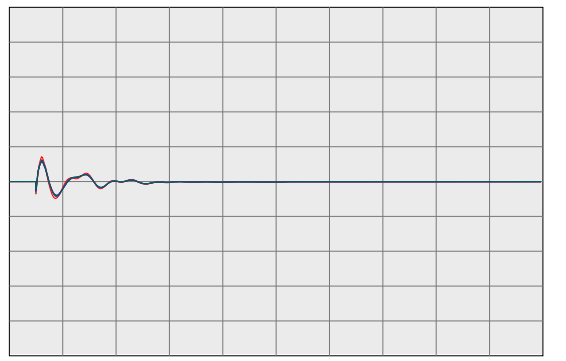
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



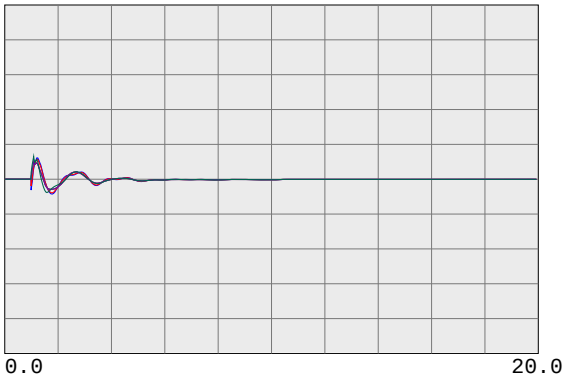
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



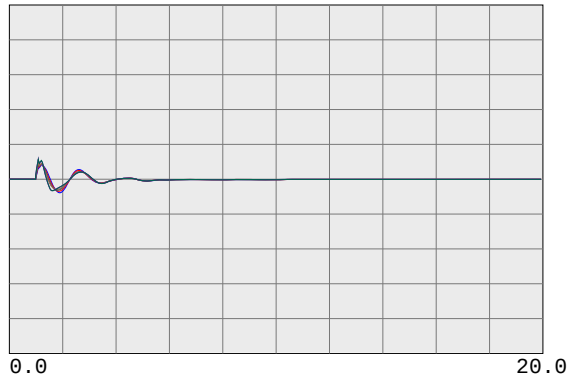
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

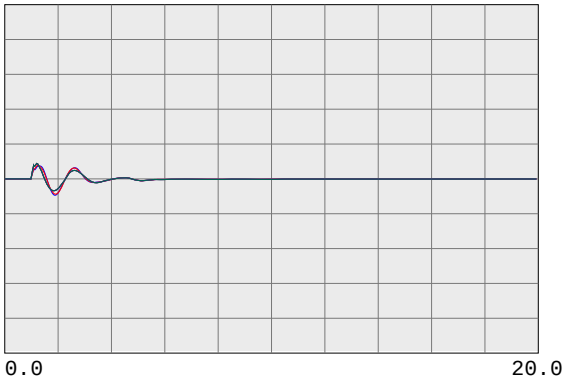
230-KV SYSTEM FREQUENCIES



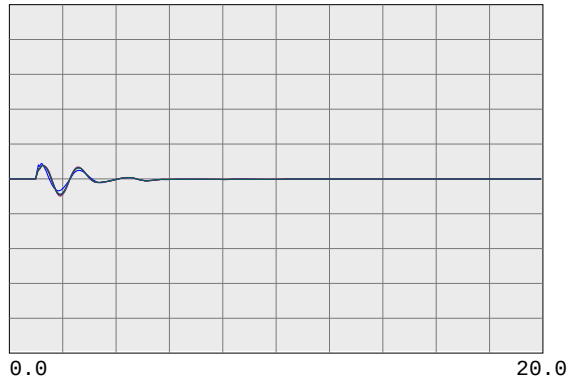
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



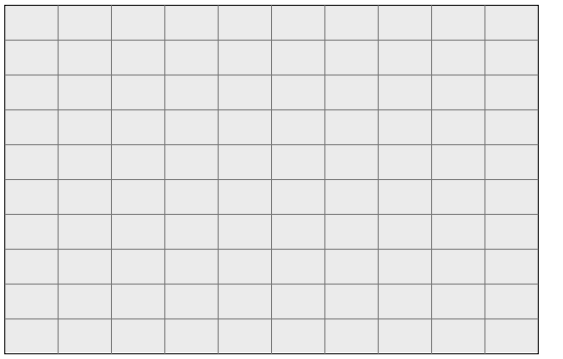
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

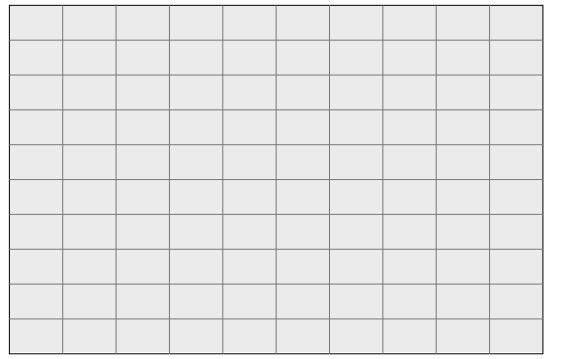


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



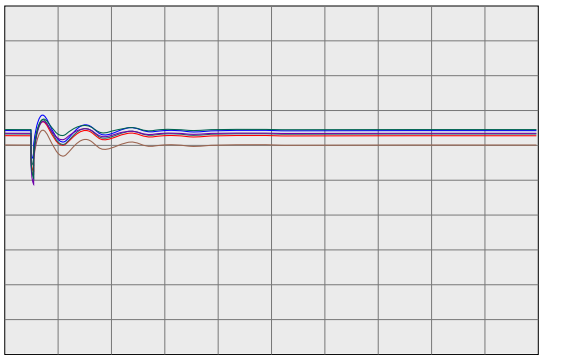
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



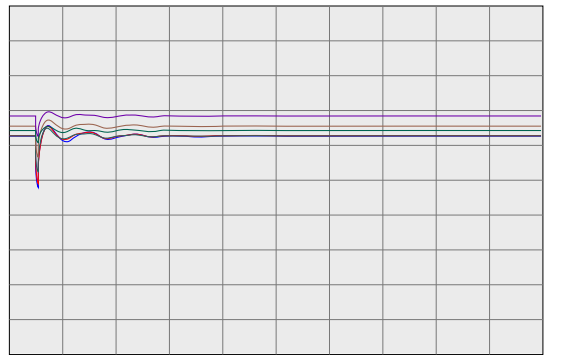


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

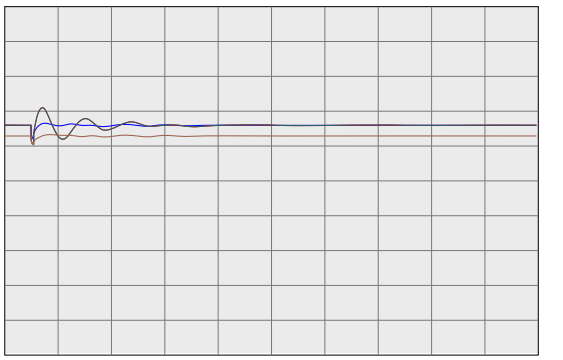
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



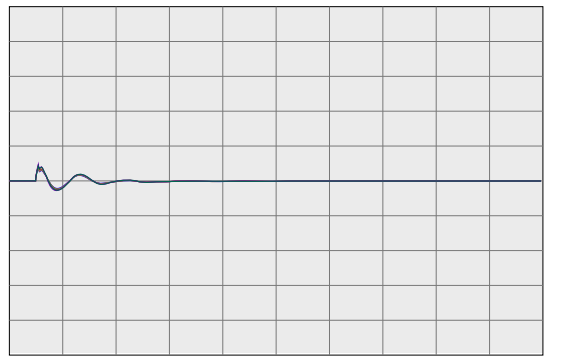
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



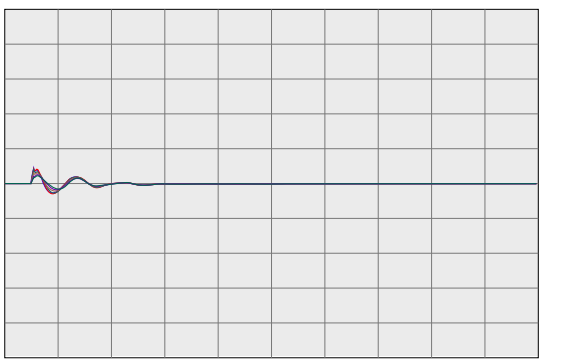
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



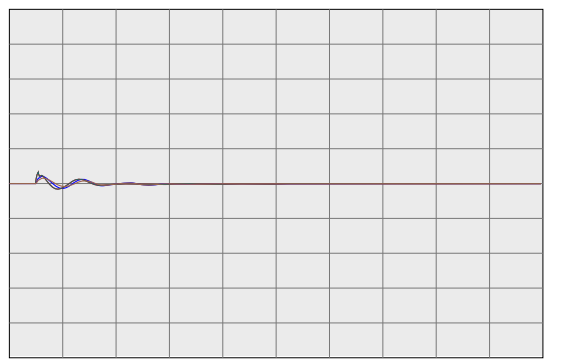
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



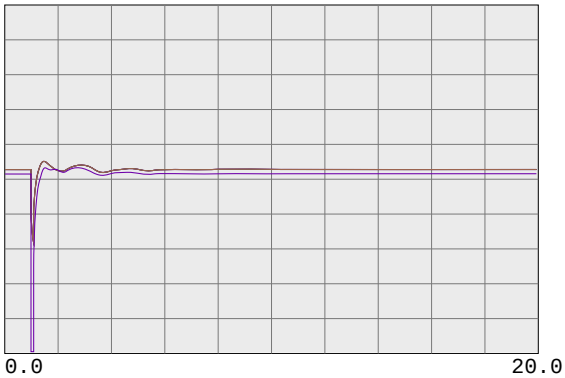
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

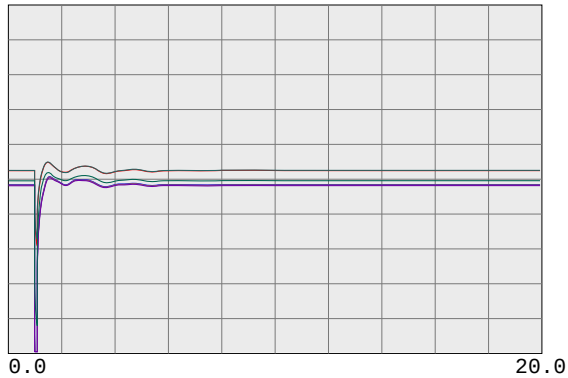
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

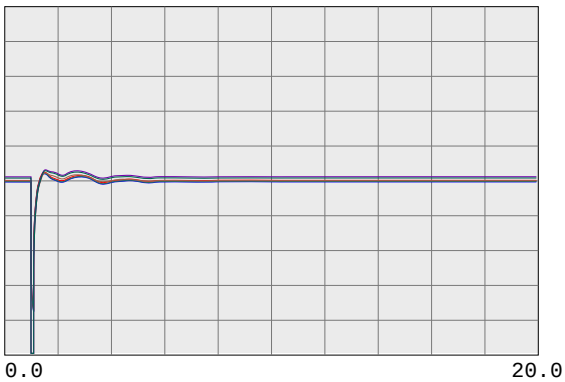
230-KV SYSTEM VOLTAGES



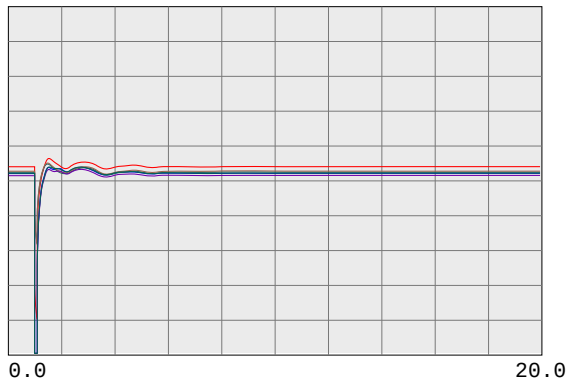
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



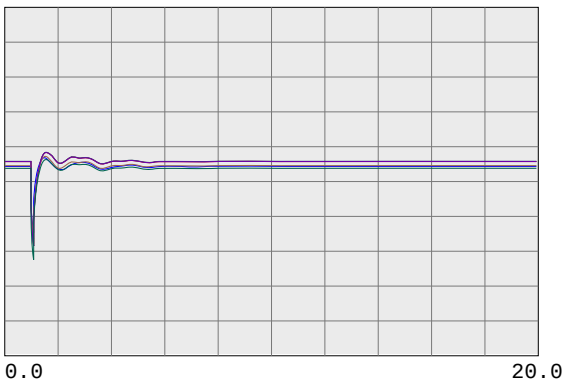
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



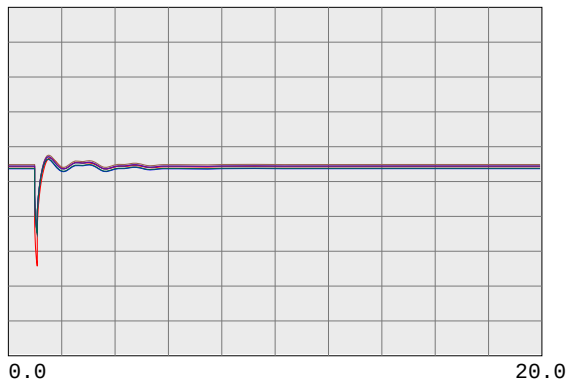
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



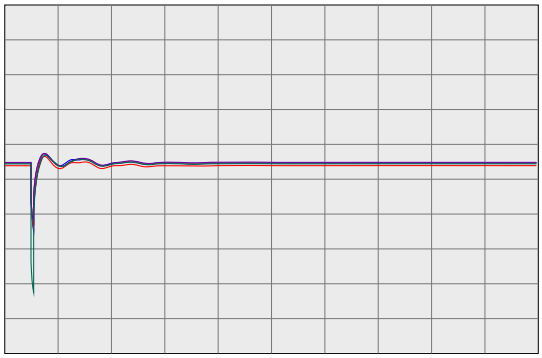
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

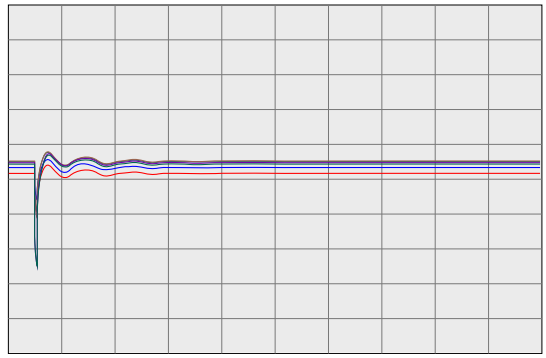
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

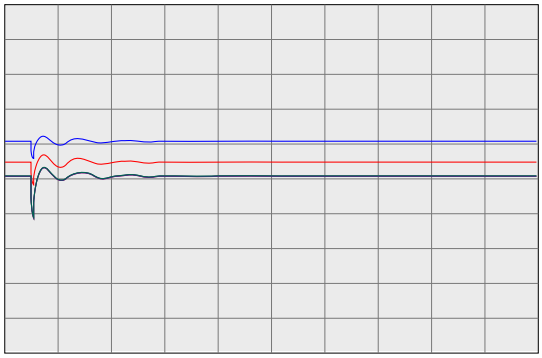
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

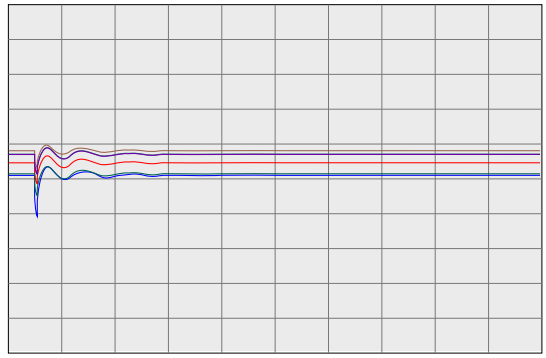
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

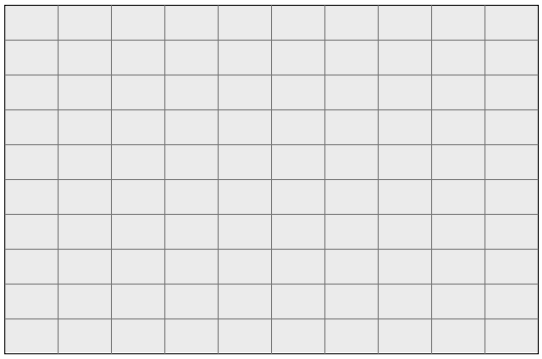
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

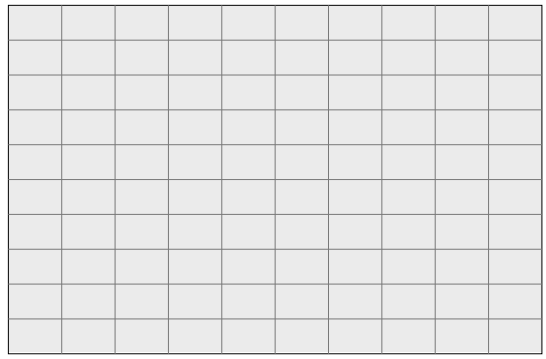


0.0 20.0

Time(sec)

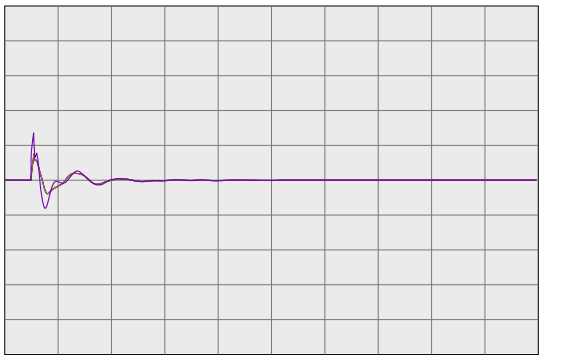
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



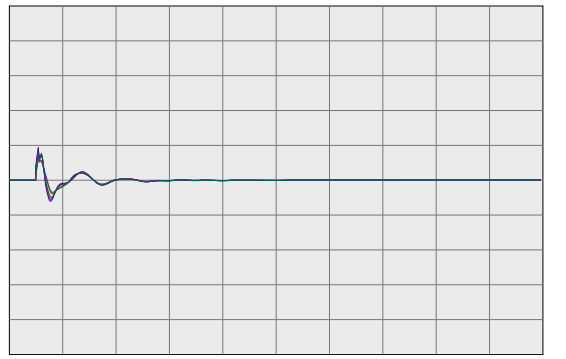


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

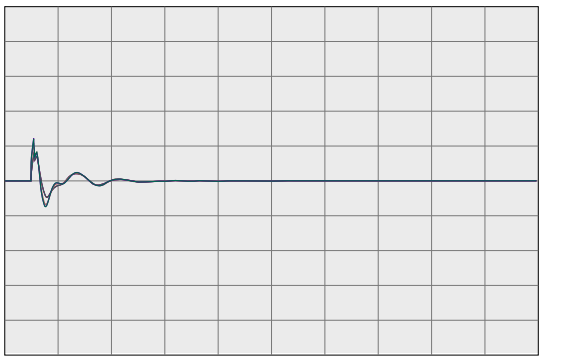
230-KV SYSTEM FREQUENCIES



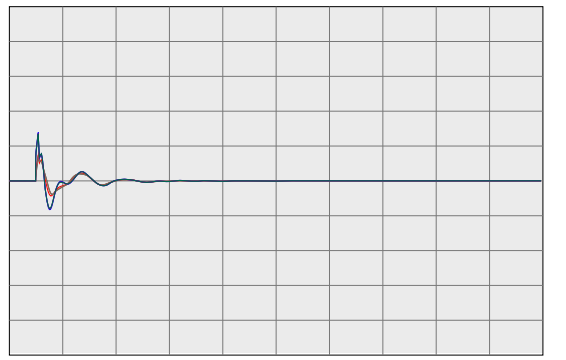
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



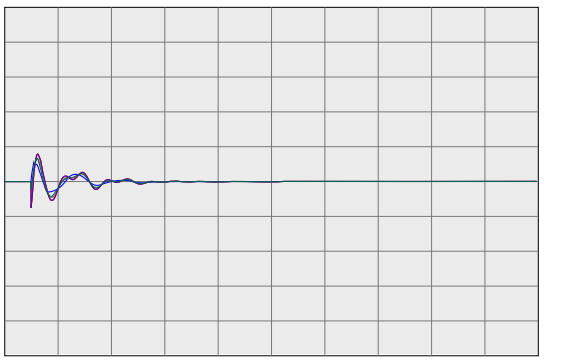
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



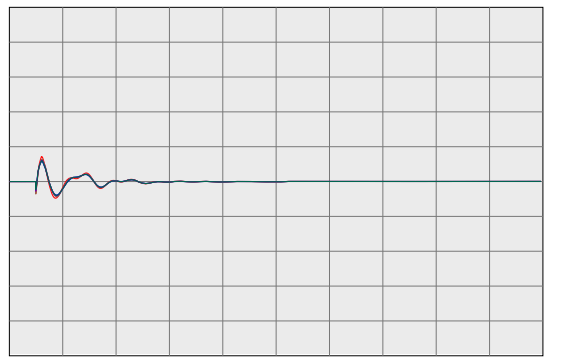
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



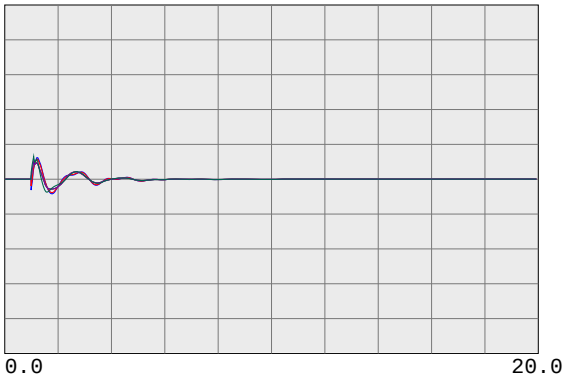
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



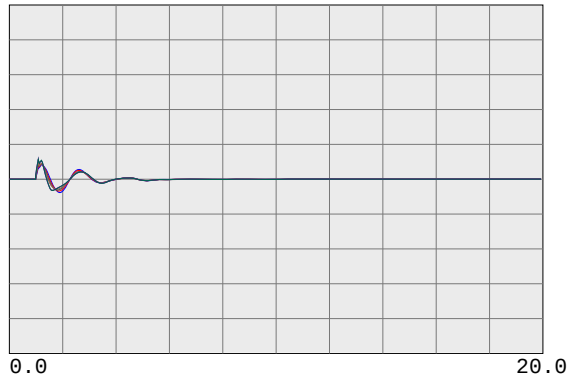
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

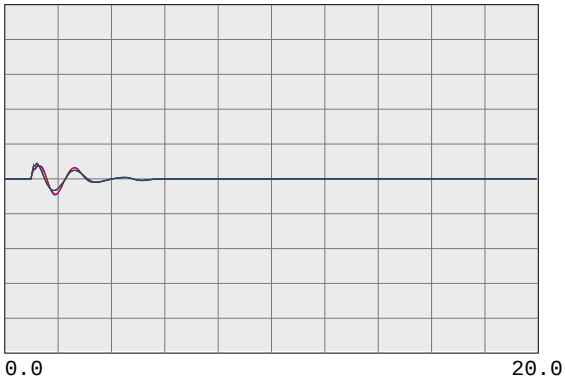
230-KV SYSTEM FREQUENCIES



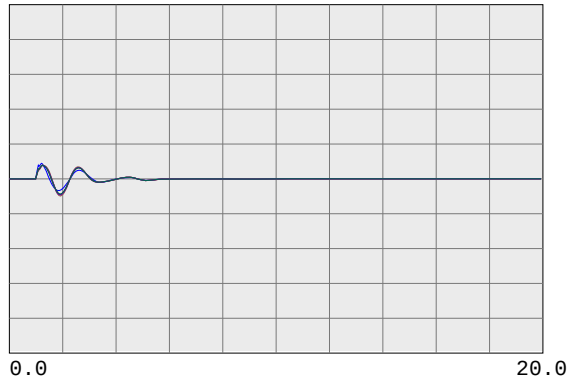
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



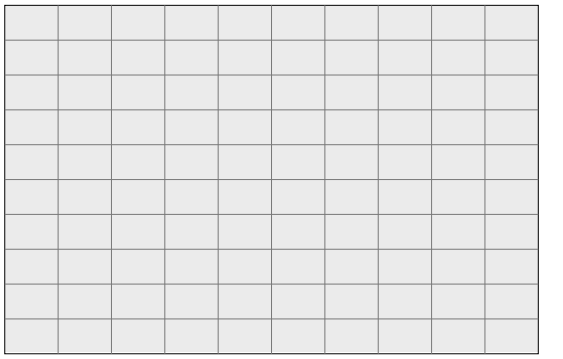
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

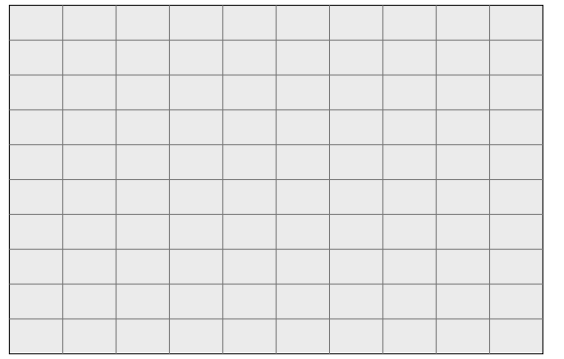


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



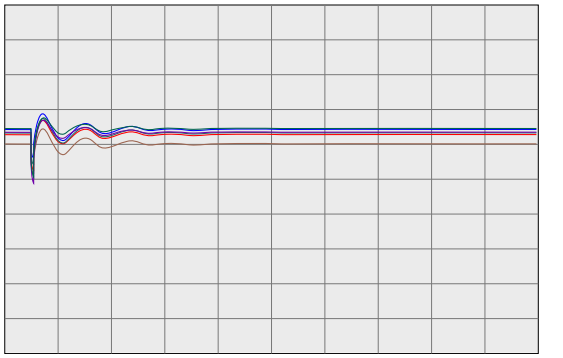
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



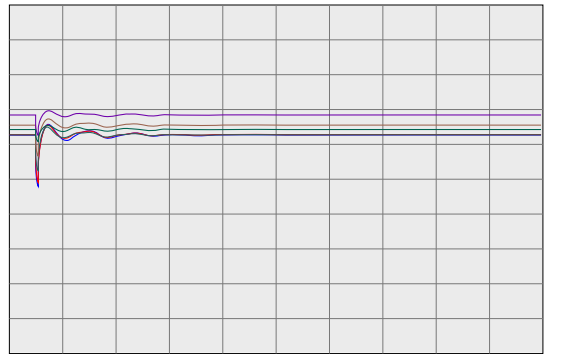


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

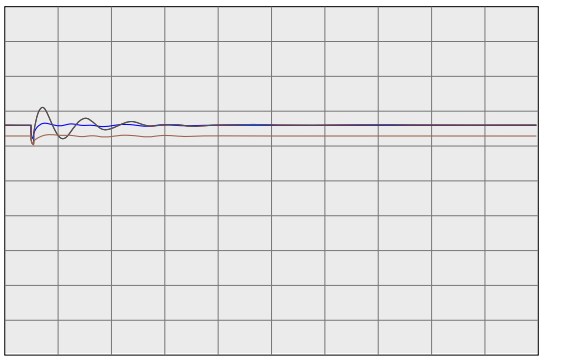
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



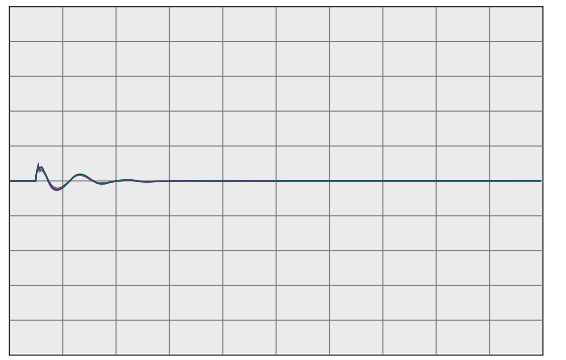
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



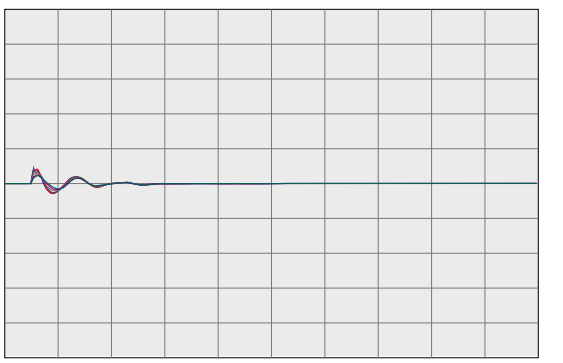
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



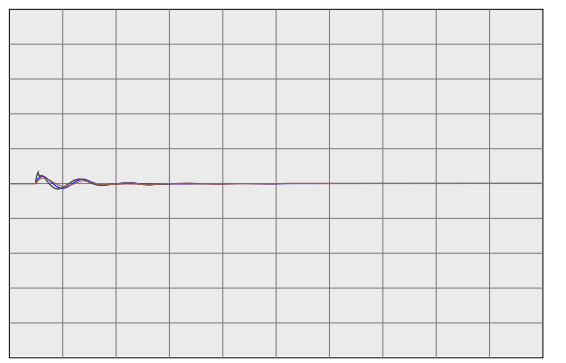
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



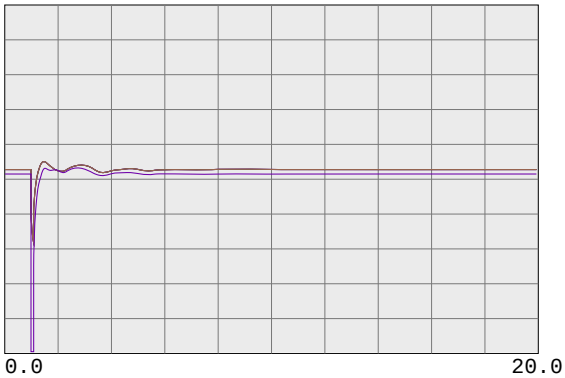
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

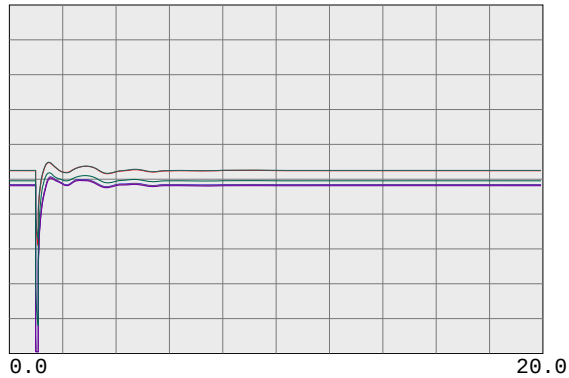
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

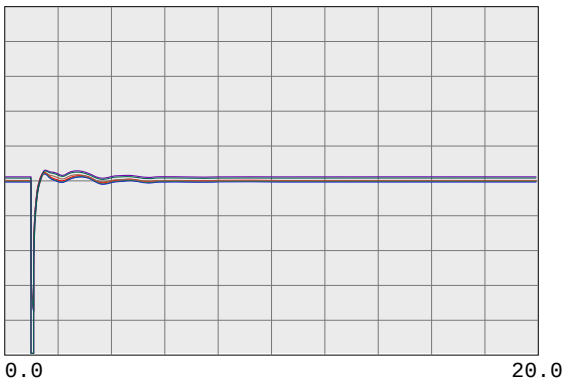
230-KV SYSTEM VOLTAGES



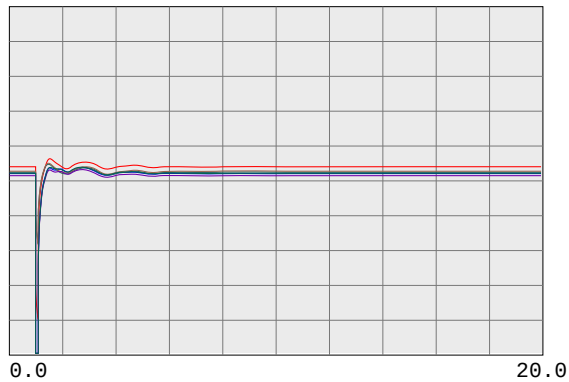
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



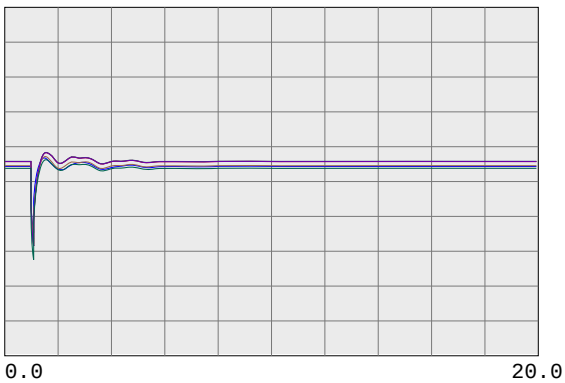
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



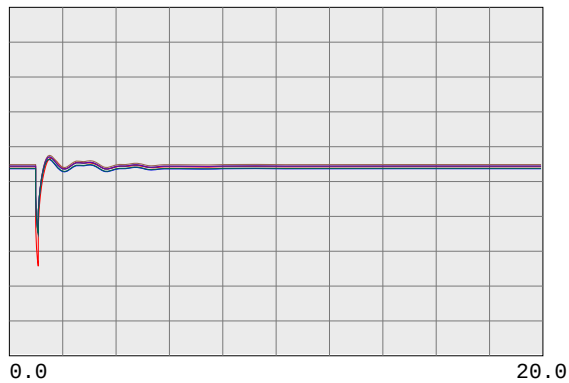
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



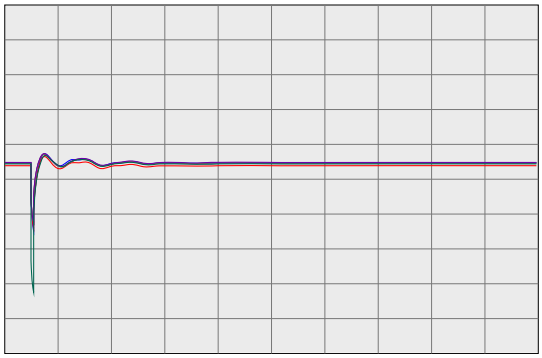
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

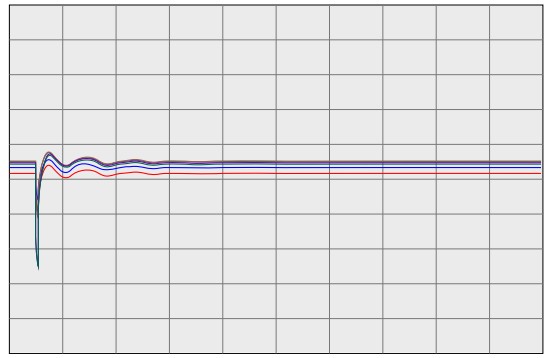
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

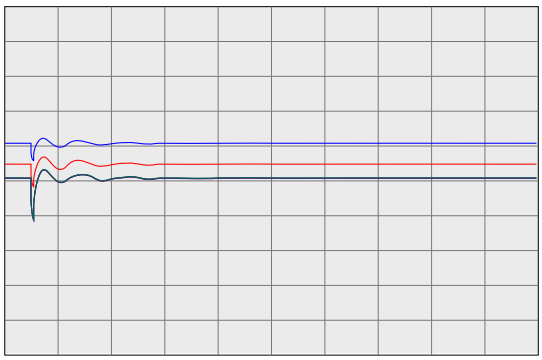
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

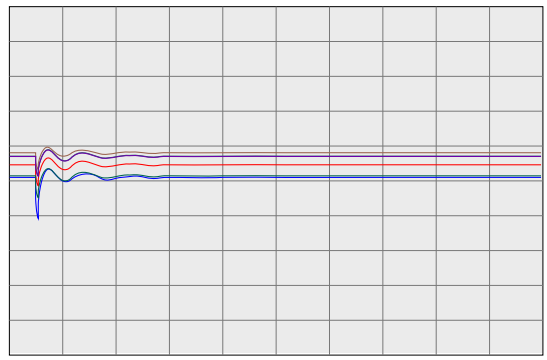
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

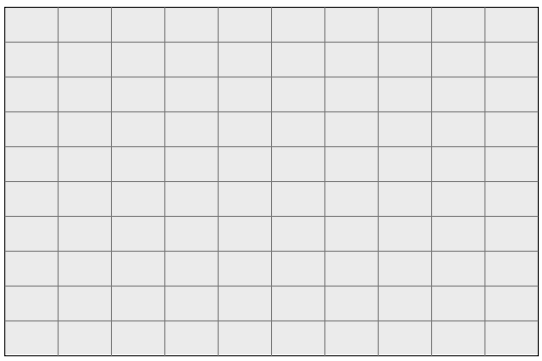
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

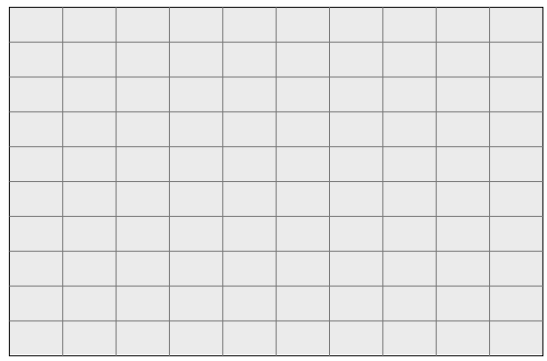


0.0 20.0

Time(sec)

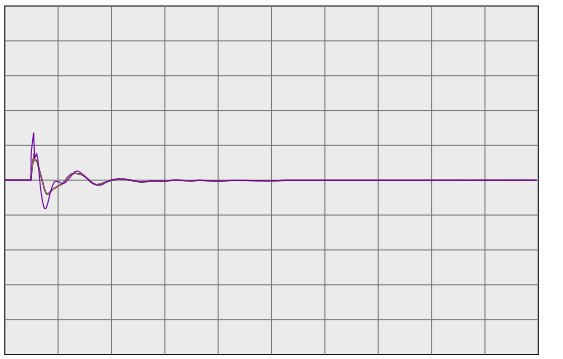
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



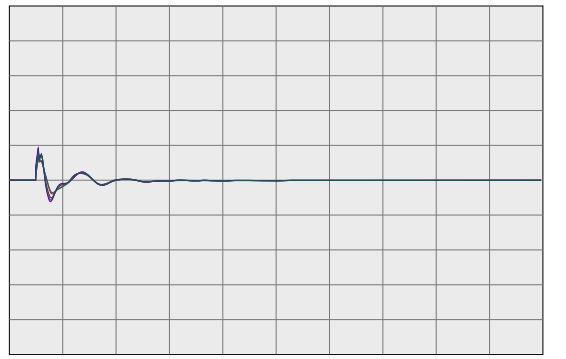


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

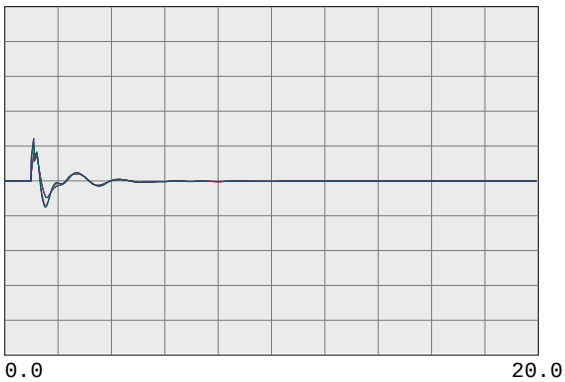
230-KV SYSTEM FREQUENCIES



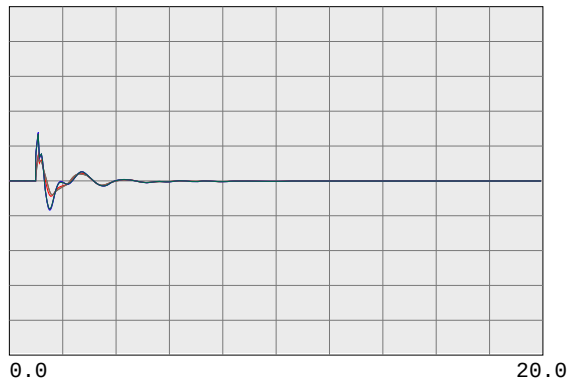
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



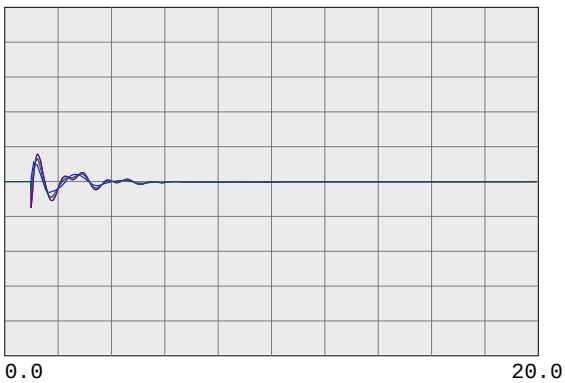
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



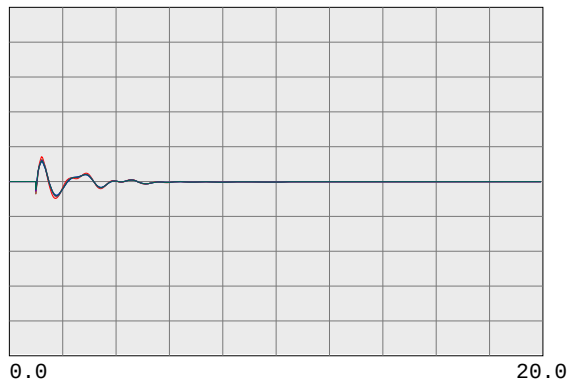
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



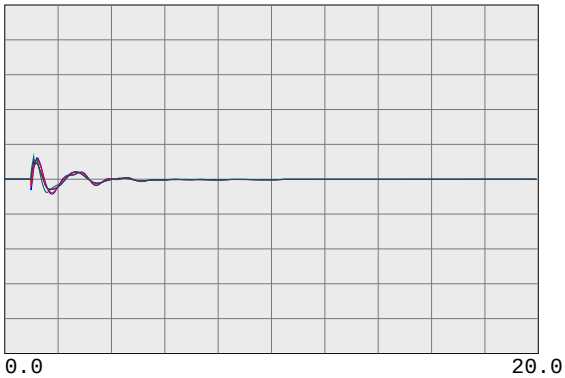
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



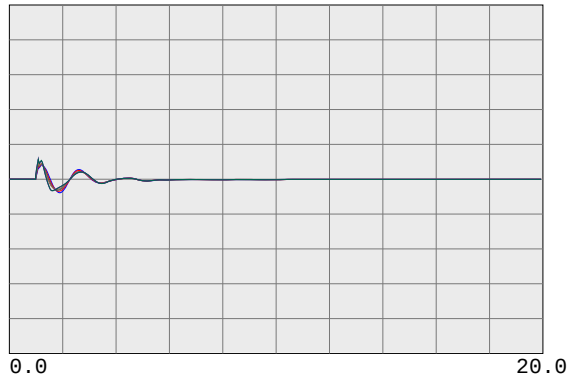
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

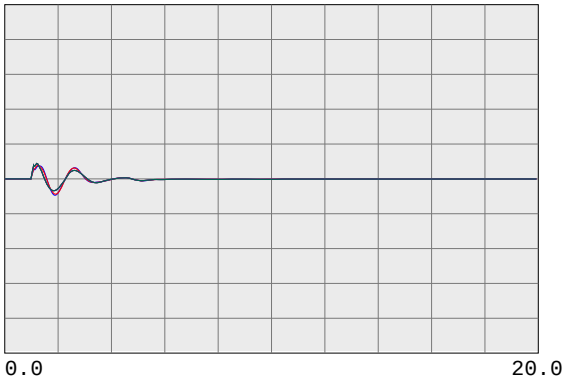
230-KV SYSTEM FREQUENCIES



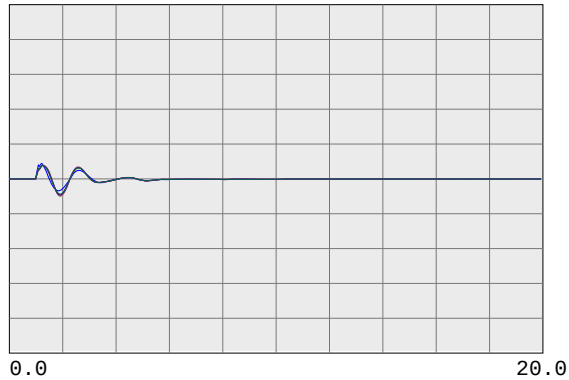
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



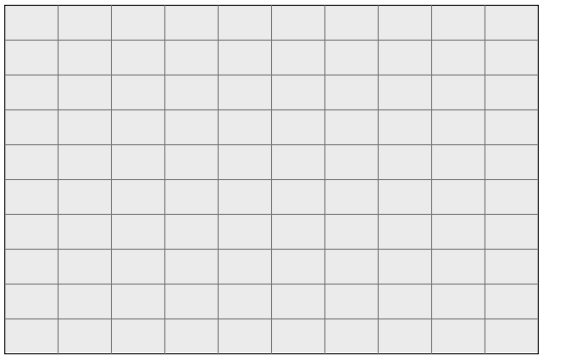
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

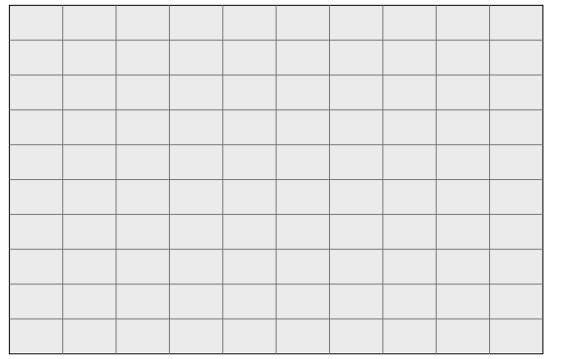


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



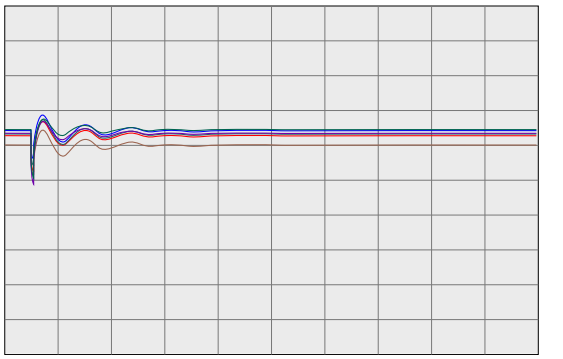
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



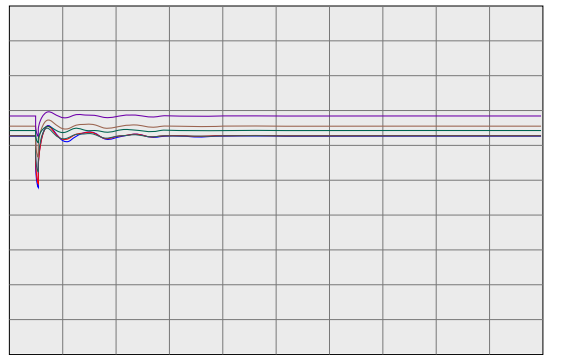


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

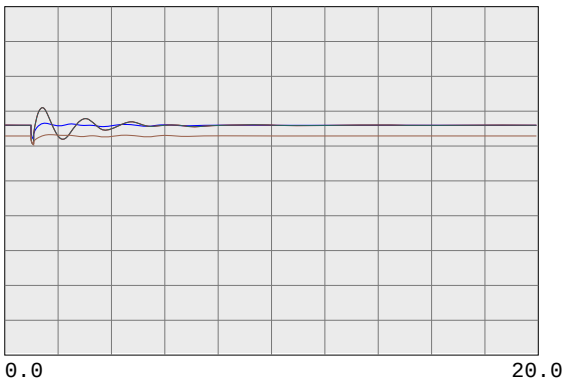
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



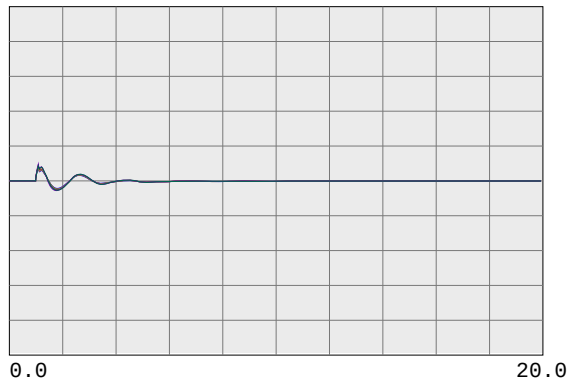
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



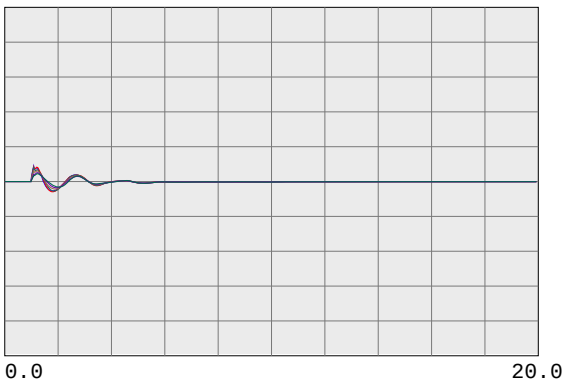
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



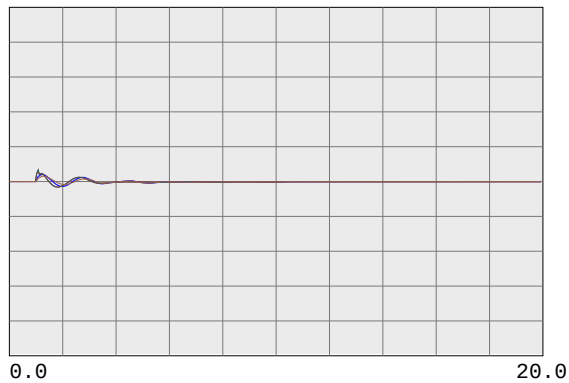
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



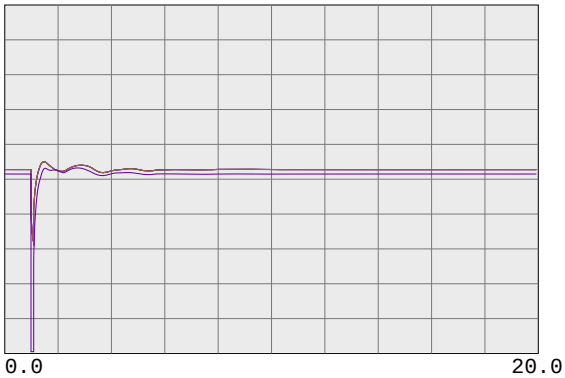
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

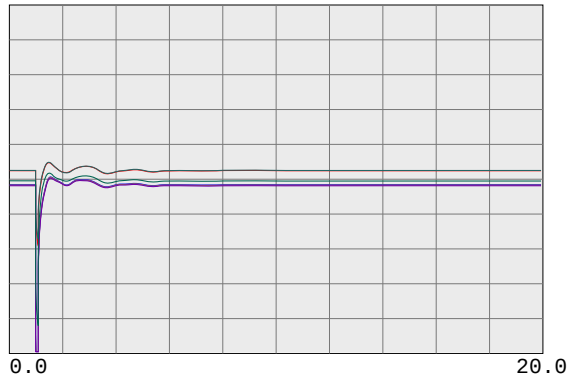
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

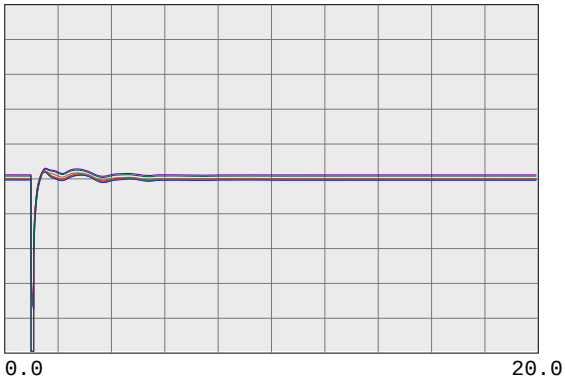
230-KV SYSTEM VOLTAGES



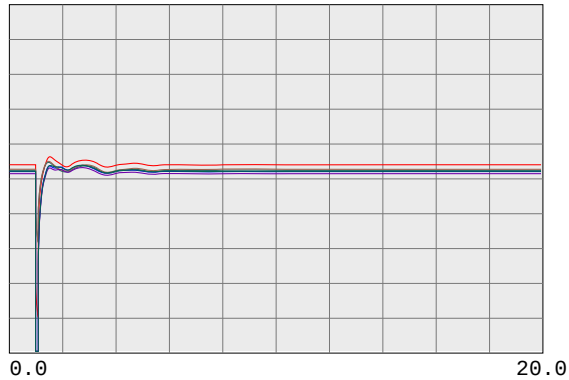
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



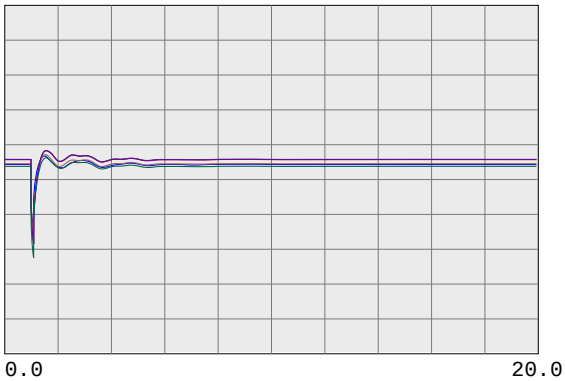
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



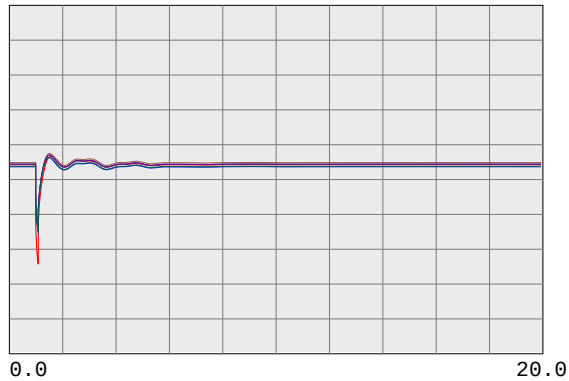
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



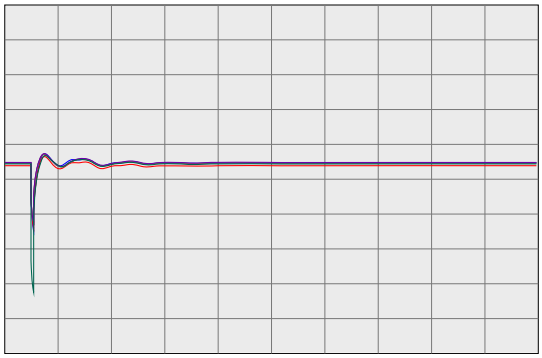
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

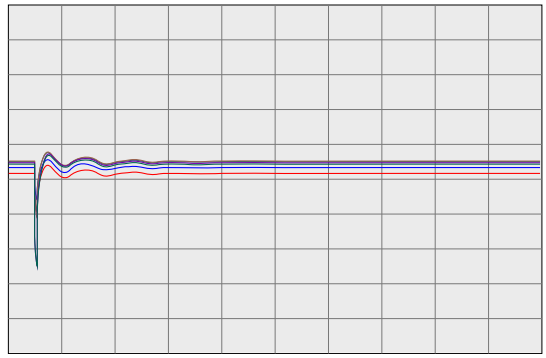
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

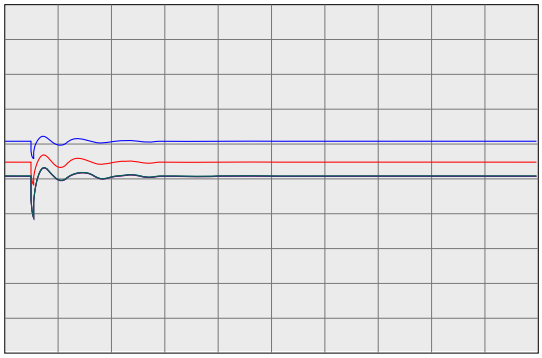
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

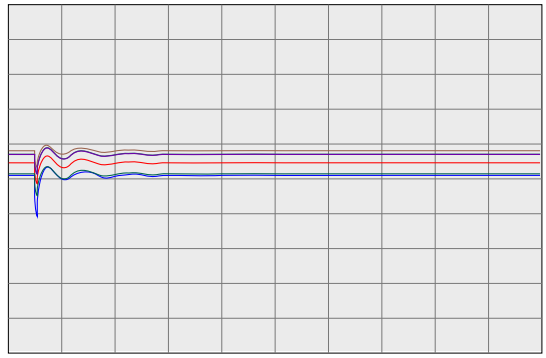
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

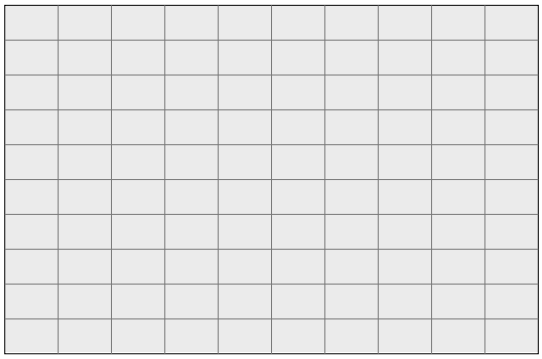
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

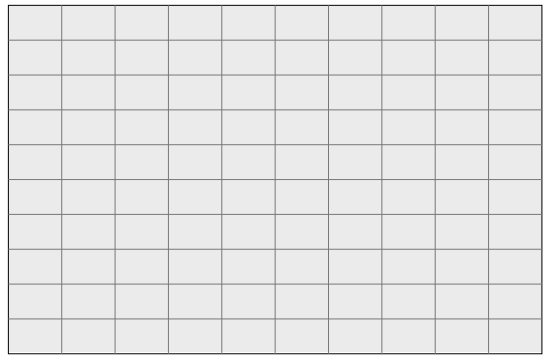


0.0 20.0

Time(sec)

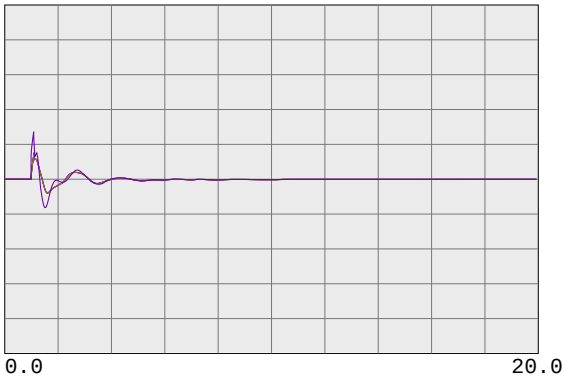
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



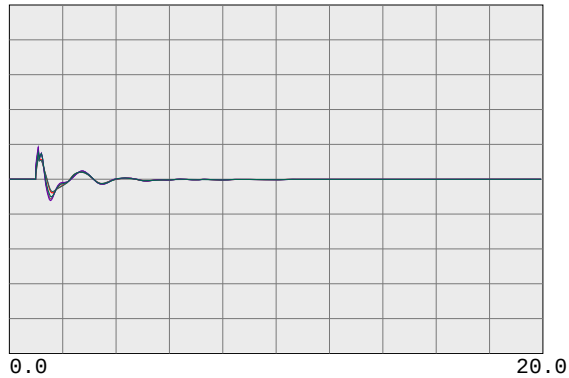


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

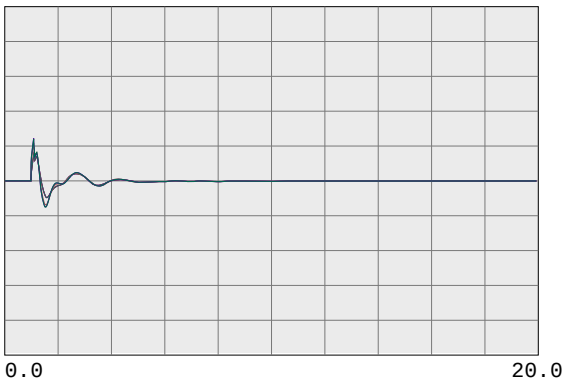
230-KV SYSTEM FREQUENCIES



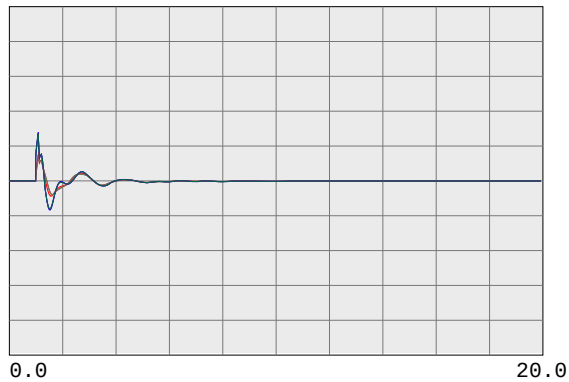
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



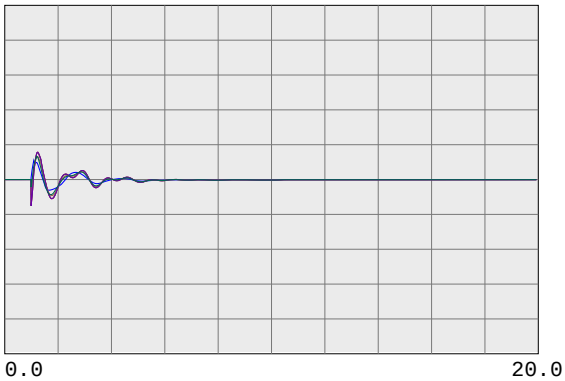
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



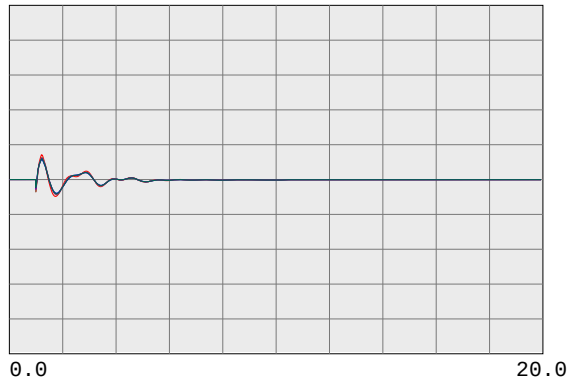
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



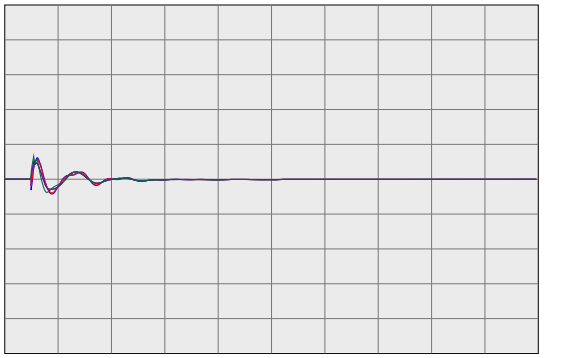
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



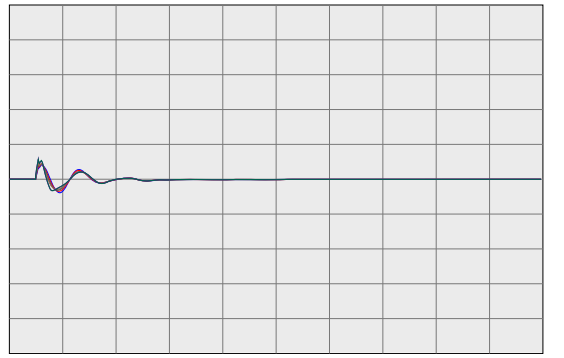
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

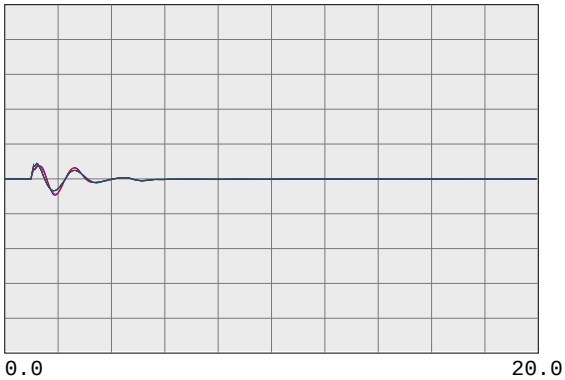
230-KV SYSTEM FREQUENCIES



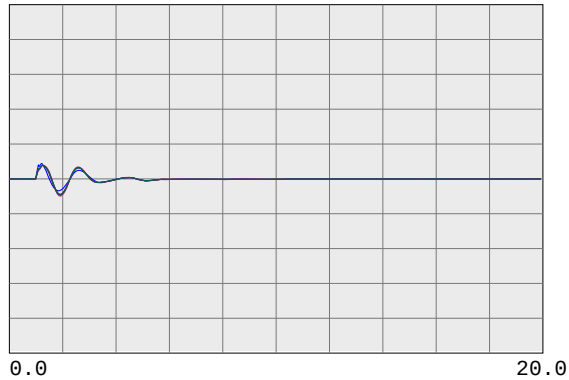
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



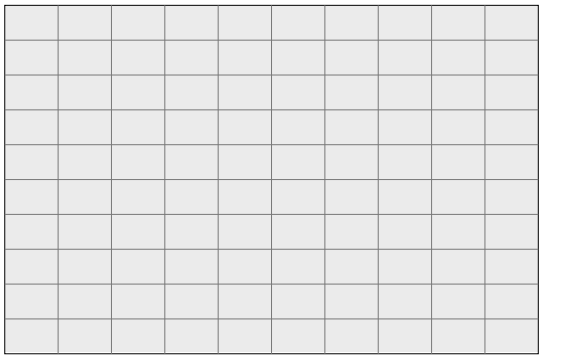
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

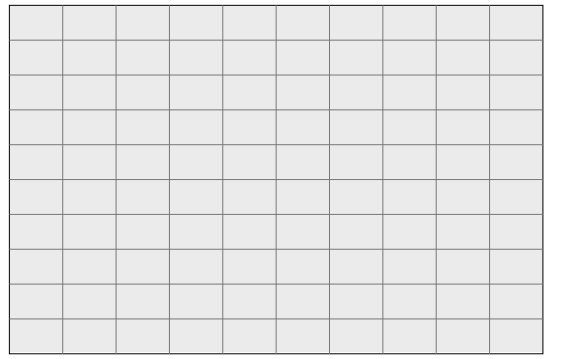


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



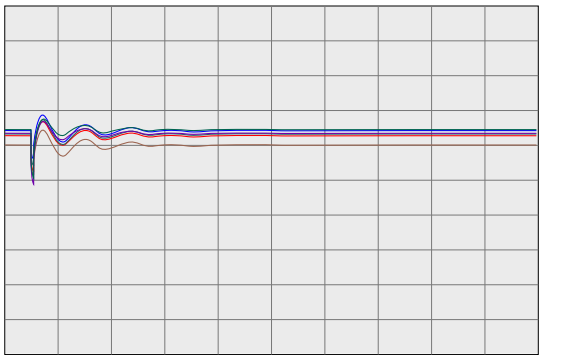
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



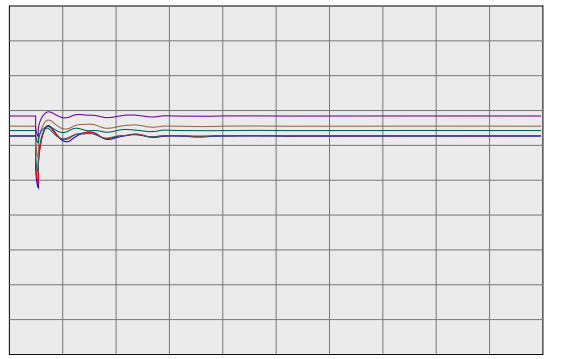


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

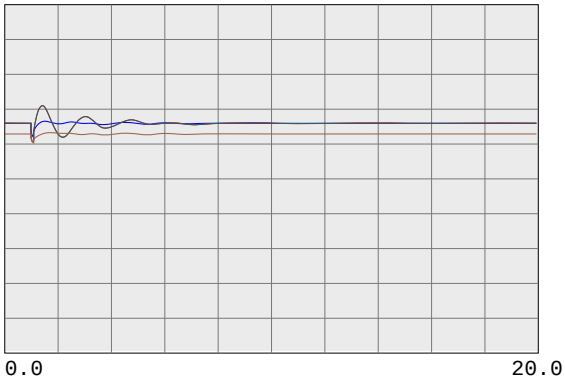
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



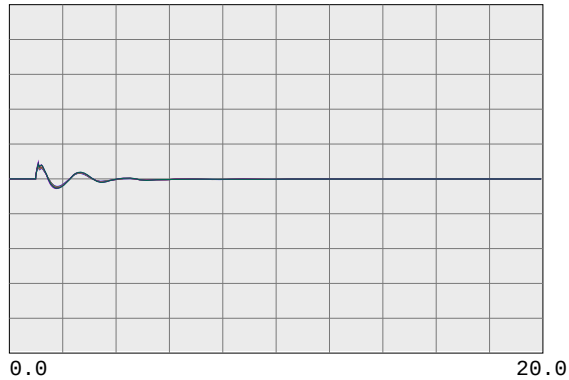
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



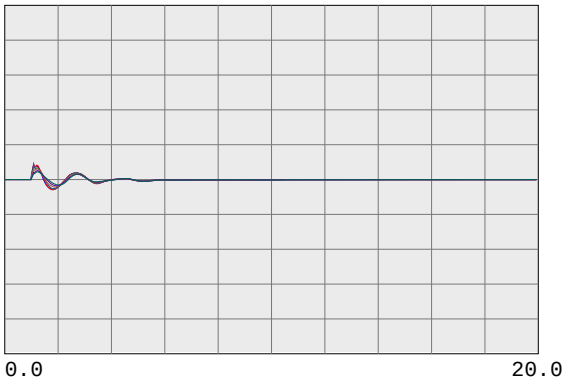
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

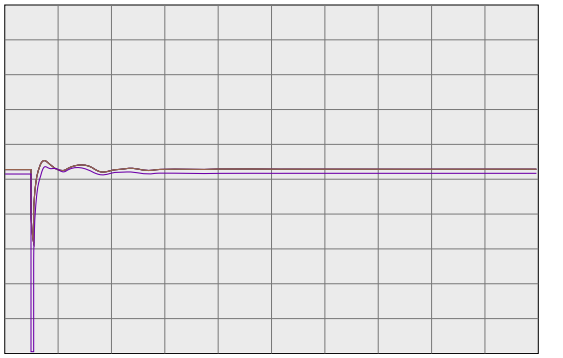
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

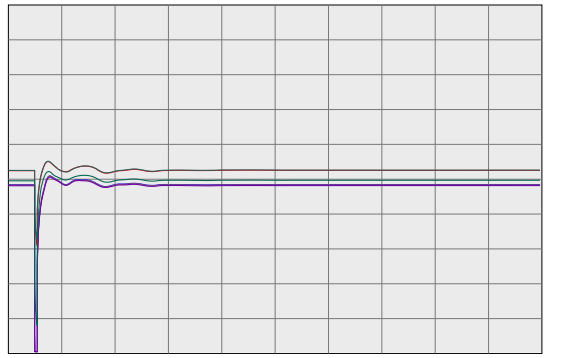
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

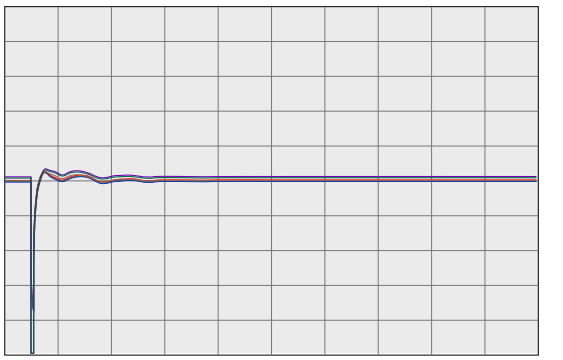
230-KV SYSTEM VOLTAGES



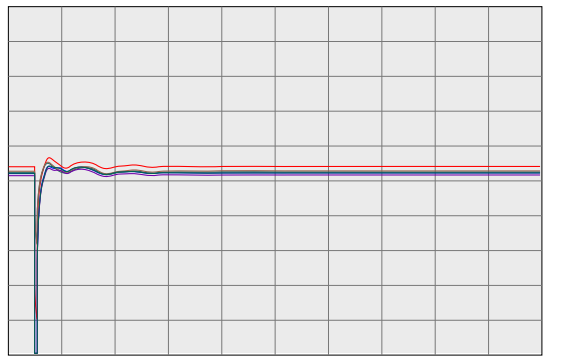
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



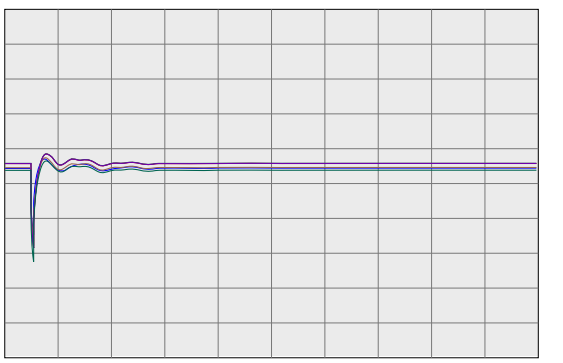
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



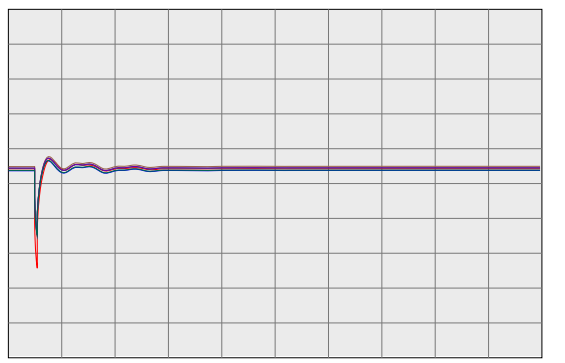
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



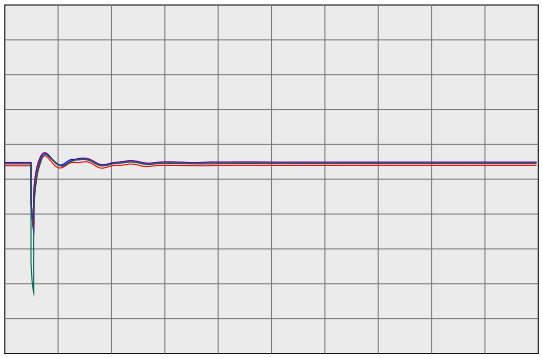
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

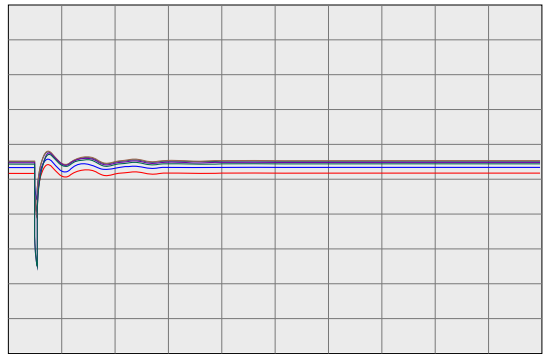
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

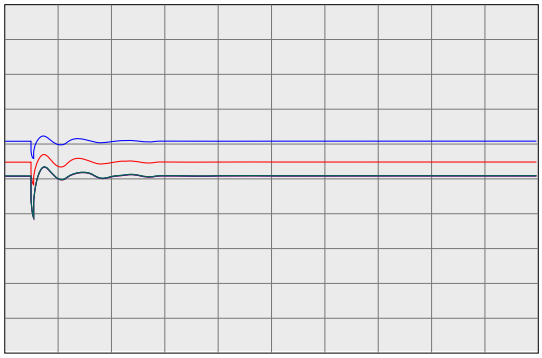
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

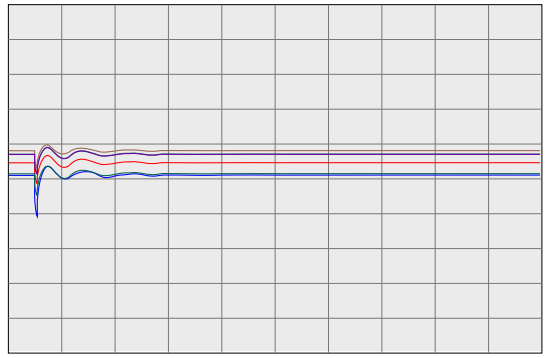
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

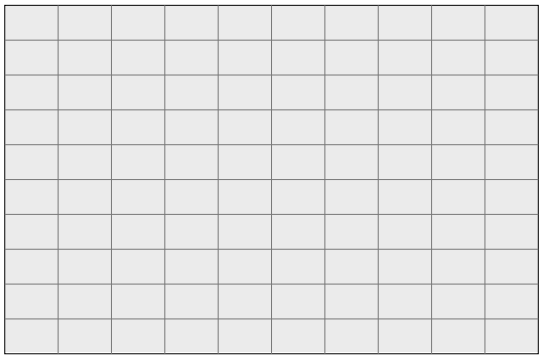
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

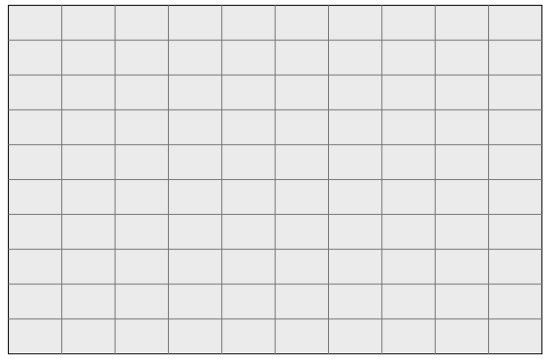


0.0 20.0

Time(sec)

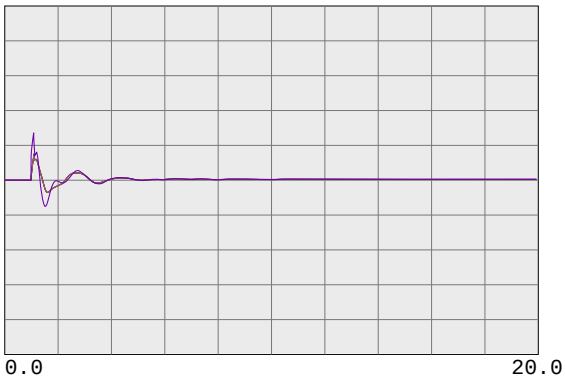
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



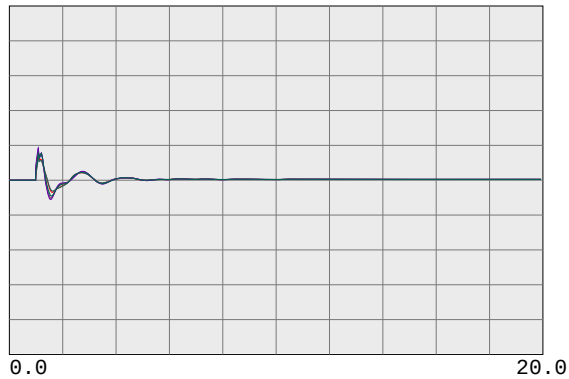


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

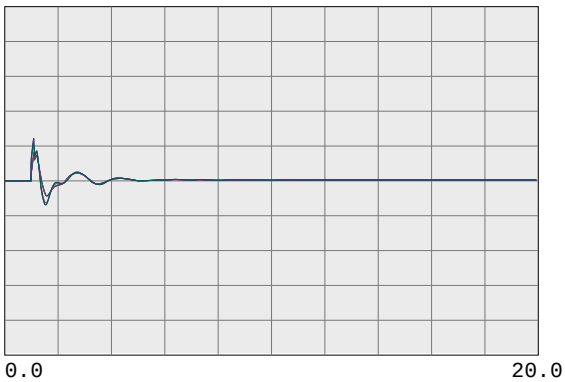
230-KV SYSTEM FREQUENCIES



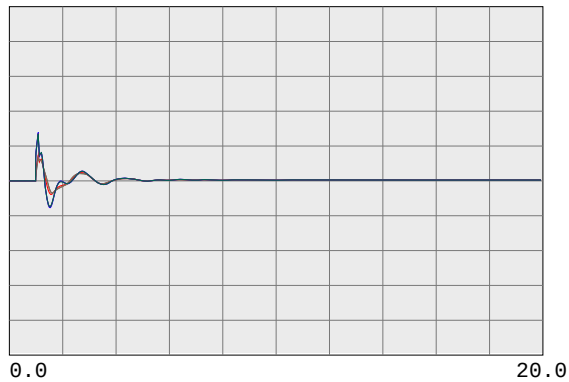
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



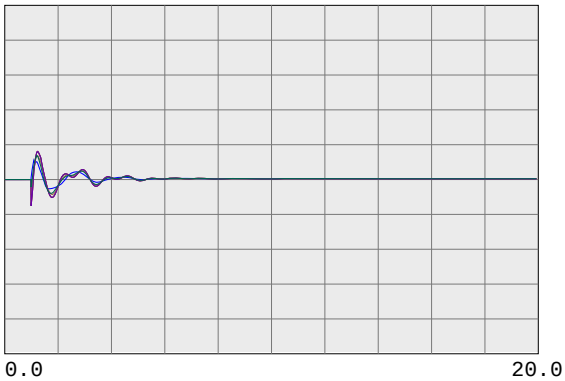
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

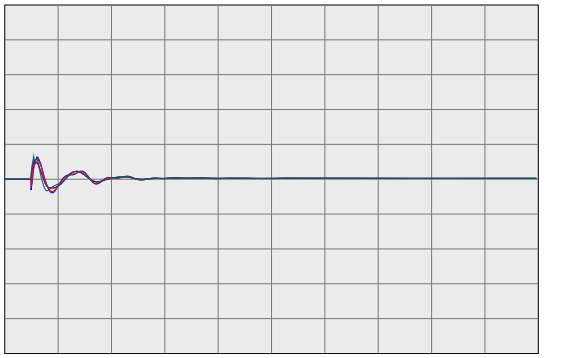


59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

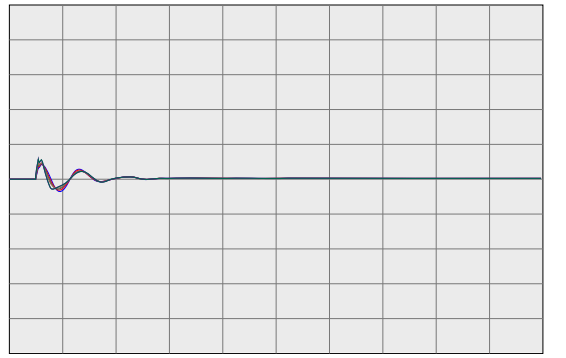
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

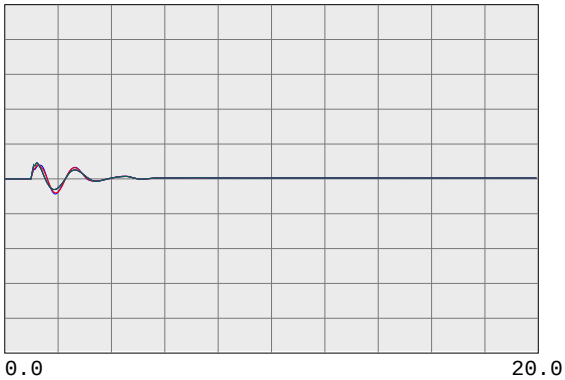
230-KV SYSTEM FREQUENCIES



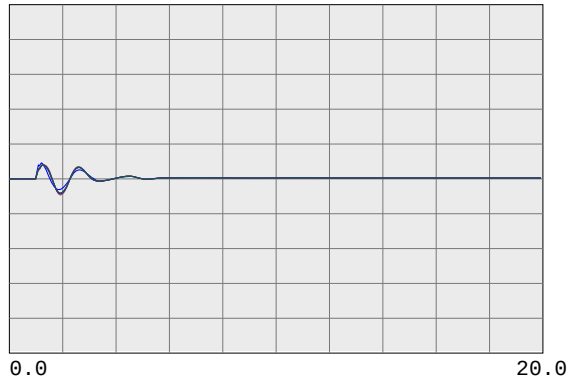
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



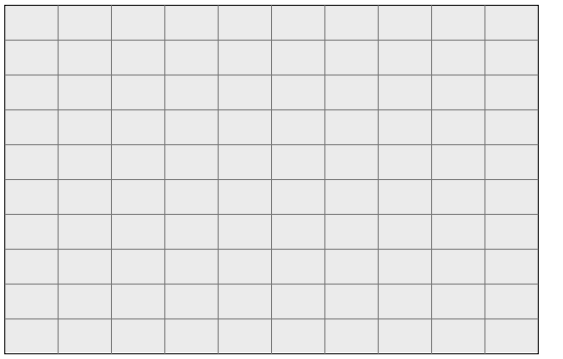
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

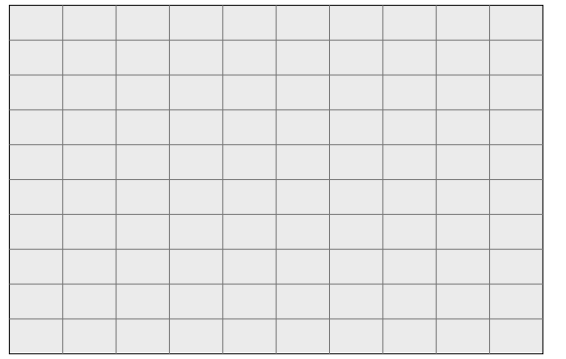


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



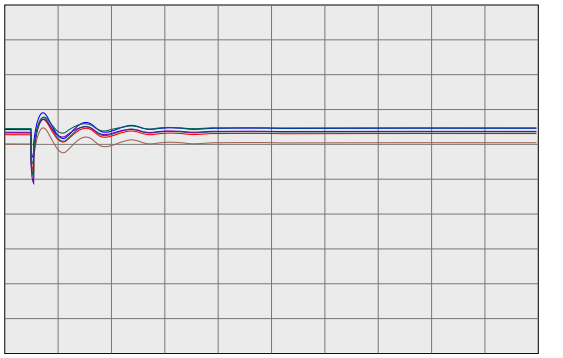
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



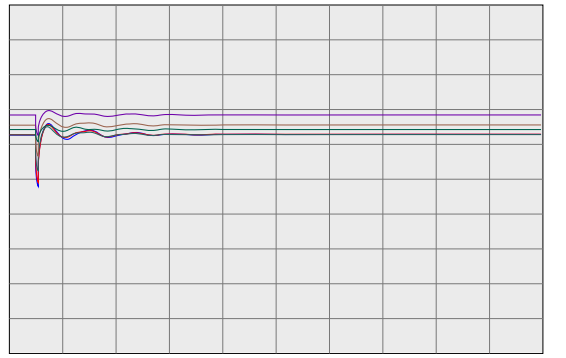


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

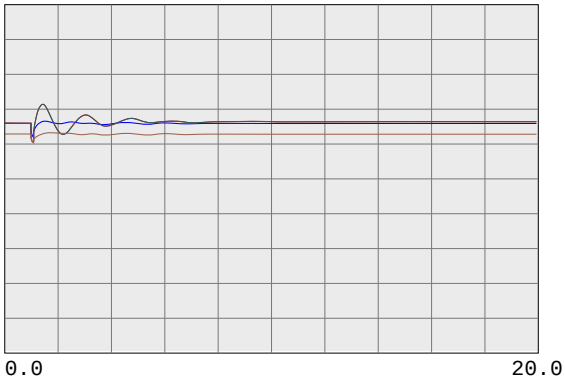
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



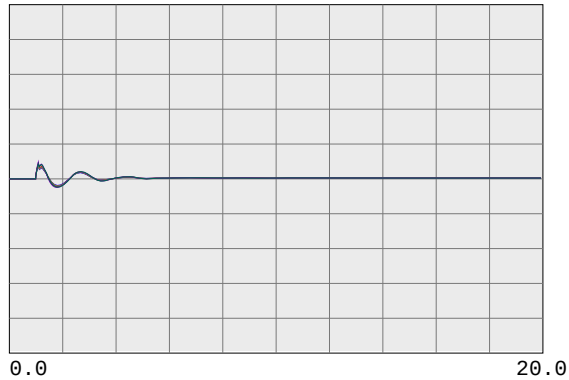
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



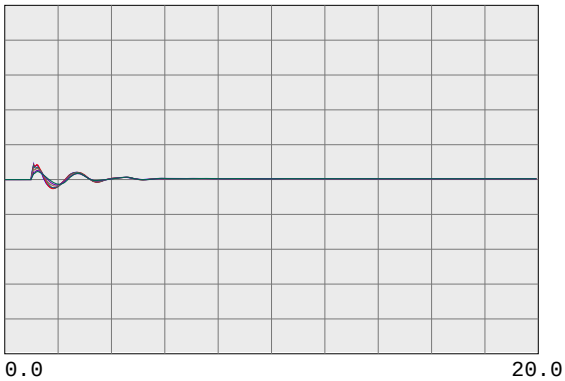
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

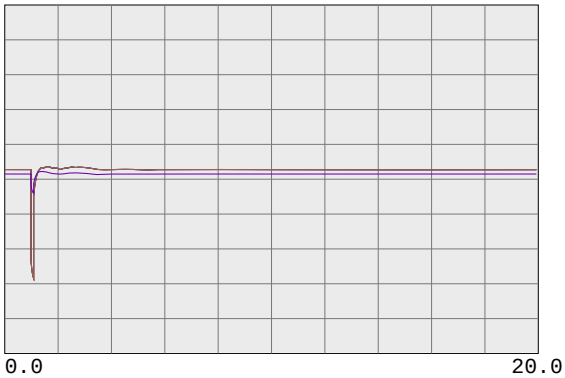
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

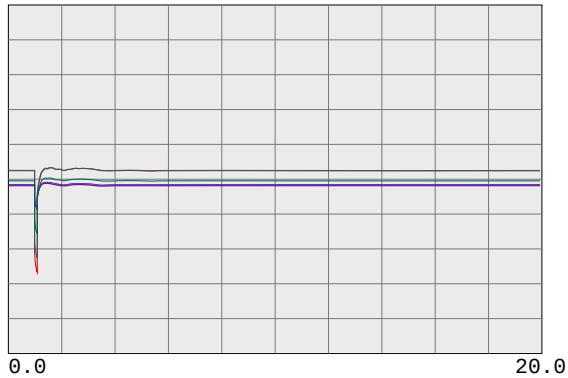
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

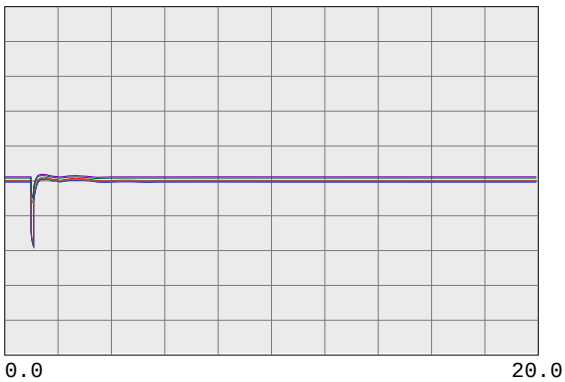
230-KV SYSTEM VOLTAGES



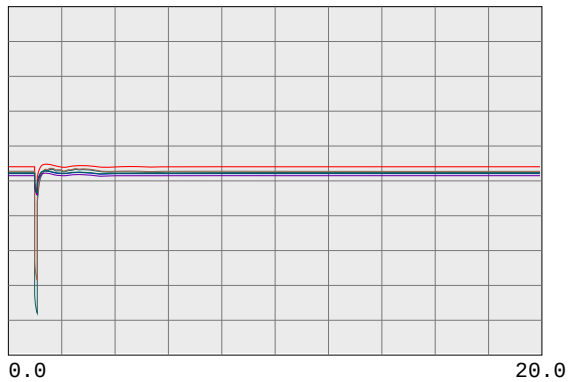
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



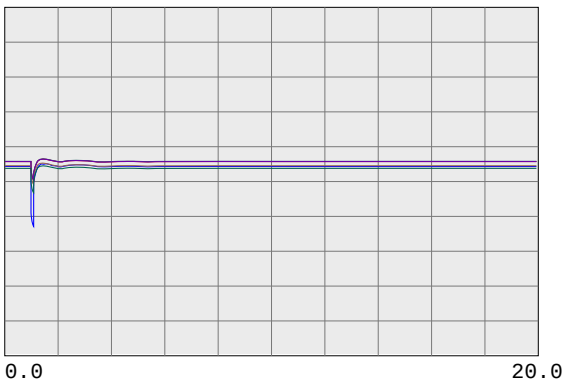
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



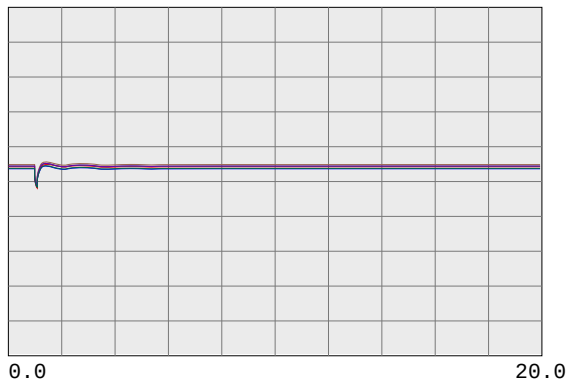
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



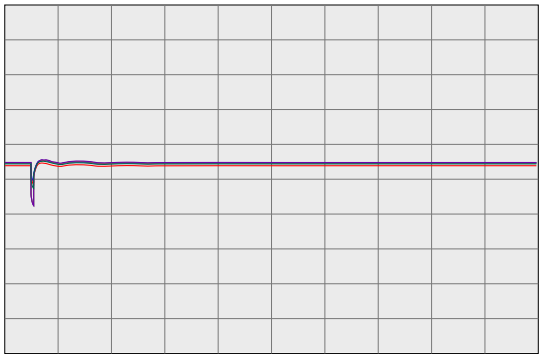
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

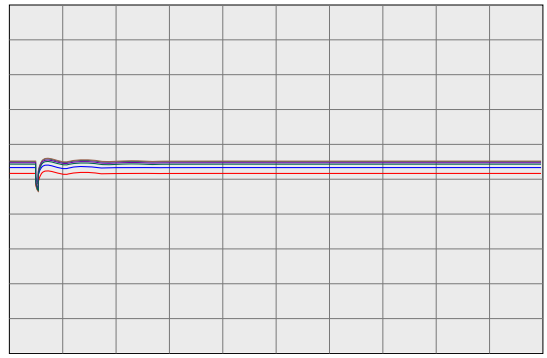
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

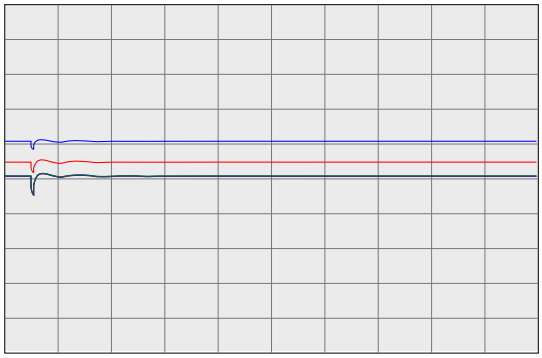
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

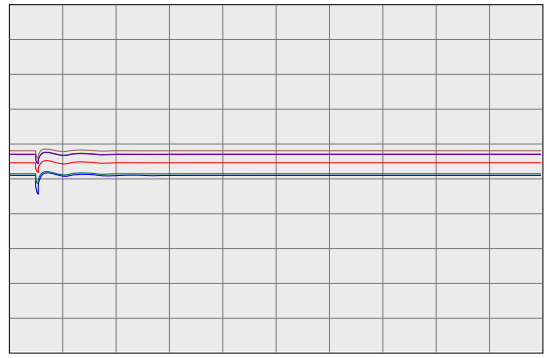
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

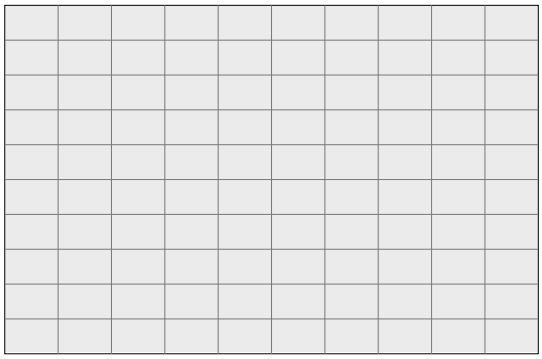
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

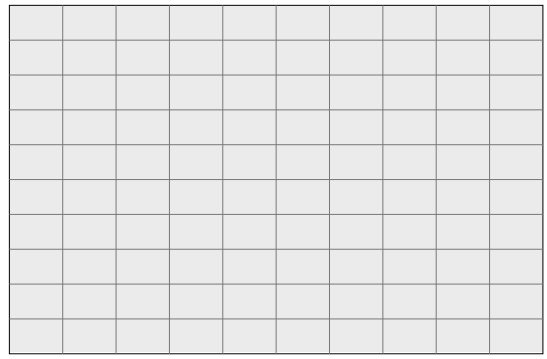


0.0 20.0

Time(sec)

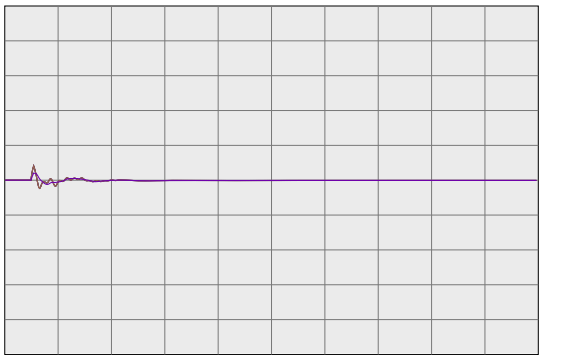
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



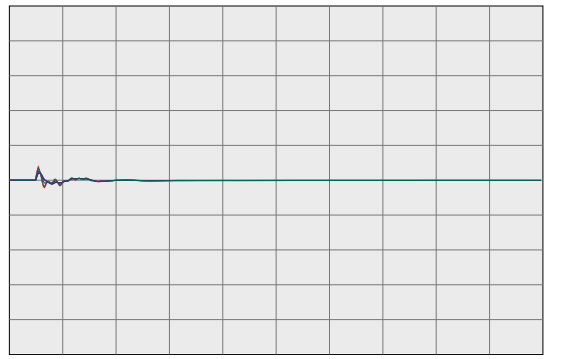


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

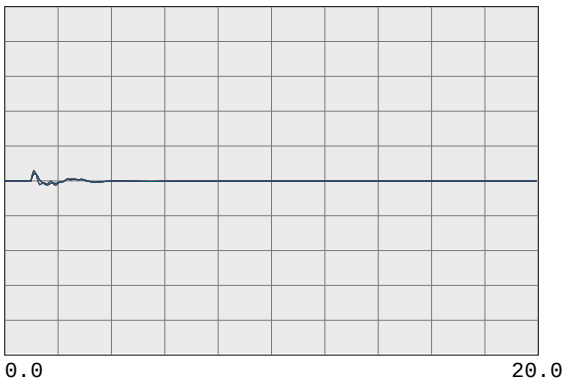
230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



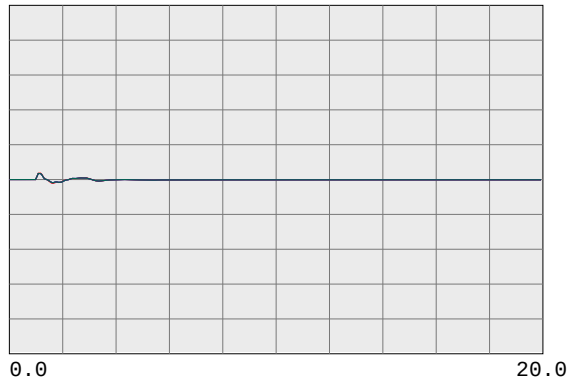
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



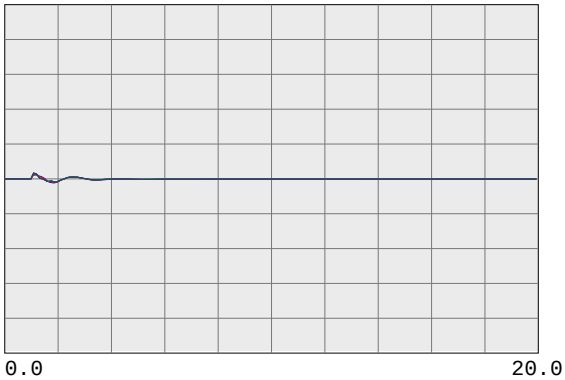
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

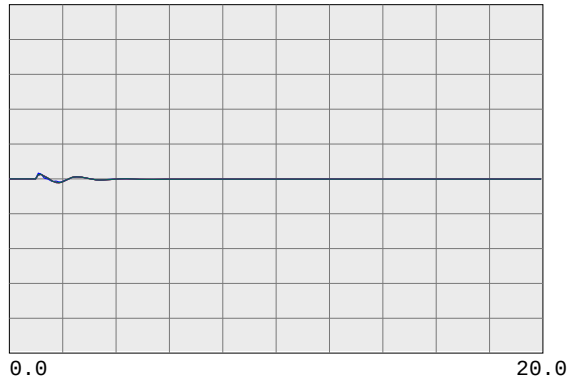
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

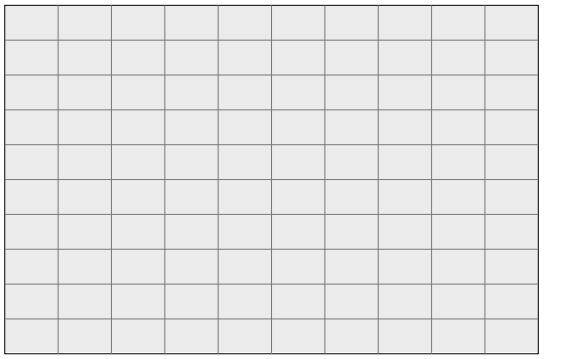
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

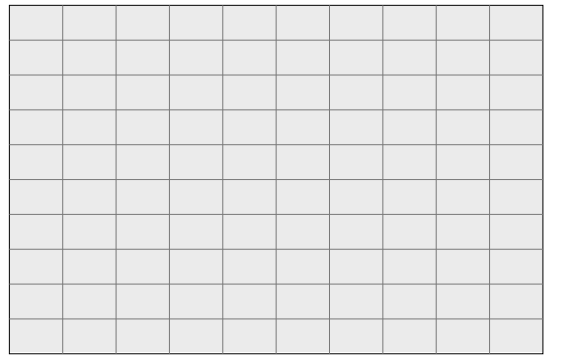


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



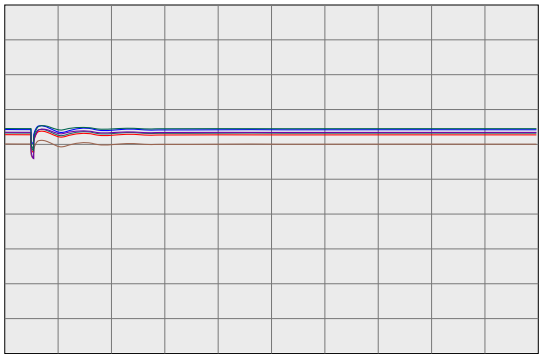
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

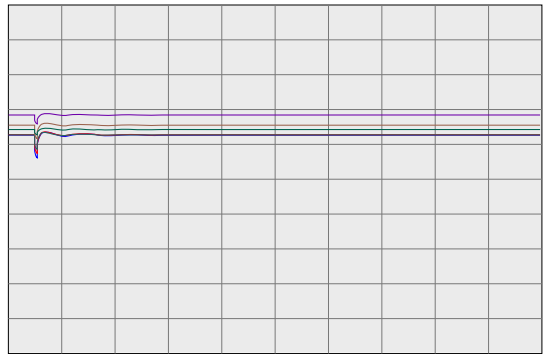
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.0 20.0

Time(sec)

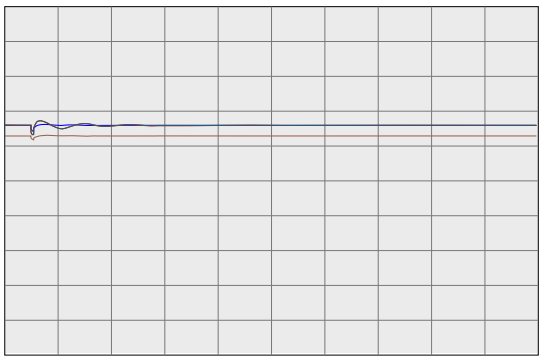
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

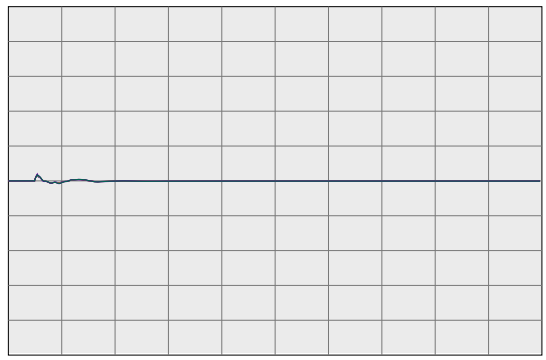
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



0.0 20.0

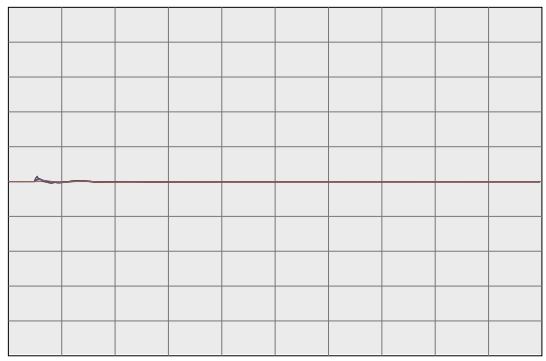
Time(sec)

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

0.0 20.0

Time(sec)

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

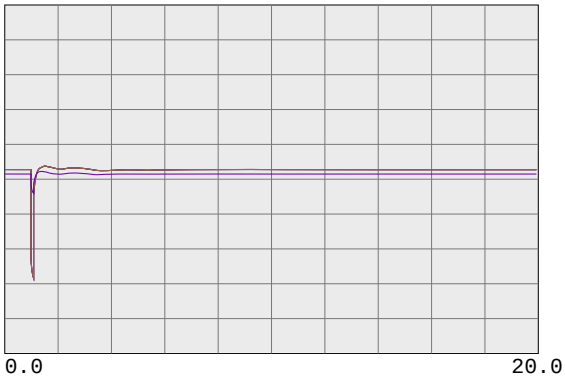
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

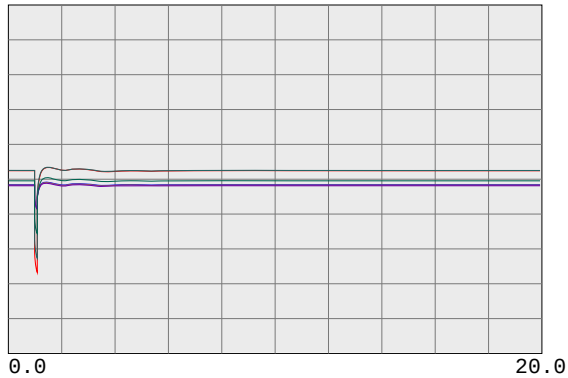
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

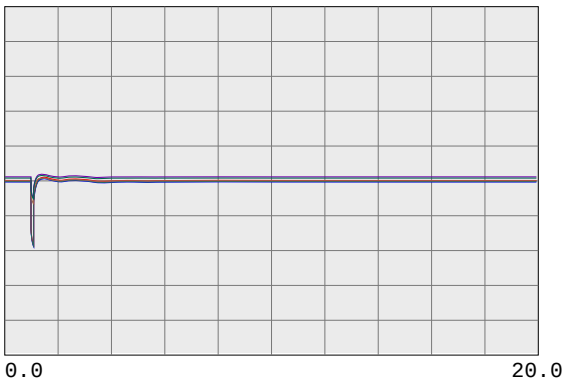
230-KV SYSTEM VOLTAGES



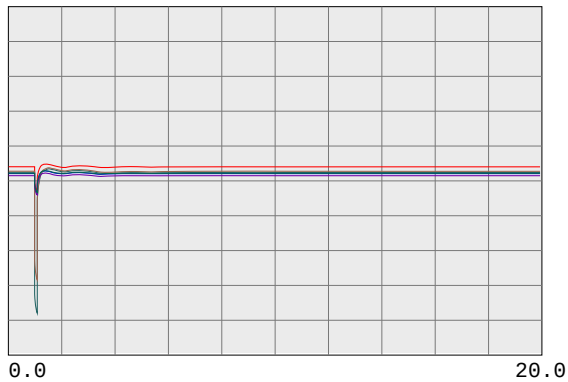
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



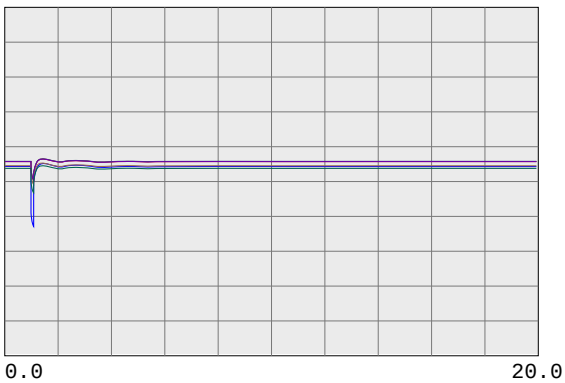
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



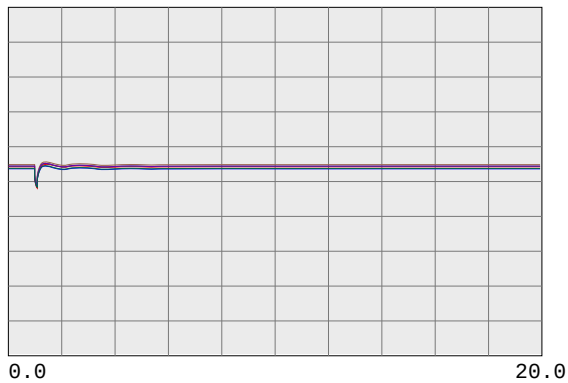
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



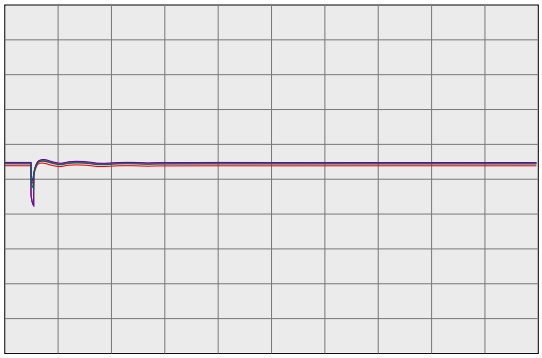
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

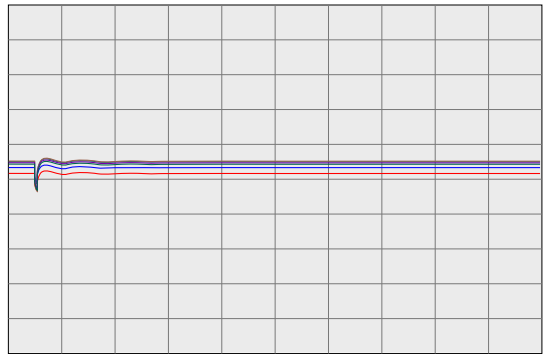
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

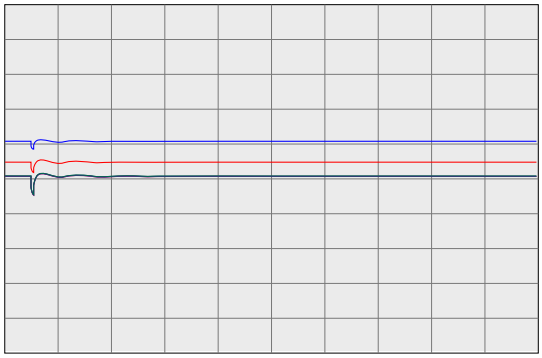
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

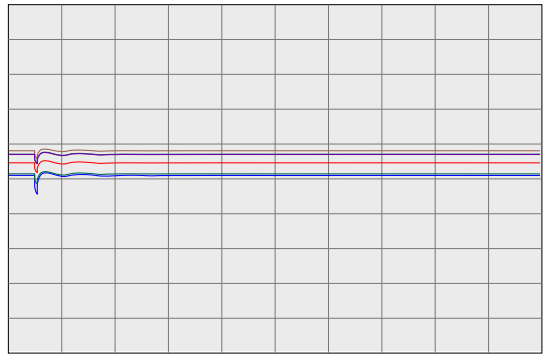
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

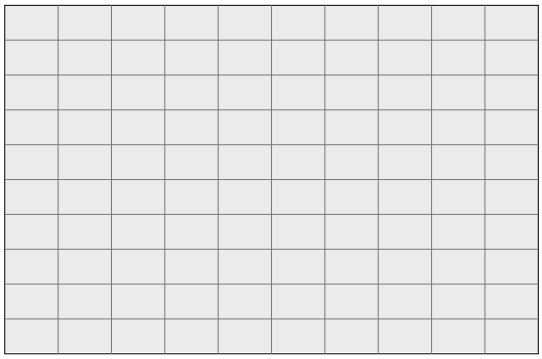
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

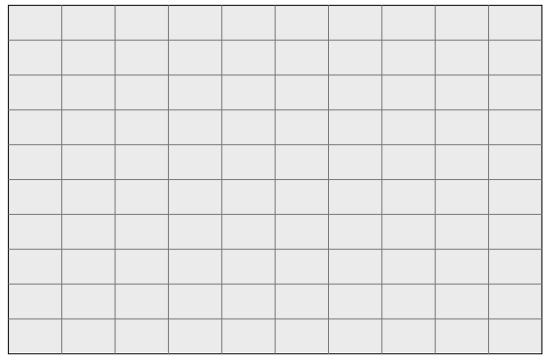


0.0 20.0

Time(sec)

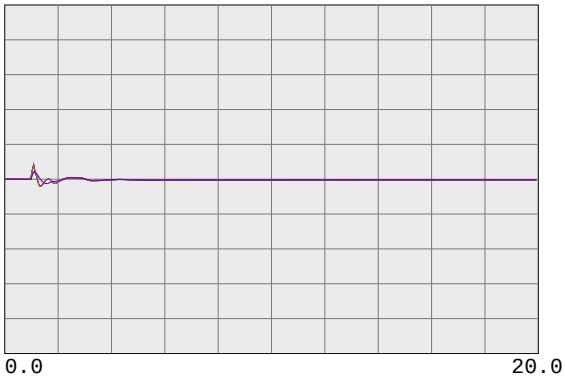
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

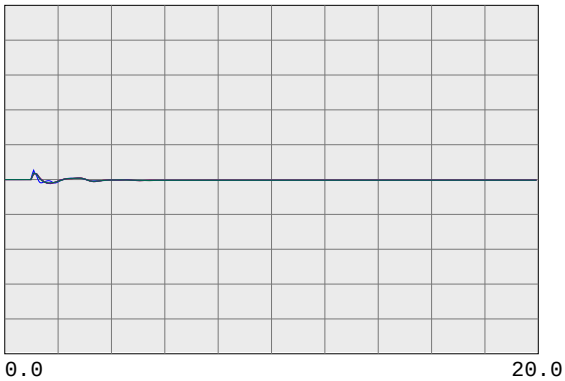


59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

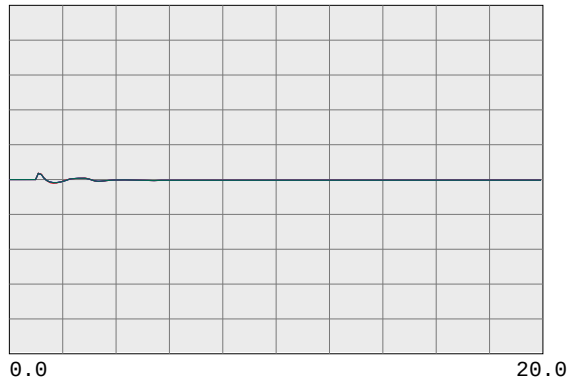
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



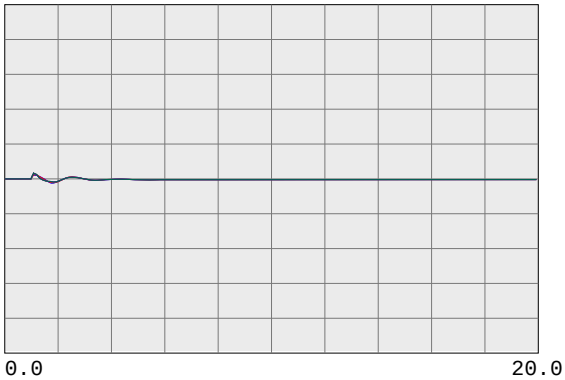
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

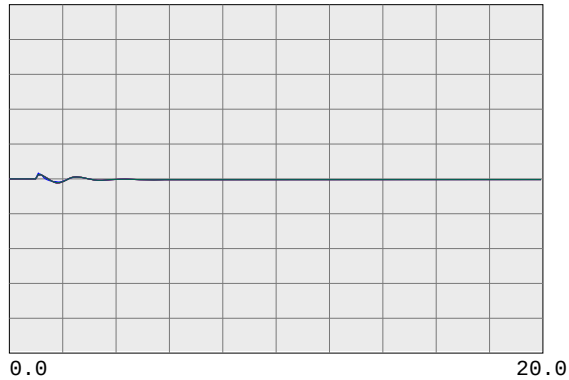
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

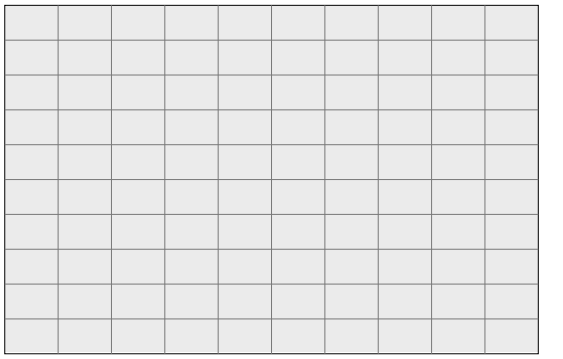
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

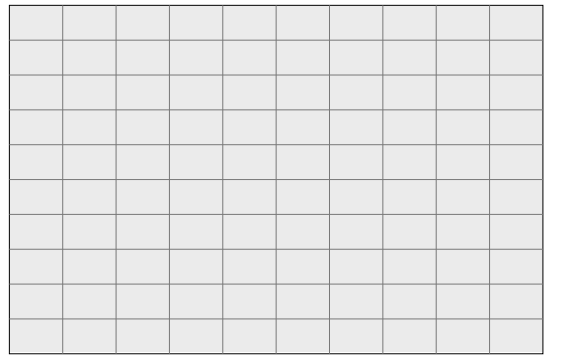


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



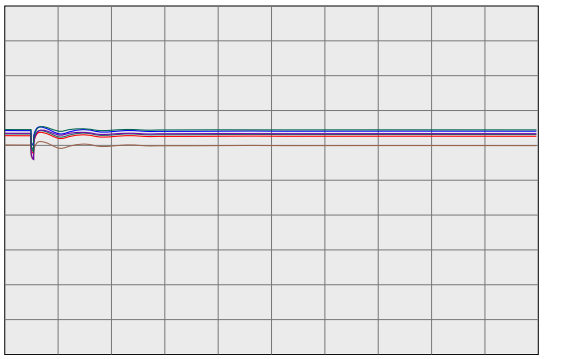
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



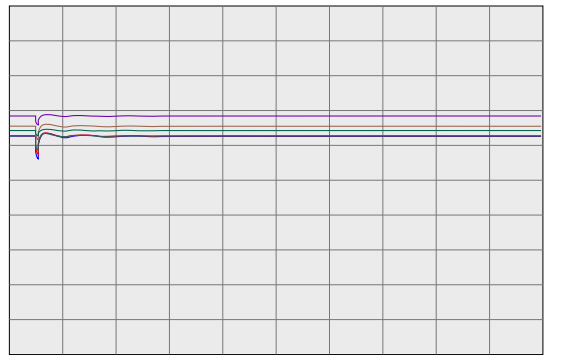


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

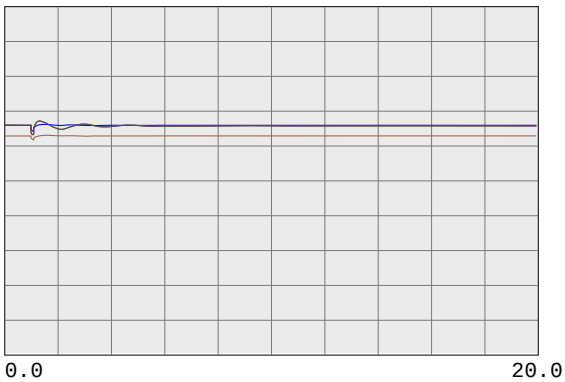
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500

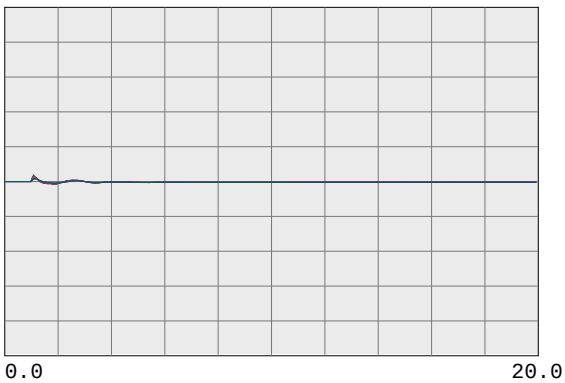


0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

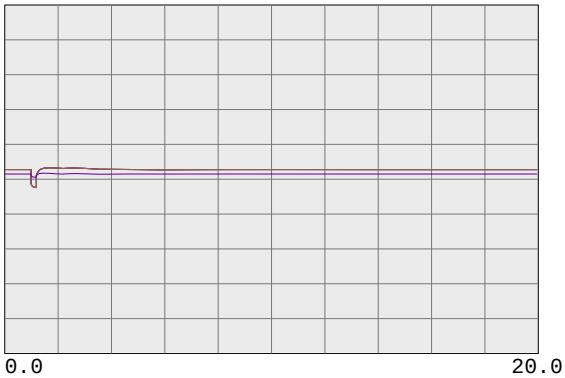
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

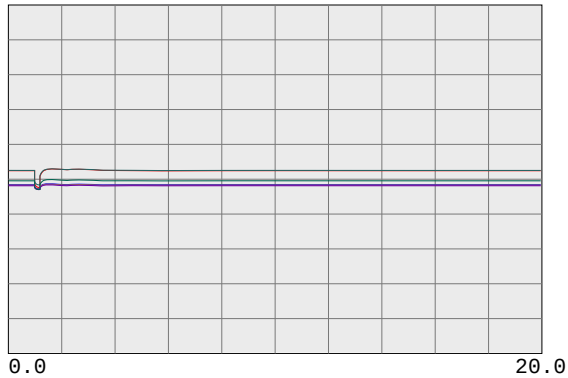
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

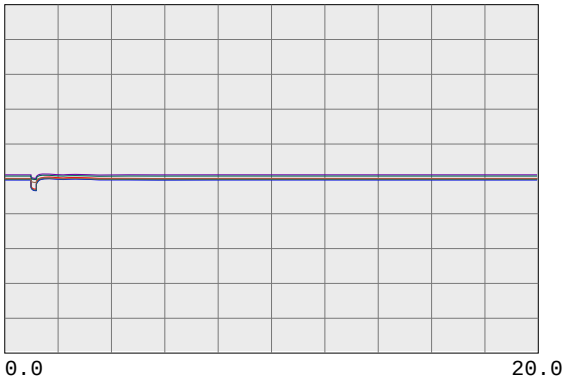
230-KV SYSTEM VOLTAGES



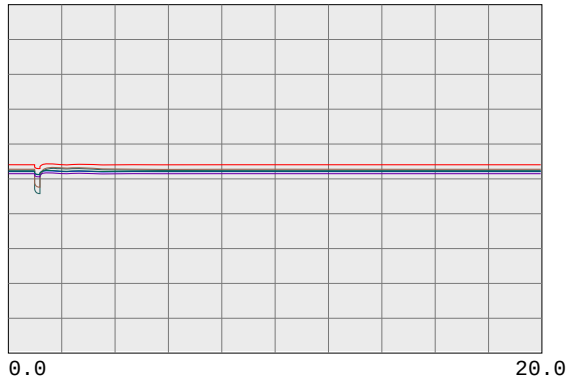
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



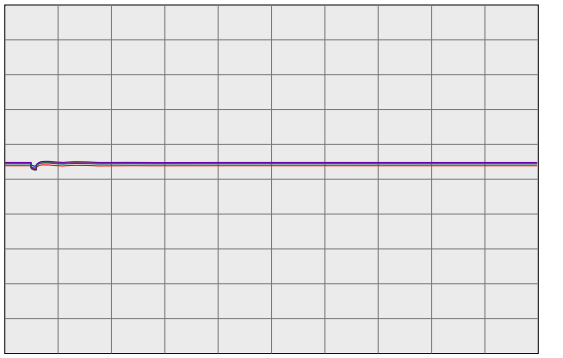
0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

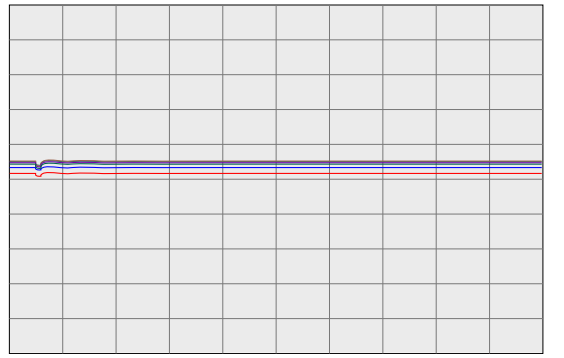
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

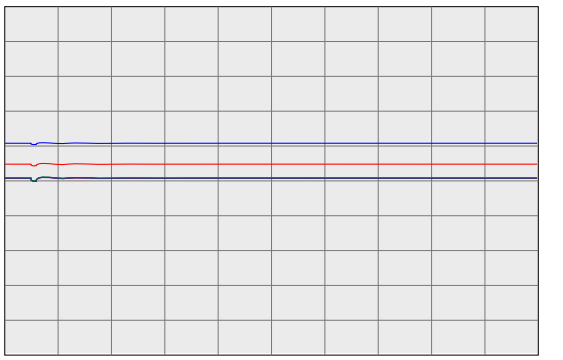
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

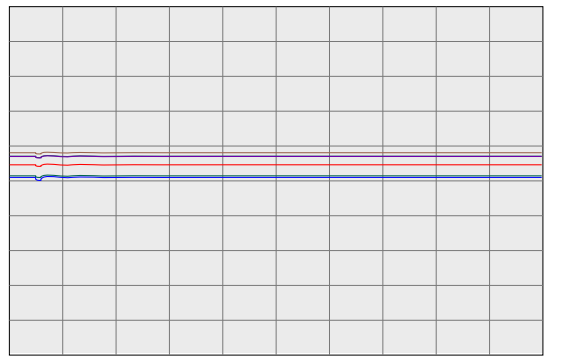
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

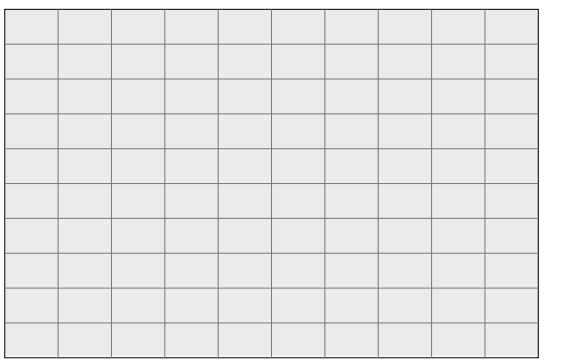
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

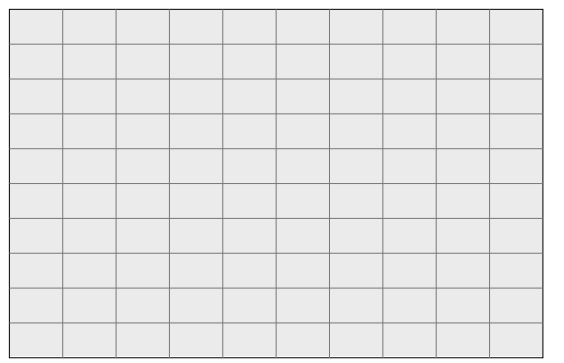


0.0 20.0

Time(sec)

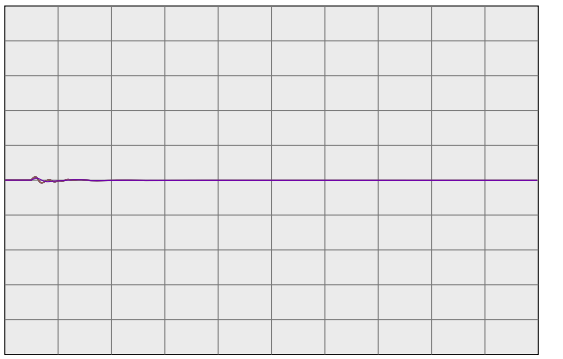
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



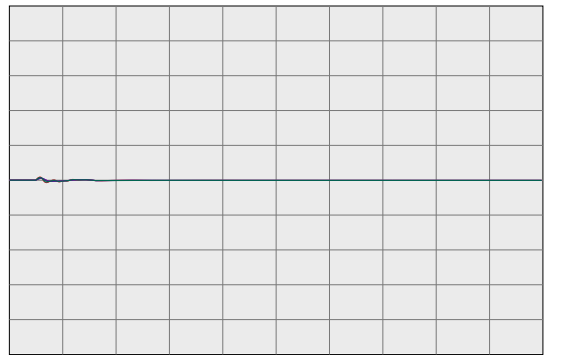


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

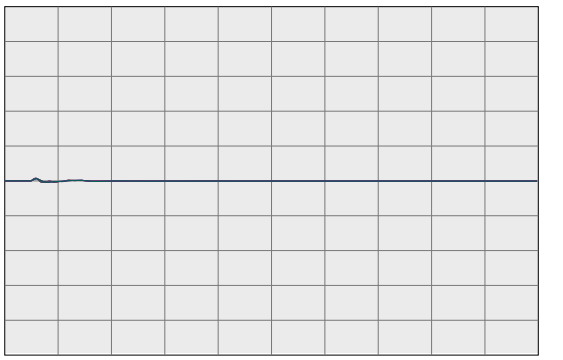
230-KV SYSTEM FREQUENCIES



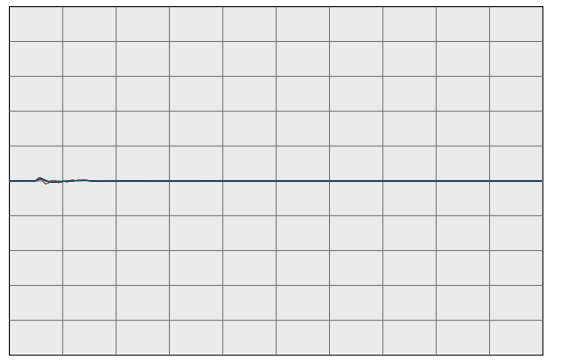
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



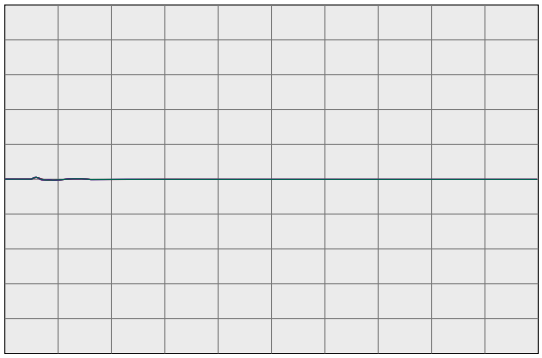
59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



0.0 20.0

Time(sec)

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

0.0 20.0

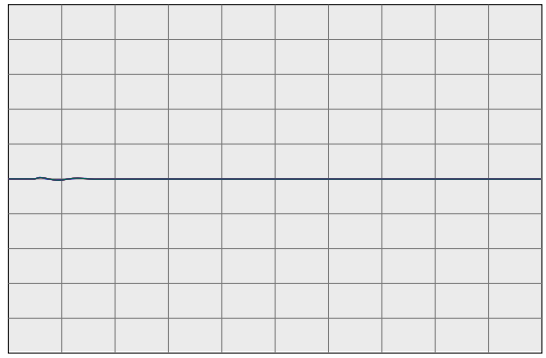
Time(sec)

59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

0.0 20.0

Time(sec)

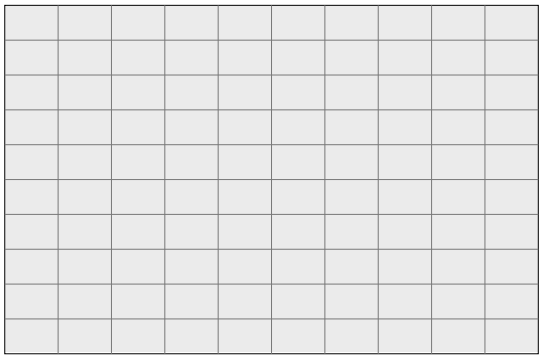
59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

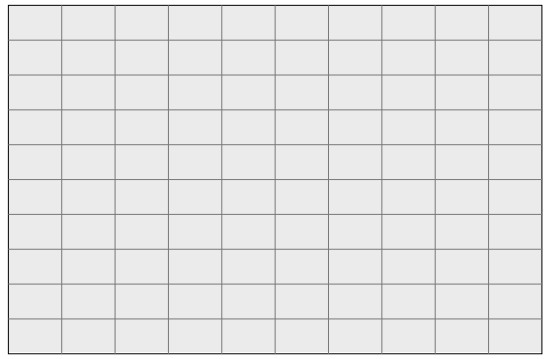


0.0 20.0

Time(sec)

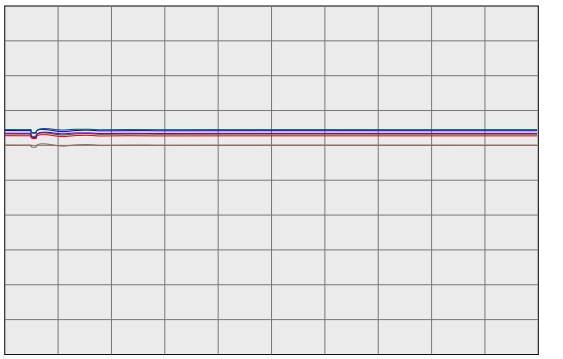
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



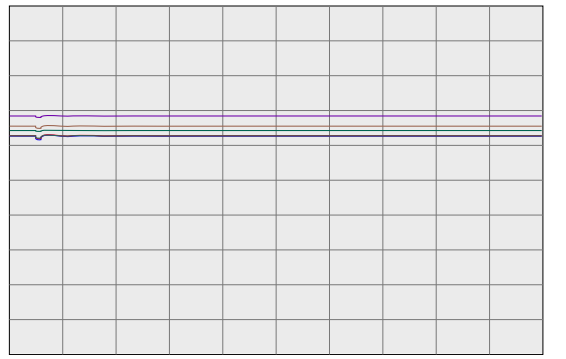


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

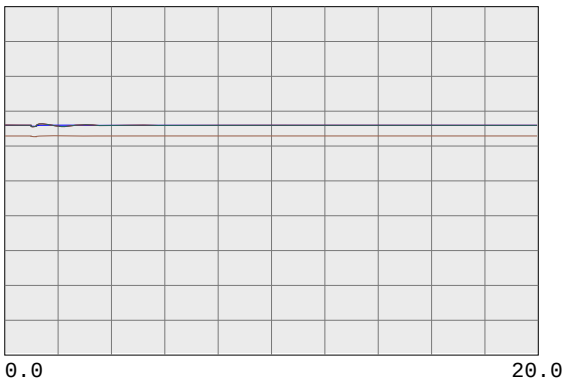
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



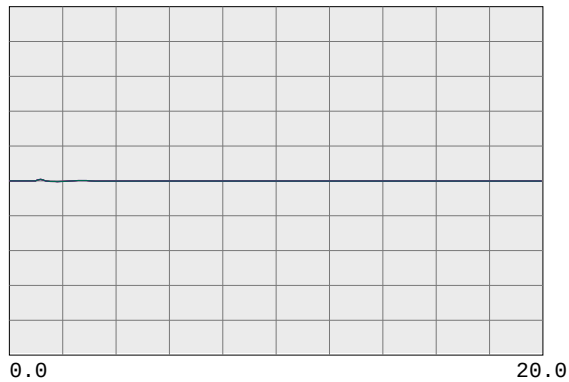
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



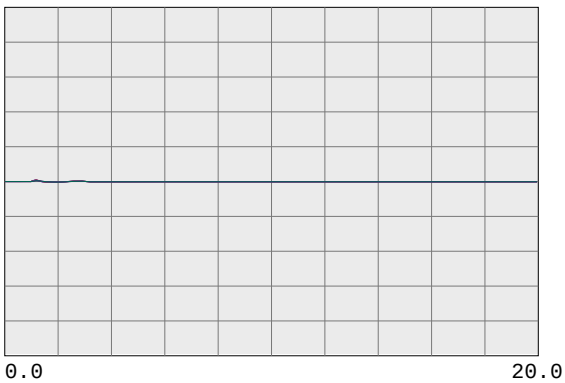
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

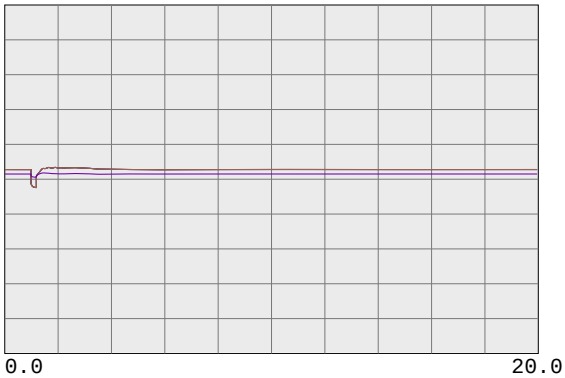
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

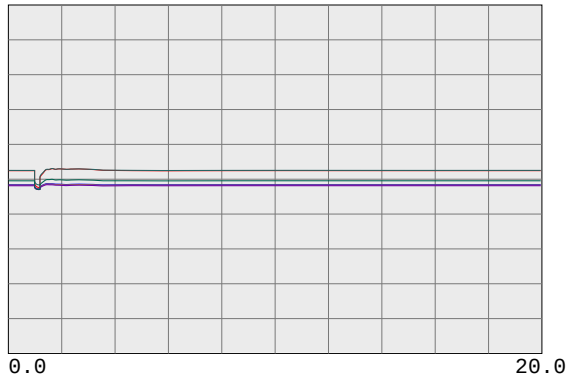
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

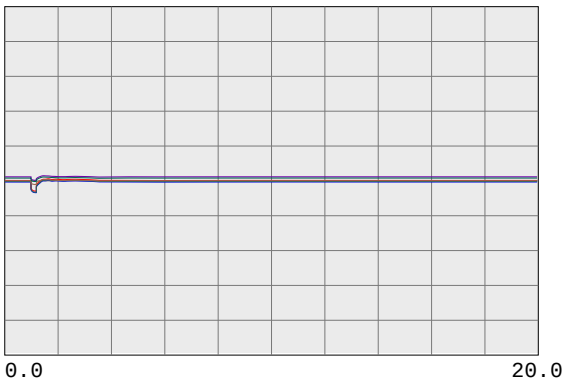
230-KV SYSTEM VOLTAGES



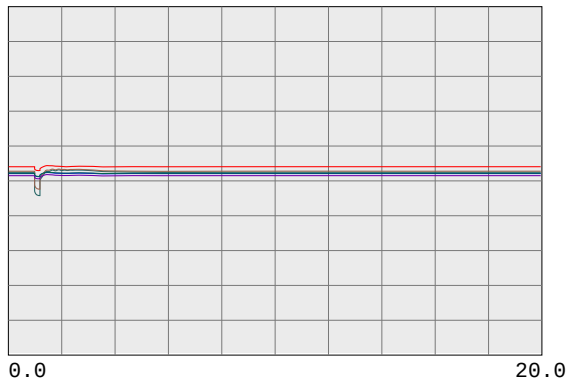
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



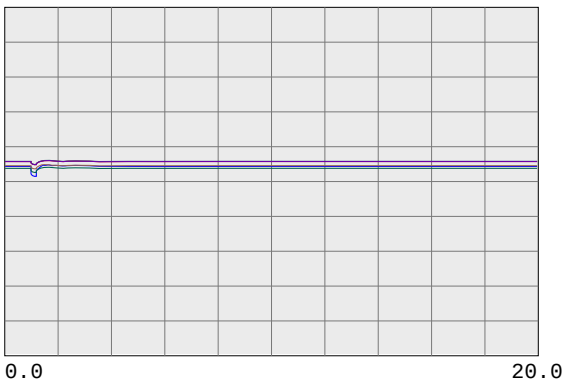
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



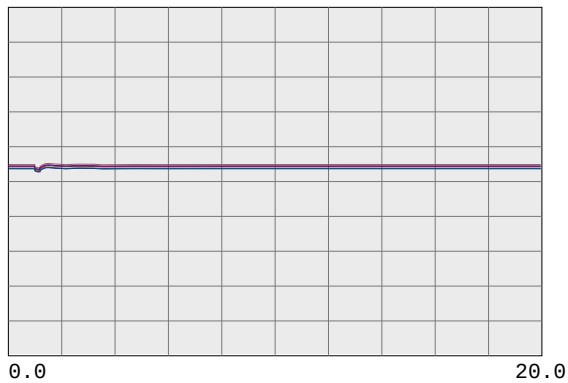
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



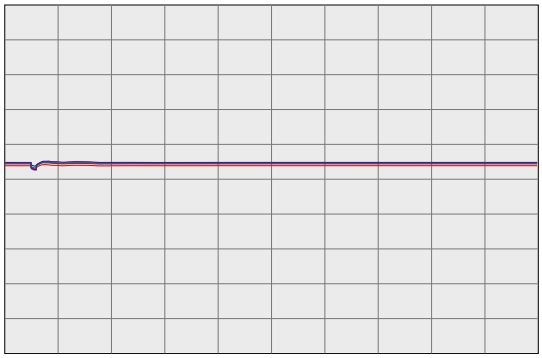
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

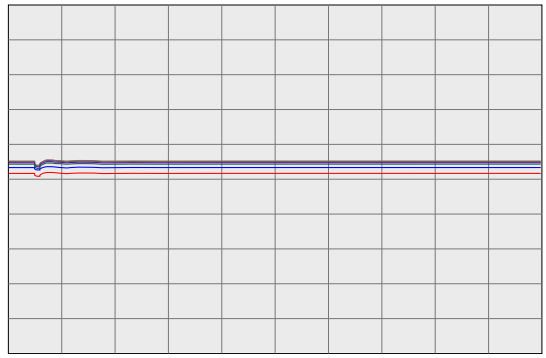
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

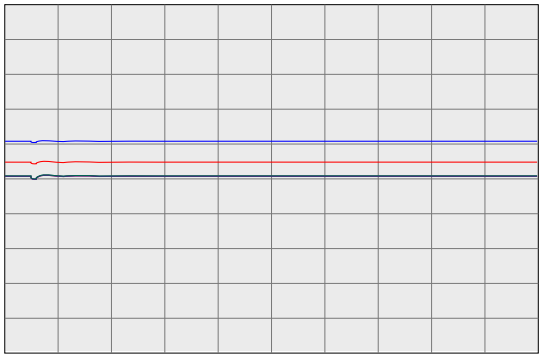
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

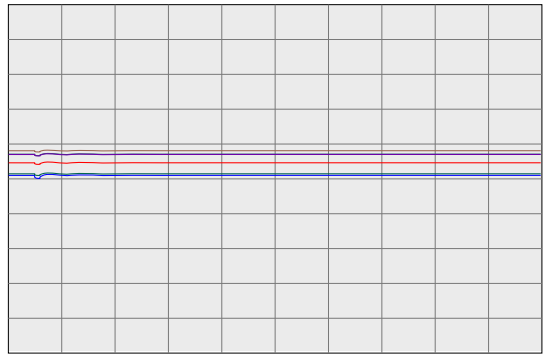
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

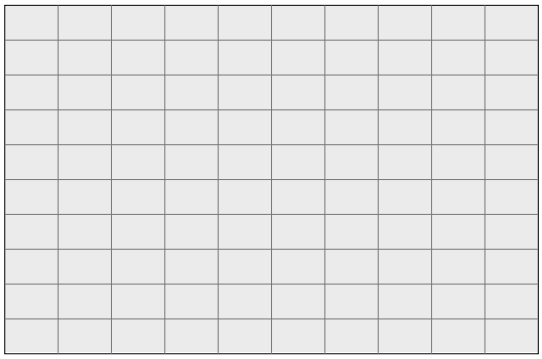
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

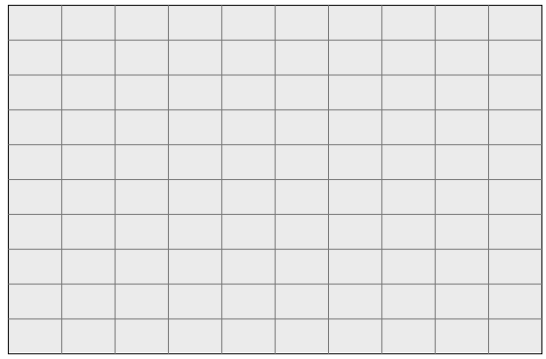


0.0 20.0

Time(sec)

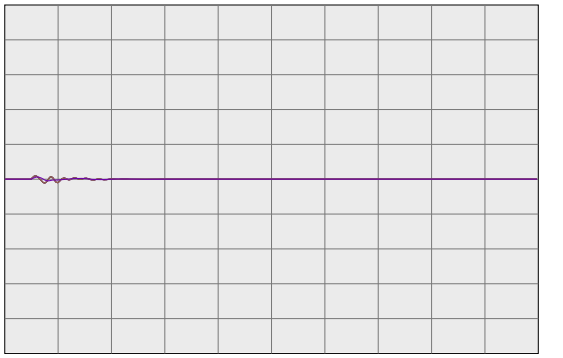
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



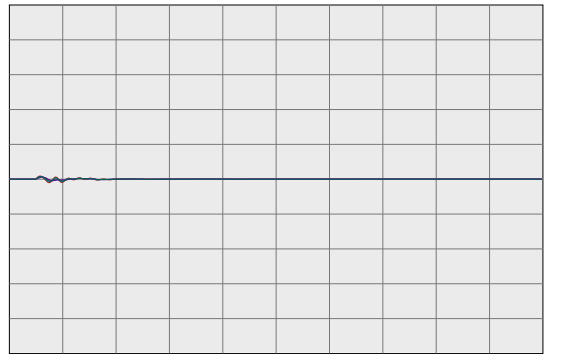


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

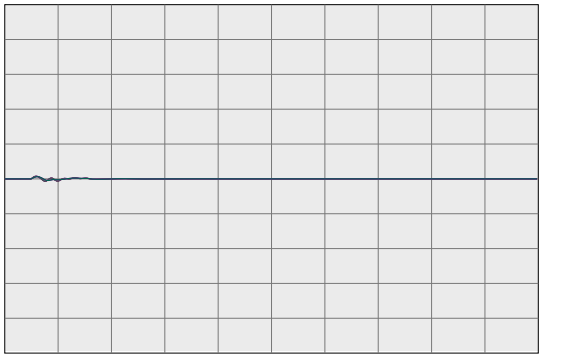
230-KV SYSTEM FREQUENCIES



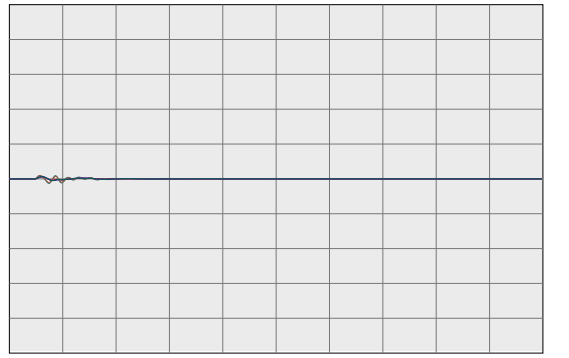
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

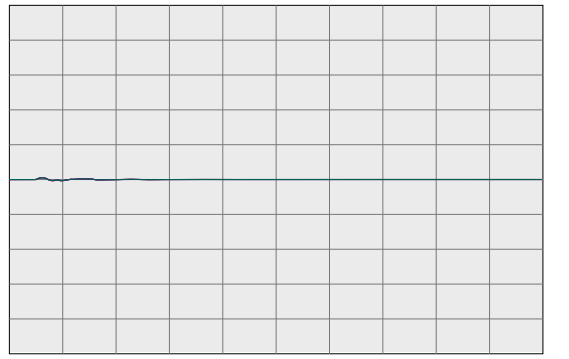


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

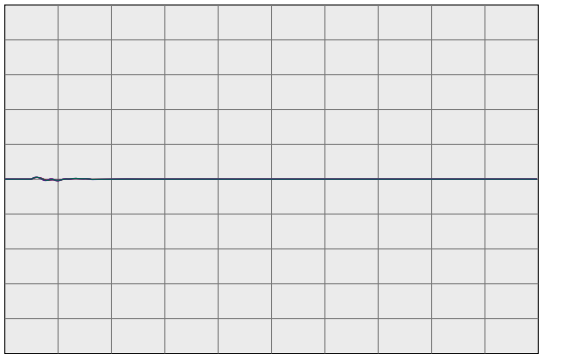
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



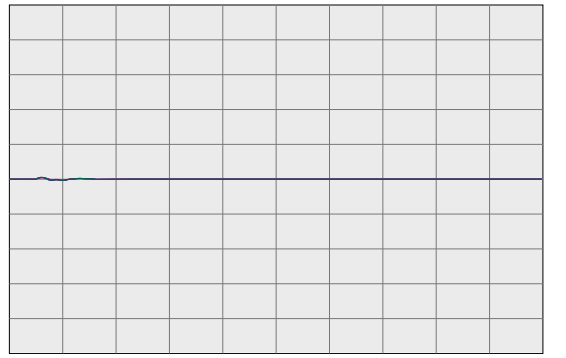
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

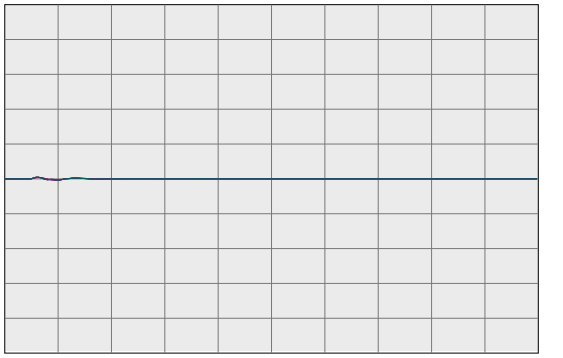
230-KV SYSTEM FREQUENCIES



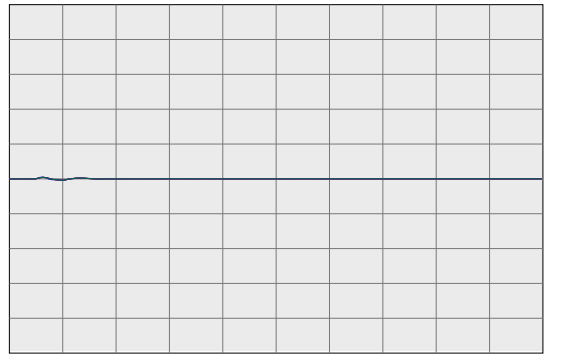
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



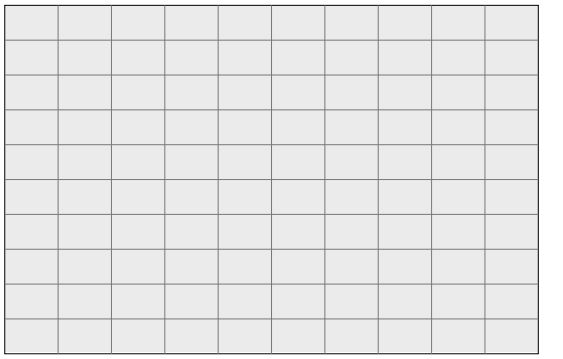
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

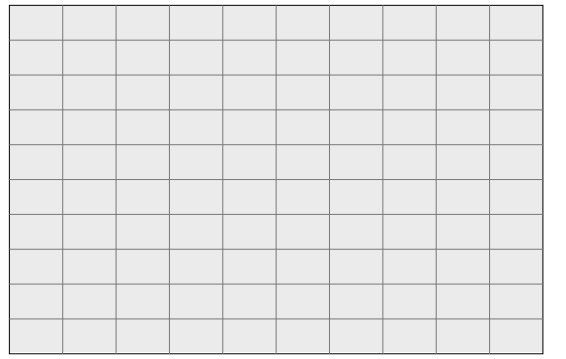


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



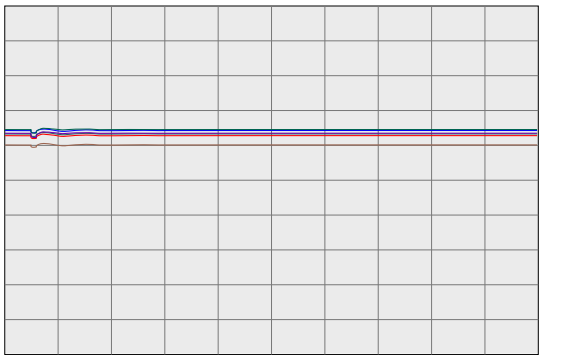
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



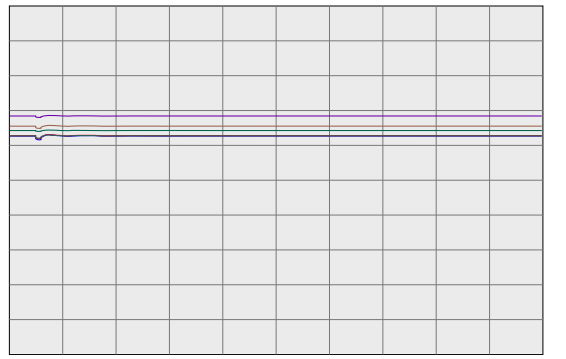


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

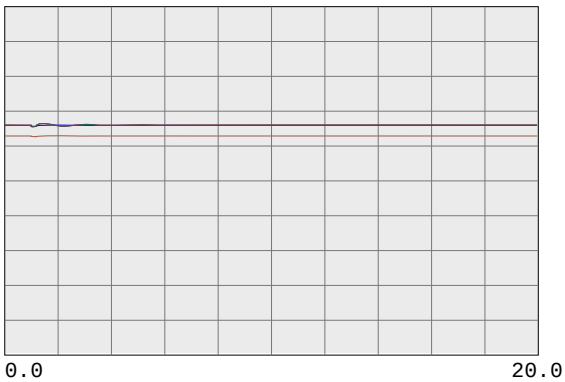
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



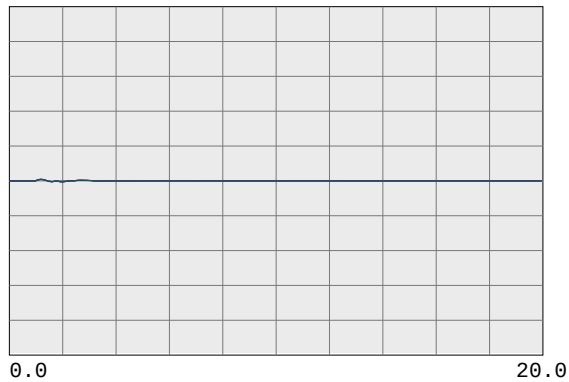
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500

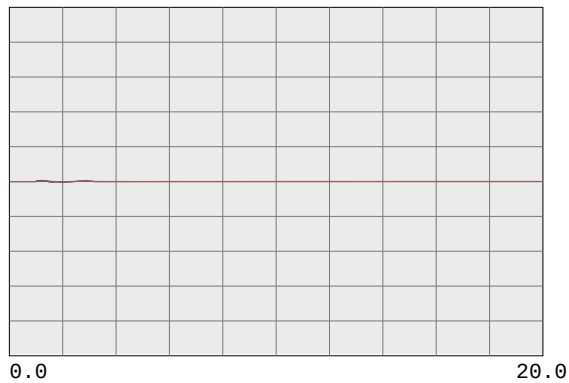


0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



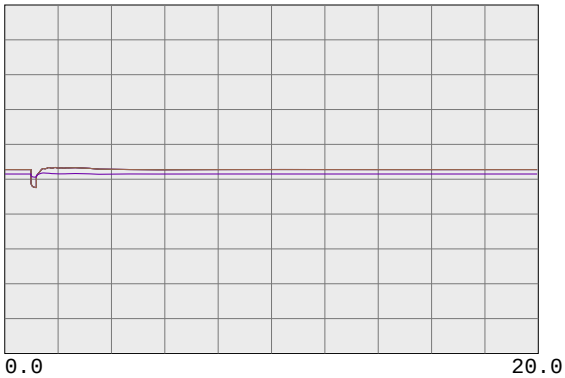
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

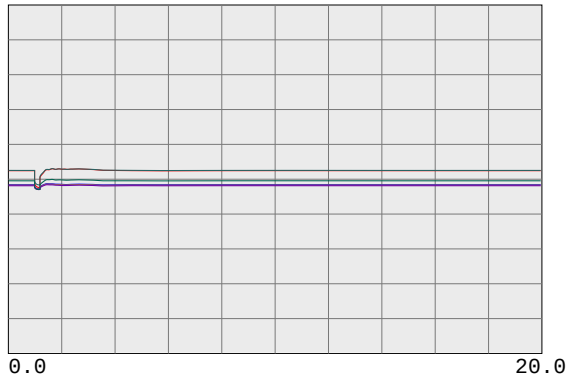
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

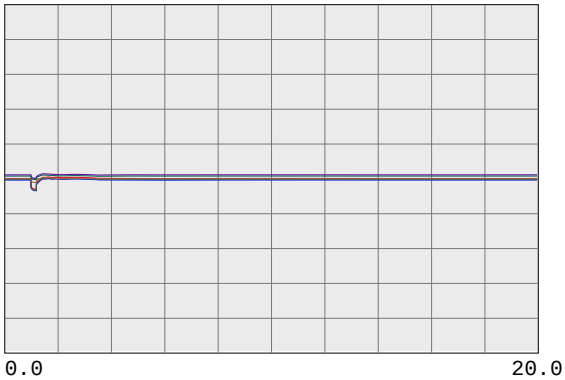
230-KV SYSTEM VOLTAGES



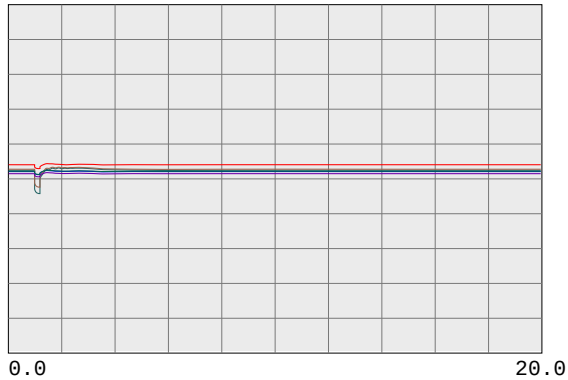
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



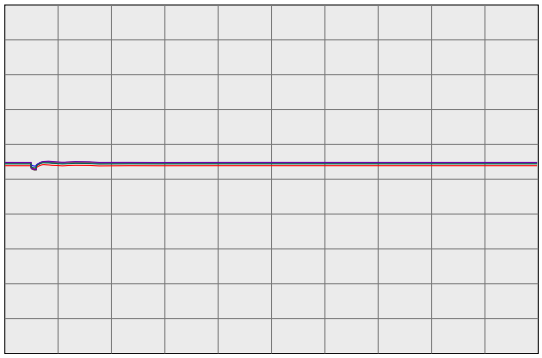
0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

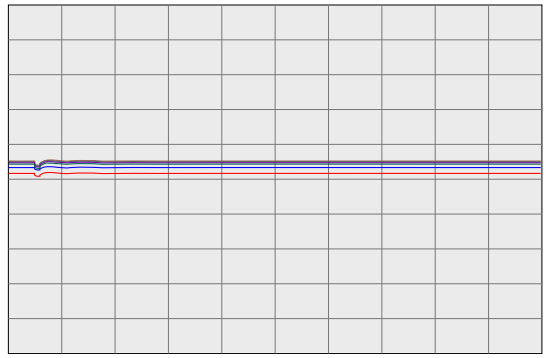
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

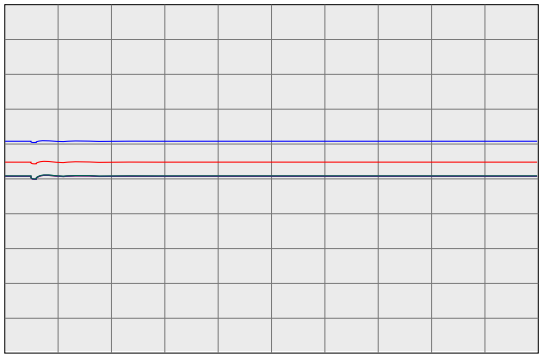
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

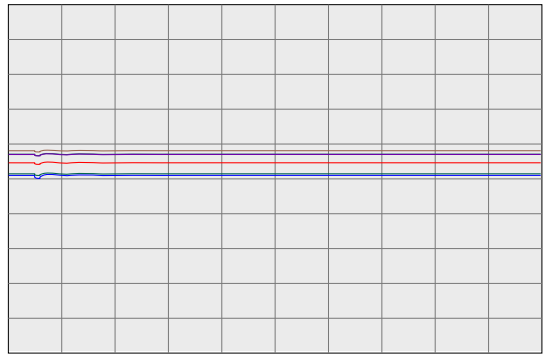
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

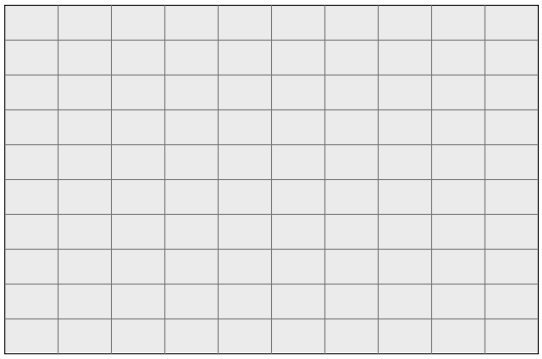
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

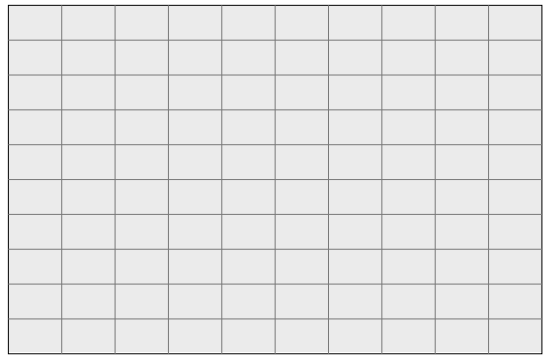


0.0 20.0

Time(sec)

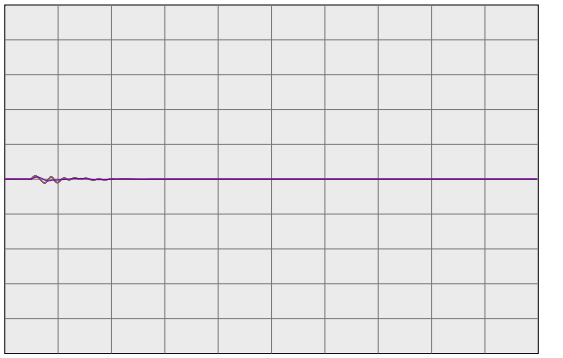
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



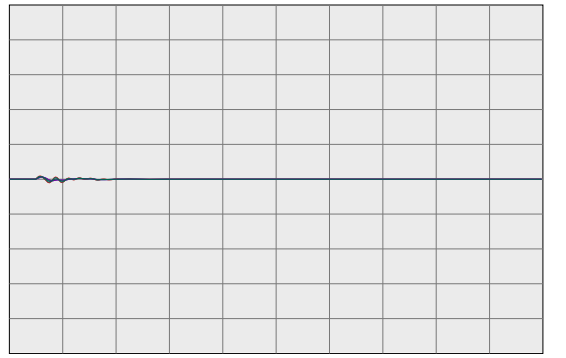


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

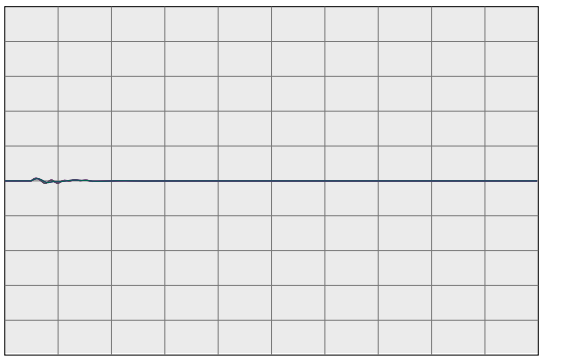
230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

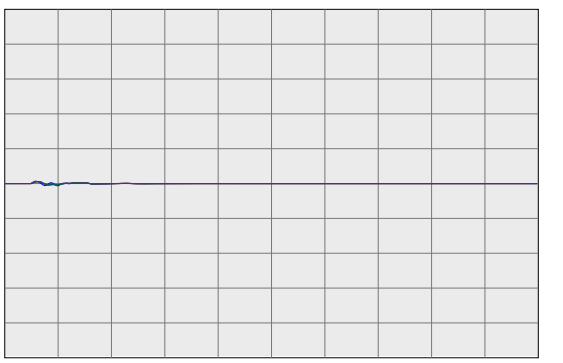


59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

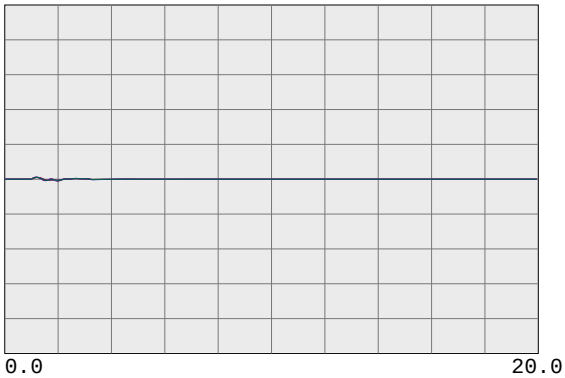


59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

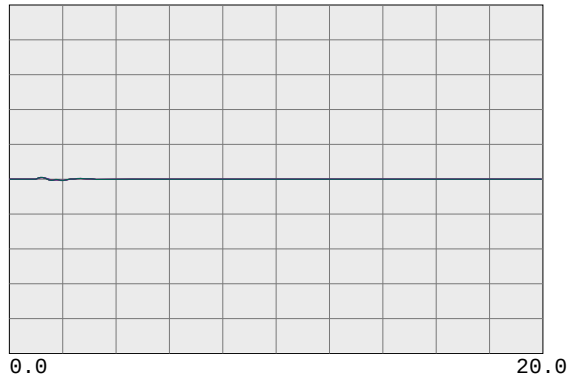
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

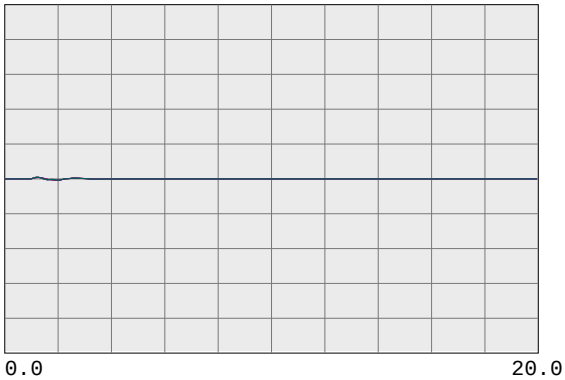
230-KV SYSTEM FREQUENCIES



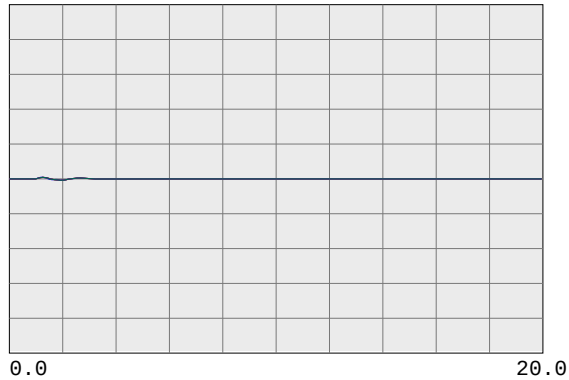
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



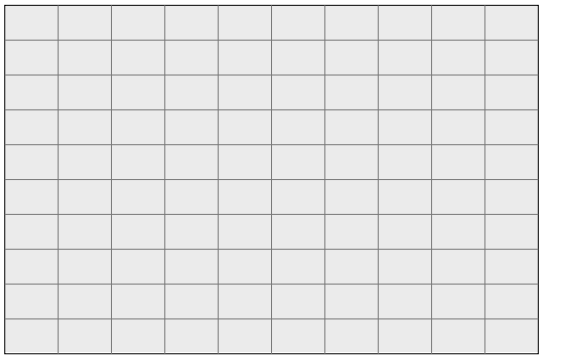
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

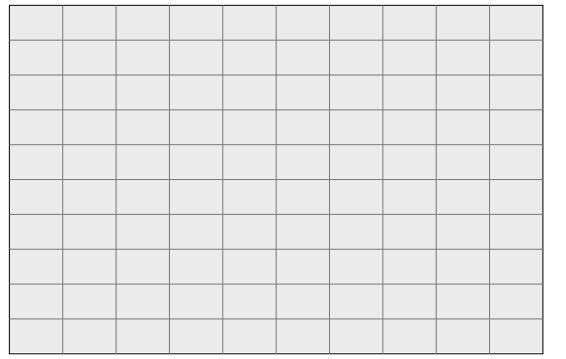


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



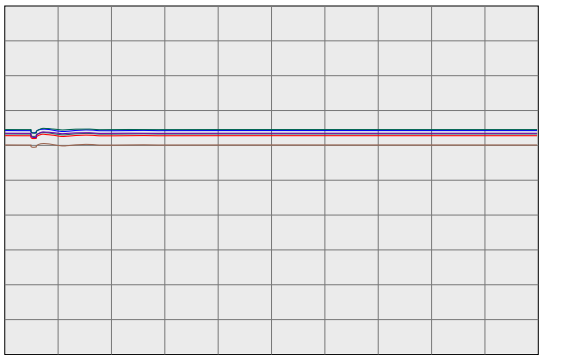
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



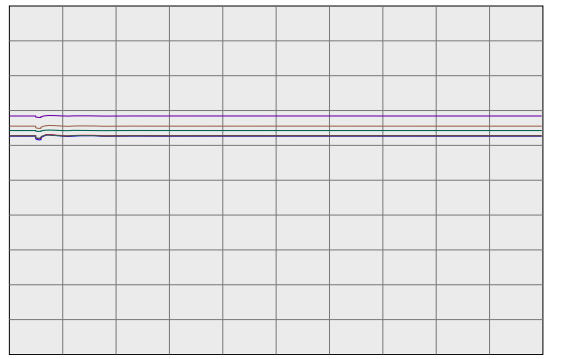


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

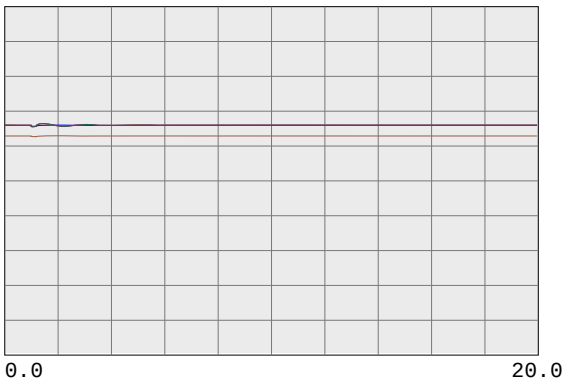
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



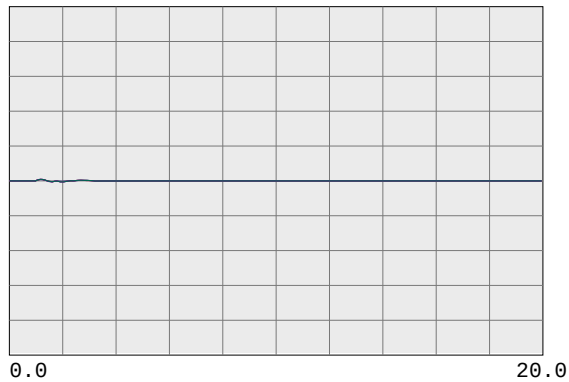
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



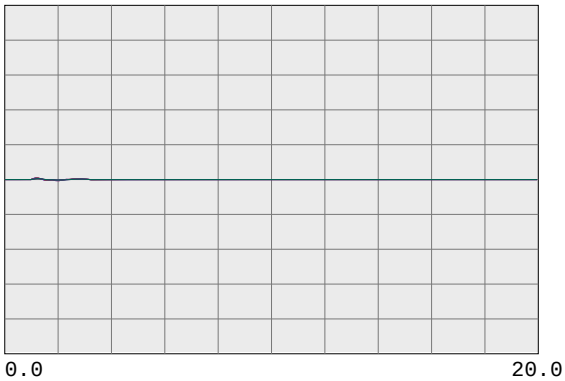
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



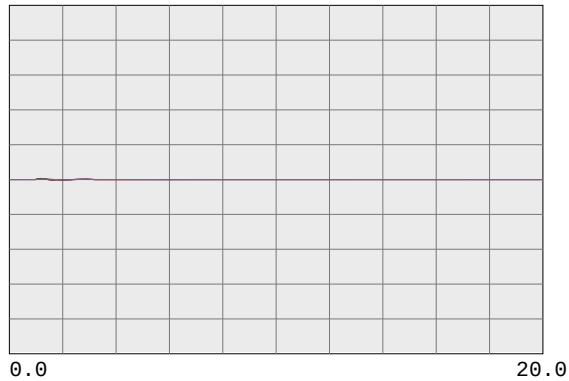
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



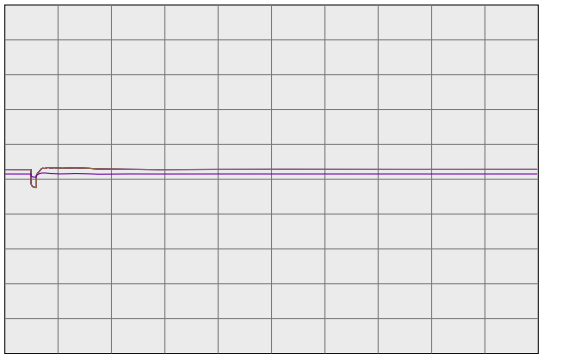
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

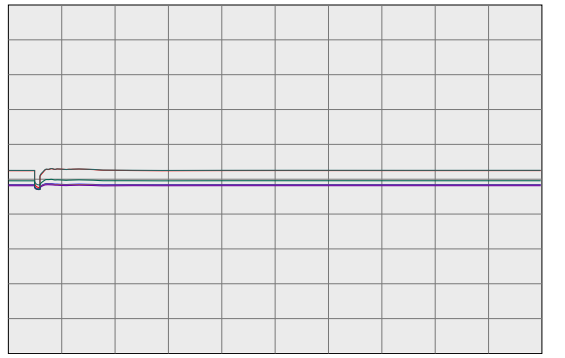
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

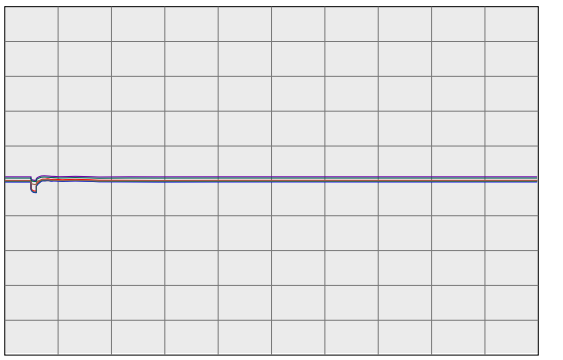
230-KV SYSTEM VOLTAGES



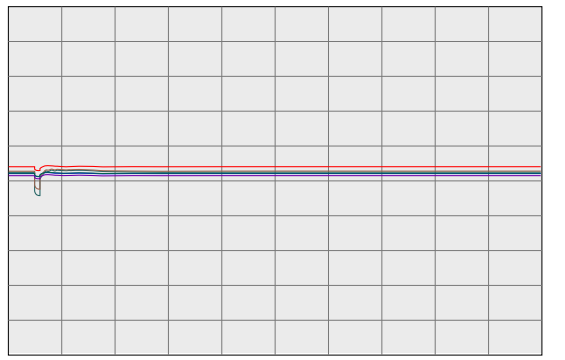
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



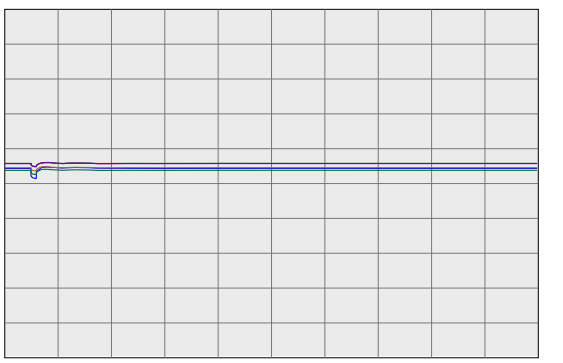
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



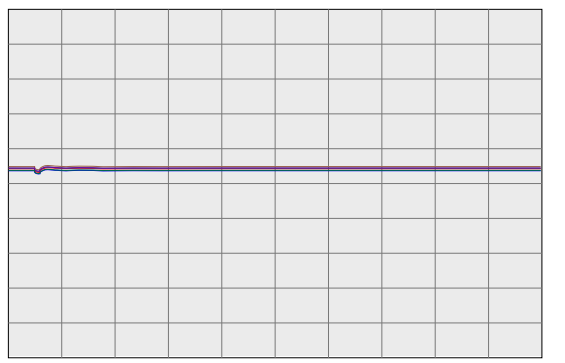
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



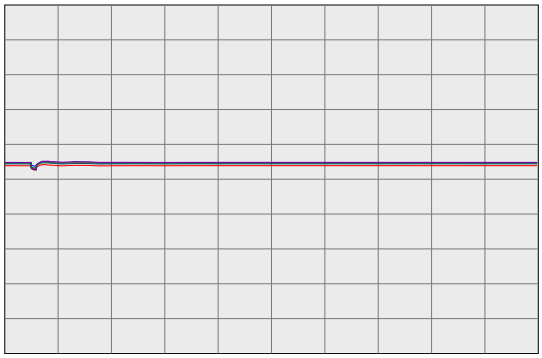
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

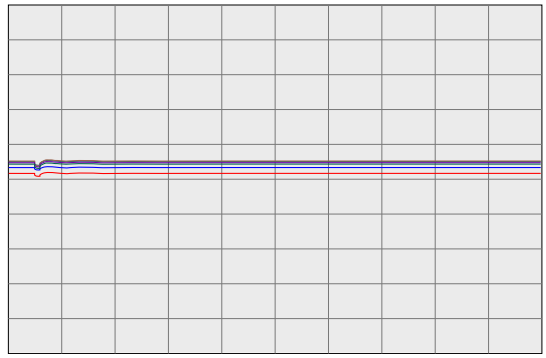
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

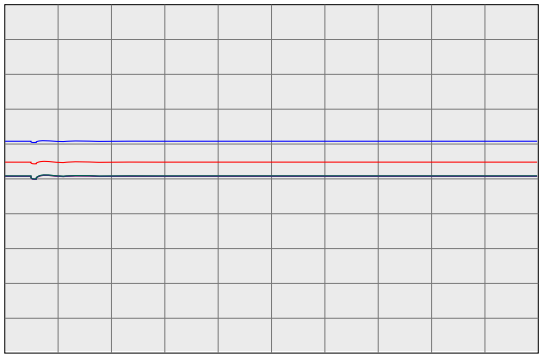
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

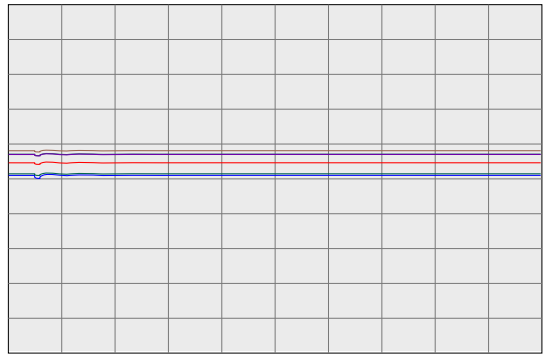
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

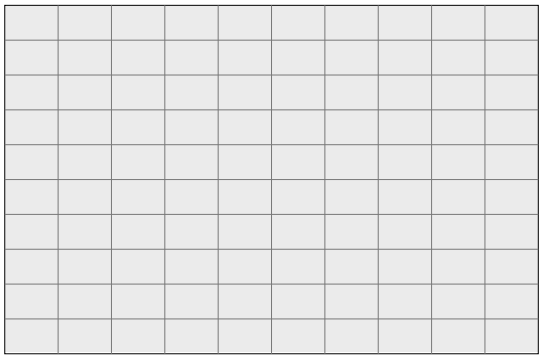
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

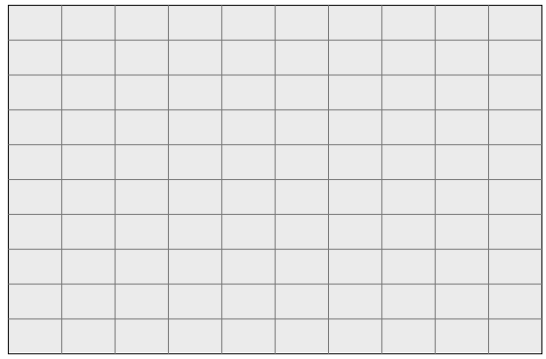


0.0 20.0

Time(sec)

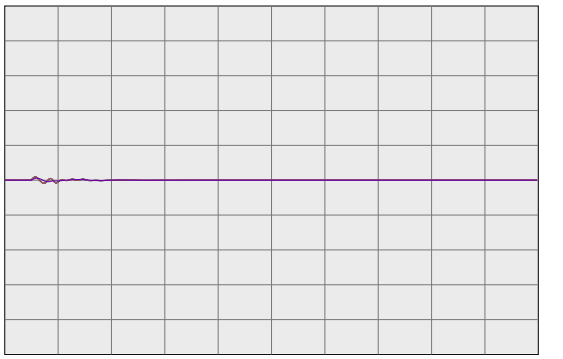
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



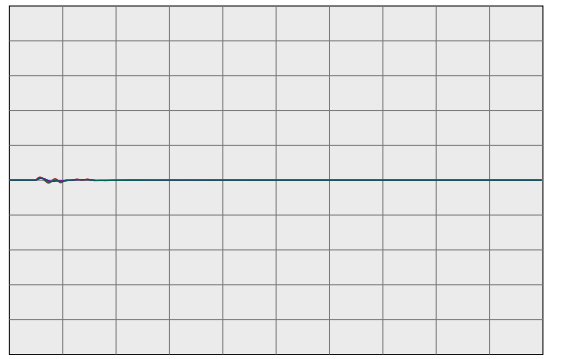


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

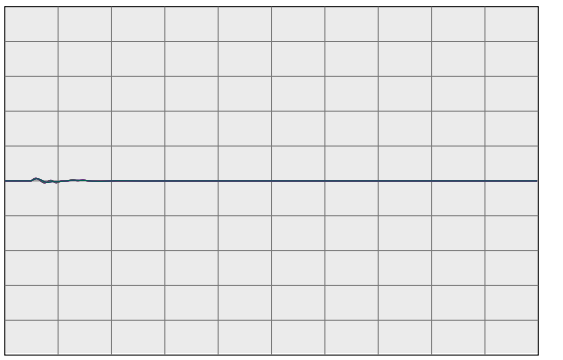
230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

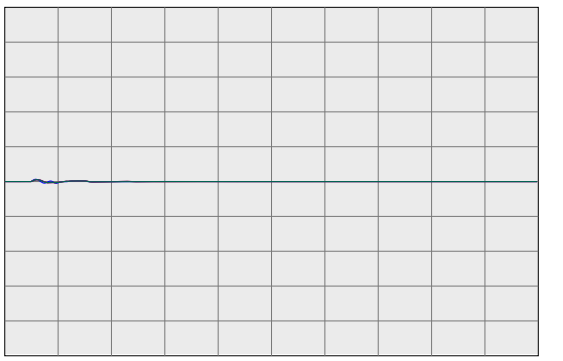


59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

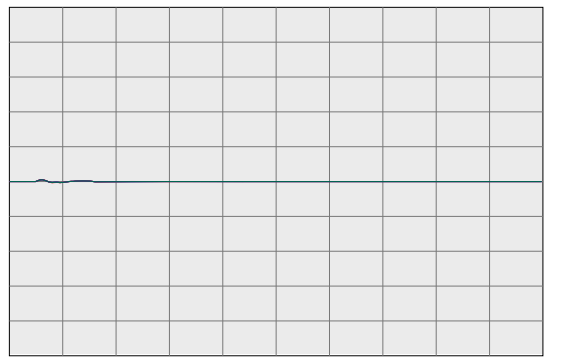


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



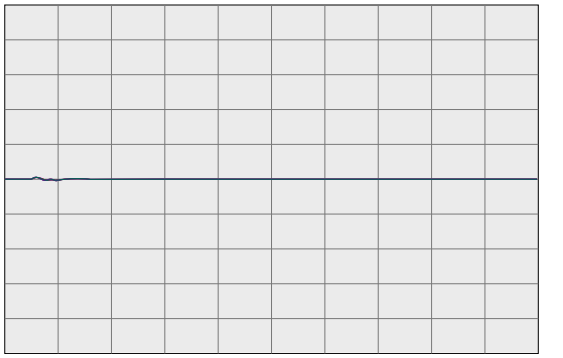
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



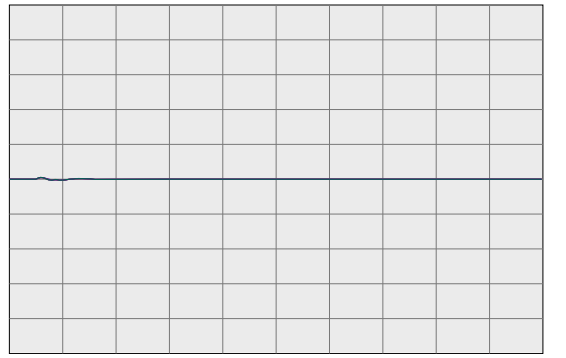
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

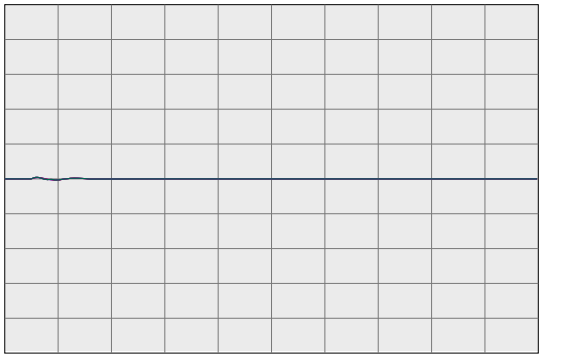
230-KV SYSTEM FREQUENCIES



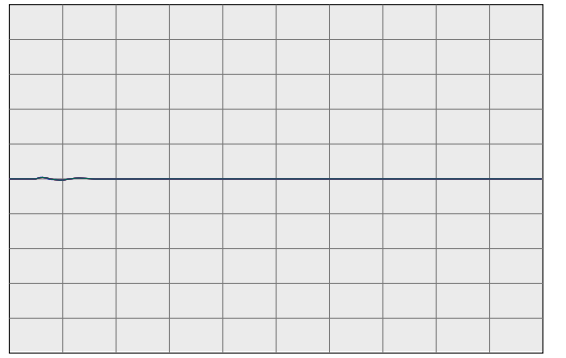
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



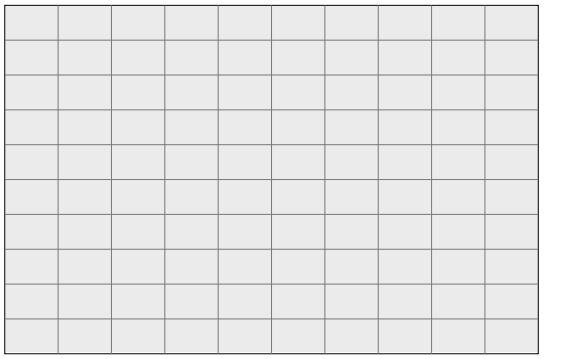
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

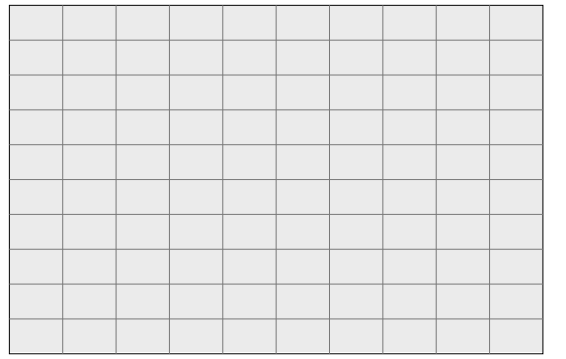


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



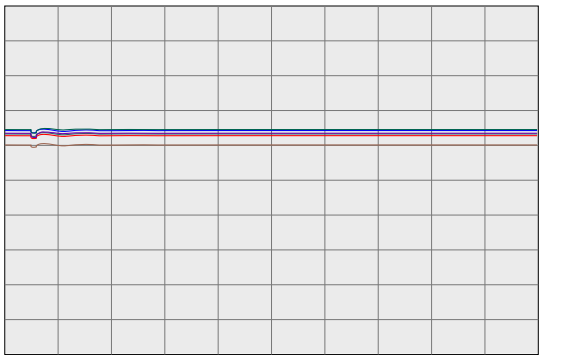
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



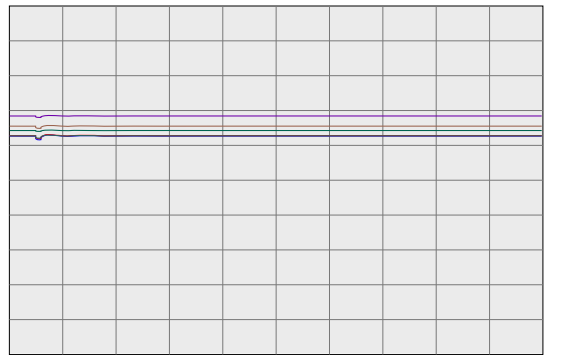


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

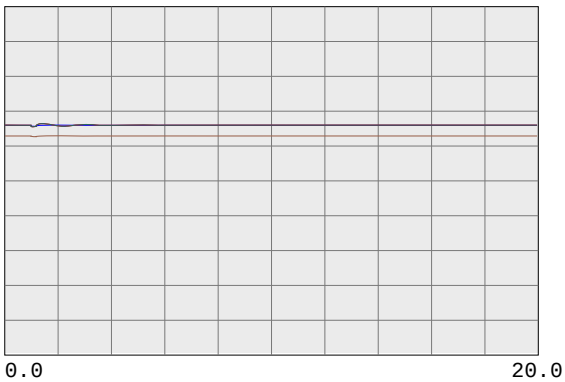
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



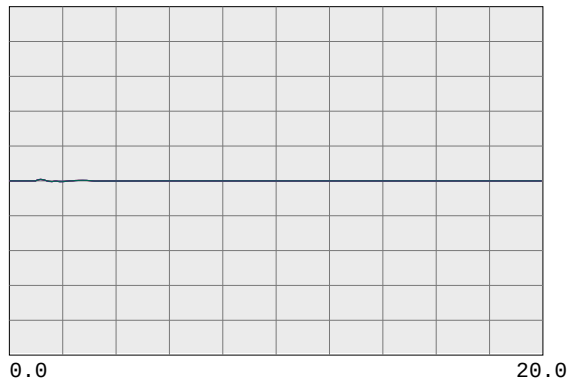
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



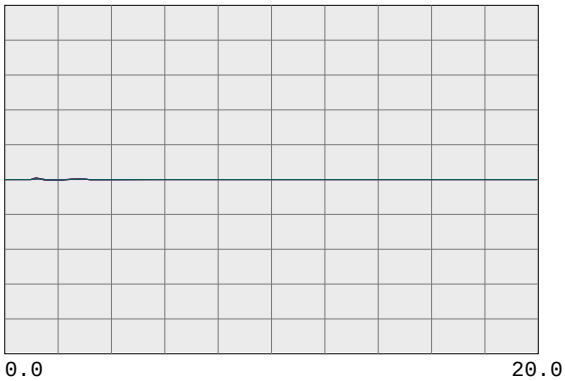
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



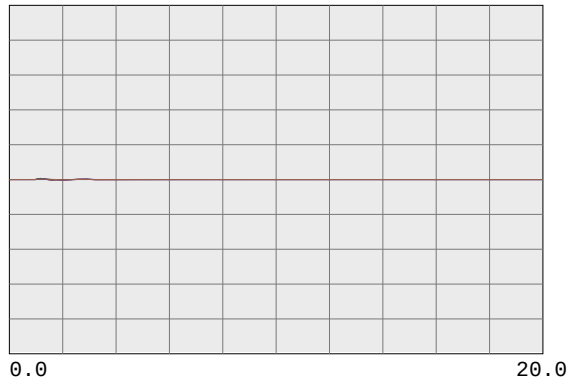
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



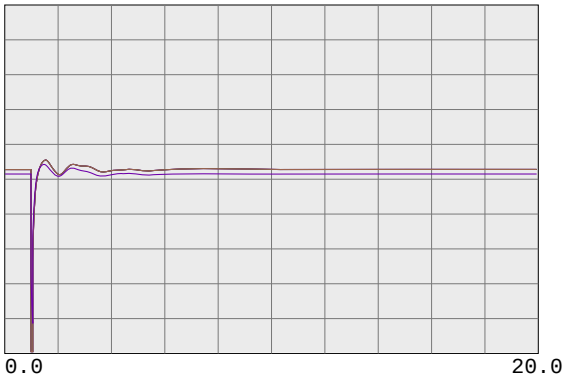
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

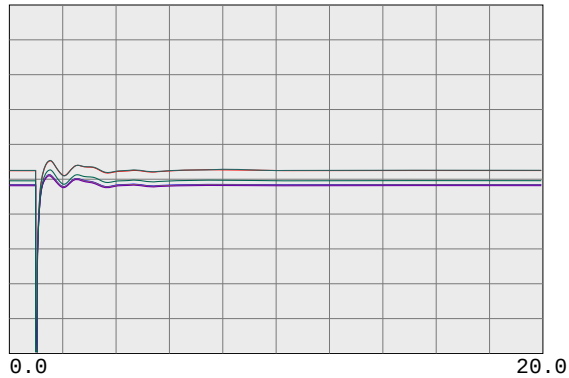
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

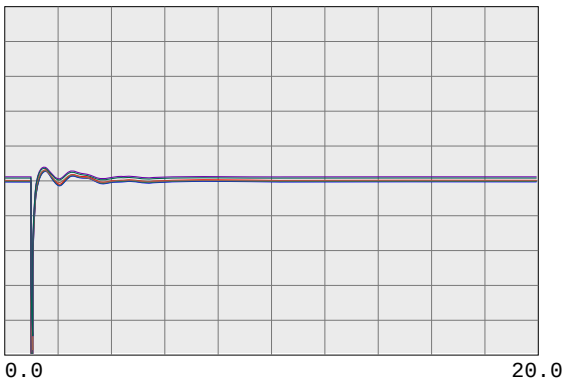
230-KV SYSTEM VOLTAGES



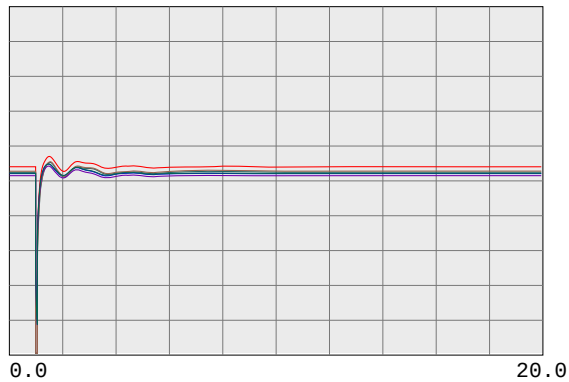
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



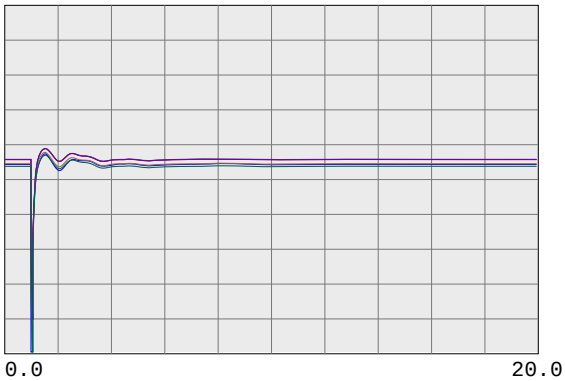
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



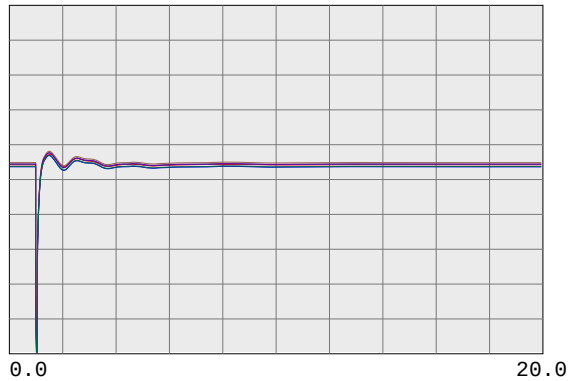
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



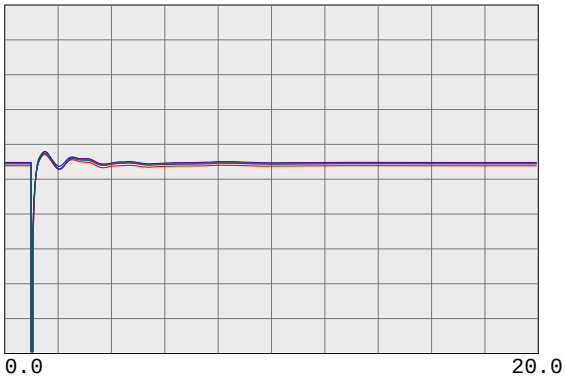
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



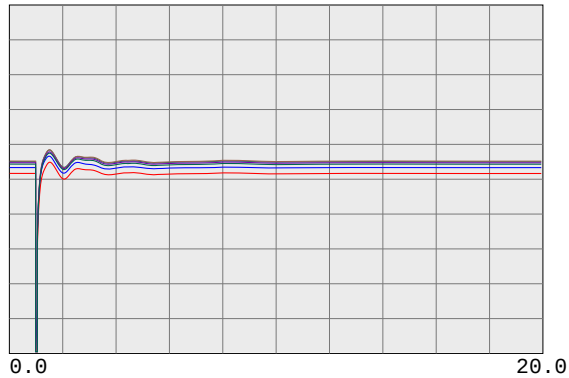
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

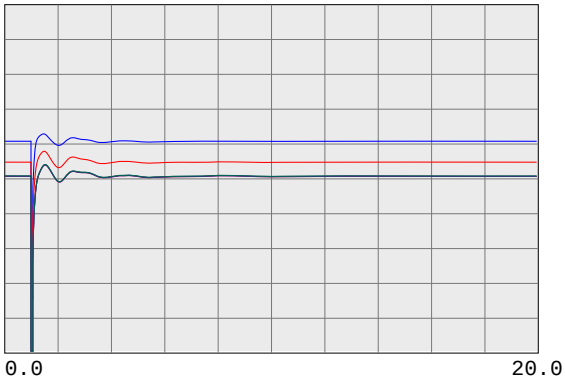
230-KV SYSTEM VOLTAGES



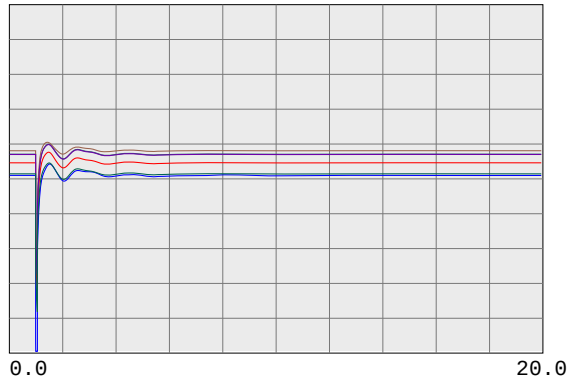
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



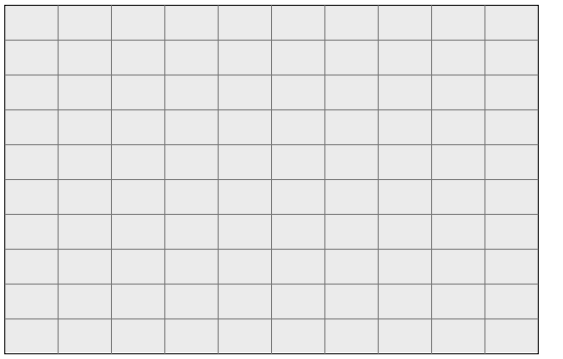
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

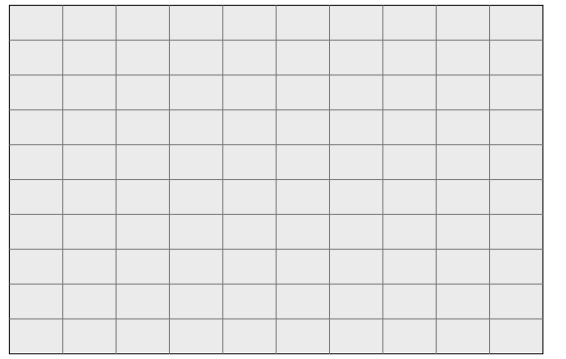


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



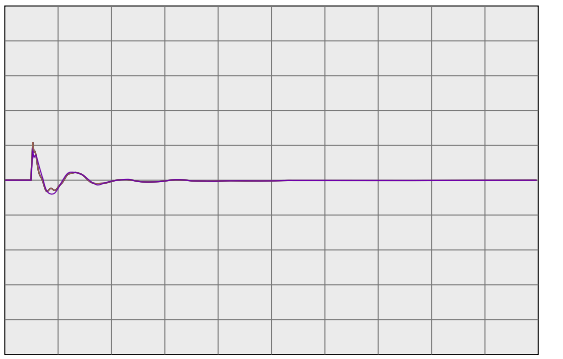
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



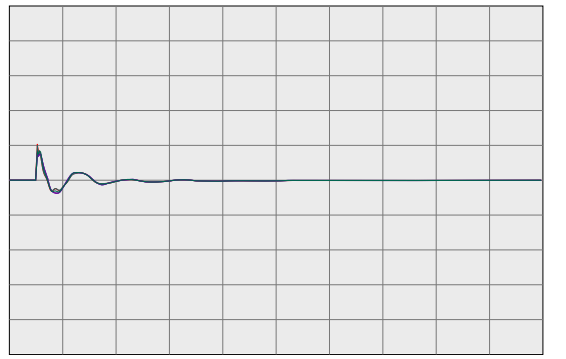


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

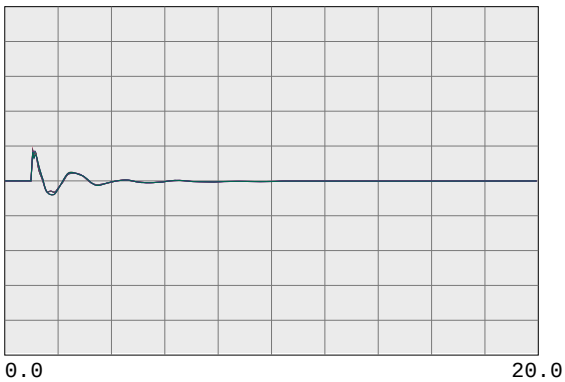
230-KV SYSTEM FREQUENCIES



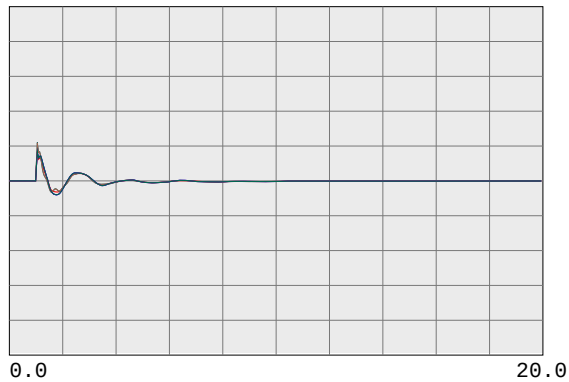
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



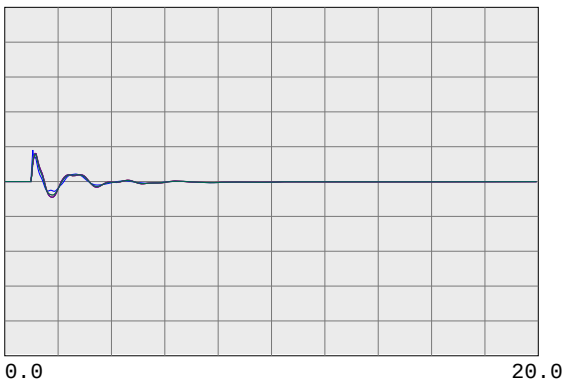
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



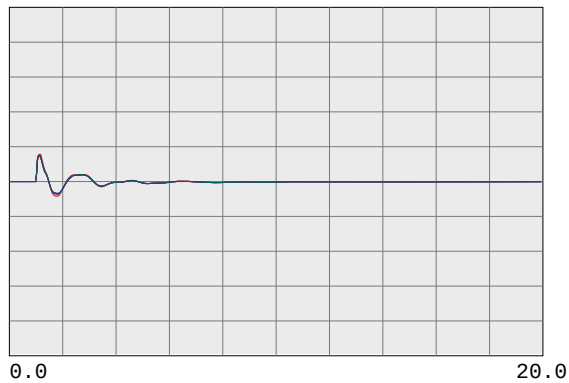
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



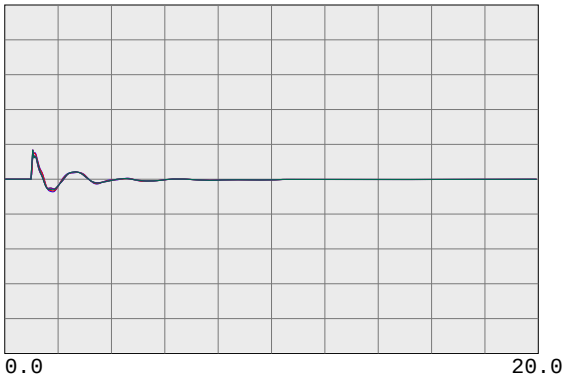
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



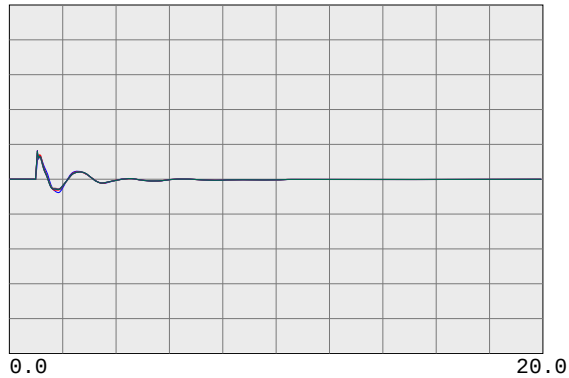
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

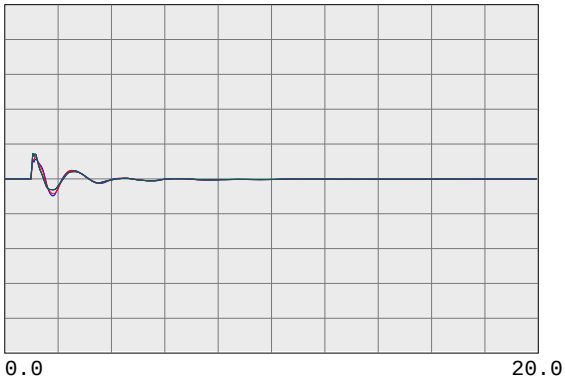
230-KV SYSTEM FREQUENCIES



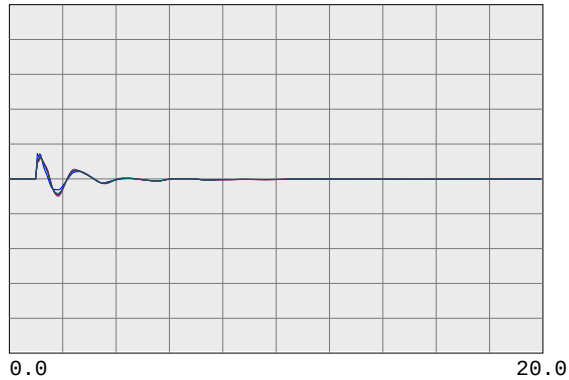
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



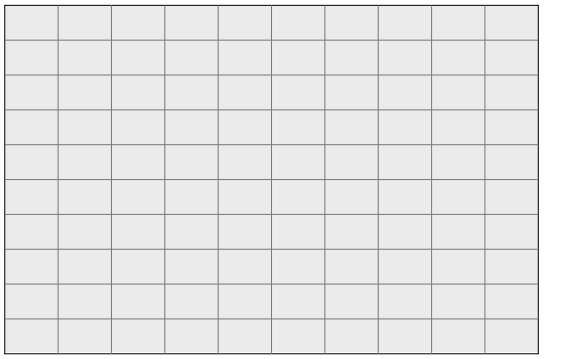
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

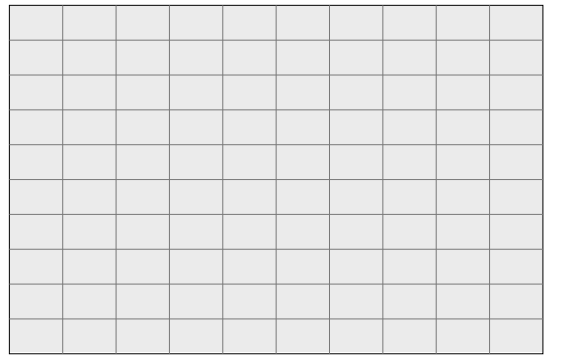


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



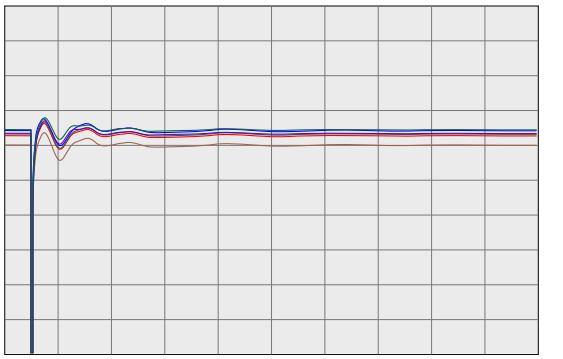
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



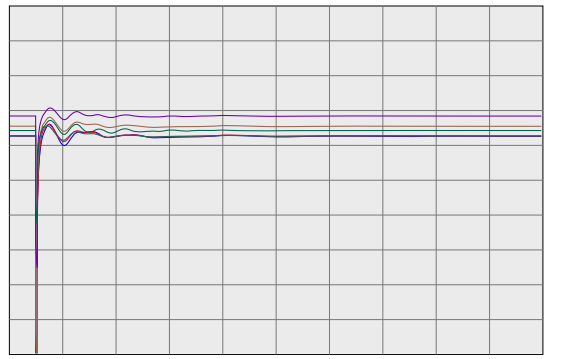


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

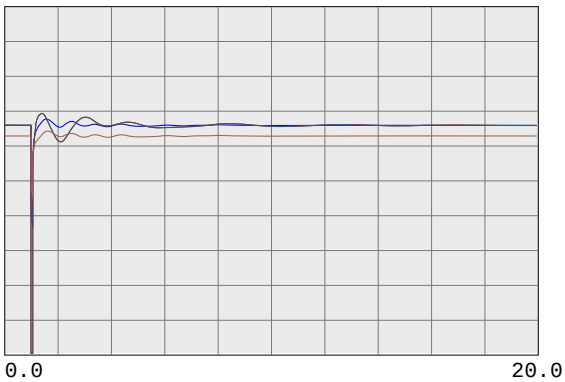
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



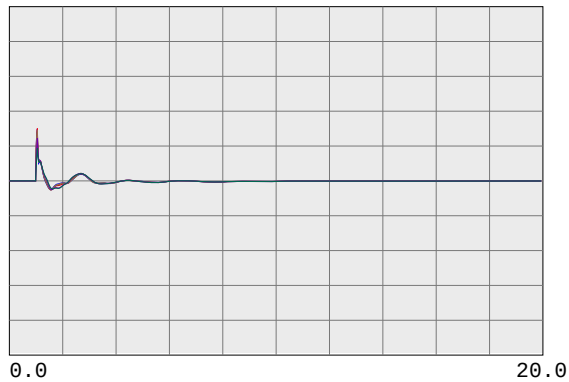
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



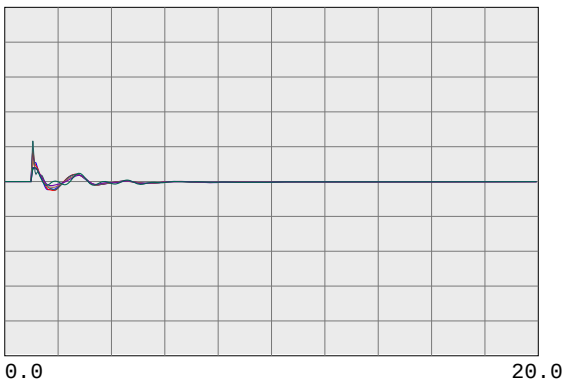
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



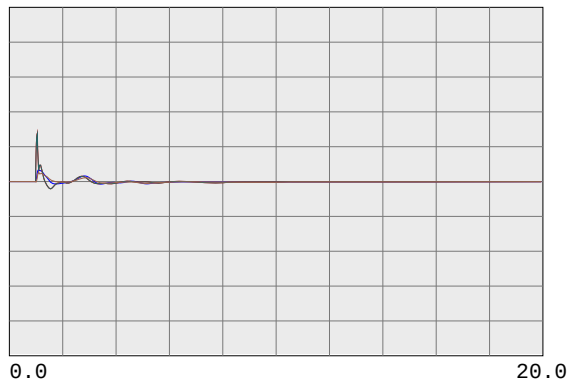
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



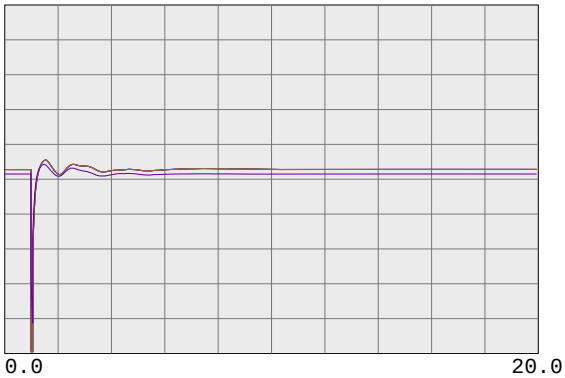
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

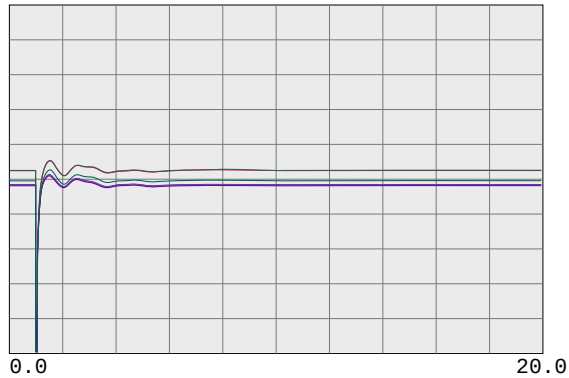
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

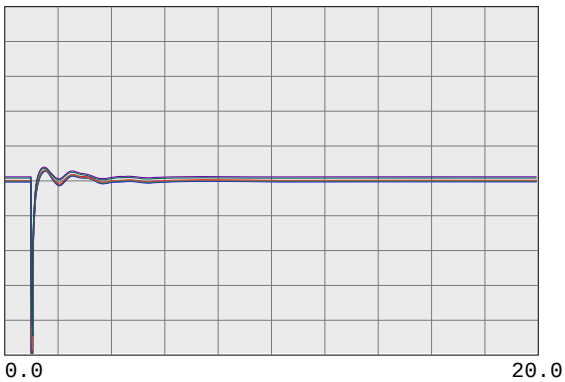
230-KV SYSTEM VOLTAGES



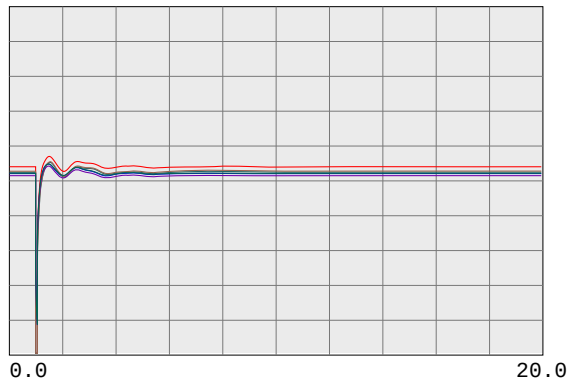
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



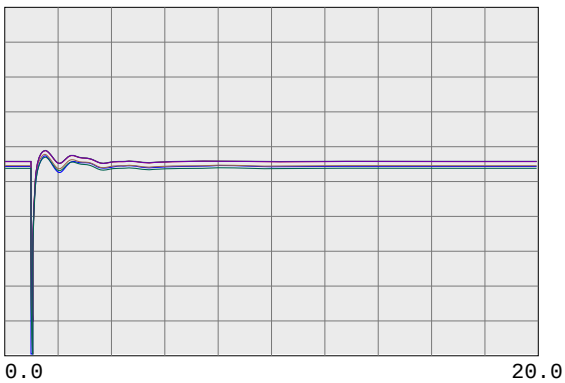
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



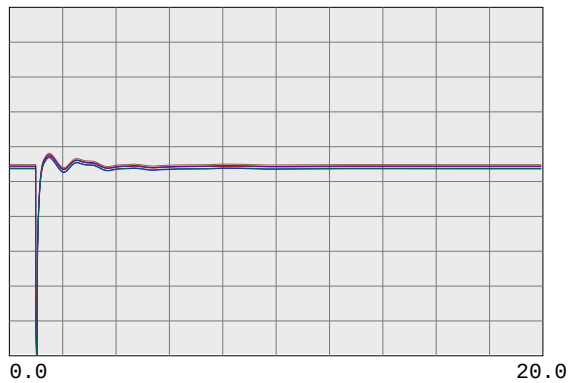
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



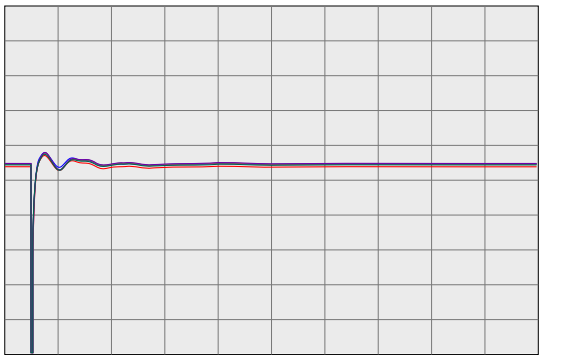
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



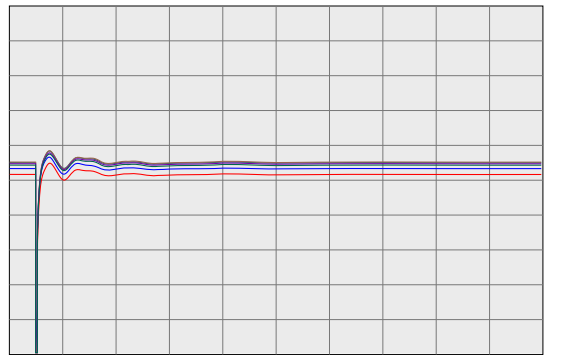
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

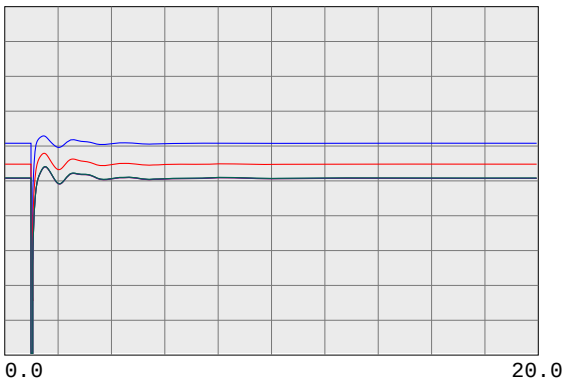
230-KV SYSTEM VOLTAGES



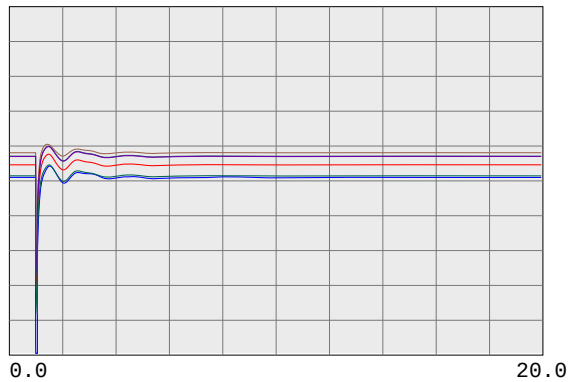
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



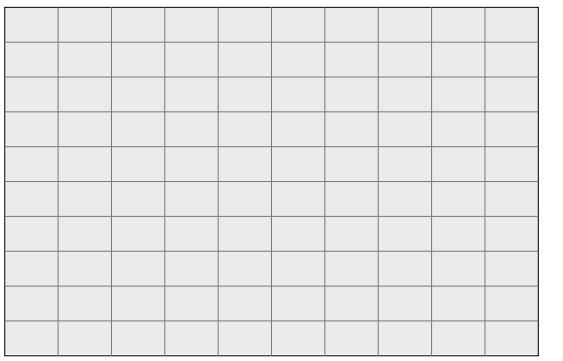
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

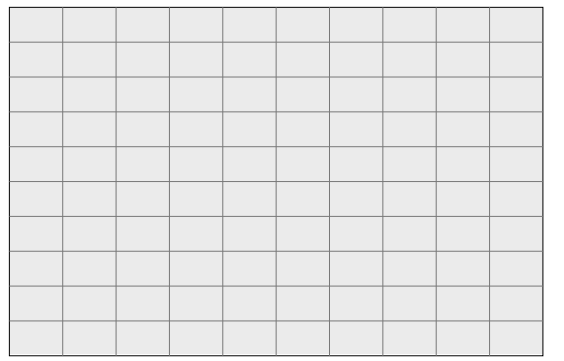


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



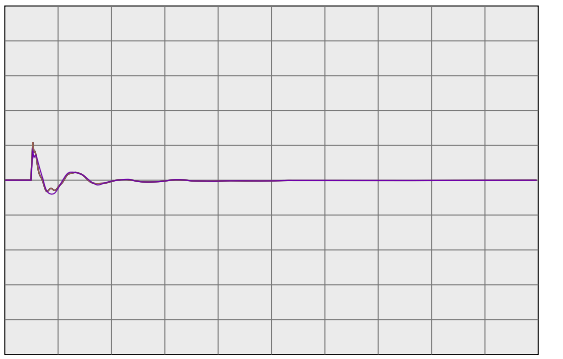
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



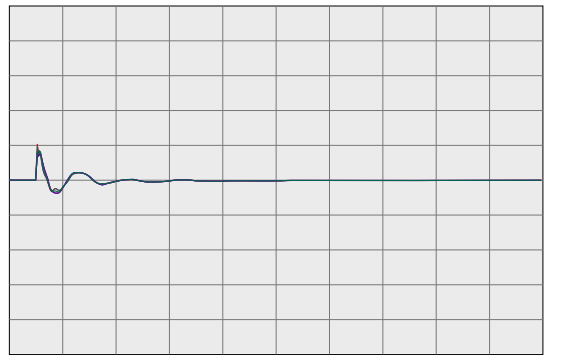


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

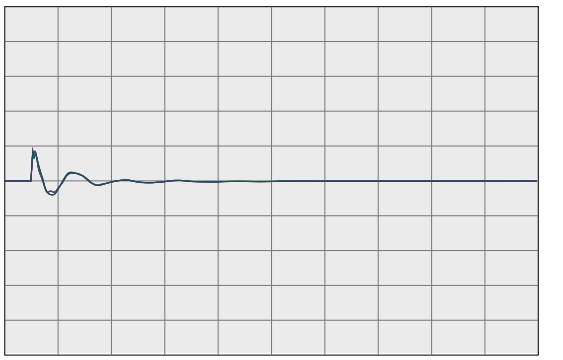
230-KV SYSTEM FREQUENCIES



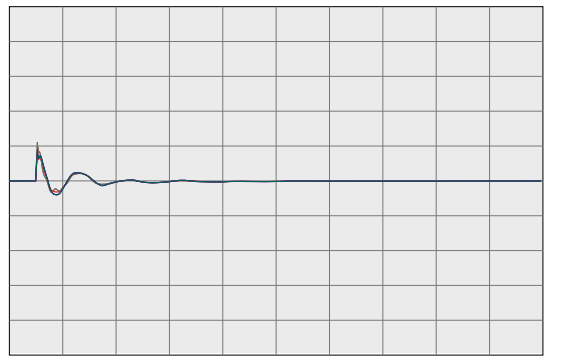
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



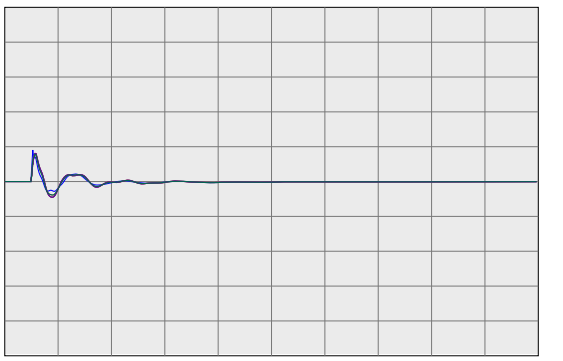
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



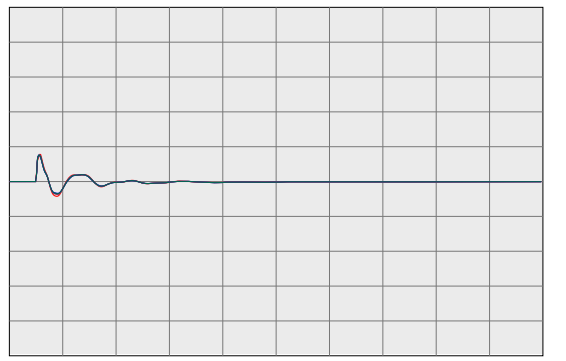
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



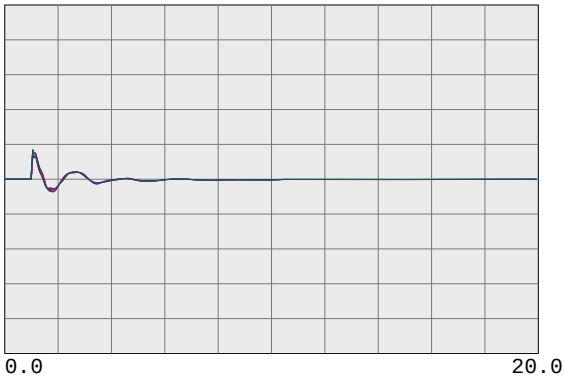
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



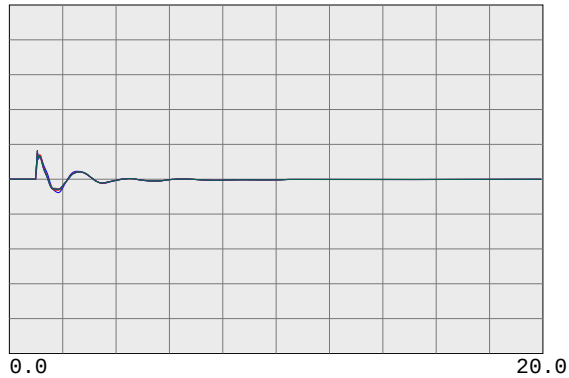
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

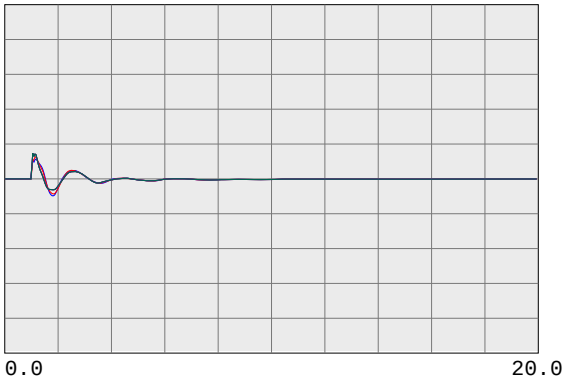
230-KV SYSTEM FREQUENCIES



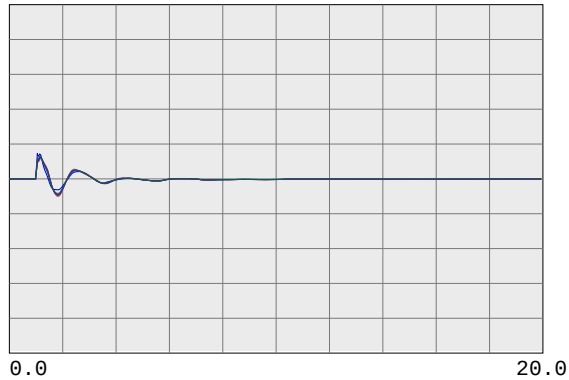
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



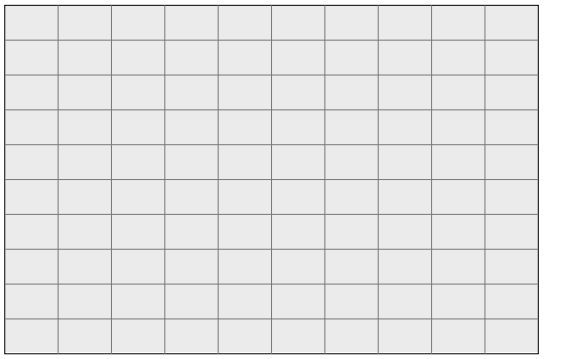
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

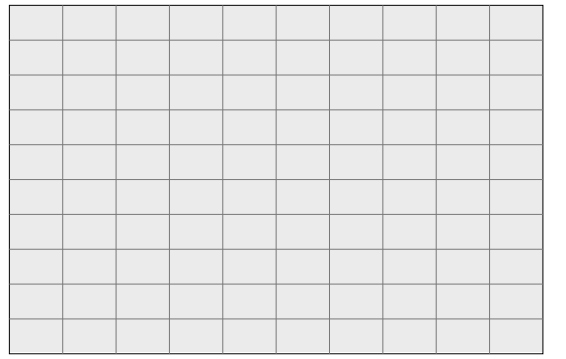


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



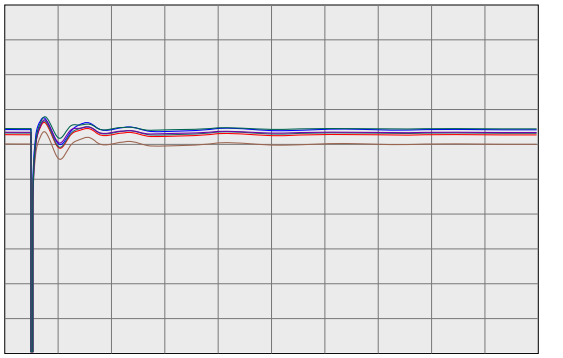
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



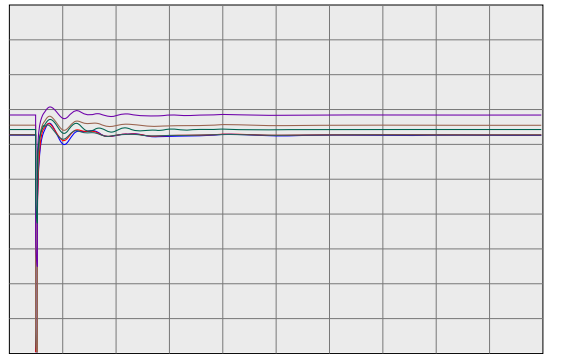


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

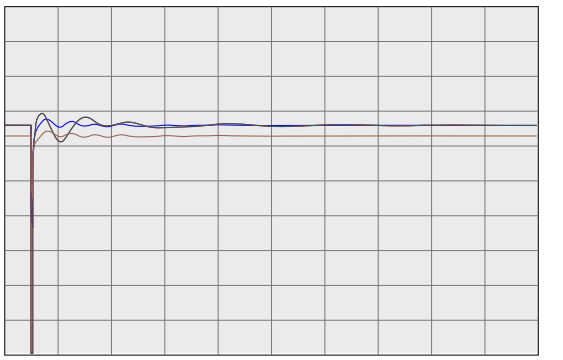
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



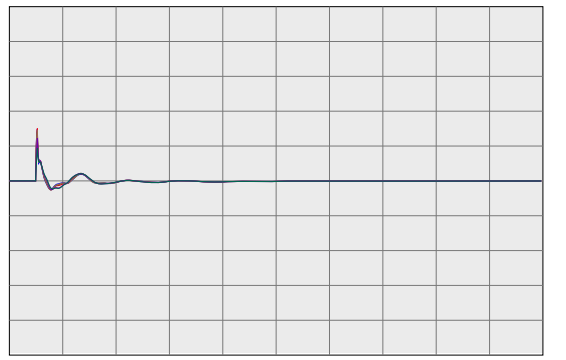
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



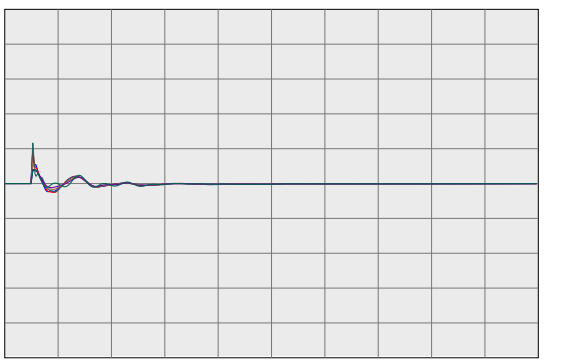
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



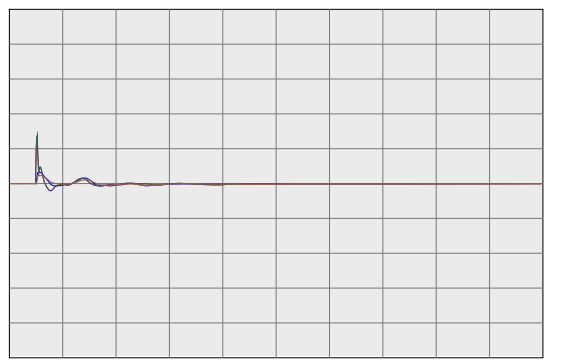
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



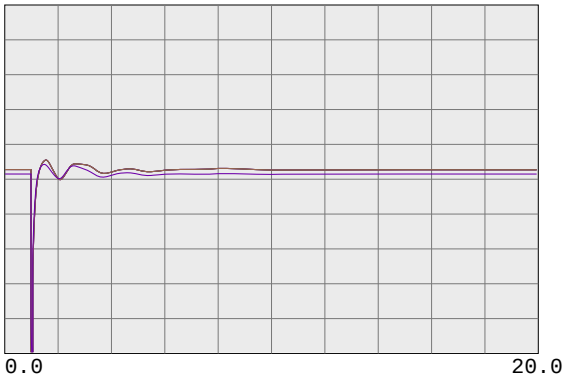
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

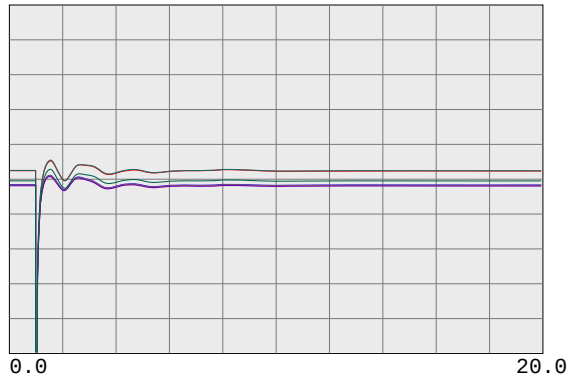
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

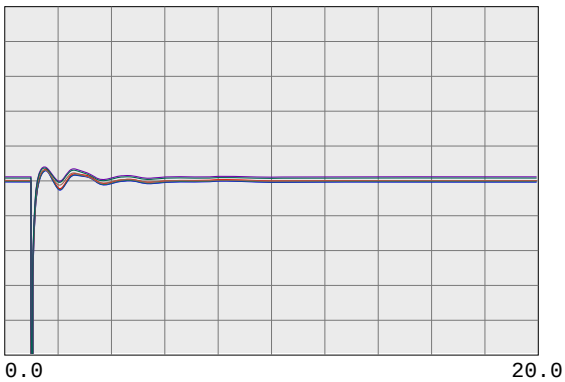
230-KV SYSTEM VOLTAGES



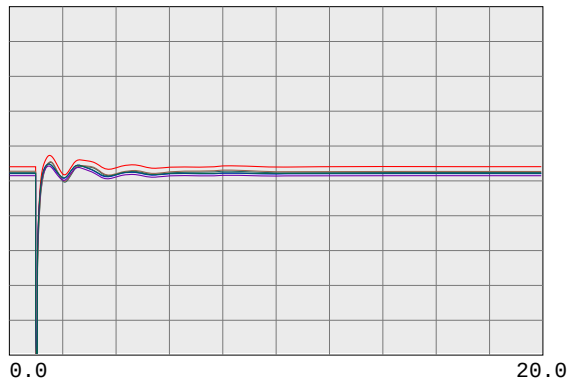
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



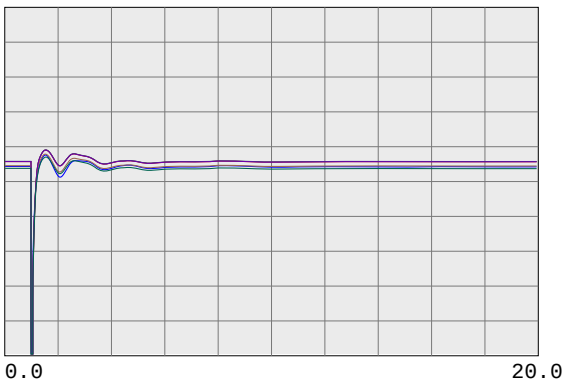
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



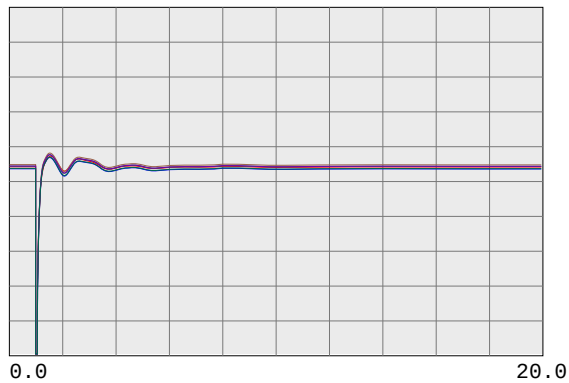
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



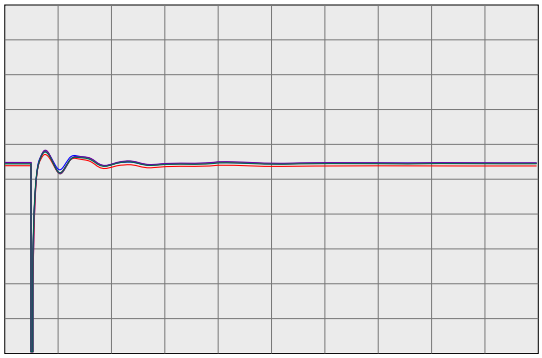
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

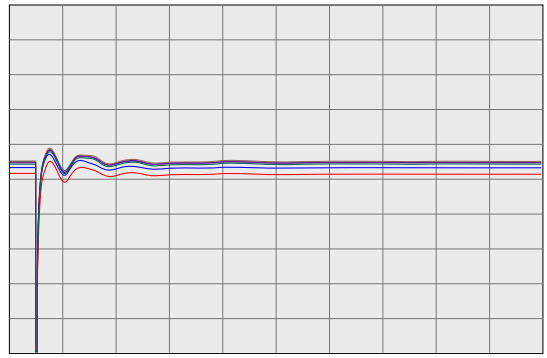
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

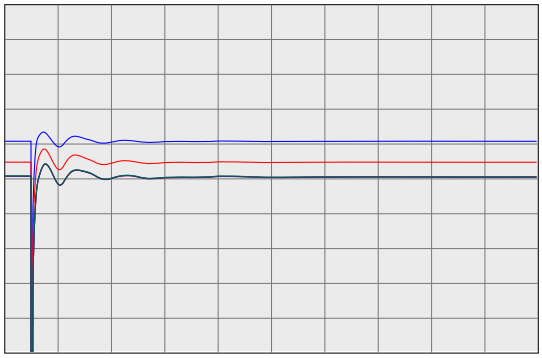
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

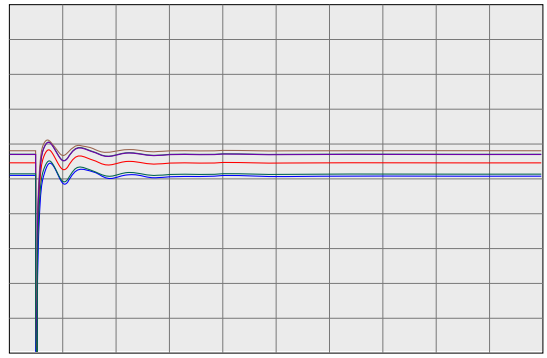
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

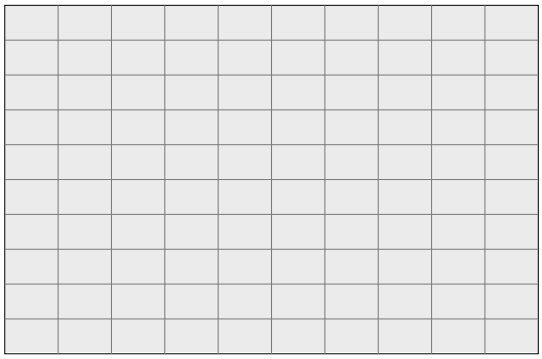
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

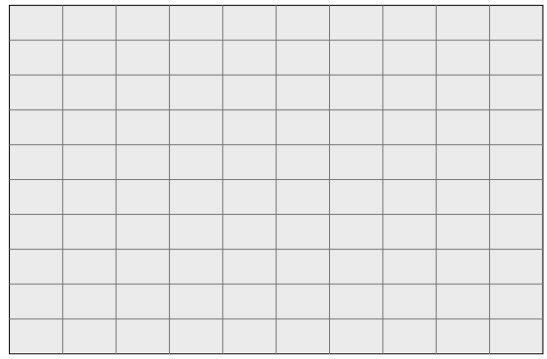


0.0 20.0

Time(sec)

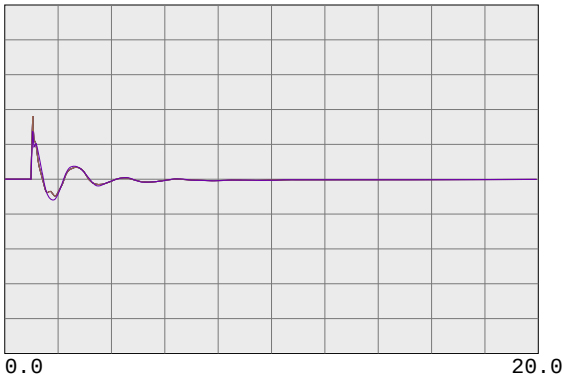
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



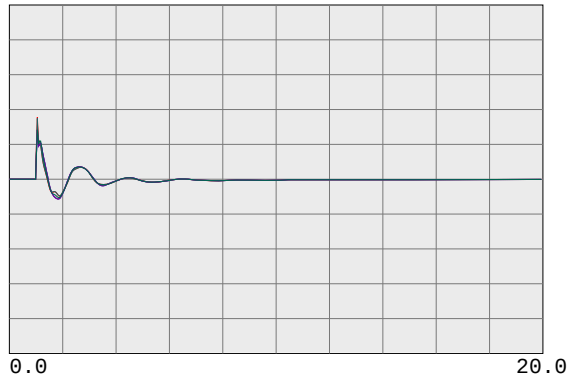


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

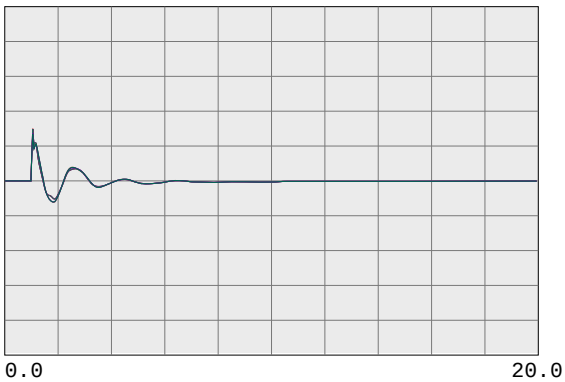
230-KV SYSTEM FREQUENCIES



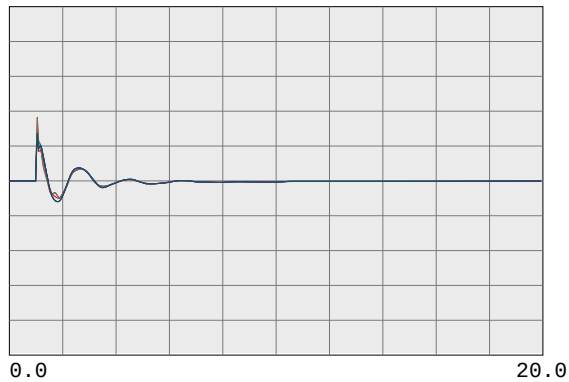
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



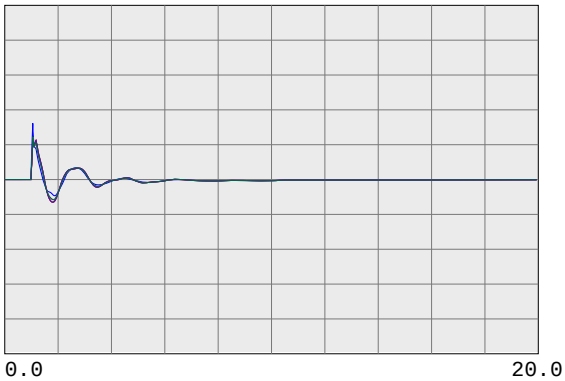
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



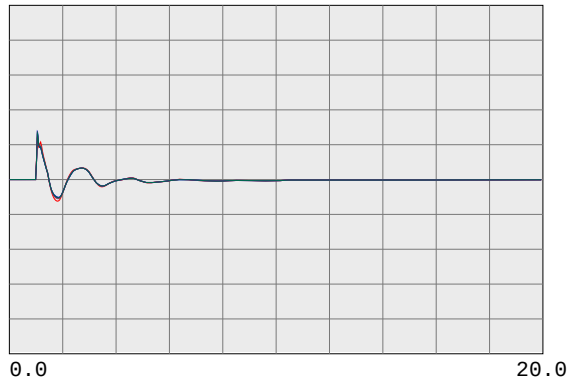
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



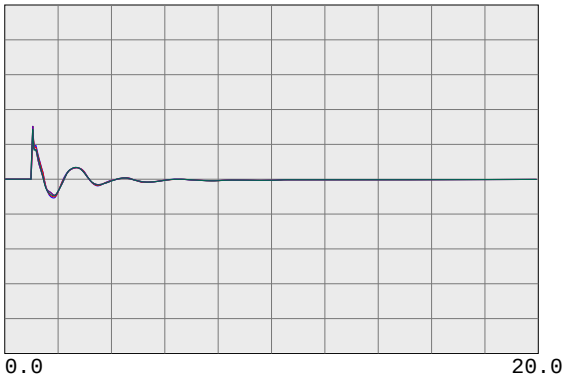
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



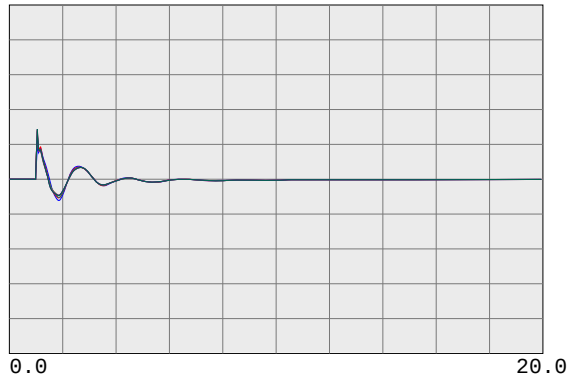
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

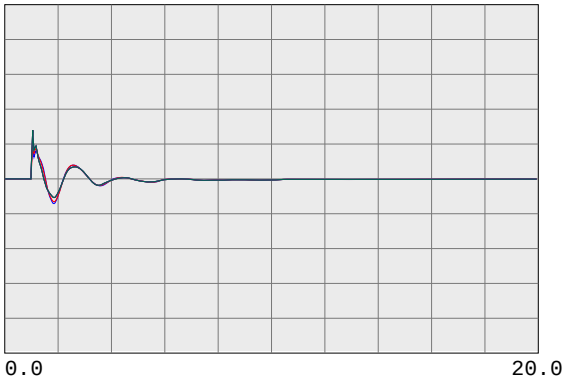
230-KV SYSTEM FREQUENCIES



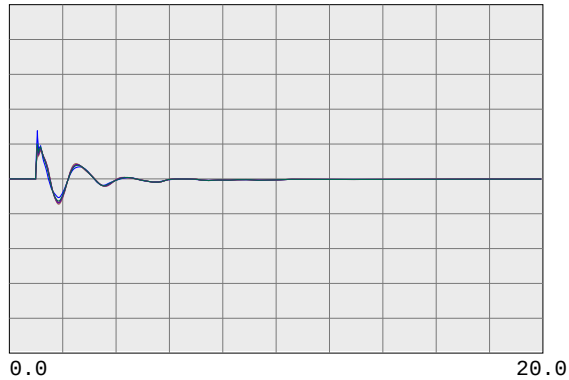
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



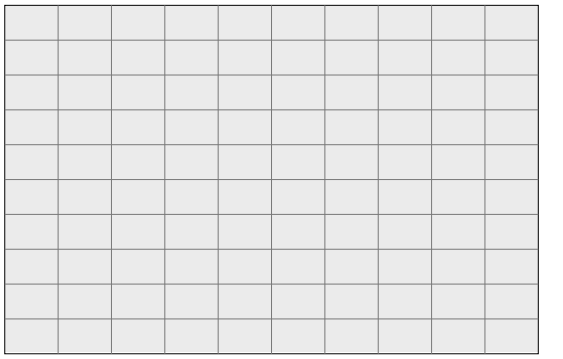
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

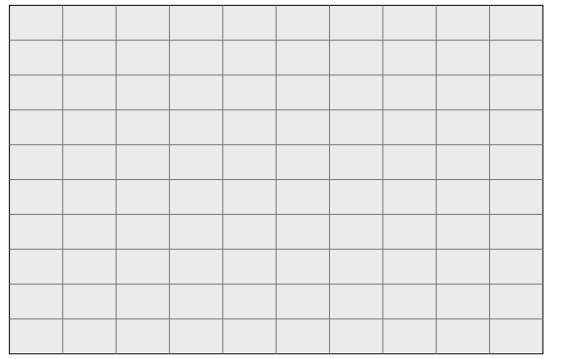


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



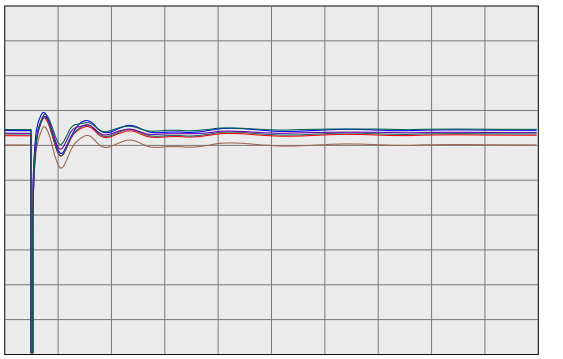
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



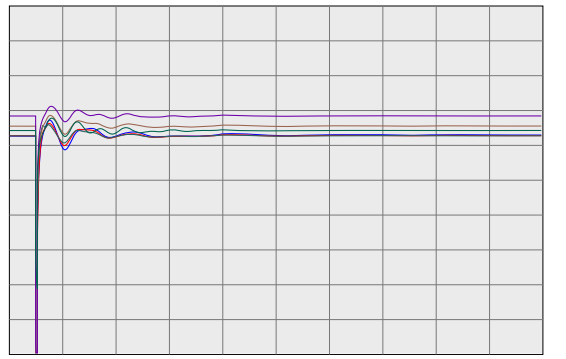


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

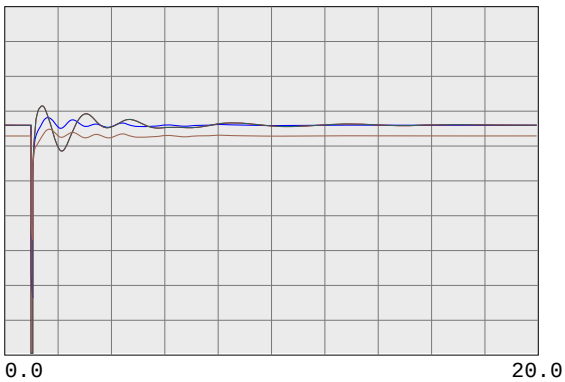
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



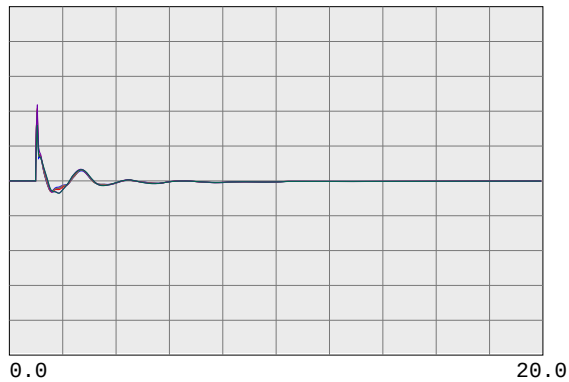
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



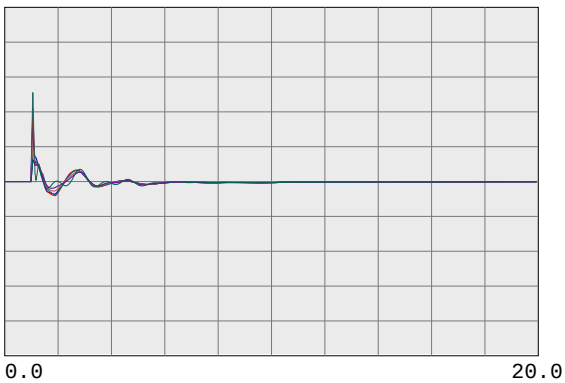
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



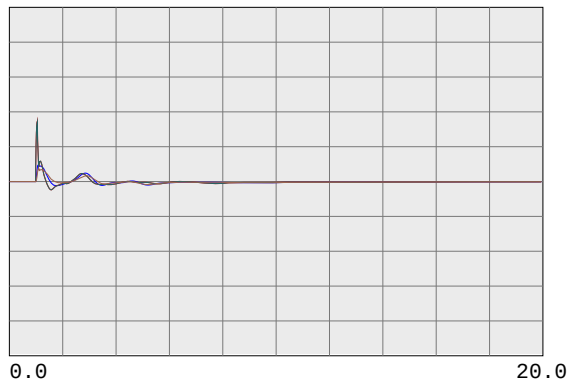
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



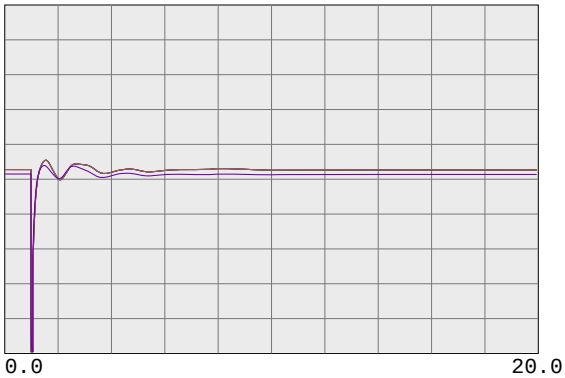
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

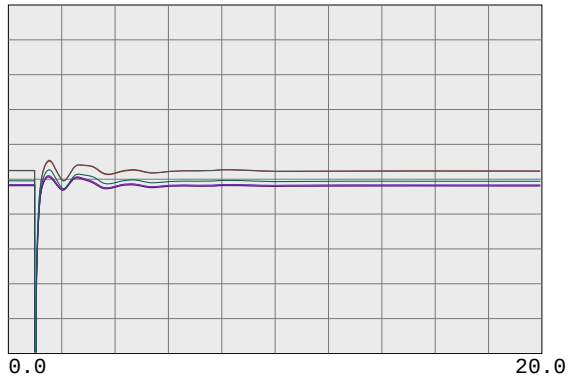
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

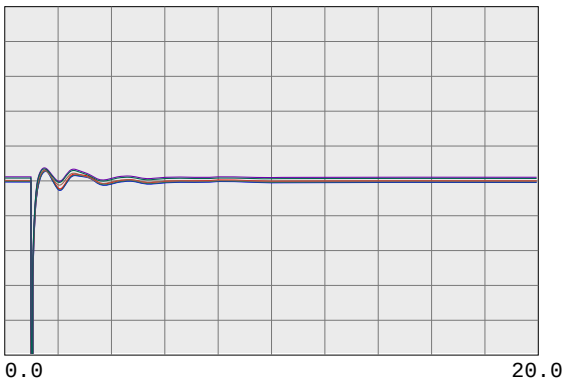
230-KV SYSTEM VOLTAGES



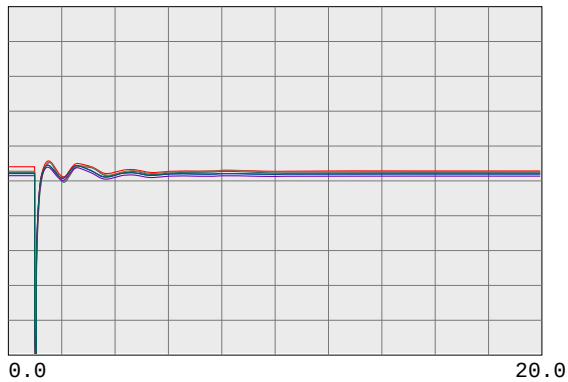
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



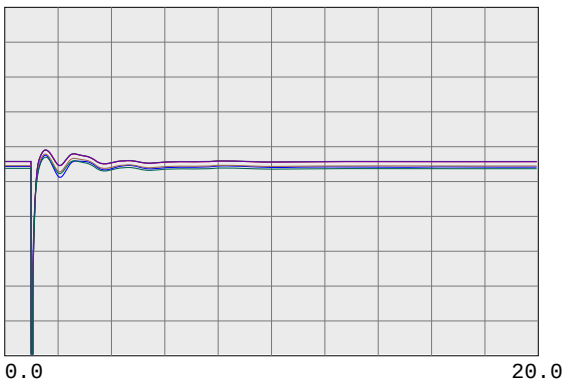
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



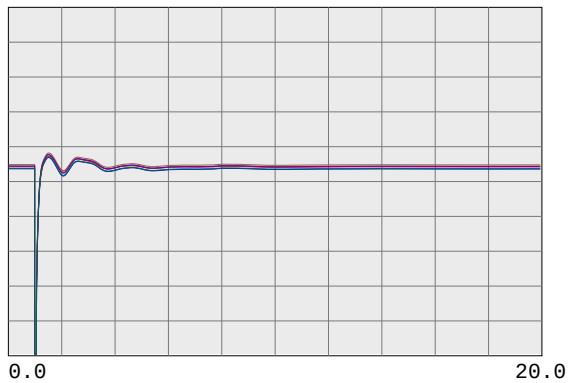
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



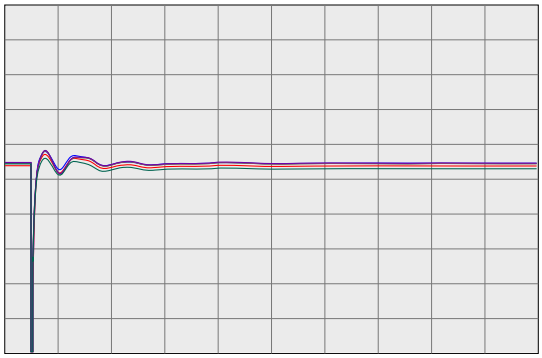
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

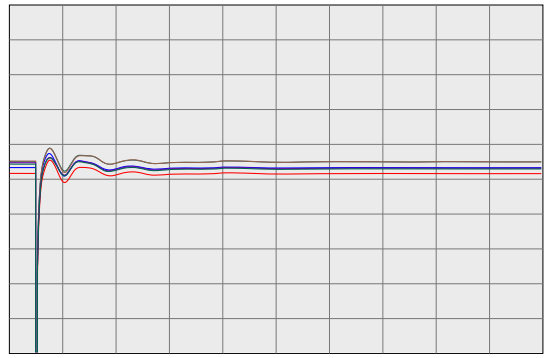
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

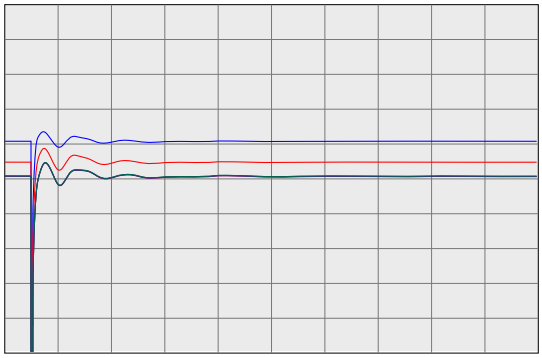
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

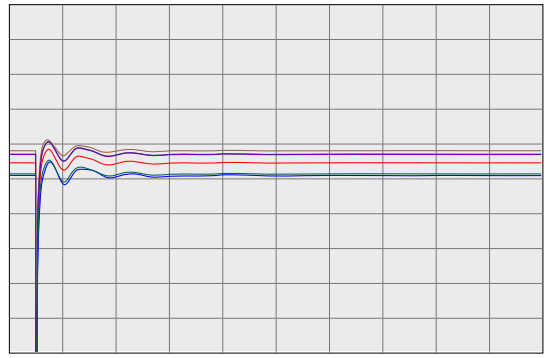
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

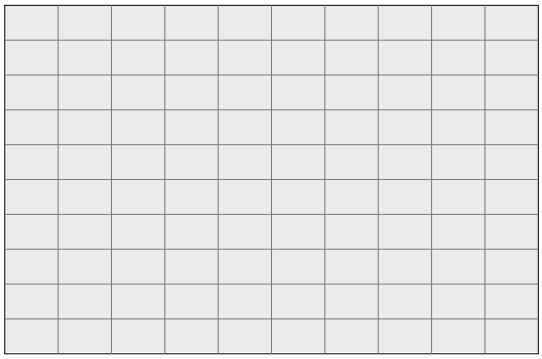
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

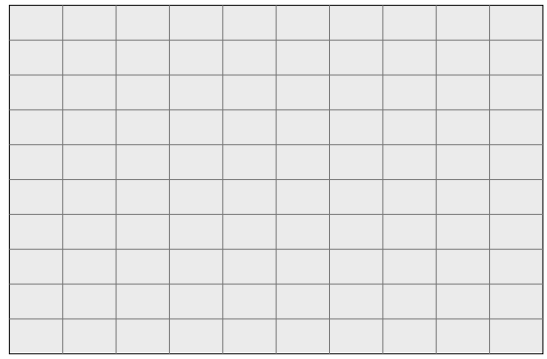


0.0 20.0

Time(sec)

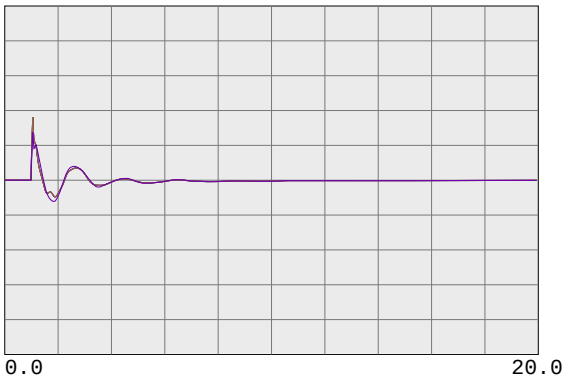
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



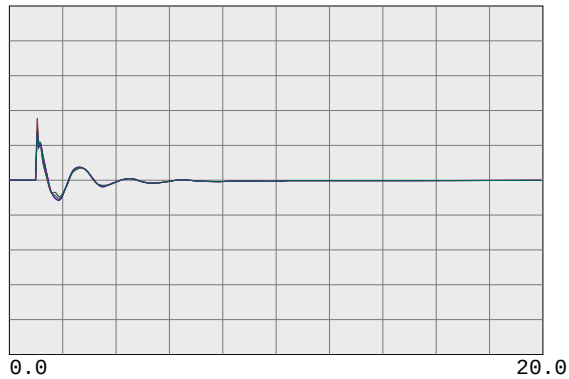


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

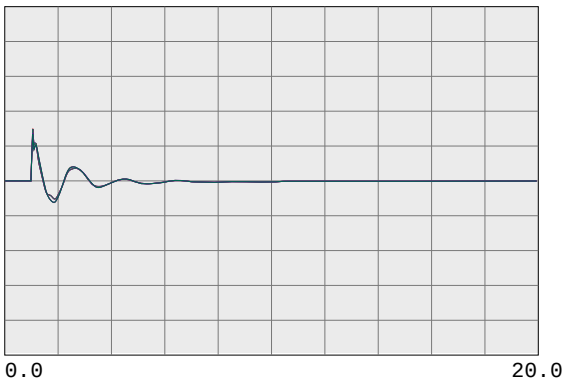
230-KV SYSTEM FREQUENCIES



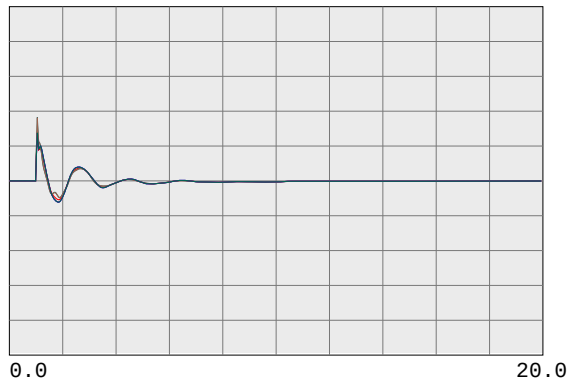
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



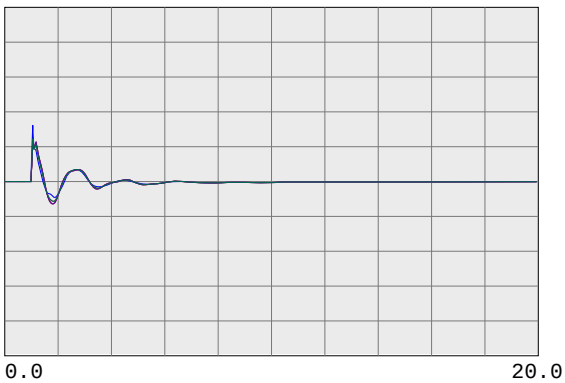
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



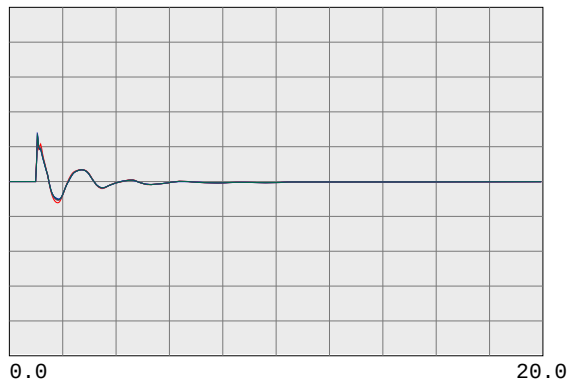
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



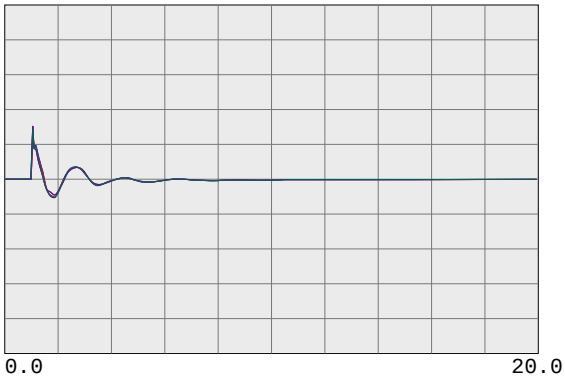
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



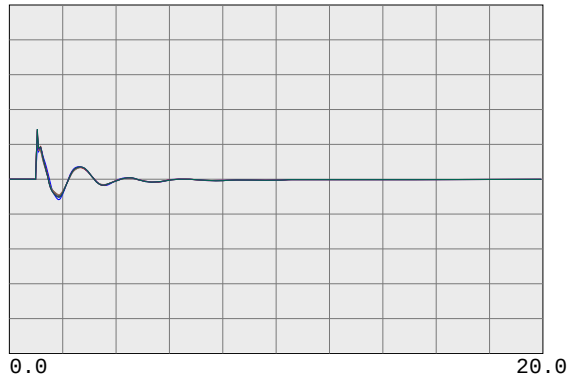
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

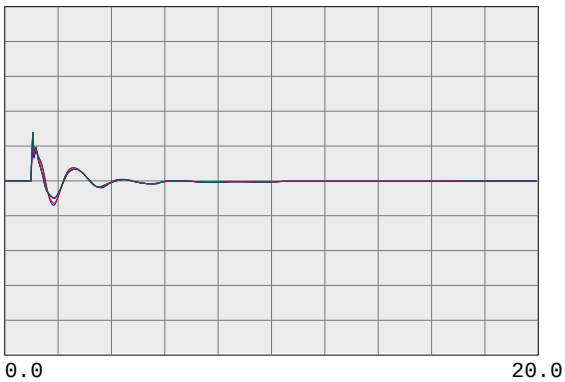
230-KV SYSTEM FREQUENCIES



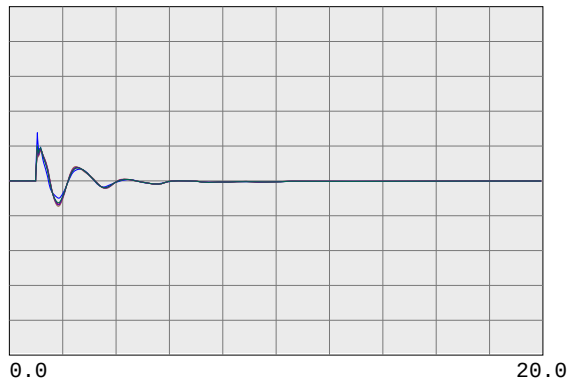
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



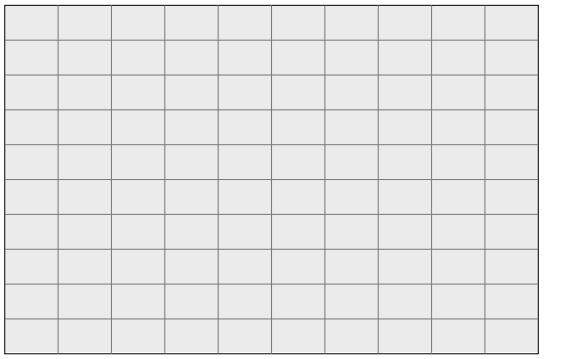
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

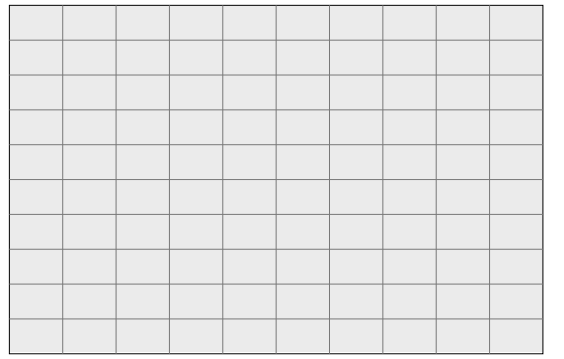


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



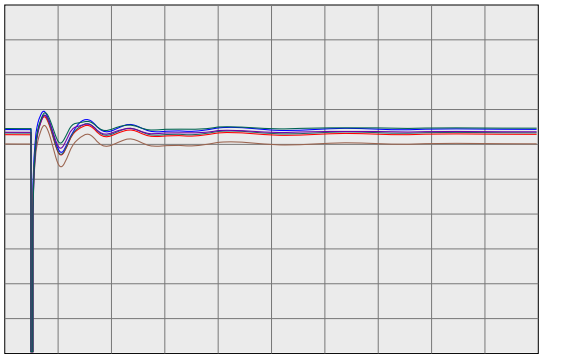
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



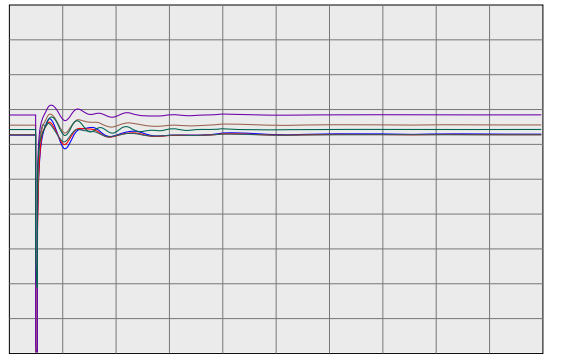


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

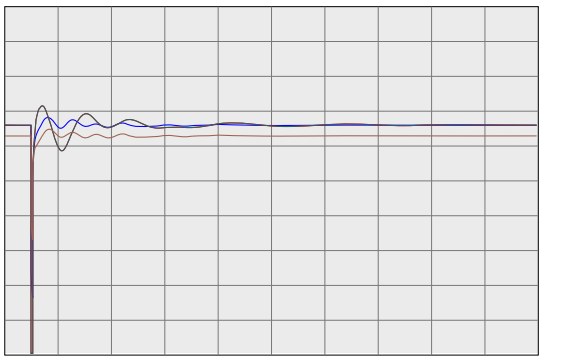
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



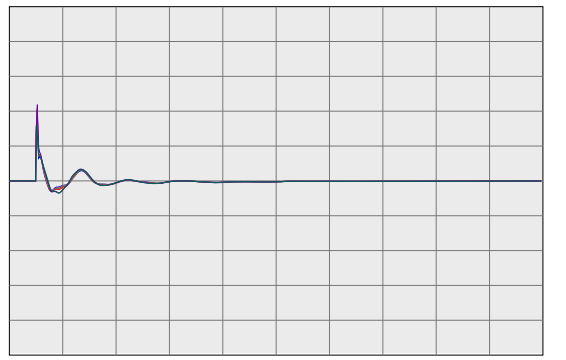
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



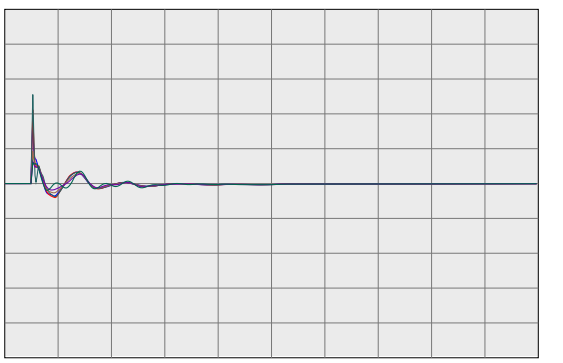
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



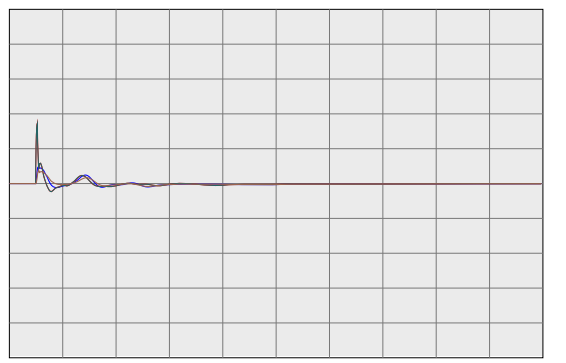
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



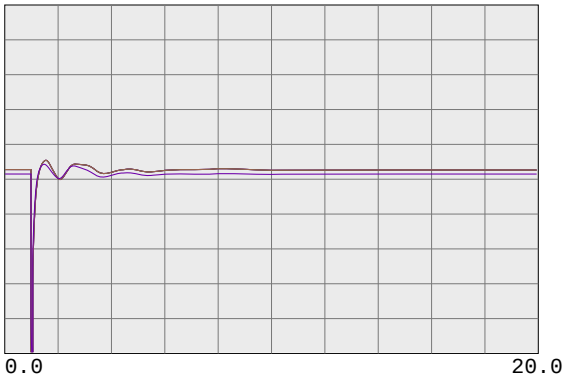
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

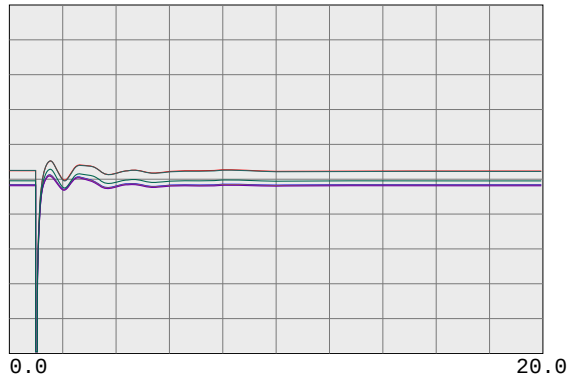
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

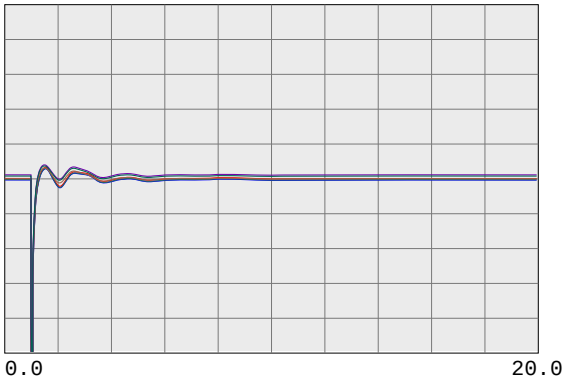
230-KV SYSTEM VOLTAGES



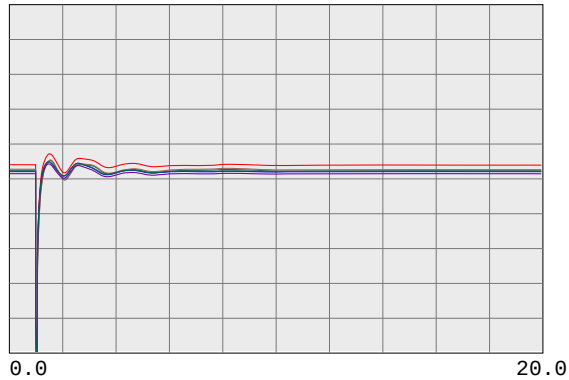
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



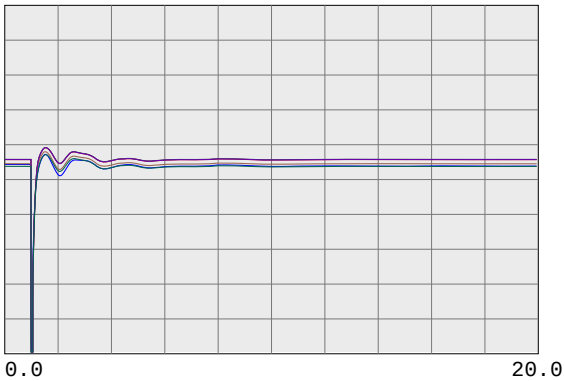
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



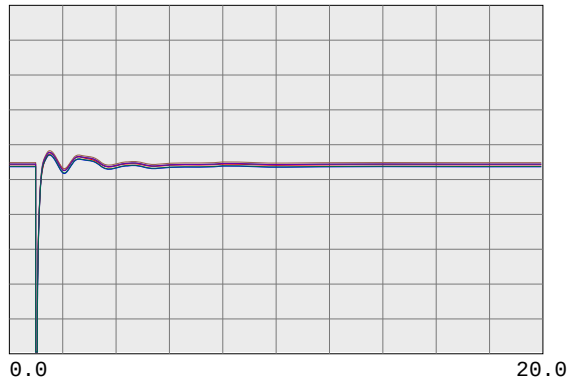
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



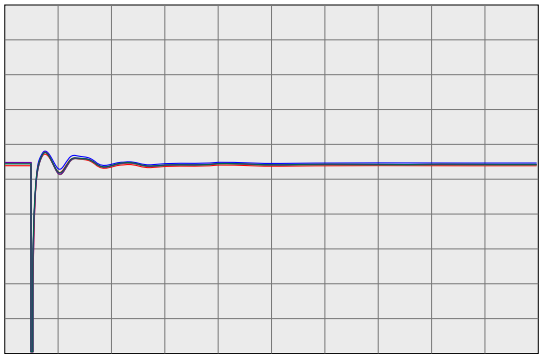
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



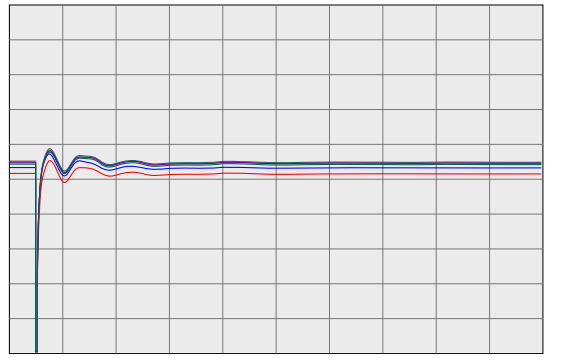
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

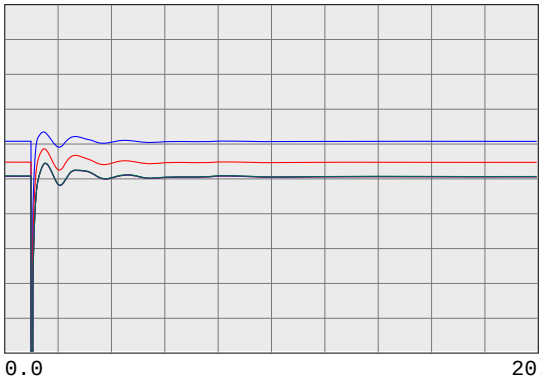
230-KV SYSTEM VOLTAGES



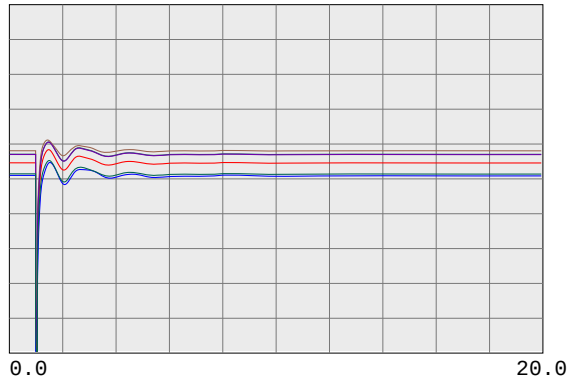
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



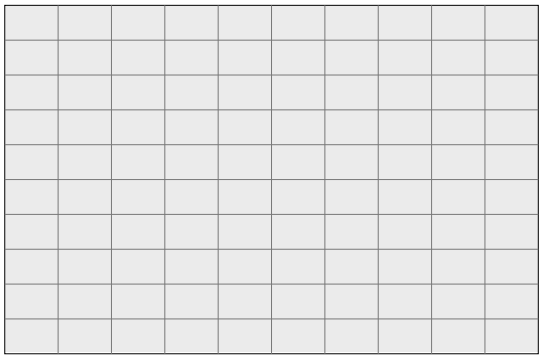
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

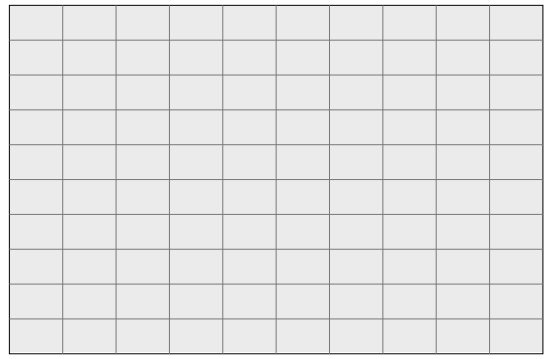


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



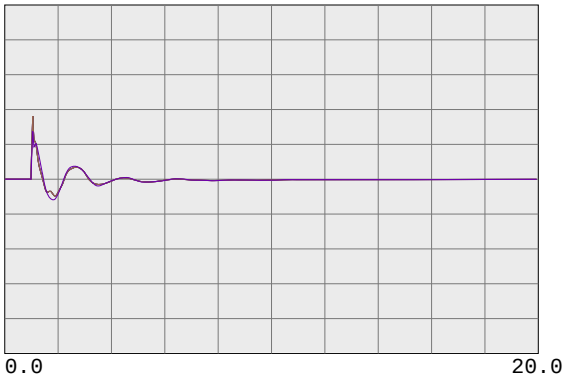
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



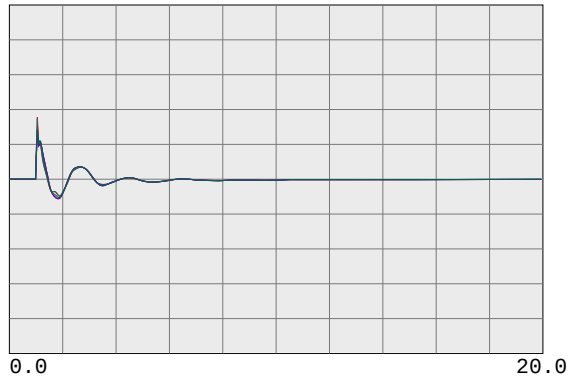


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

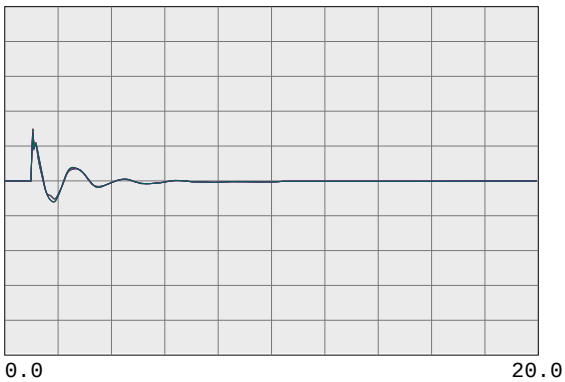
230-KV SYSTEM FREQUENCIES



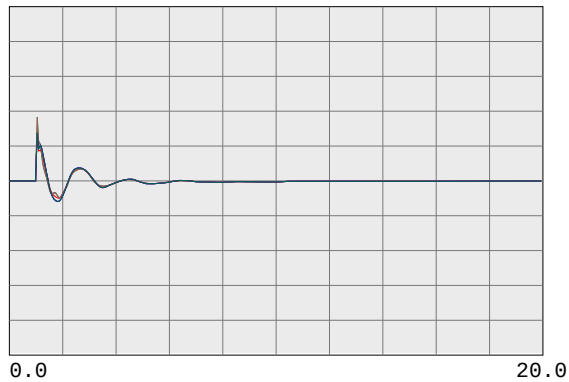
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



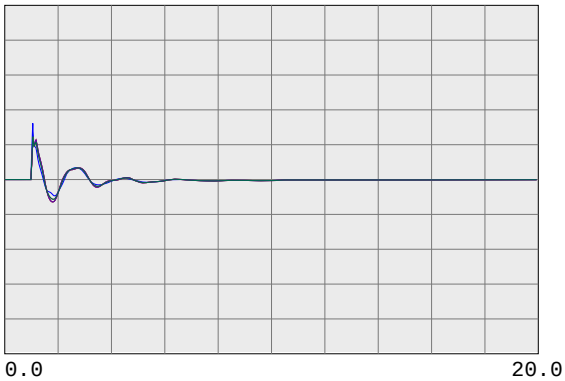
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



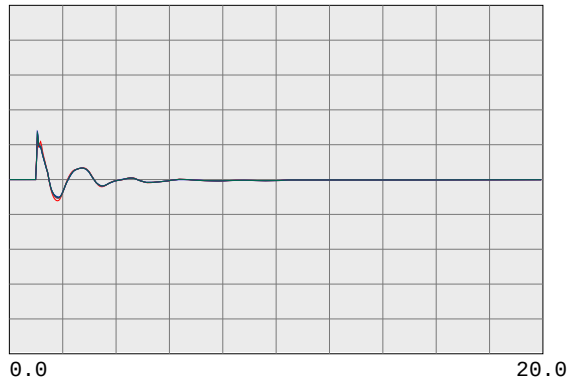
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



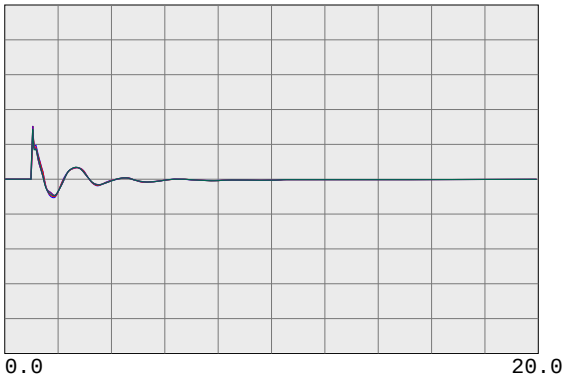
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



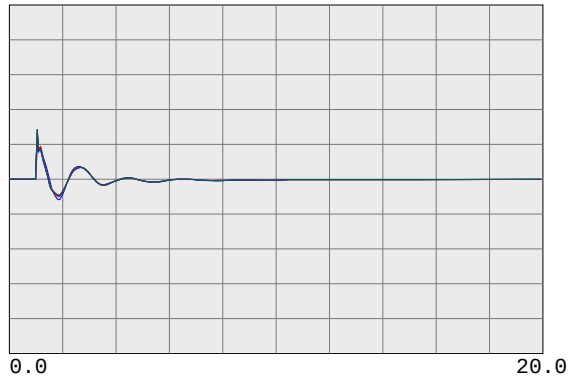
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

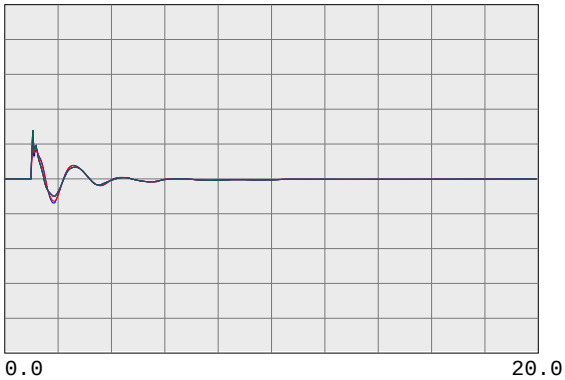
230-KV SYSTEM FREQUENCIES



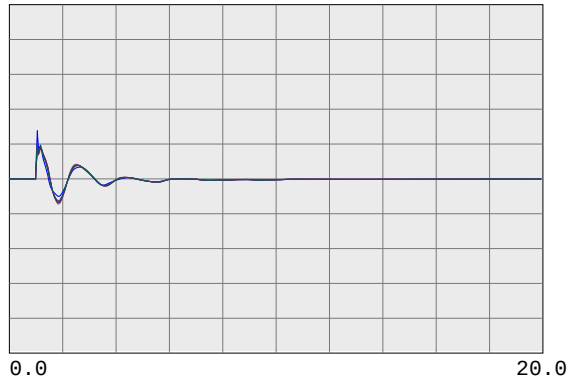
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



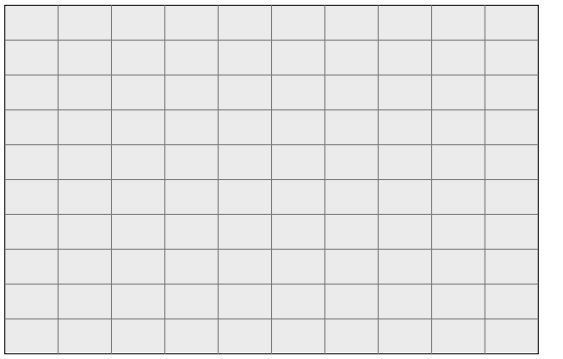
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

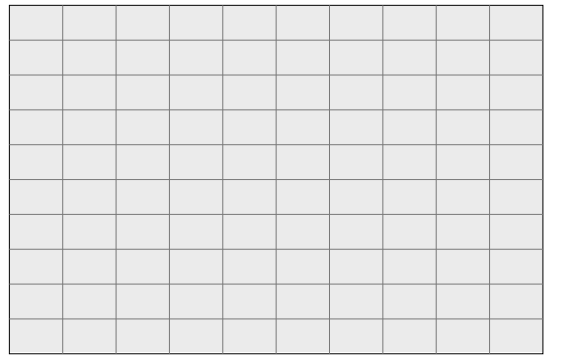


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



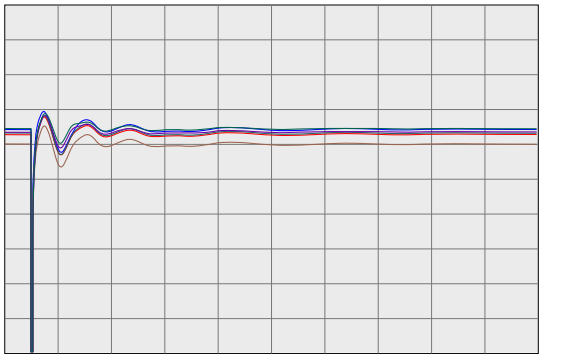
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



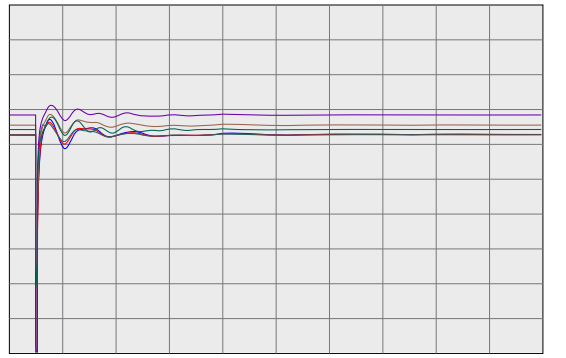


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

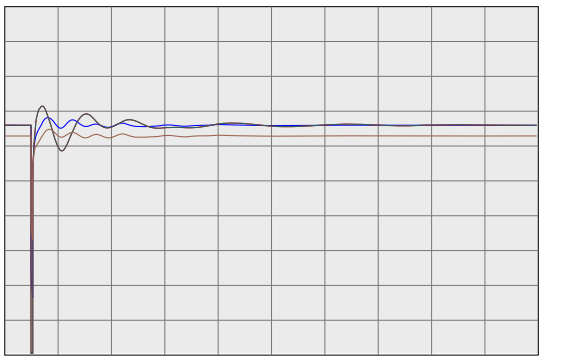
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



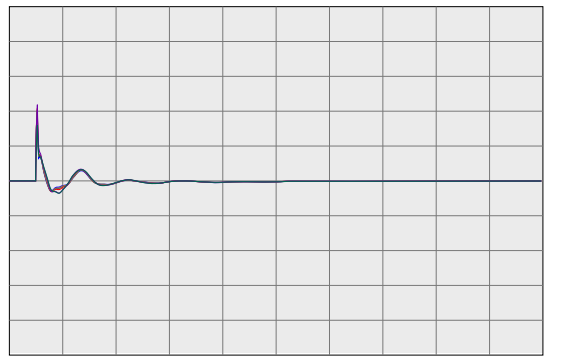
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



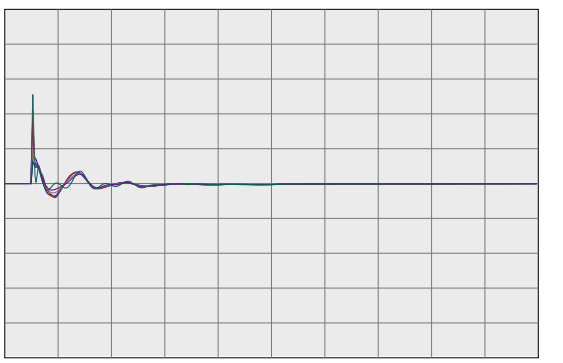
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



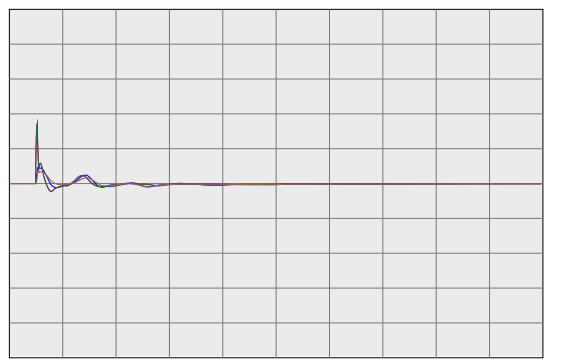
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



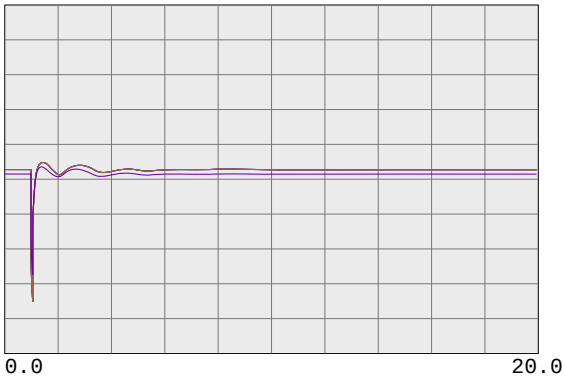
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

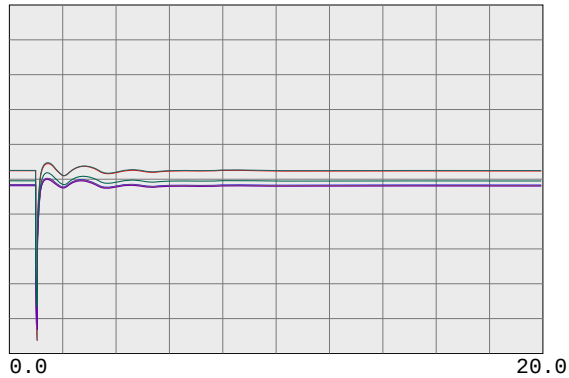
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

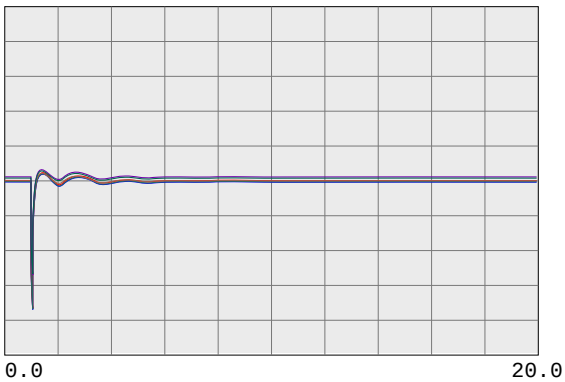
230-KV SYSTEM VOLTAGES



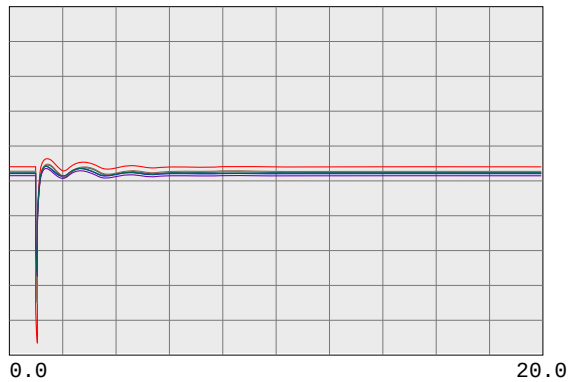
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



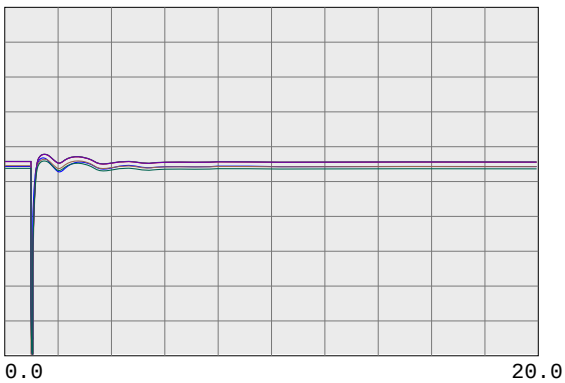
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



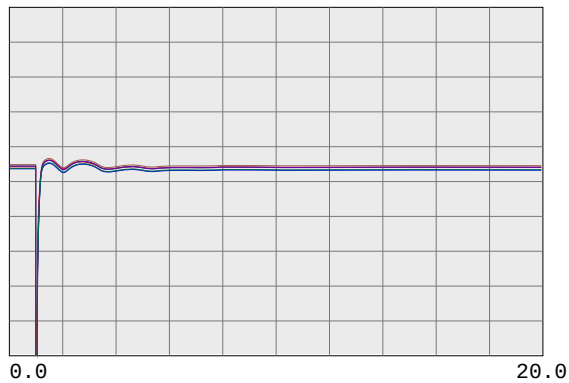
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



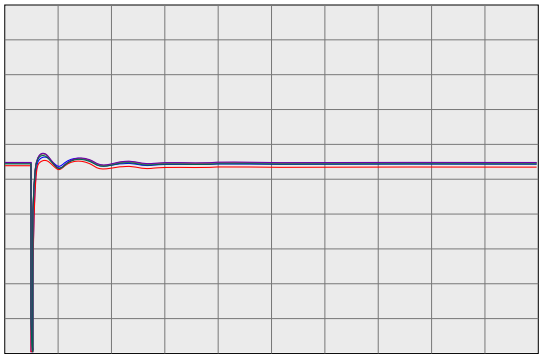
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

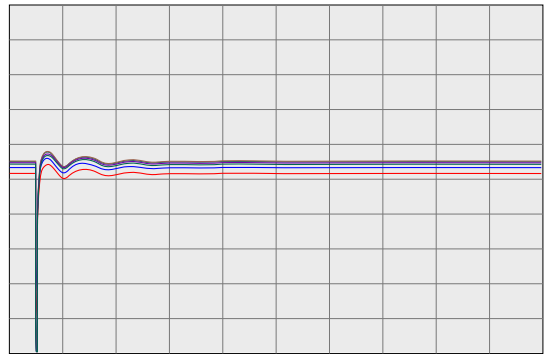
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

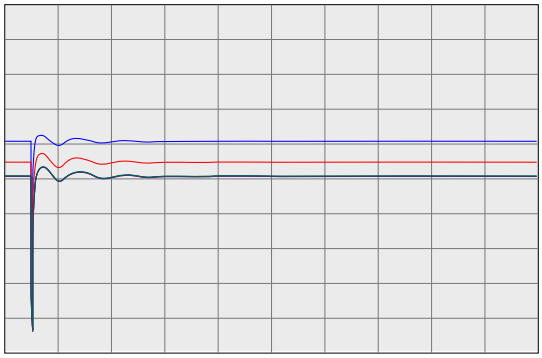
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

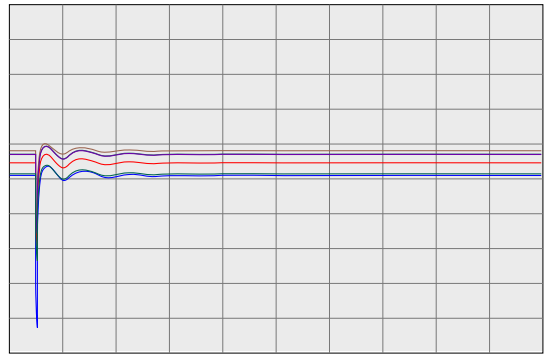
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

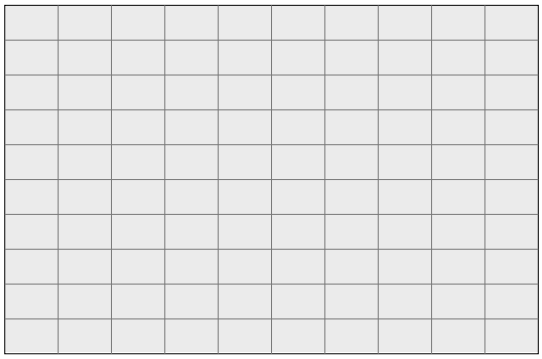
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

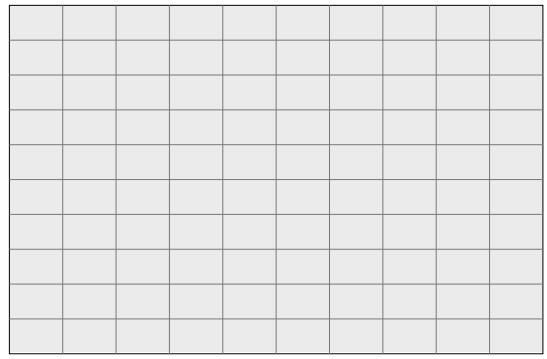


0.0 20.0

Time(sec)

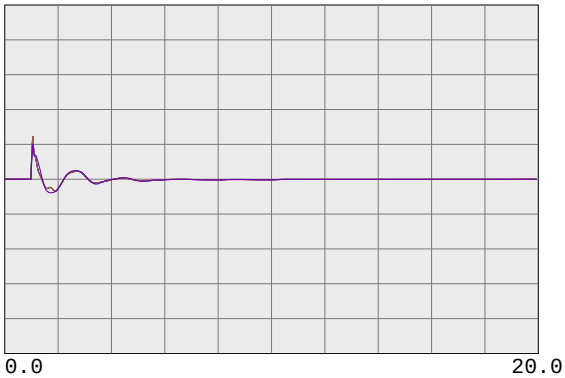
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



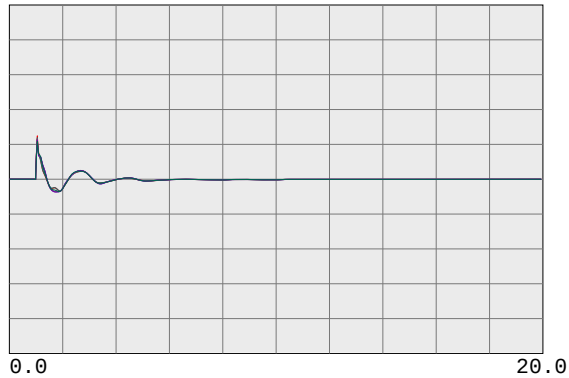


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

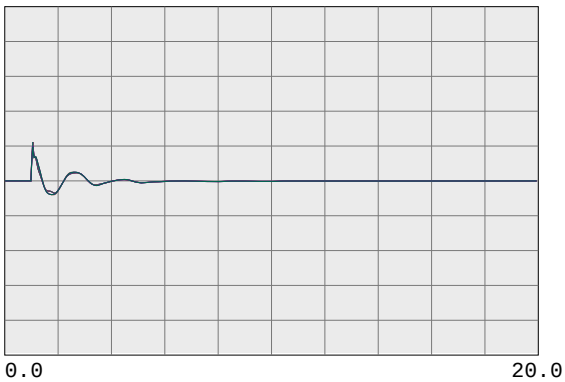
230-KV SYSTEM FREQUENCIES



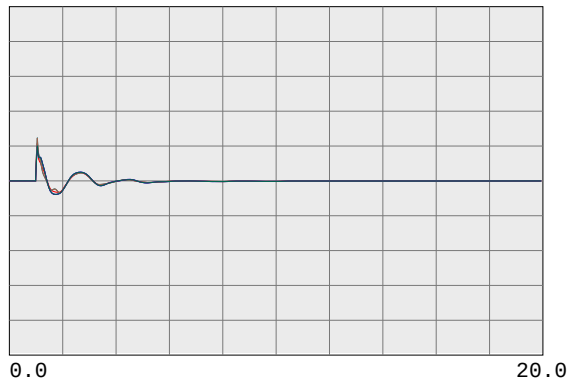
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



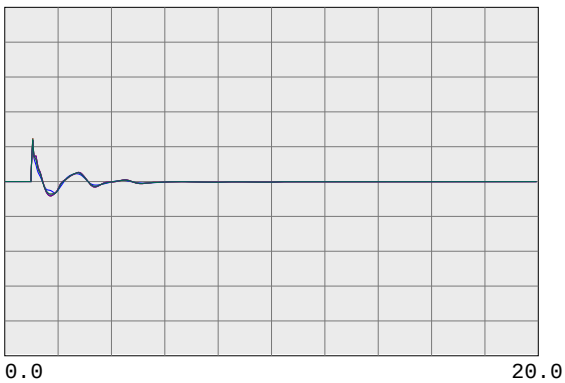
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



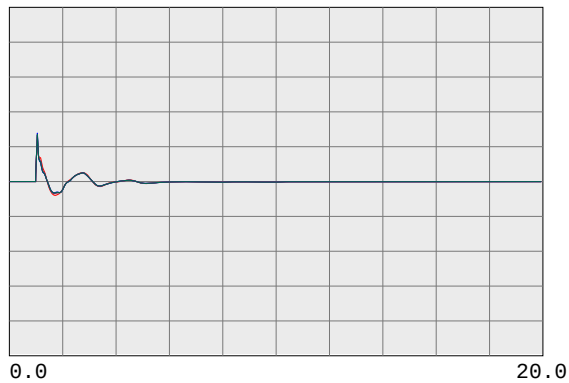
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



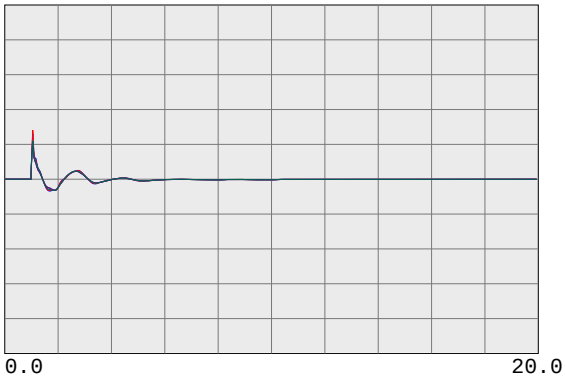
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



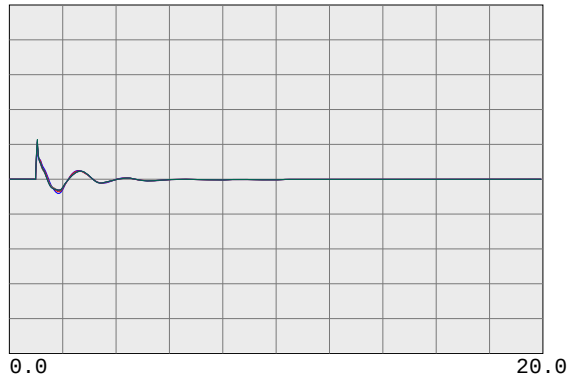
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

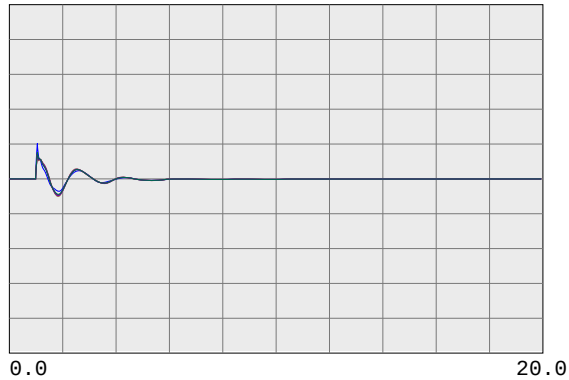


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

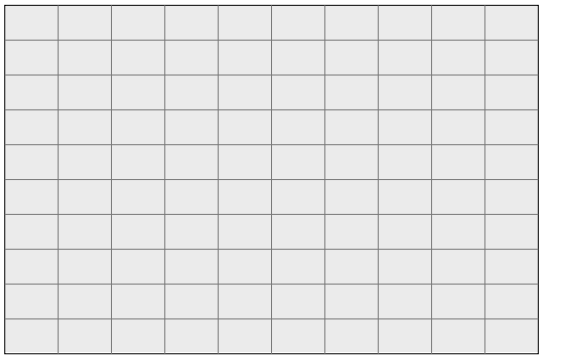


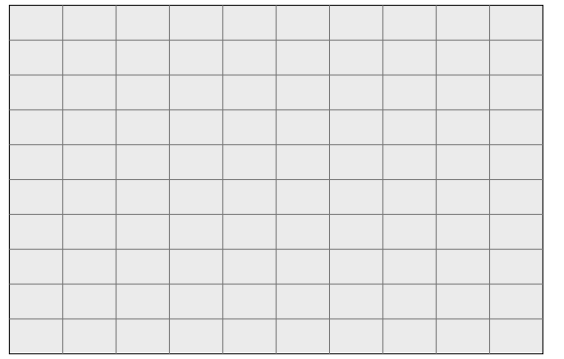
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



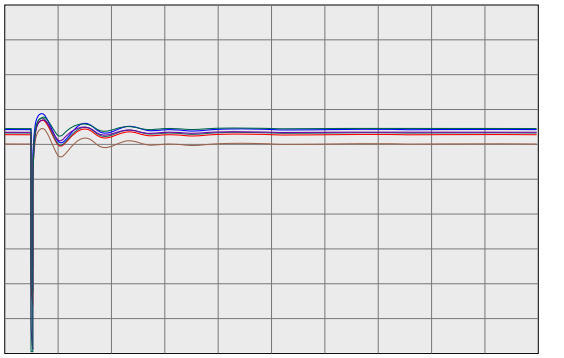
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



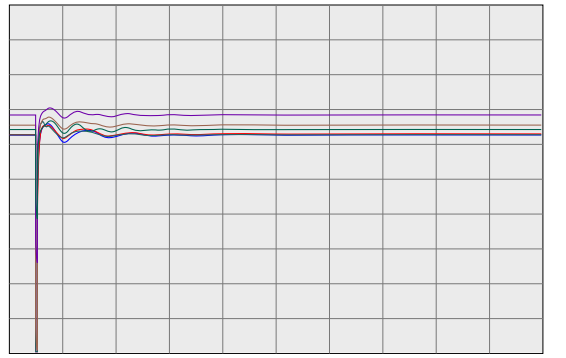


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

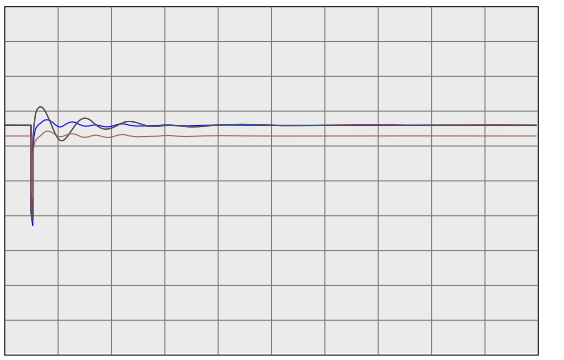
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



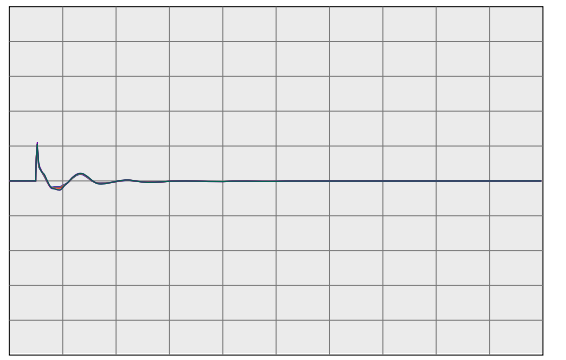
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



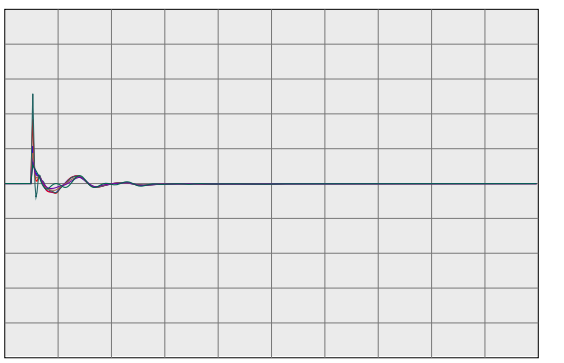
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



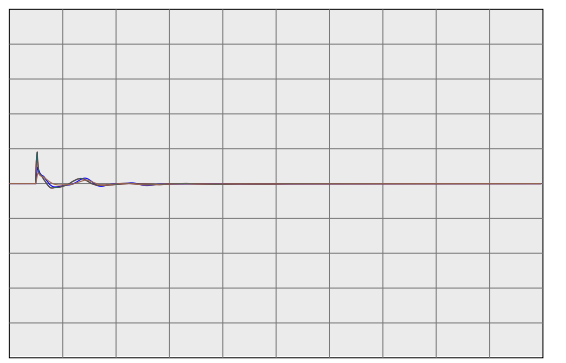
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



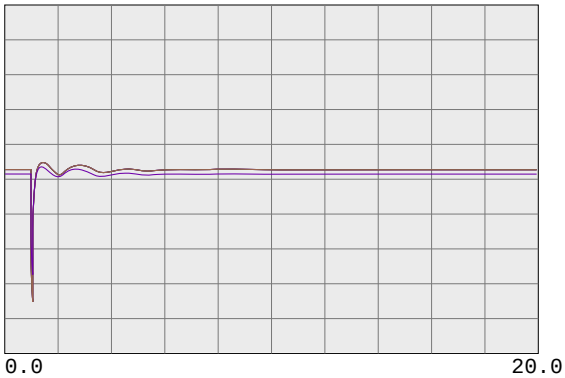
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

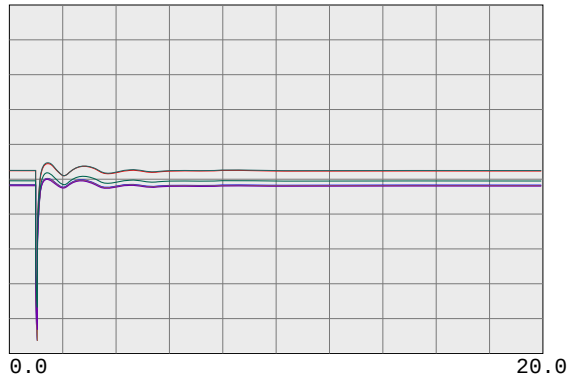
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

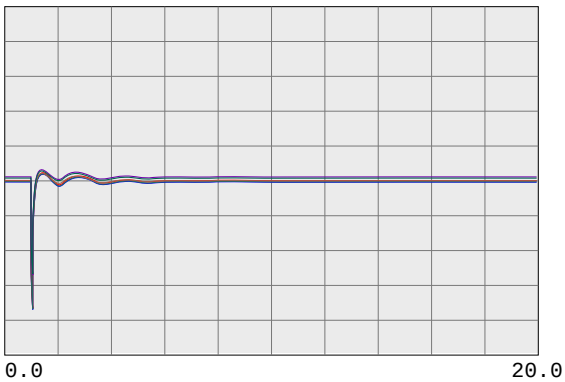
230-KV SYSTEM VOLTAGES



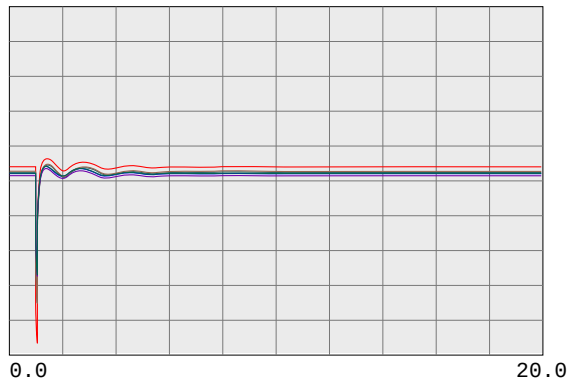
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



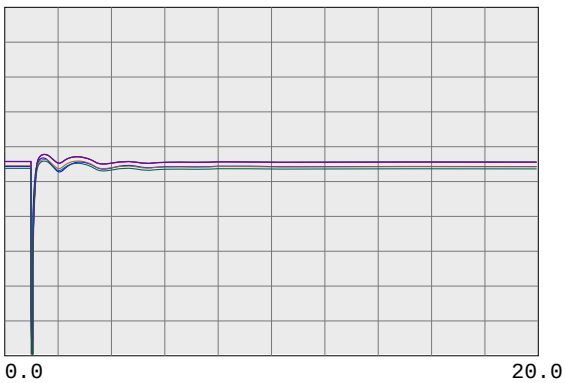
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



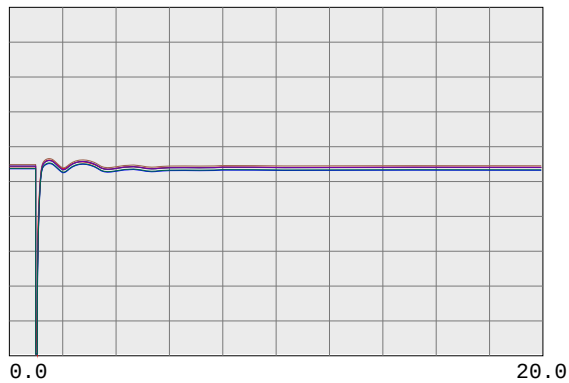
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



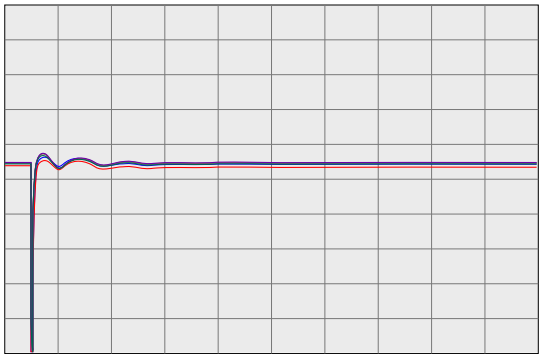
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

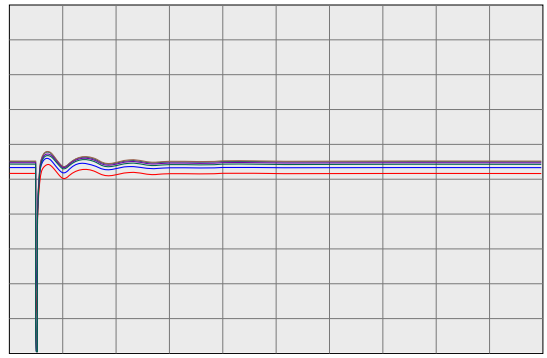
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

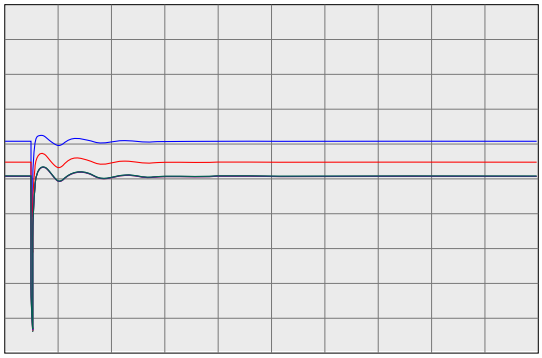
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

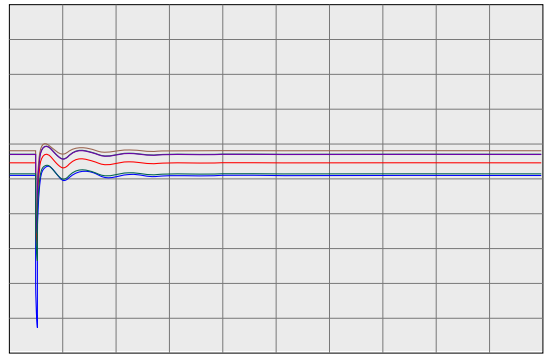
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

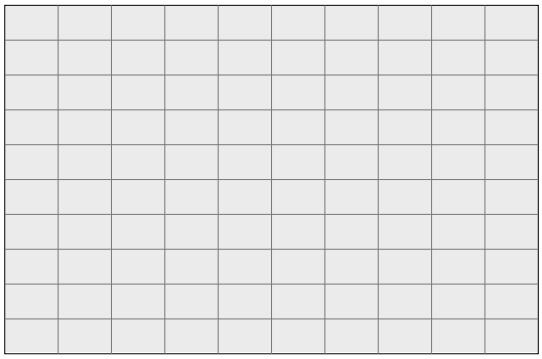
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

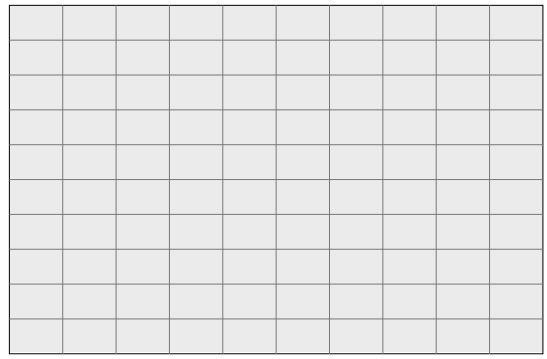


0.0 20.0

Time(sec)

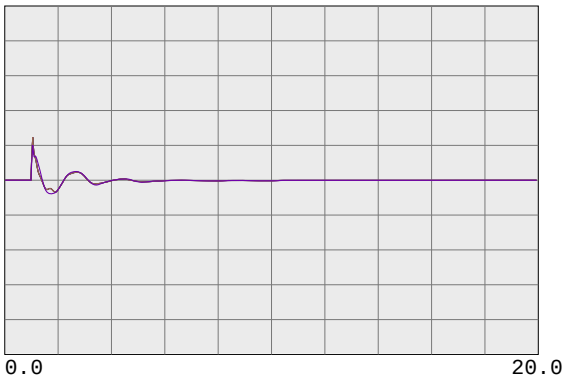
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



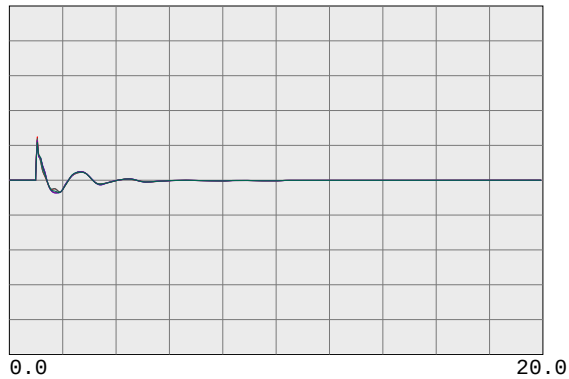


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

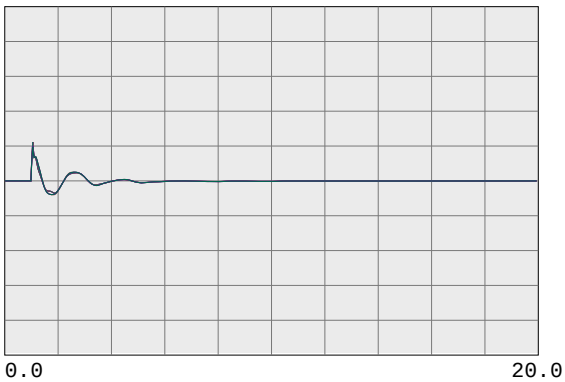
230-KV SYSTEM FREQUENCIES



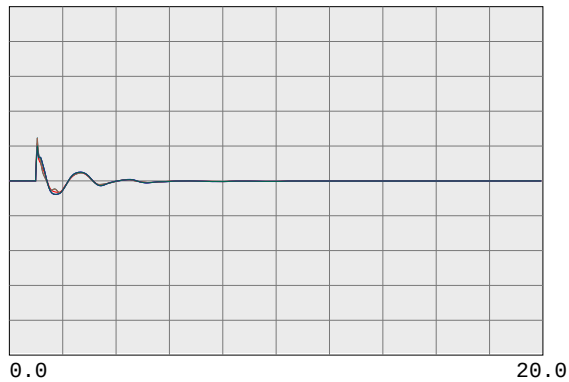
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



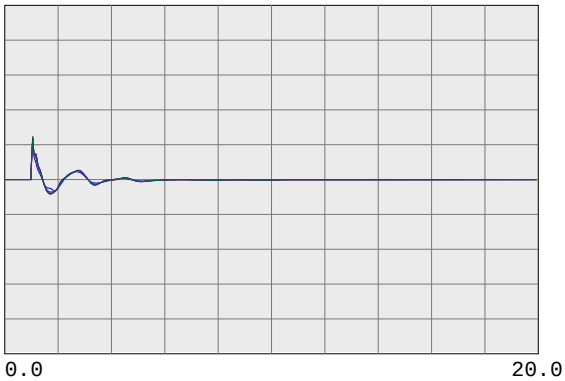
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



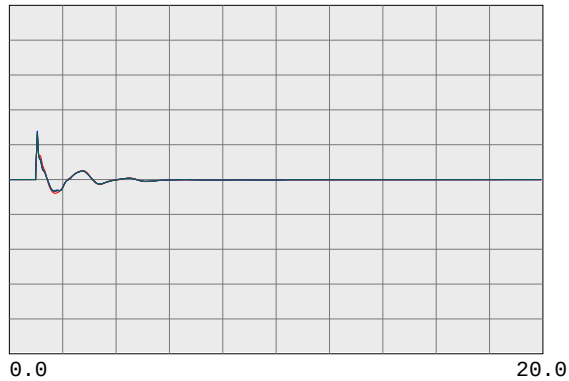
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



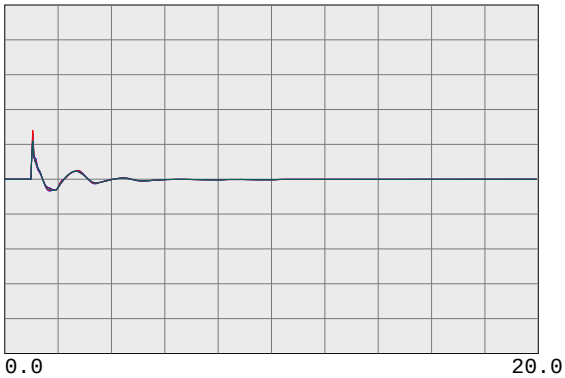
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



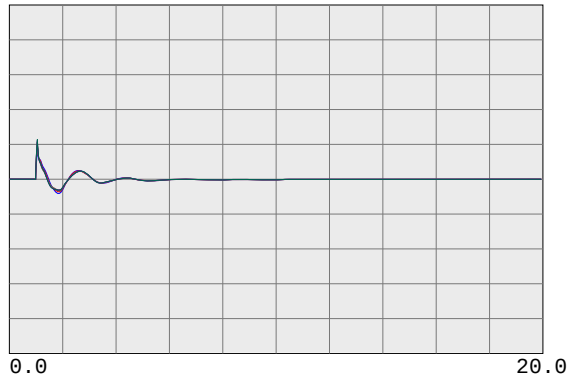
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

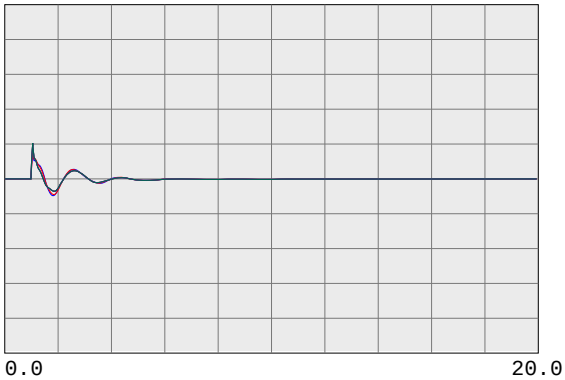
230-KV SYSTEM FREQUENCIES



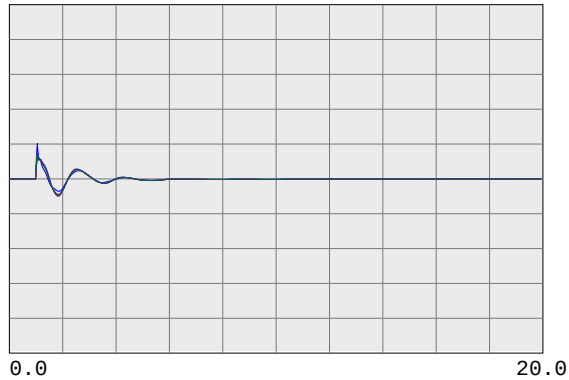
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



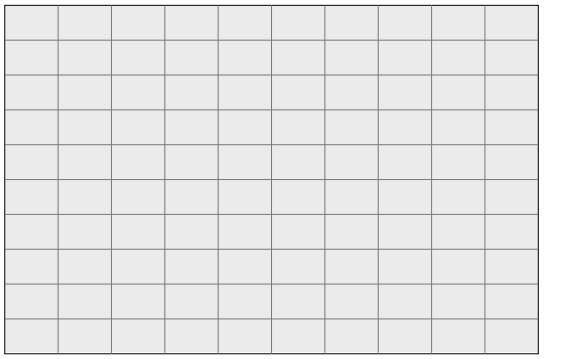
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

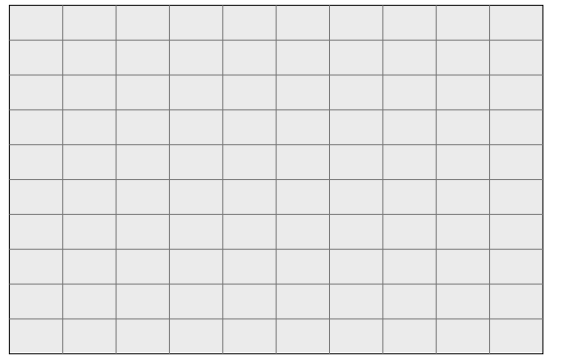


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



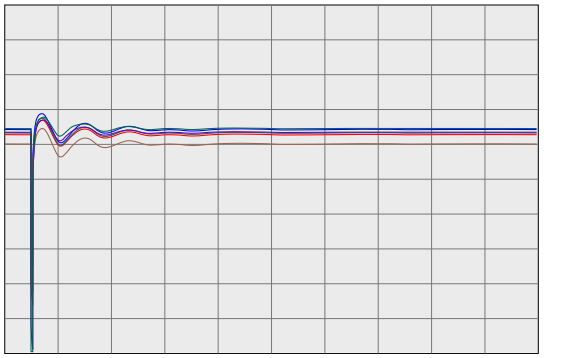
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



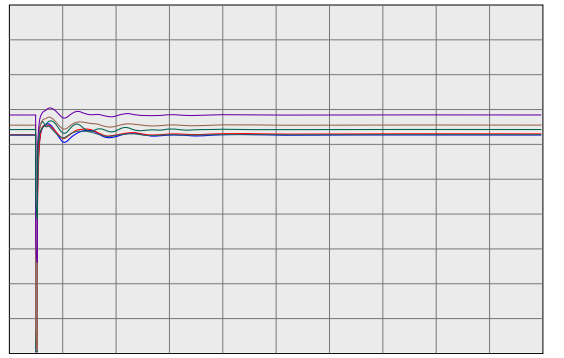


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

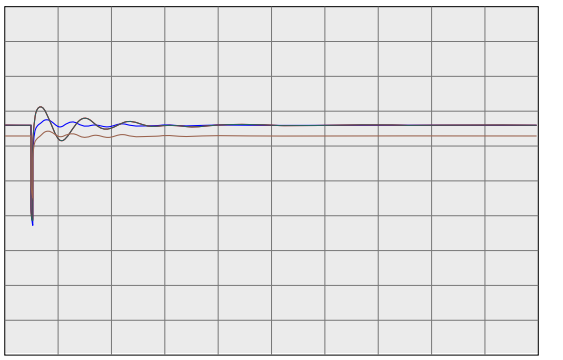
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



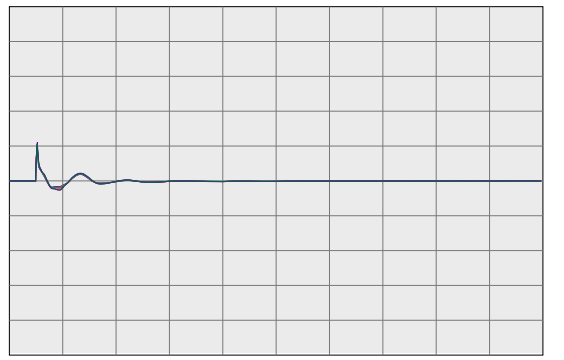
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



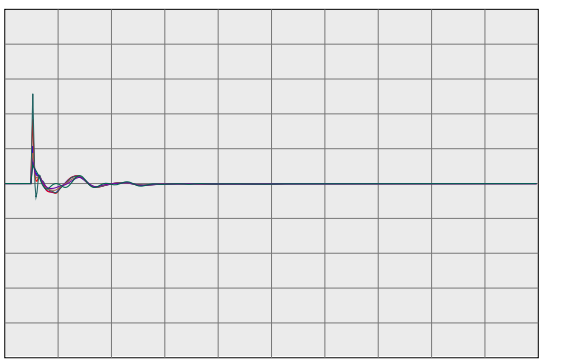
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



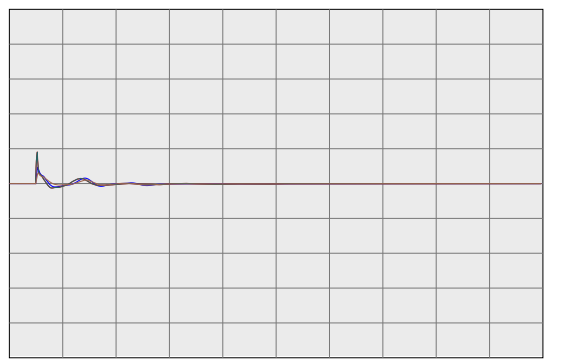
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



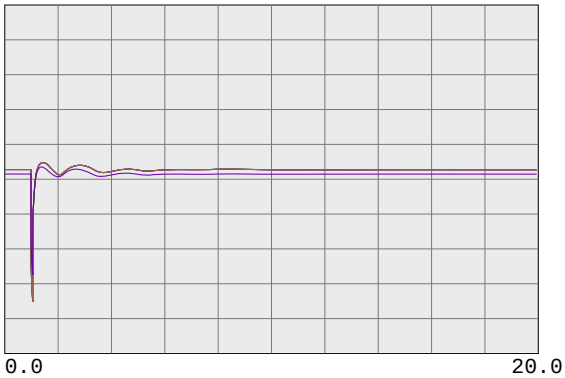
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

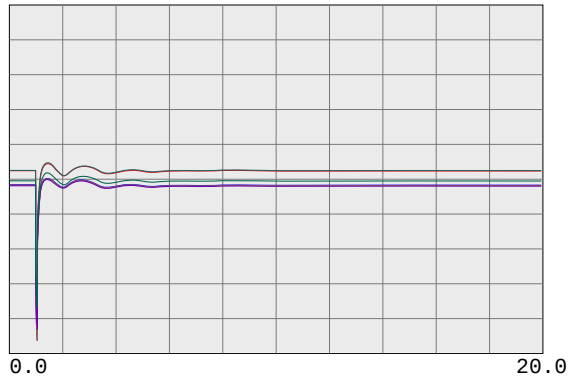
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

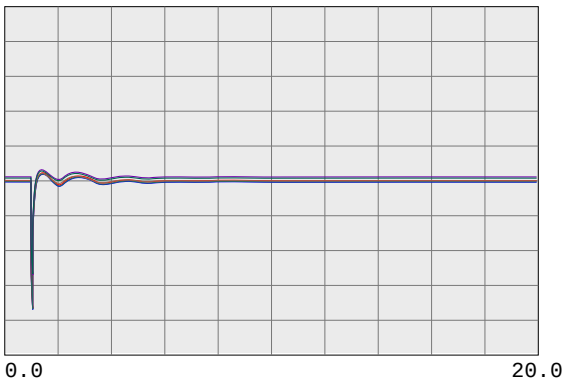
230-KV SYSTEM VOLTAGES



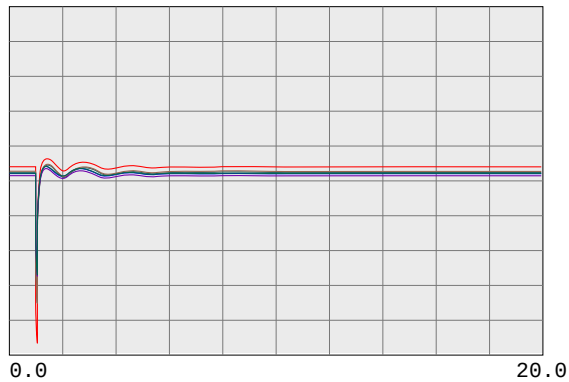
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



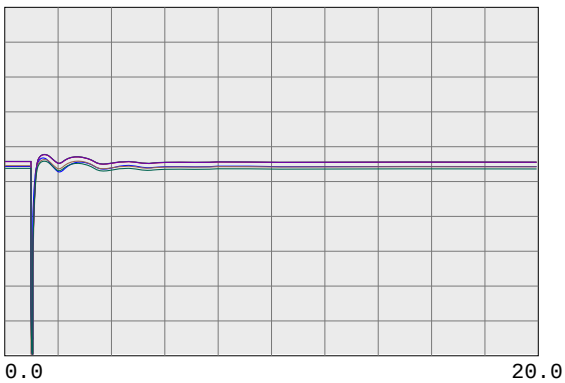
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



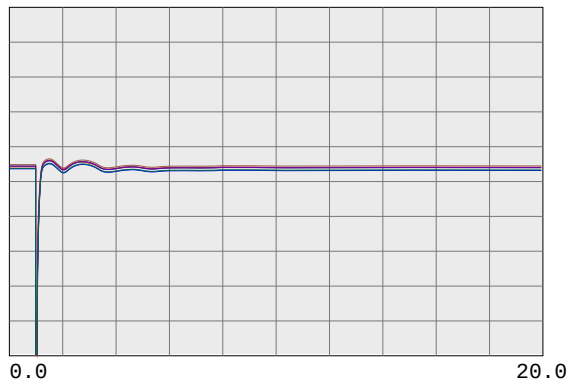
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



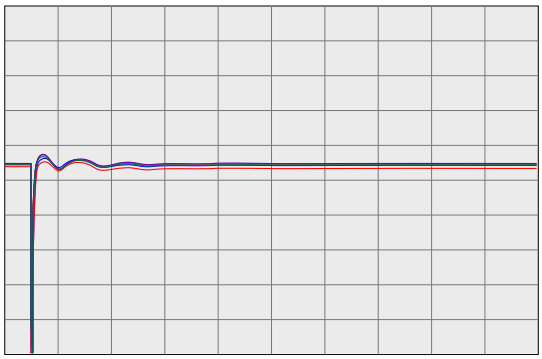
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

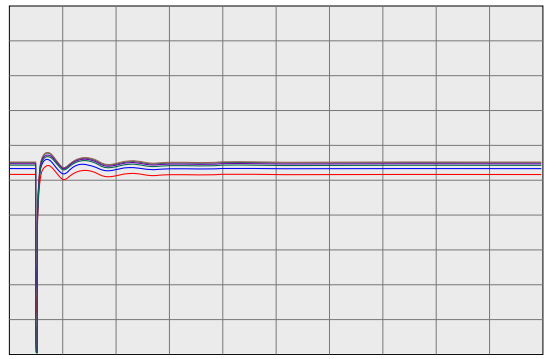
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

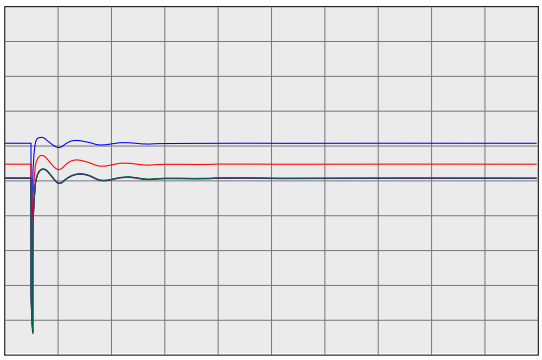
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

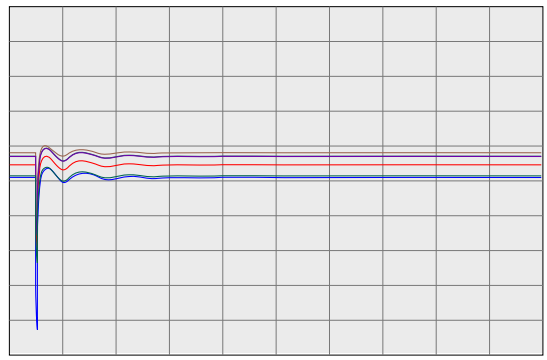
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

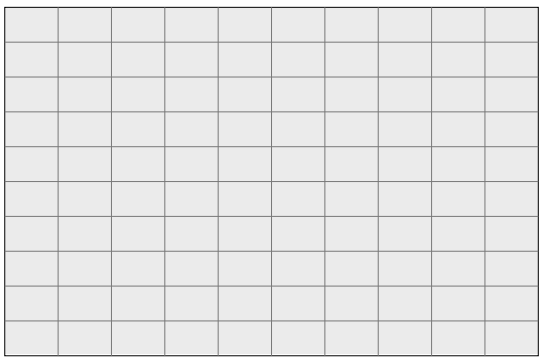
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

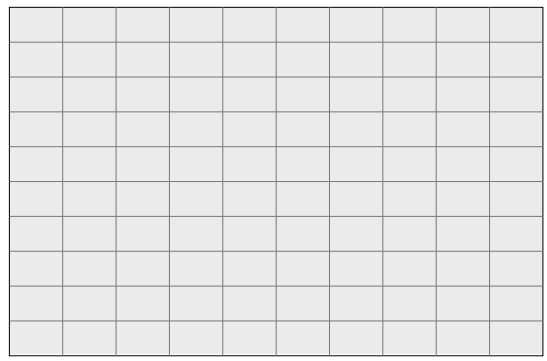


0.0 20.0

Time(sec)

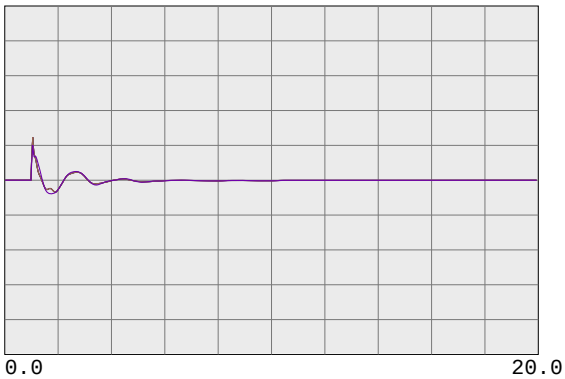
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



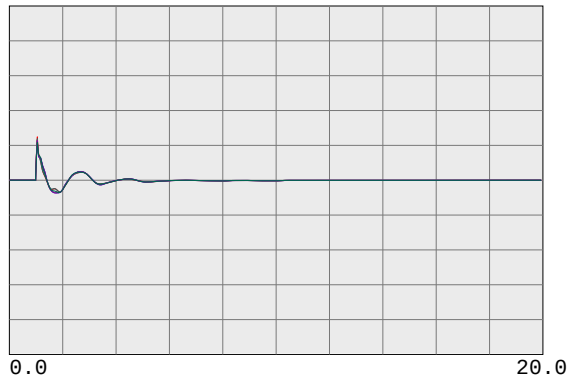


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

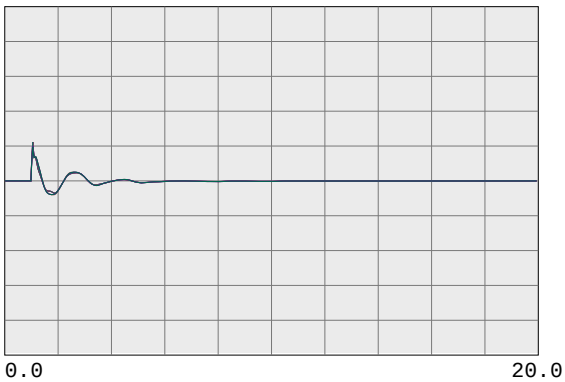
230-KV SYSTEM FREQUENCIES



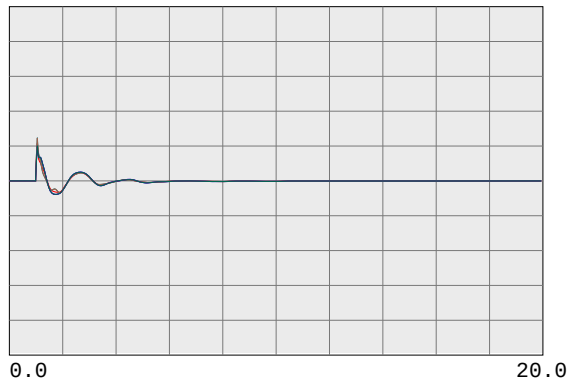
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



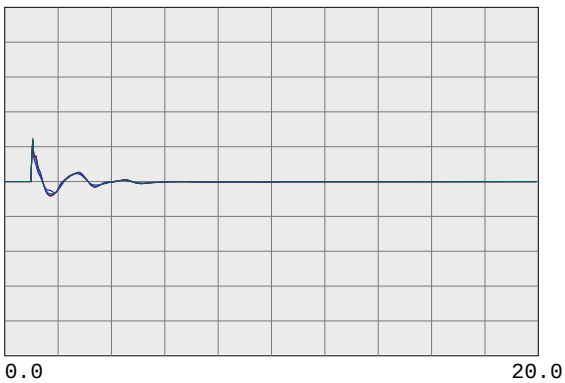
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



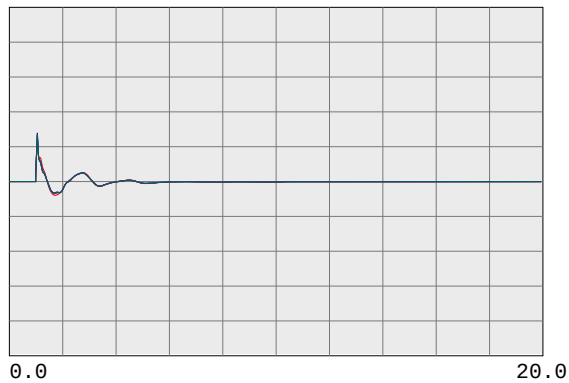
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



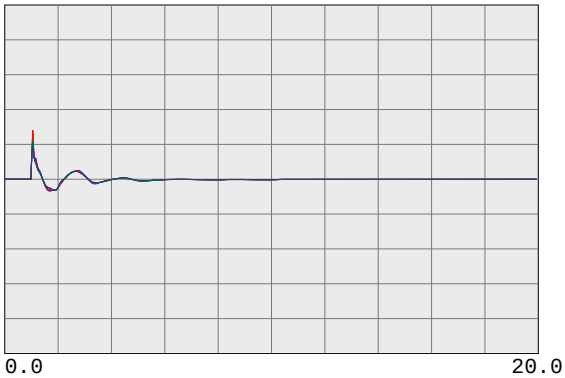
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



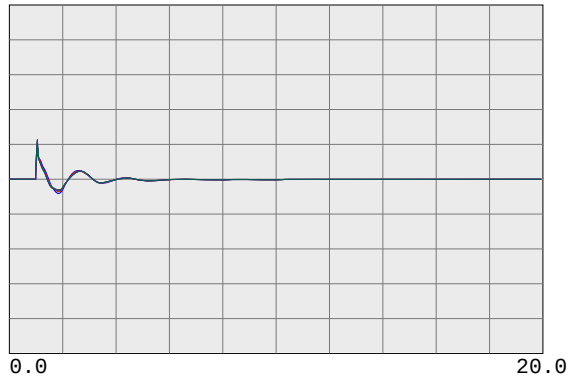
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

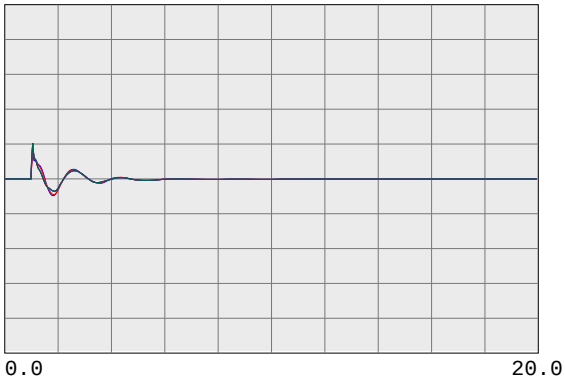
230-KV SYSTEM FREQUENCIES



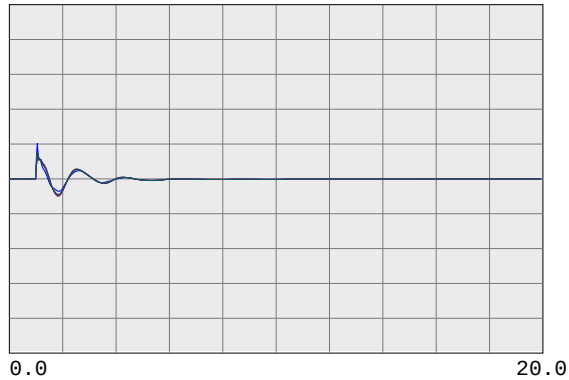
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



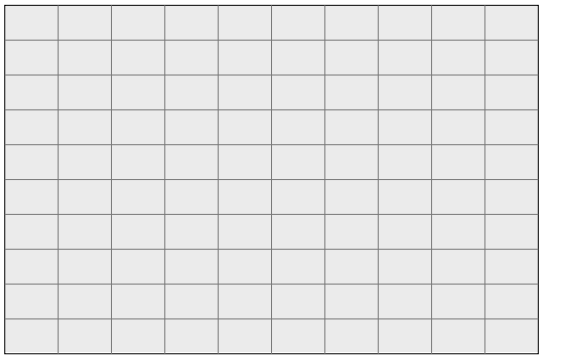
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

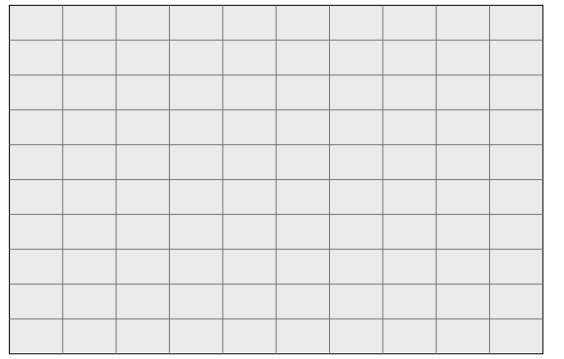


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



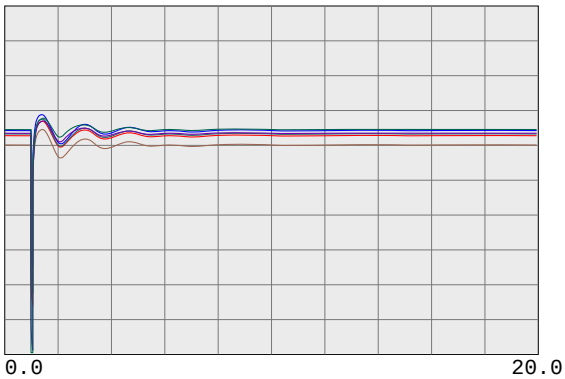
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



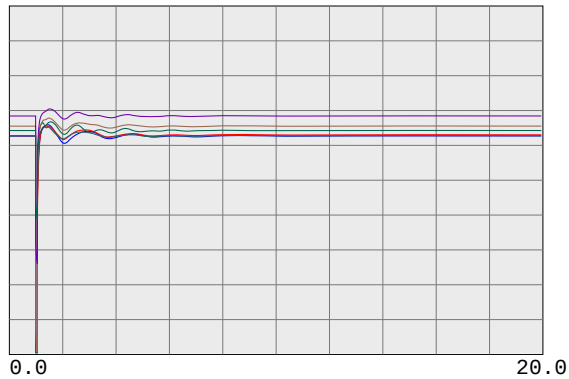


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

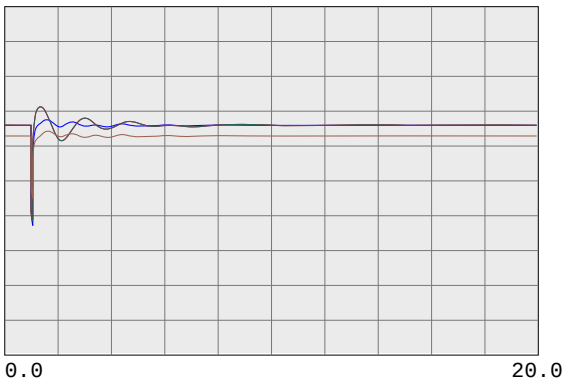
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



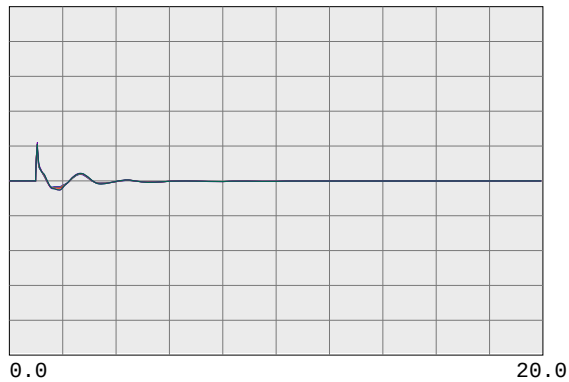
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



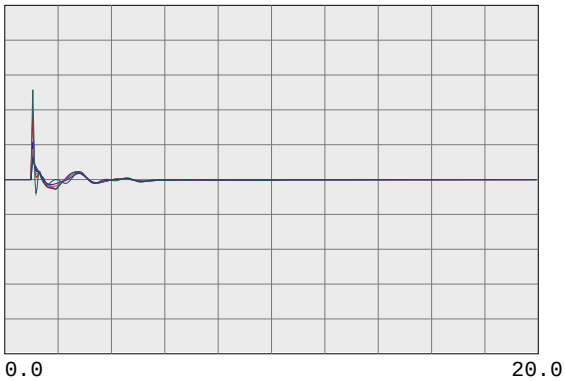
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



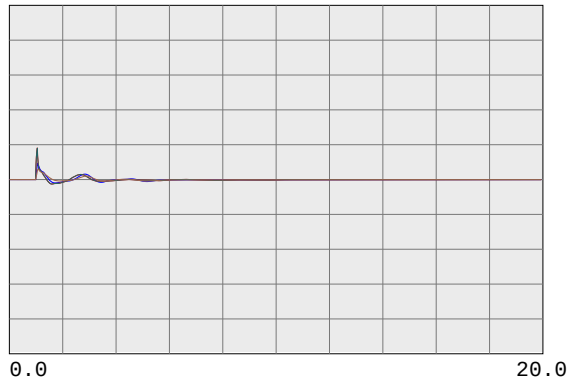
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



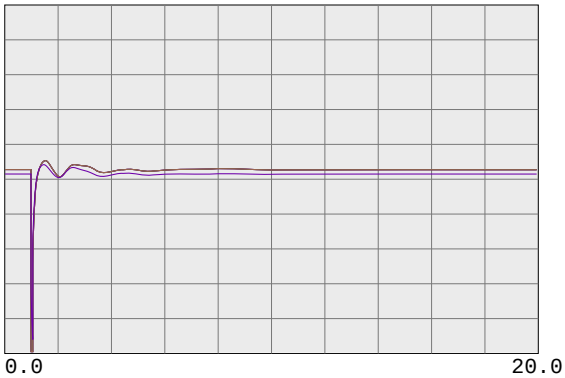
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

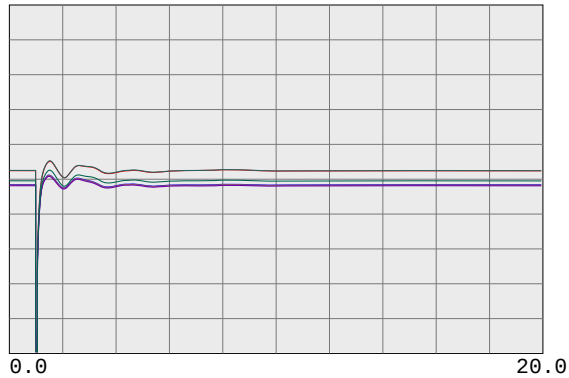
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

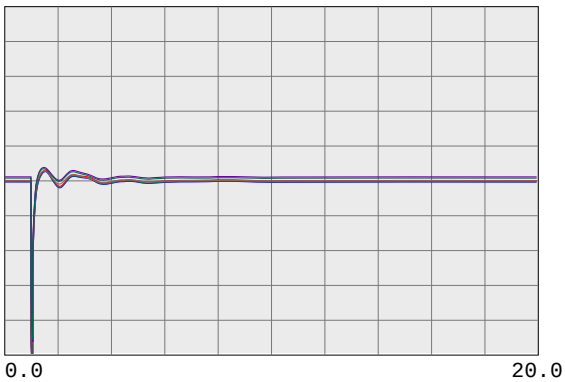
230-KV SYSTEM VOLTAGES



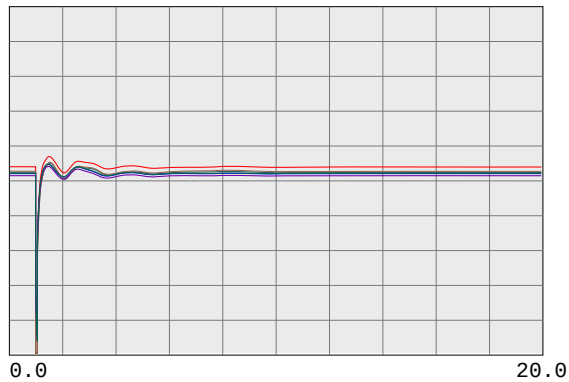
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



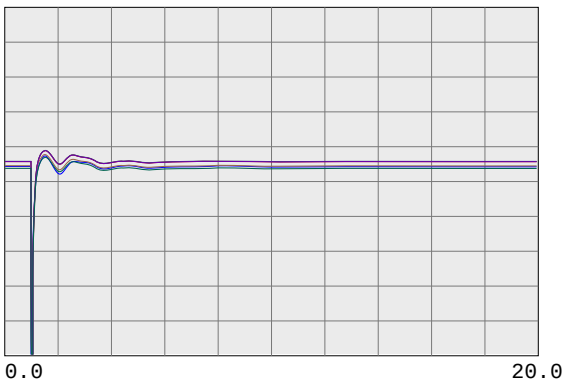
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



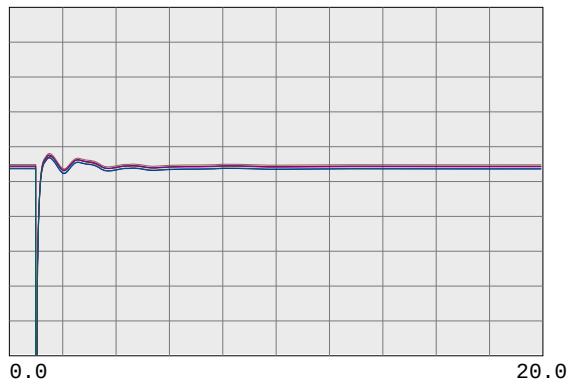
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



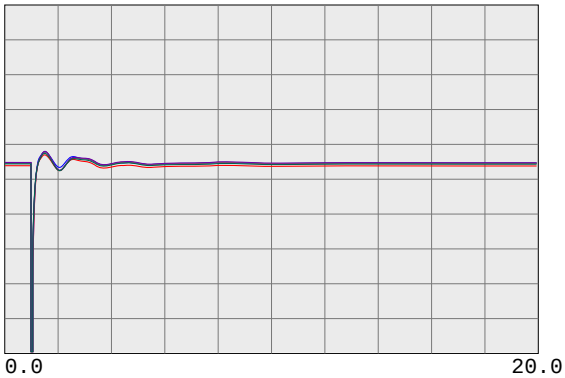
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



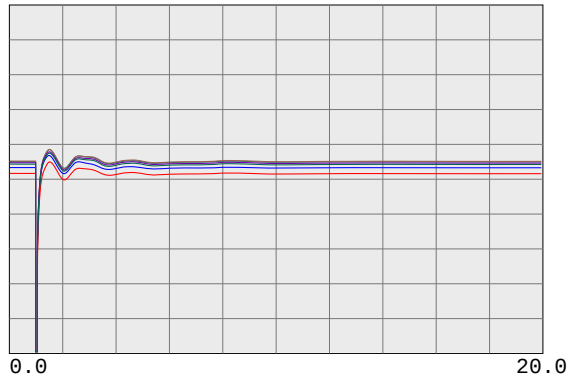
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

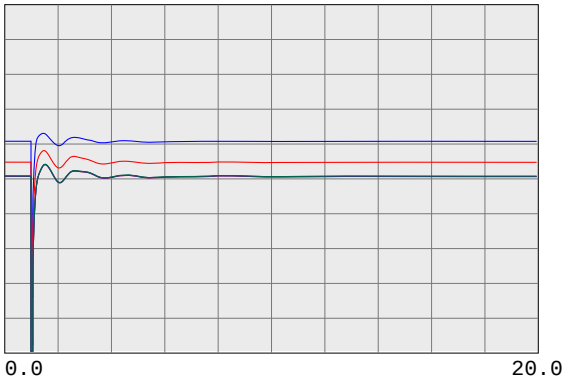
230-KV SYSTEM VOLTAGES



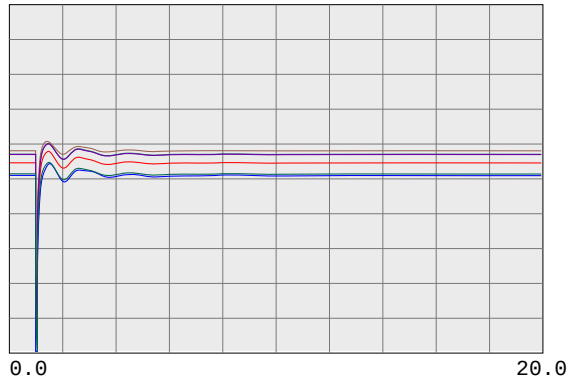
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



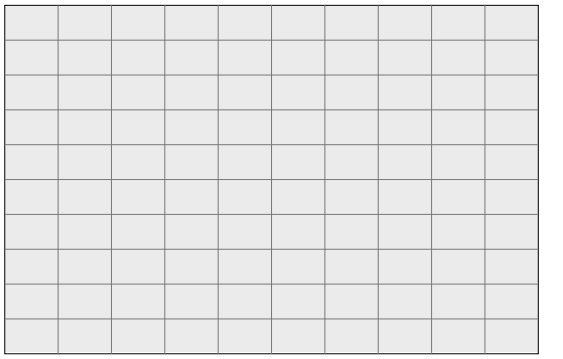
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

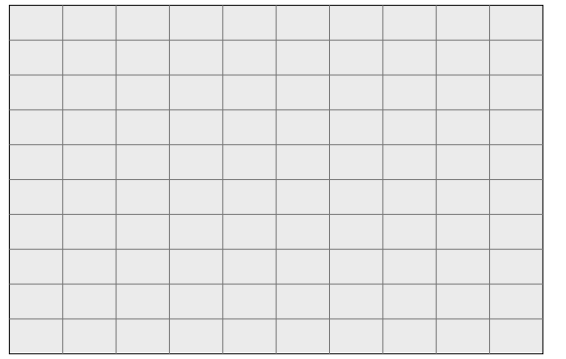


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



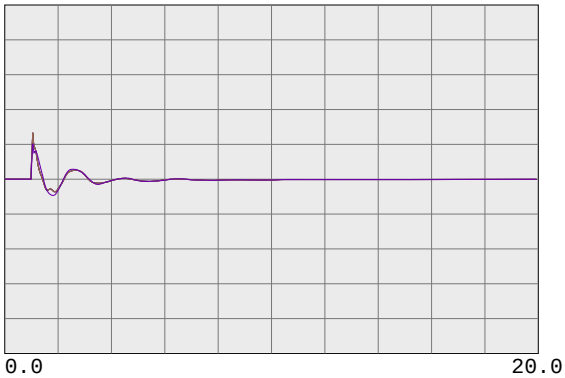
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



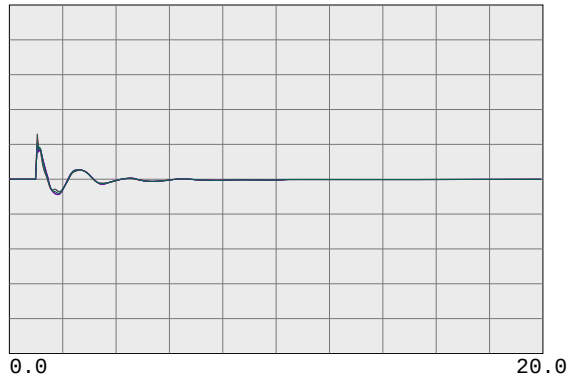


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

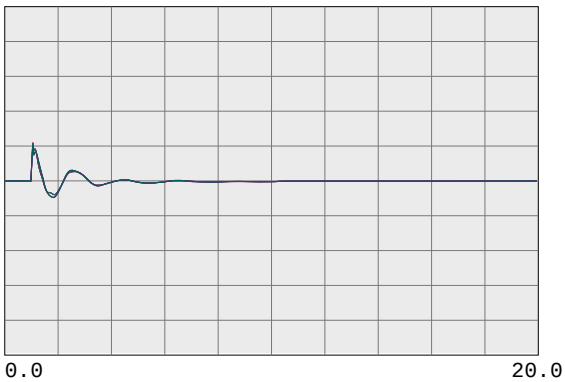
230-KV SYSTEM FREQUENCIES



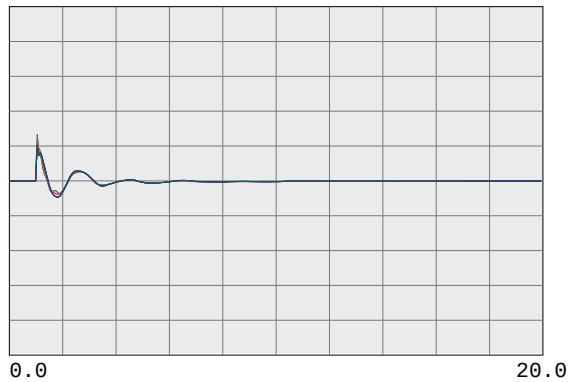
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



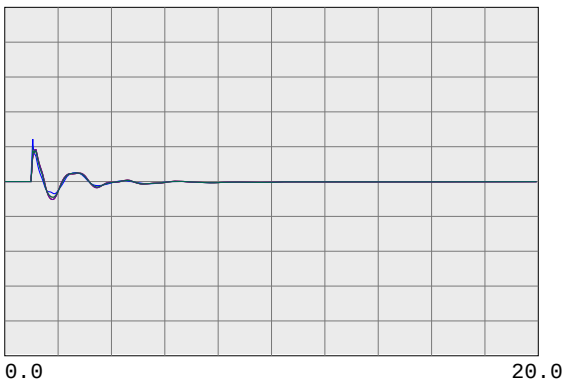
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



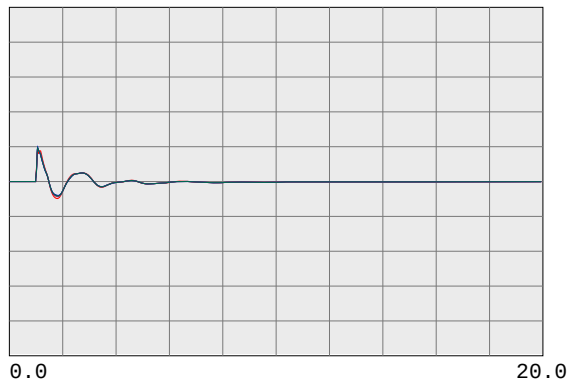
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



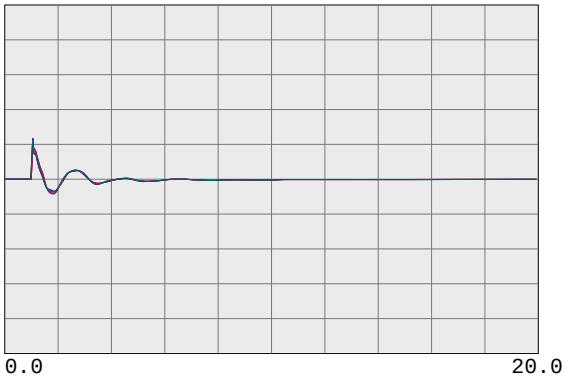
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



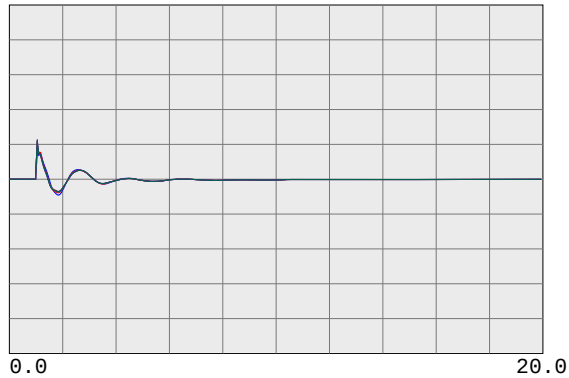
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

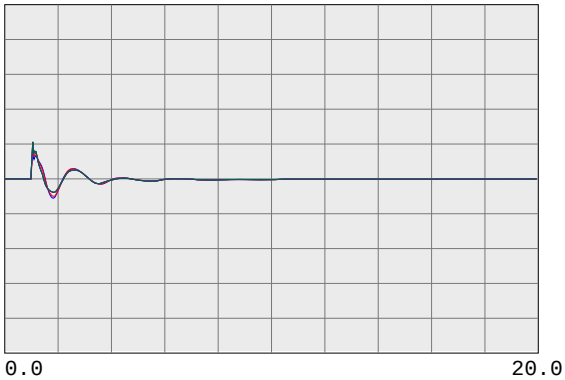
230-KV SYSTEM FREQUENCIES



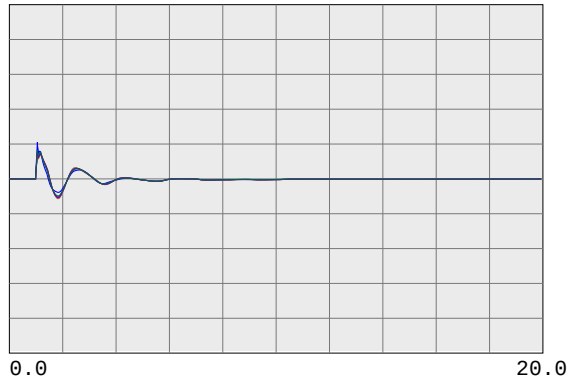
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



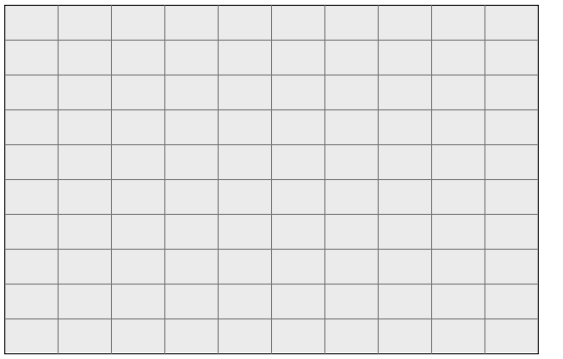
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

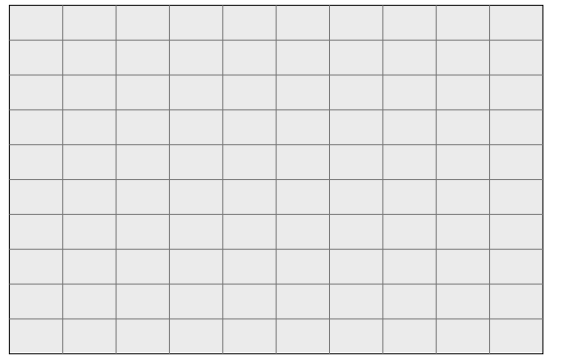


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



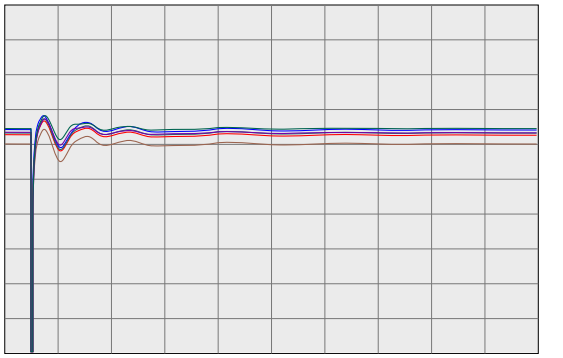
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



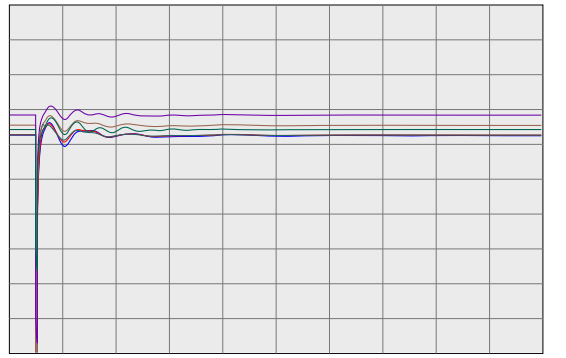


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

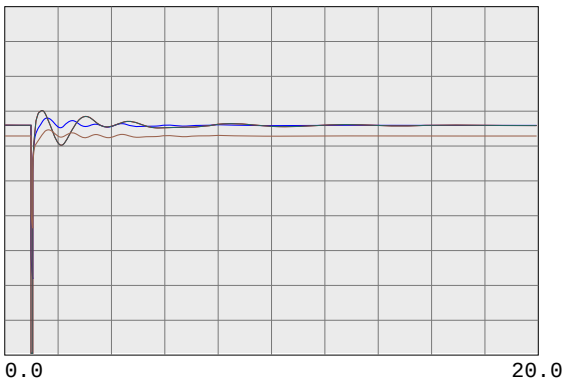
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



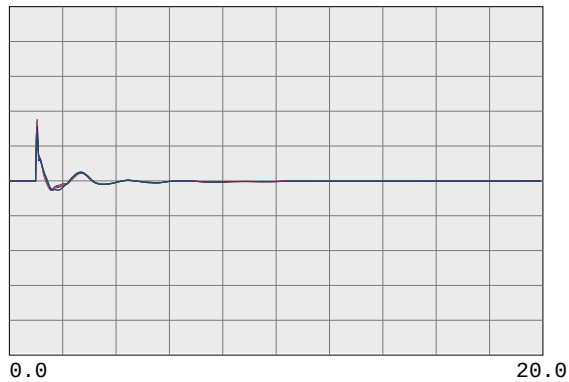
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



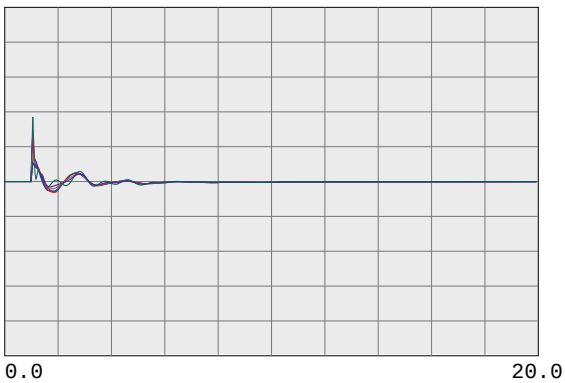
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



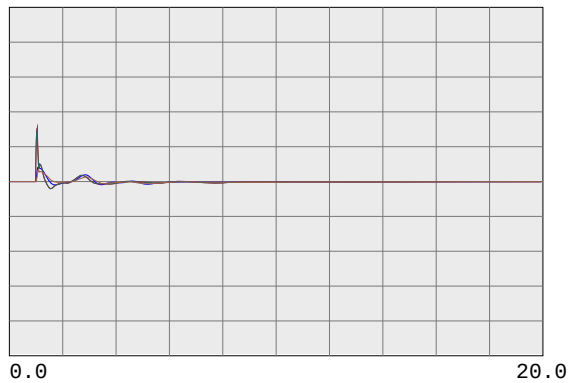
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



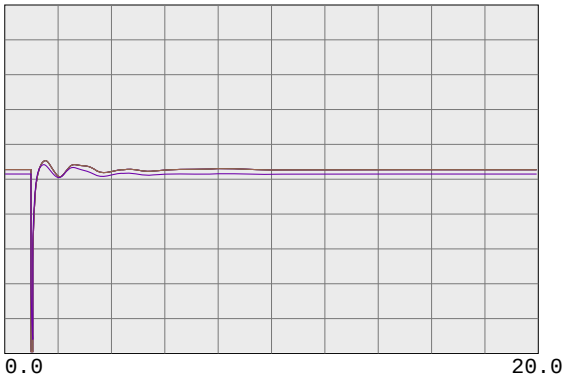
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

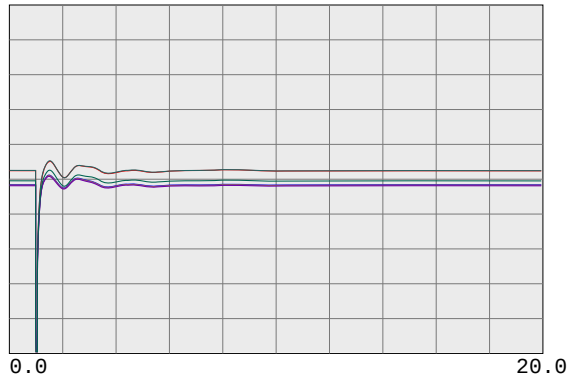
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

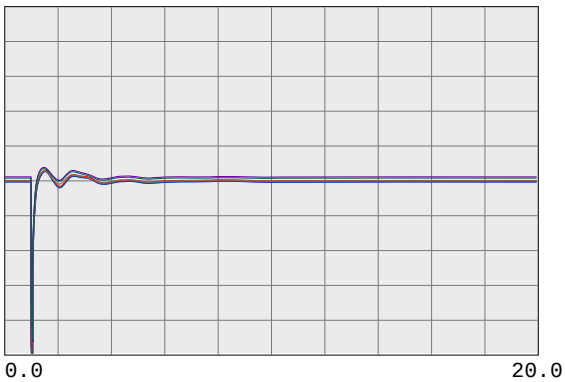
230-KV SYSTEM VOLTAGES



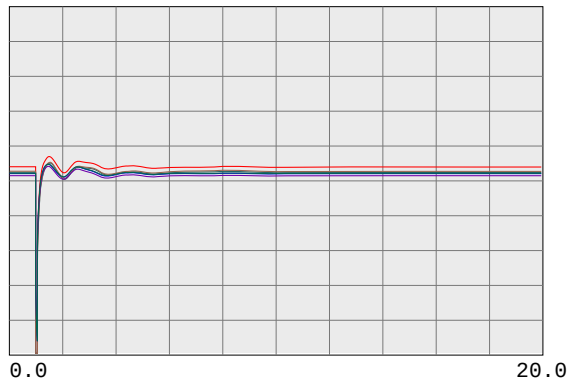
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



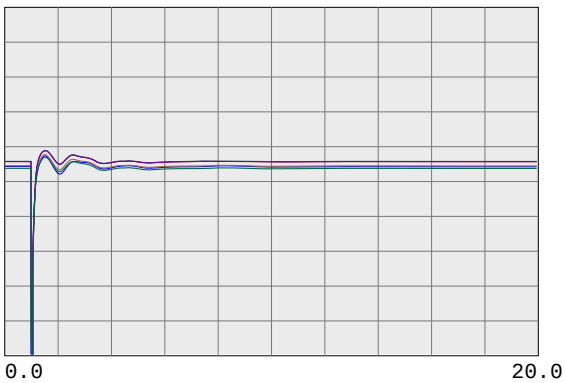
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



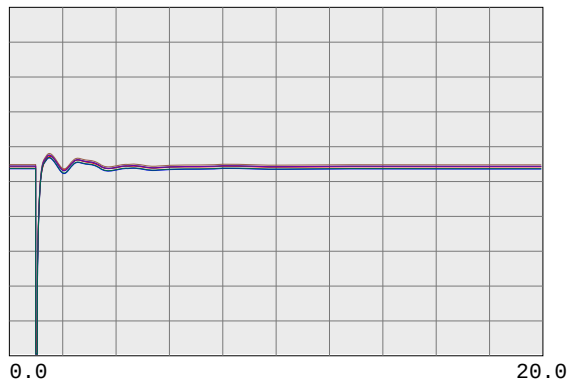
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



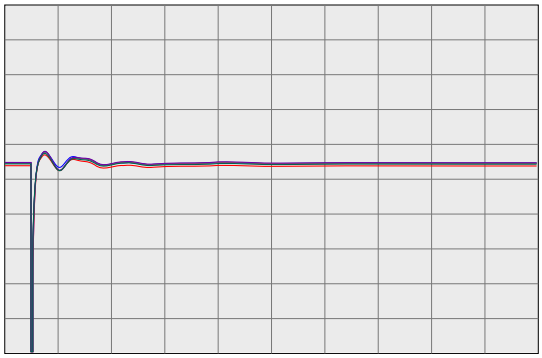
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

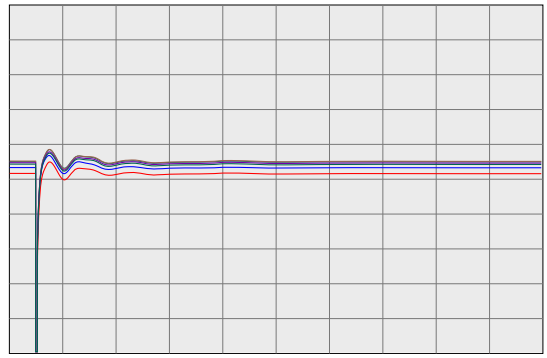
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

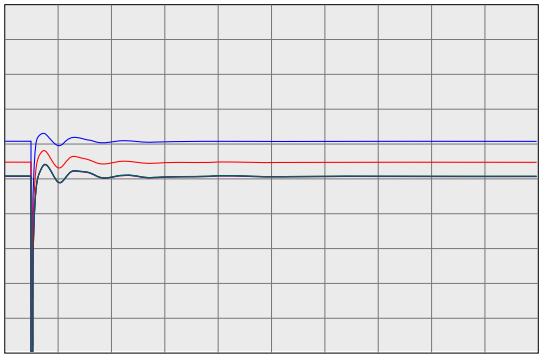
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

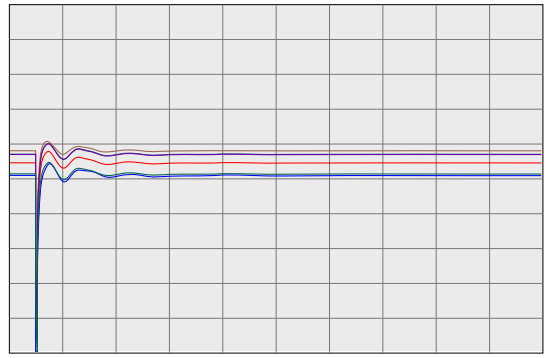
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

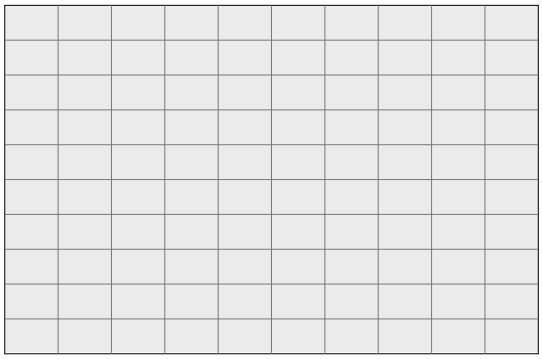
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

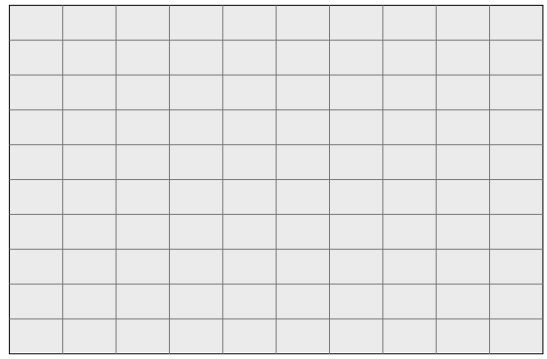


0.0 20.0

Time(sec)

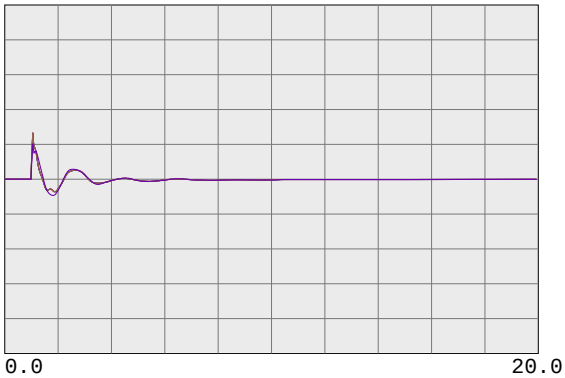
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



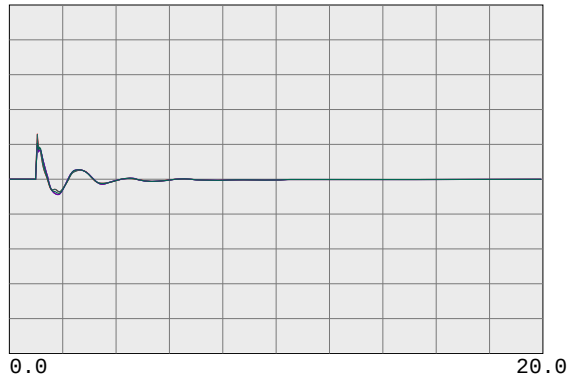


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

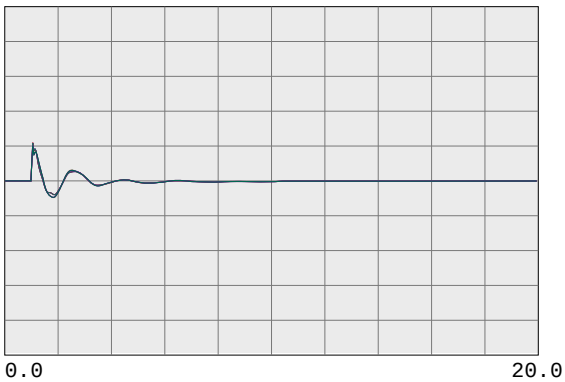
230-KV SYSTEM FREQUENCIES



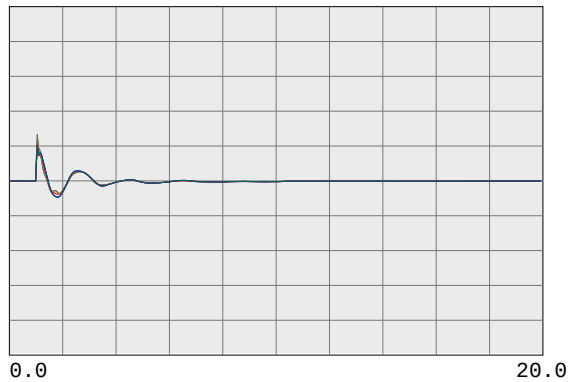
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



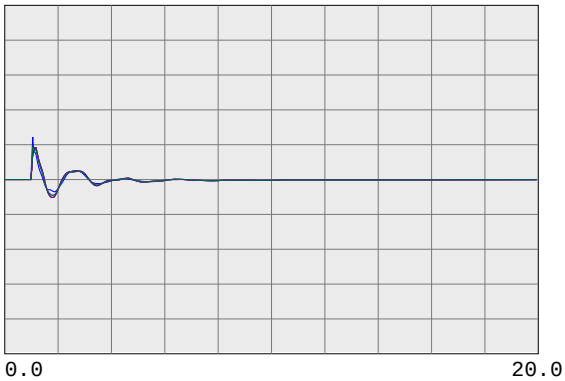
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



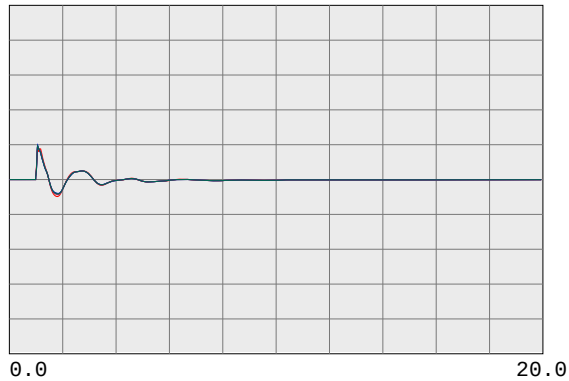
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



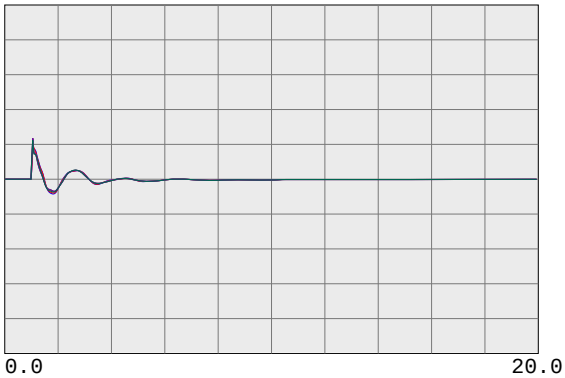
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



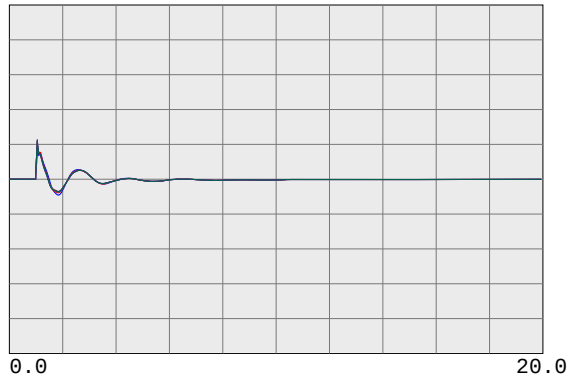
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

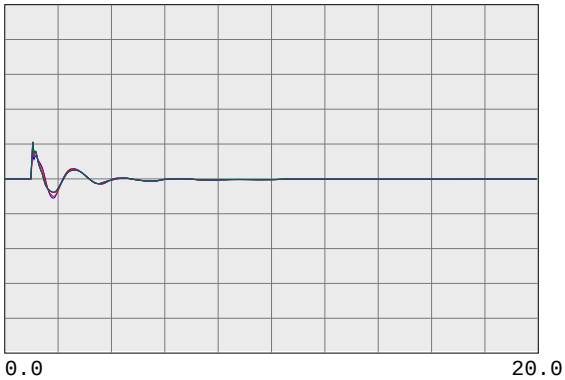
230-KV SYSTEM FREQUENCIES



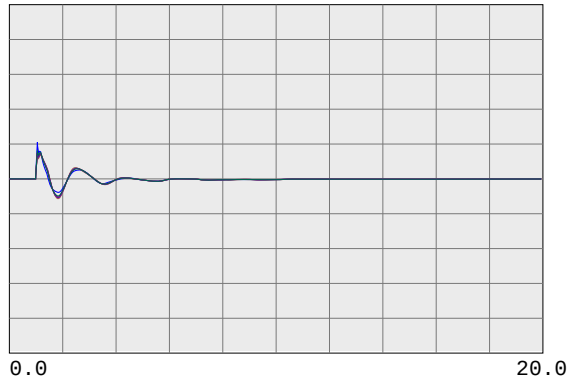
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



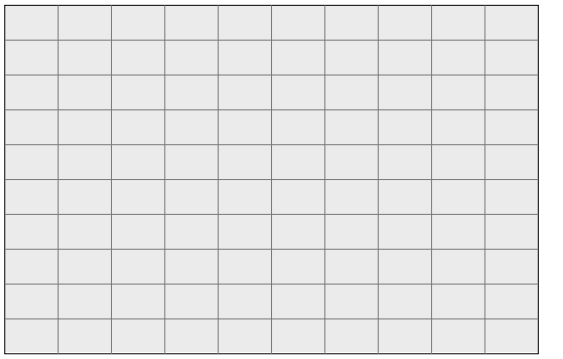
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

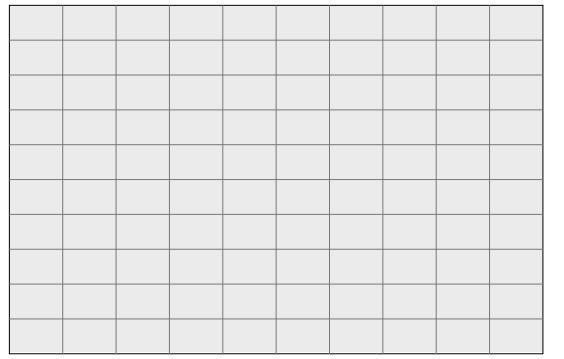


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



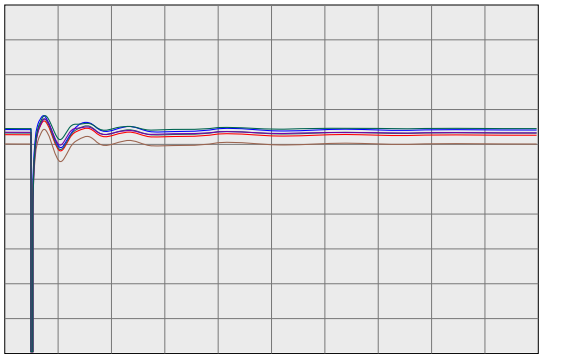
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



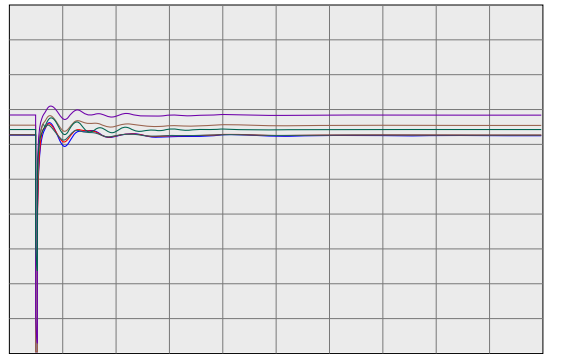


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

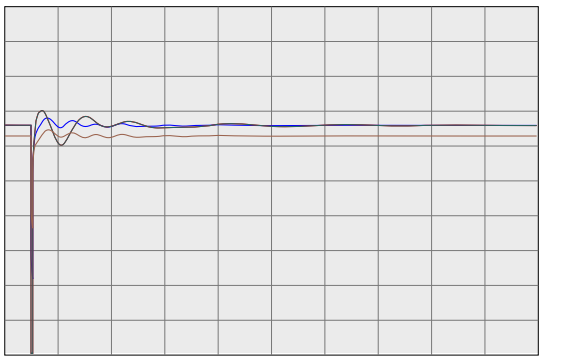
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



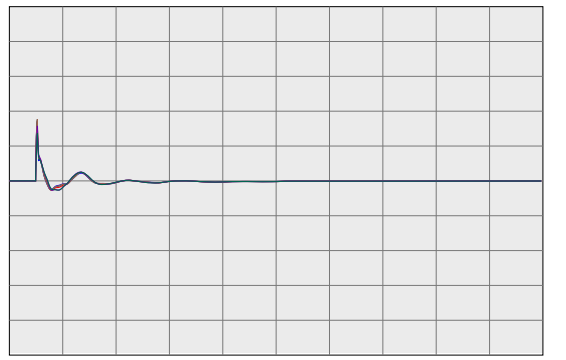
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



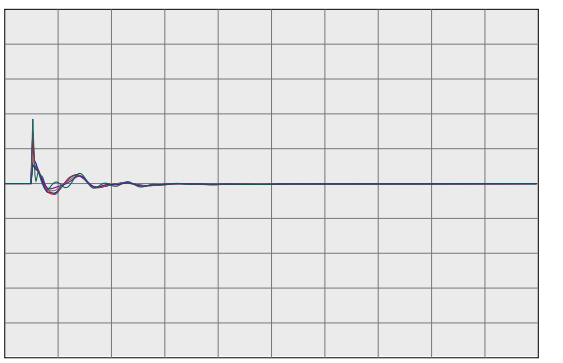
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



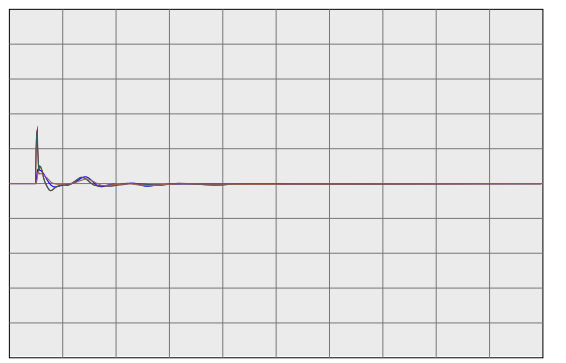
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



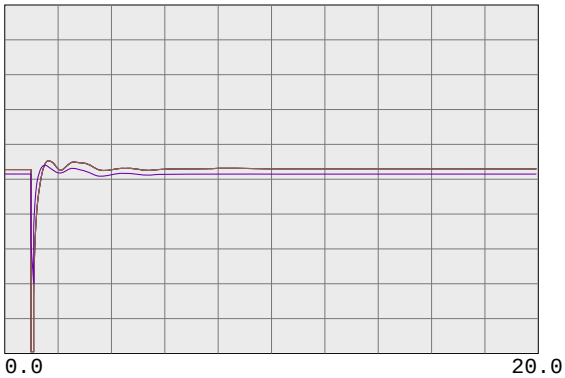
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

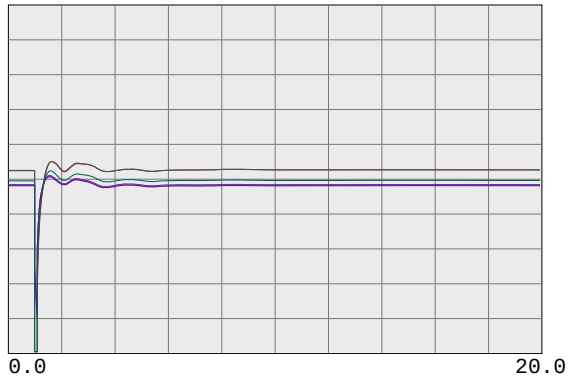
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

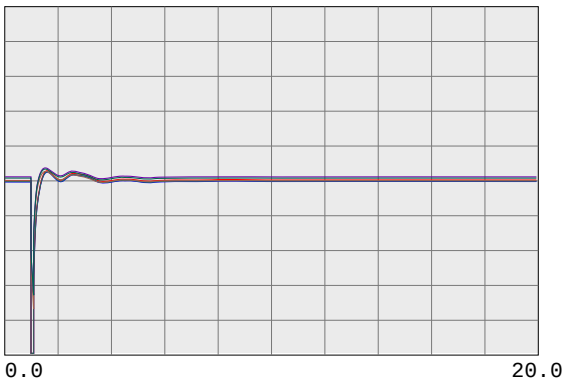
230-KV SYSTEM VOLTAGES



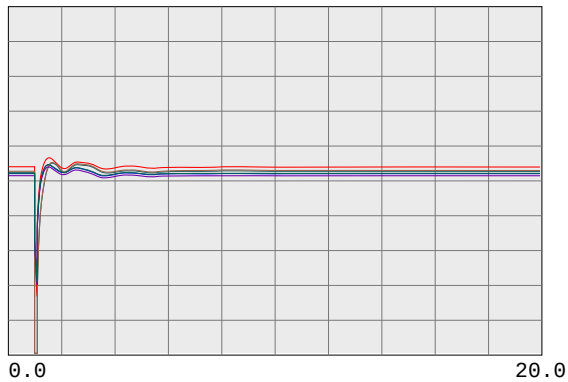
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



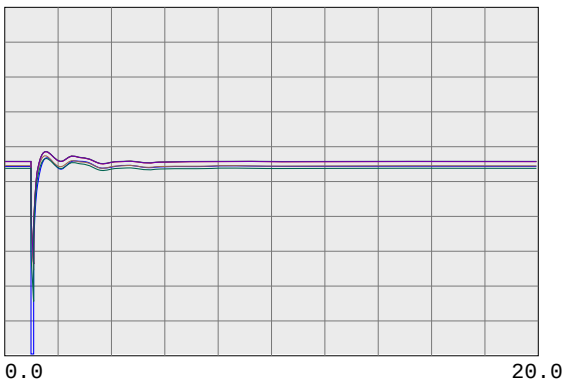
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



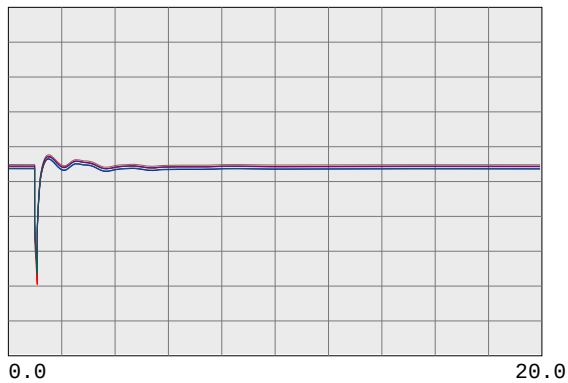
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



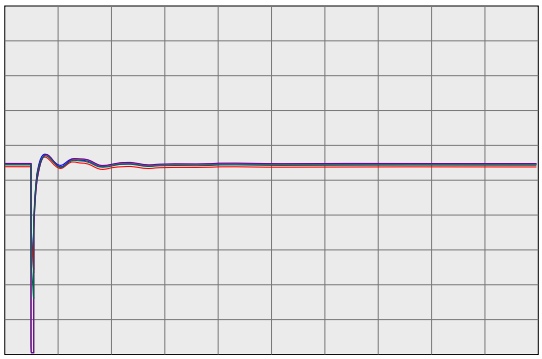
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

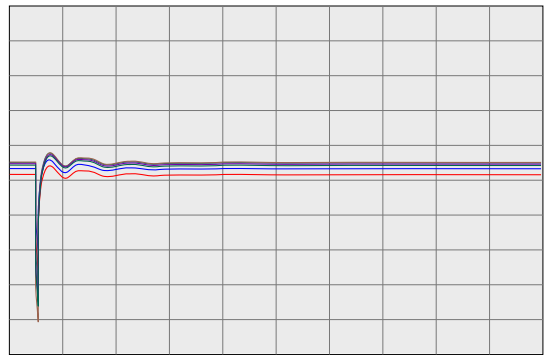
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

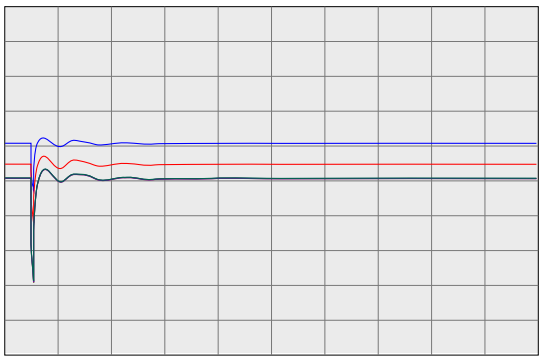
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

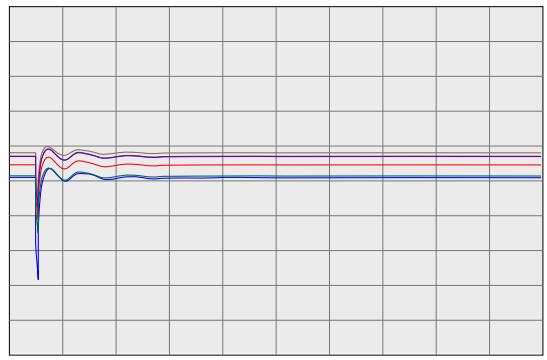
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

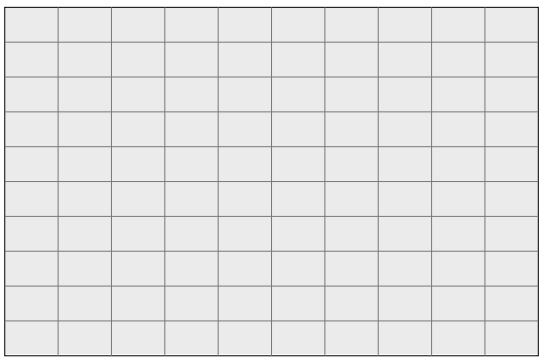
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

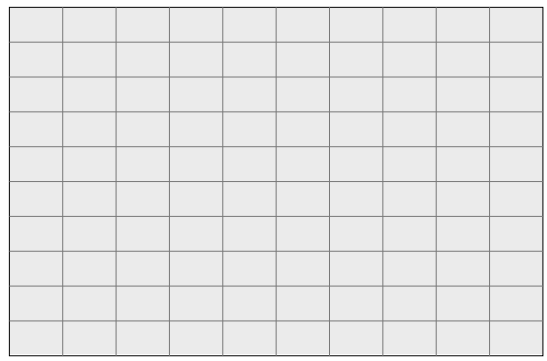


0.0 20.0

Time(sec)

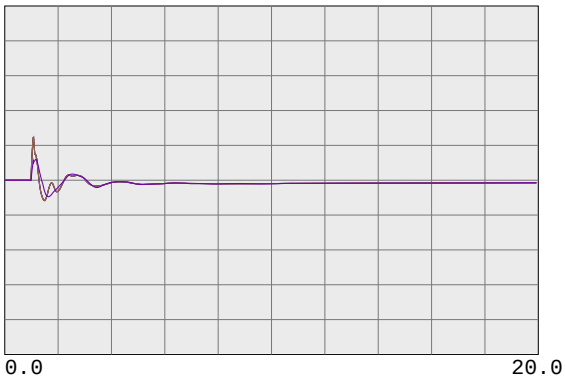
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



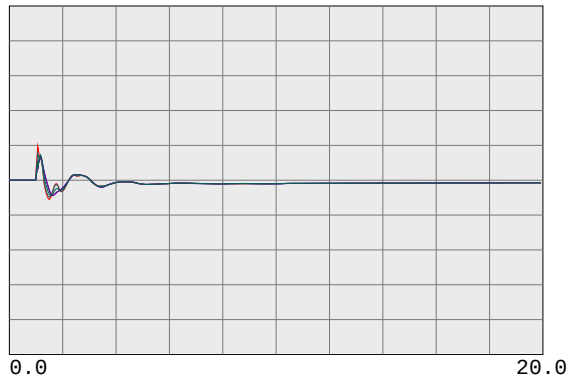


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

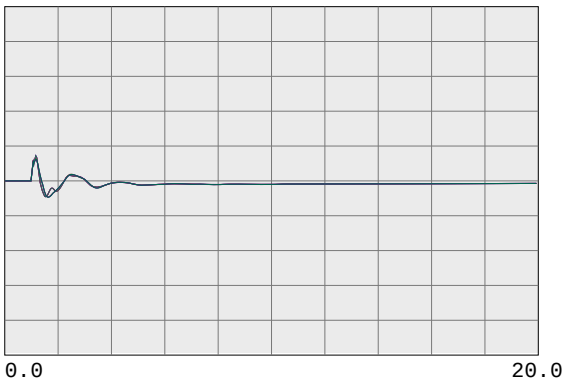
230-KV SYSTEM FREQUENCIES



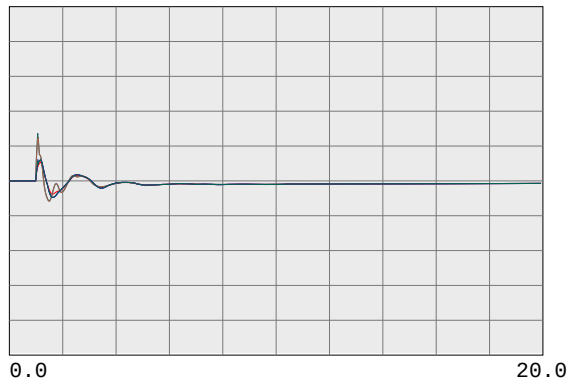
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



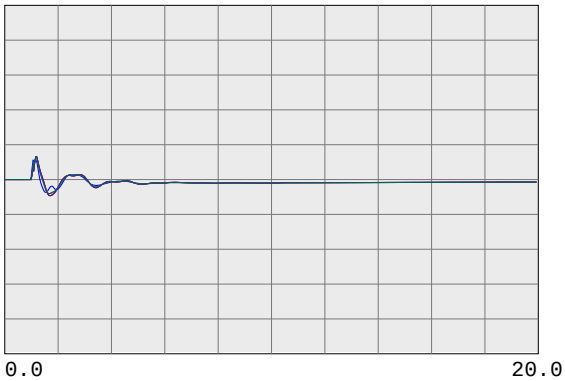
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



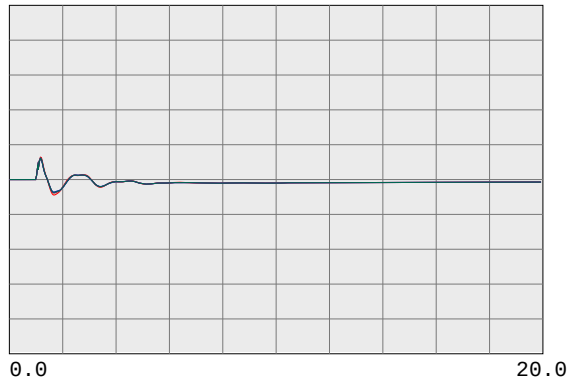
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



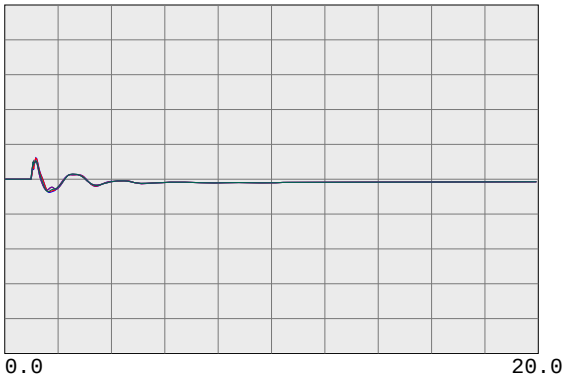
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



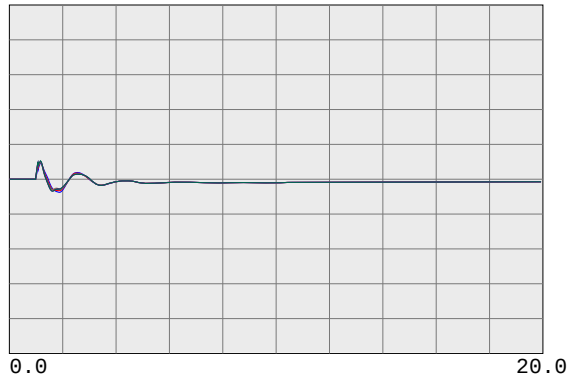
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

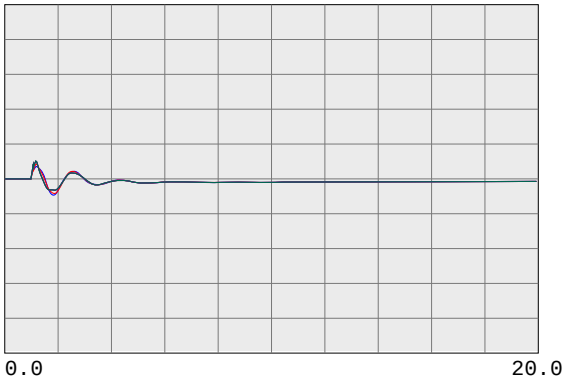
230-KV SYSTEM FREQUENCIES



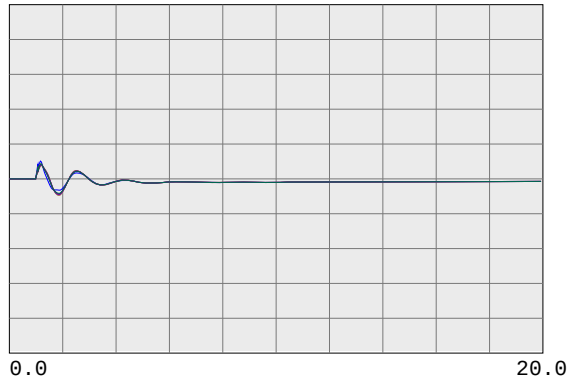
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



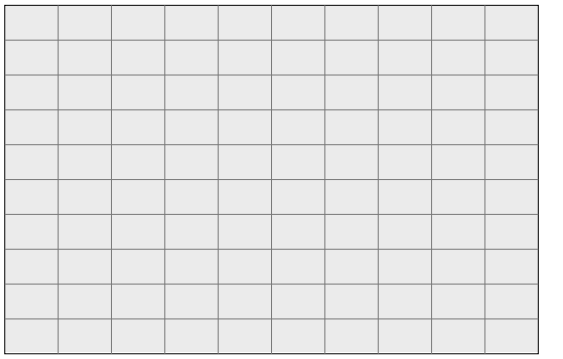
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

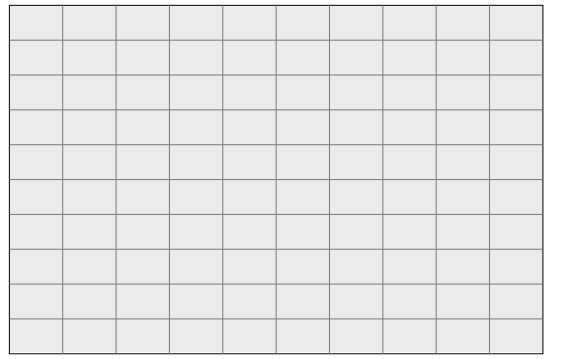


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



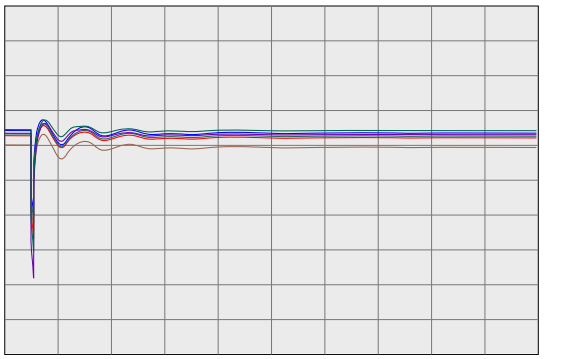
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



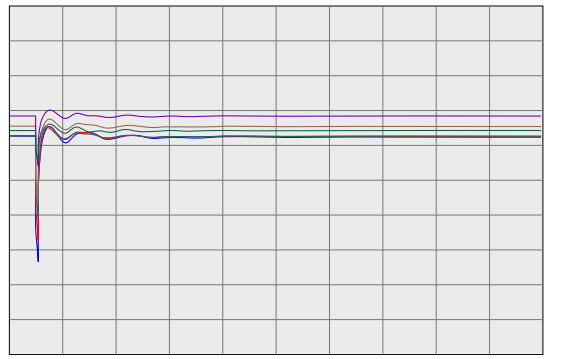


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

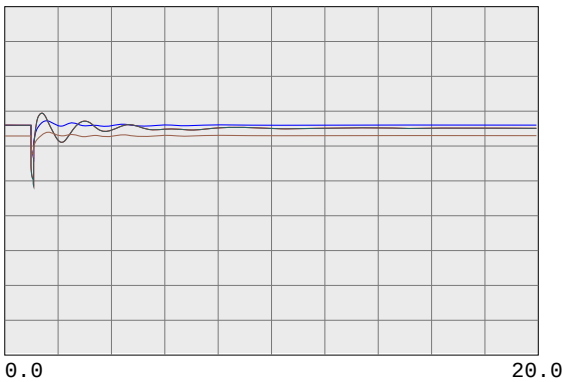
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



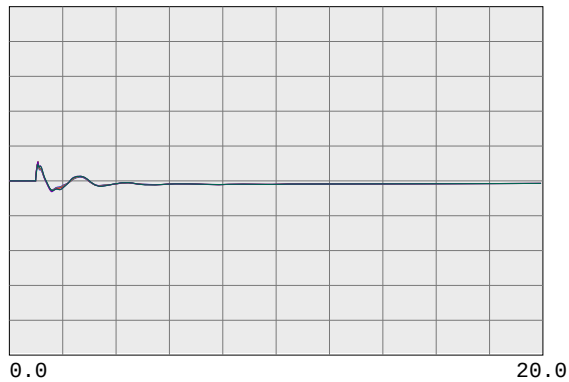
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



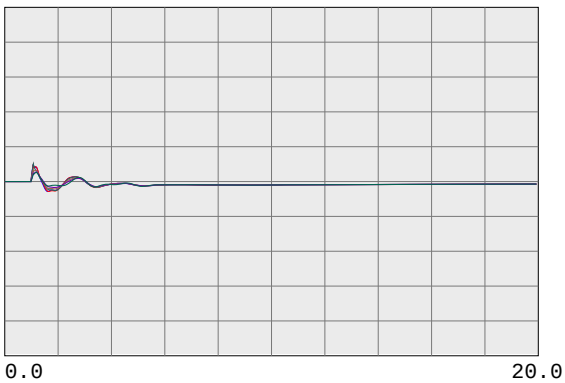
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



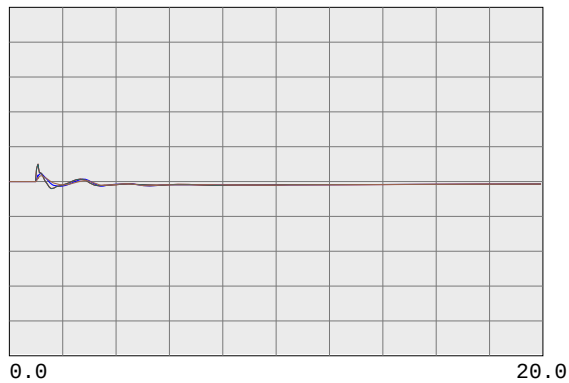
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



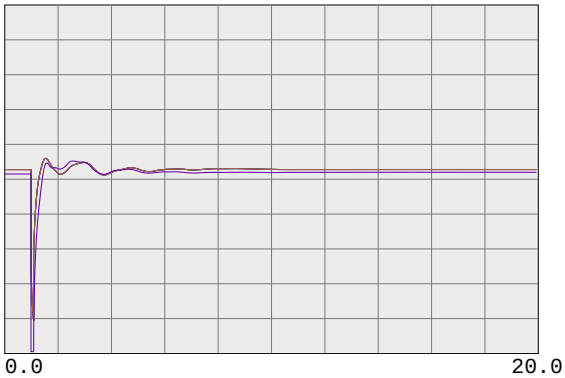
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

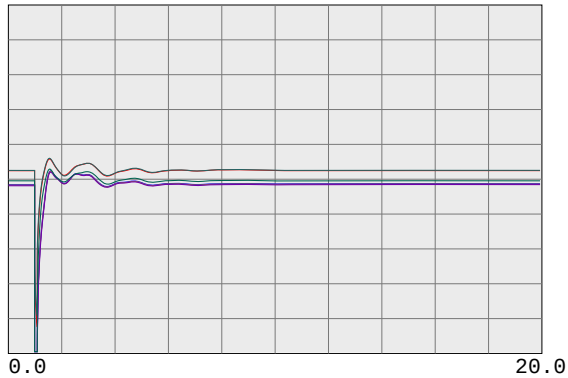
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

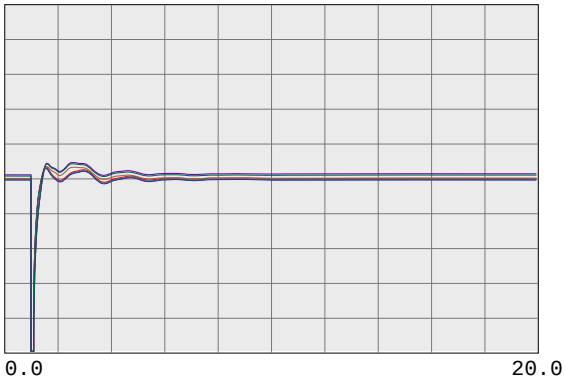
230-KV SYSTEM VOLTAGES



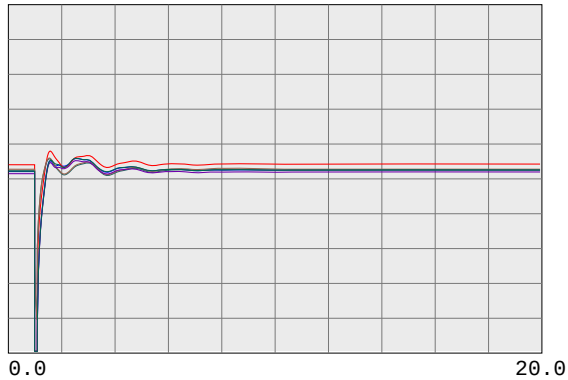
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



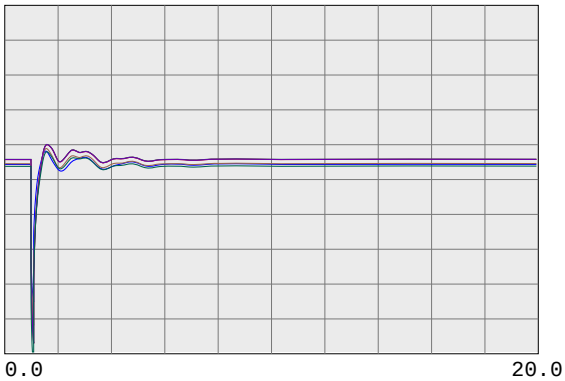
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



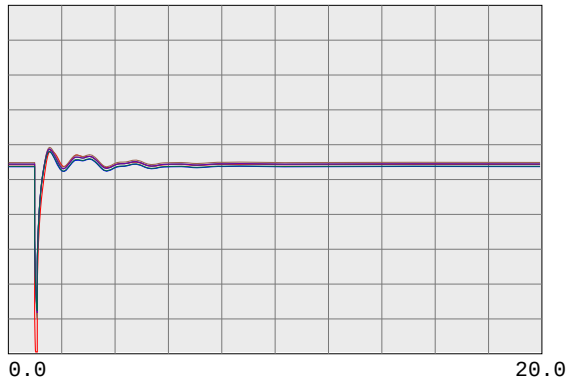
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



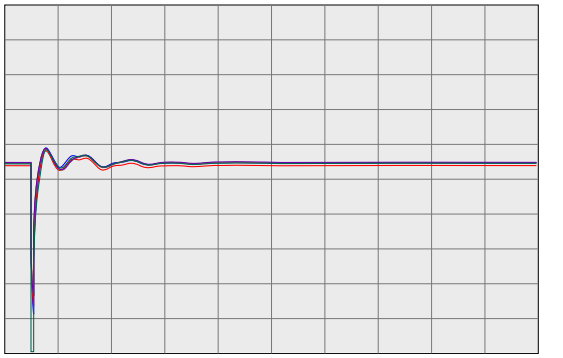
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



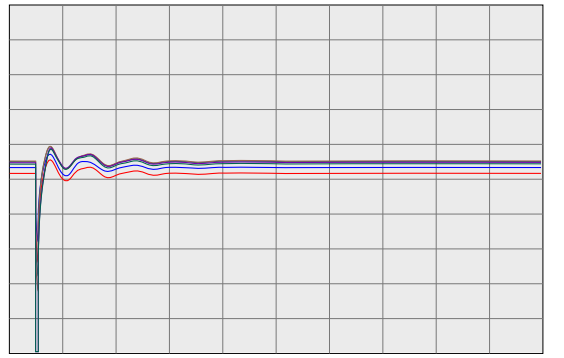
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

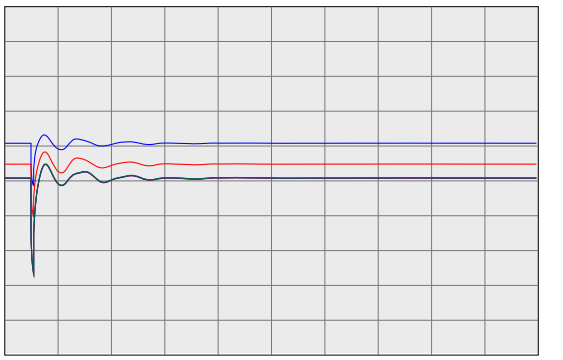
230-KV SYSTEM VOLTAGES



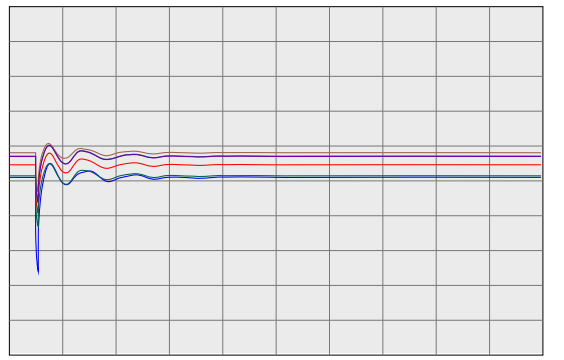
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



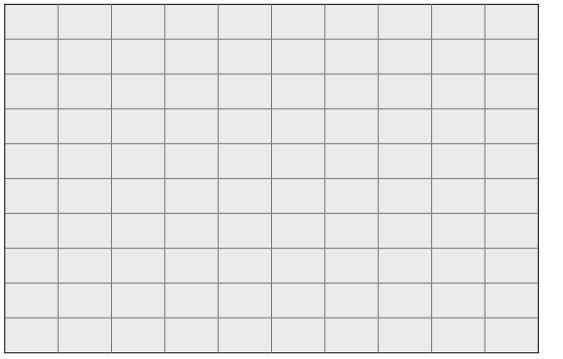
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

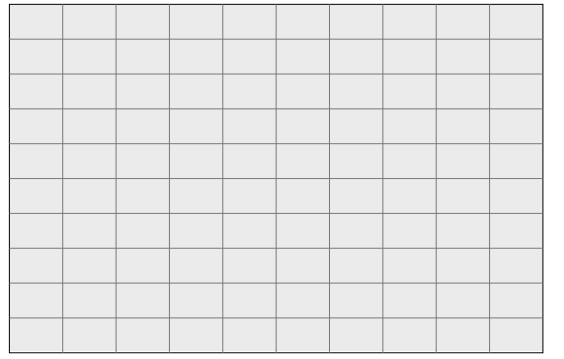


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



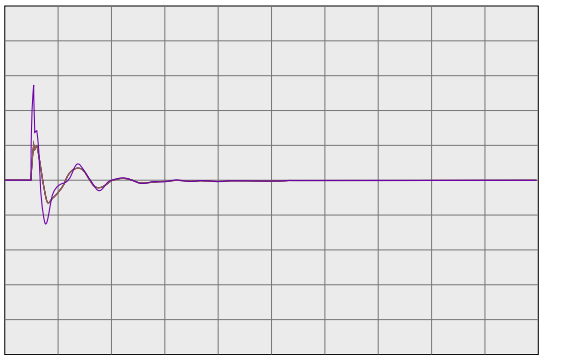
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



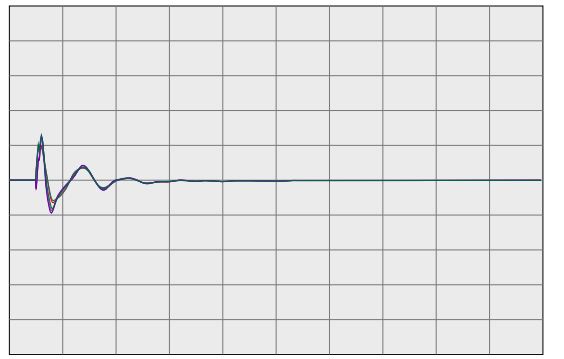


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

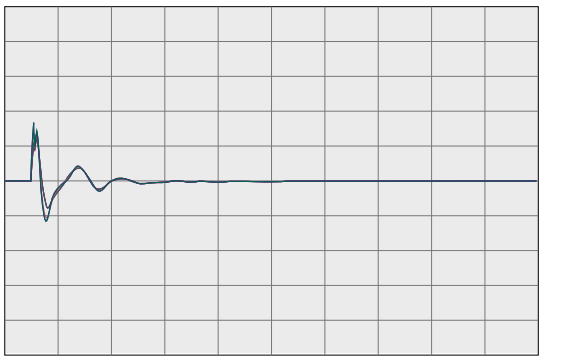
230-KV SYSTEM FREQUENCIES



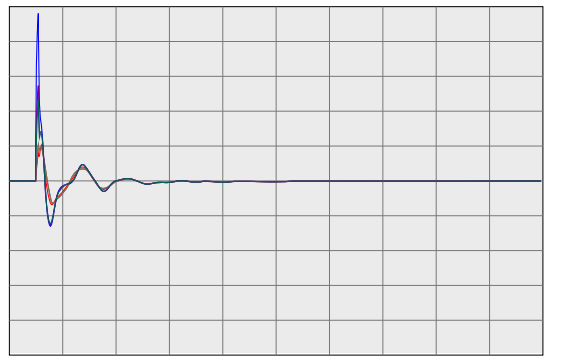
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



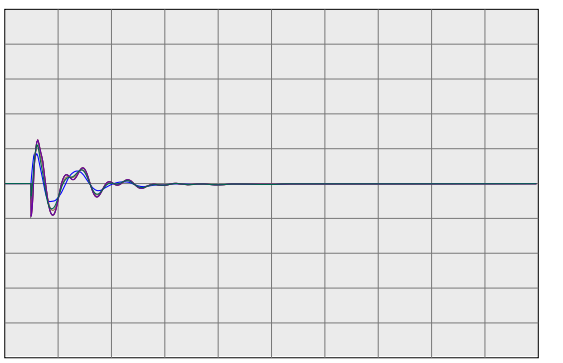
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



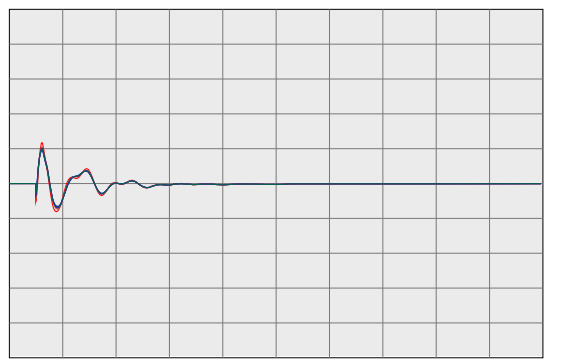
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



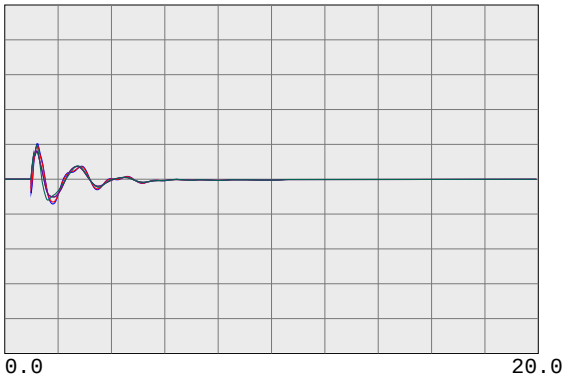
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



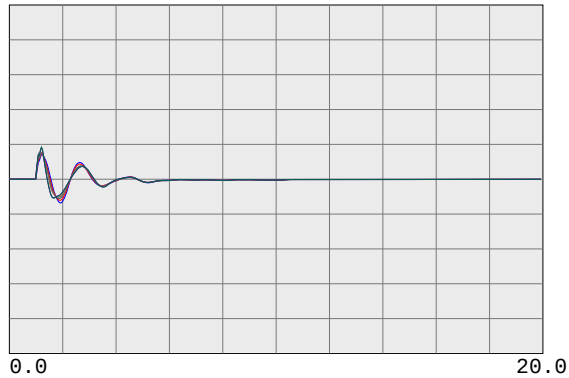
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

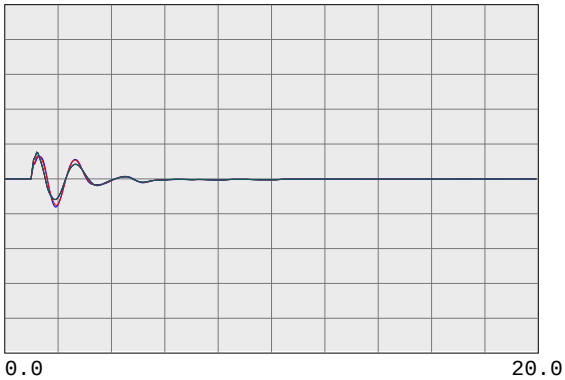
230-KV SYSTEM FREQUENCIES



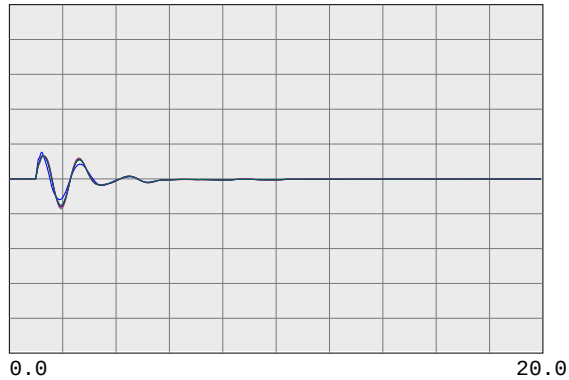
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



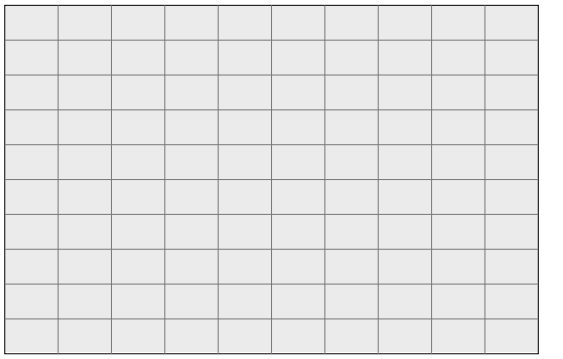
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

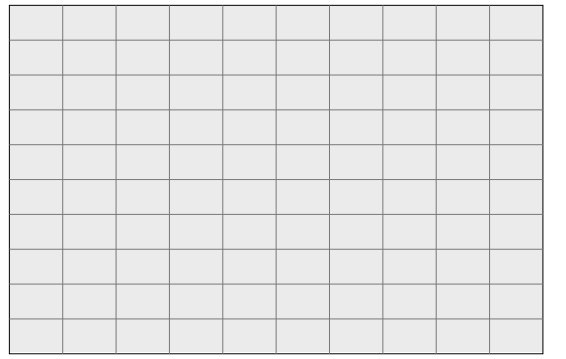


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



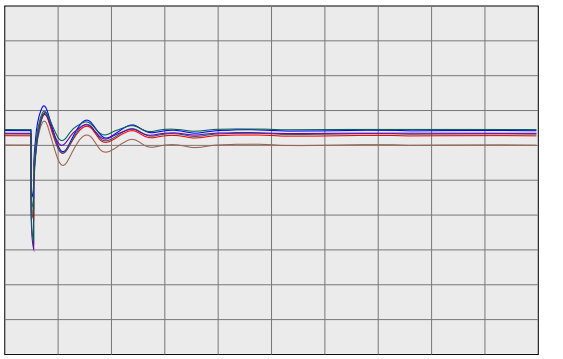
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



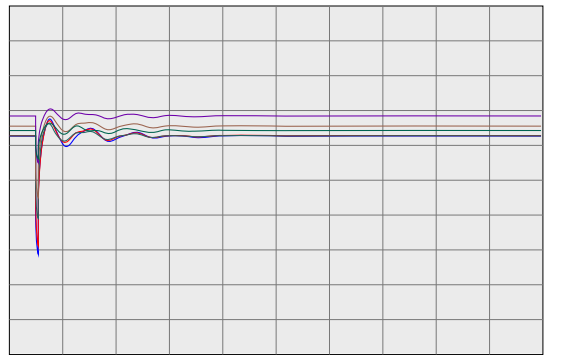


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

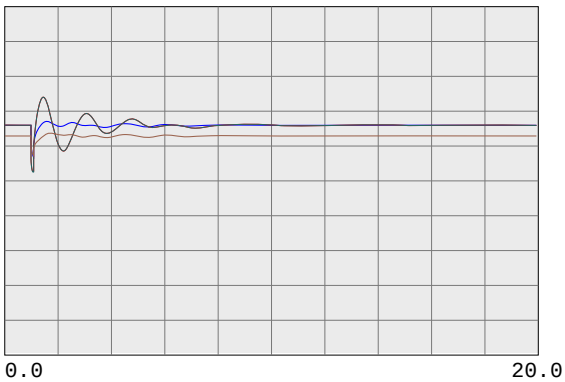
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



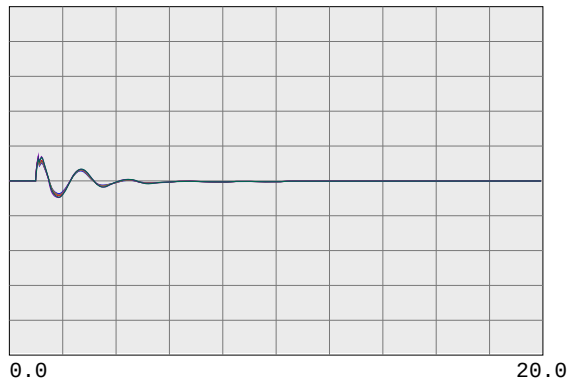
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



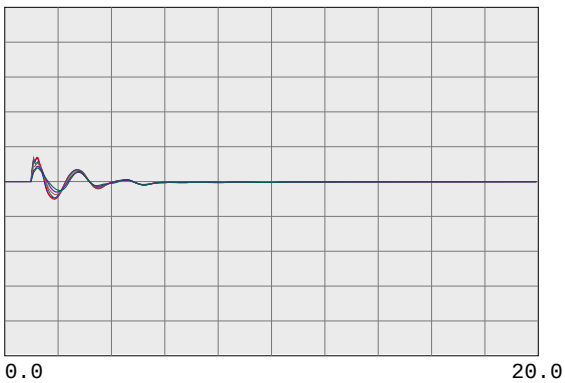
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



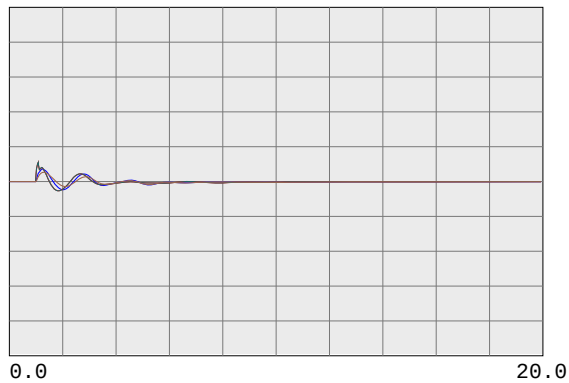
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



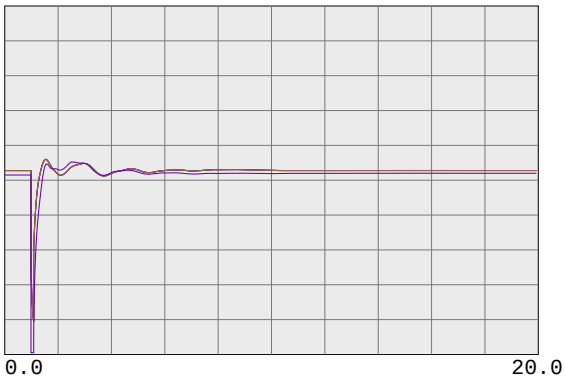
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

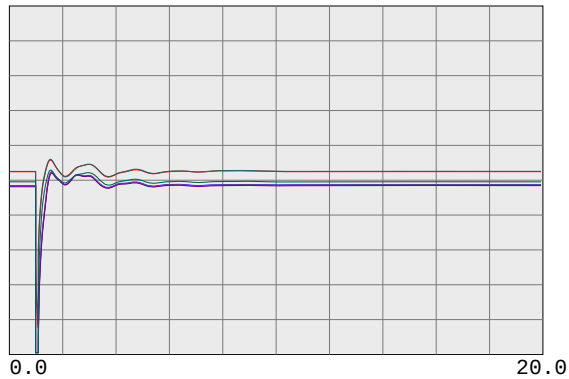
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

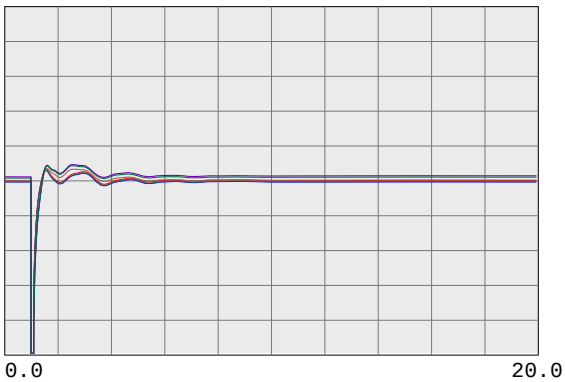
230-KV SYSTEM VOLTAGES



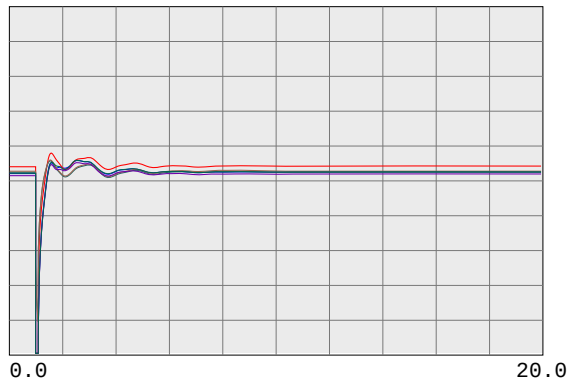
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



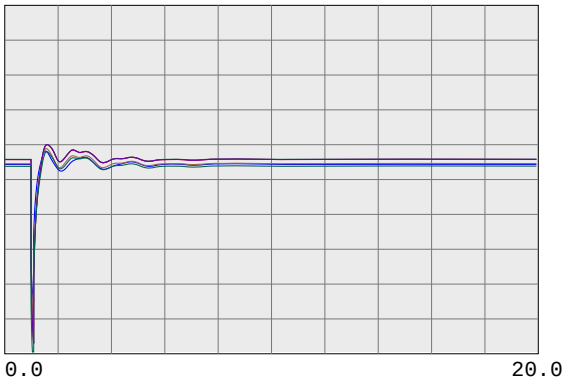
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



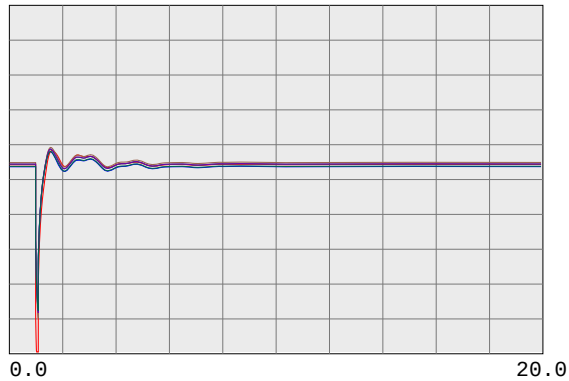
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



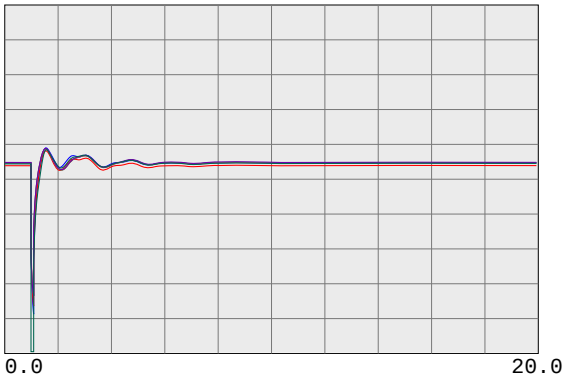
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



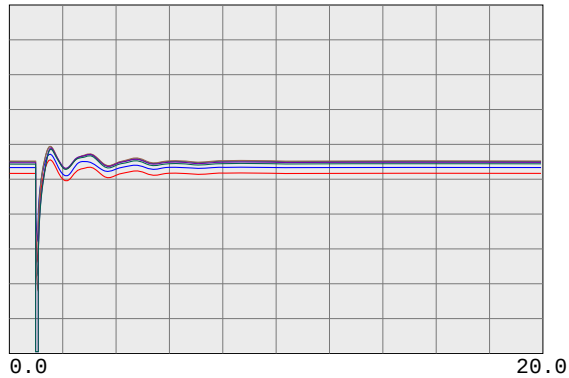
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

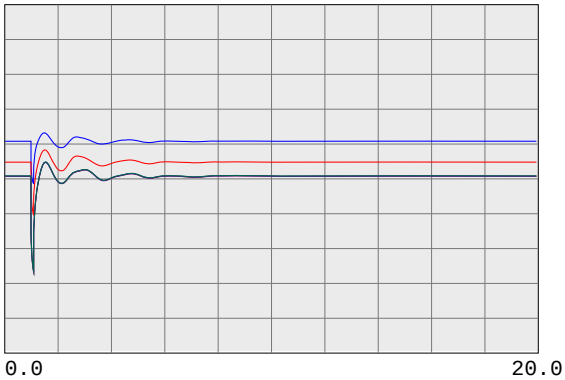
230-KV SYSTEM VOLTAGES



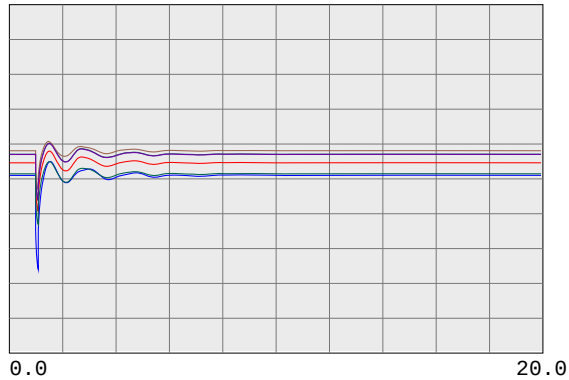
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



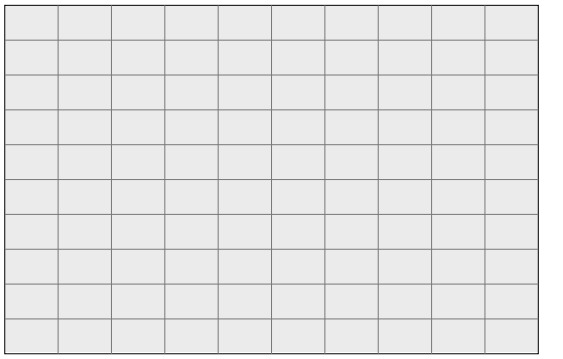
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

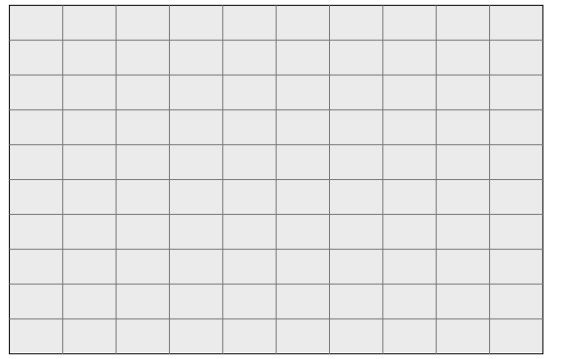


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



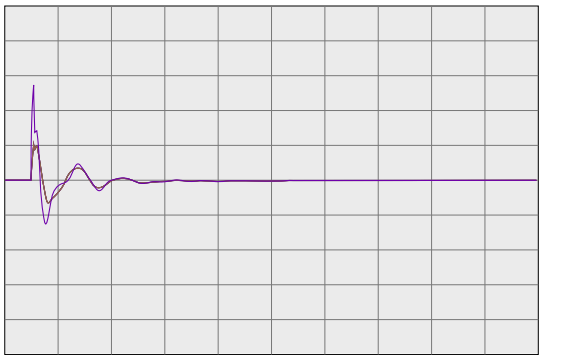
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



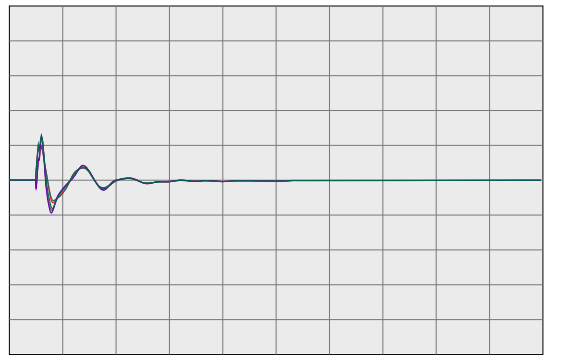


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

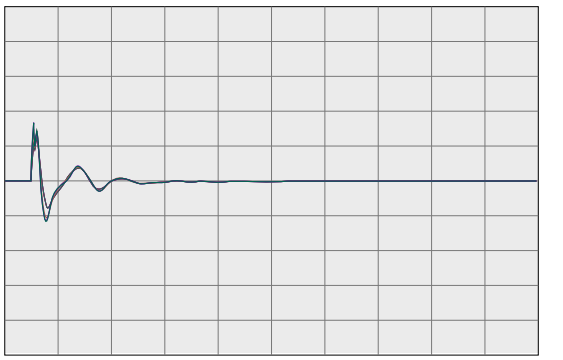
230-KV SYSTEM FREQUENCIES



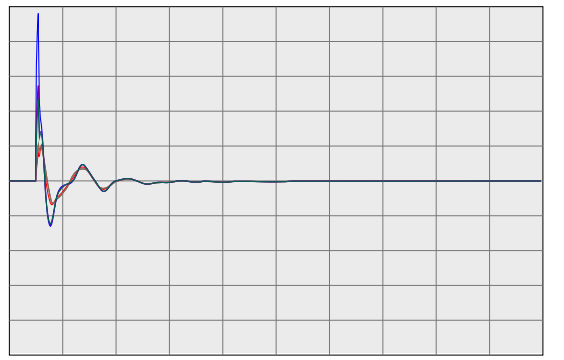
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



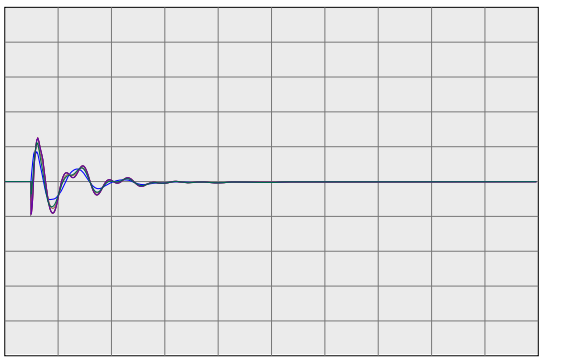
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



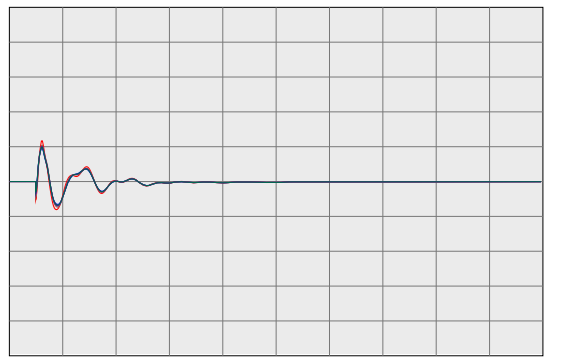
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



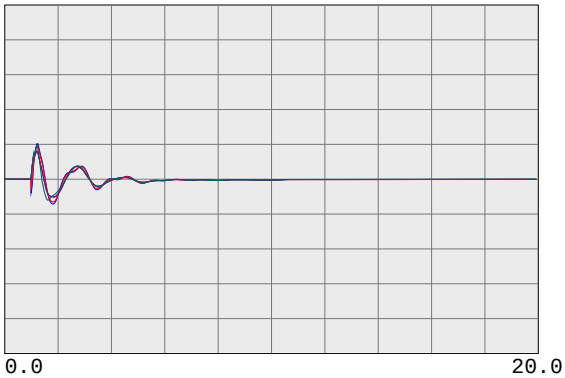
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



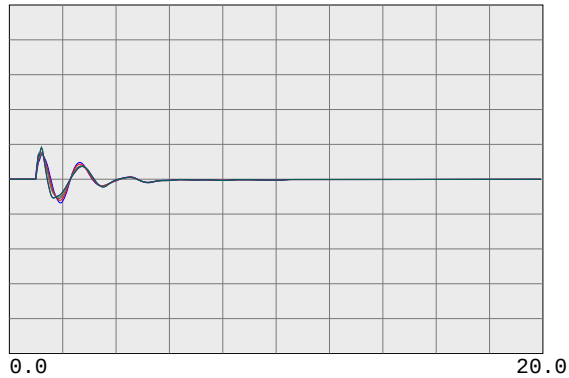
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

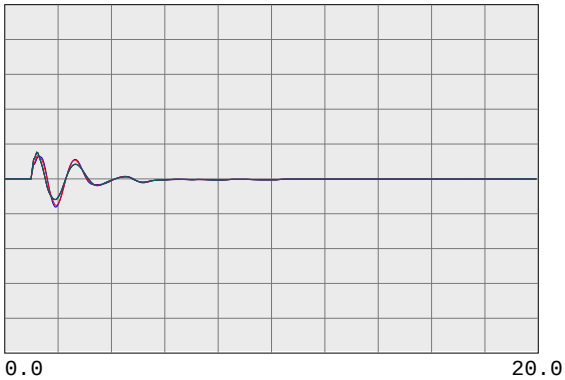
230-KV SYSTEM FREQUENCIES



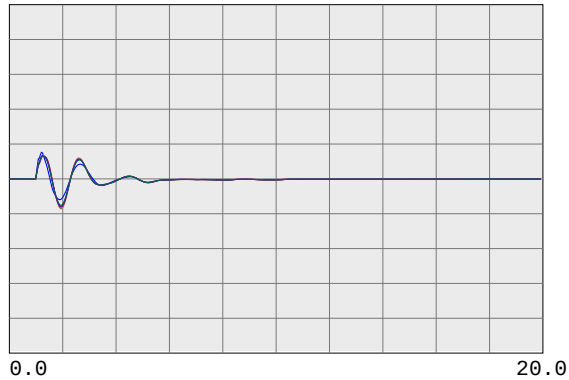
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



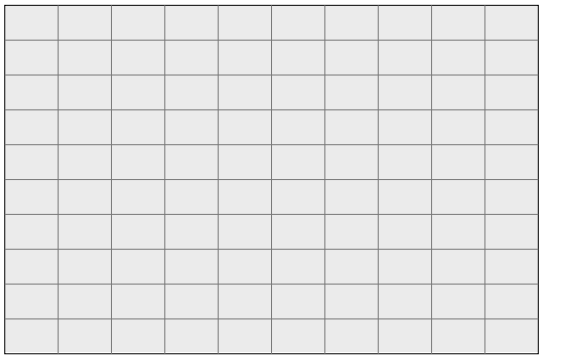
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

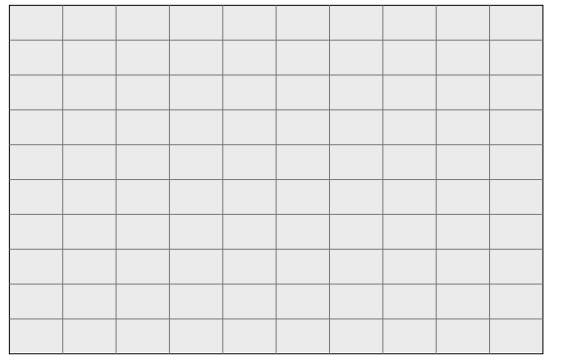


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



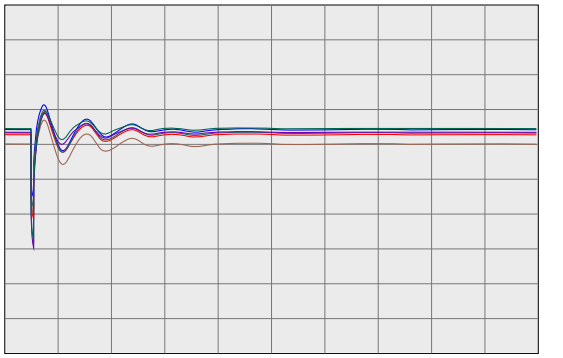
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



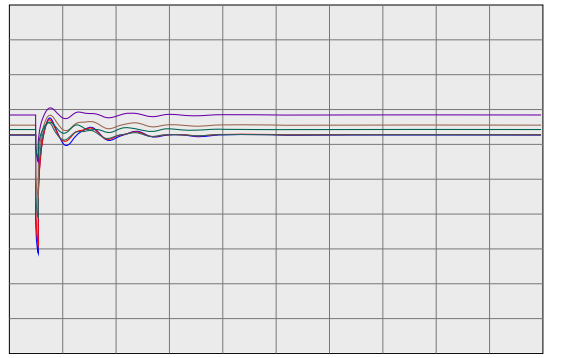


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

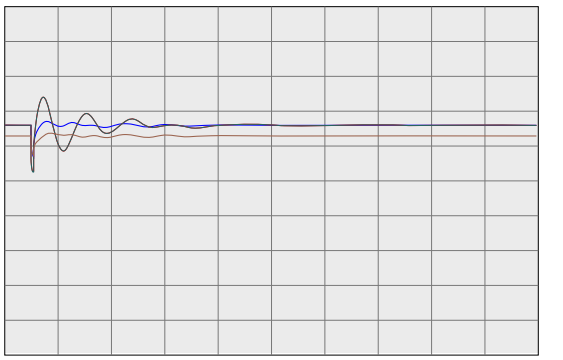
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



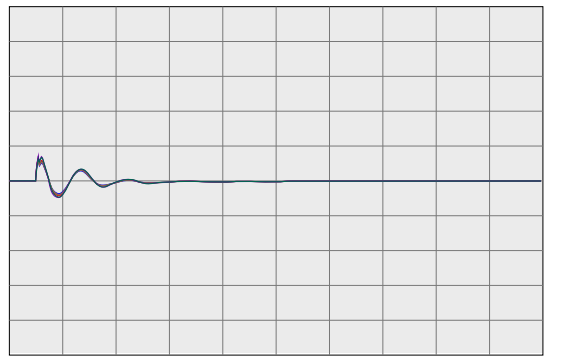
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



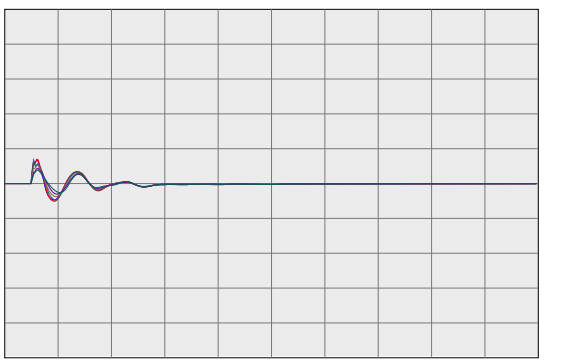
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



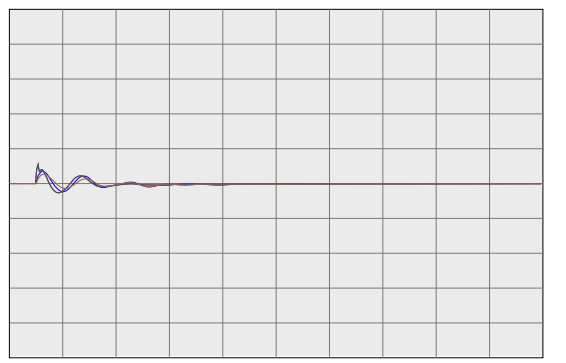
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



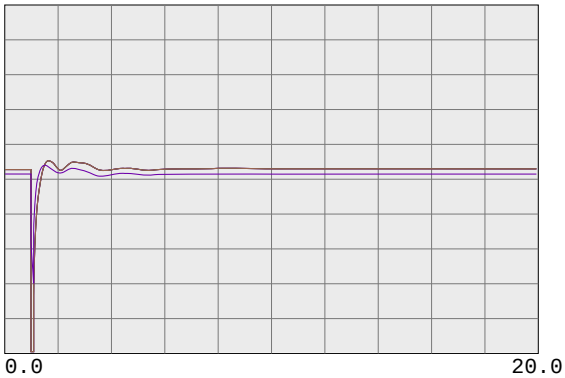
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

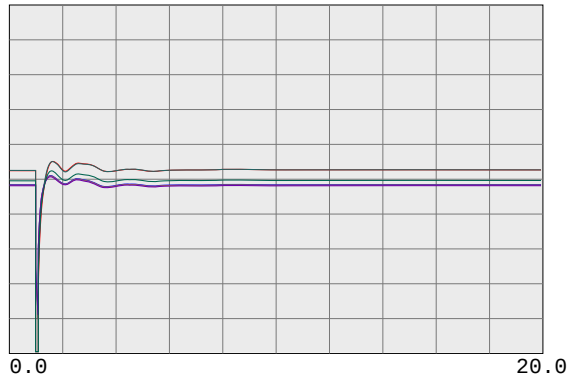
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

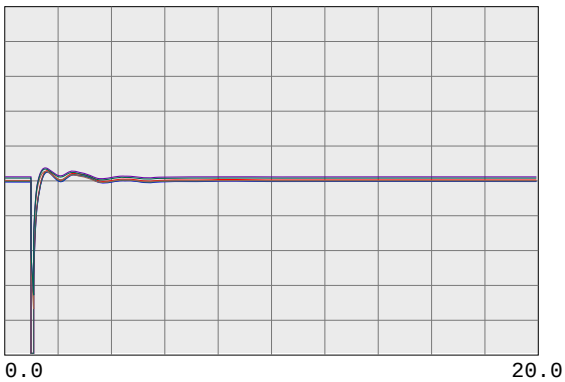
230-KV SYSTEM VOLTAGES



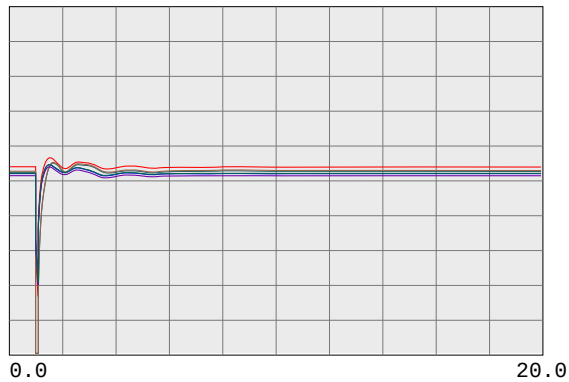
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



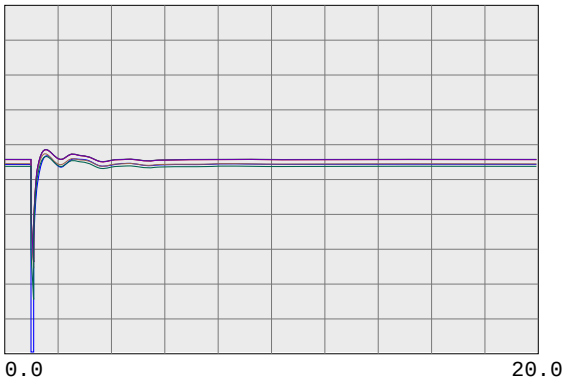
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



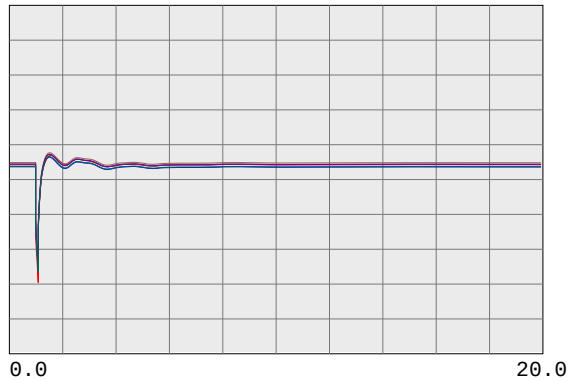
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



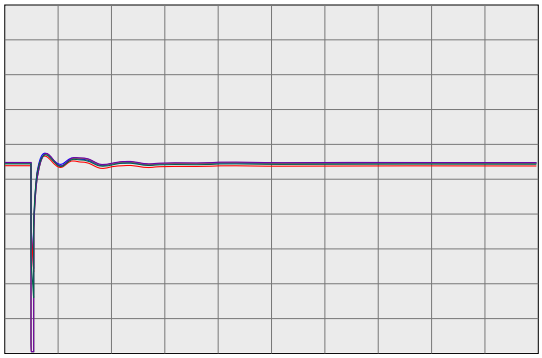
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

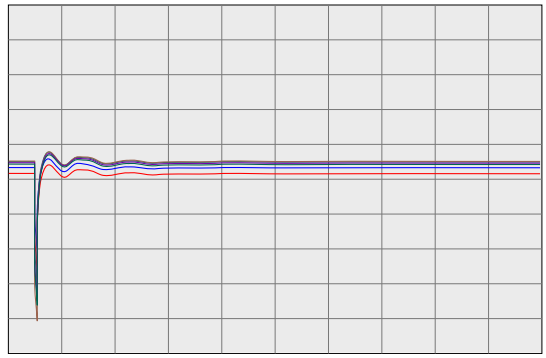
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

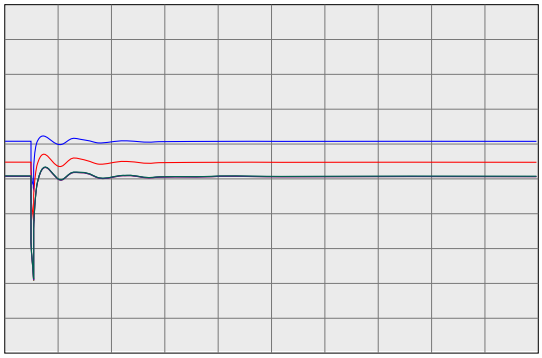
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

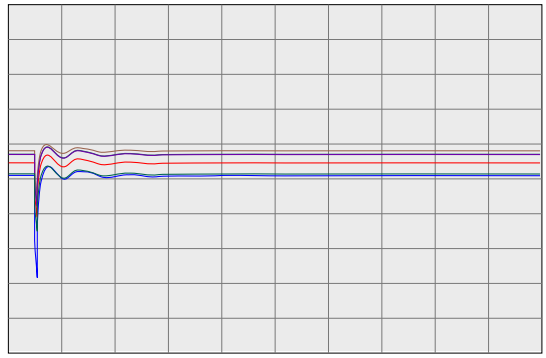
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

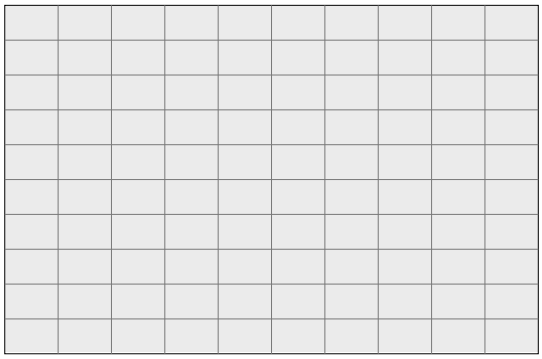
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

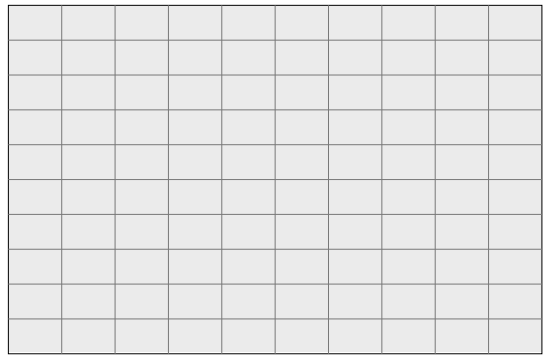


0.0 20.0

Time(sec)

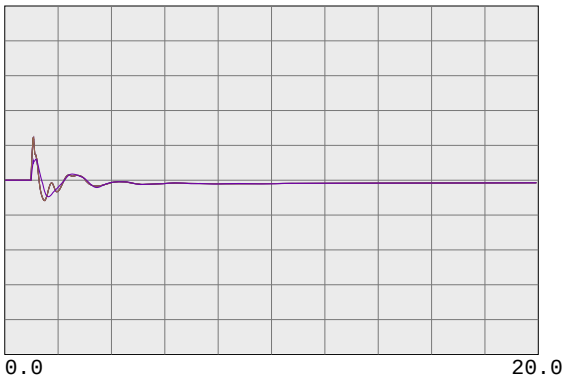
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



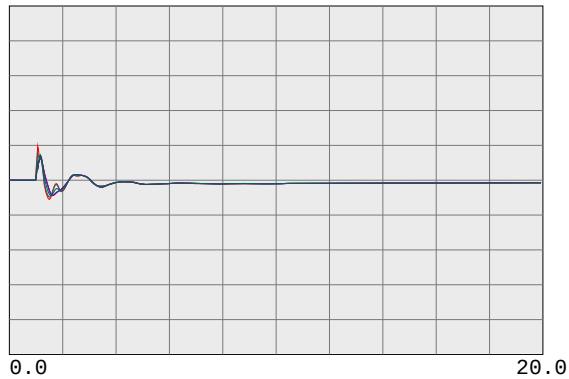


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

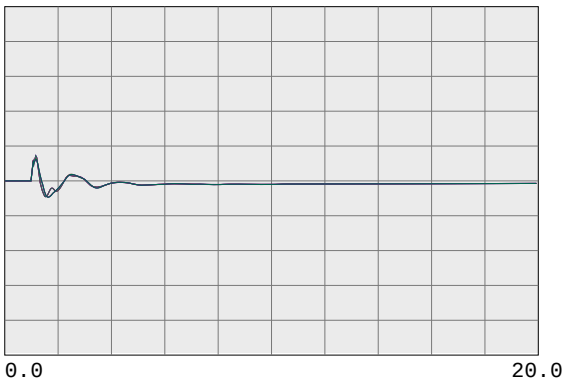
230-KV SYSTEM FREQUENCIES



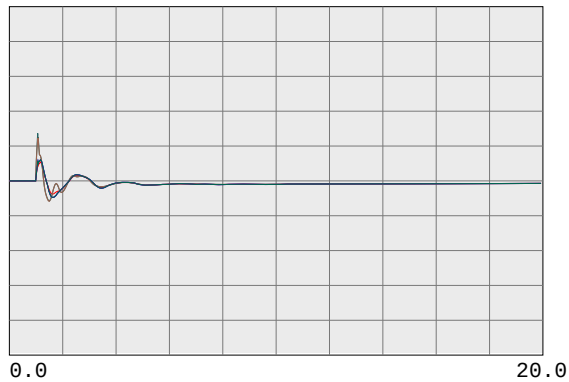
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



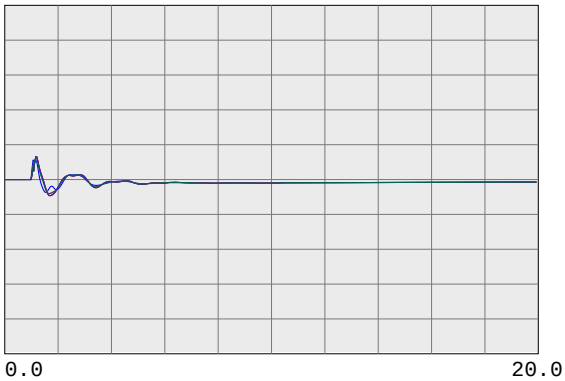
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



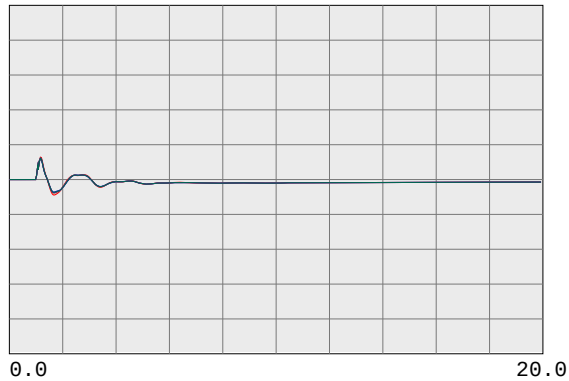
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



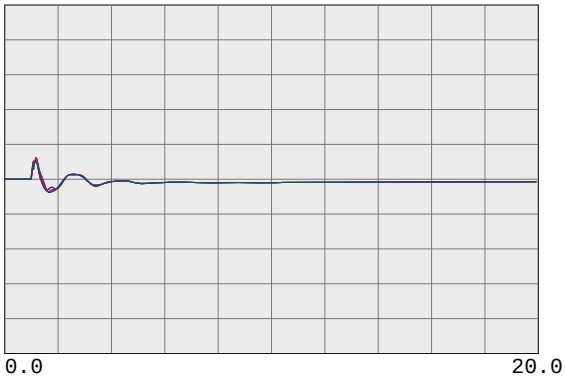
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



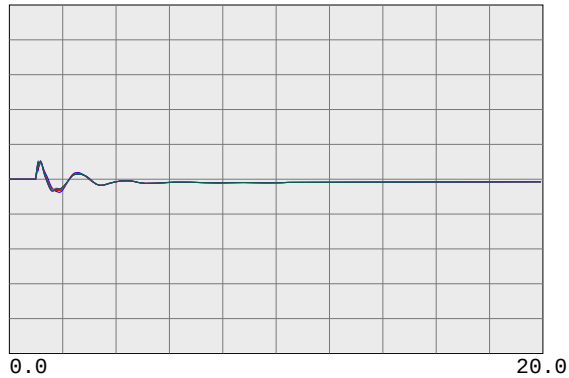
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

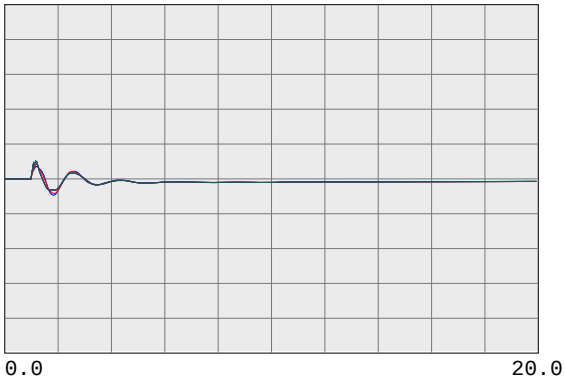
230-KV SYSTEM FREQUENCIES



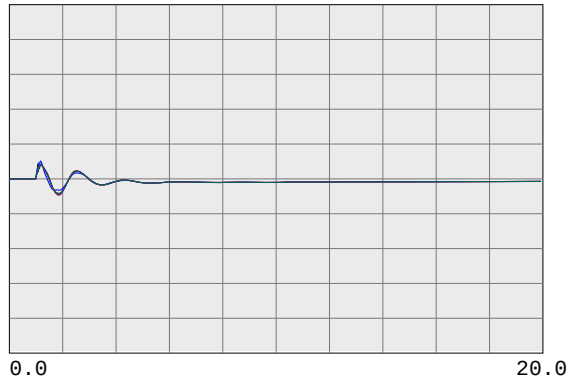
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



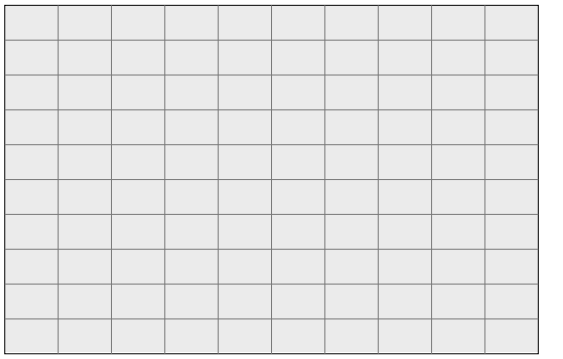
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

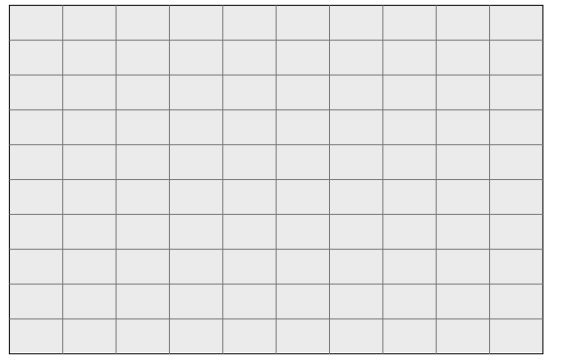


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



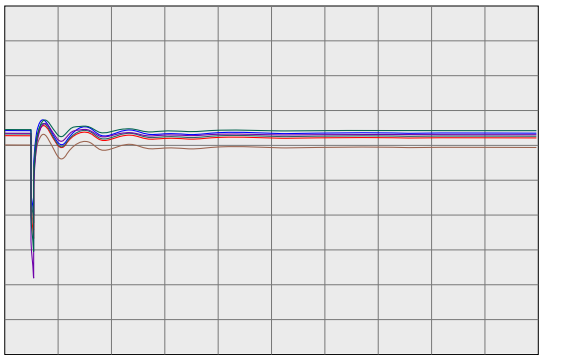
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



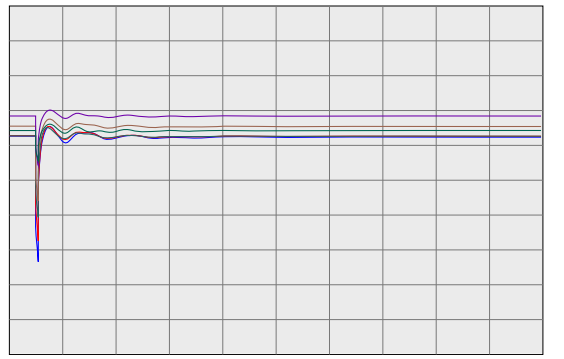


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

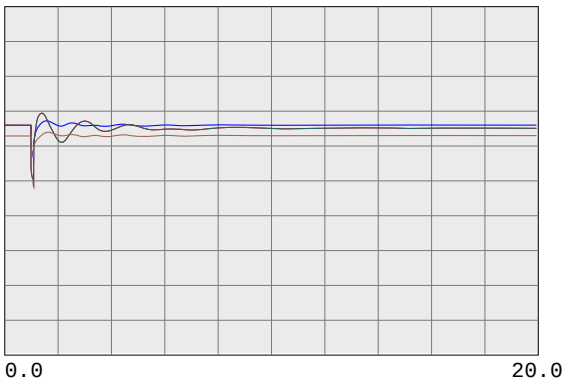
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



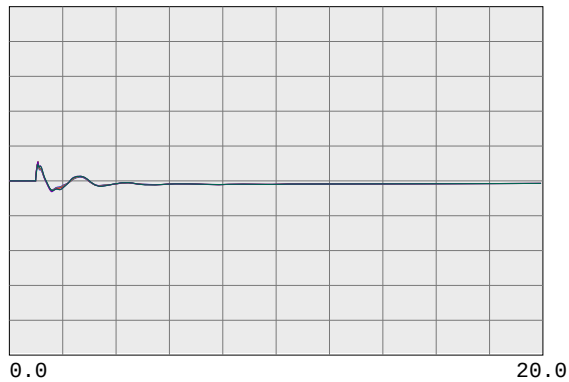
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



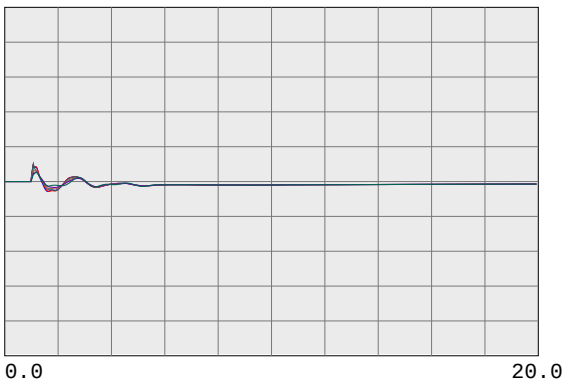
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



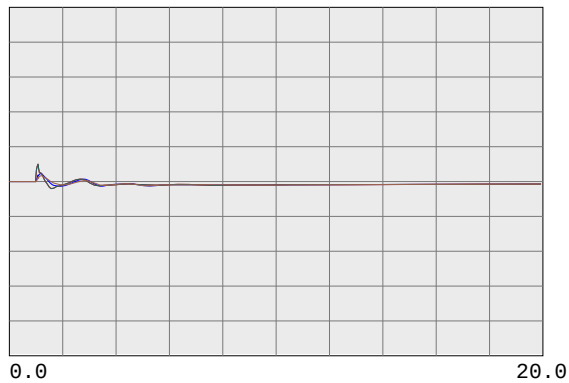
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



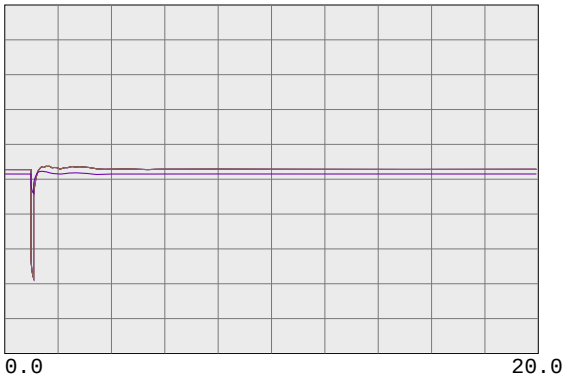
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

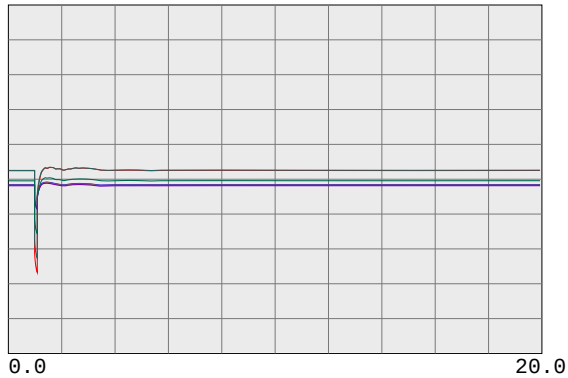
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

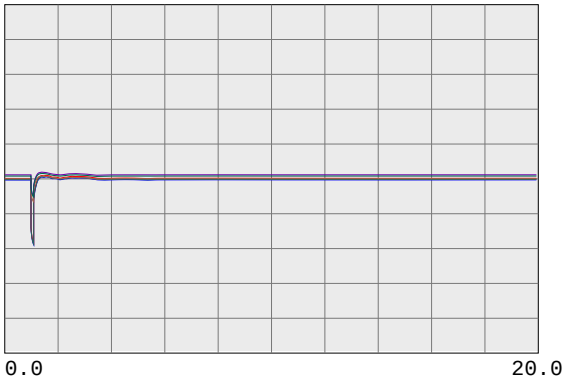
230-KV SYSTEM VOLTAGES



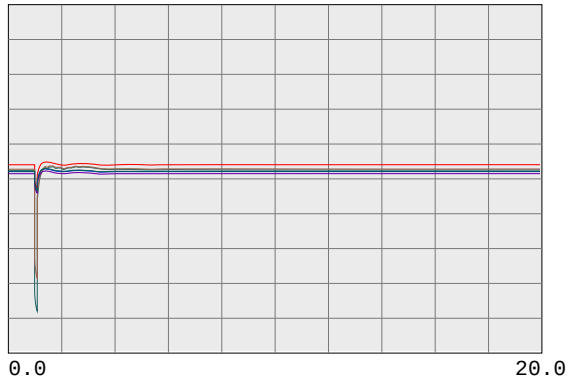
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



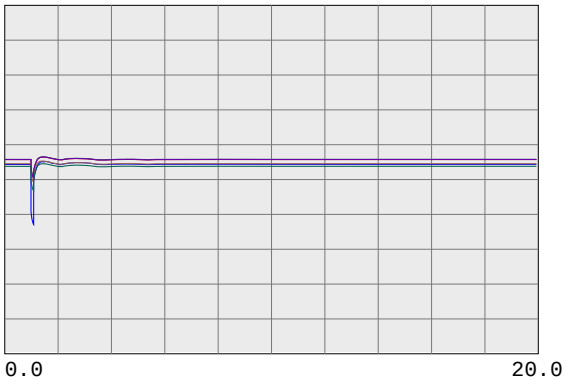
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



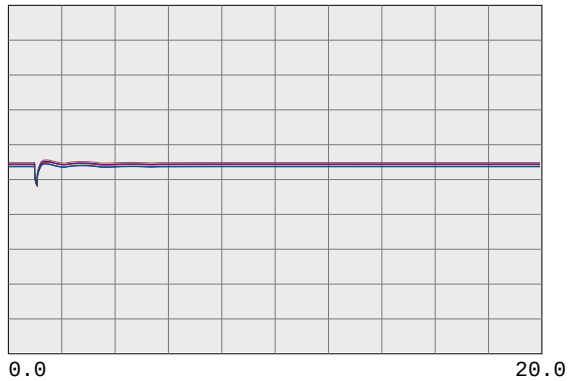
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



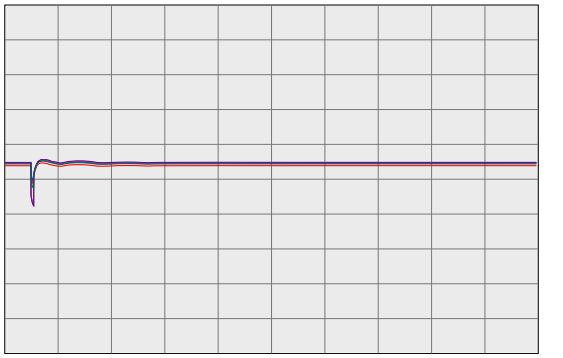
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



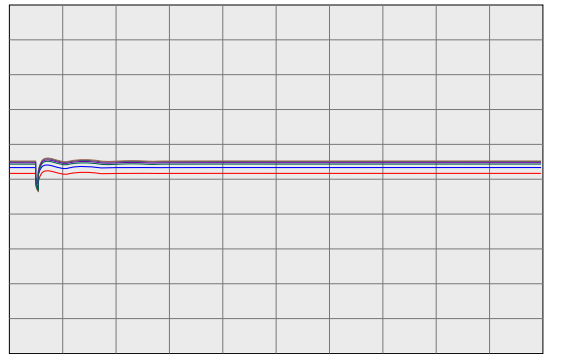
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

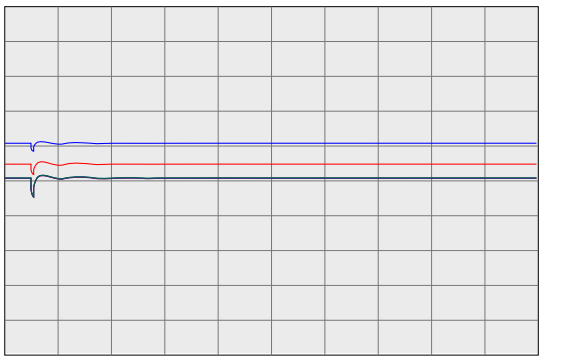
230-KV SYSTEM VOLTAGES



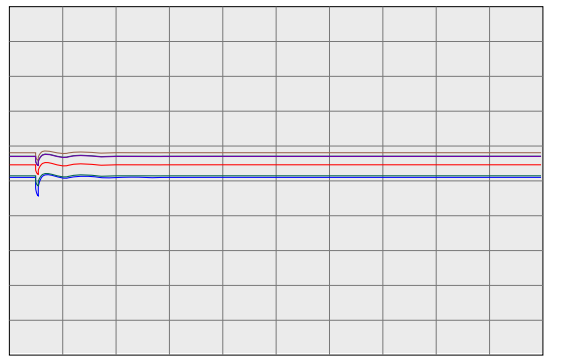
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



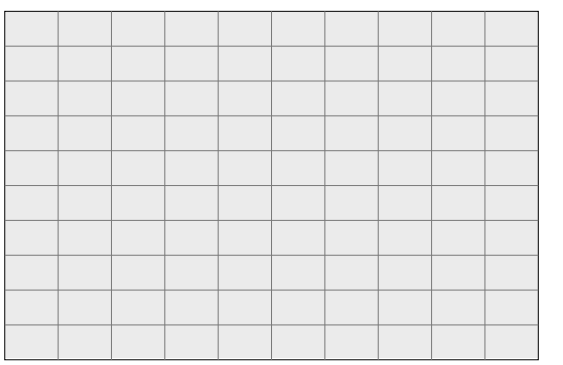
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

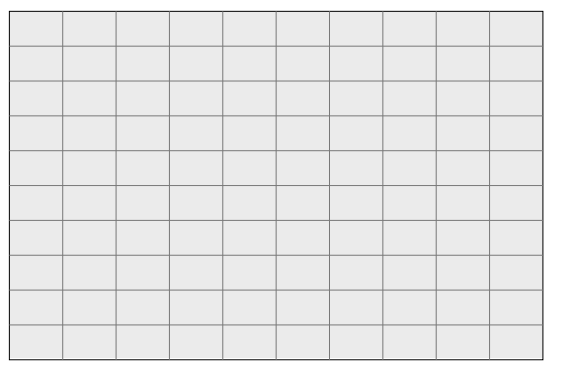


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



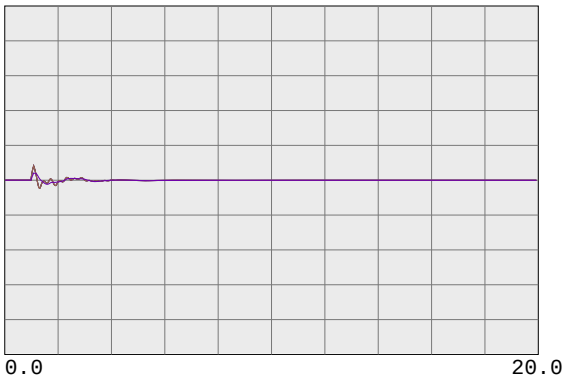
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





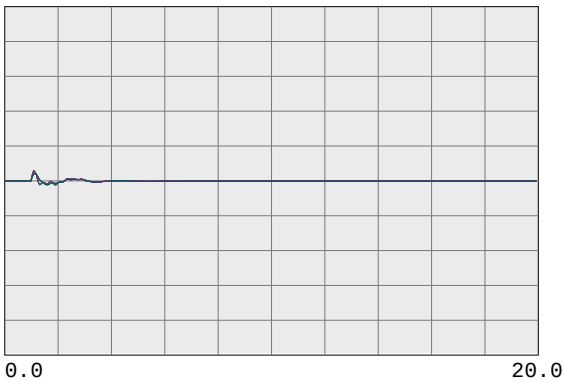
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

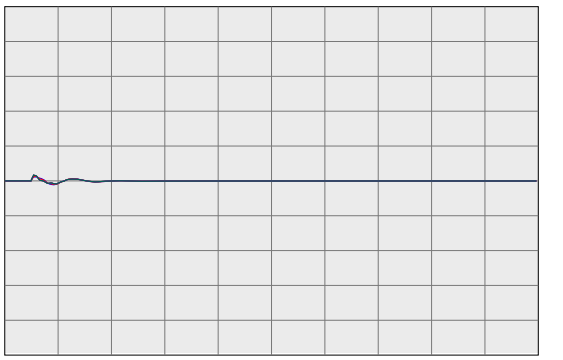
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

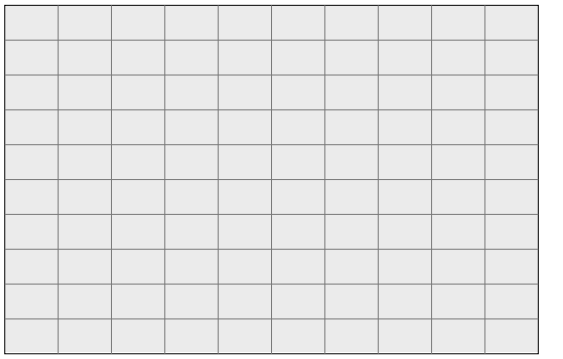
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

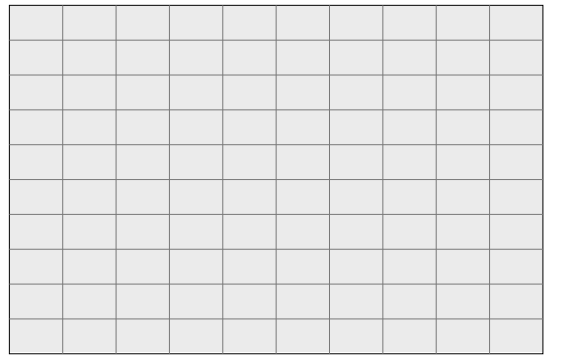
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

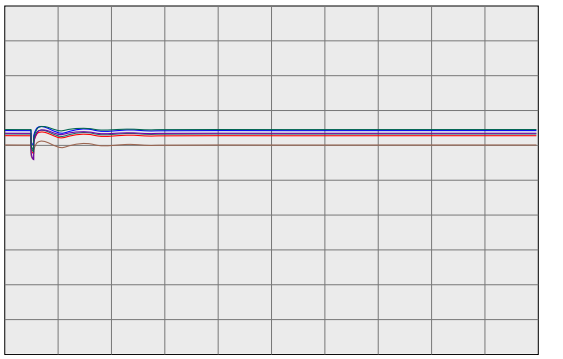
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



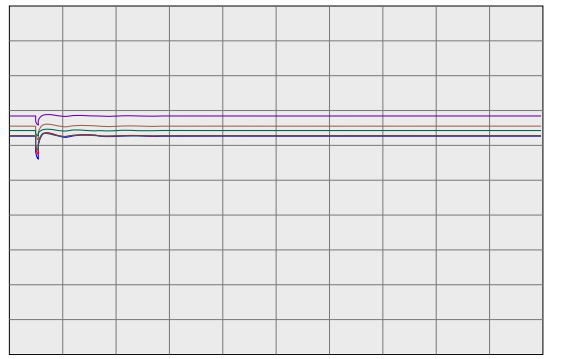


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

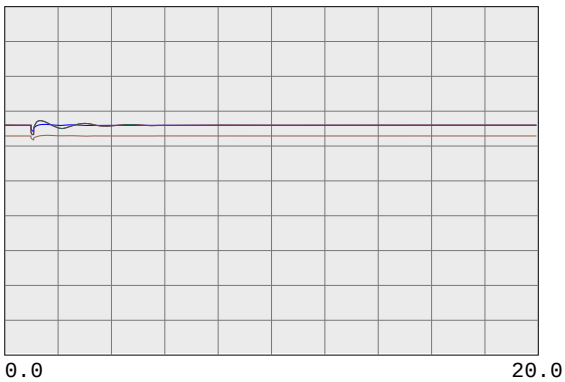
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



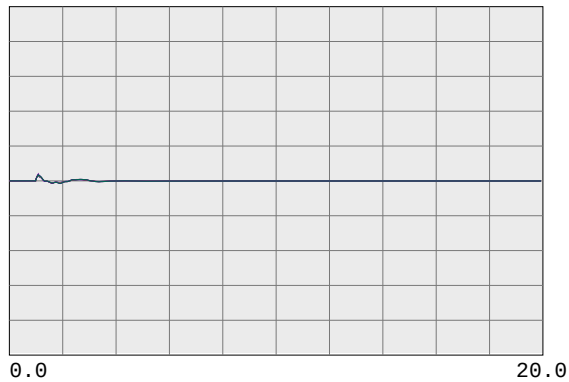
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



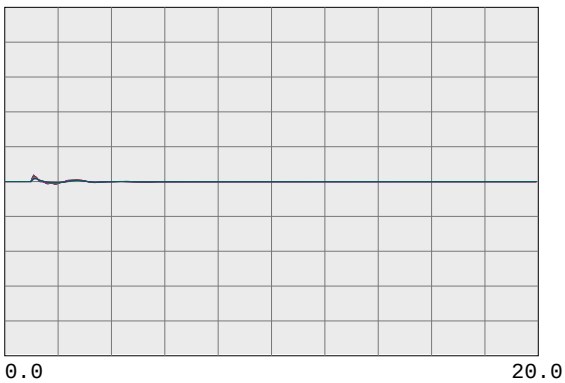
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

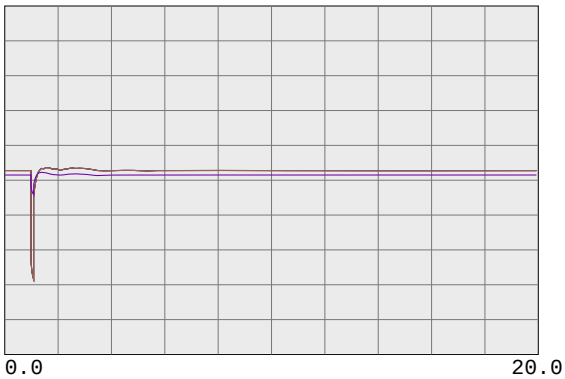
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

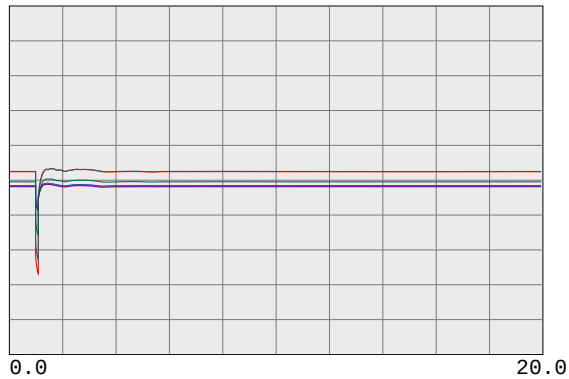
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

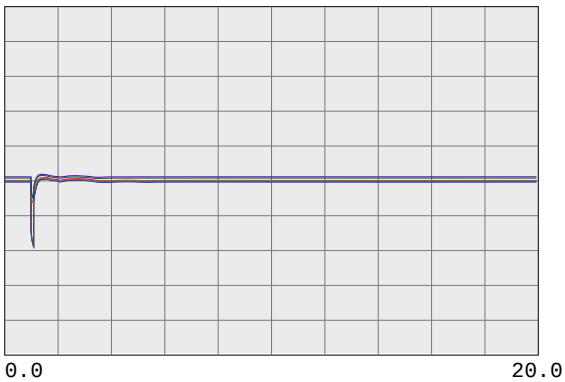
230-KV SYSTEM VOLTAGES



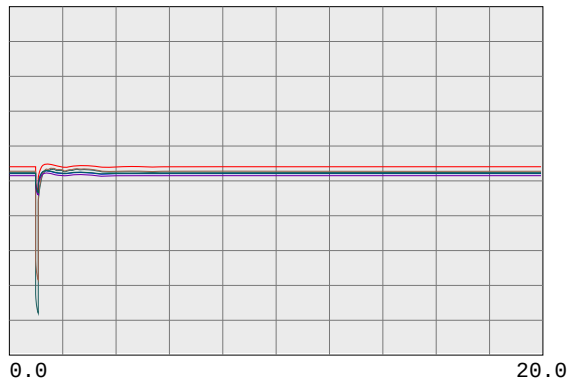
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



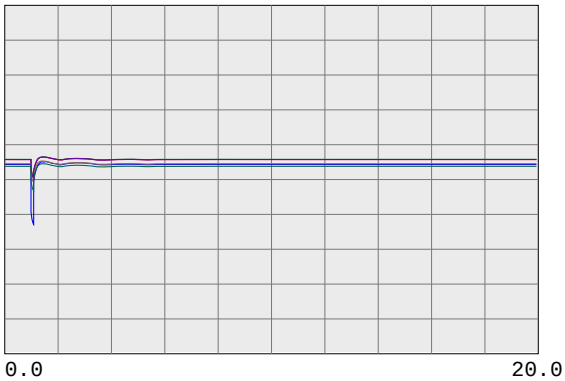
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



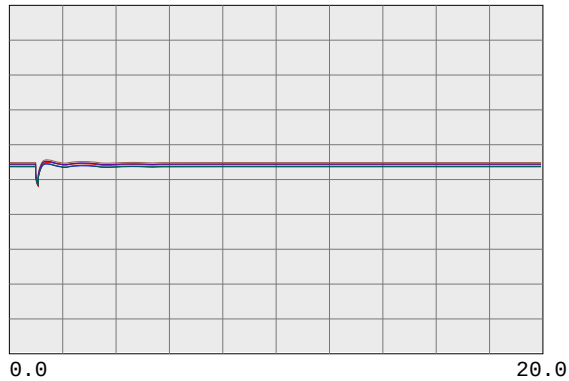
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



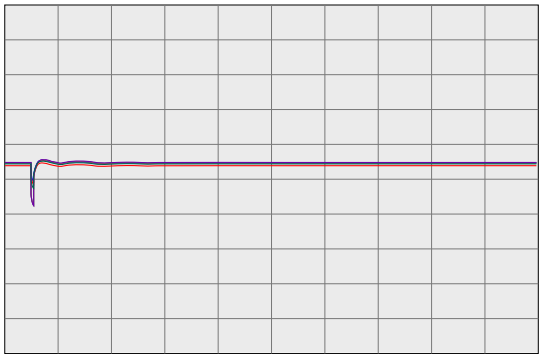
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

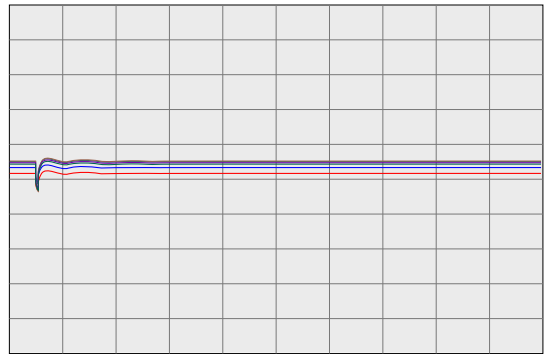
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

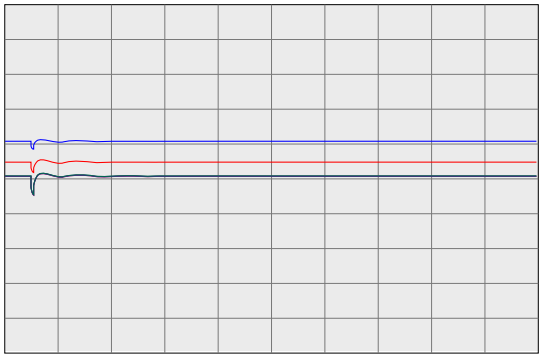
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

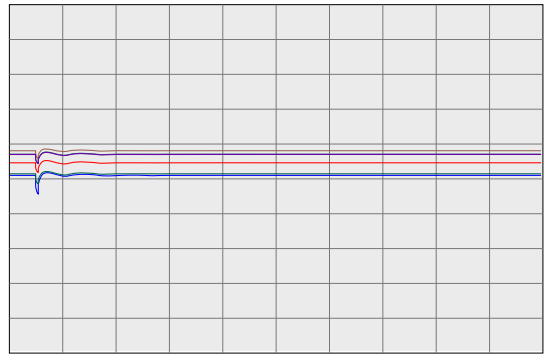
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

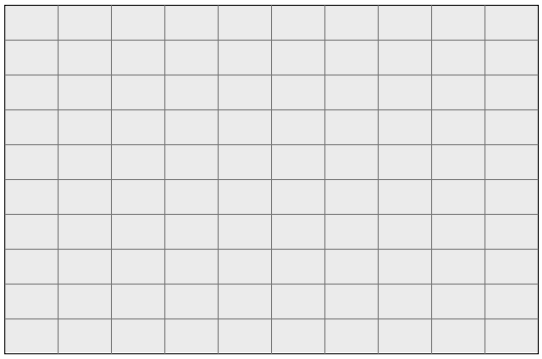
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

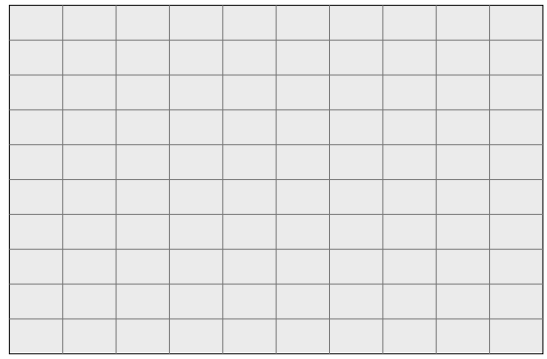


0.0 20.0

Time(sec)

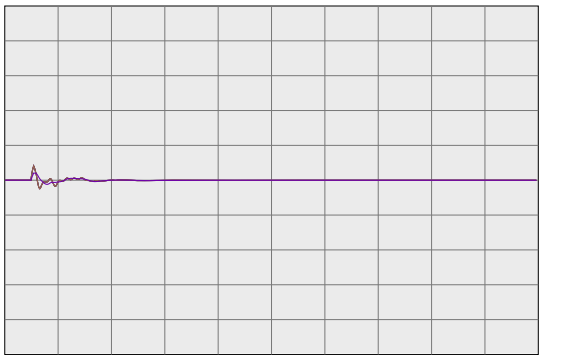
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



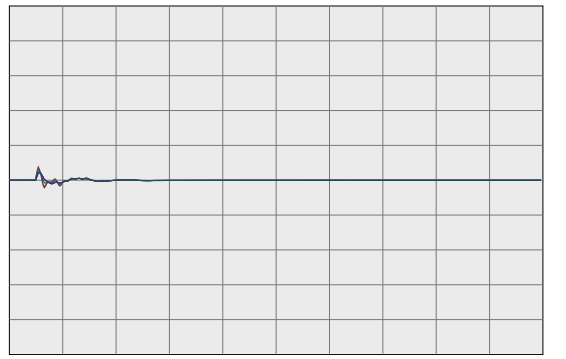


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

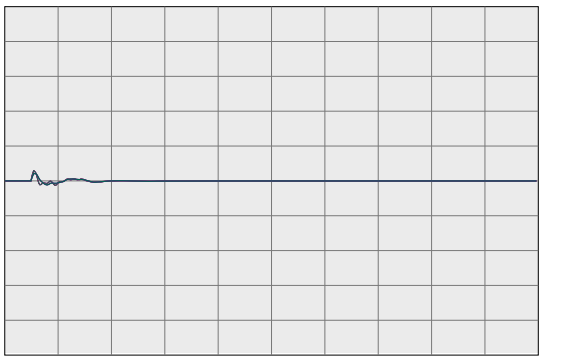
230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

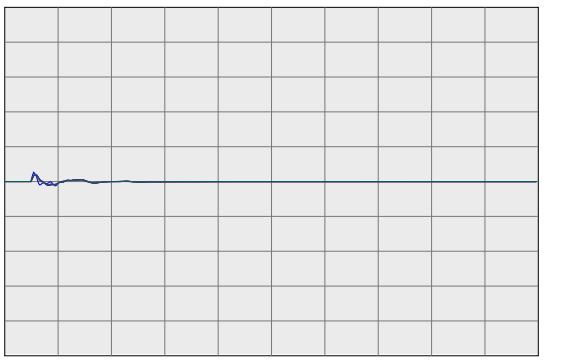


59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

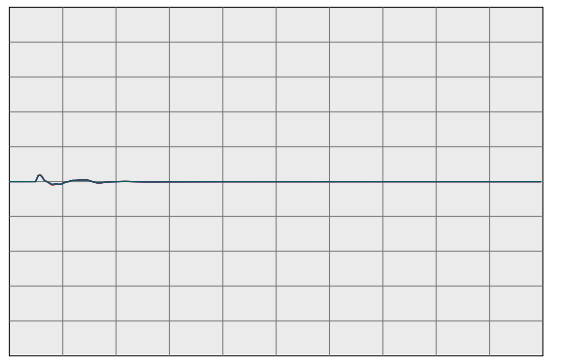


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



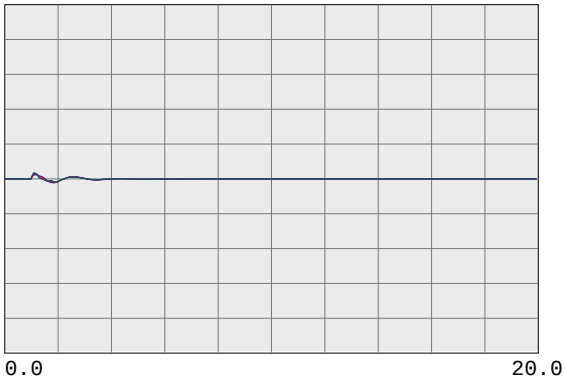
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

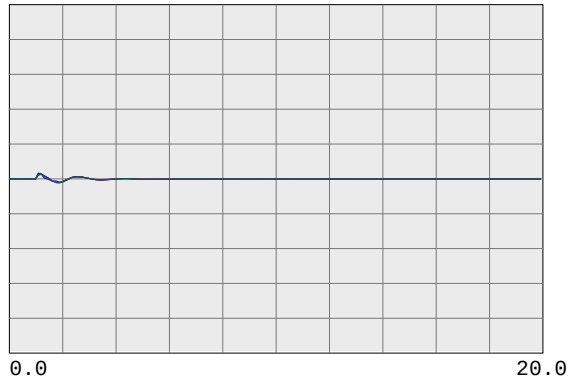
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

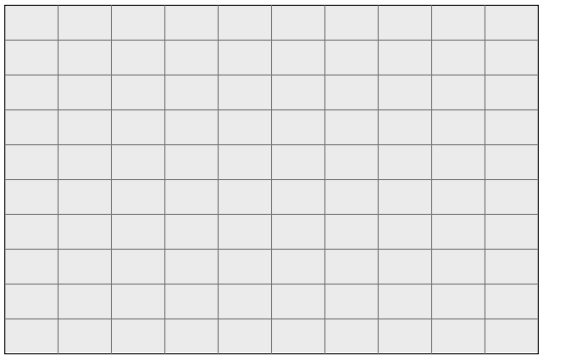
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

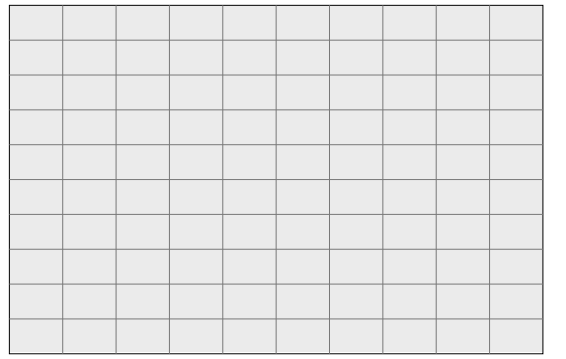


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



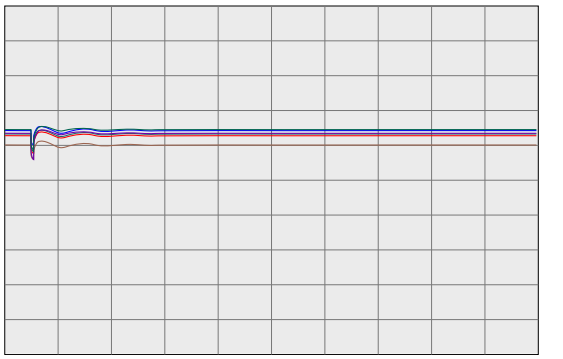
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



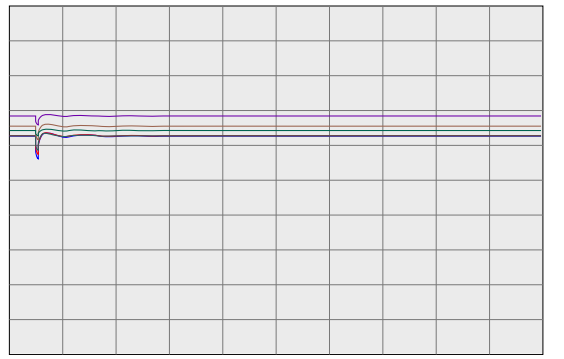


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

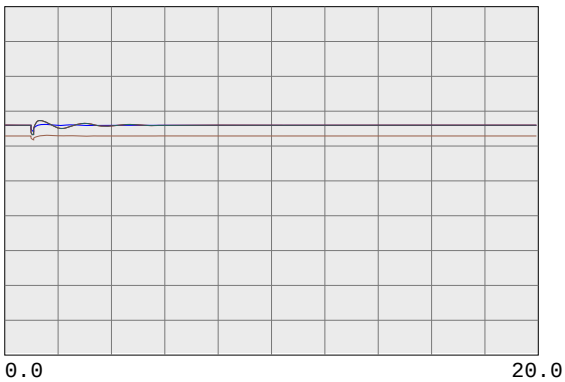
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



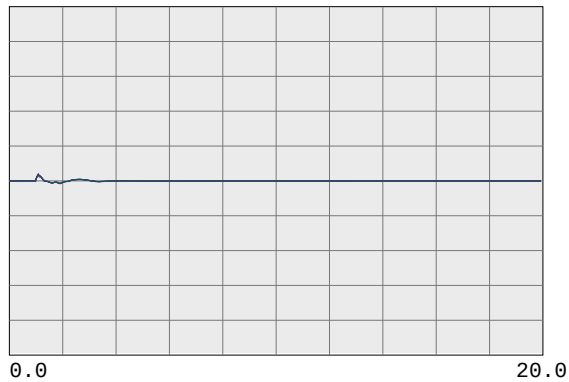
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



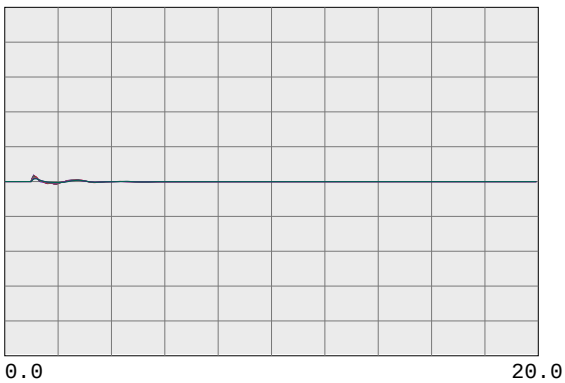
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

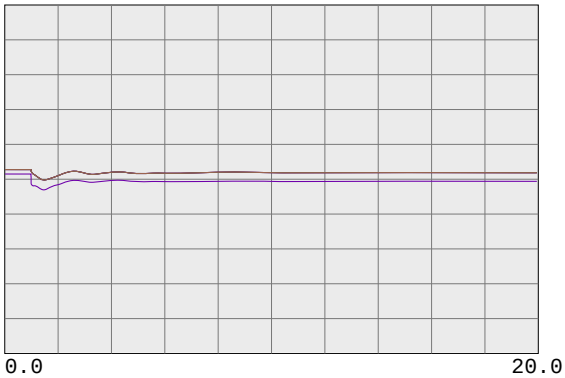
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

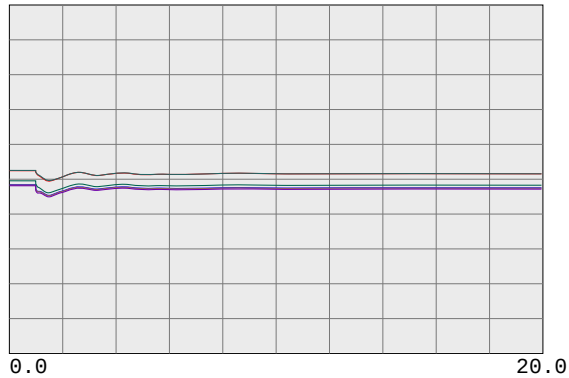
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

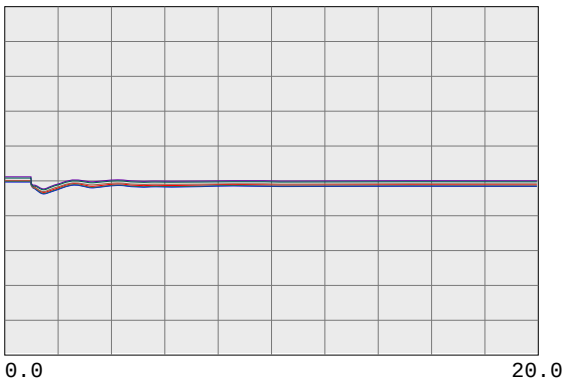
230-KV SYSTEM VOLTAGES



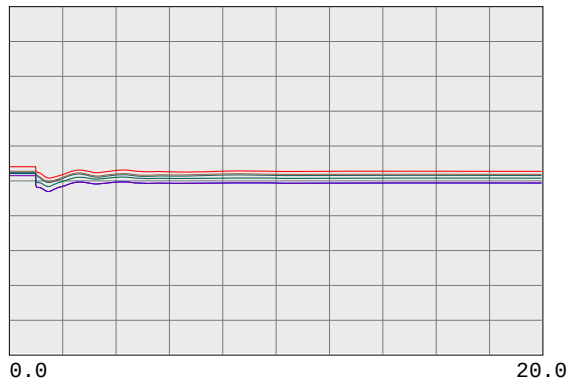
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



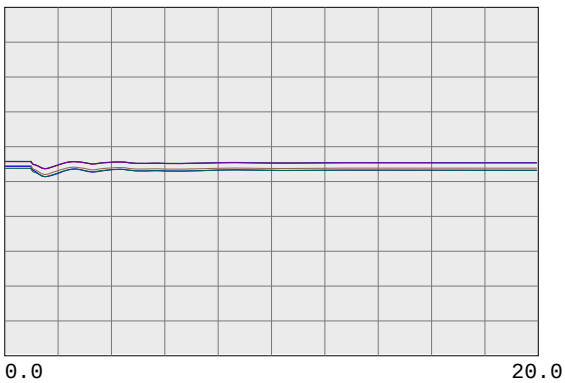
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



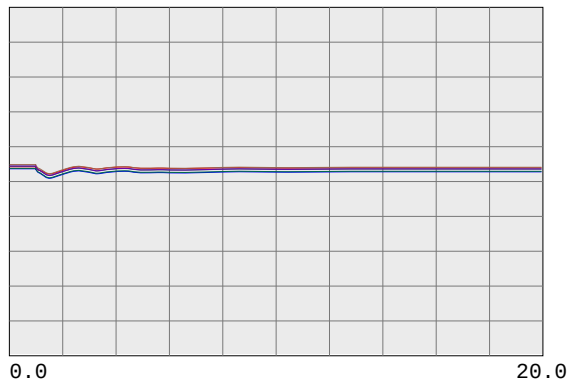
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



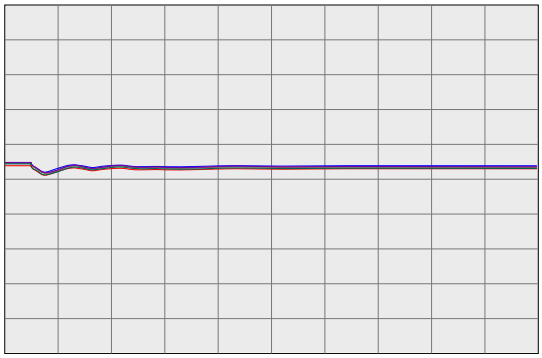
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

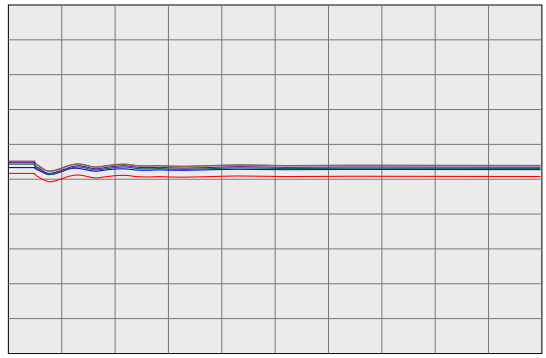
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

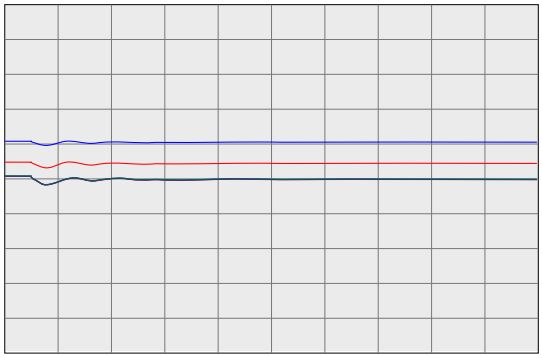
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

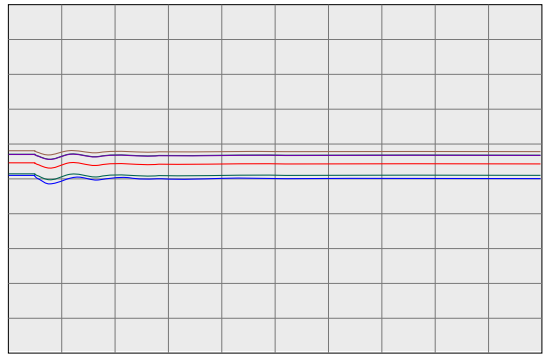
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

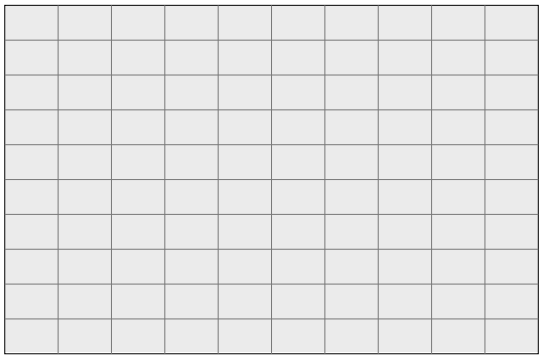
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

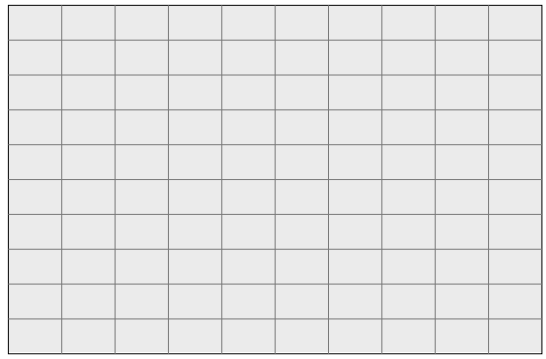


0.0 20.0

Time(sec)

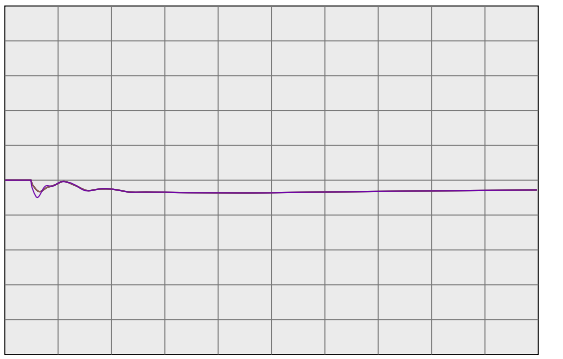
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



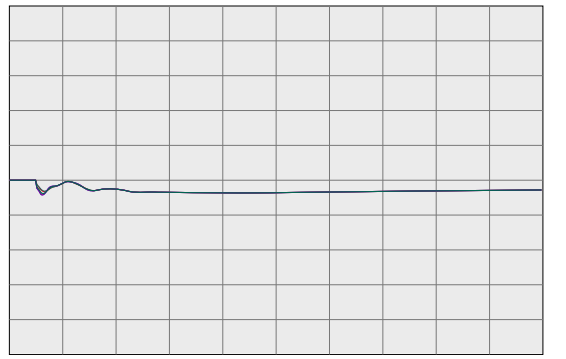


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

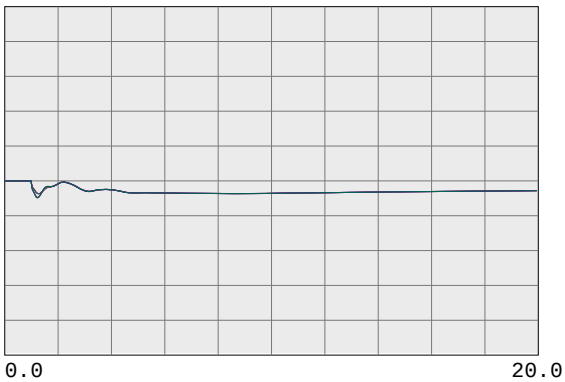
230-KV SYSTEM FREQUENCIES



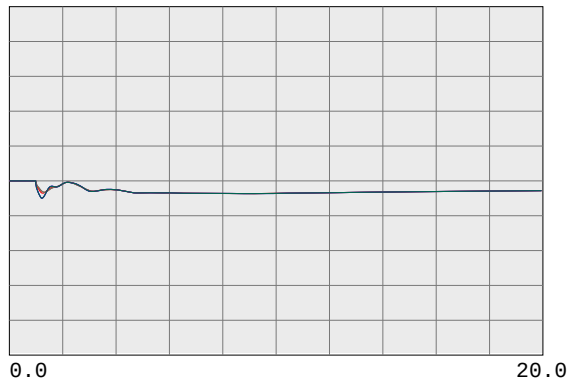
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



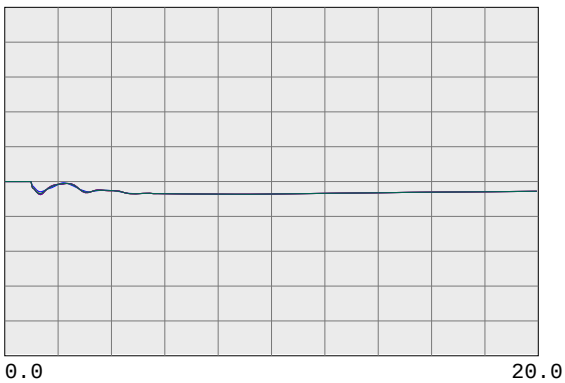
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



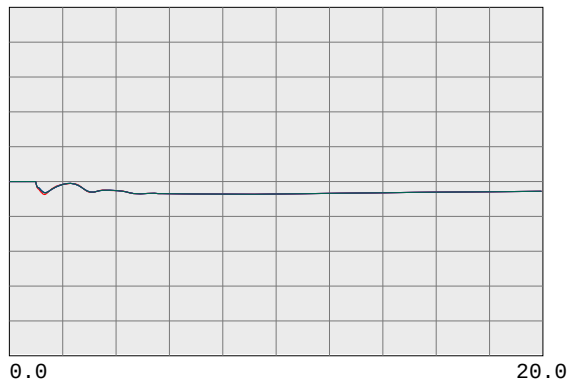
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



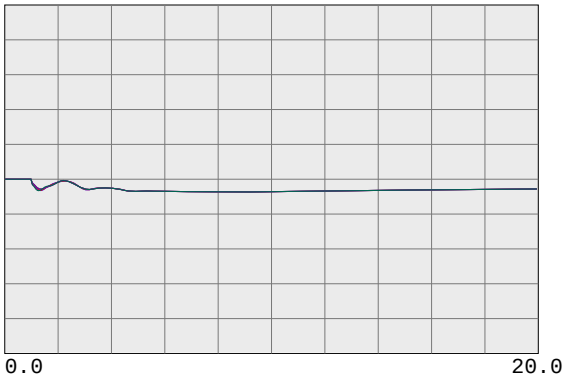
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



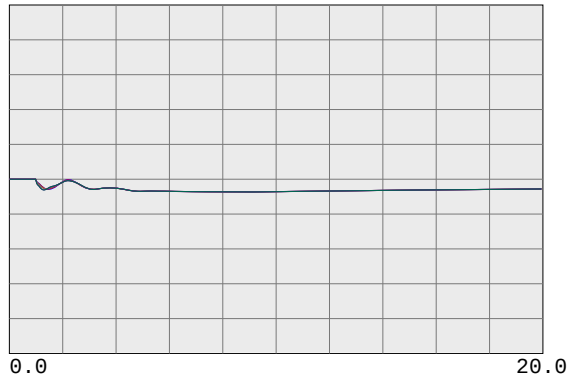
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

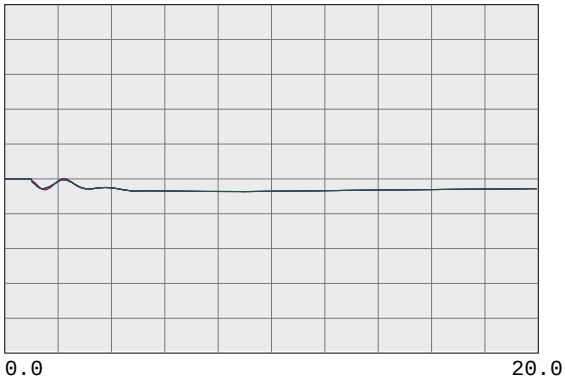
230-KV SYSTEM FREQUENCIES



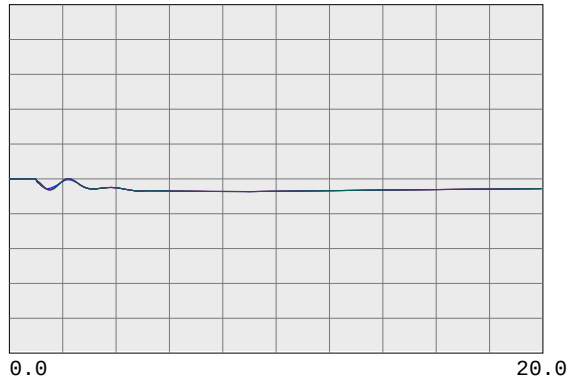
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



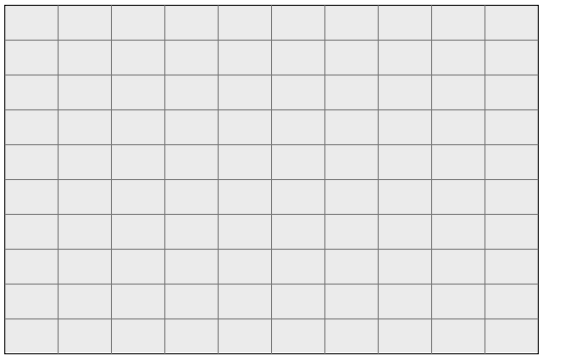
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

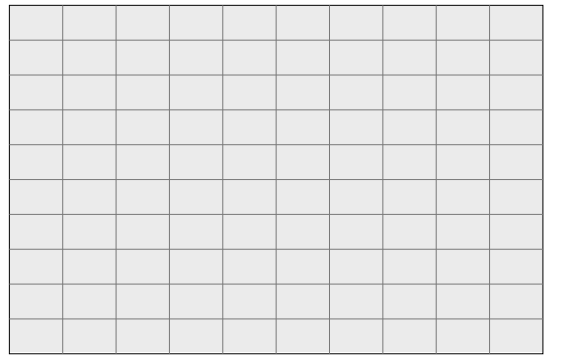


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



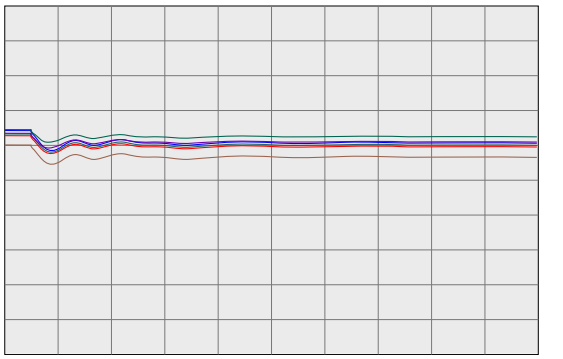
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



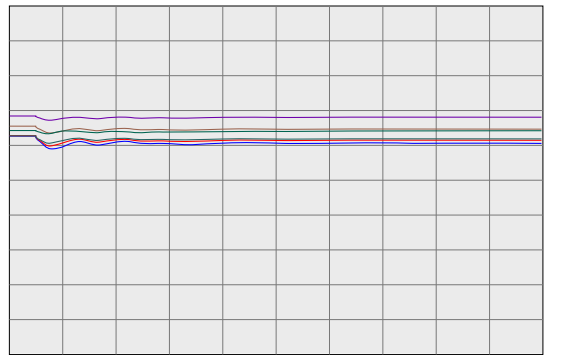


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

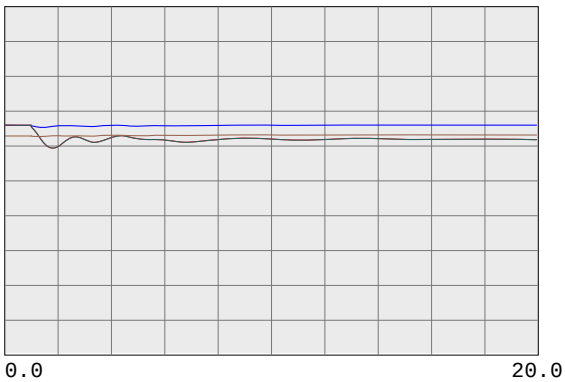
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



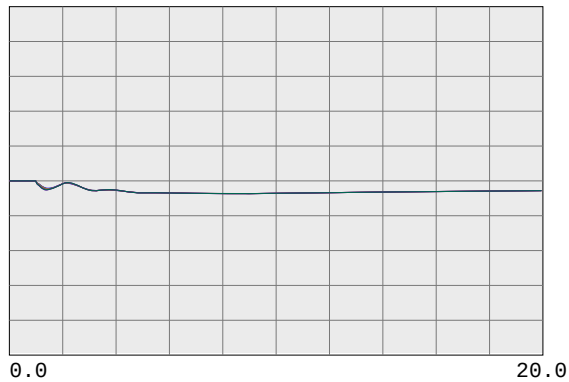
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



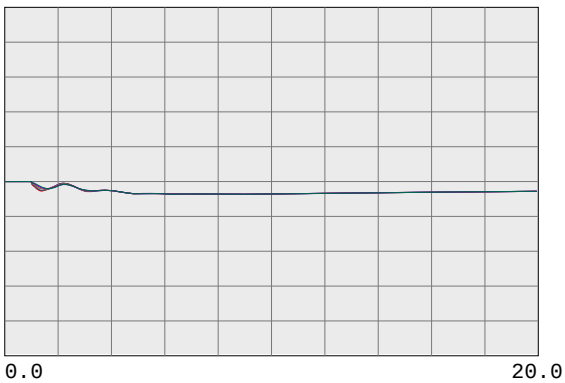
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



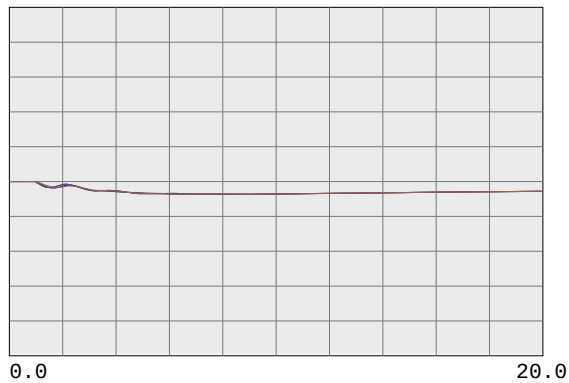
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



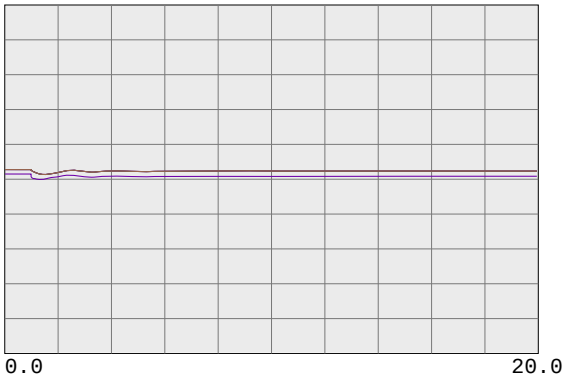
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

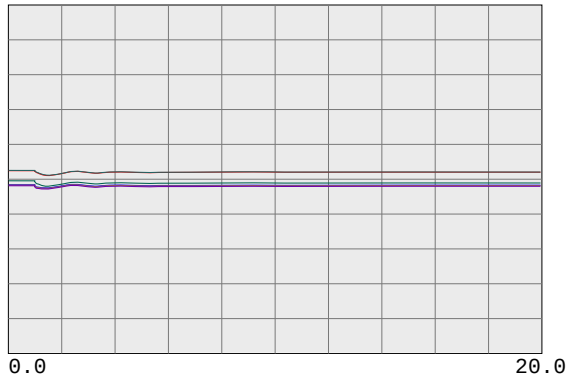
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

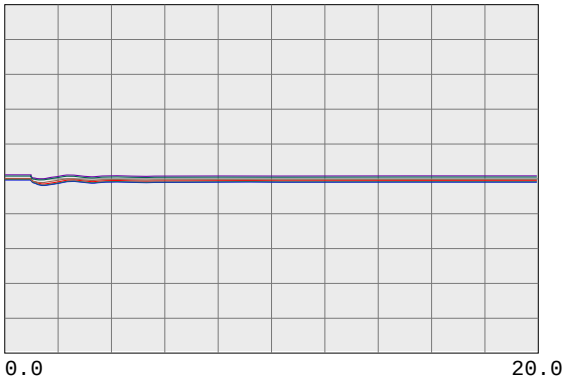
230-KV SYSTEM VOLTAGES



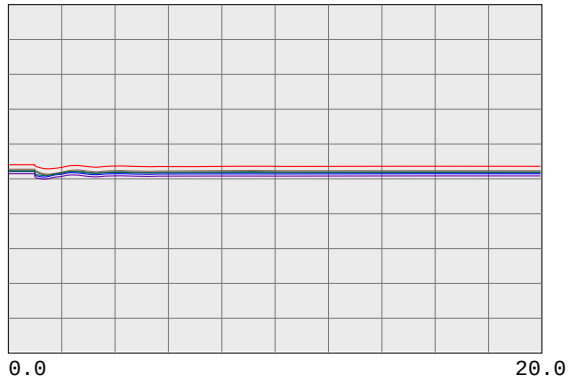
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



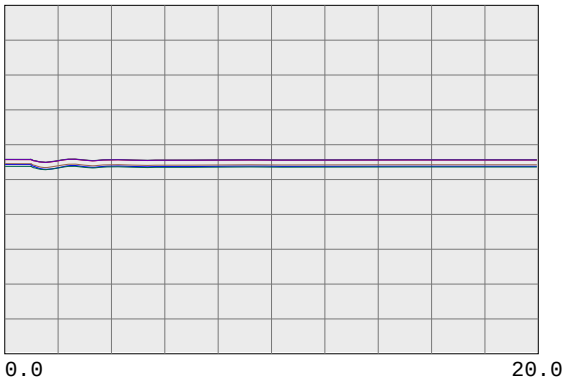
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



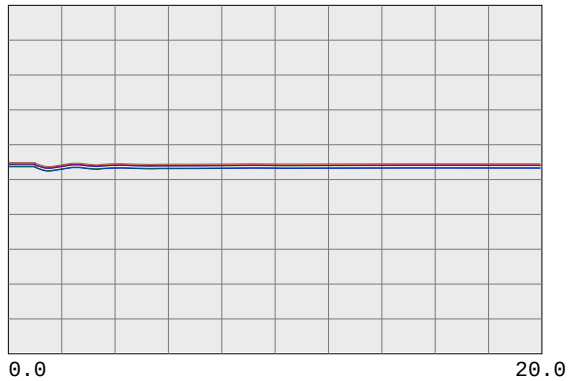
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



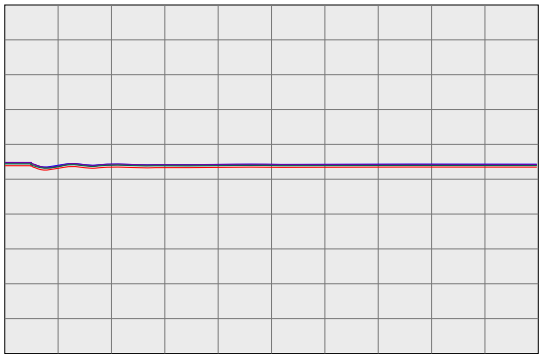
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

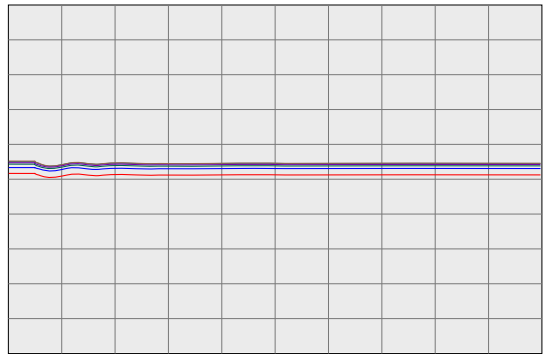
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

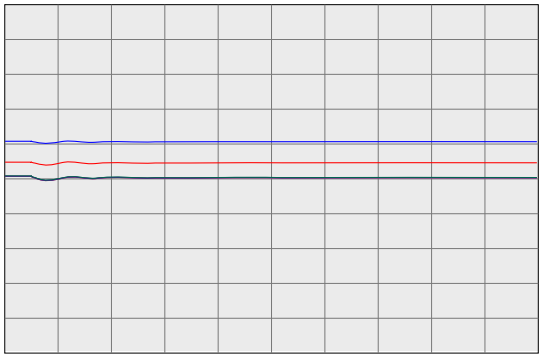
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

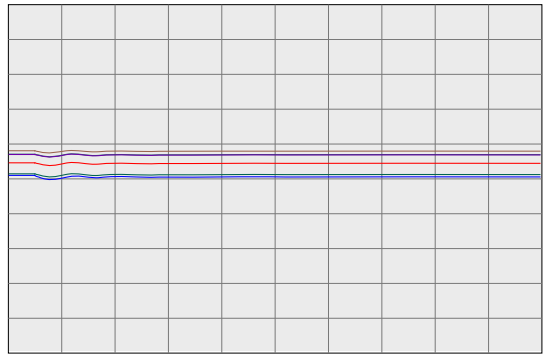
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

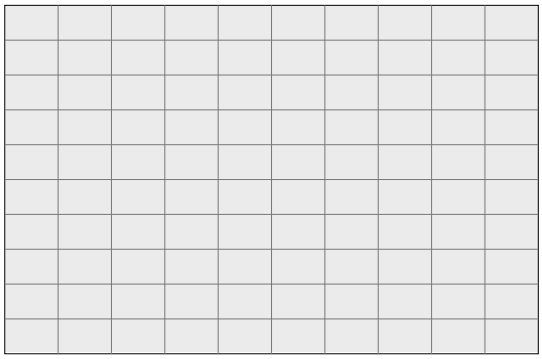
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

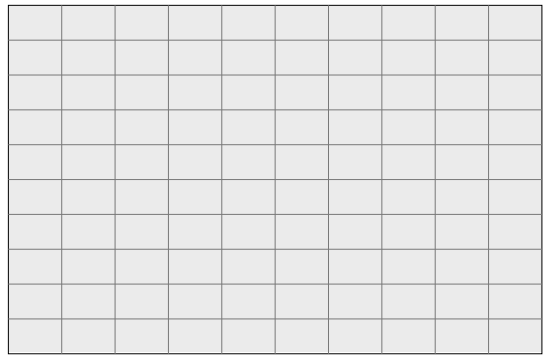


0.0 20.0

Time(sec)

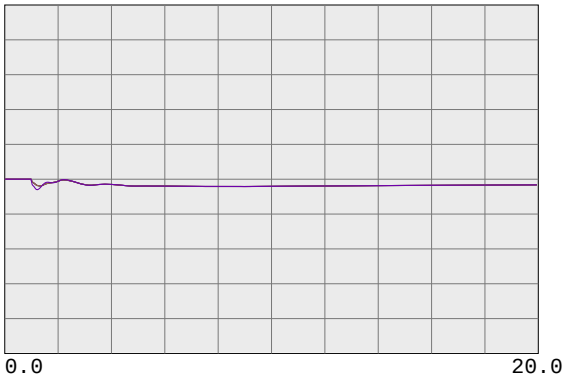
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



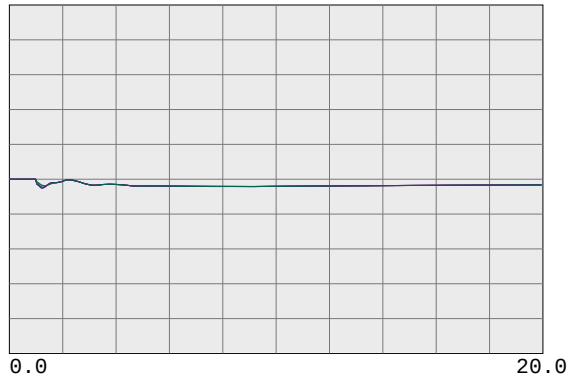


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

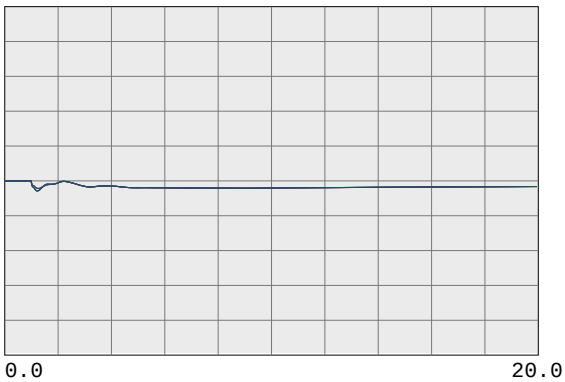
230-KV SYSTEM FREQUENCIES



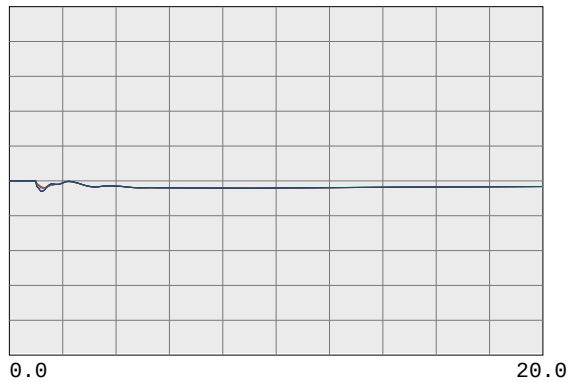
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



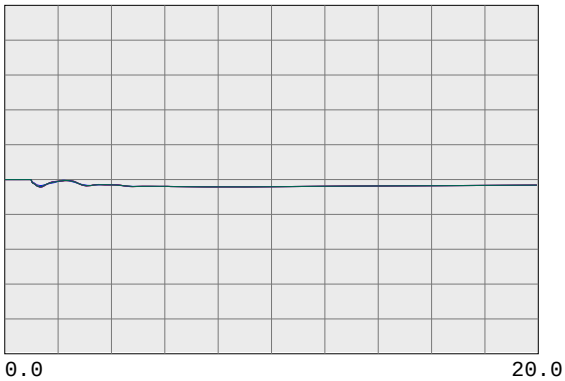
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



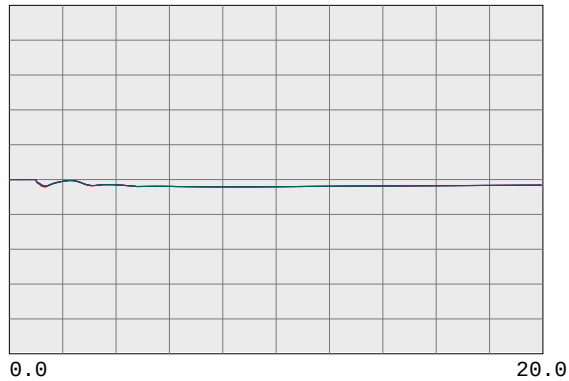
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



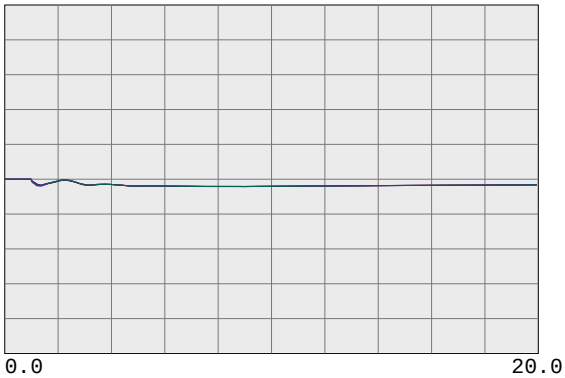
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



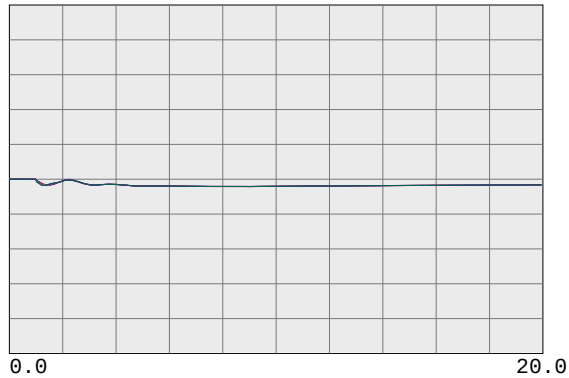
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

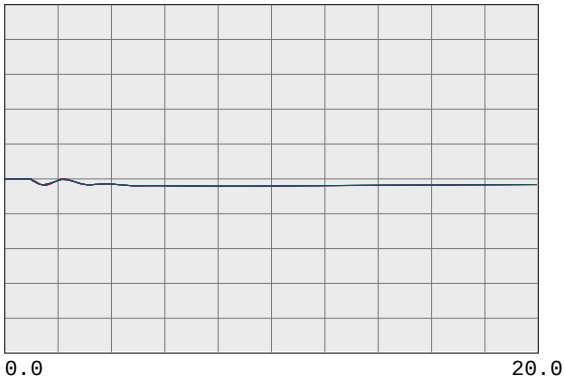
230-KV SYSTEM FREQUENCIES



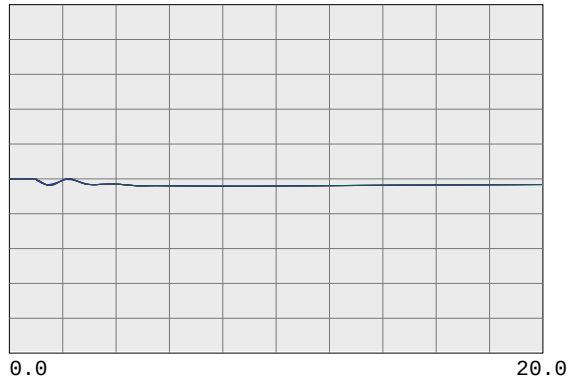
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



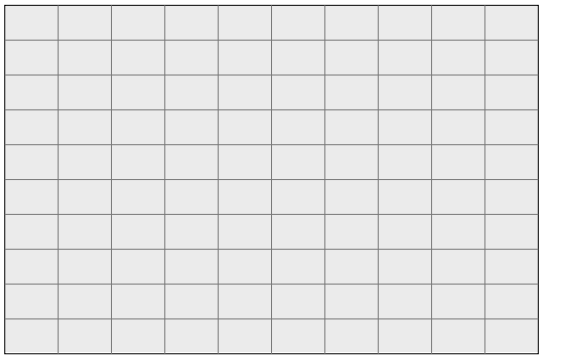
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

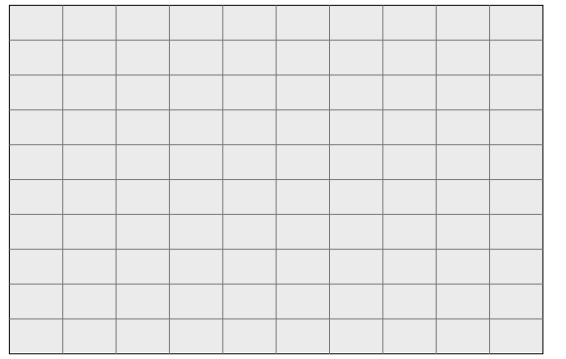


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



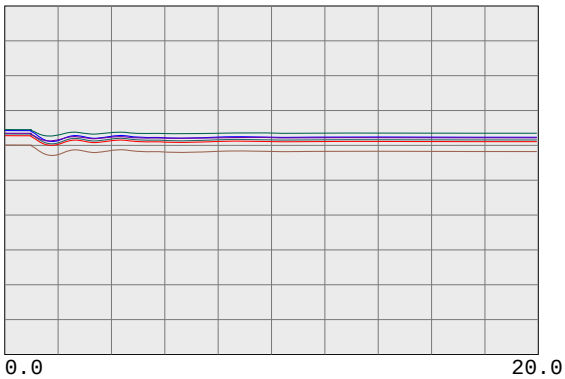
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



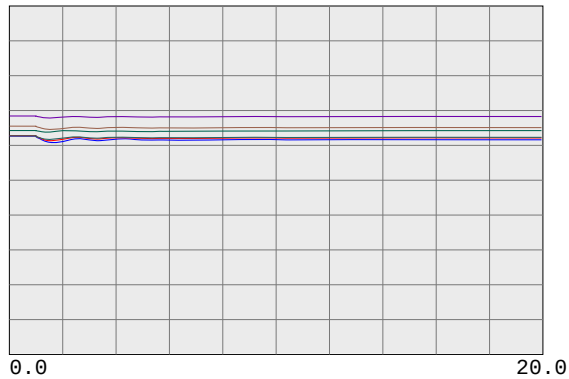


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

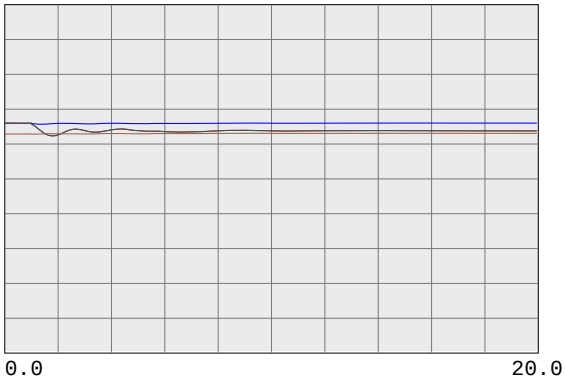
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



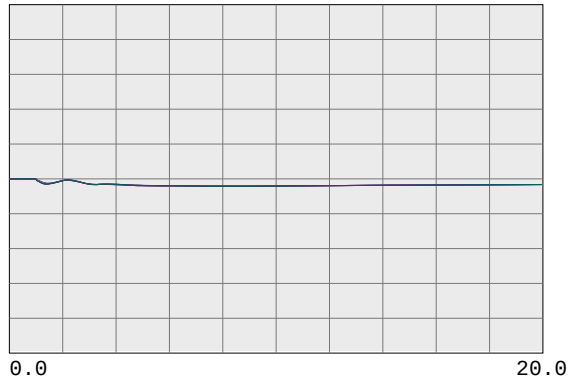
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



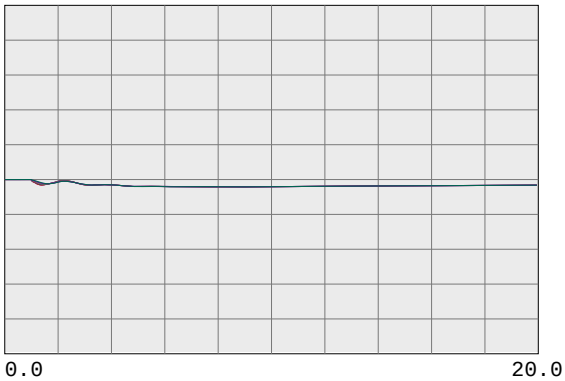
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



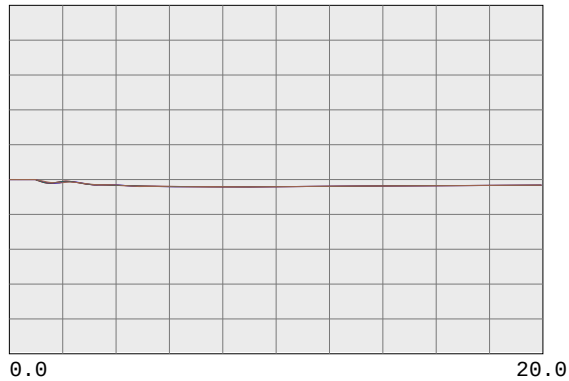
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



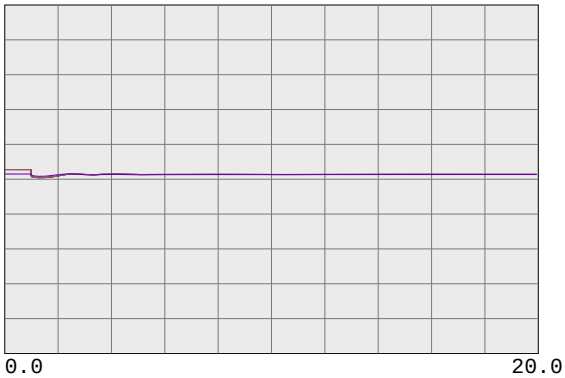
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

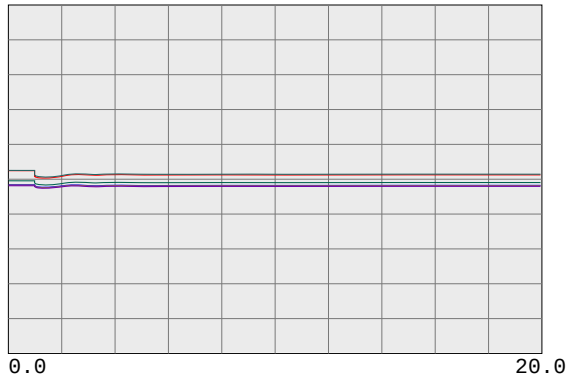
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

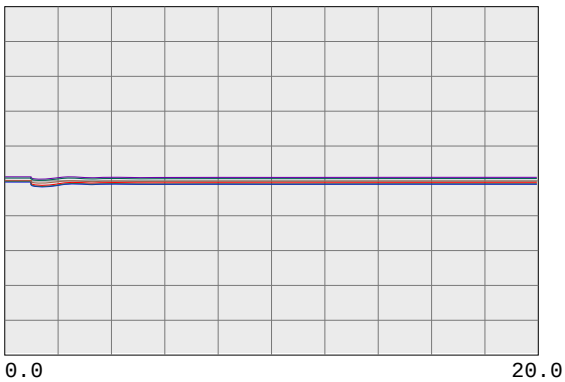
230-KV SYSTEM VOLTAGES



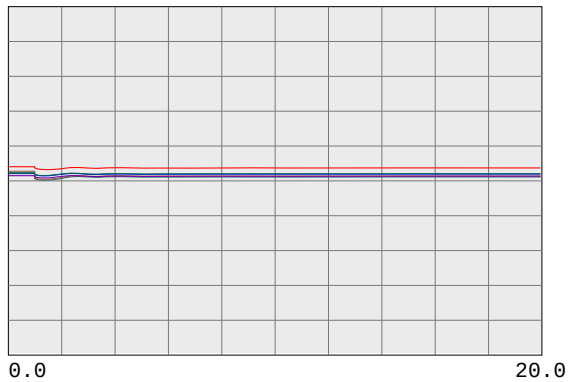
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



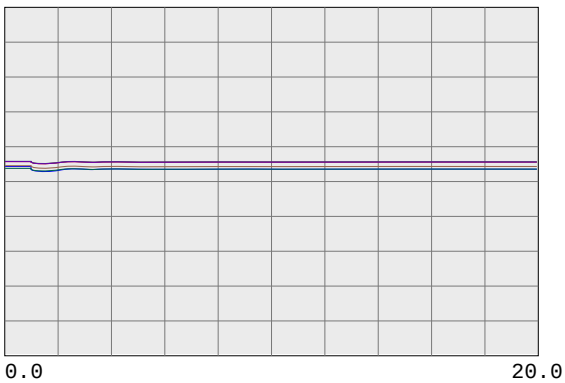
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



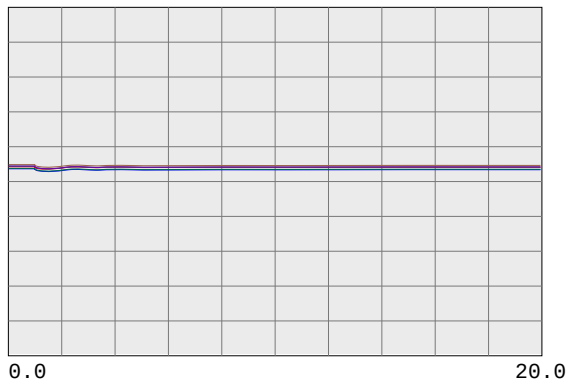
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



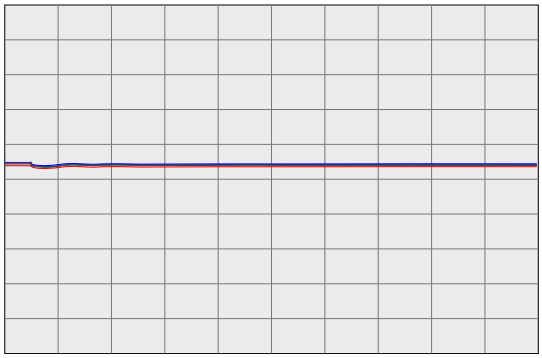
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

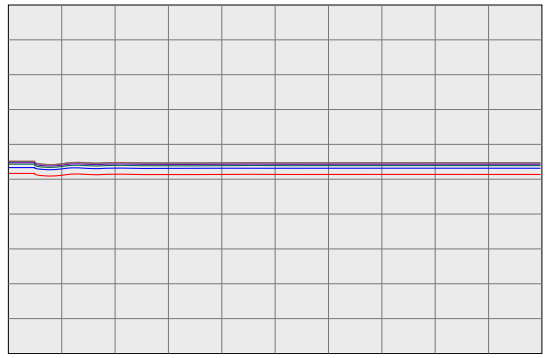
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

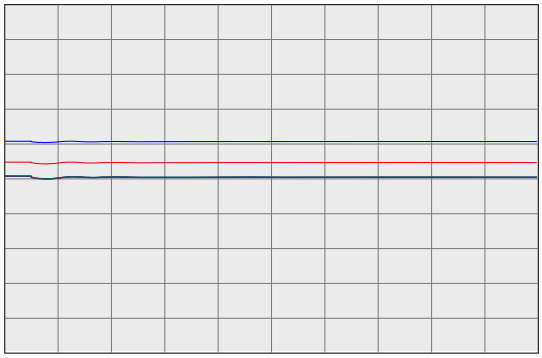
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

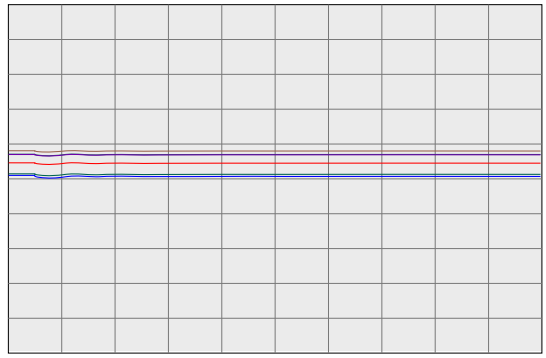
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

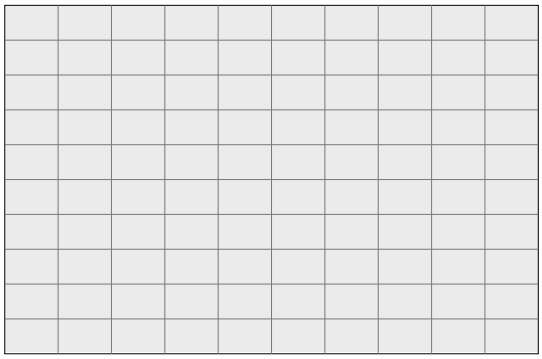
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

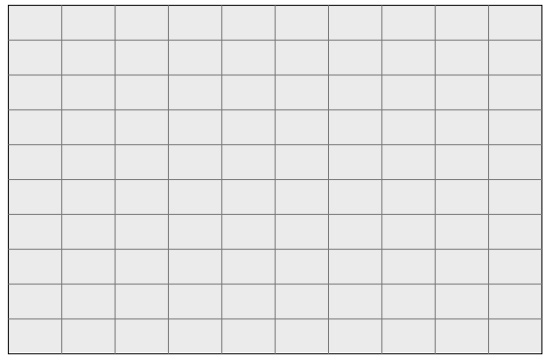


0.0 20.0

Time(sec)

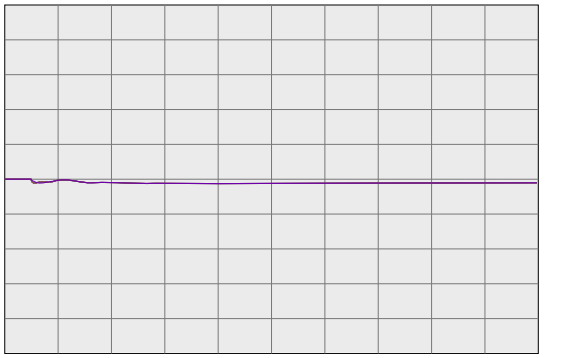
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



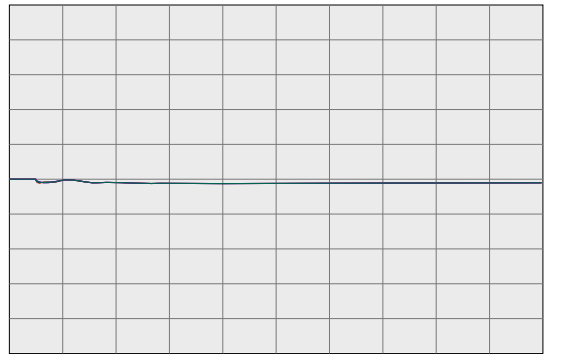


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

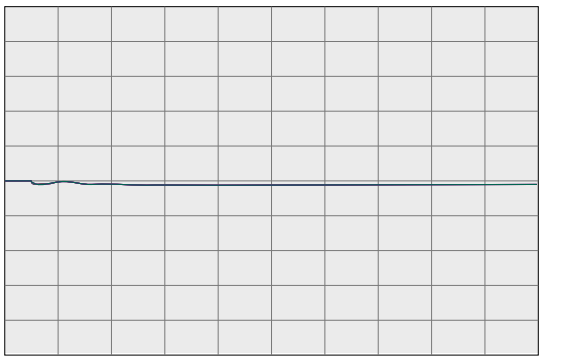
230-KV SYSTEM FREQUENCIES



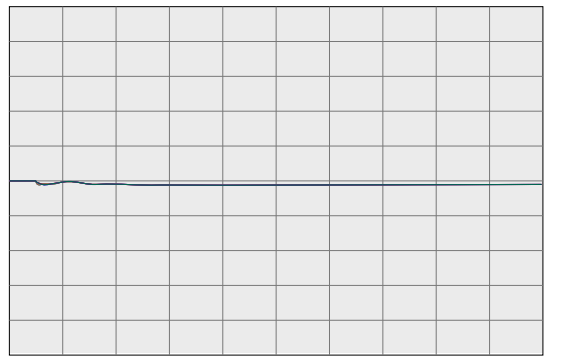
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



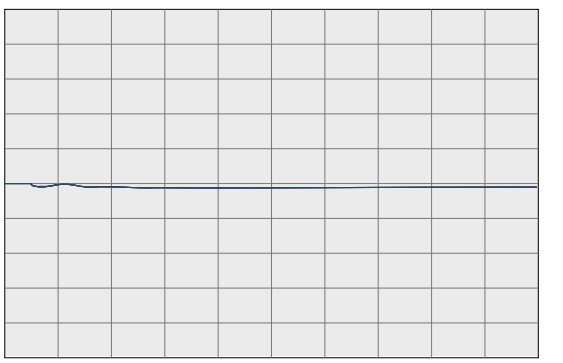
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



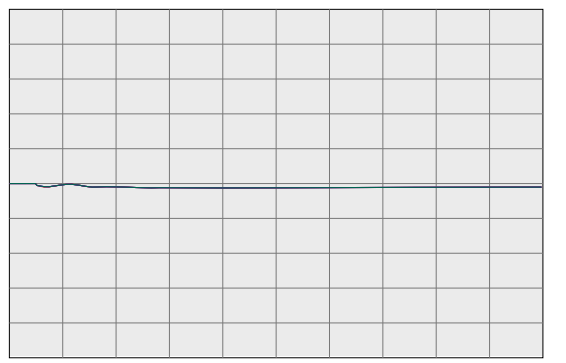
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



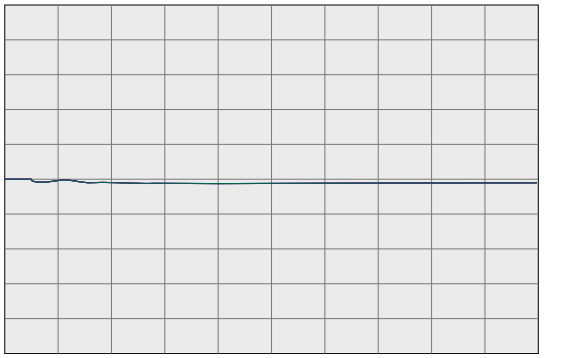
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



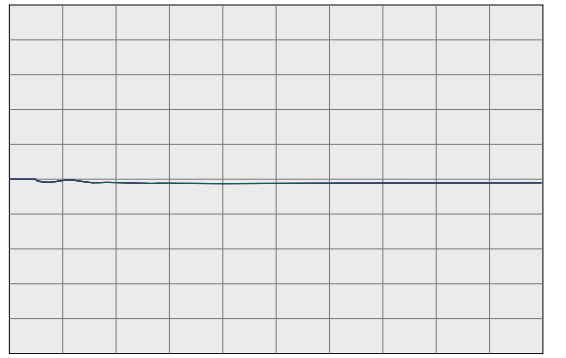
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

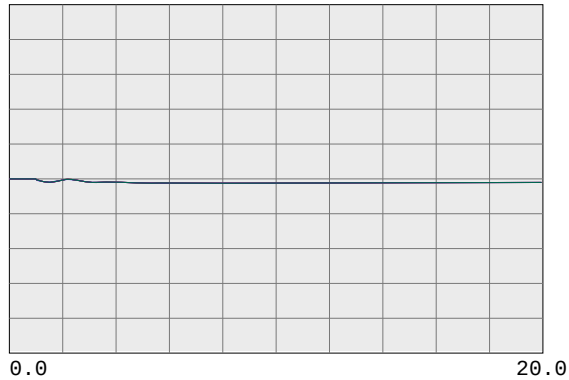


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

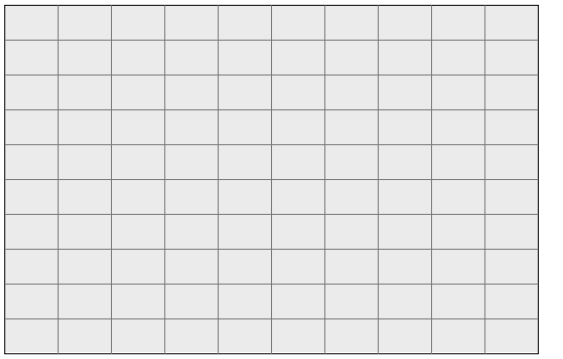


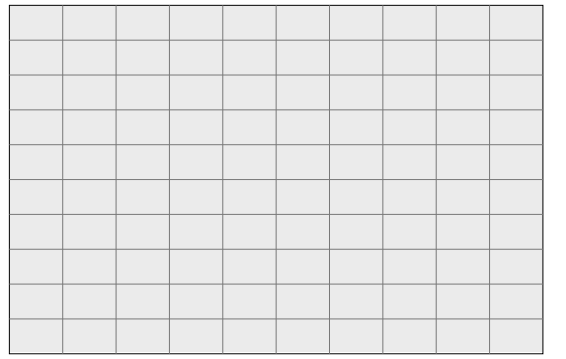
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



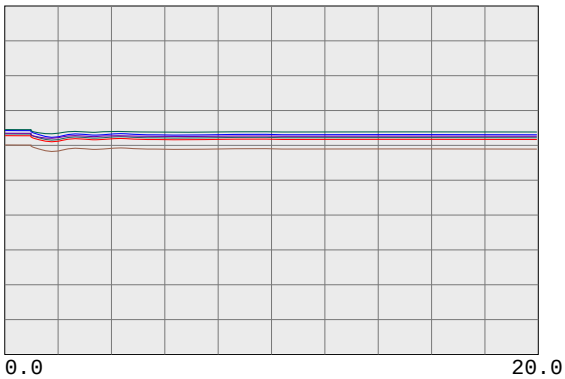
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



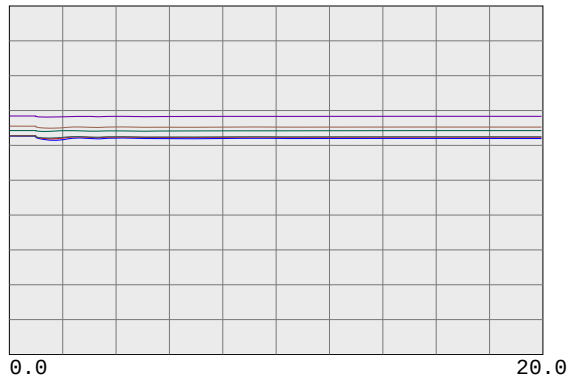


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

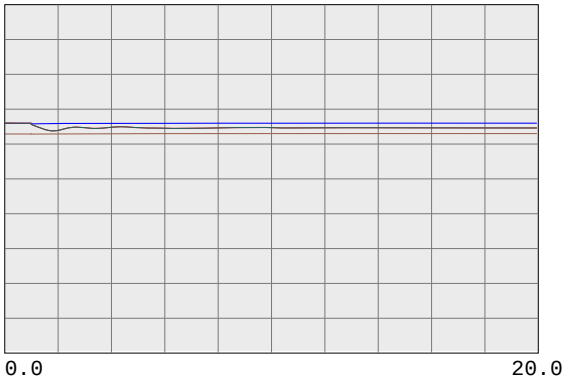
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



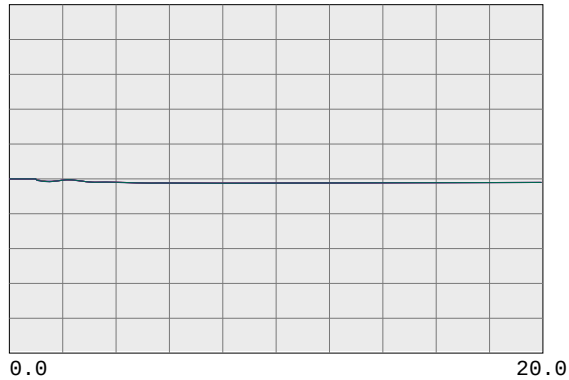
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



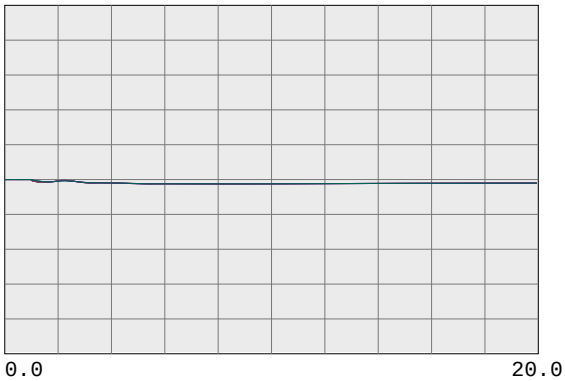
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



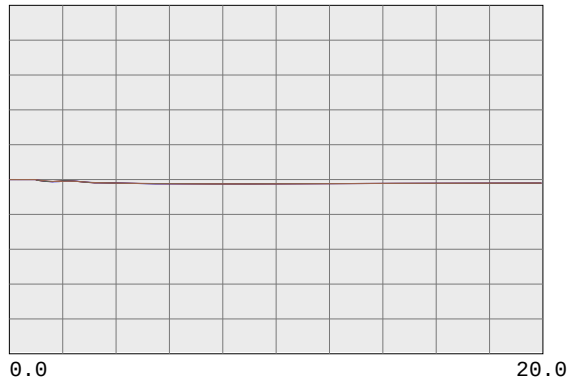
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



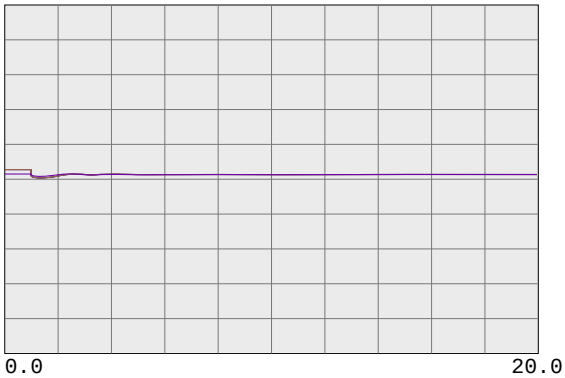
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

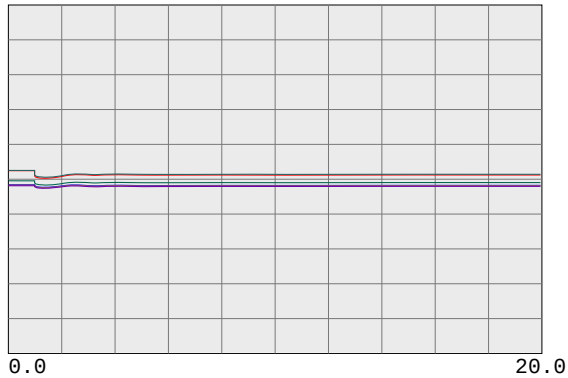
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

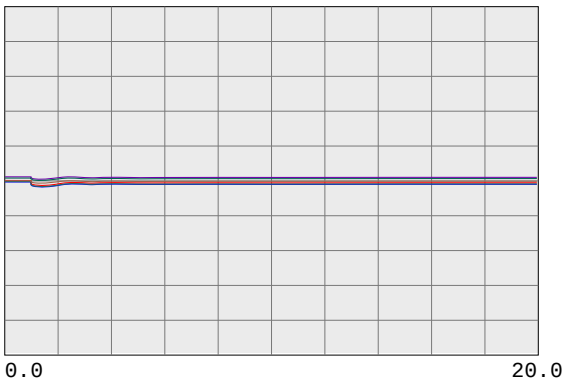
230-KV SYSTEM VOLTAGES



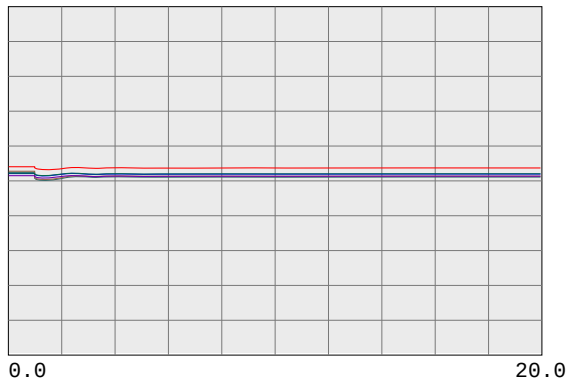
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



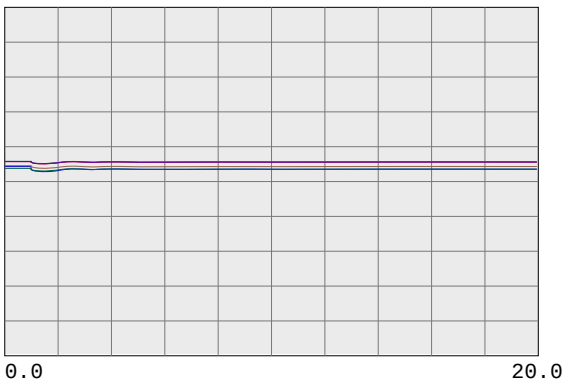
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



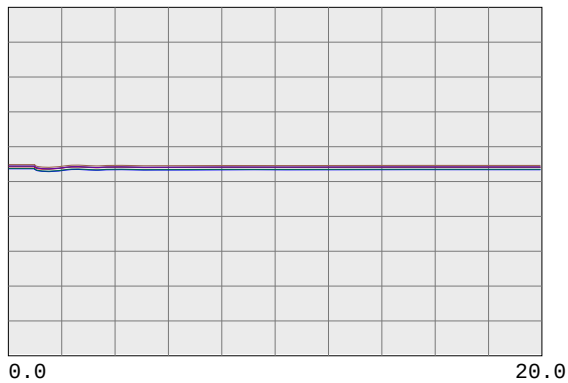
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



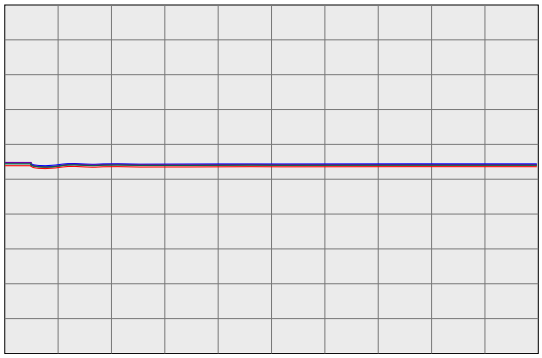
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

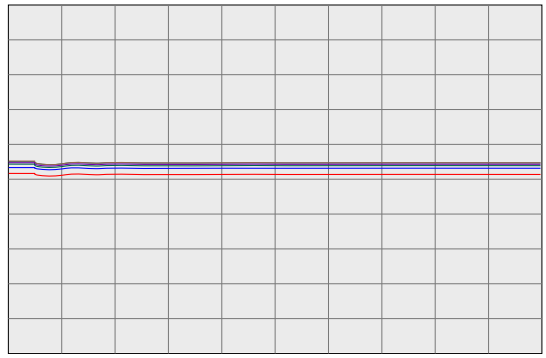
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

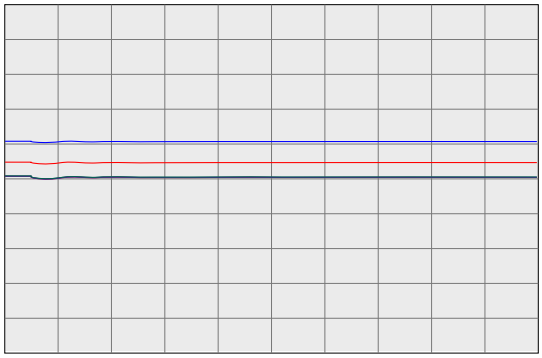
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

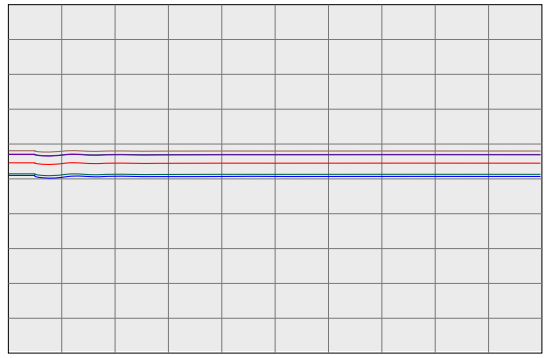
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

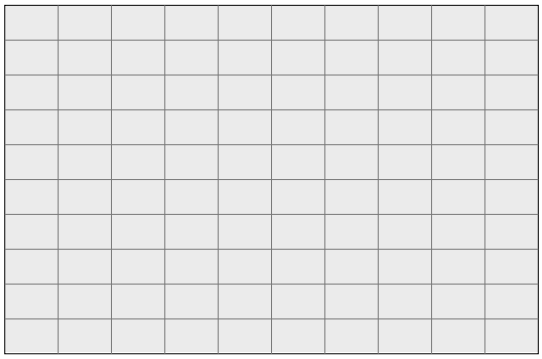
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

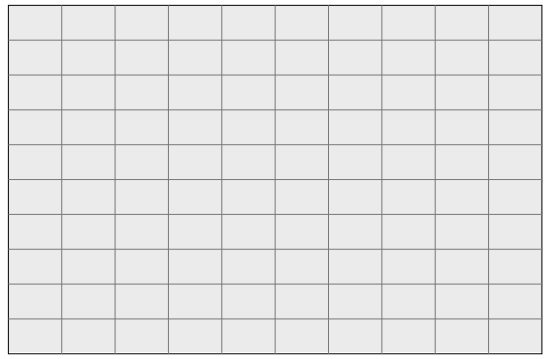


0.0 20.0

Time(sec)

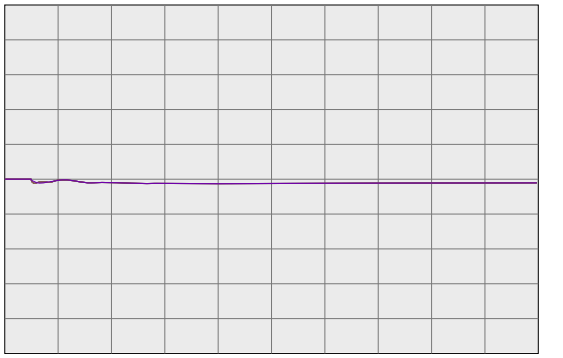
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



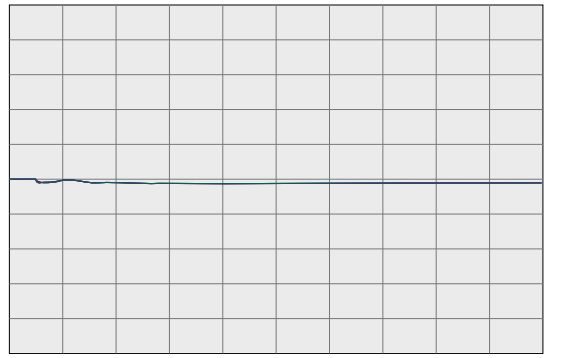


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

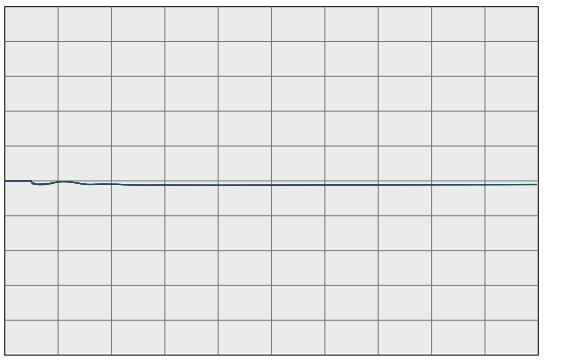
230-KV SYSTEM FREQUENCIES



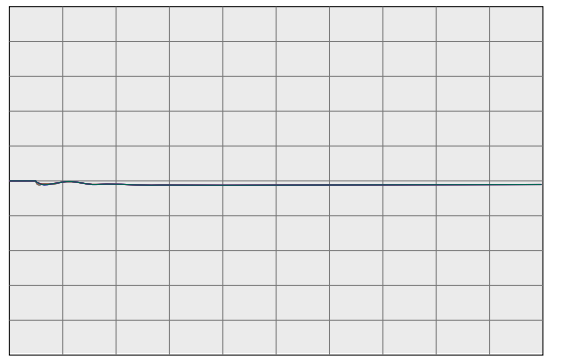
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



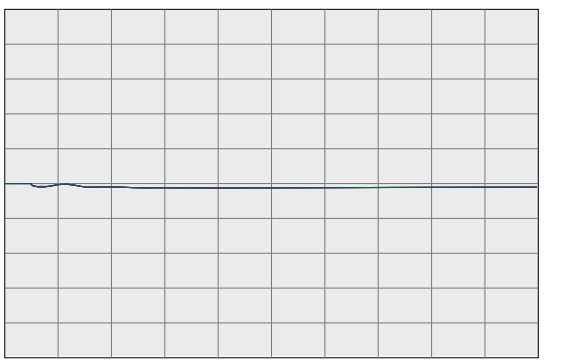
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



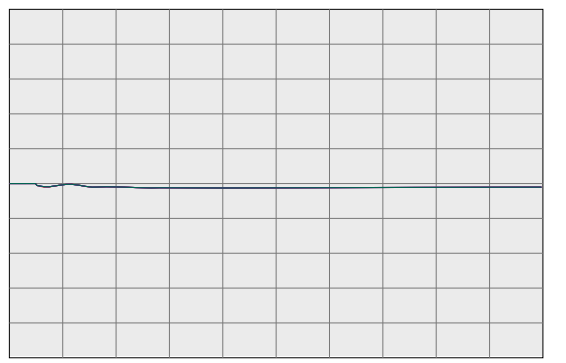
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



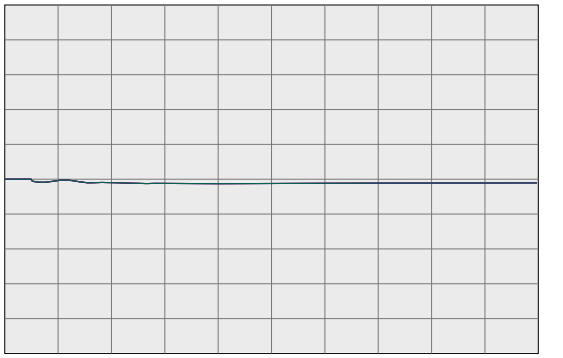
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



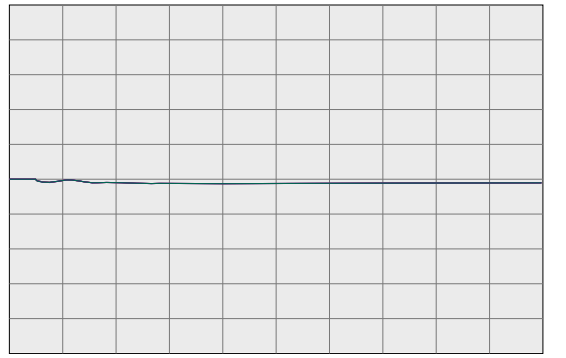
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

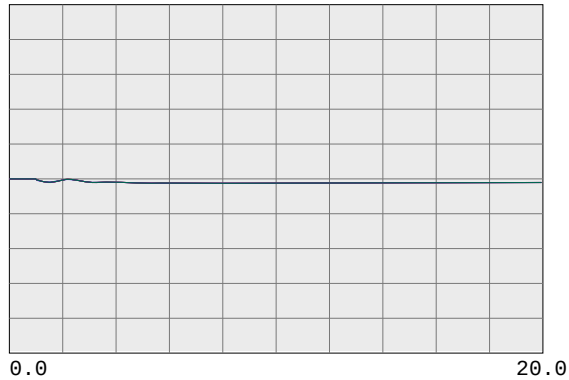


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

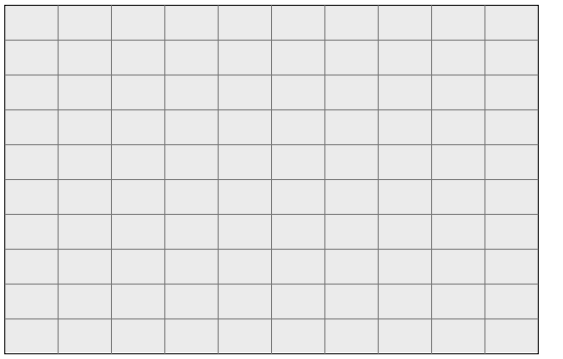


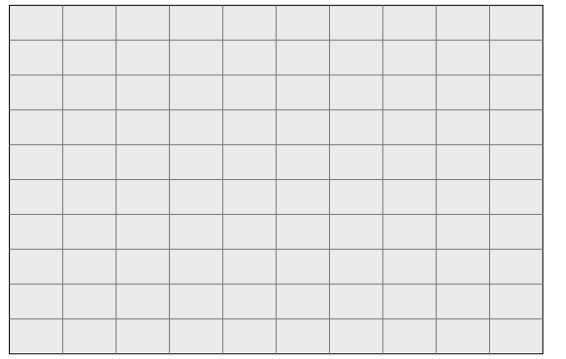
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



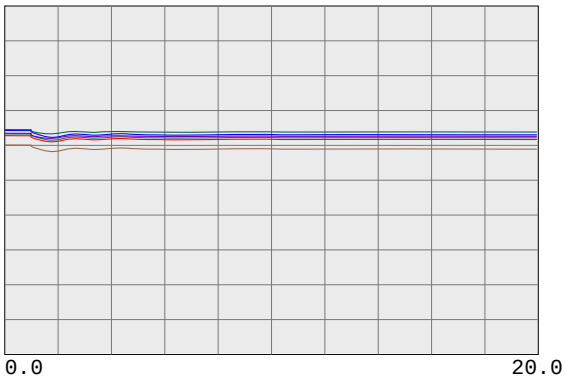
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



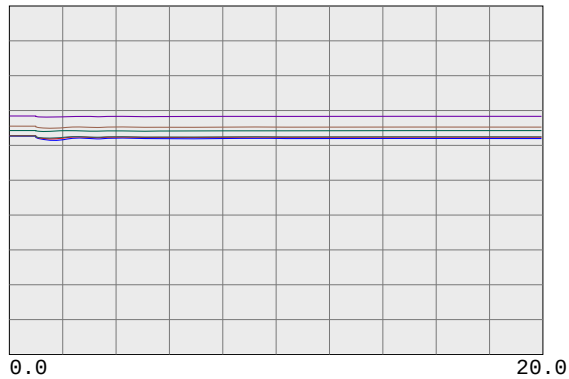


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

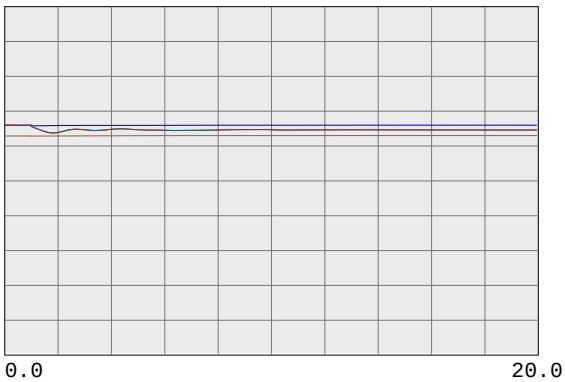
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



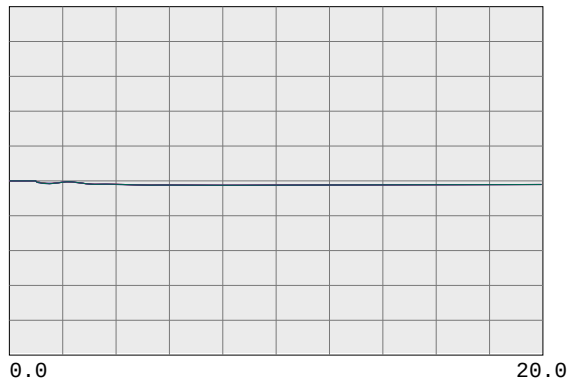
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



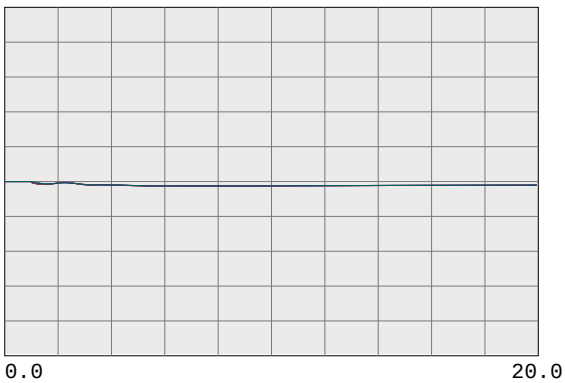
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



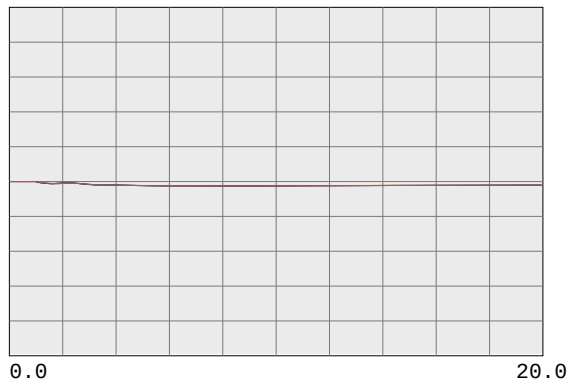
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



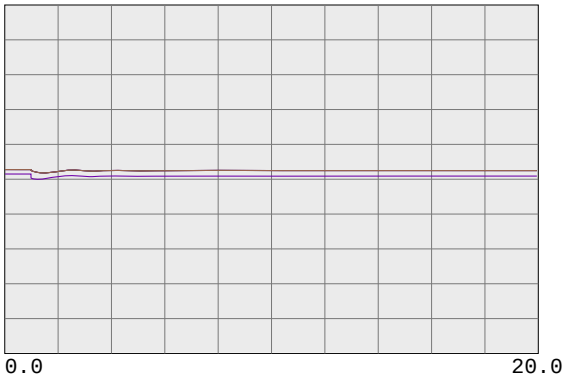
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

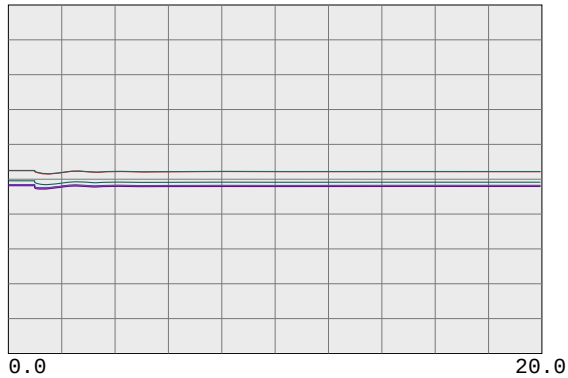
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

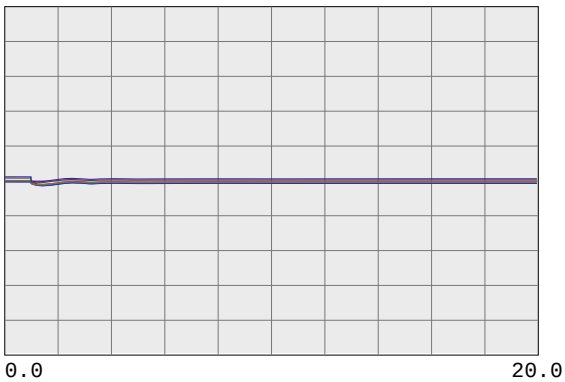
230-KV SYSTEM VOLTAGES



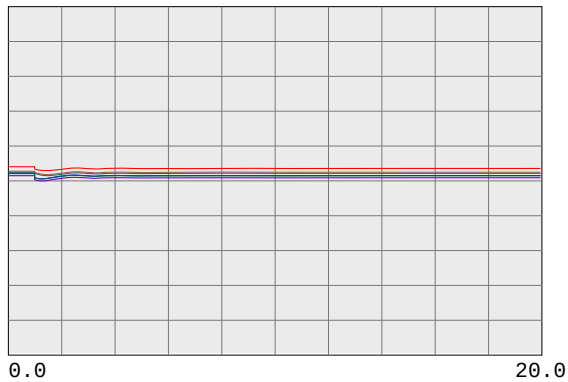
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



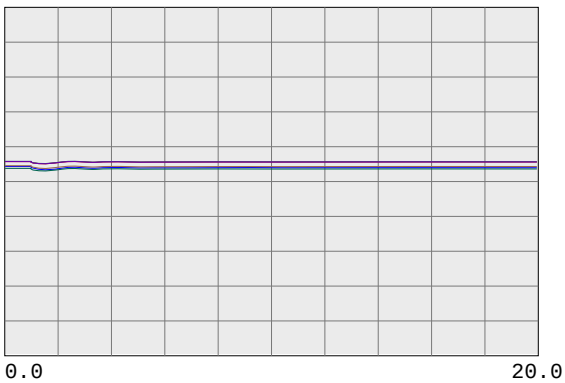
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



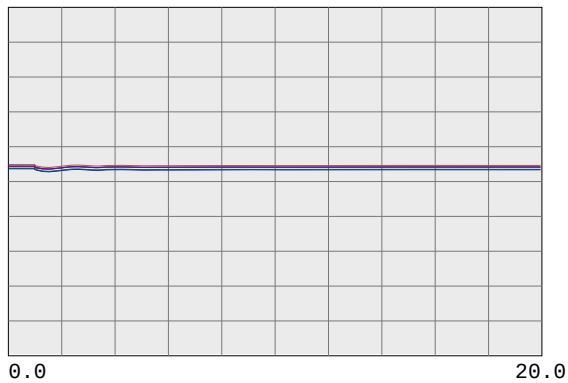
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



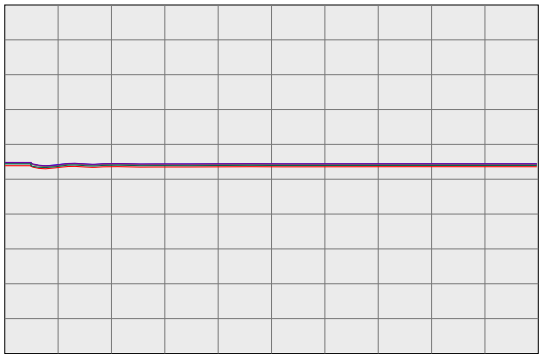
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

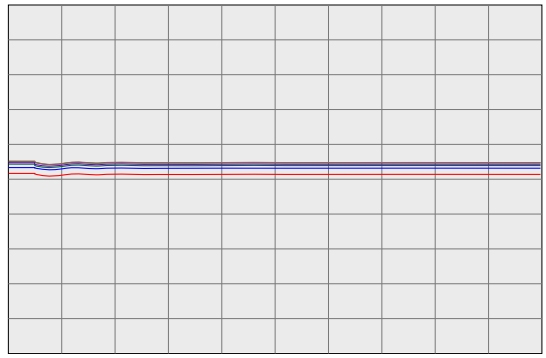
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

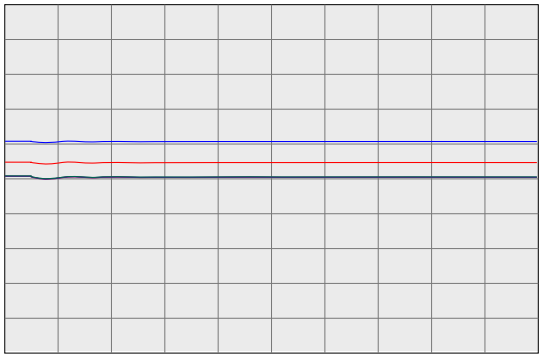
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

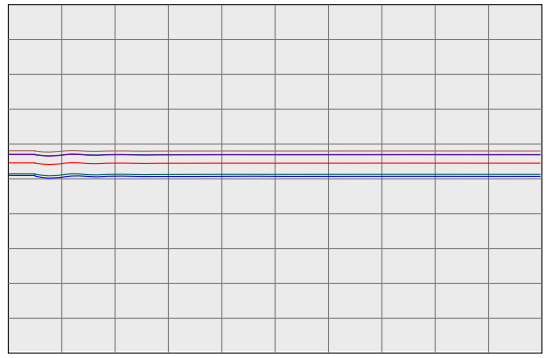
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

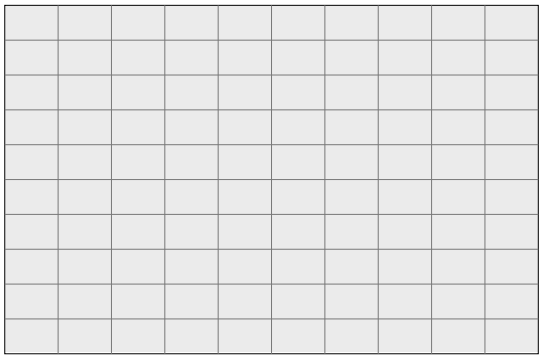
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

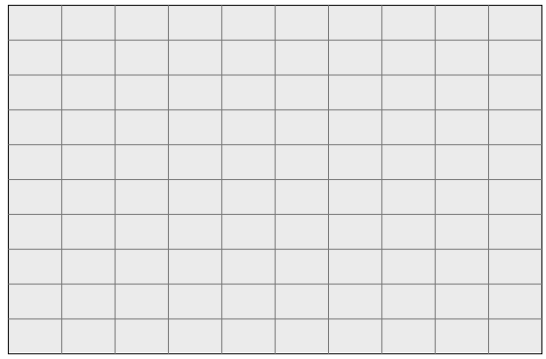


0.0 20.0

Time(sec)

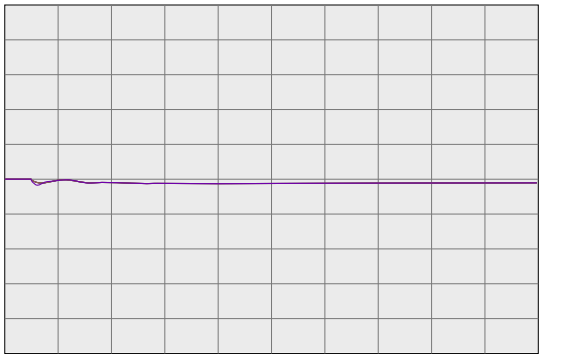
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



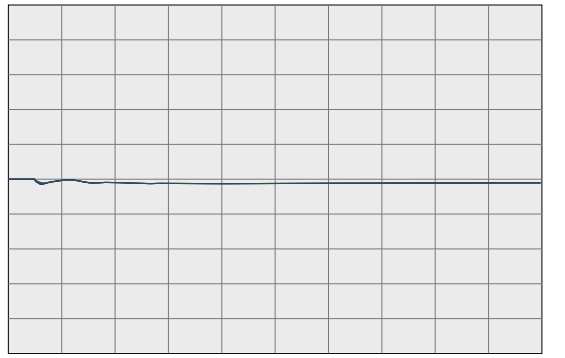


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

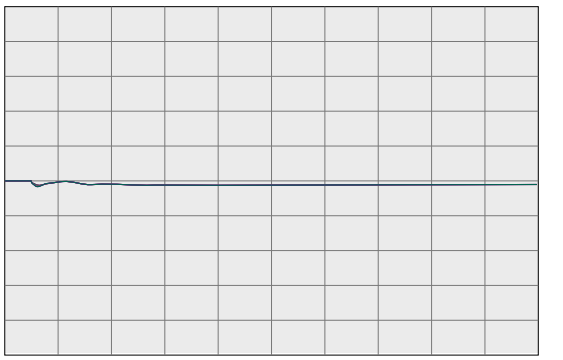
230-KV SYSTEM FREQUENCIES



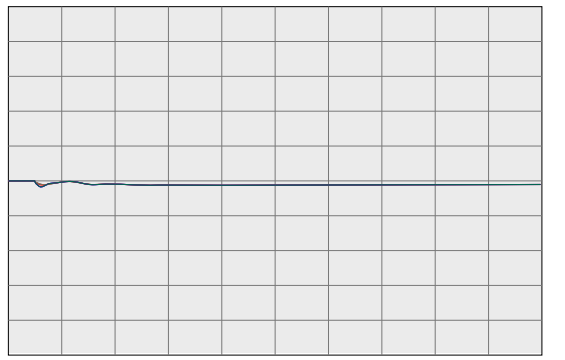
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



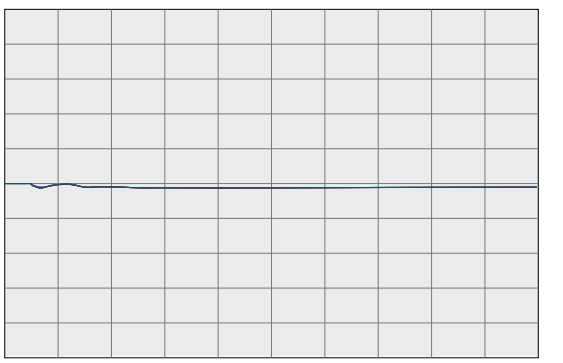
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



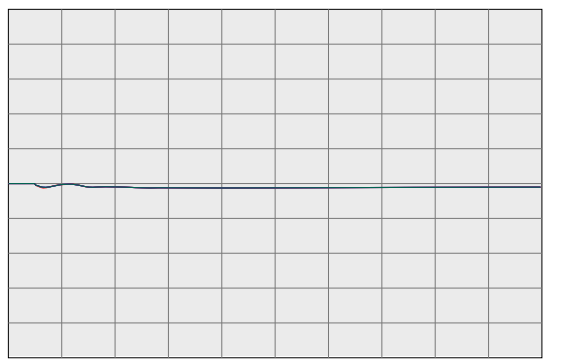
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



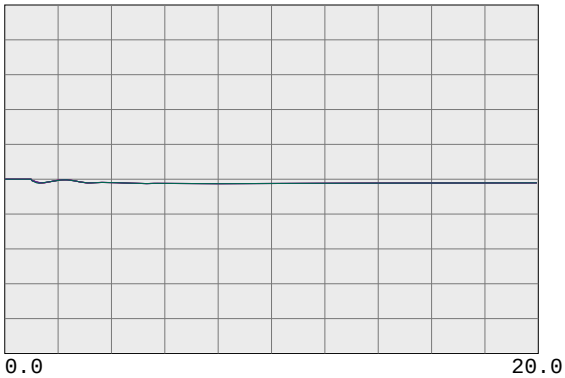
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



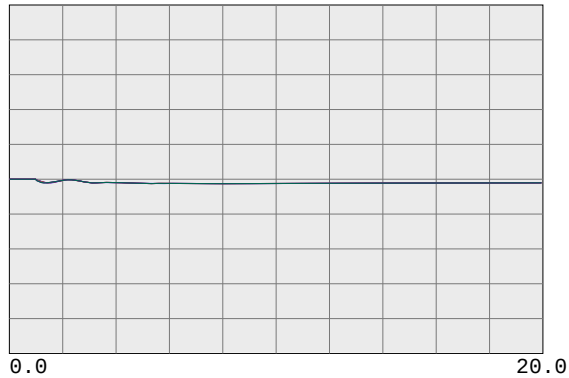
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

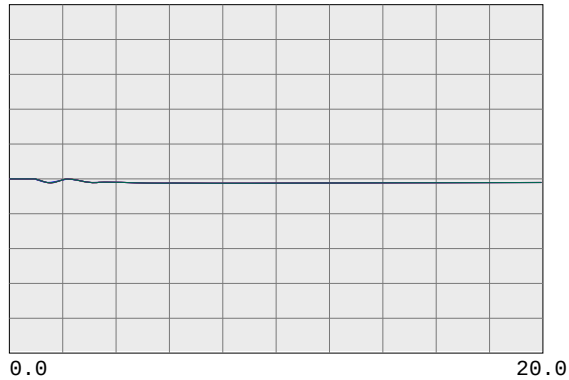


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

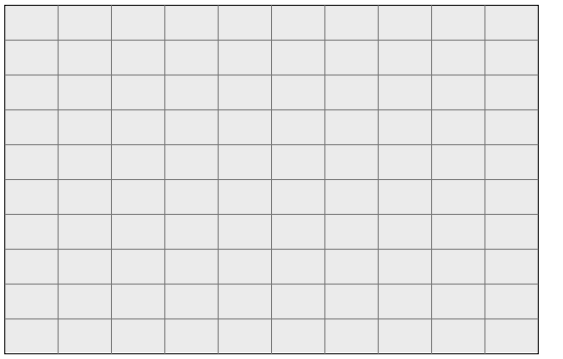


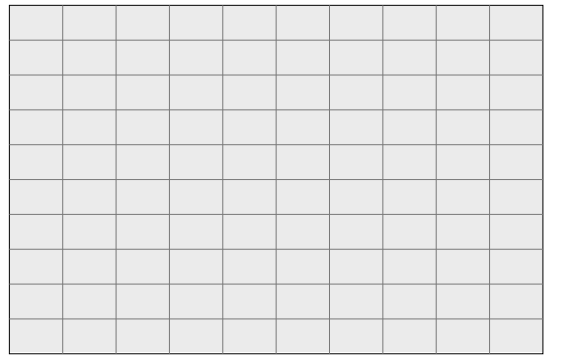
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



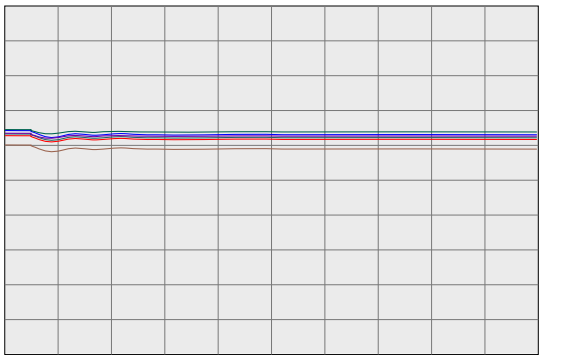
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



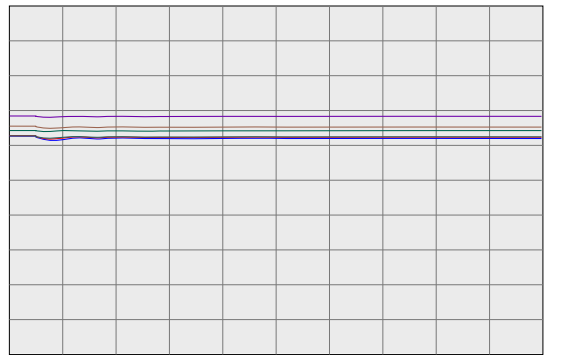


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

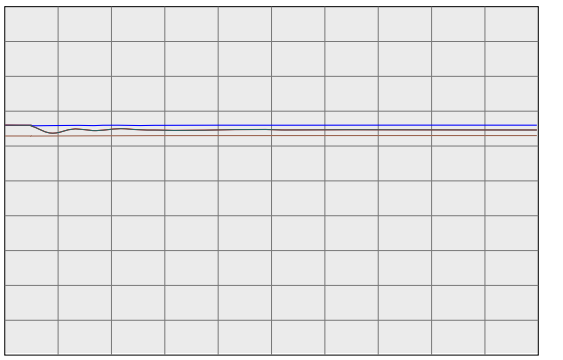
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



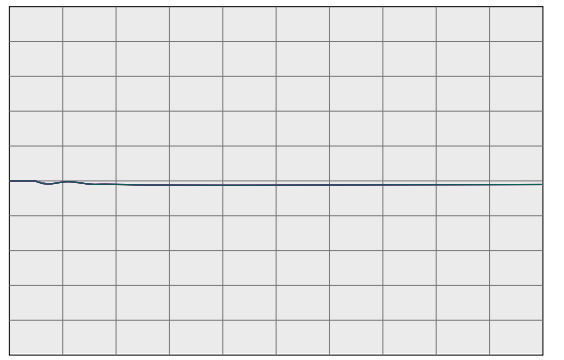
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



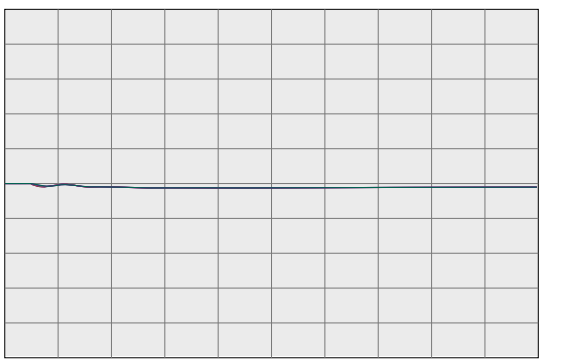
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



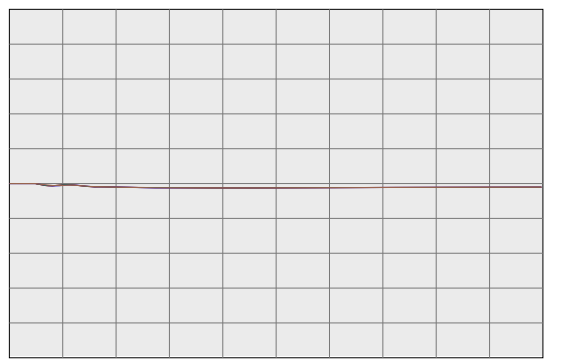
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



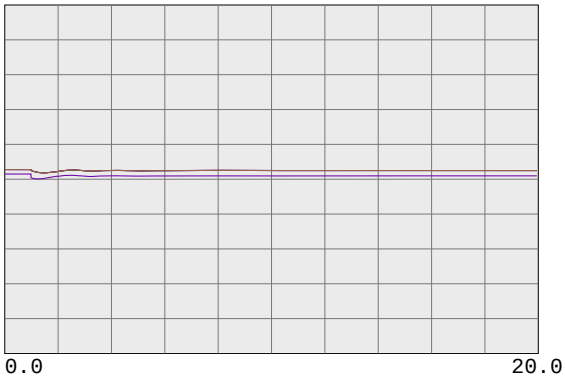
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

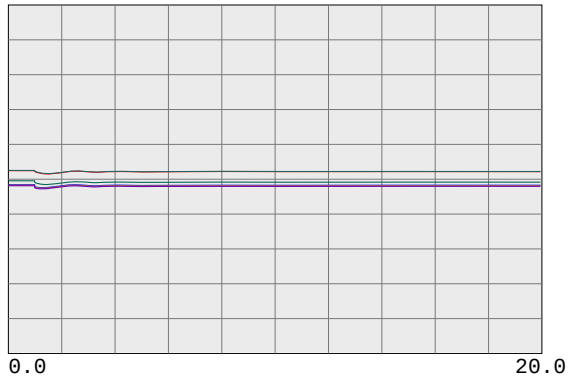
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

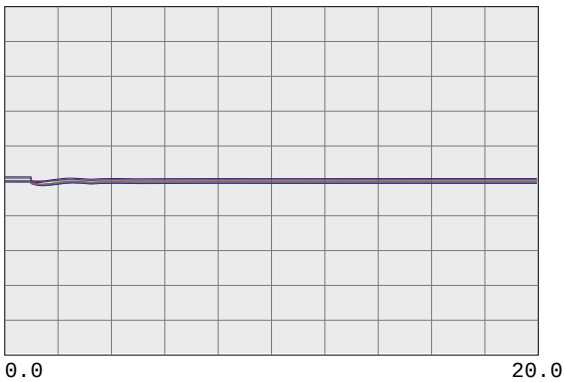
230-KV SYSTEM VOLTAGES



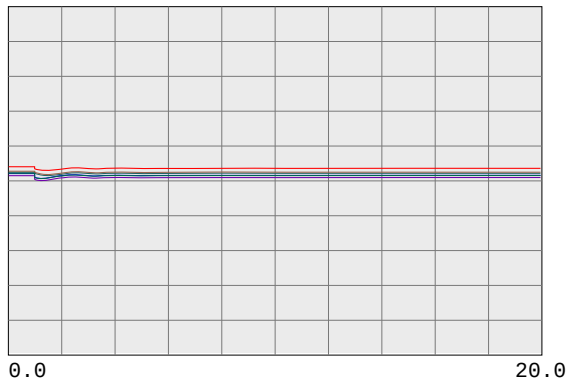
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



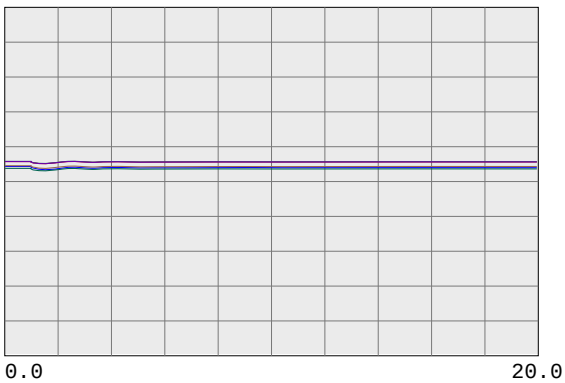
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



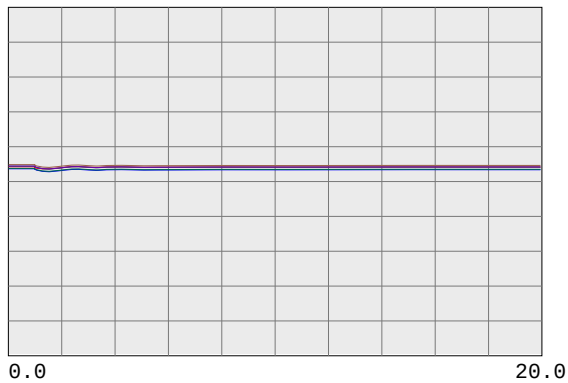
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



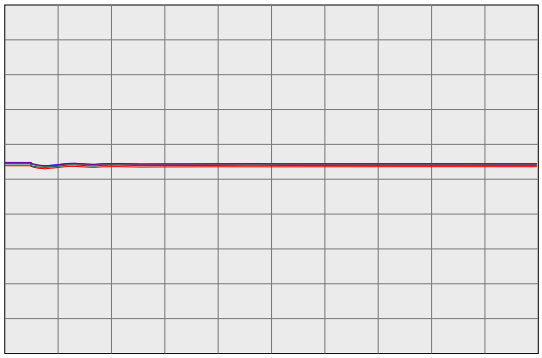
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

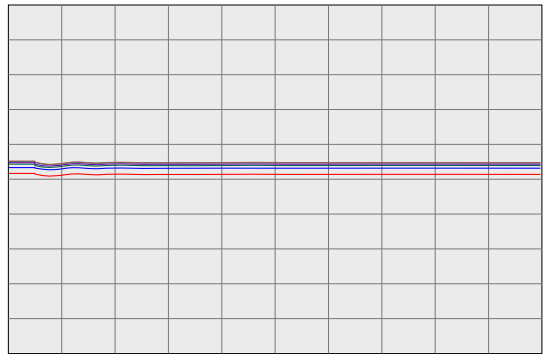
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

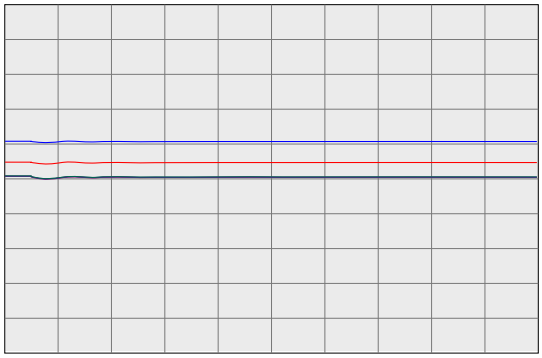
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

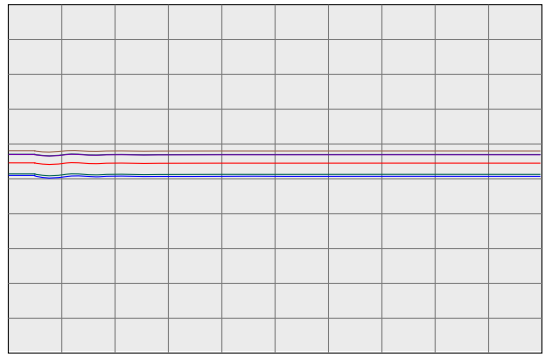
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

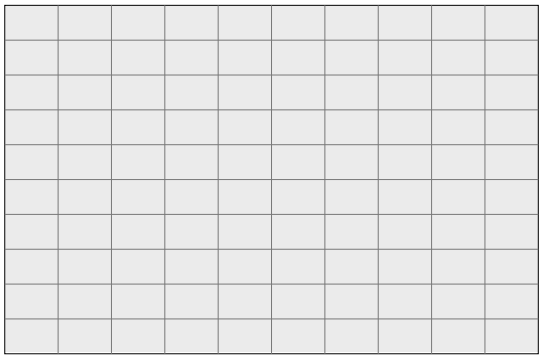
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

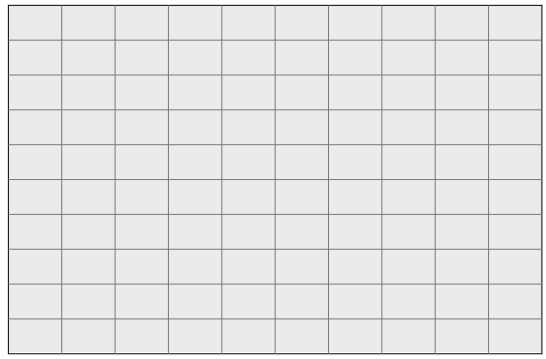


0.0 20.0

Time(sec)

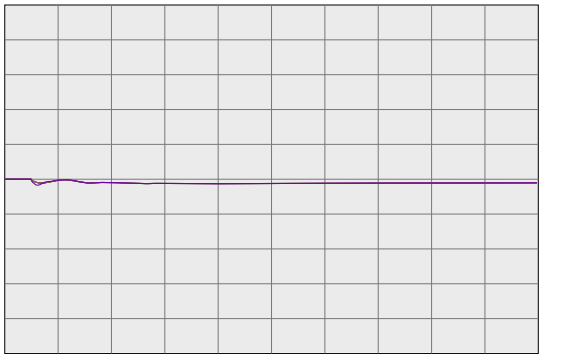
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



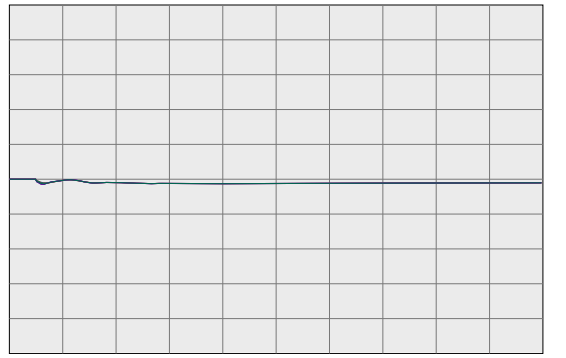


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

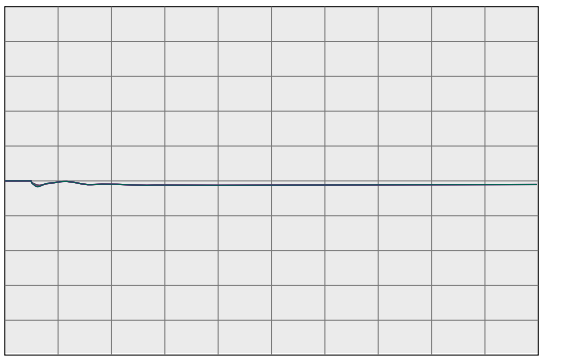
230-KV SYSTEM FREQUENCIES



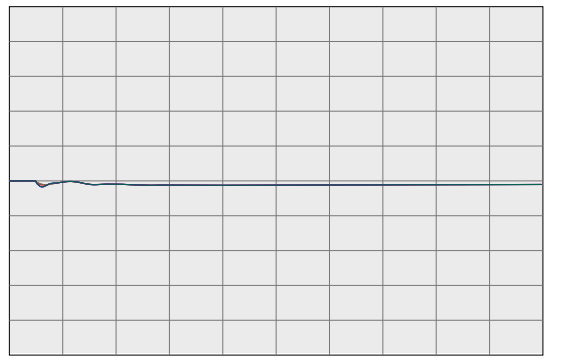
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



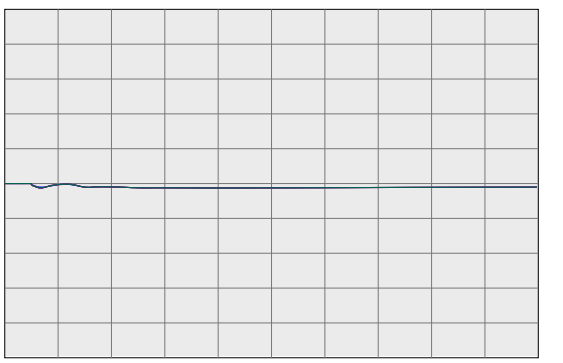
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



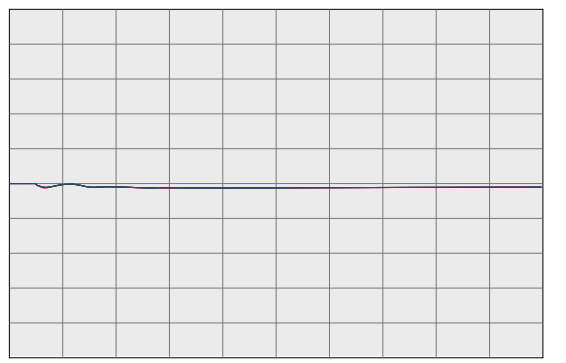
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



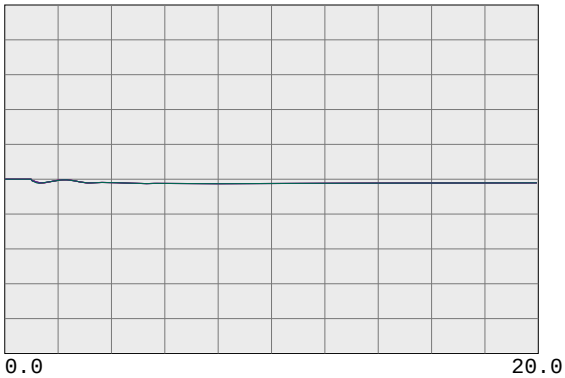
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



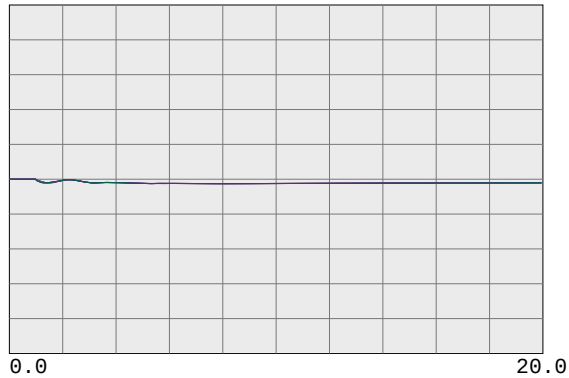
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

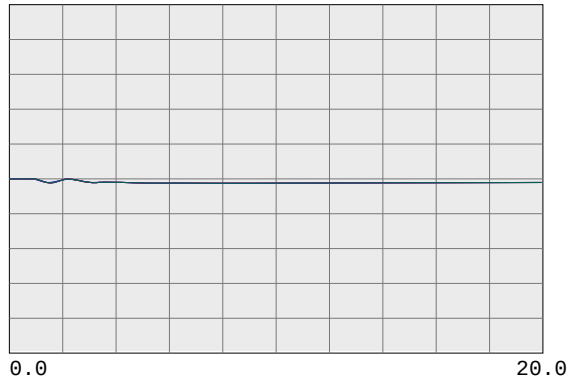


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

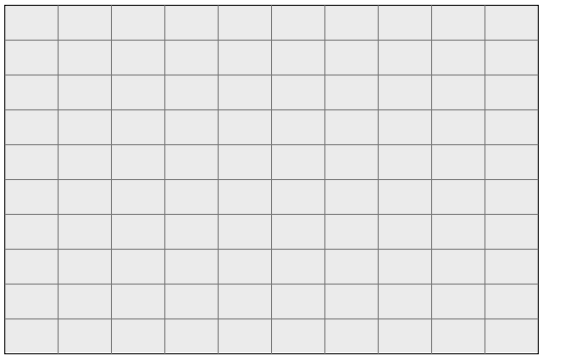


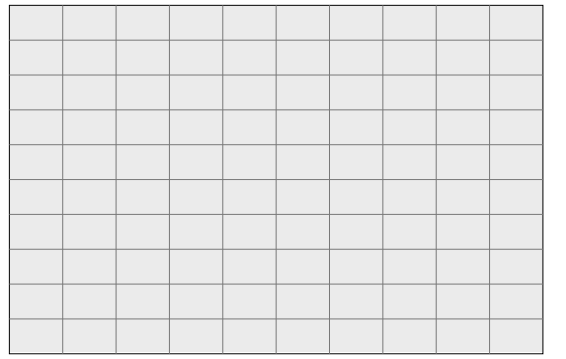
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



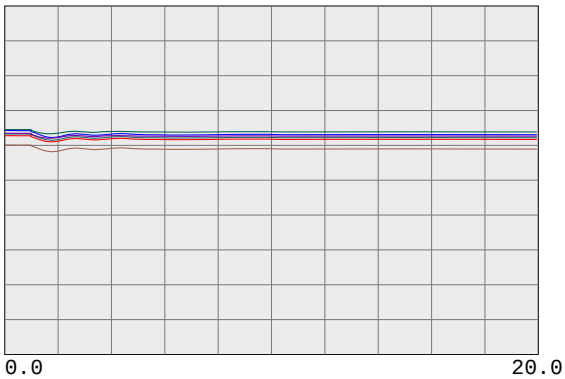
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



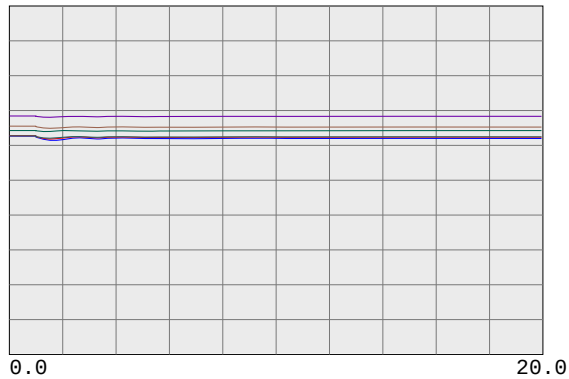


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

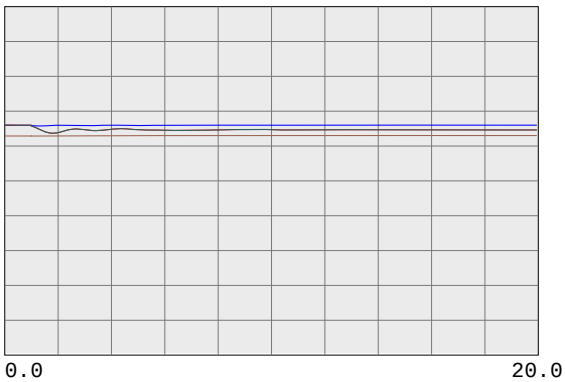
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



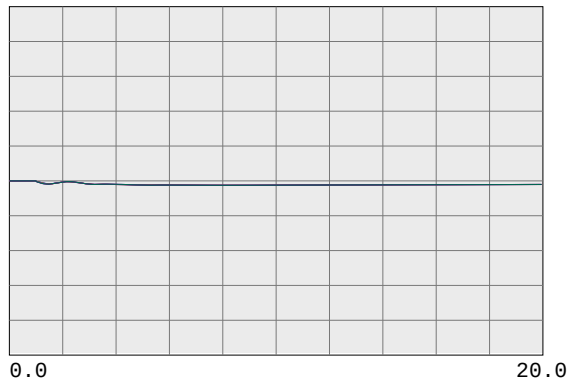
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



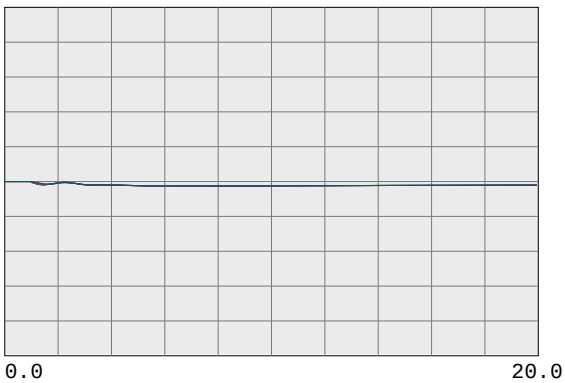
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



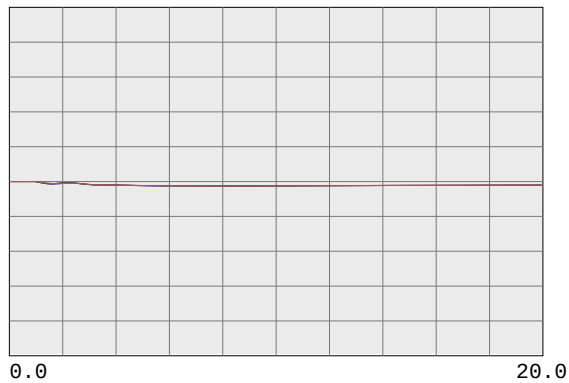
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



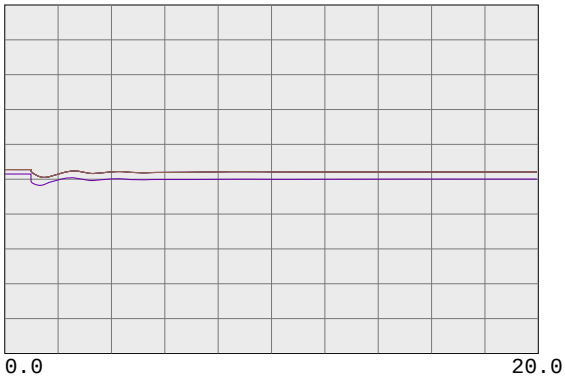
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

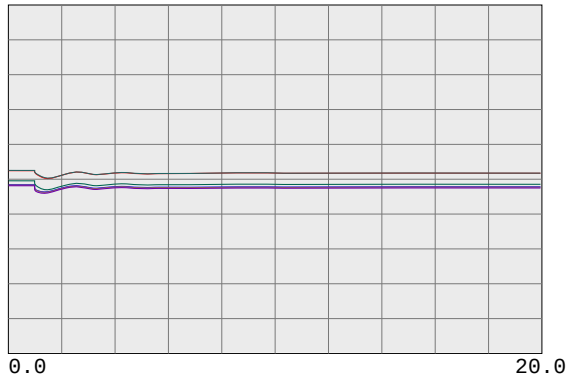
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

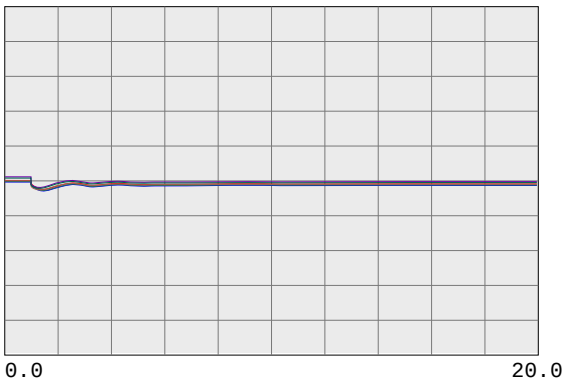
230-KV SYSTEM VOLTAGES



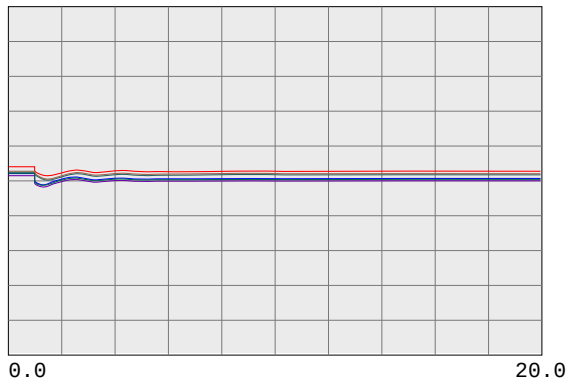
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



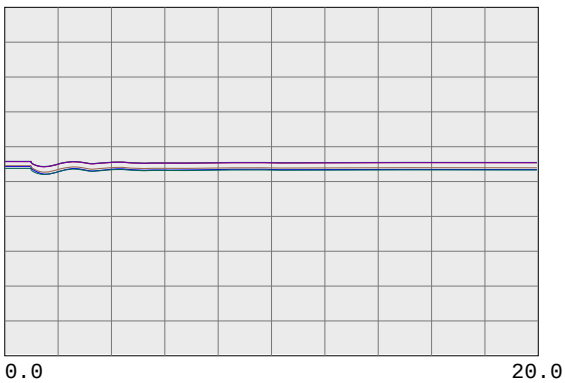
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



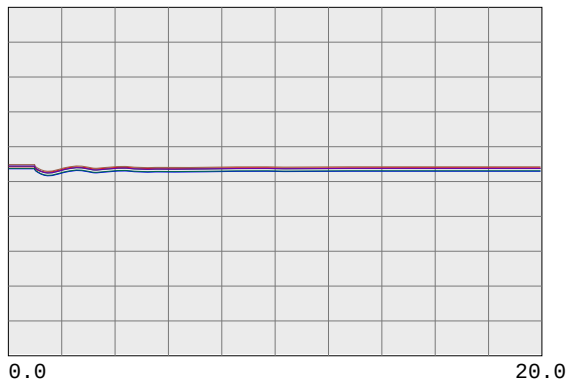
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



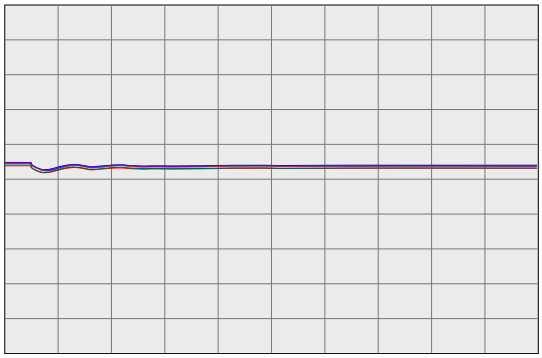
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

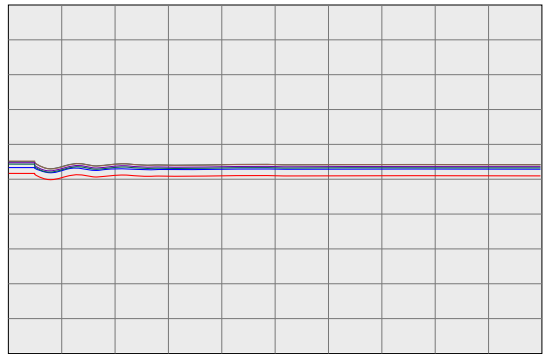
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

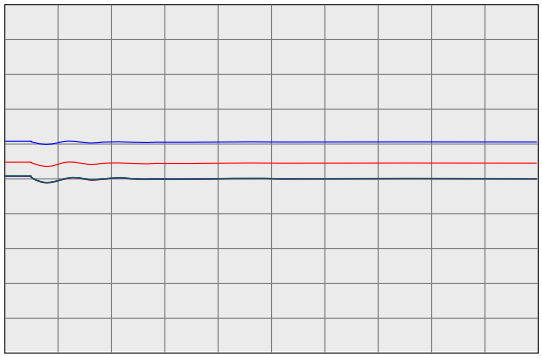
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

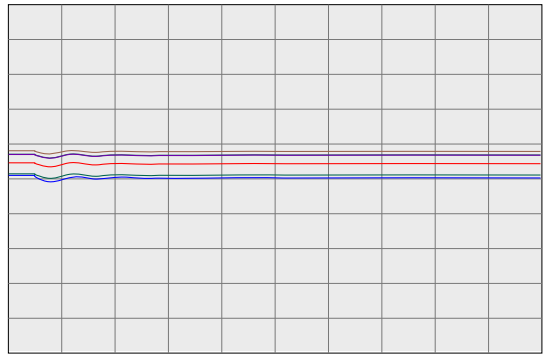
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

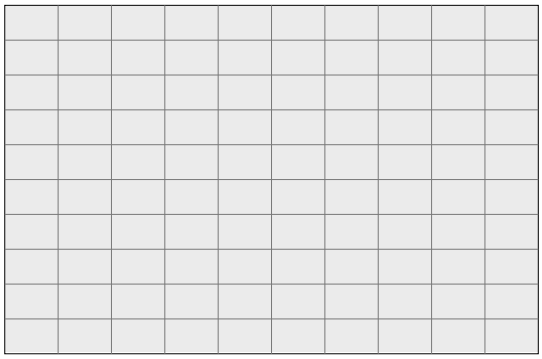
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

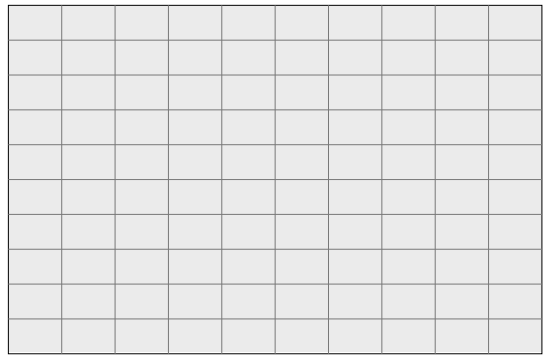


0.0 20.0

Time(sec)

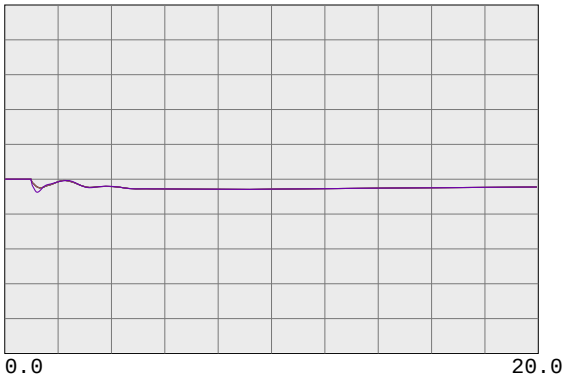
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



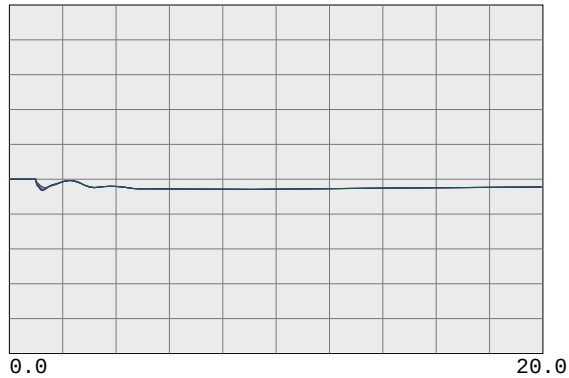


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

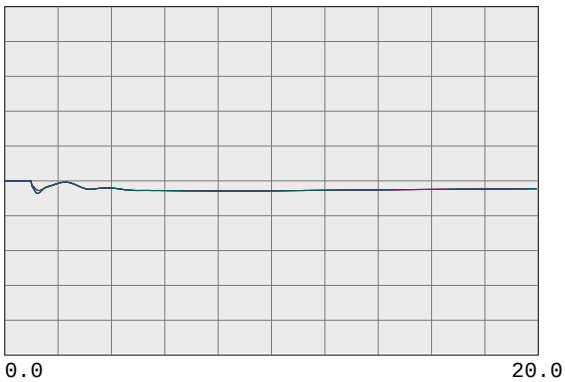
230-KV SYSTEM FREQUENCIES



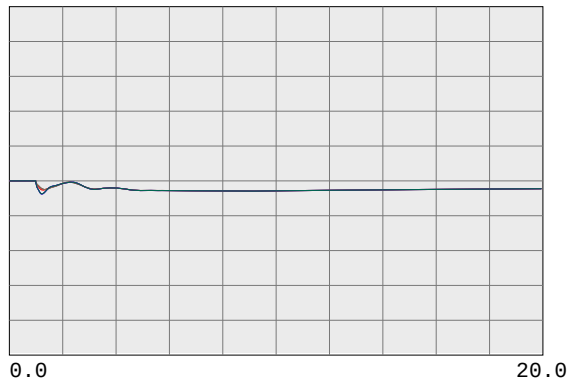
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



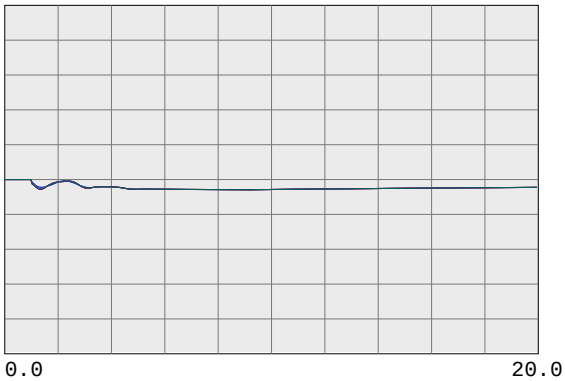
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



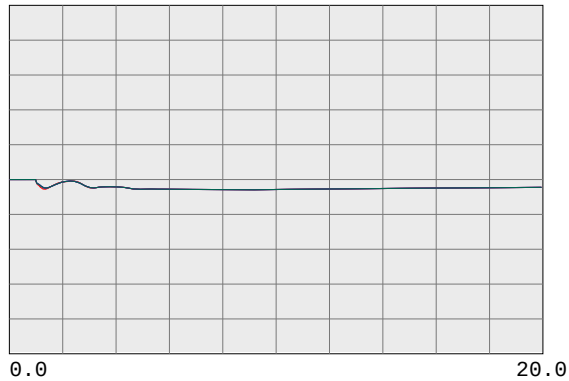
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



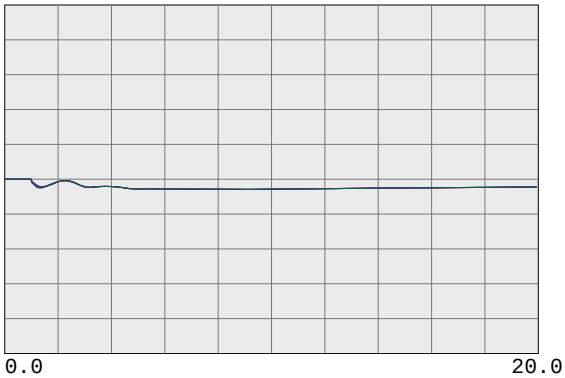
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



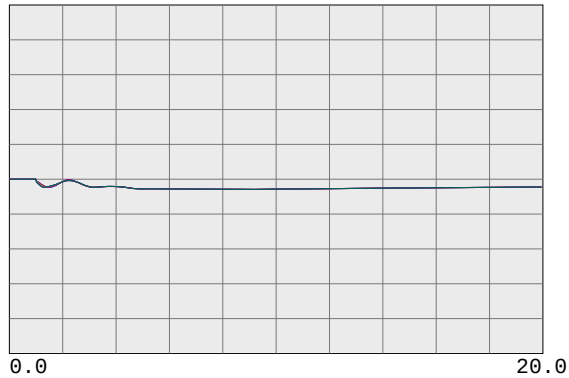
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

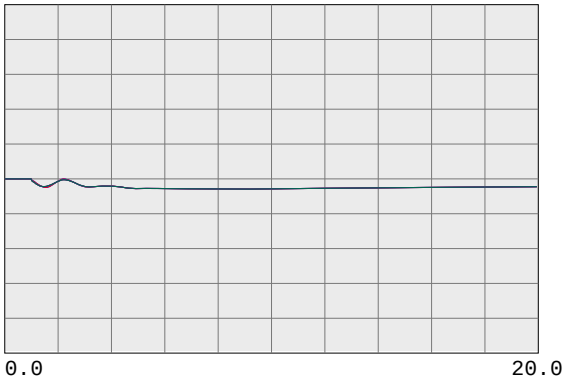
230-KV SYSTEM FREQUENCIES



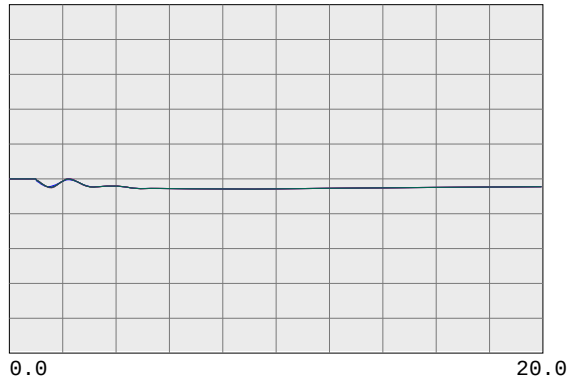
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



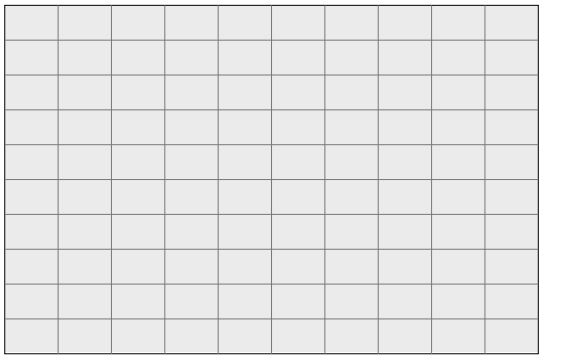
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

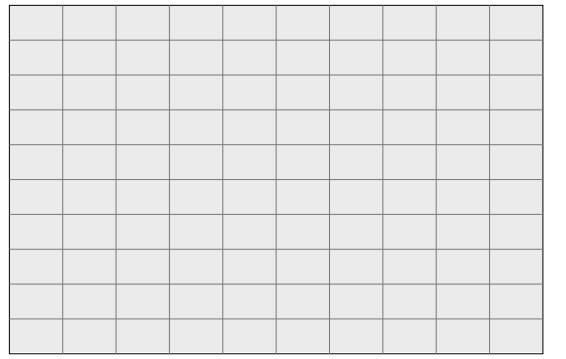


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



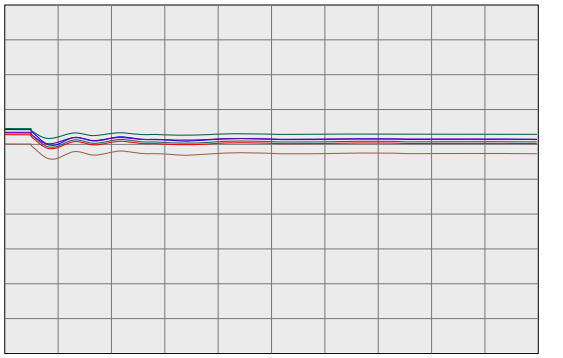
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



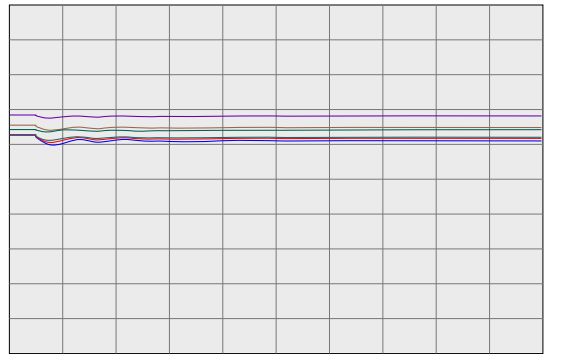


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

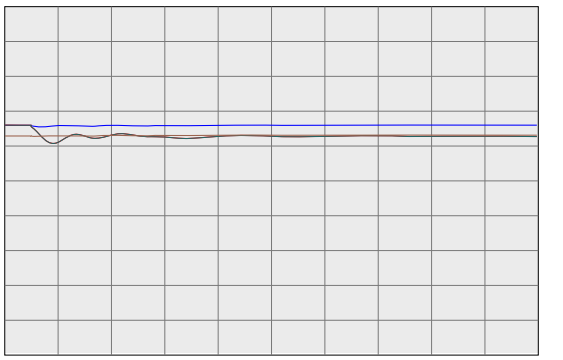
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



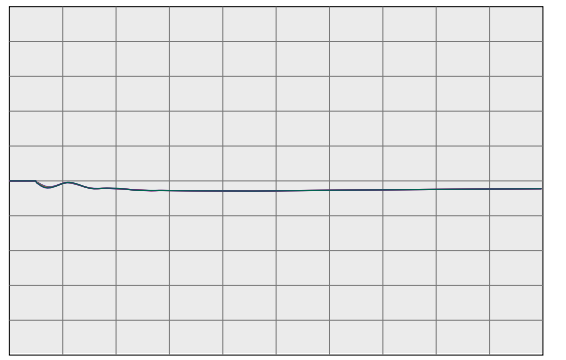
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



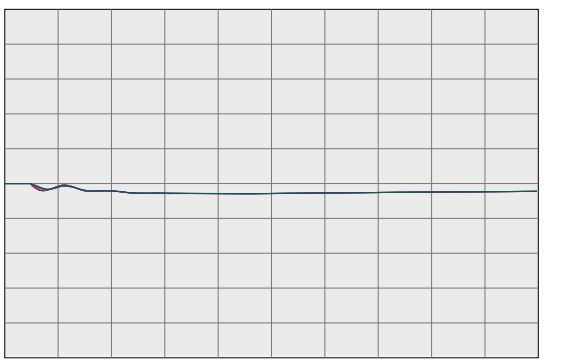
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



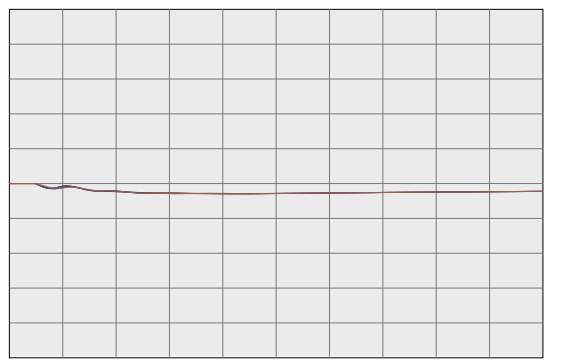
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

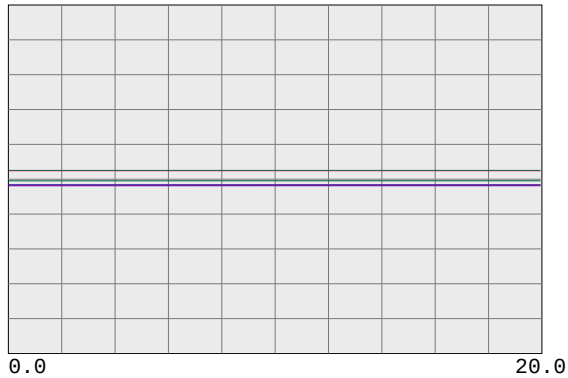
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

WILLOW PASS GENERATION PLANT

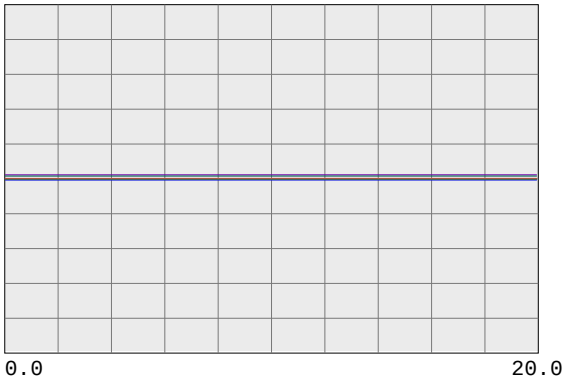
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM VOLTAGES

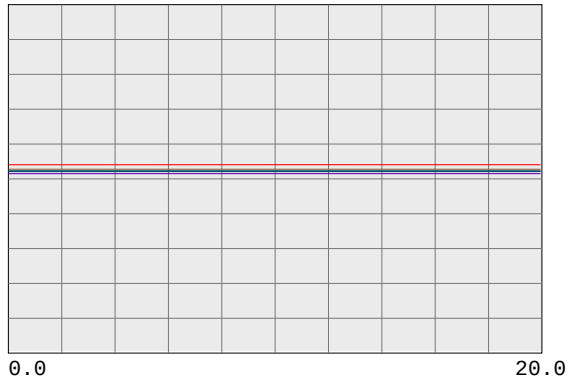
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



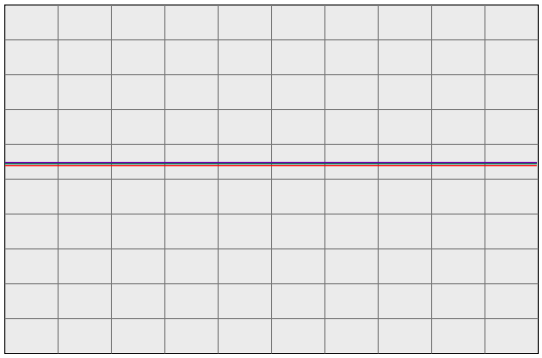
0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

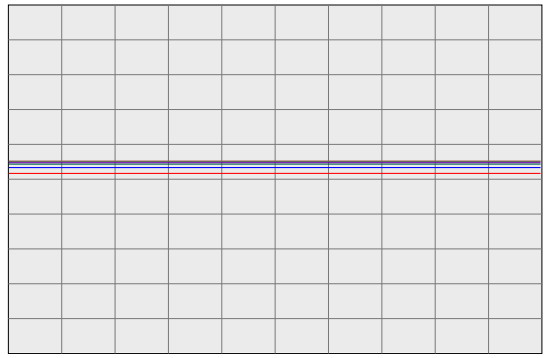
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

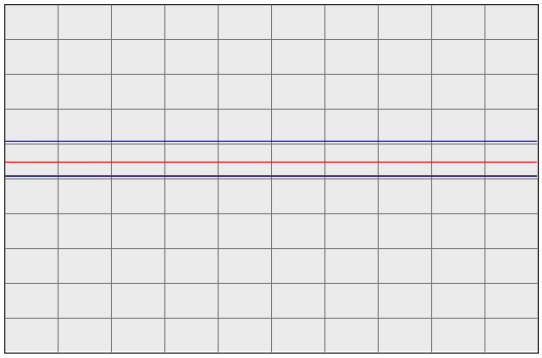
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

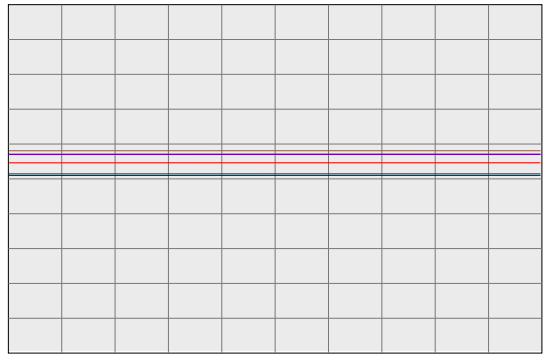
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

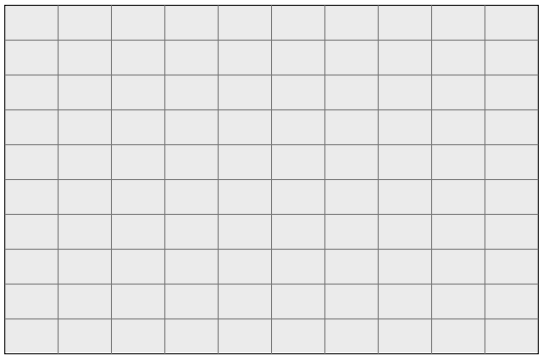
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

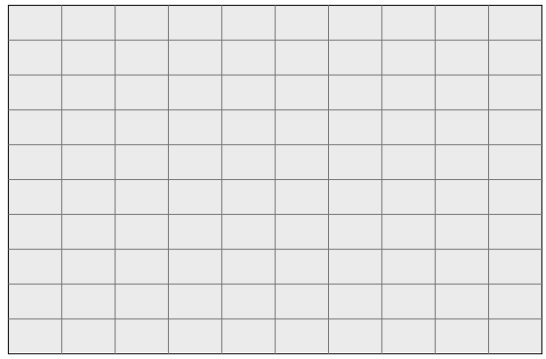


0.0 20.0

Time(sec)

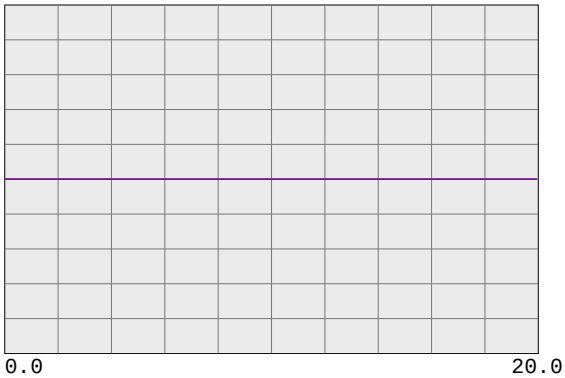
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



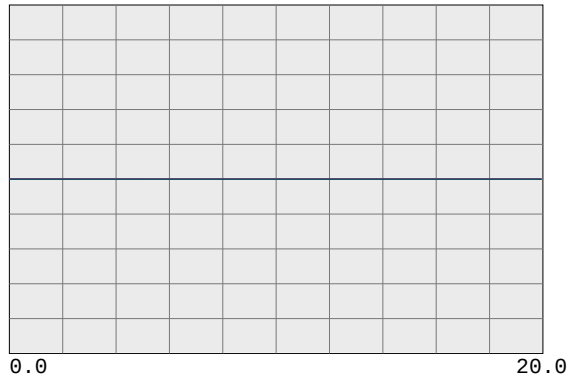


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

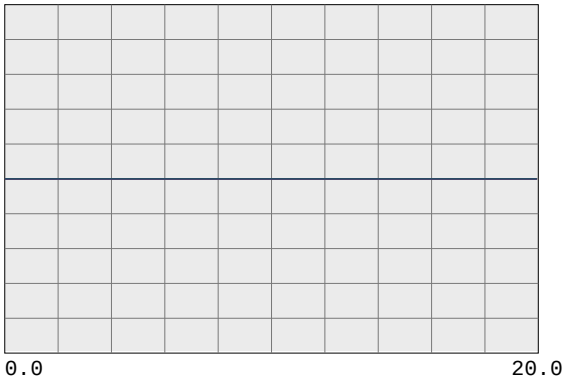
230-KV SYSTEM FREQUENCIES



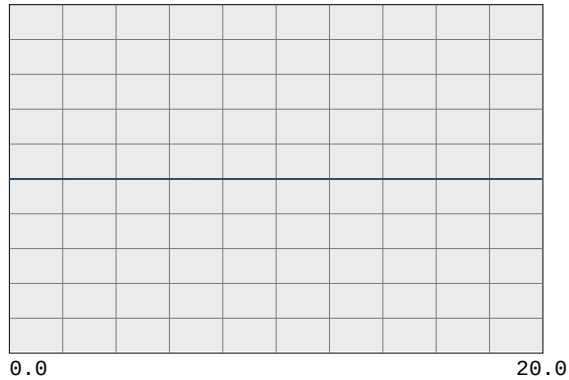
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



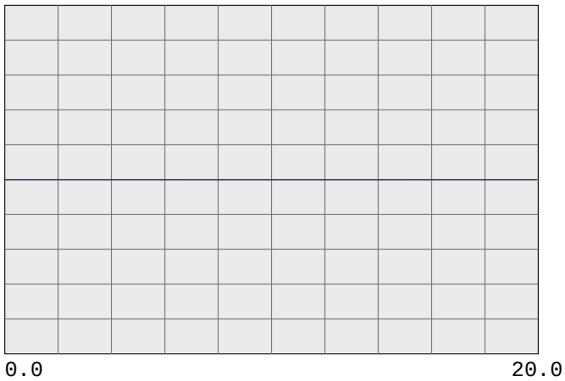
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



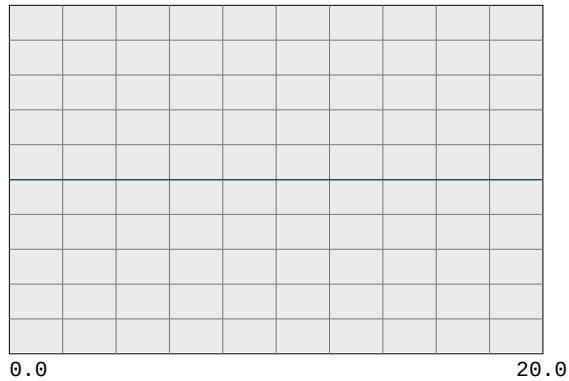
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

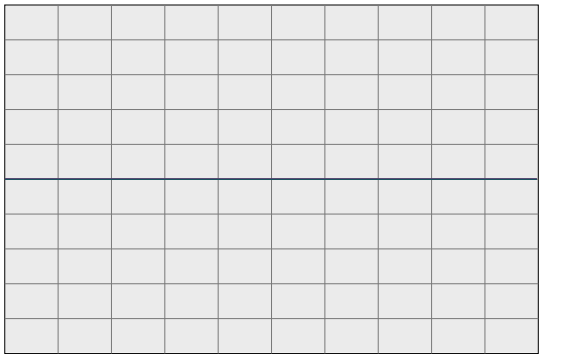


59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

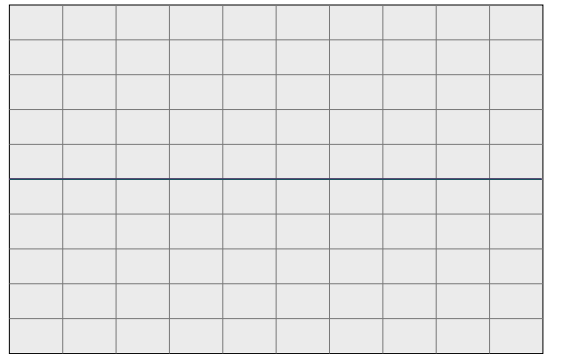


59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

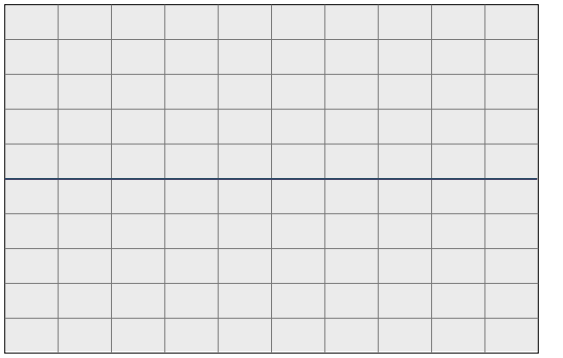
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07



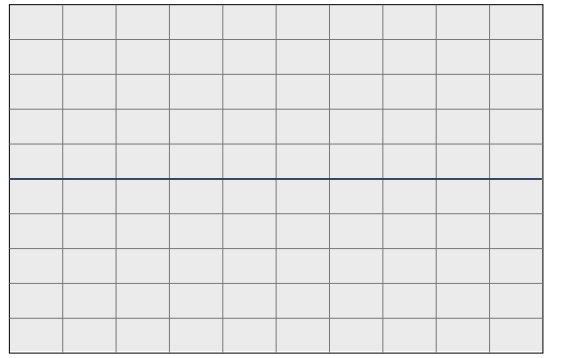
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



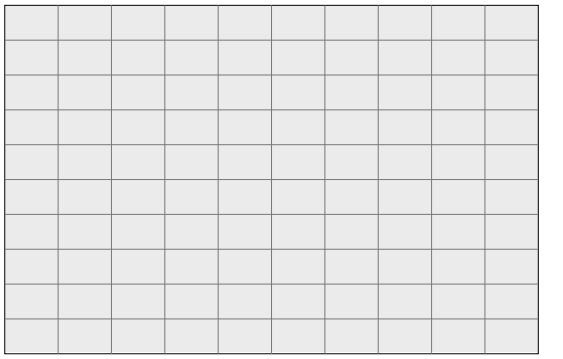
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

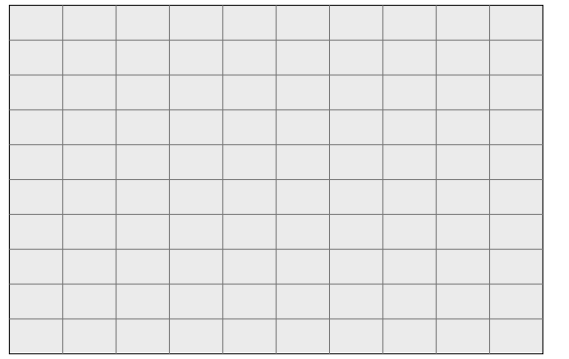


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



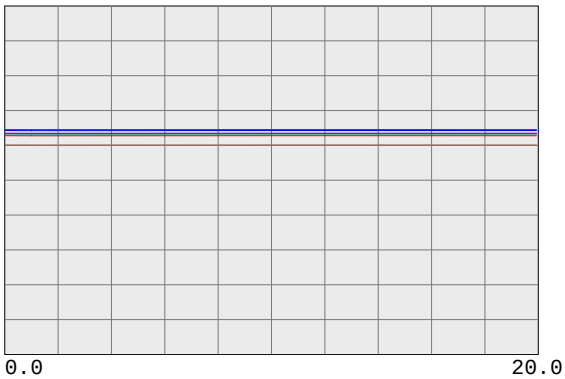
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



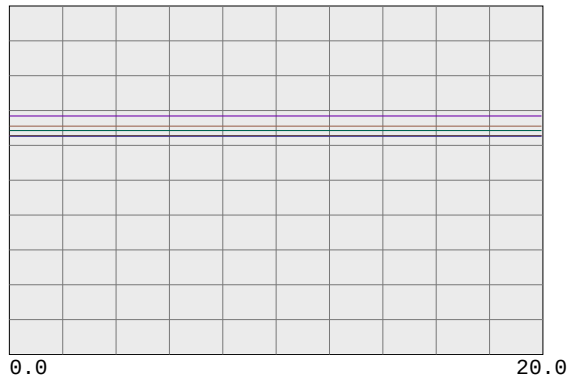


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

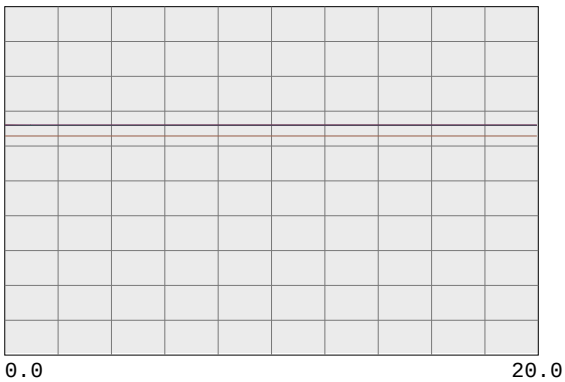
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



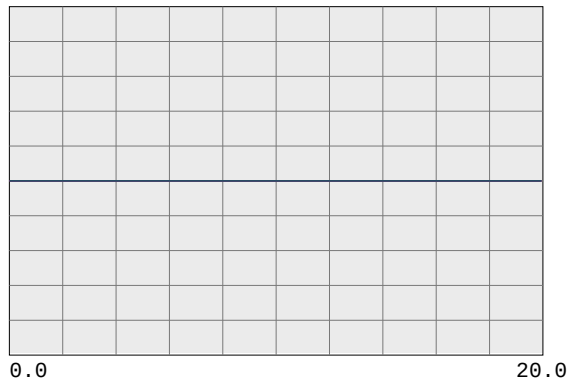
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500

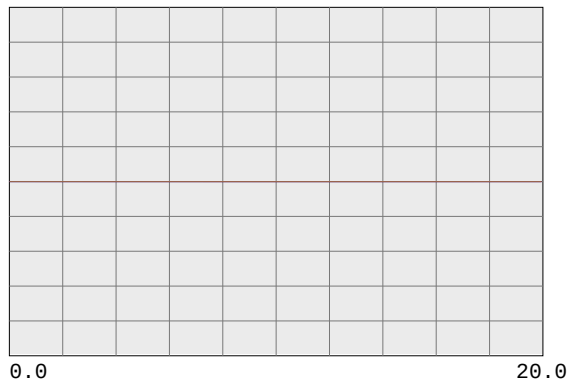


0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

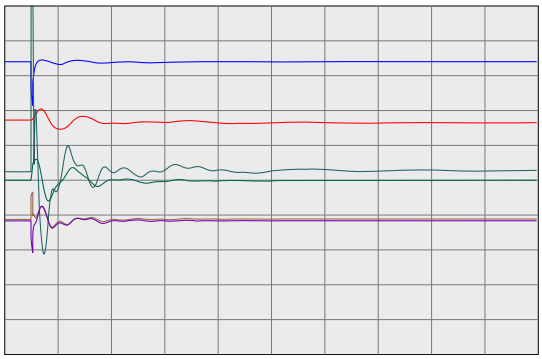
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



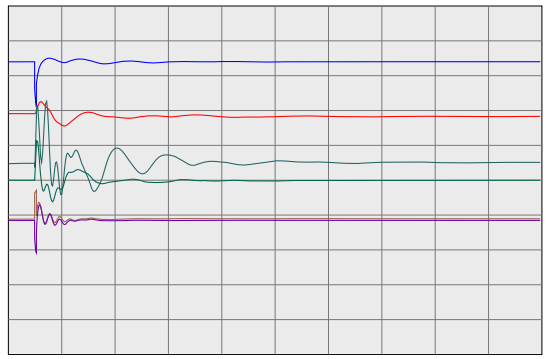
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

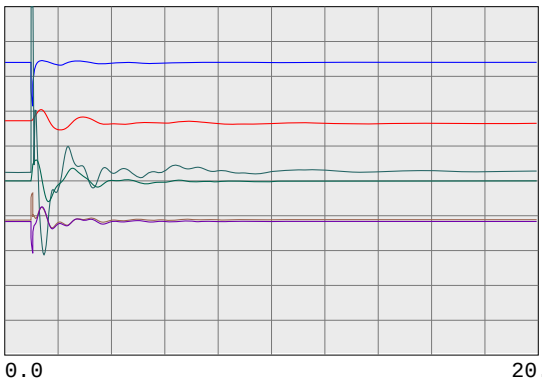
WILLOW PASS GENERATION PLANT



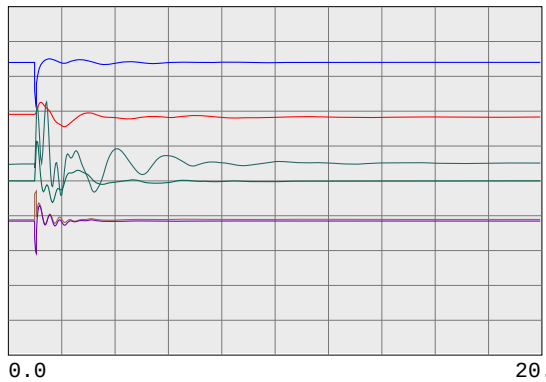
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



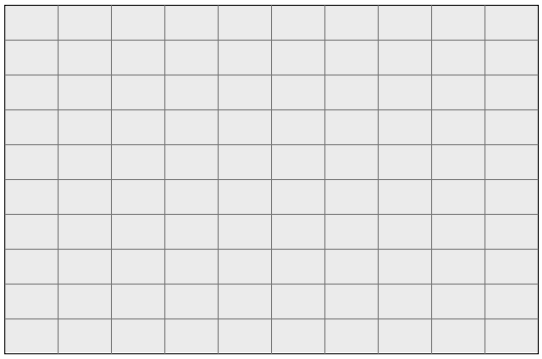
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

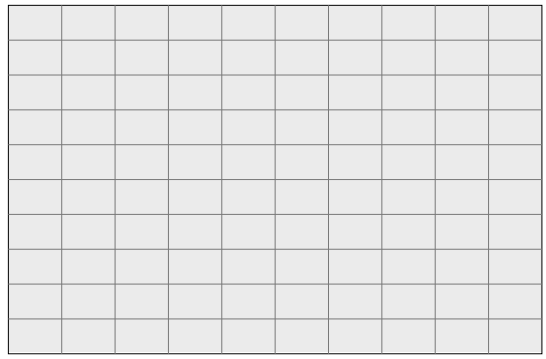


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



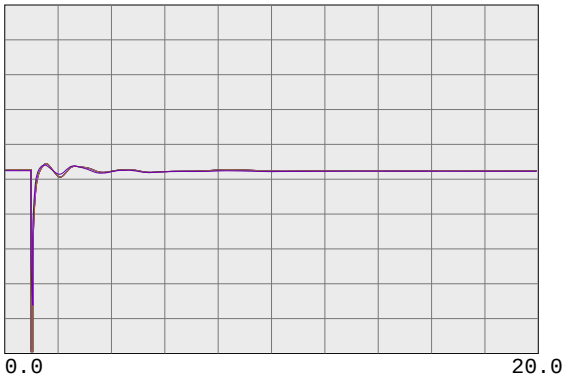
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



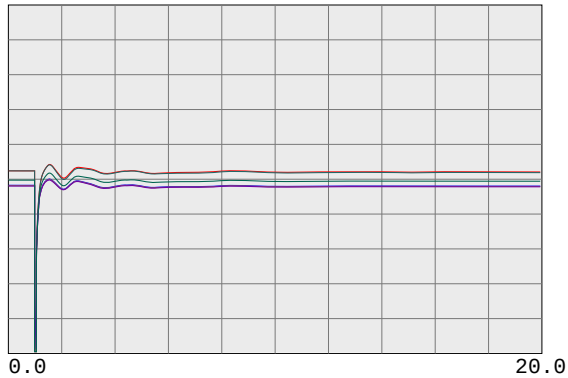


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

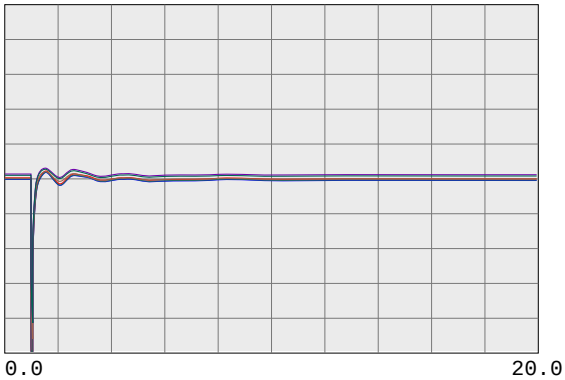
230-KV SYSTEM VOLTAGES



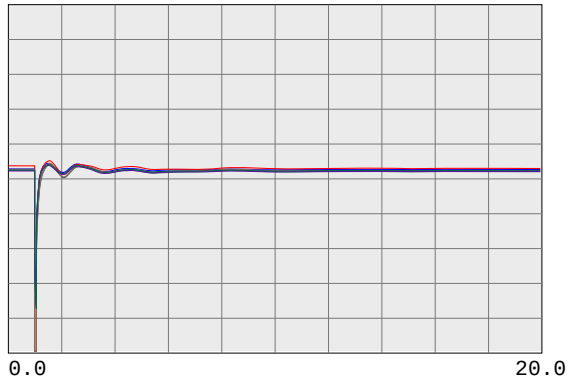
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



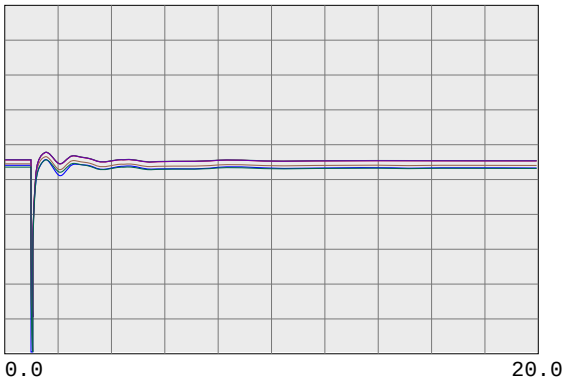
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



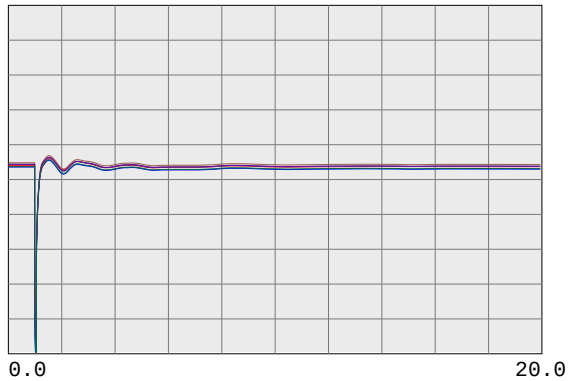
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



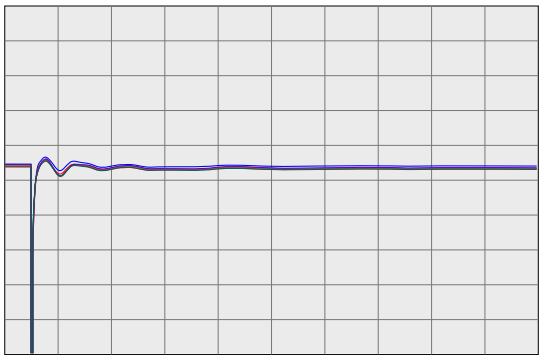
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

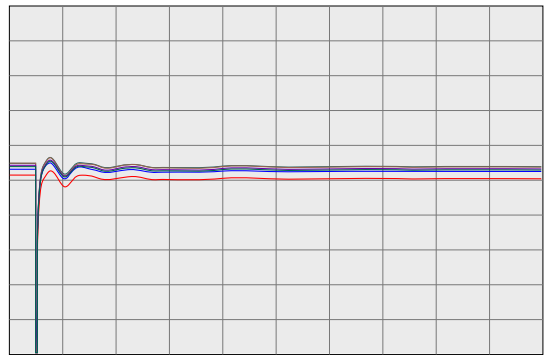
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

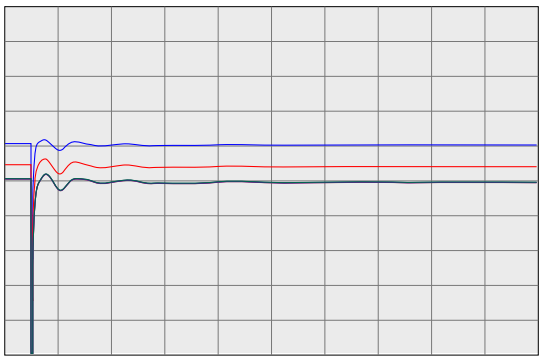
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

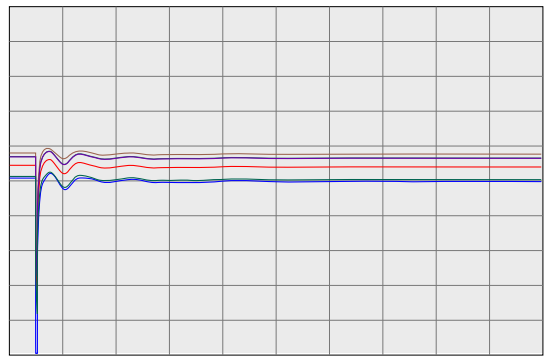
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

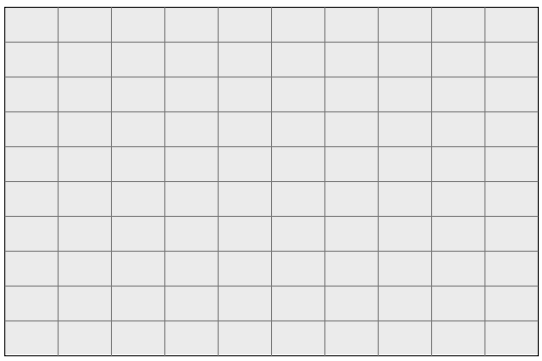
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

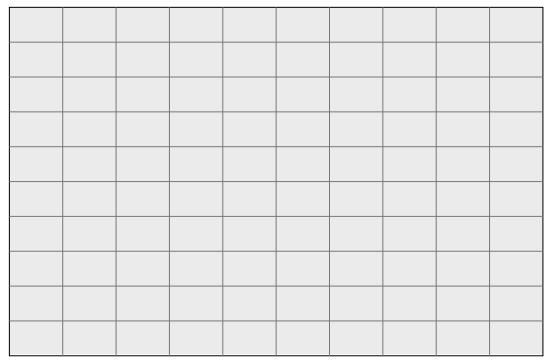


0.0 20.0

Time(sec)

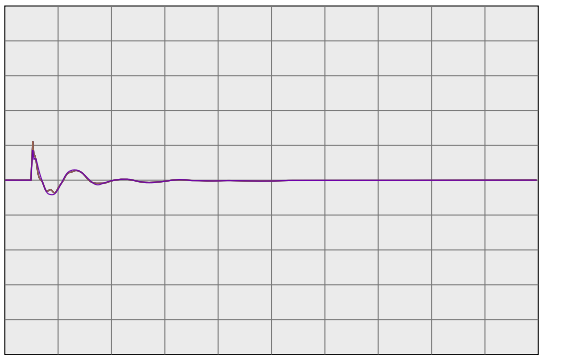
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



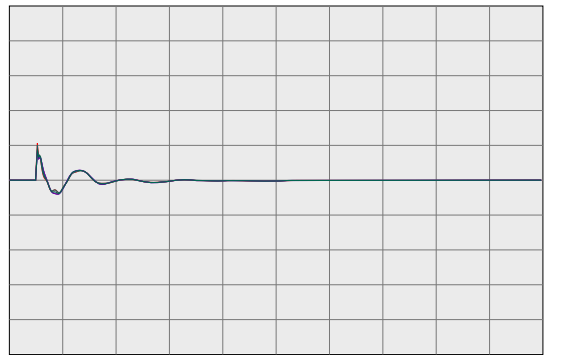


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

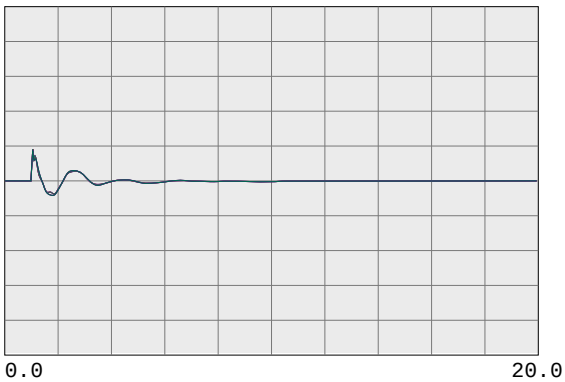
230-KV SYSTEM FREQUENCIES



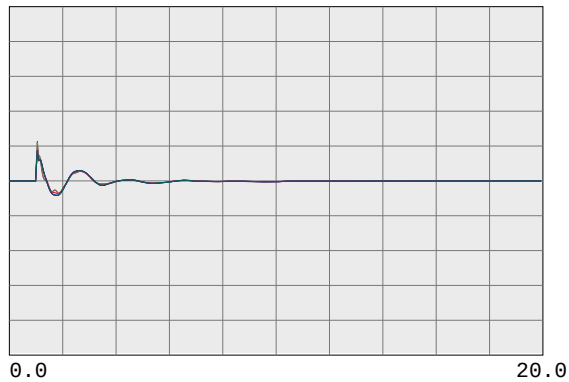
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



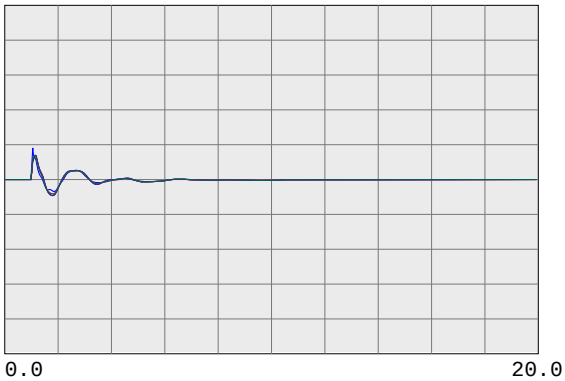
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



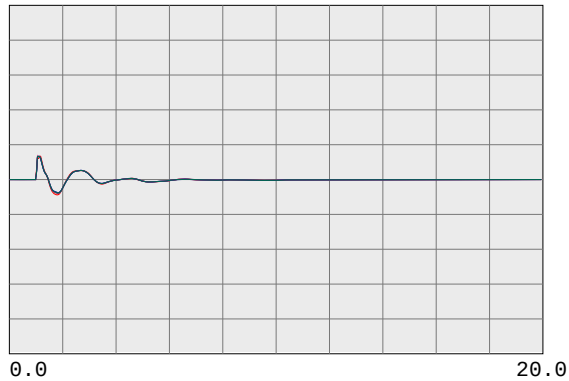
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



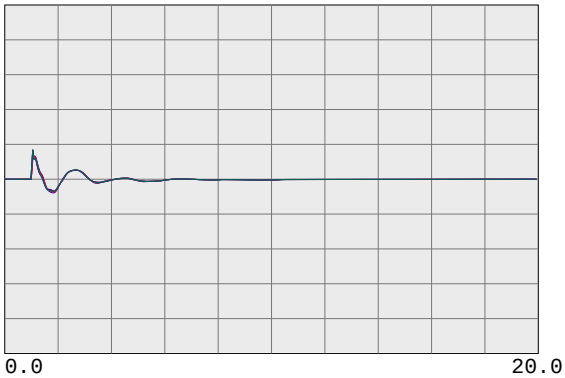
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



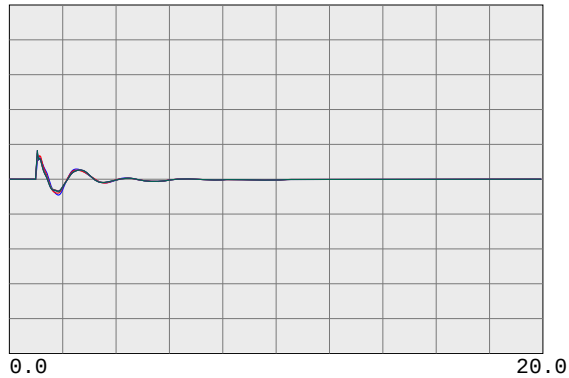
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

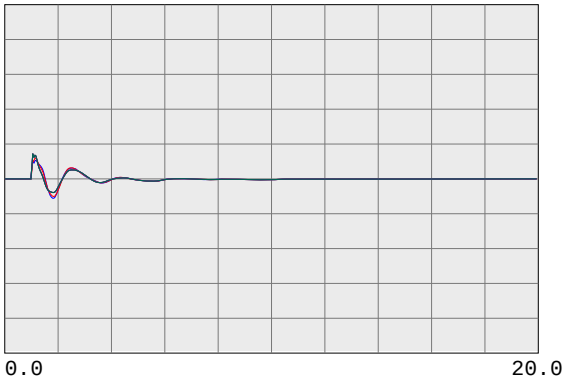
230-KV SYSTEM FREQUENCIES



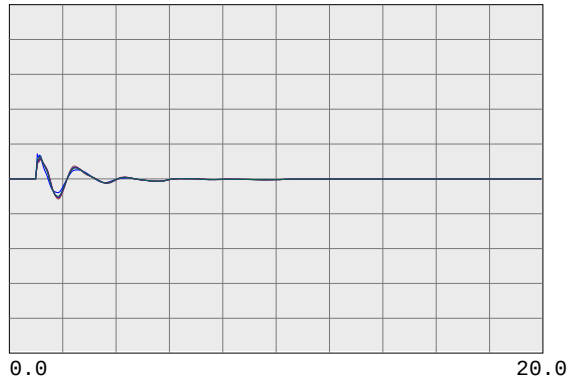
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



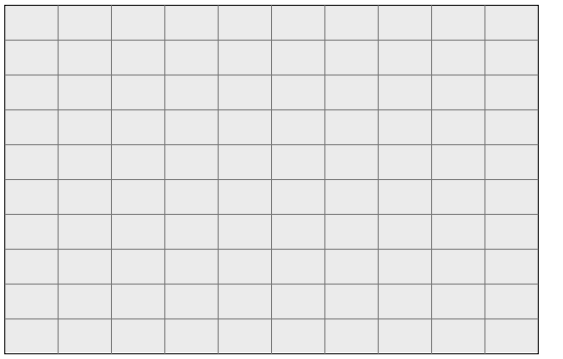
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

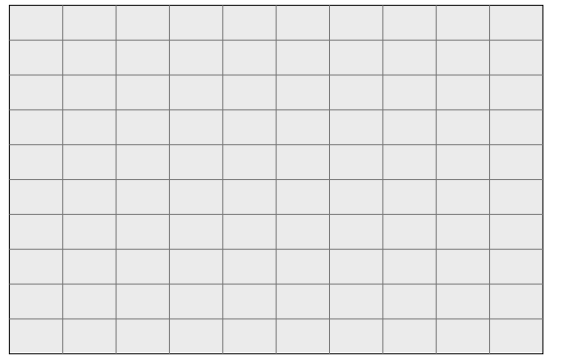


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



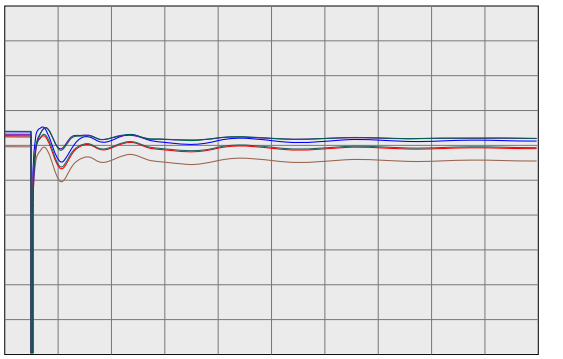
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



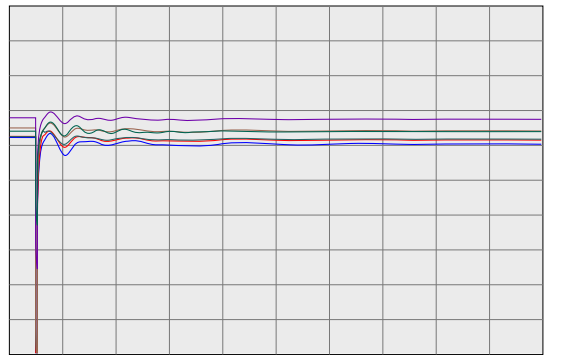


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

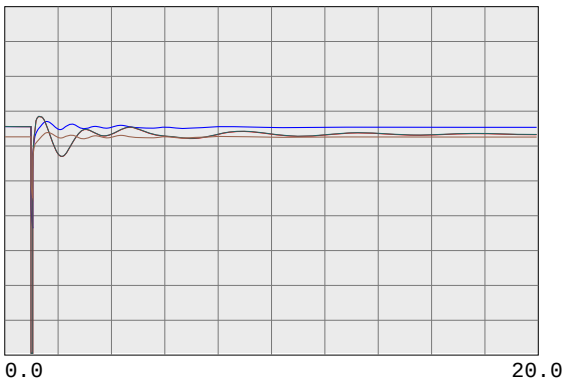
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



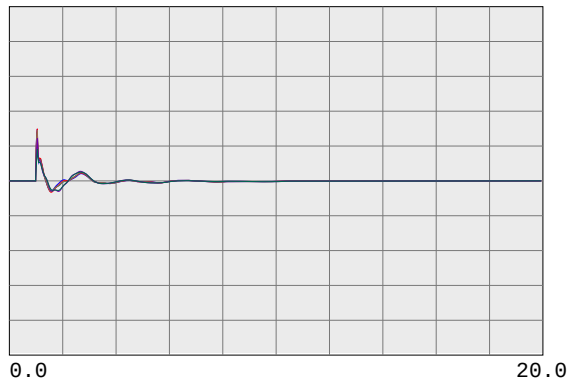
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



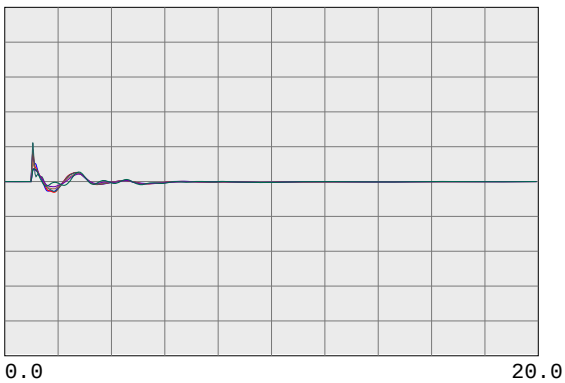
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



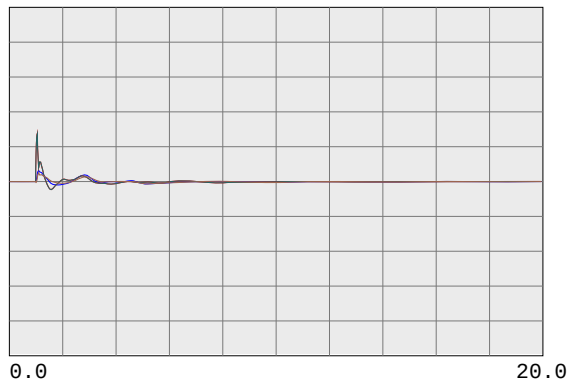
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



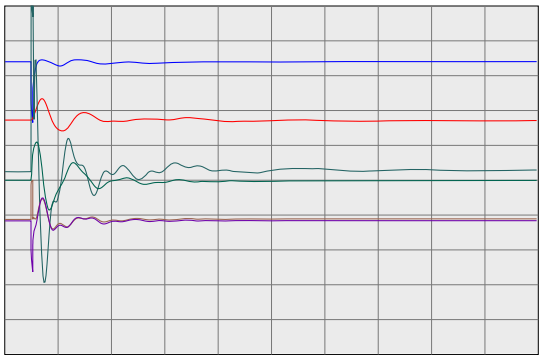
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



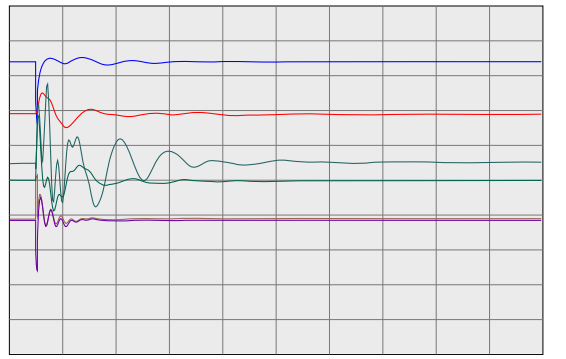
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

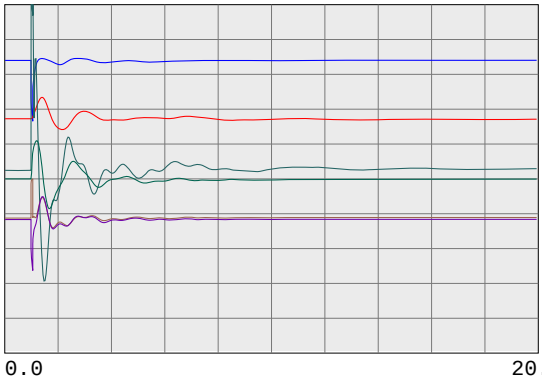
WILLOW PASS GENERATION PLANT



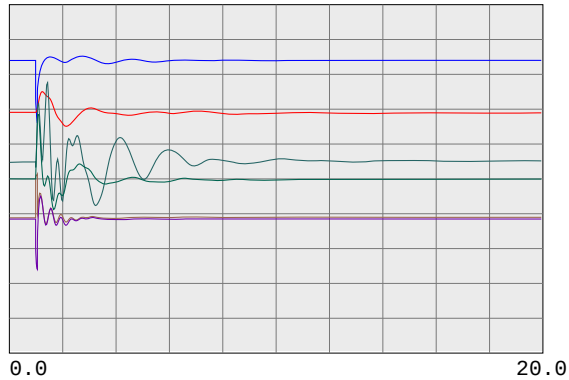
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



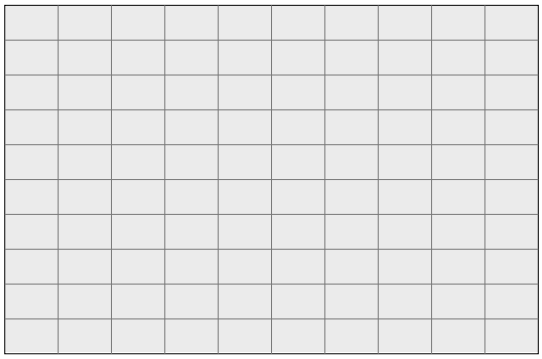
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

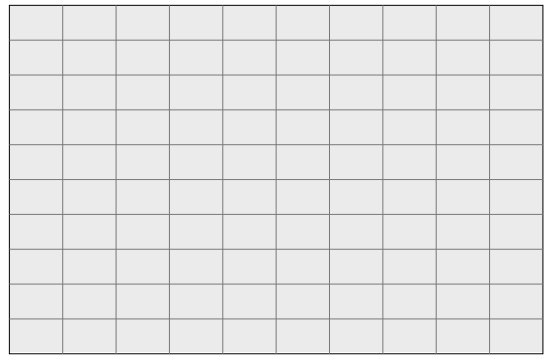


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



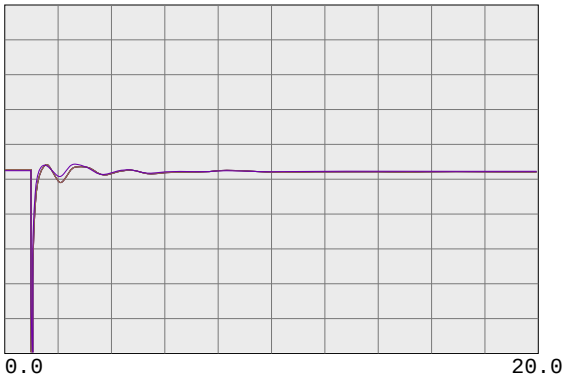
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



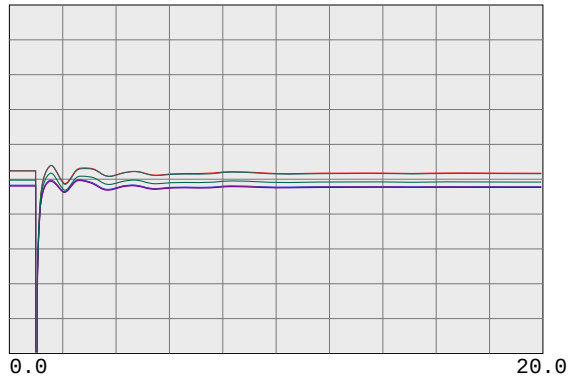


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

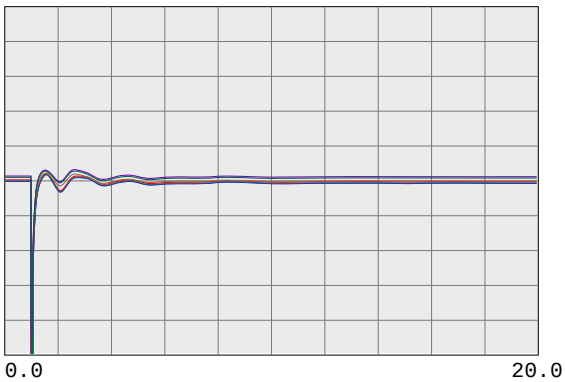
230-KV SYSTEM VOLTAGES



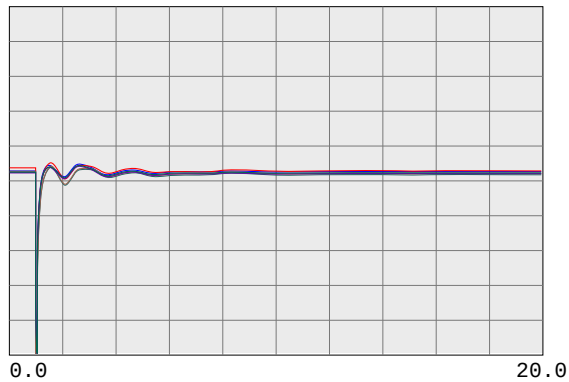
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



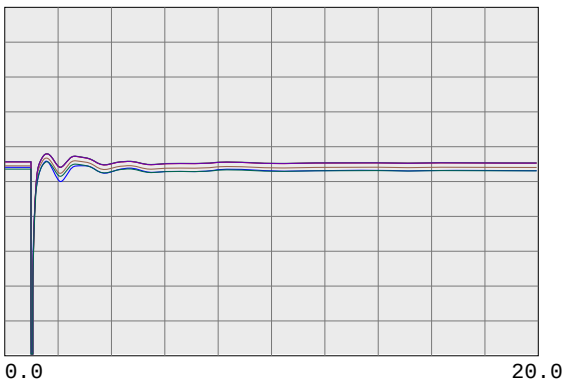
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



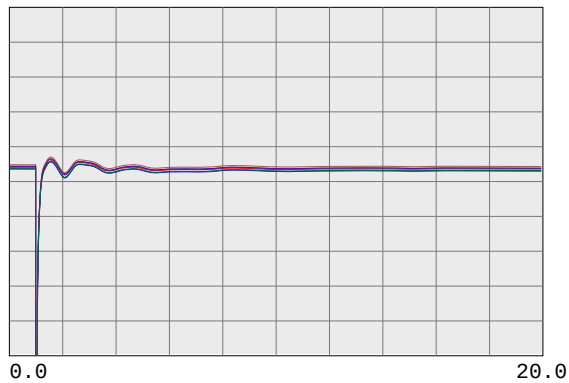
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



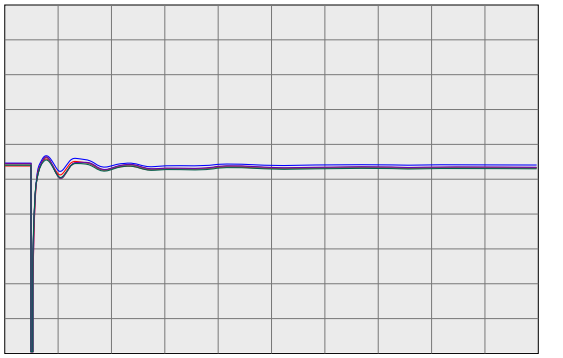
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



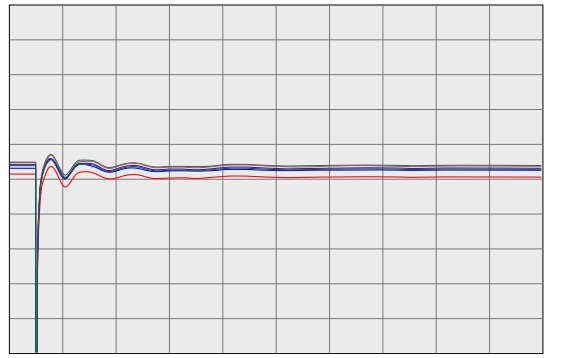
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

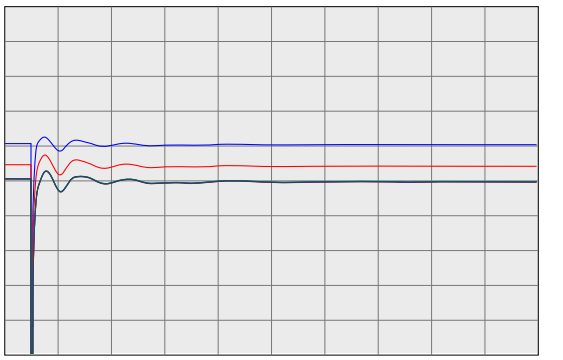
230-KV SYSTEM VOLTAGES



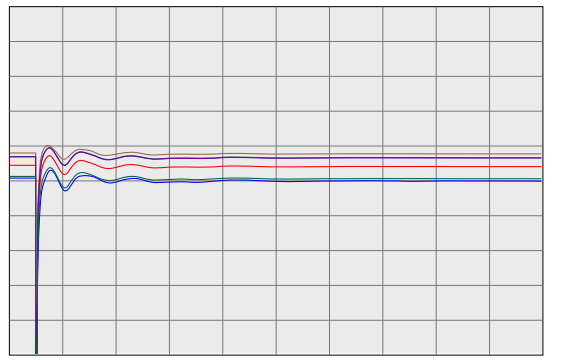
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



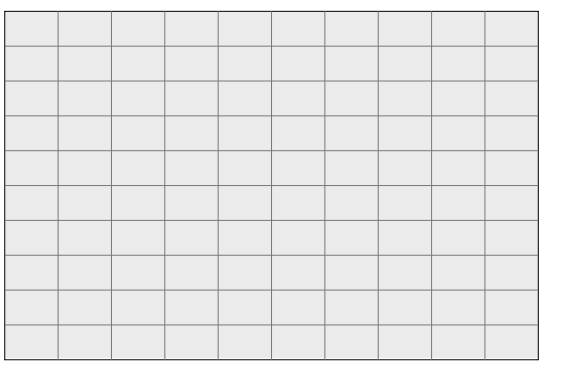
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

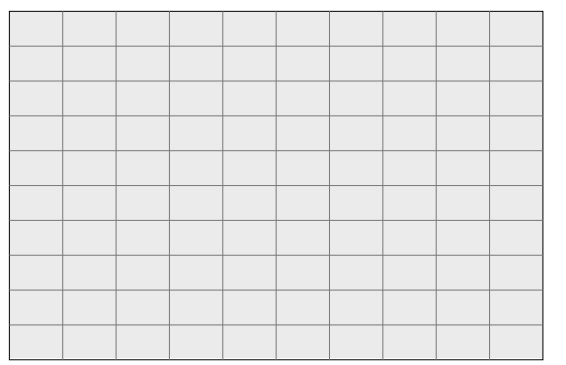


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



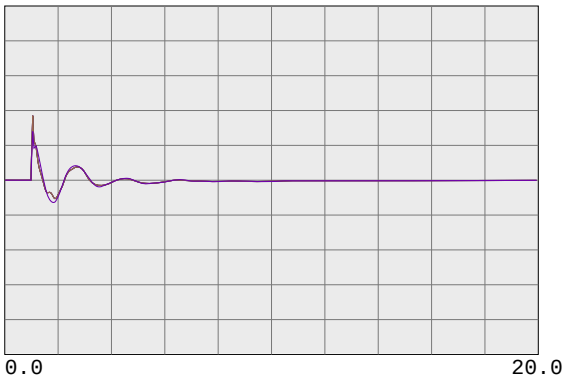
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



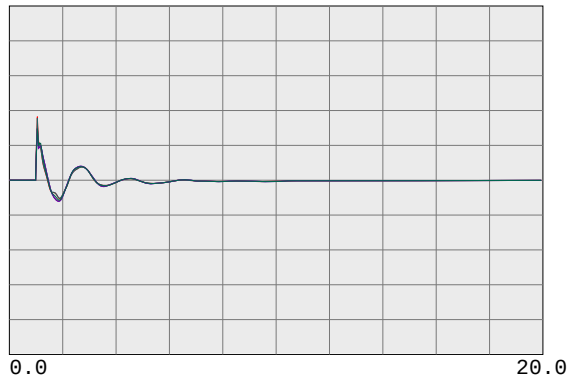


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

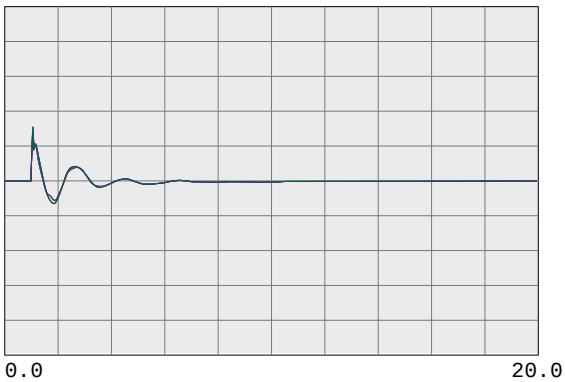
230-KV SYSTEM FREQUENCIES



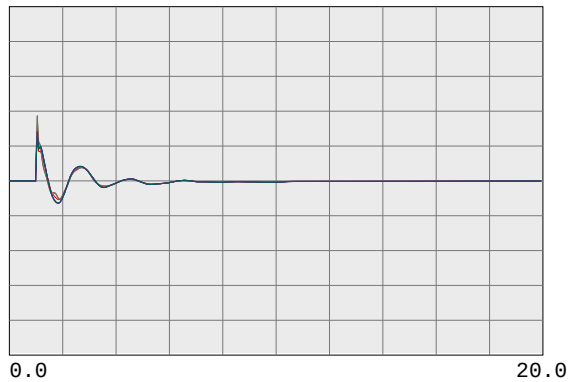
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



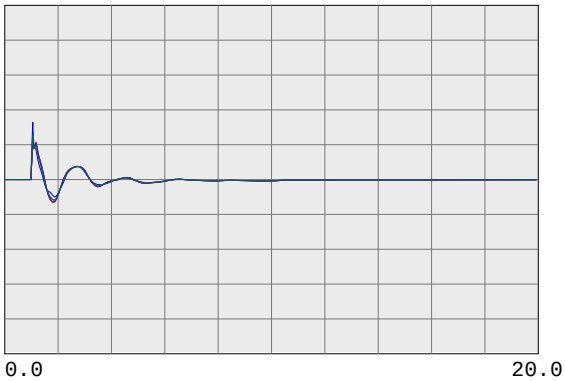
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



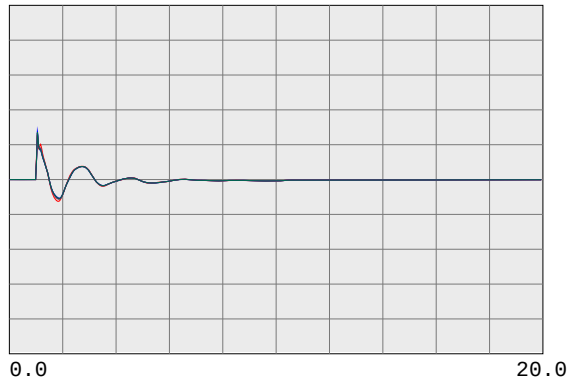
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



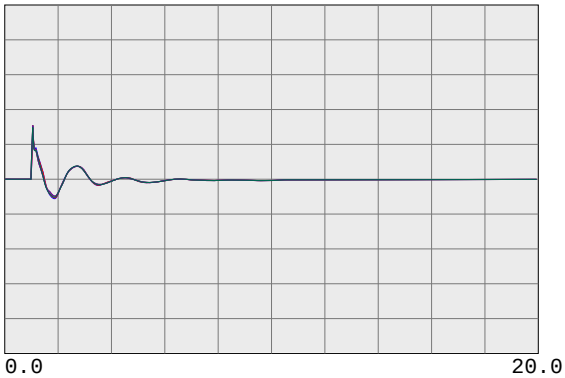
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



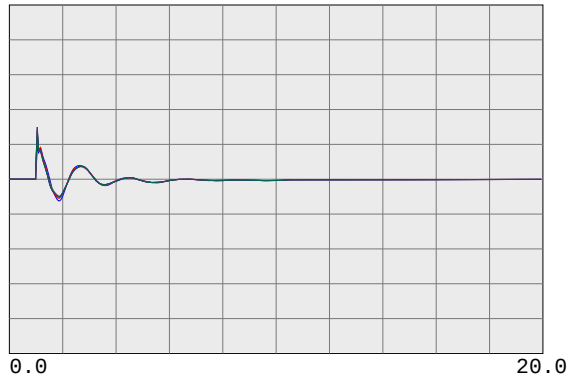
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

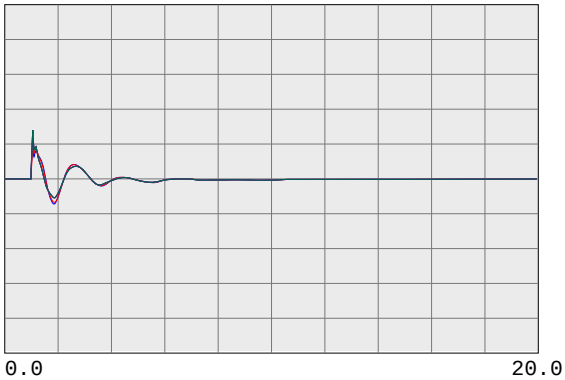
230-KV SYSTEM FREQUENCIES



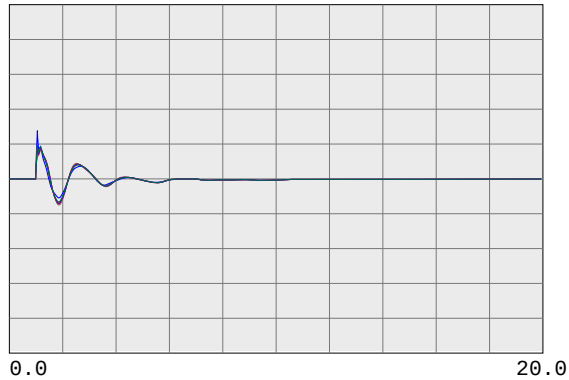
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



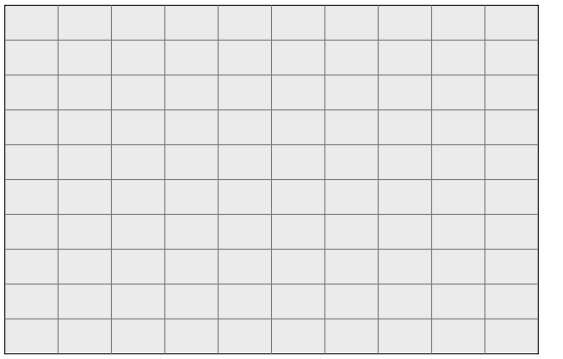
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

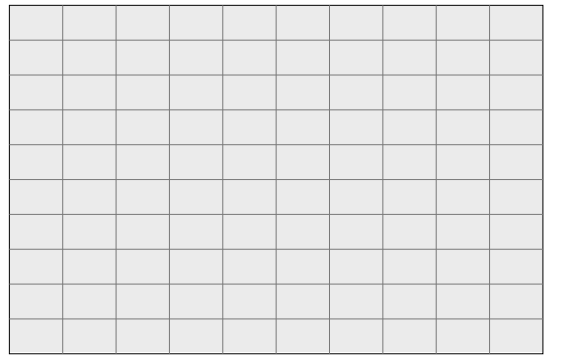


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



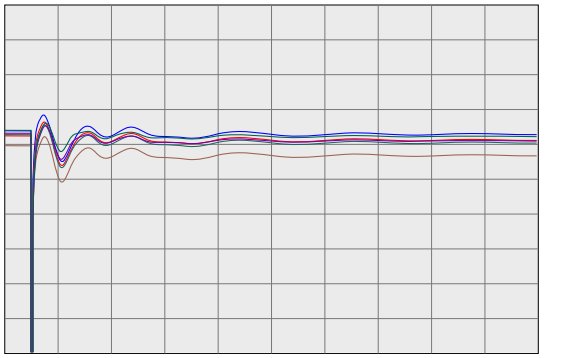
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



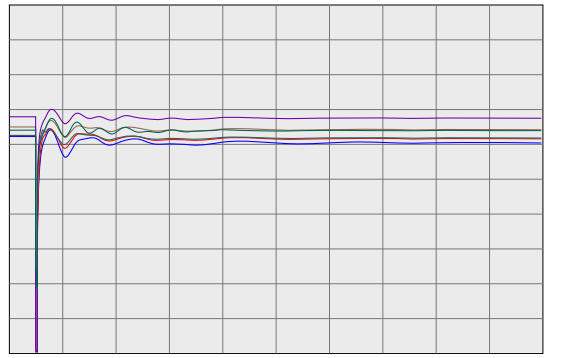


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

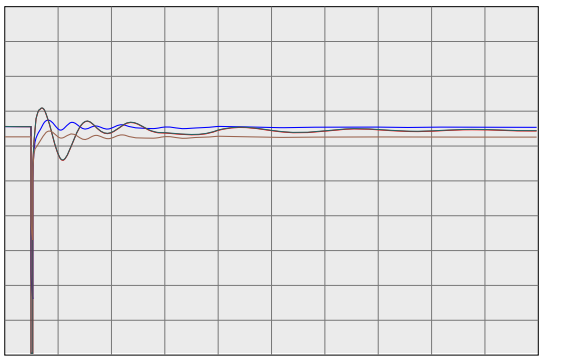
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



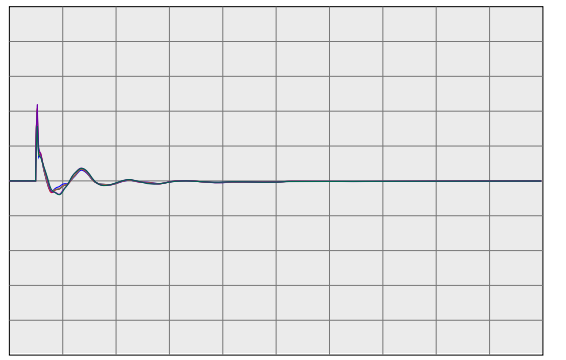
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



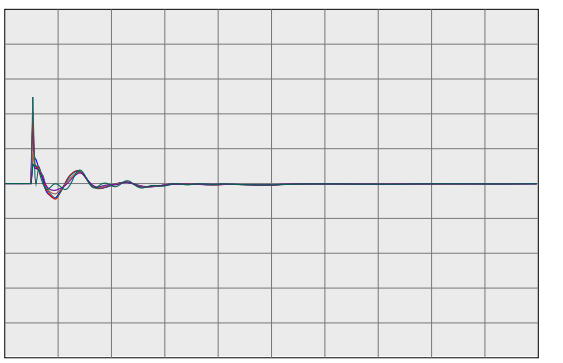
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



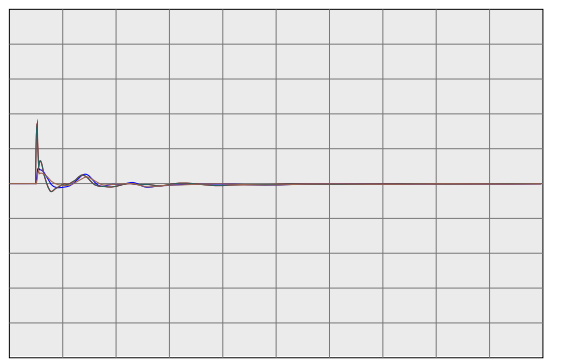
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

HS13_PST_WLLW_PSS_B-102_N-1_TABLE_MT-TESLA_500.chf

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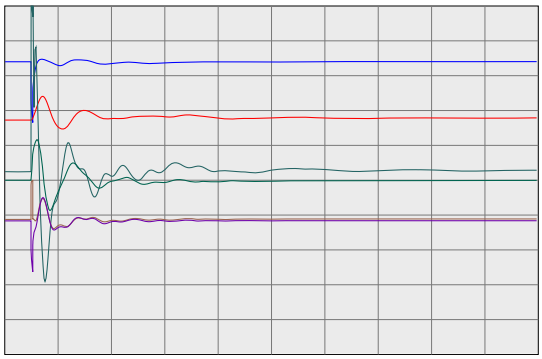
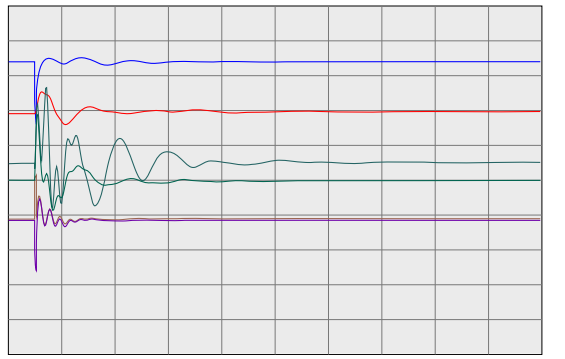
Thu Feb 26 18:39:13 2009

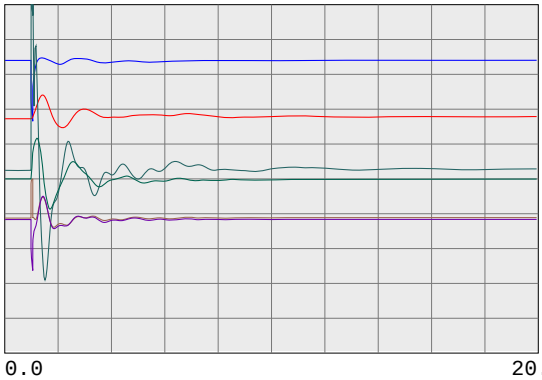
WILLOW PASS GENERATION PLANT



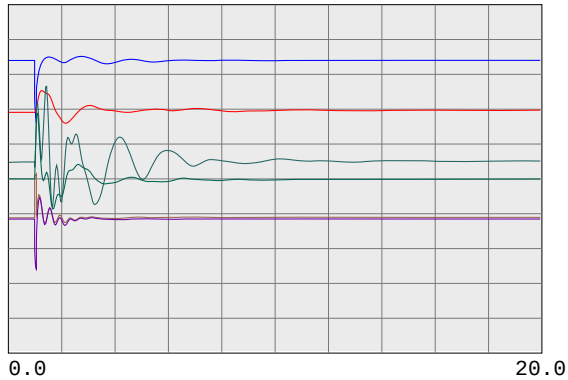
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



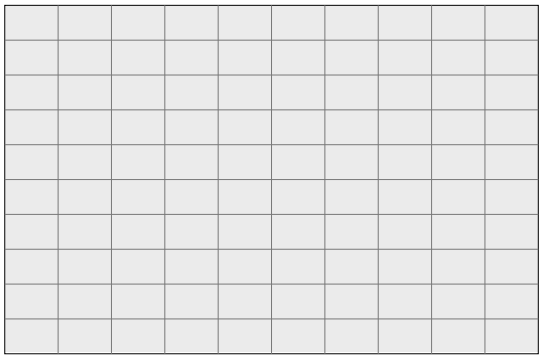
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

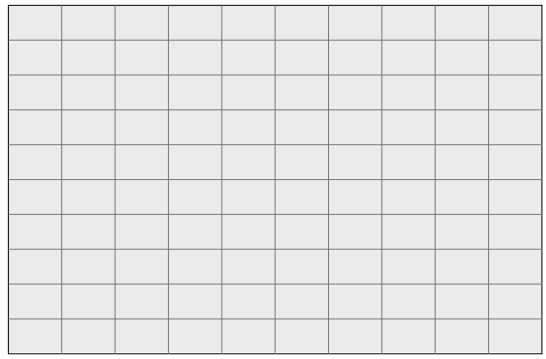


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



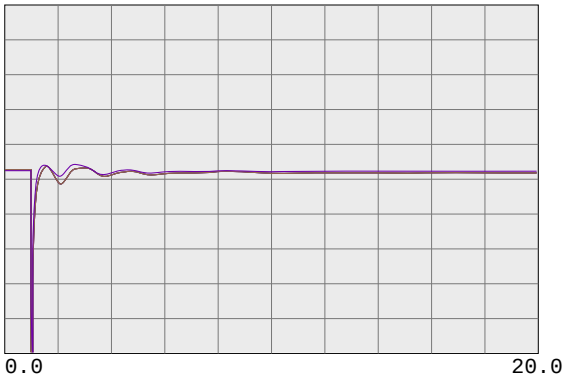
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



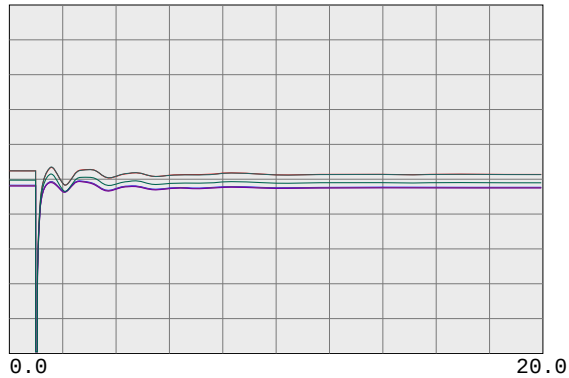


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

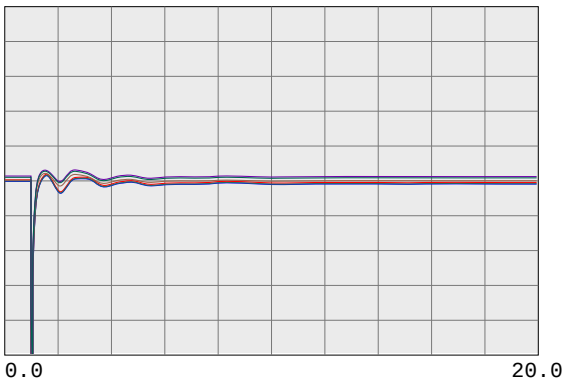
230-KV SYSTEM VOLTAGES



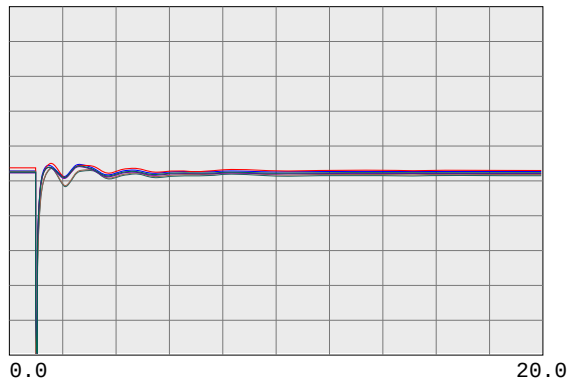
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



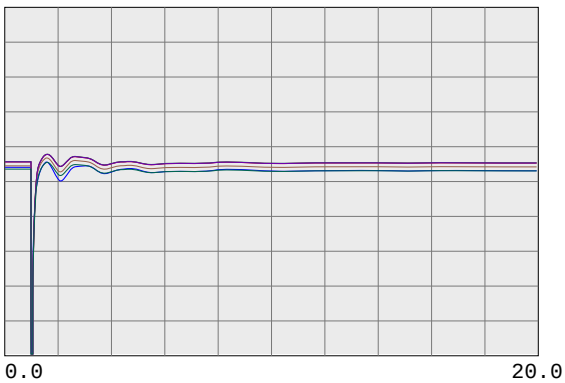
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



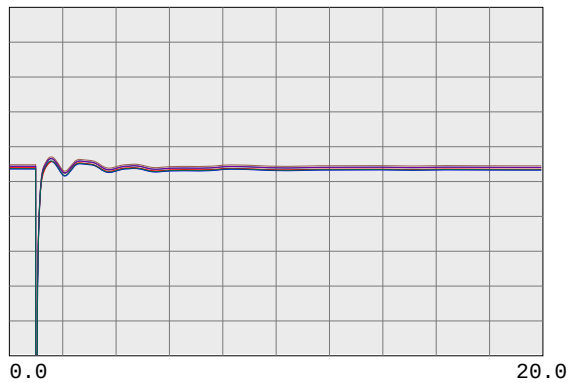
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



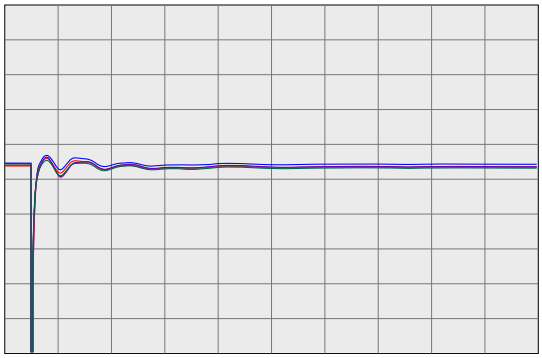
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

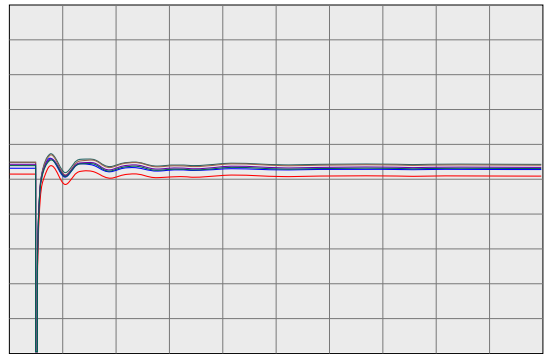
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

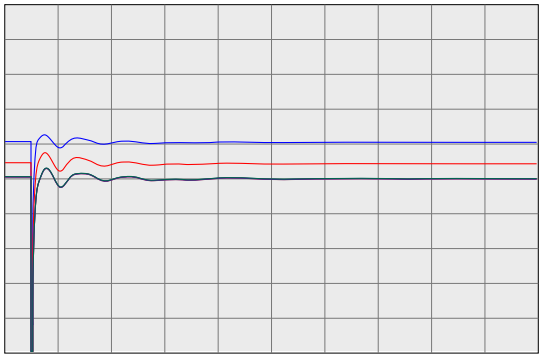
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

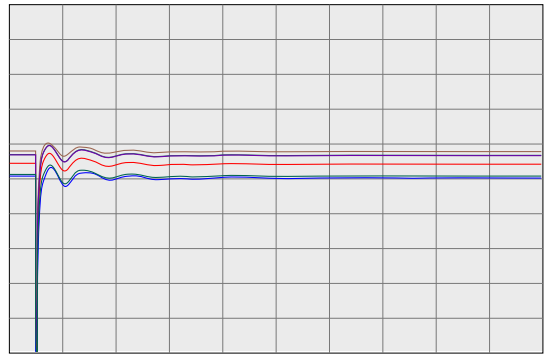
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

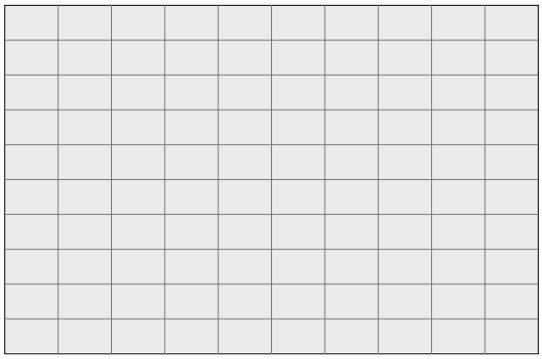
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

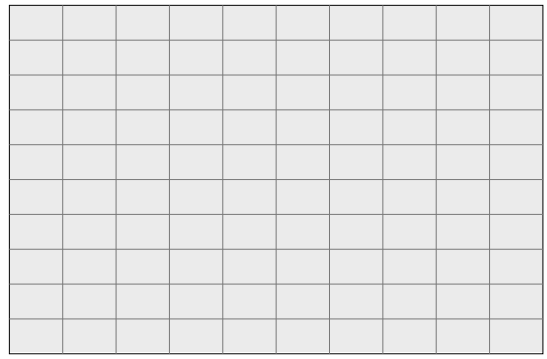


0.0 20.0

Time(sec)

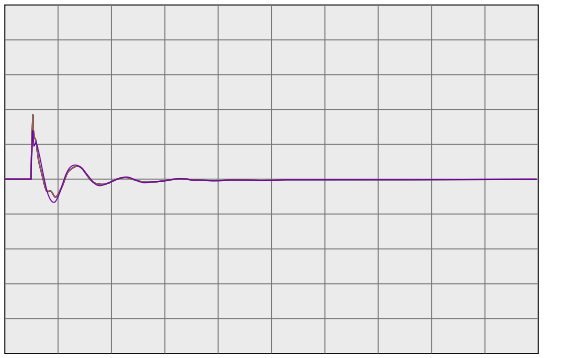
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



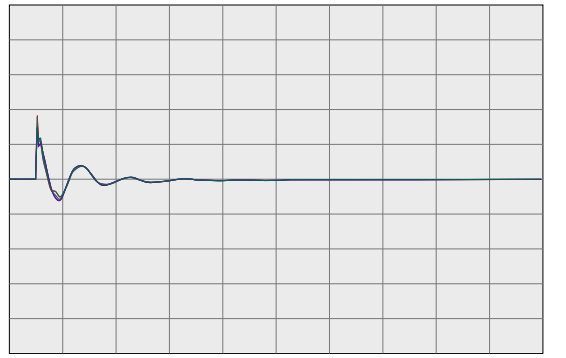


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

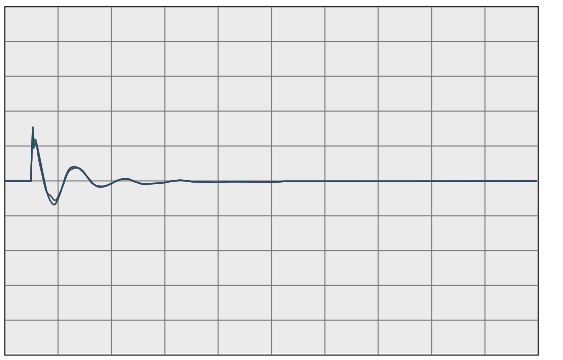
230-KV SYSTEM FREQUENCIES



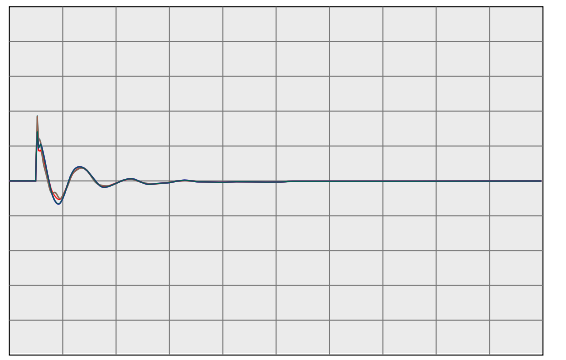
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



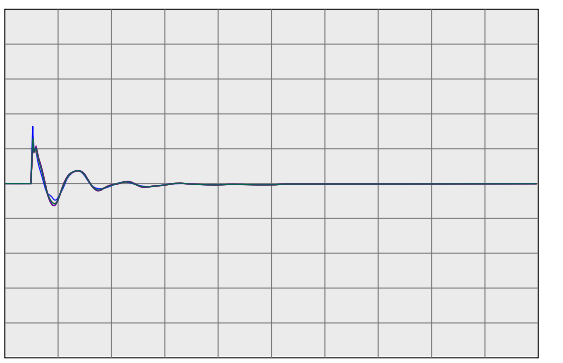
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



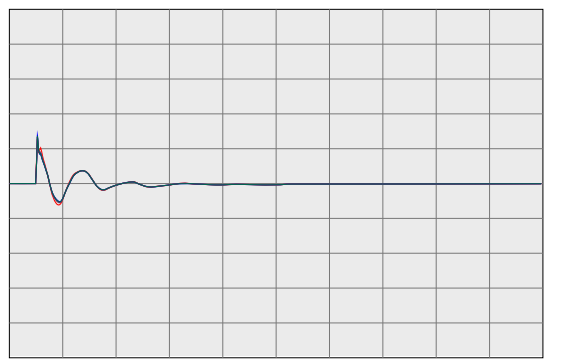
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



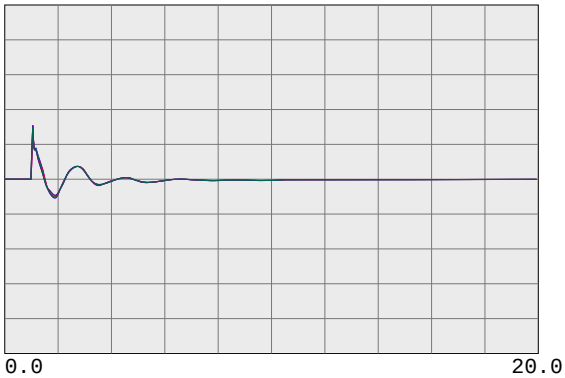
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



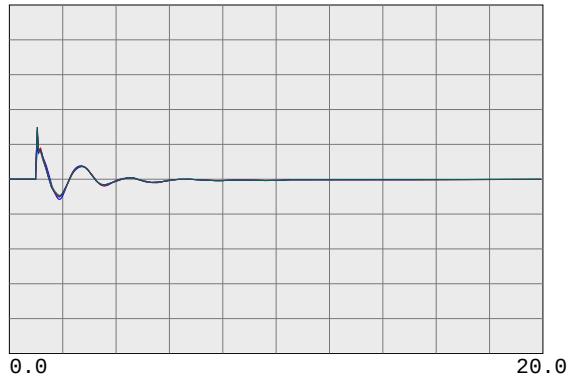
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

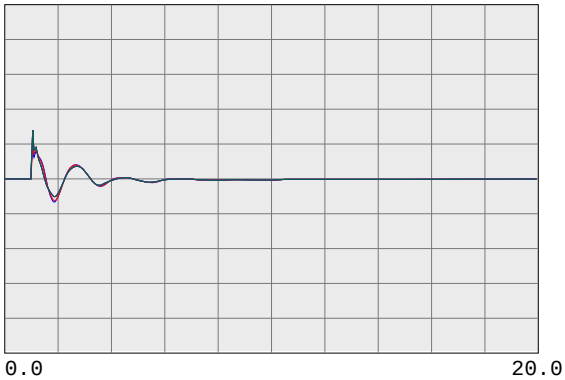
230-KV SYSTEM FREQUENCIES



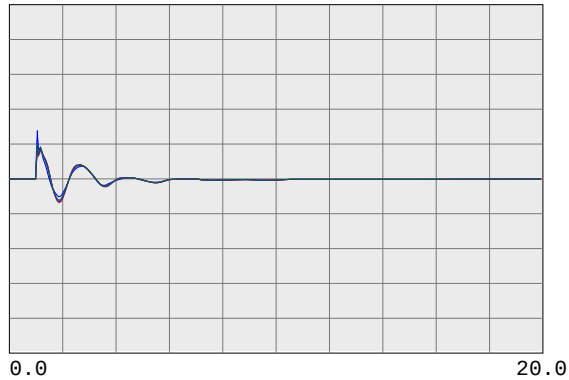
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



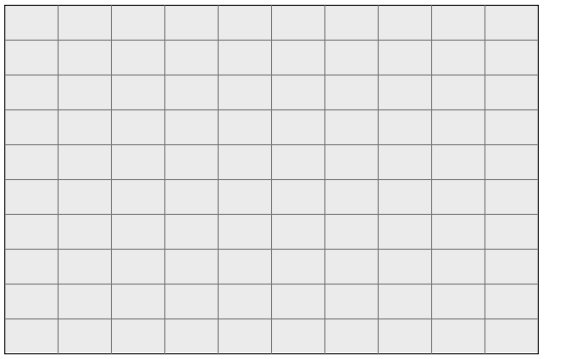
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

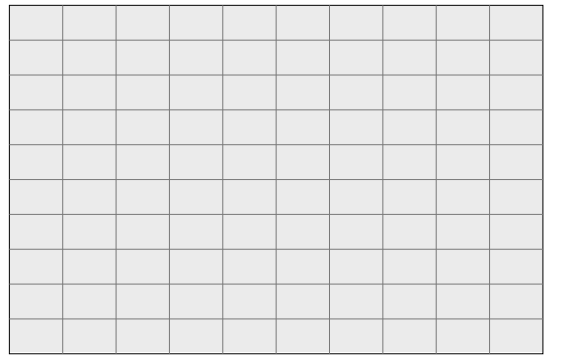


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



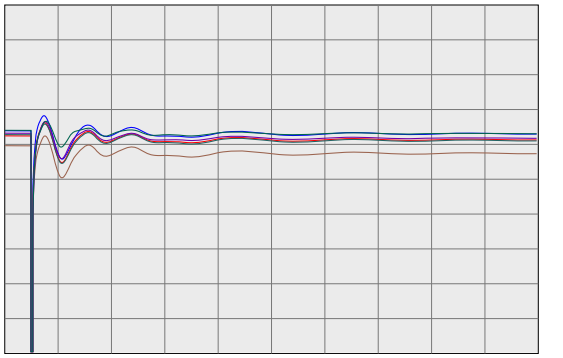
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



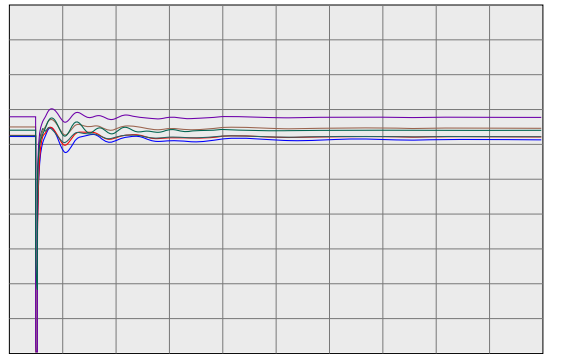


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

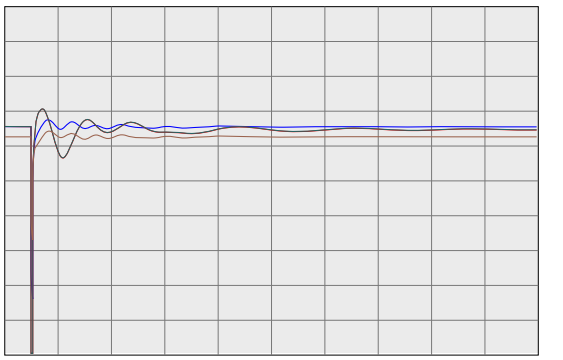
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



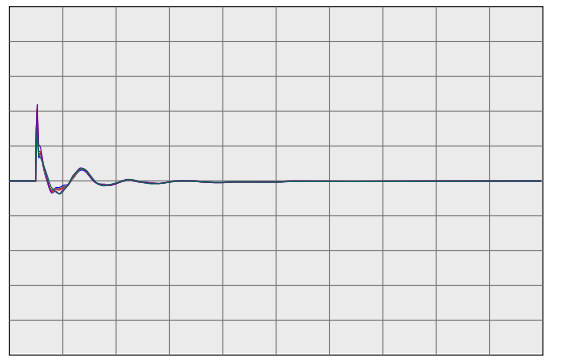
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



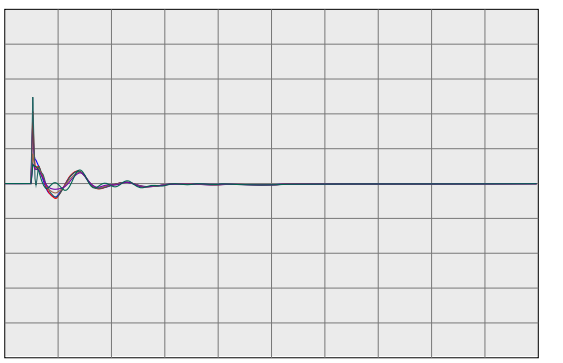
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



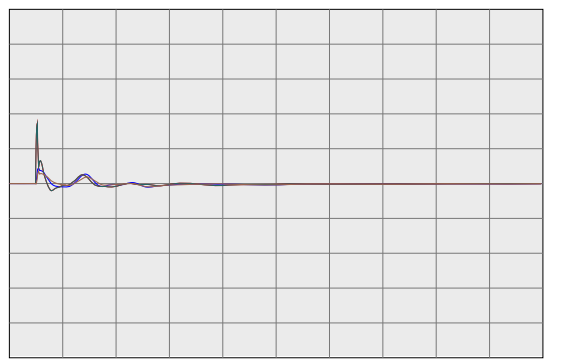
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



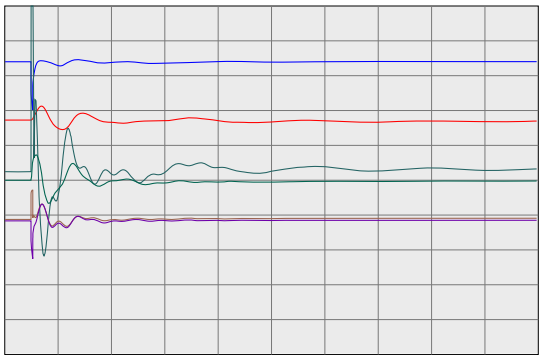
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



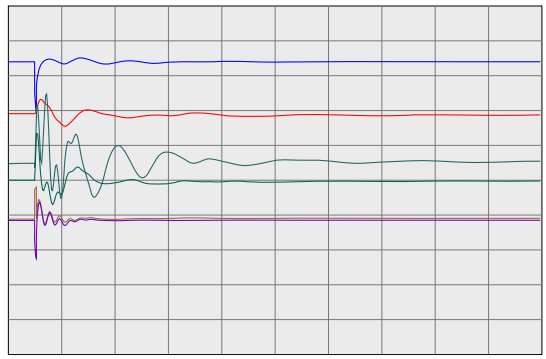
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

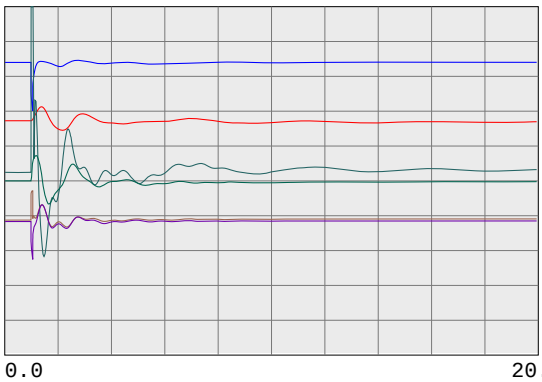
WILLOW PASS GENERATION PLANT



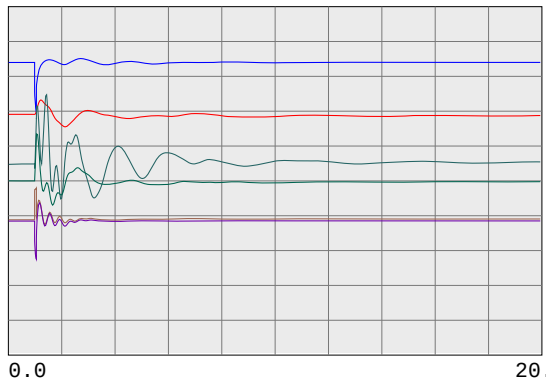
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



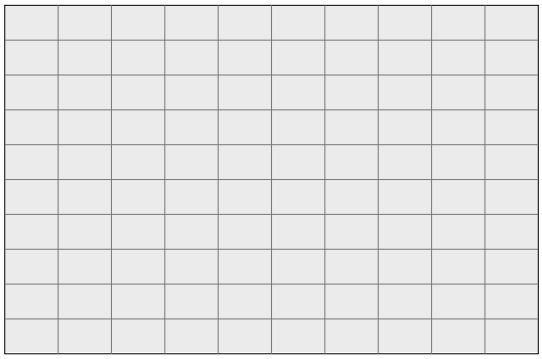
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

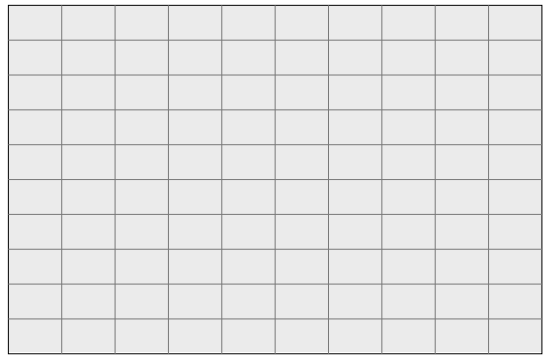


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



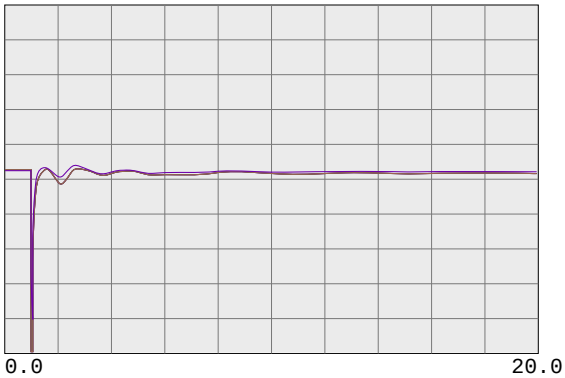
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



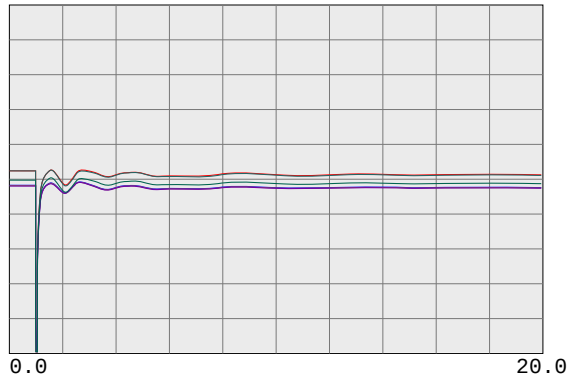


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

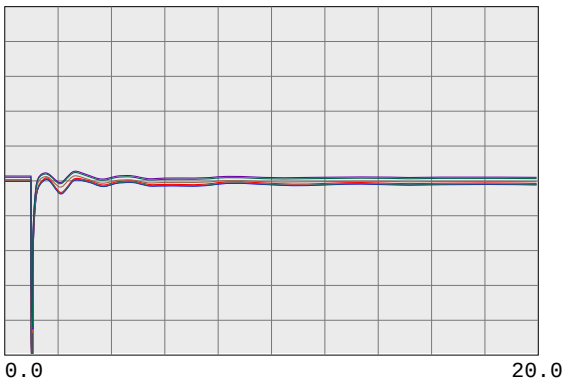
230-KV SYSTEM VOLTAGES



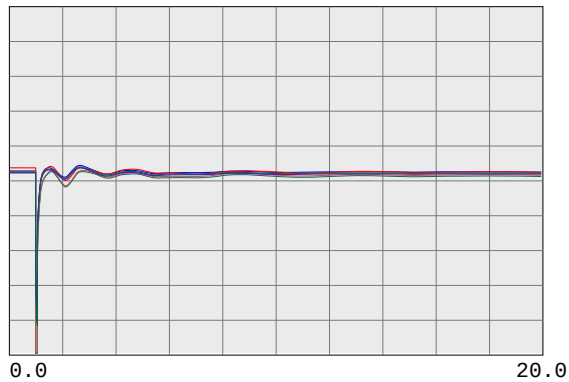
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



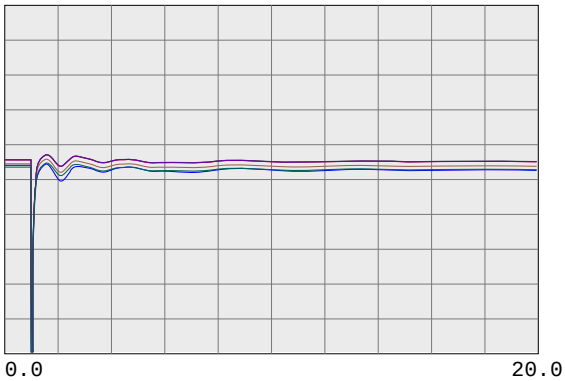
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



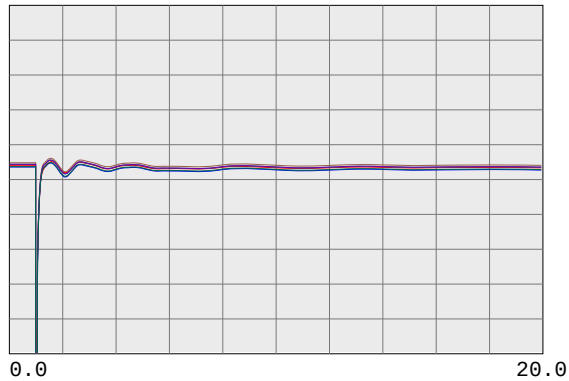
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



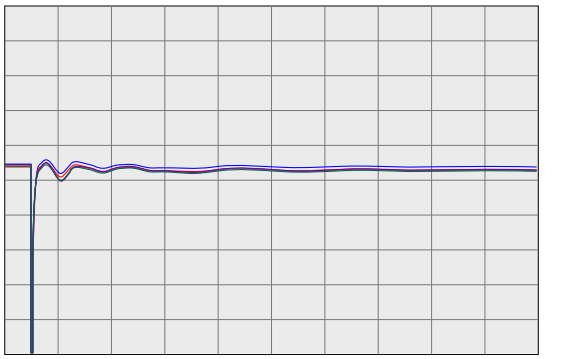
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



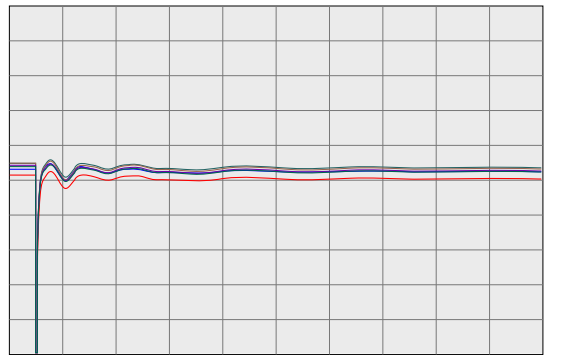
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

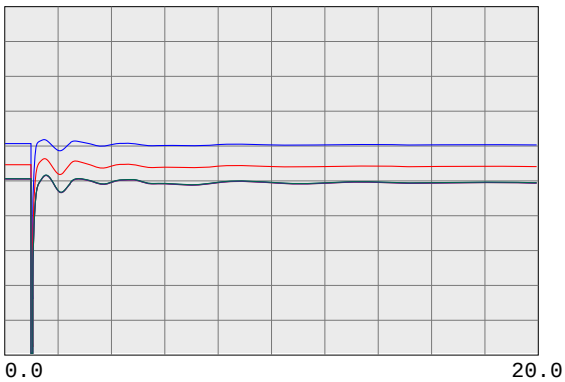
230-KV SYSTEM VOLTAGES



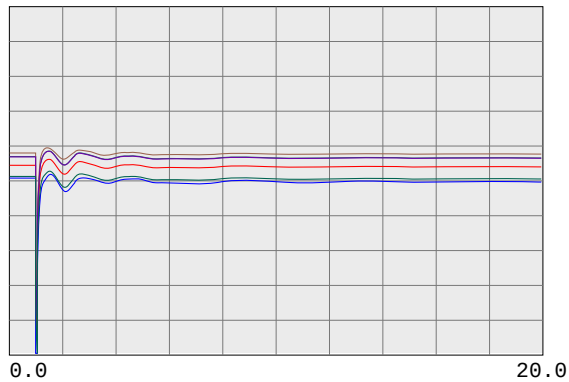
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



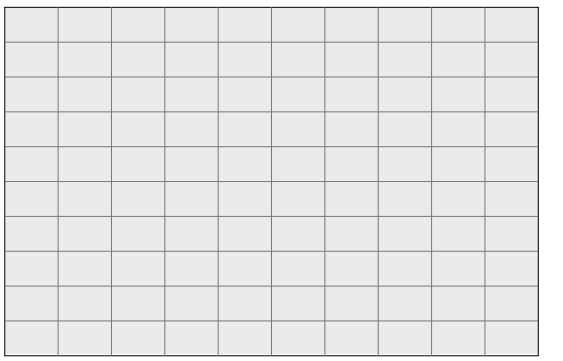
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

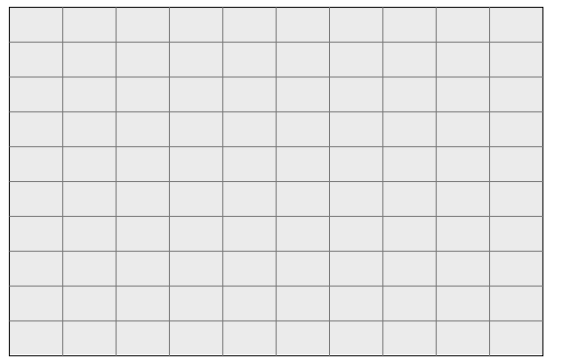


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



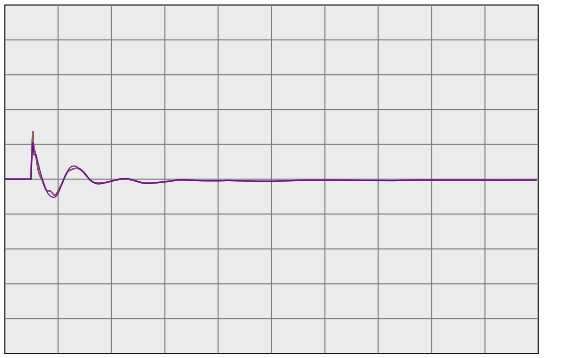
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



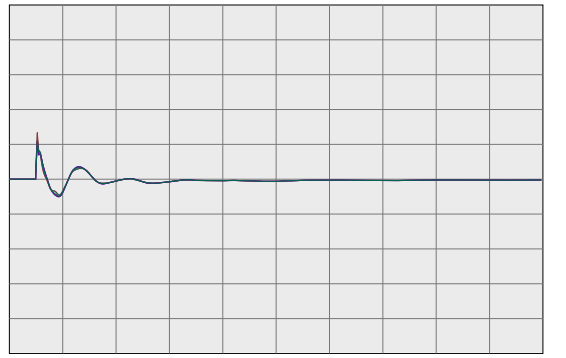


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

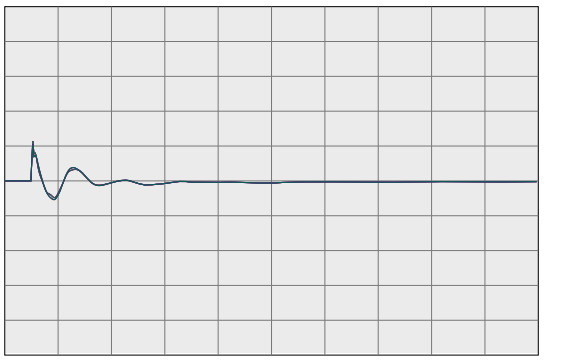
230-KV SYSTEM FREQUENCIES



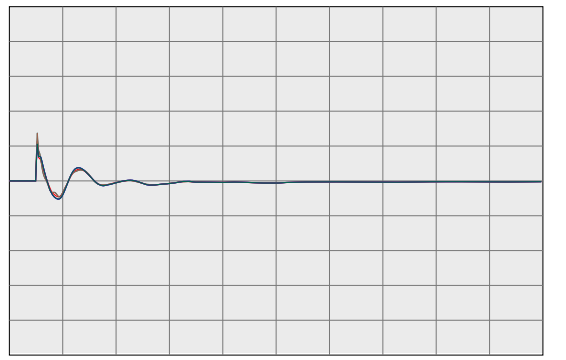
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



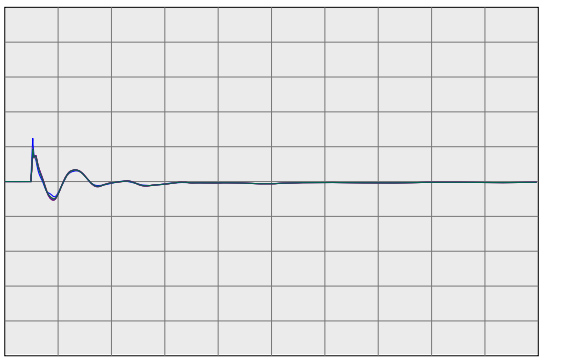
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



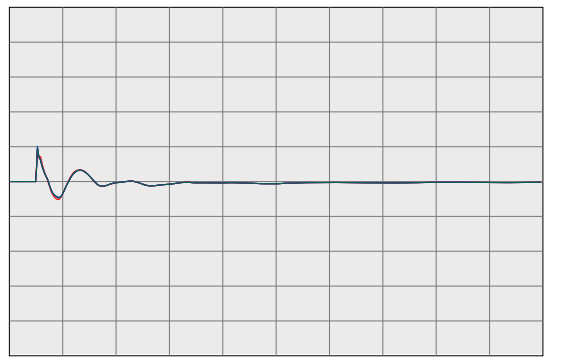
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



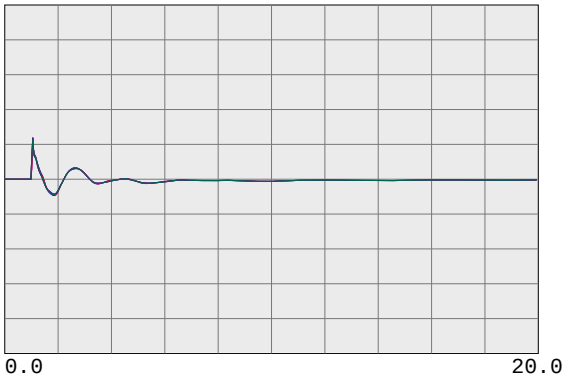
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



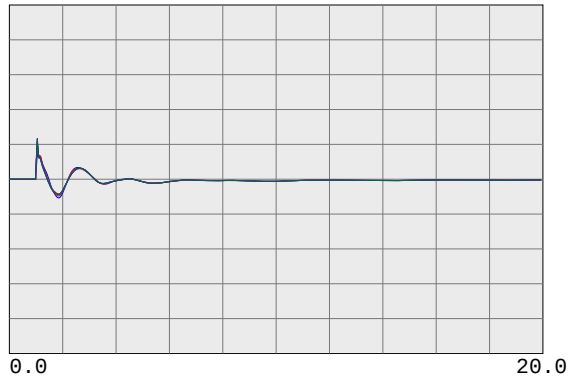
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

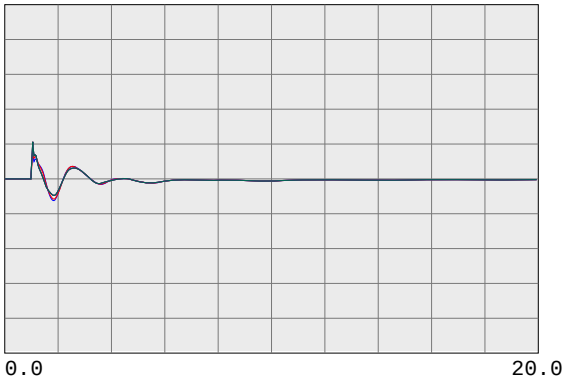
230-KV SYSTEM FREQUENCIES



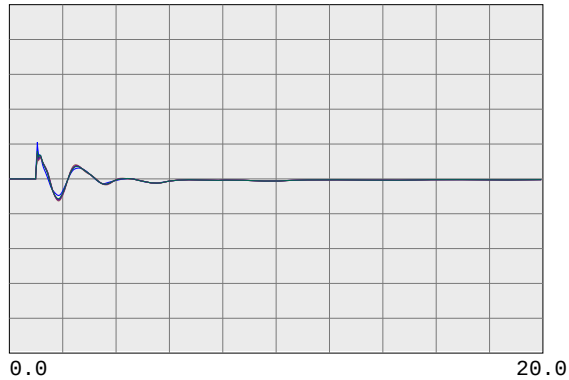
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



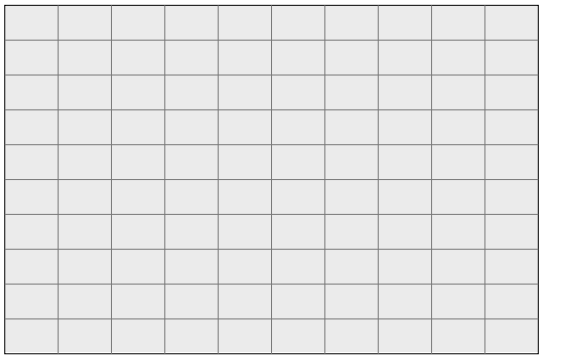
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

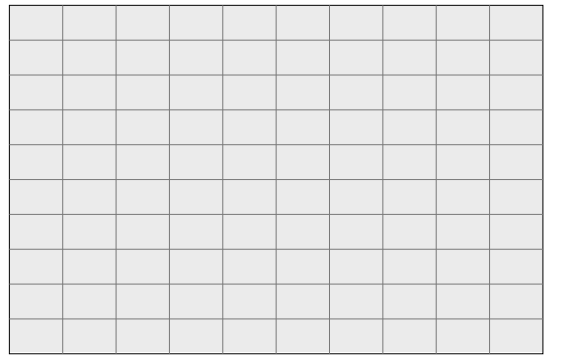


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



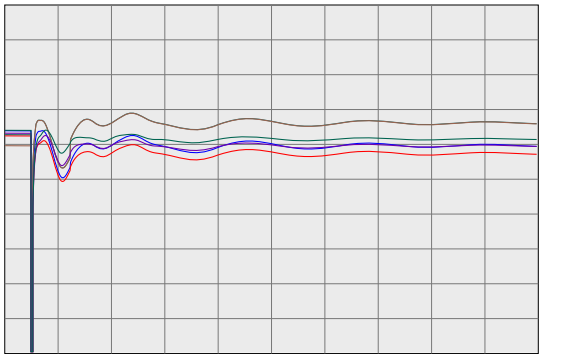
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



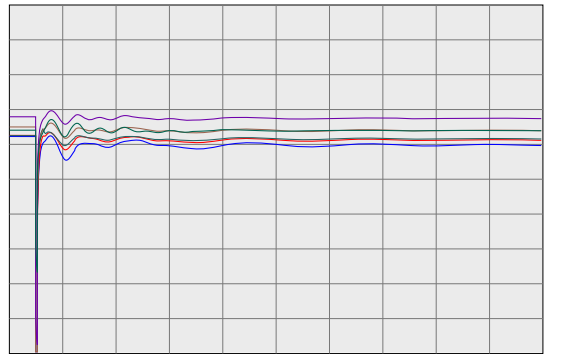


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

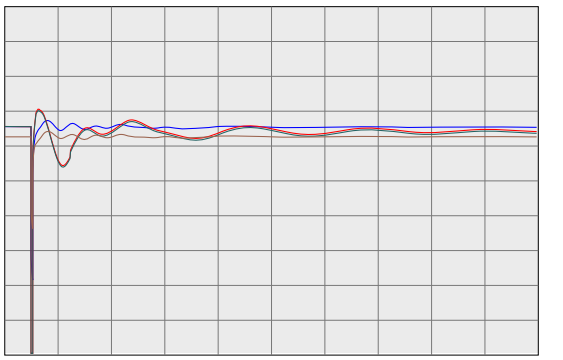
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



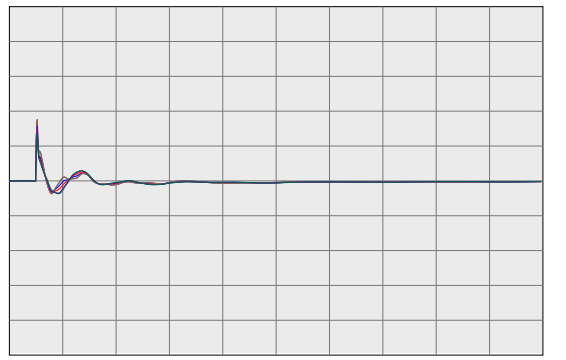
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



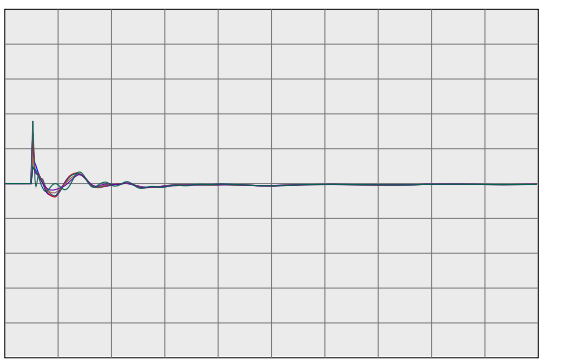
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



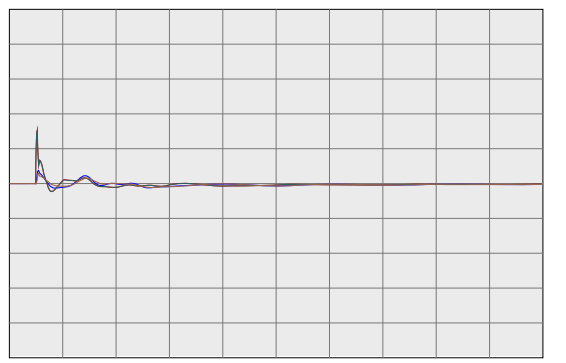
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



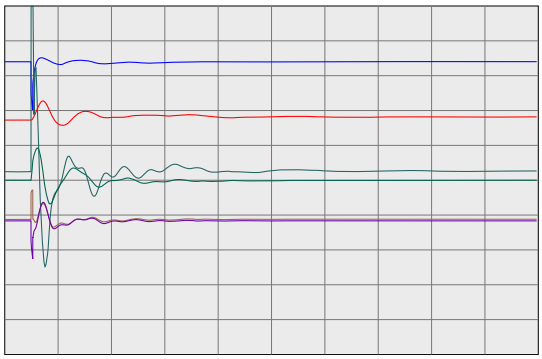
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



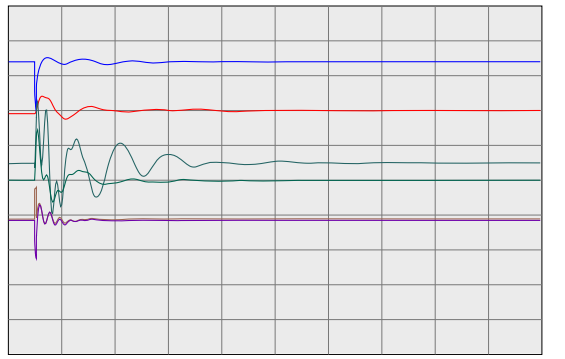
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

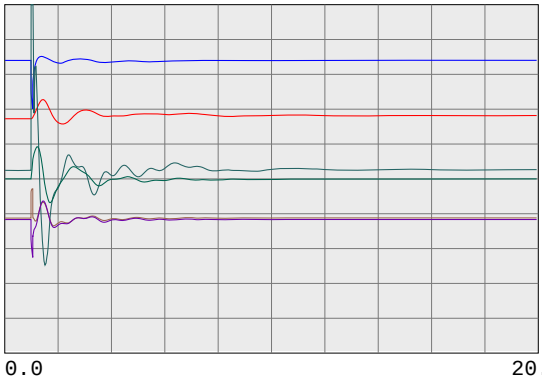
WILLOW PASS GENERATION PLANT



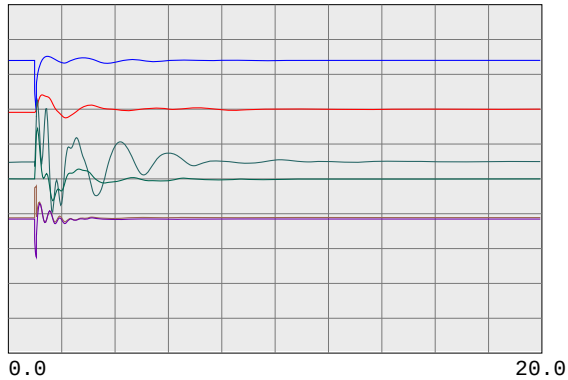
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



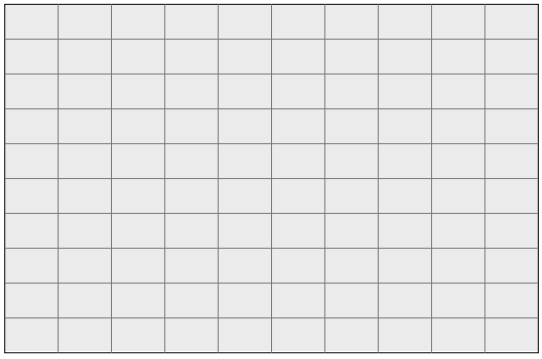
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

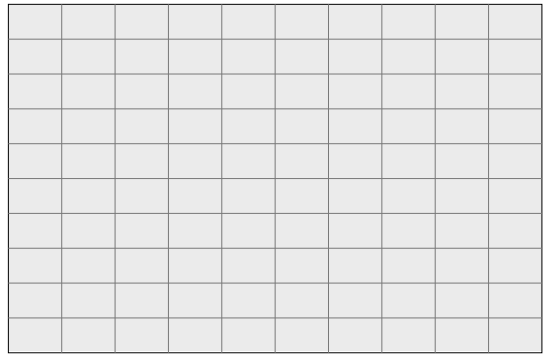


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



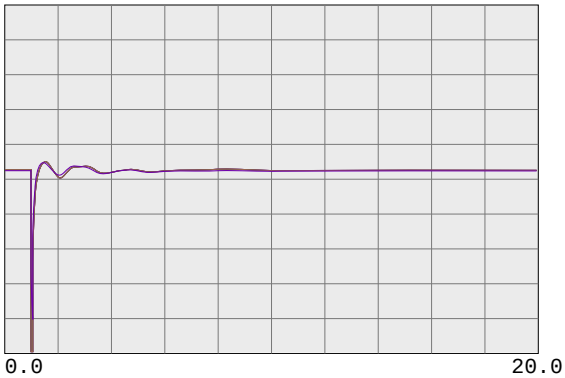
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



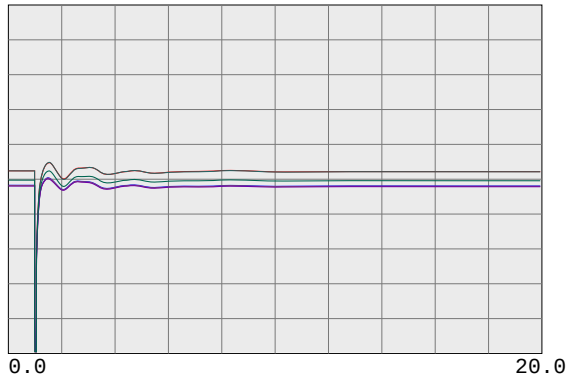


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

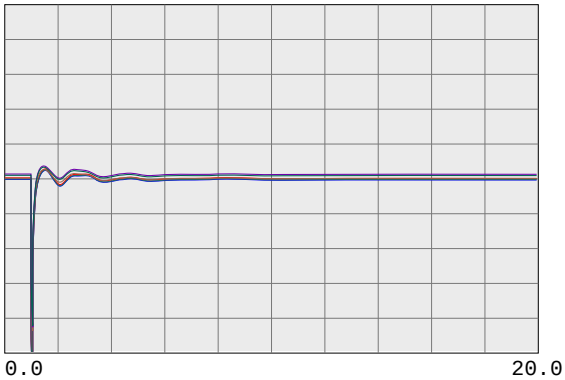
230-KV SYSTEM VOLTAGES



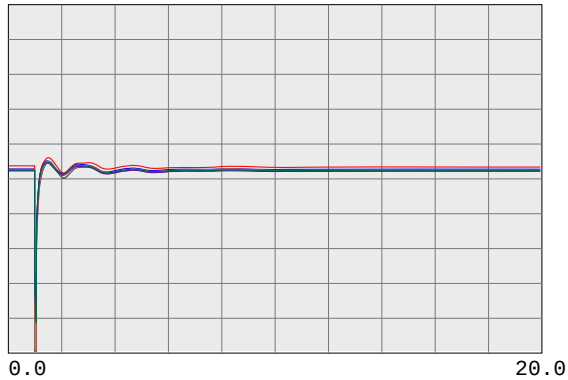
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



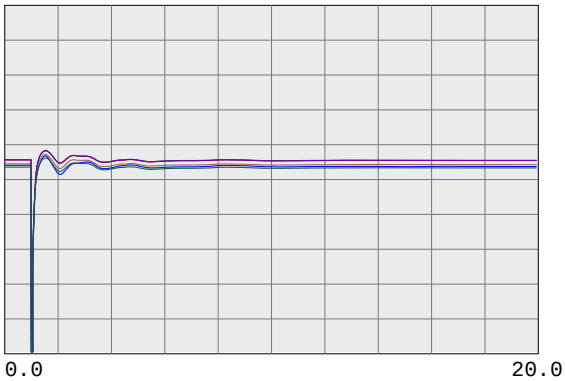
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



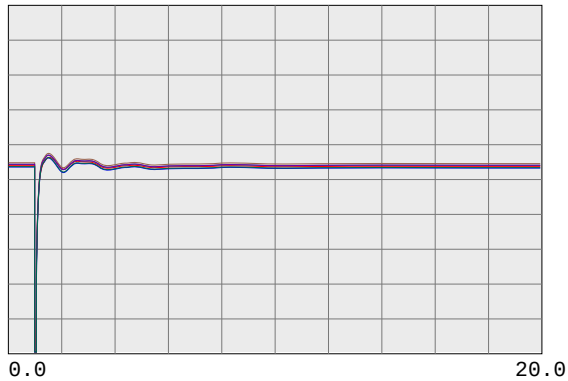
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



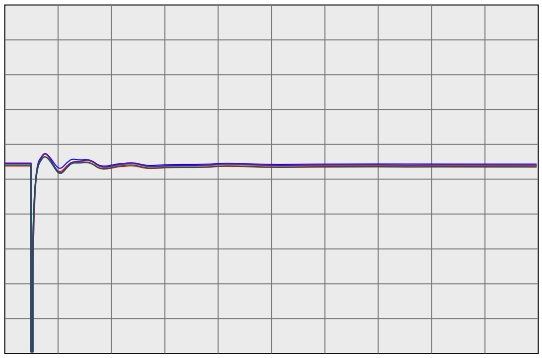
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

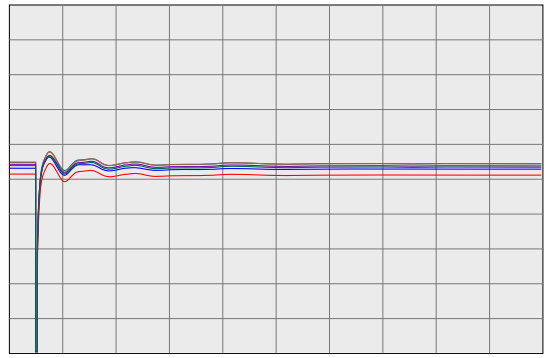
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

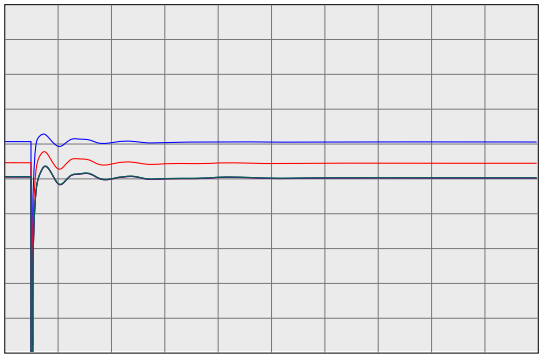
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

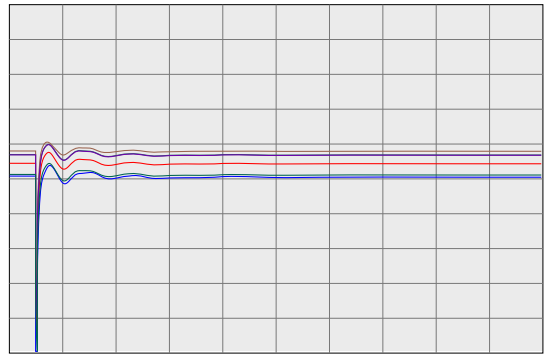
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

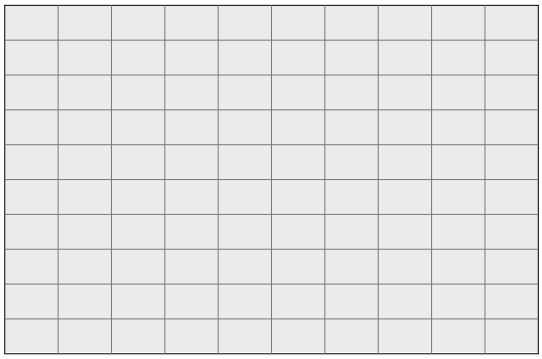
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

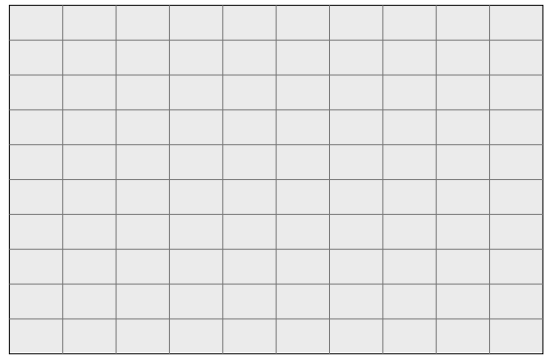


0.0 20.0

Time(sec)

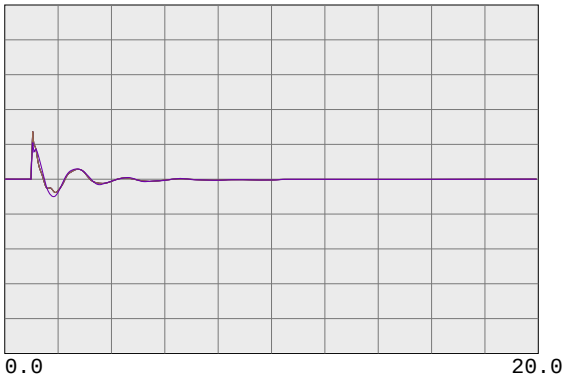
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



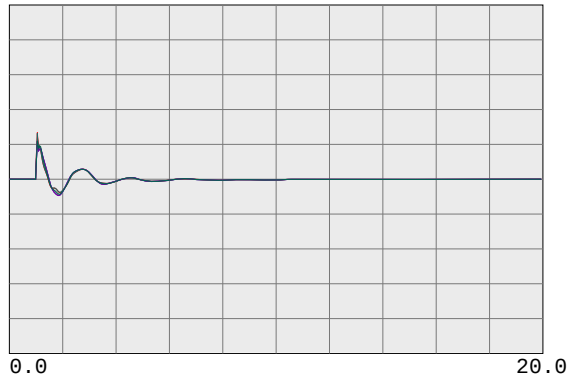


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

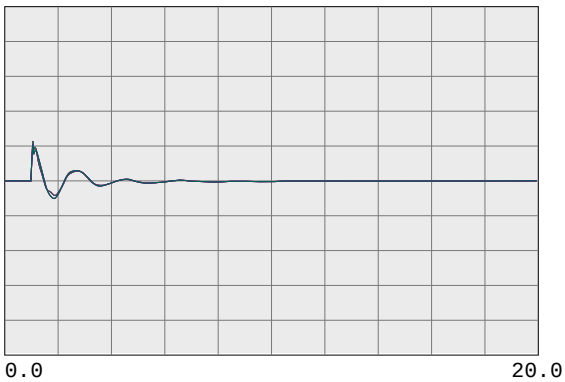
230-KV SYSTEM FREQUENCIES



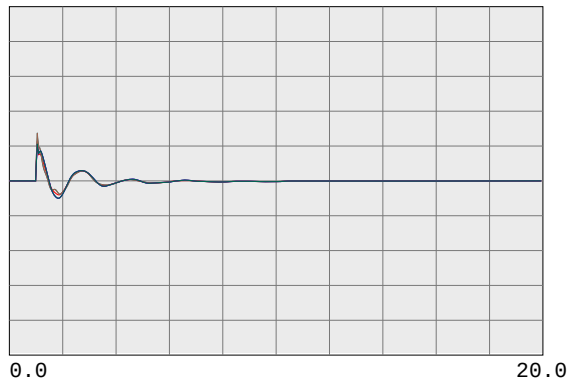
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



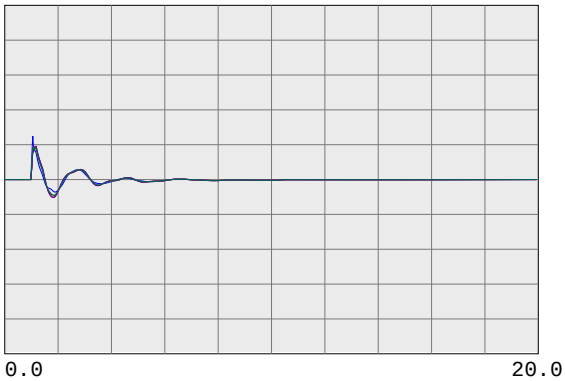
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



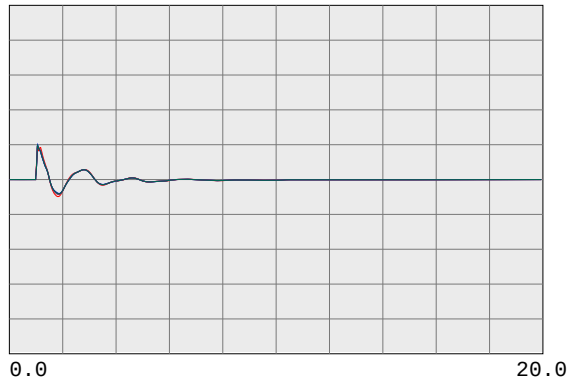
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



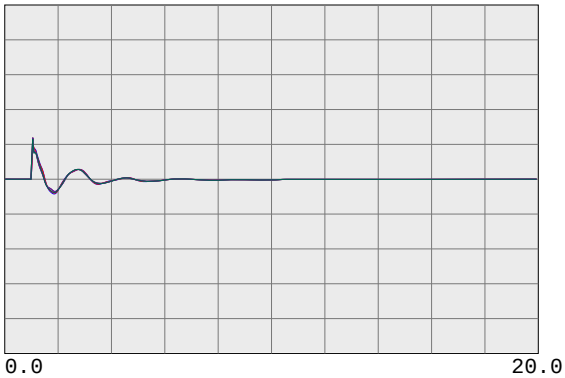
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



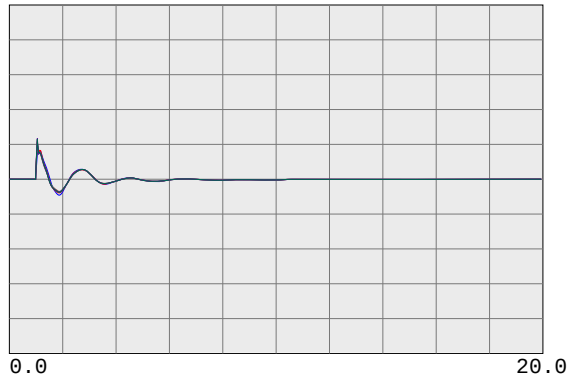
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

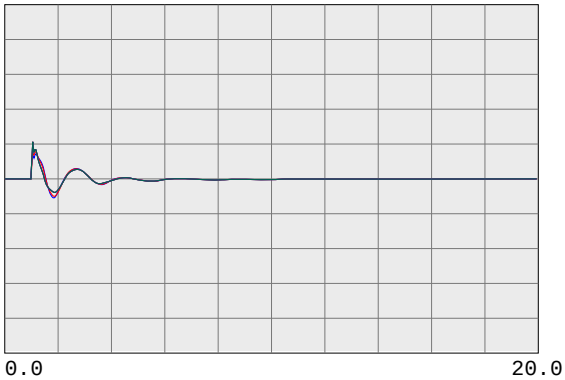
230-KV SYSTEM FREQUENCIES



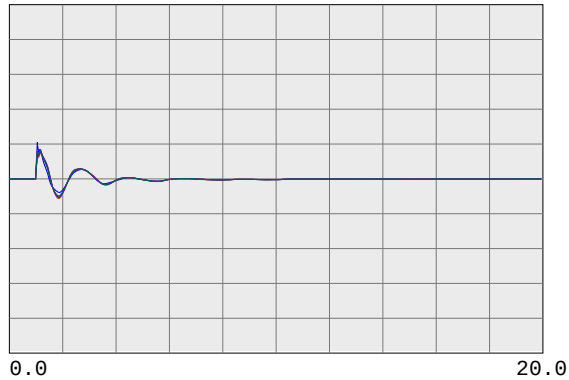
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



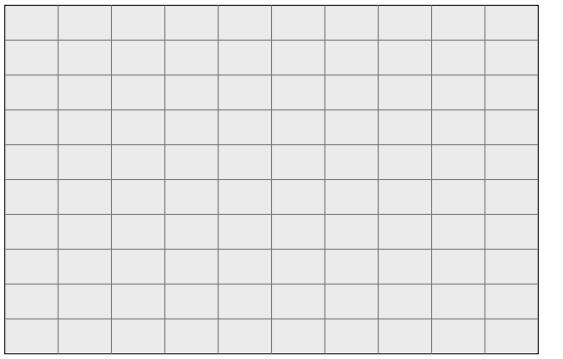
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

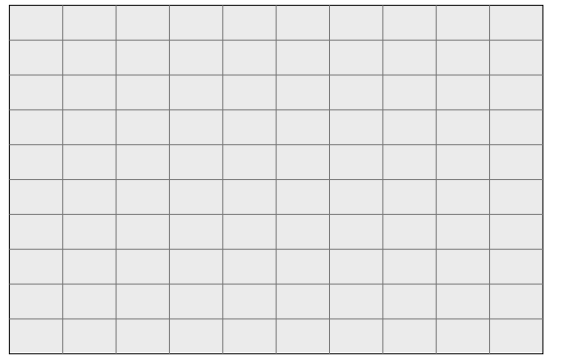


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



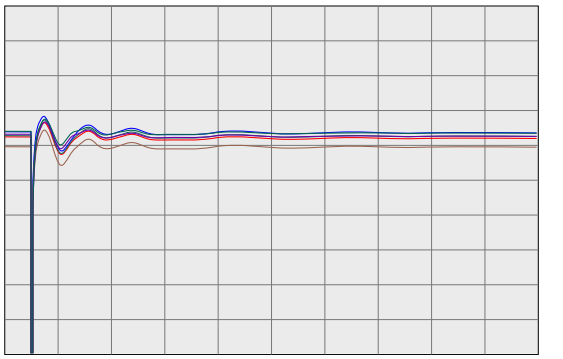
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



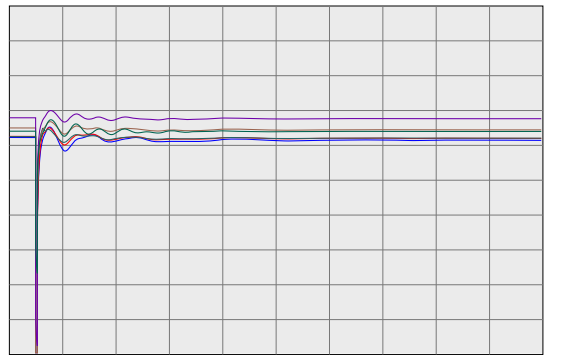


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

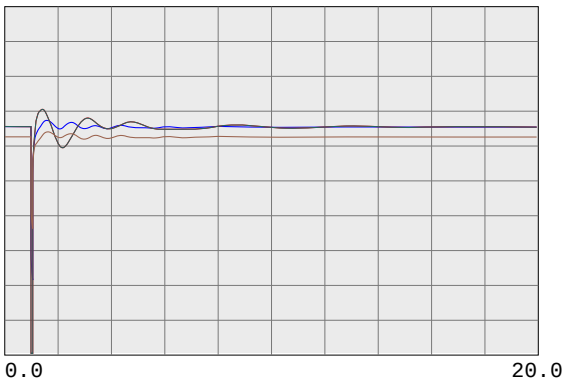
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



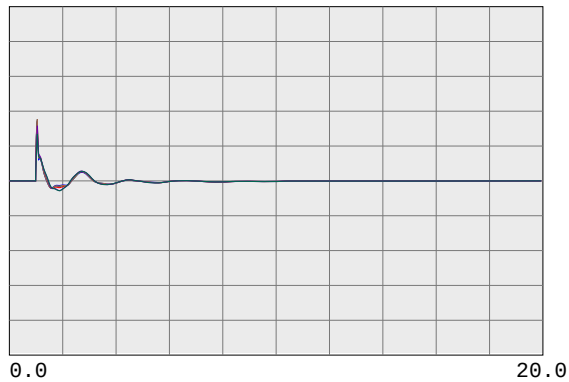
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



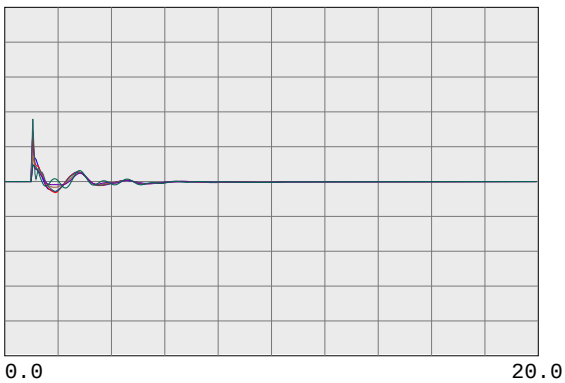
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



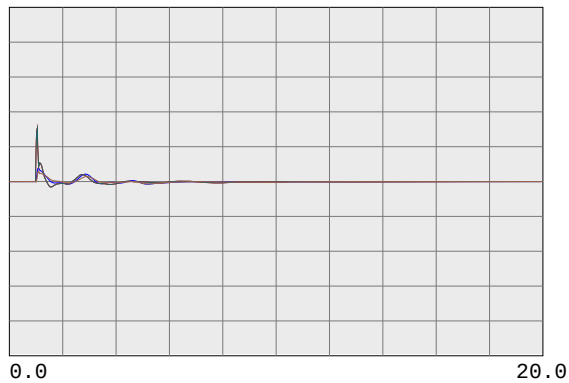
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



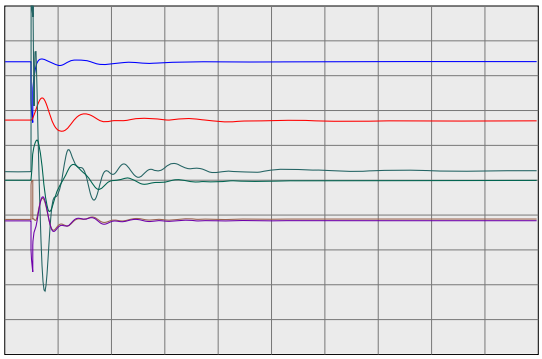
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



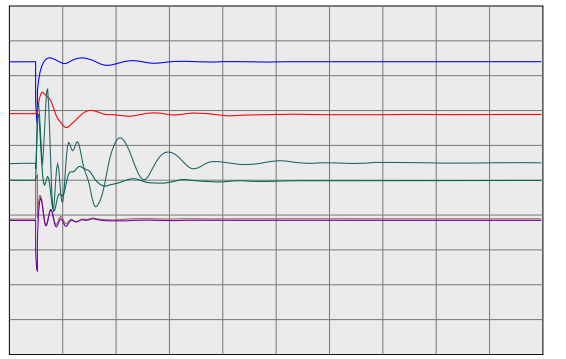
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

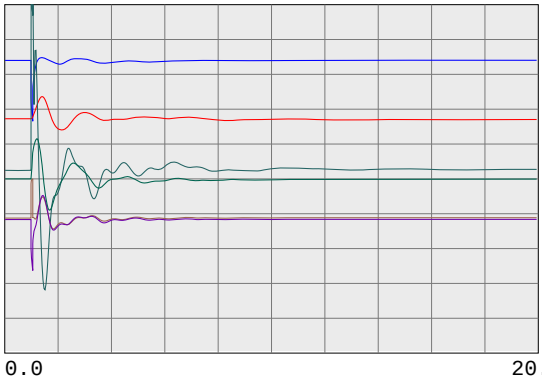
WILLOW PASS GENERATION PLANT



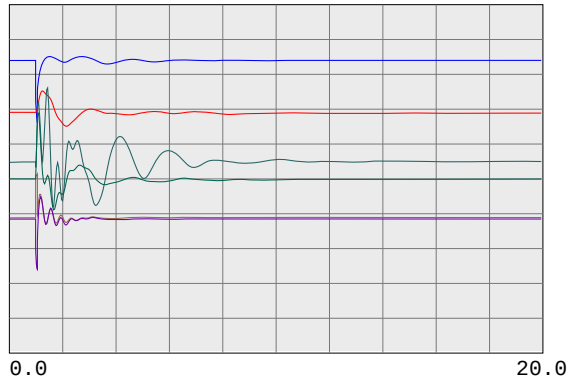
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



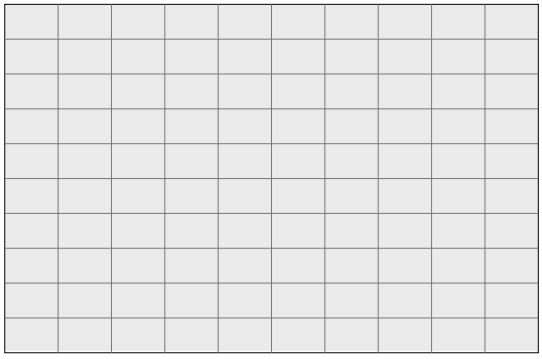
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

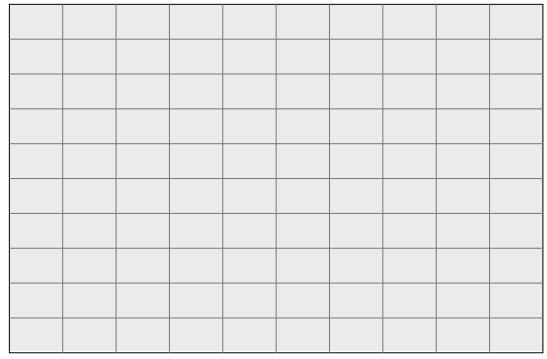


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



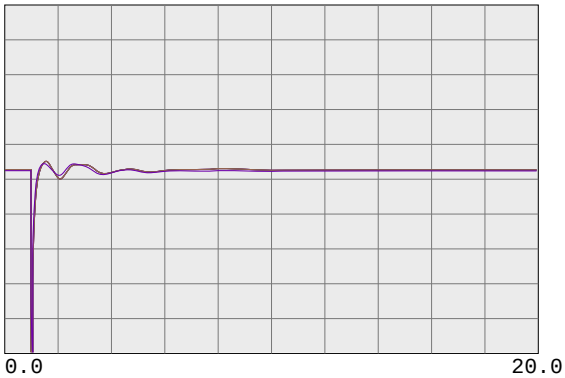
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



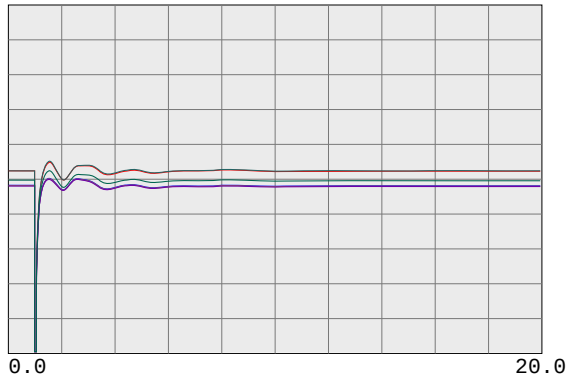


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

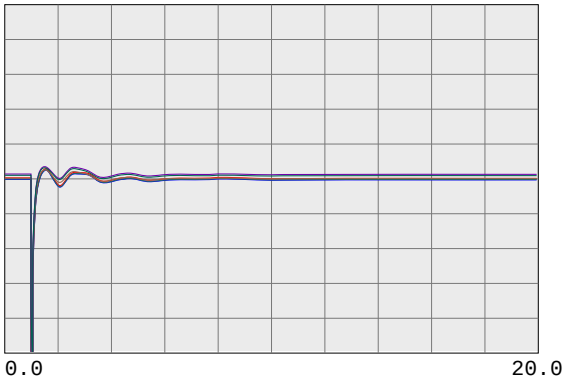
230-KV SYSTEM VOLTAGES



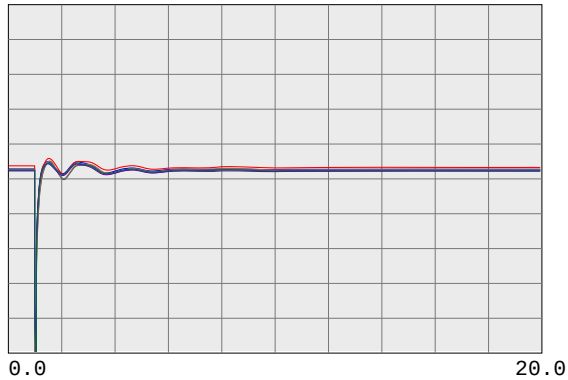
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



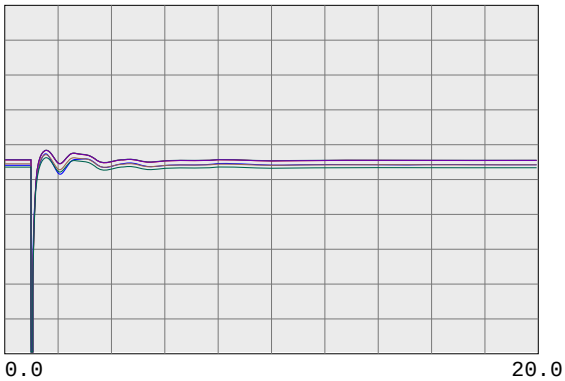
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



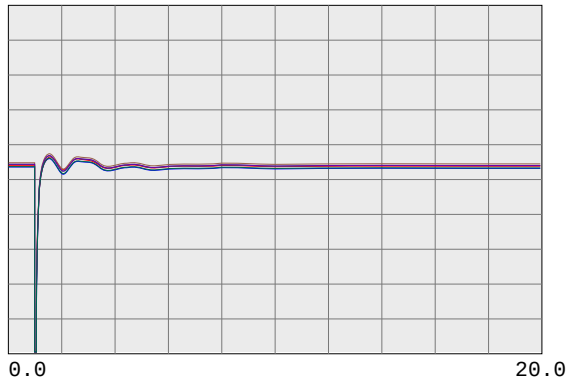
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



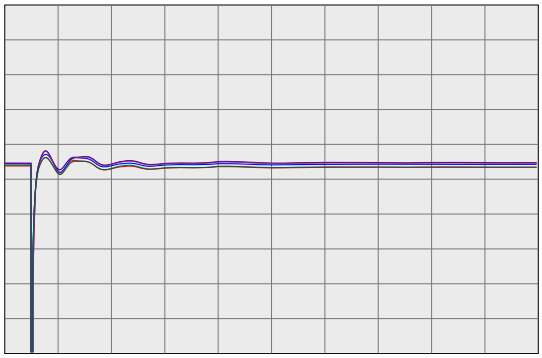
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

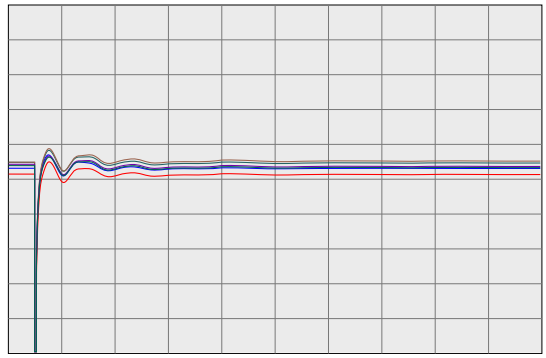
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

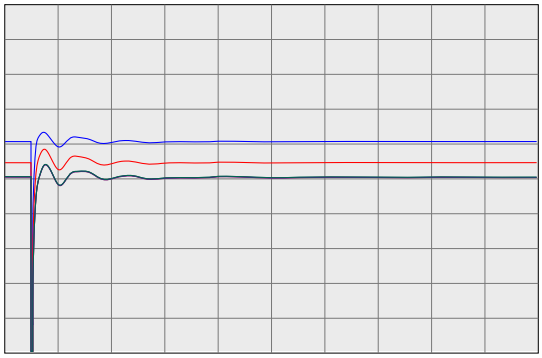
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

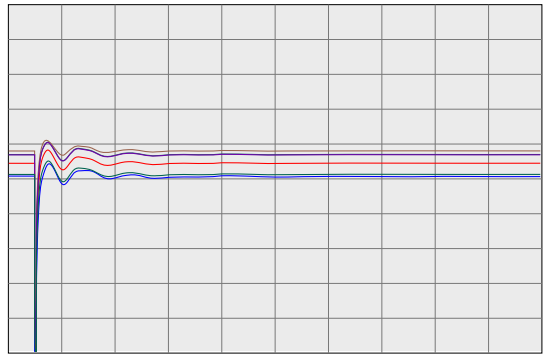
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

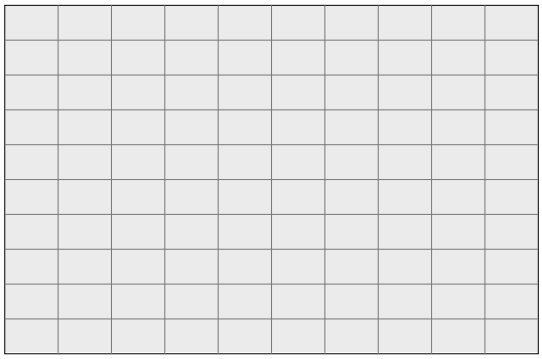
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

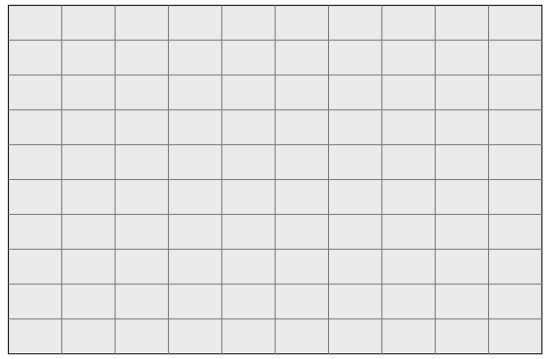


0.0 20.0

Time(sec)

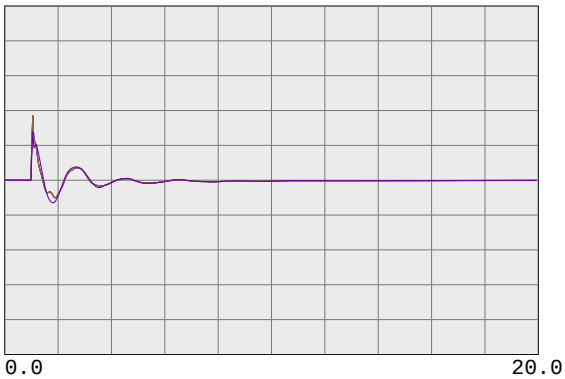
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



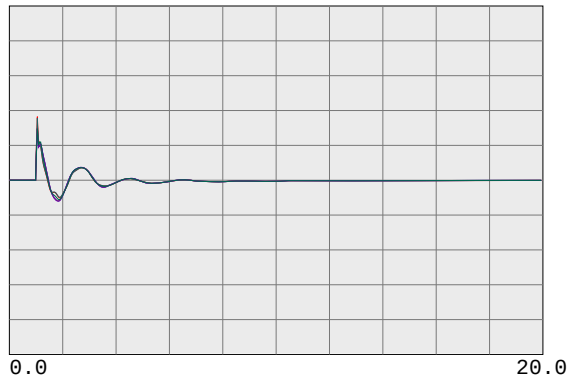


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

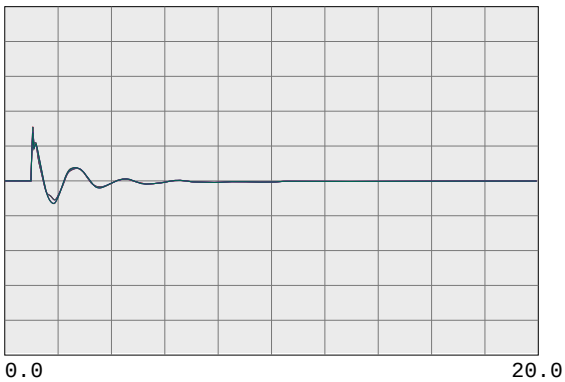
230-KV SYSTEM FREQUENCIES



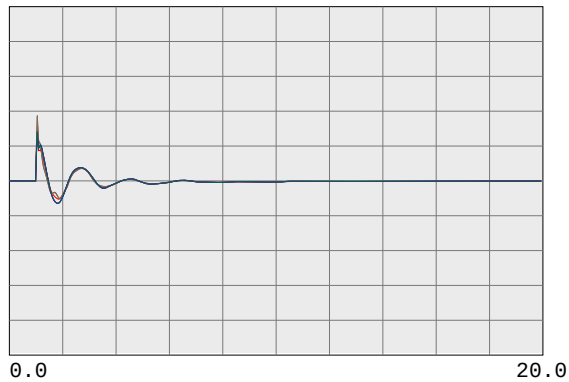
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



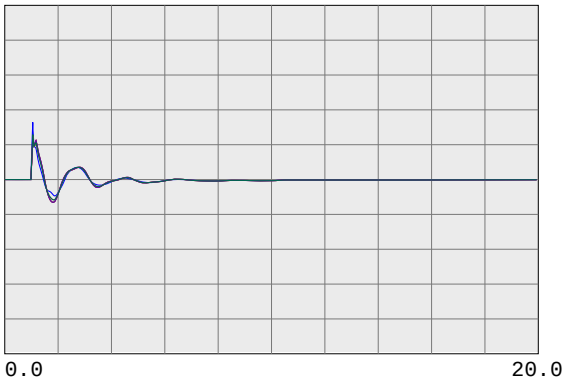
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



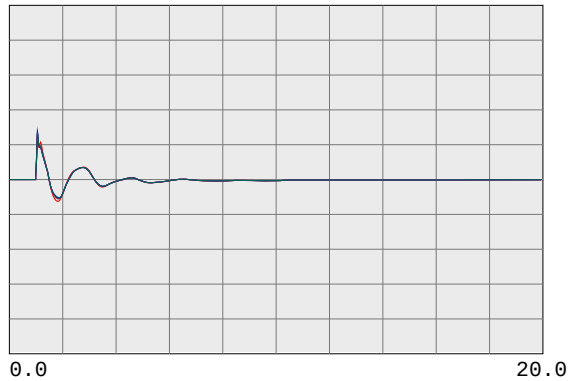
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



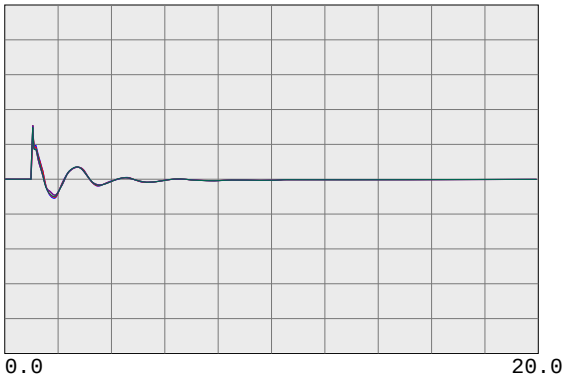
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



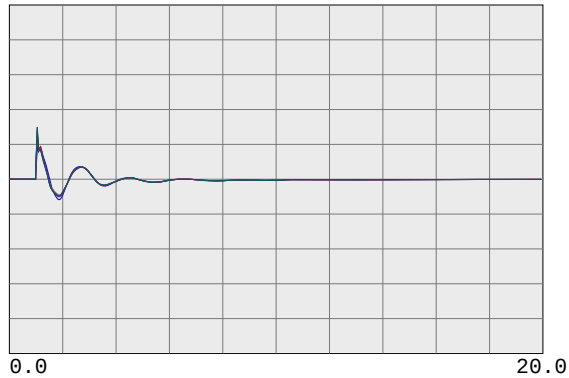
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

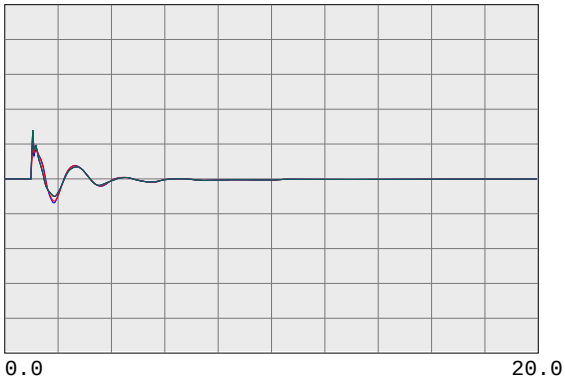
230-KV SYSTEM FREQUENCIES



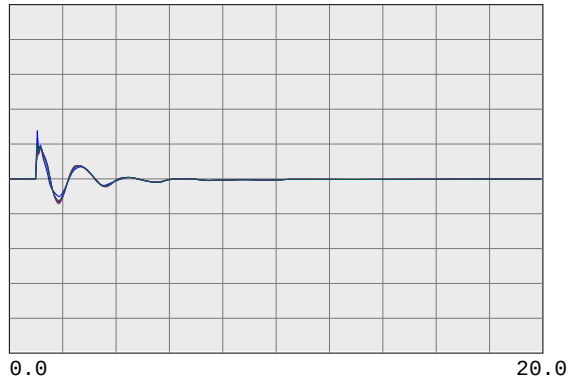
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



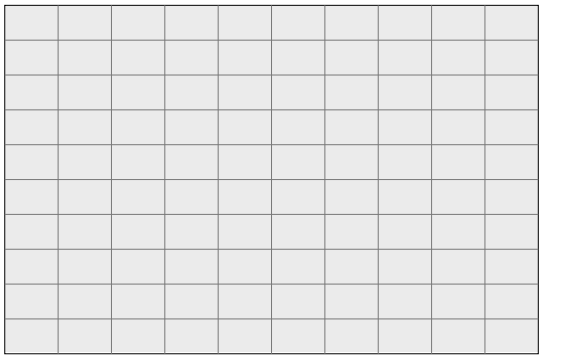
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

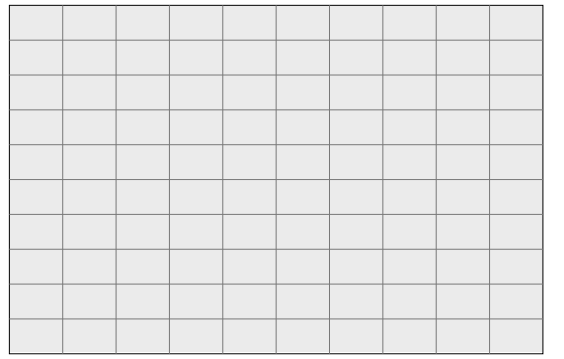


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



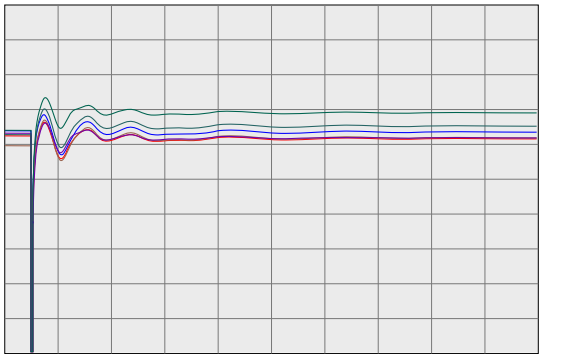
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



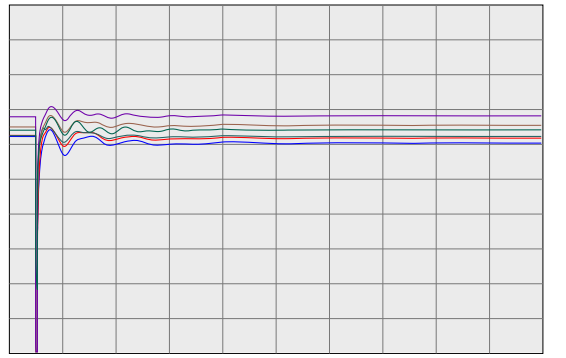


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

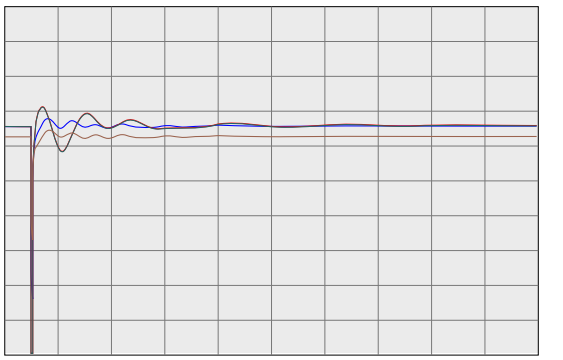
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



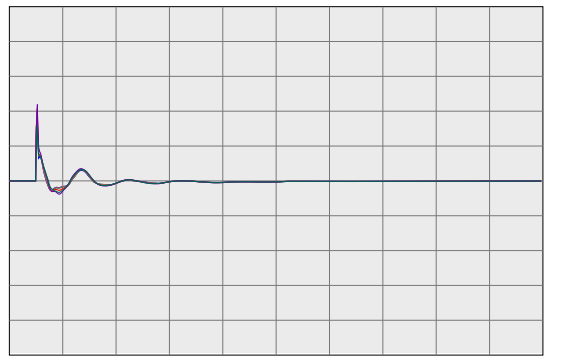
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



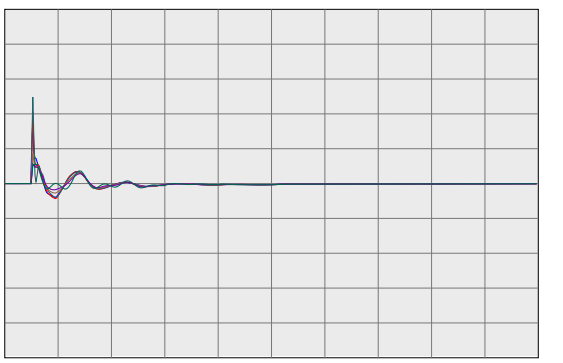
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



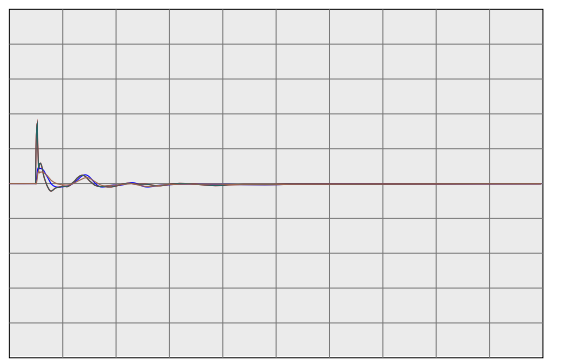
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



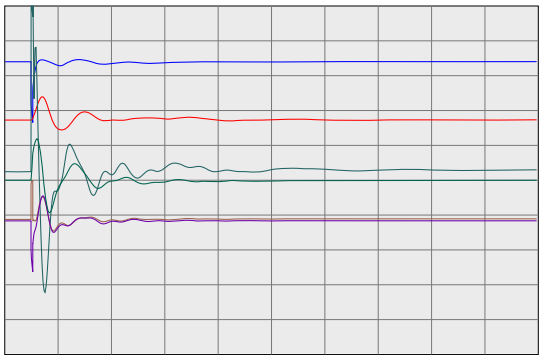
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



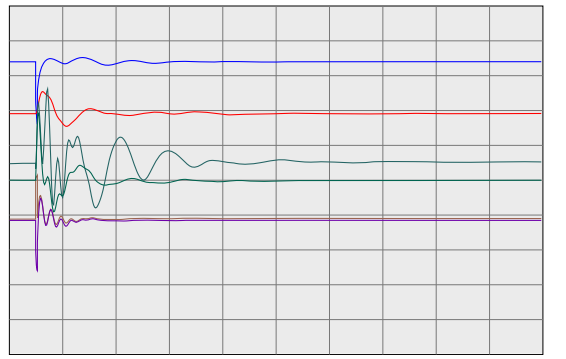
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

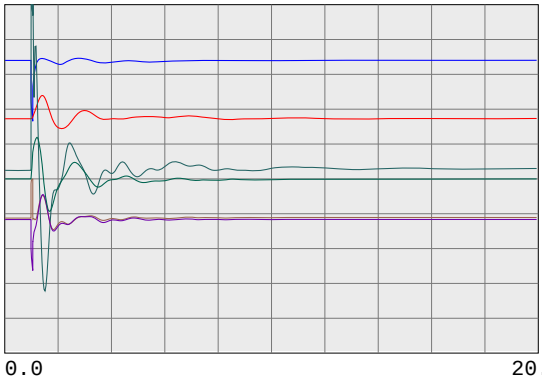
WILLOW PASS GENERATION PLANT



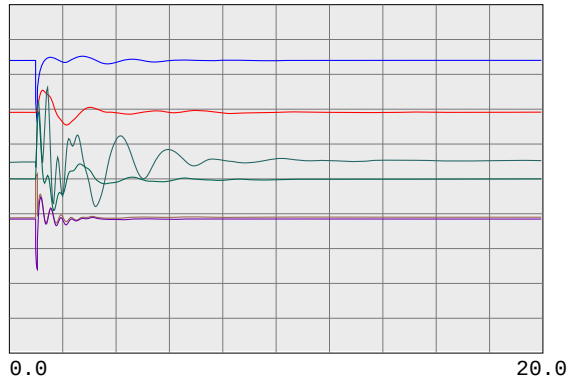
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



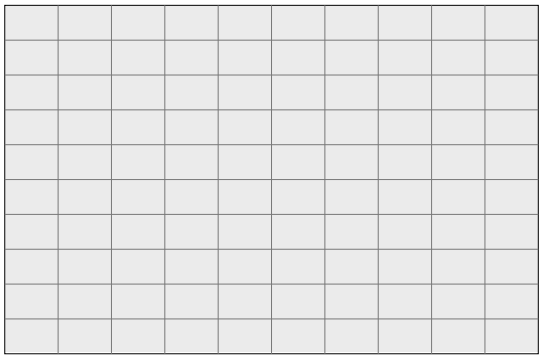
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

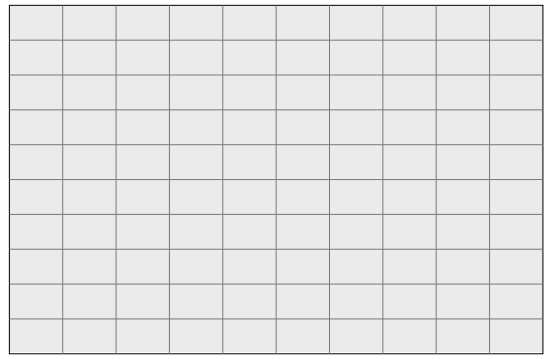


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



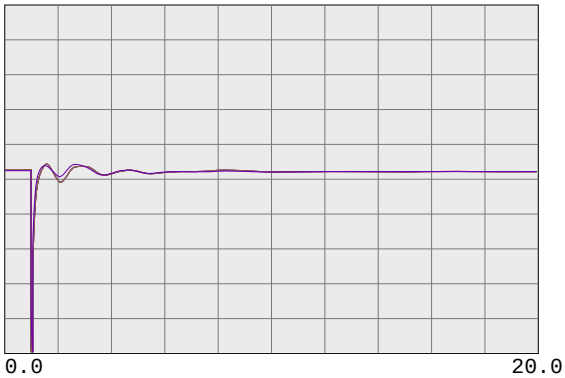
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



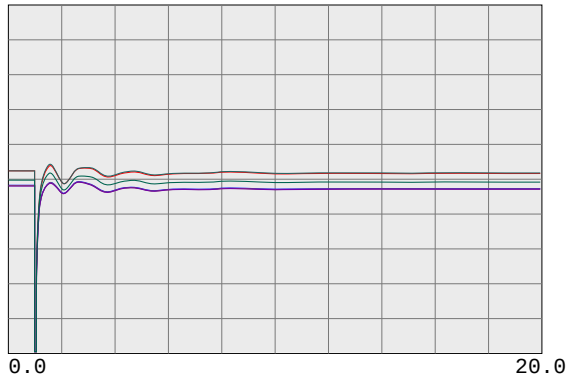


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

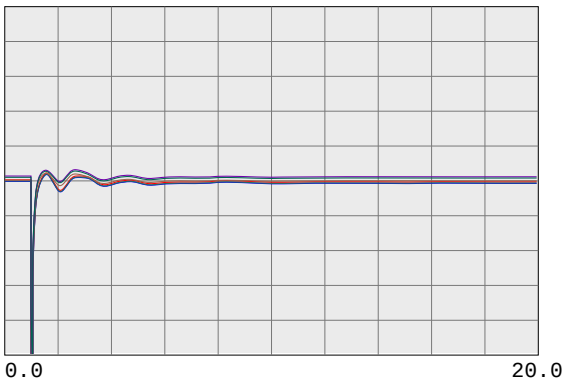
230-KV SYSTEM VOLTAGES



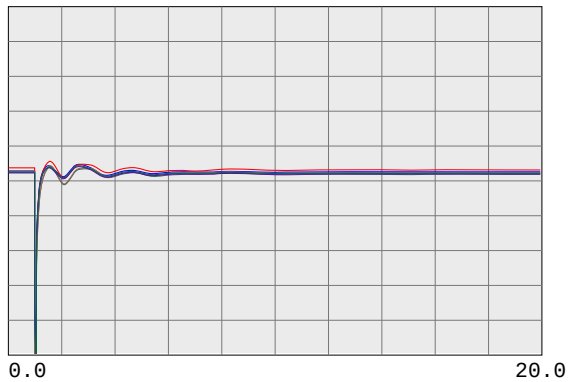
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



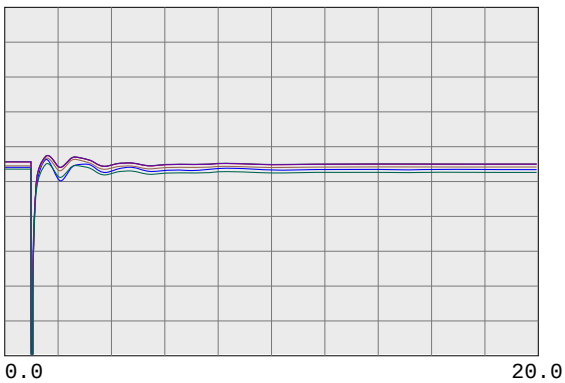
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



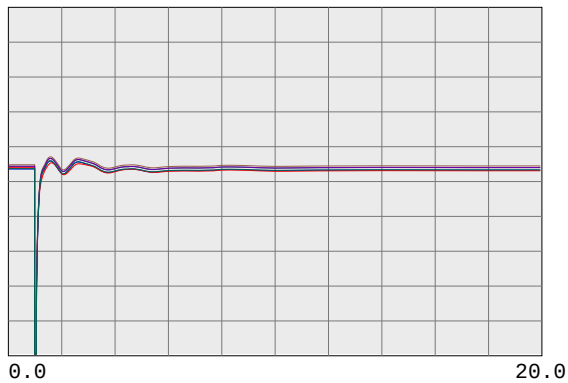
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



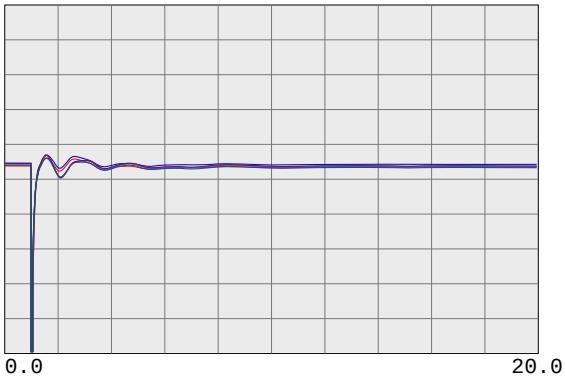
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



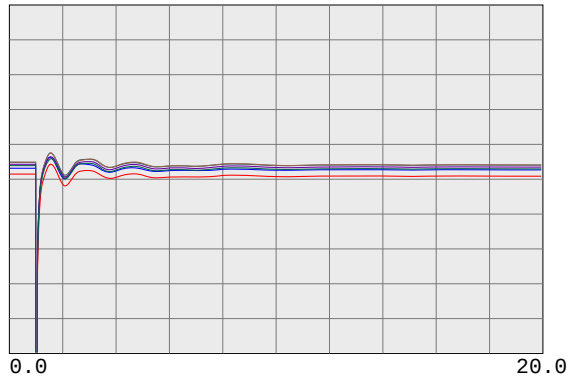
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

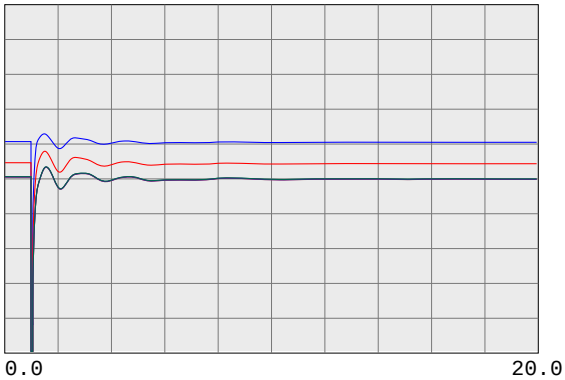
230-KV SYSTEM VOLTAGES



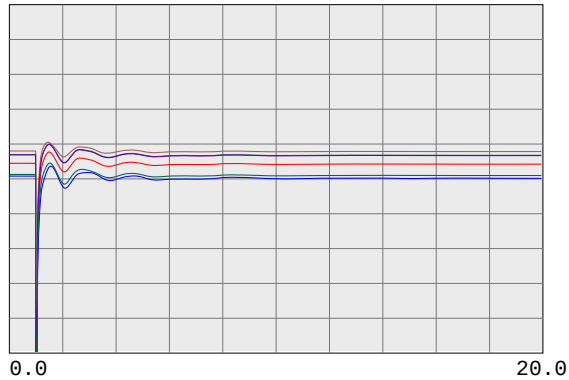
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



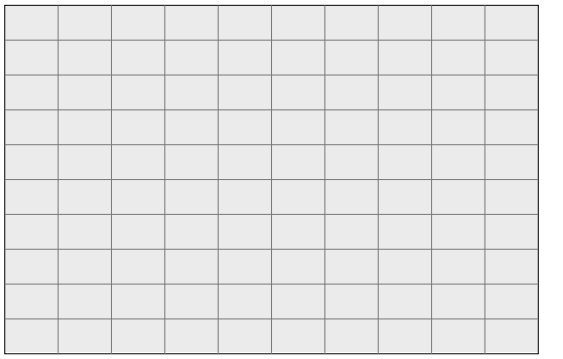
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

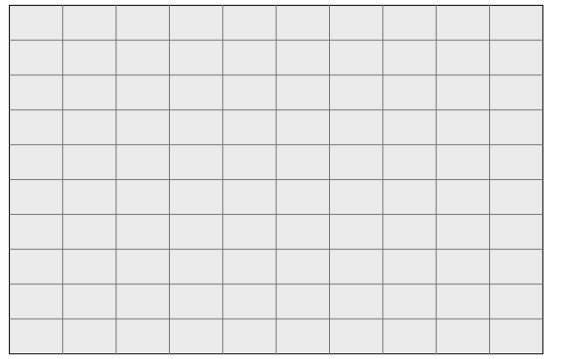


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



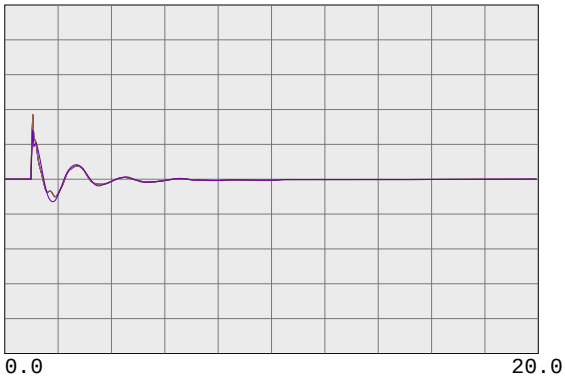
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



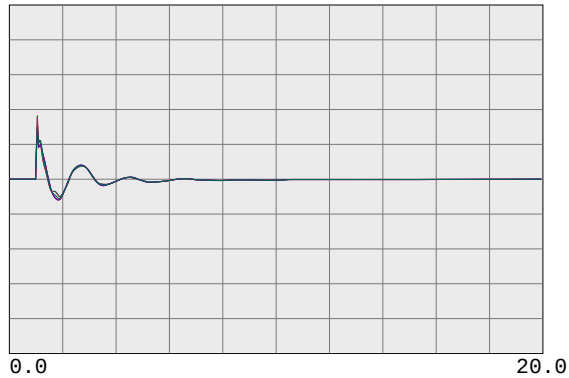


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

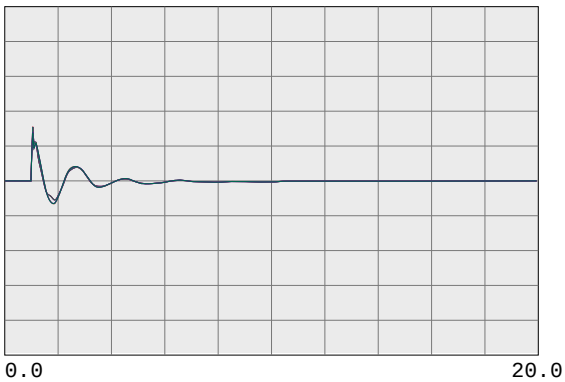
230-KV SYSTEM FREQUENCIES



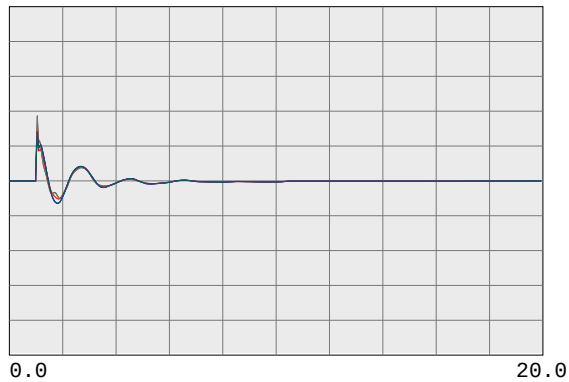
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



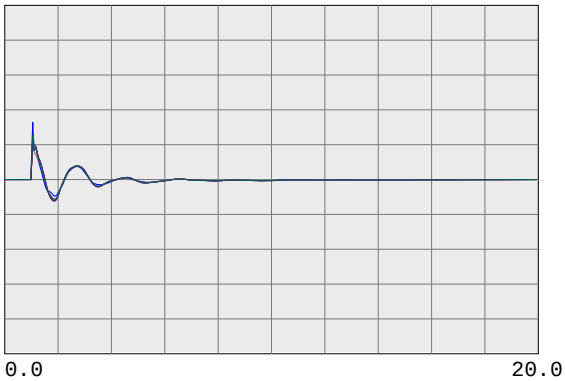
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



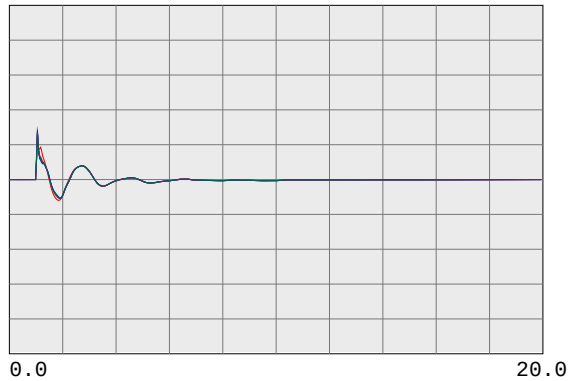
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



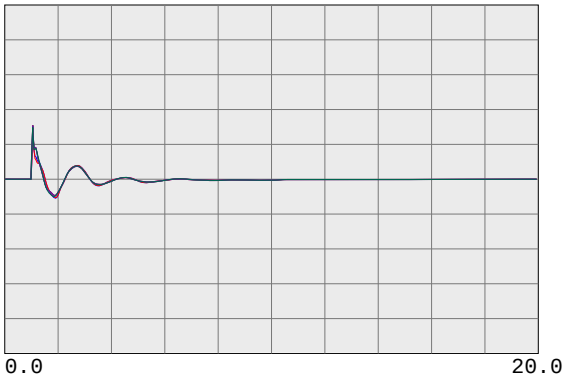
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



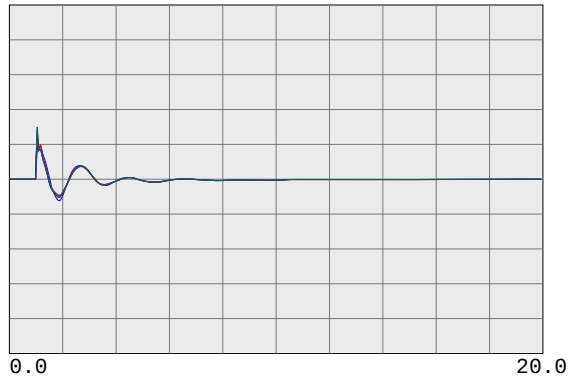
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

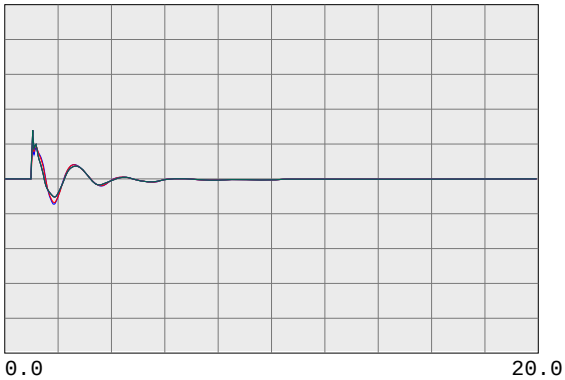
230-KV SYSTEM FREQUENCIES



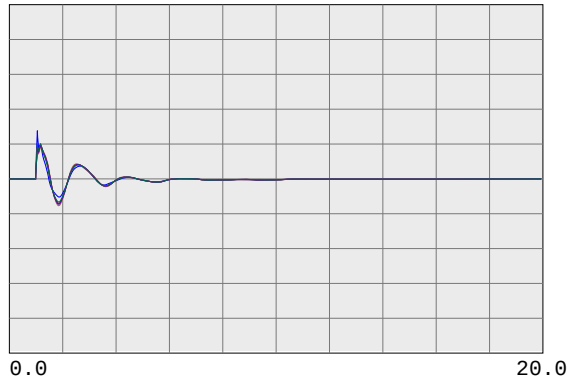
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



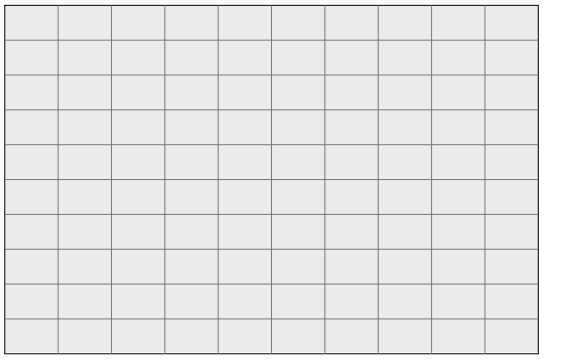
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

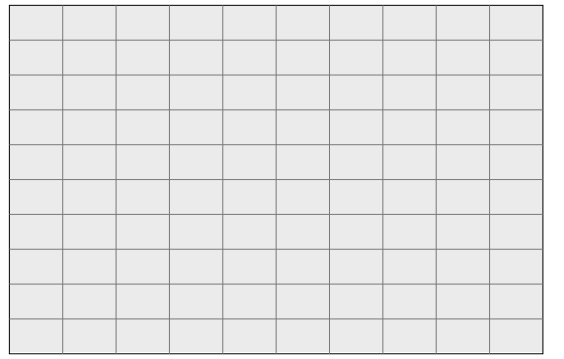


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



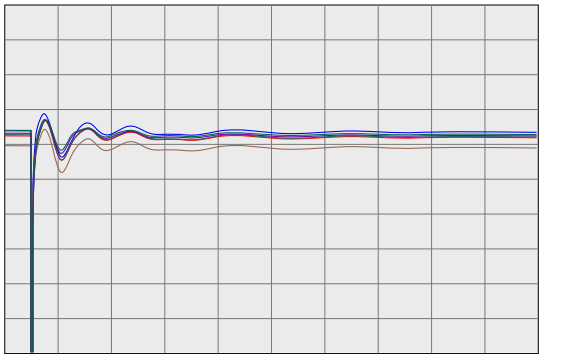
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



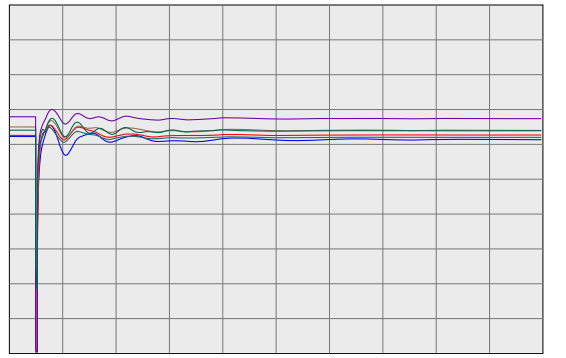


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

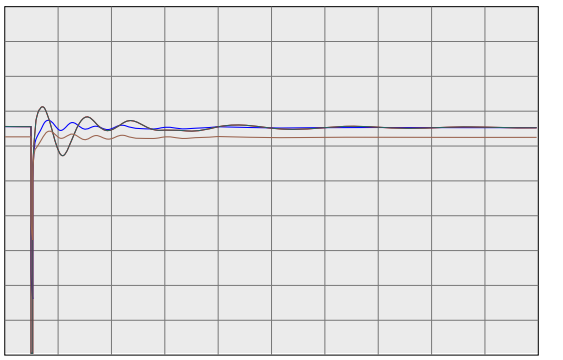
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



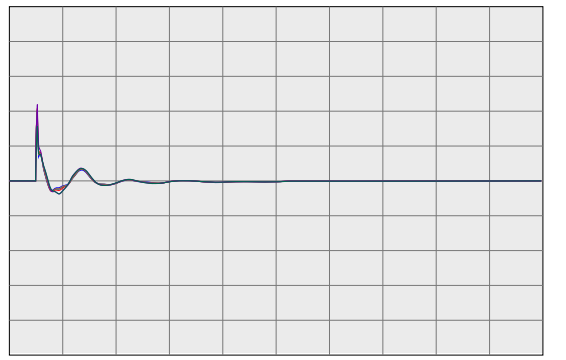
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



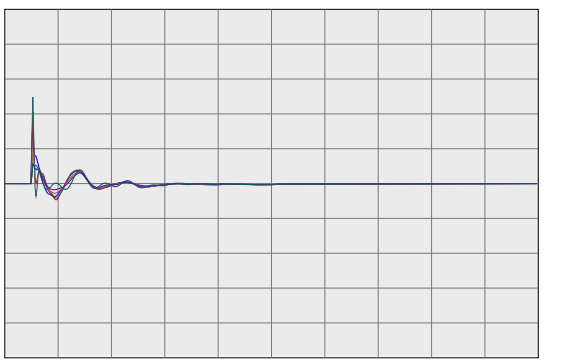
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



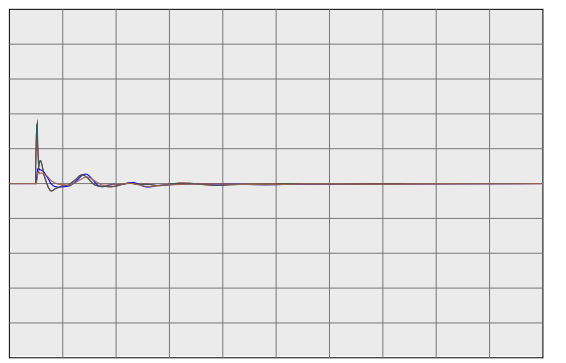
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



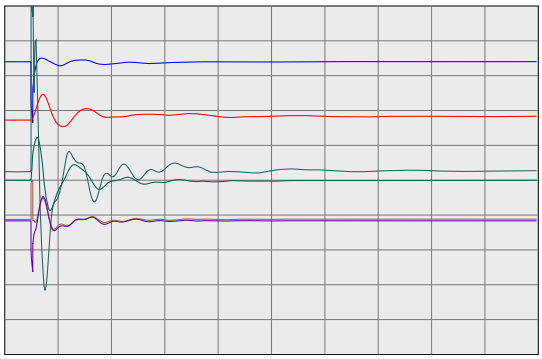
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



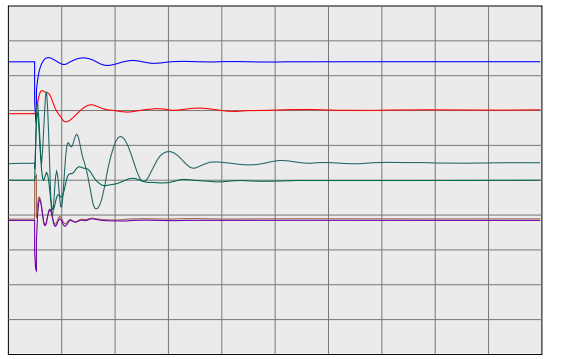
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

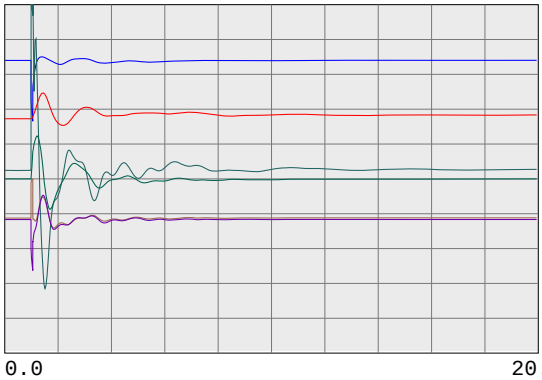
WILLOW PASS GENERATION PLANT



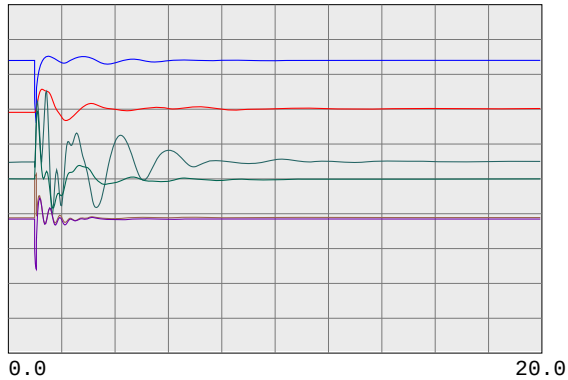
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



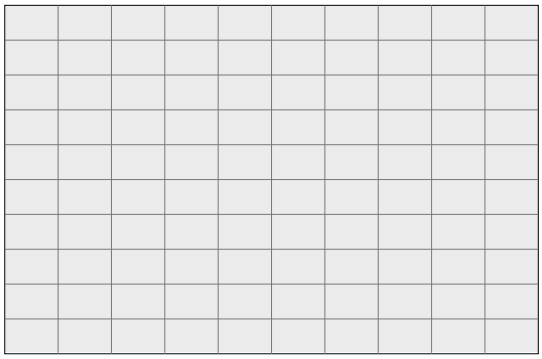
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

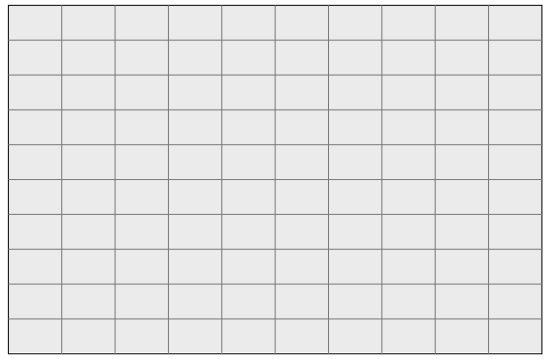


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



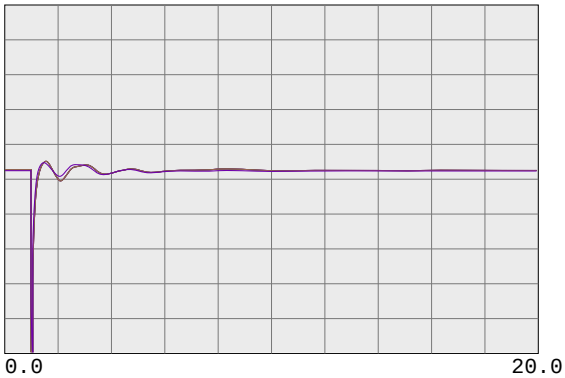
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



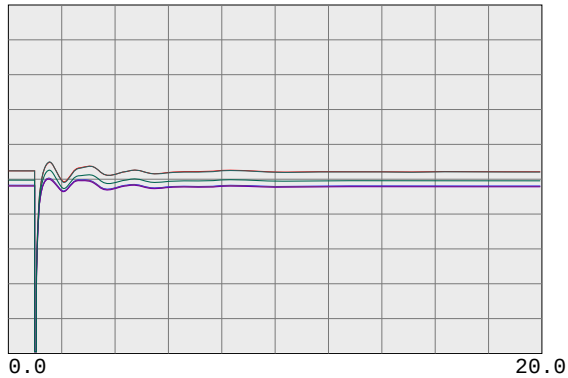


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

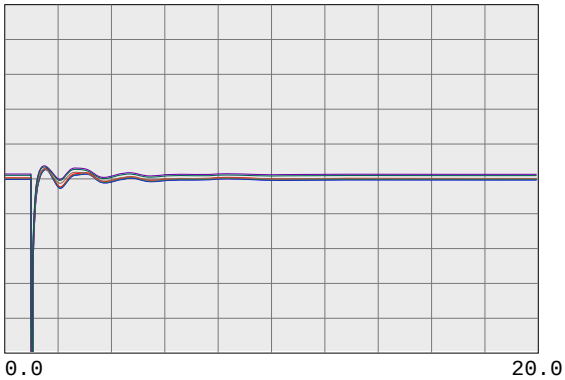
230-KV SYSTEM VOLTAGES



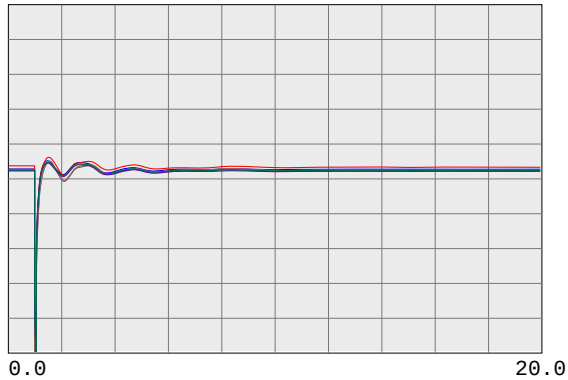
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



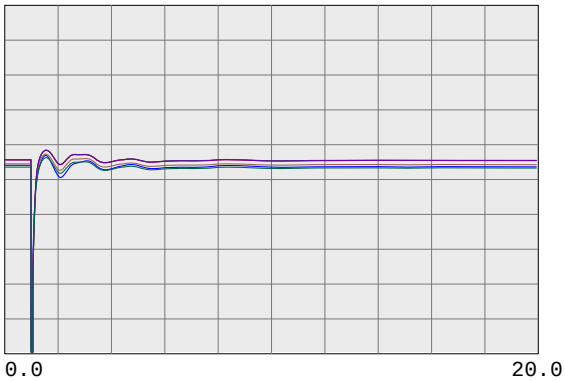
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



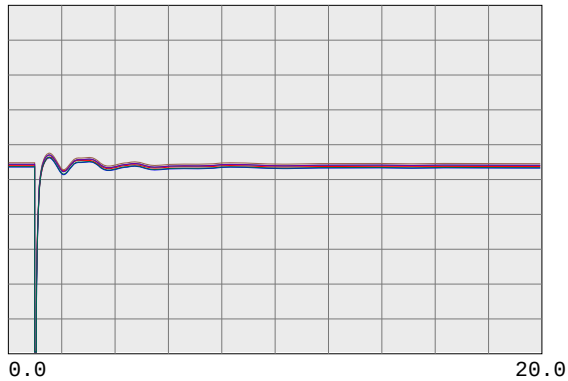
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



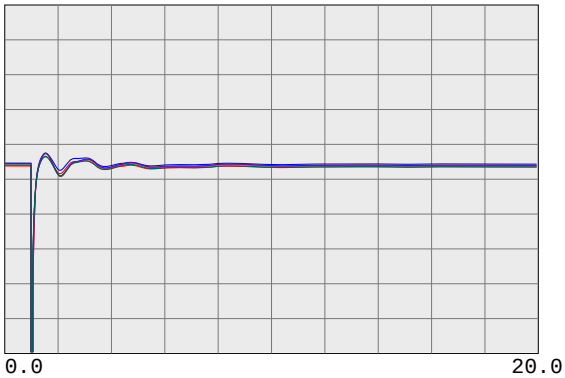
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



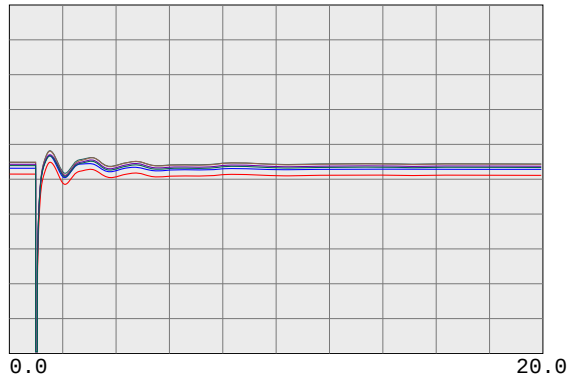
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

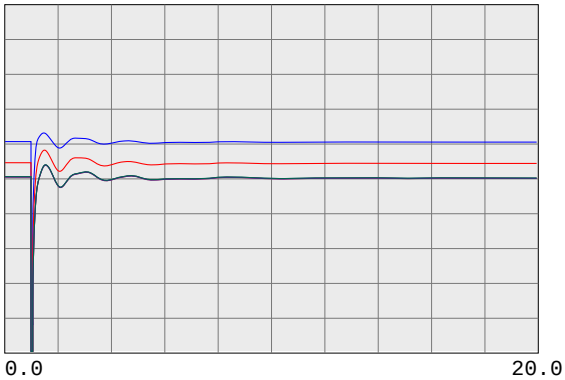
230-KV SYSTEM VOLTAGES



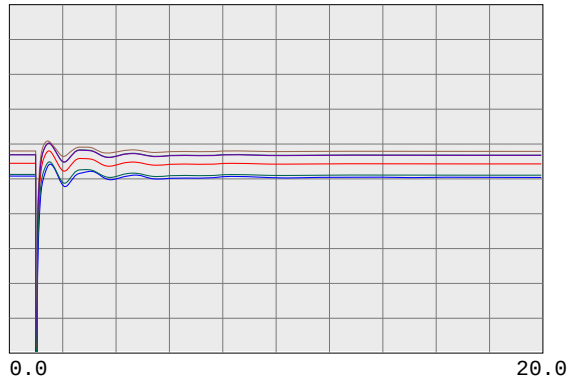
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



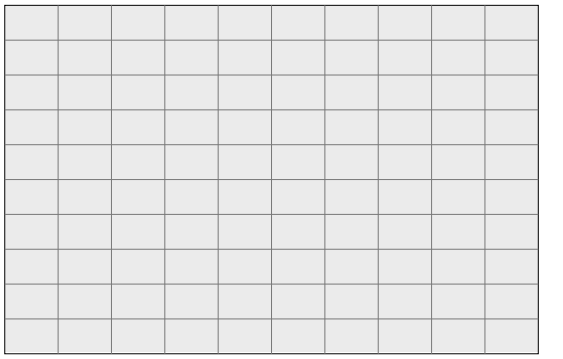
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

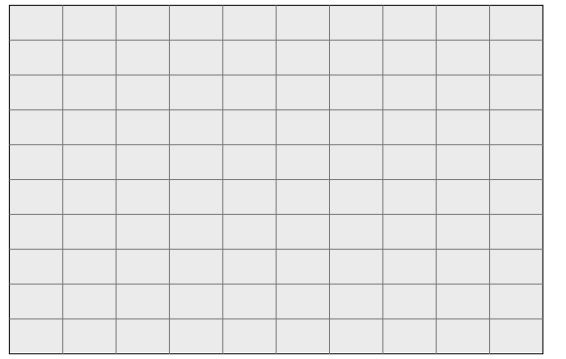


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



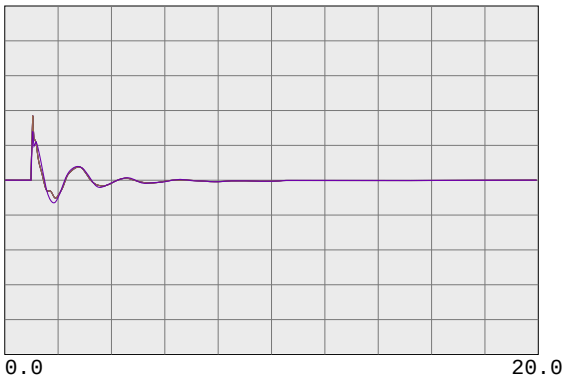
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



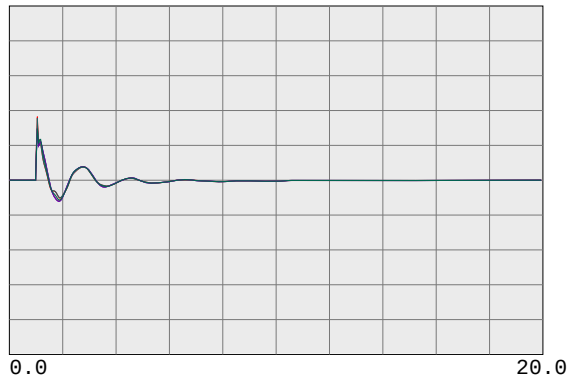


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

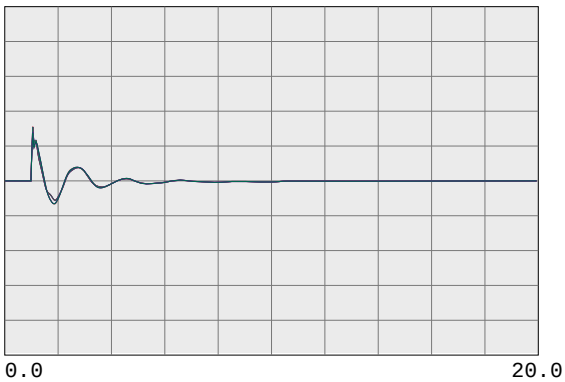
230-KV SYSTEM FREQUENCIES



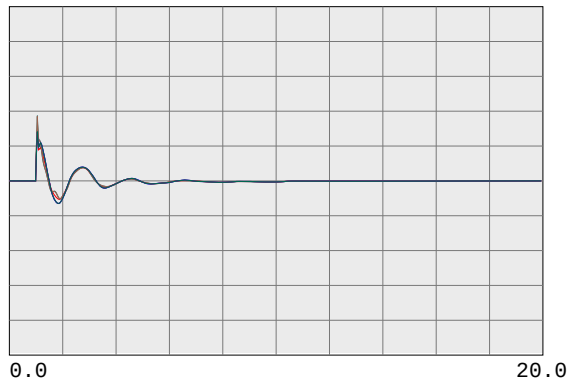
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



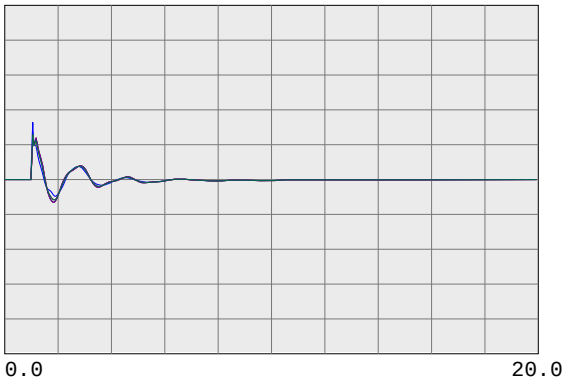
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



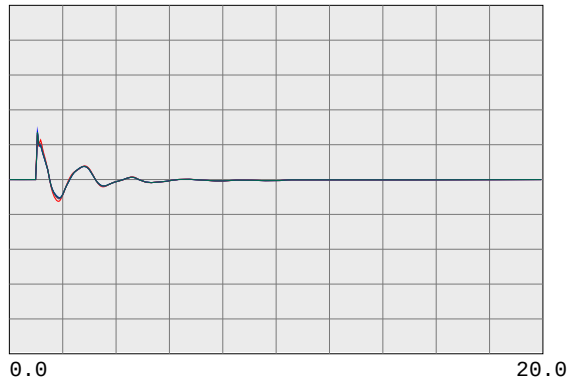
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



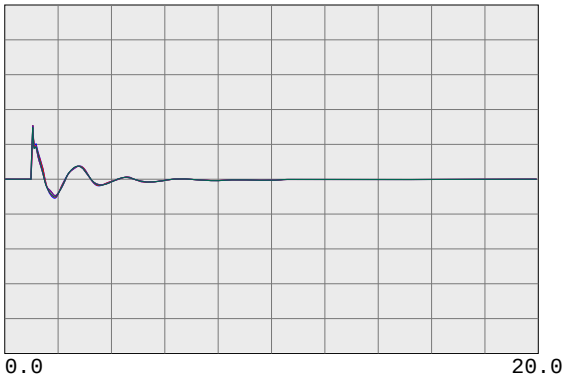
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



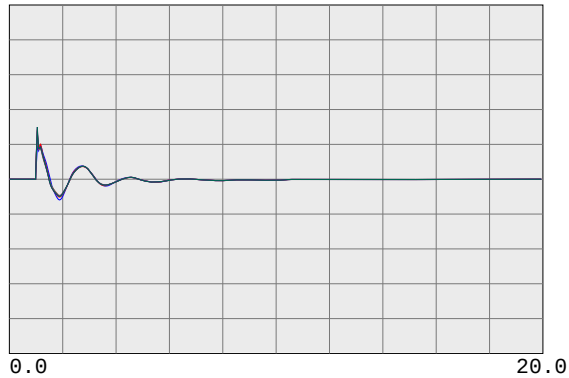
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

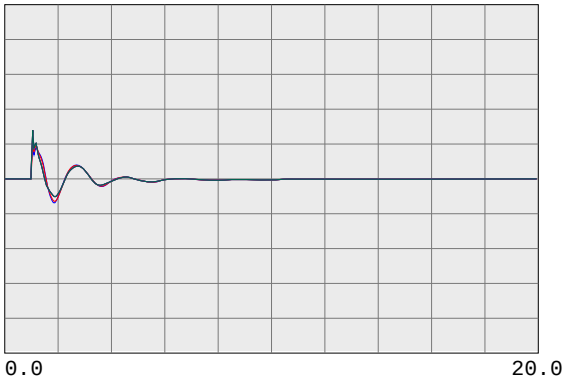
230-KV SYSTEM FREQUENCIES



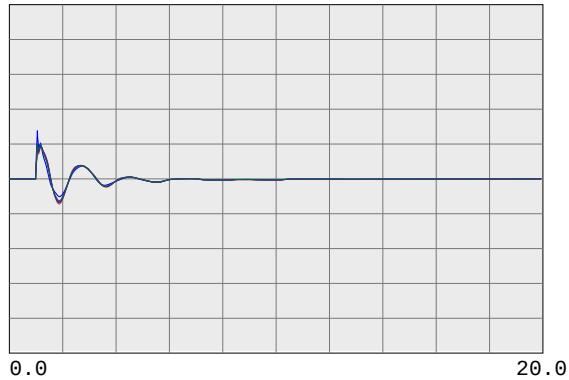
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



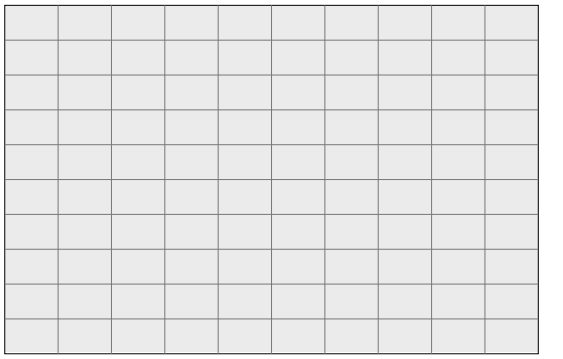
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

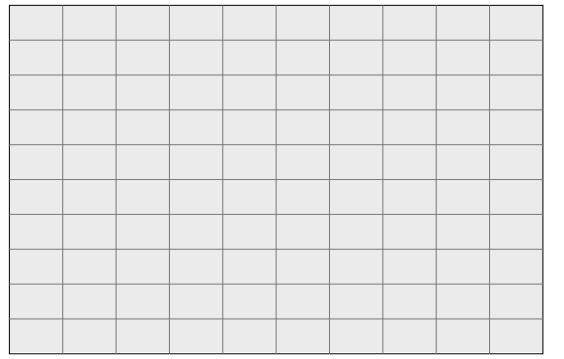


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



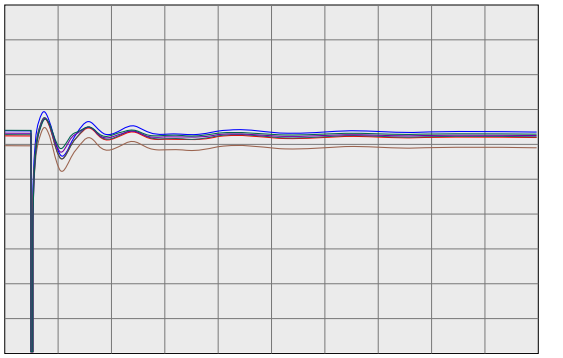
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



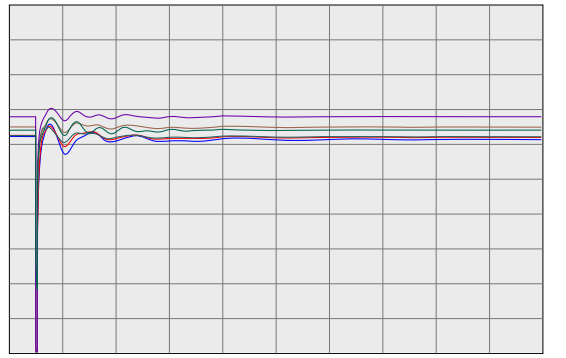


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

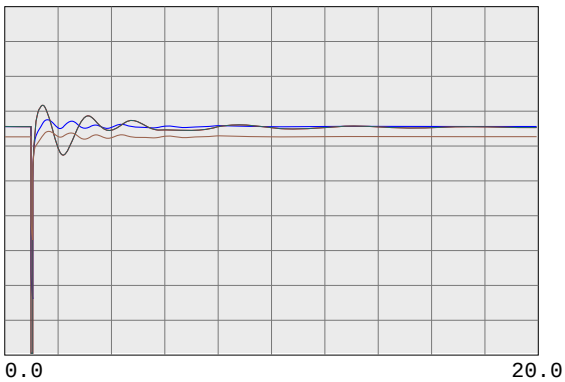
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



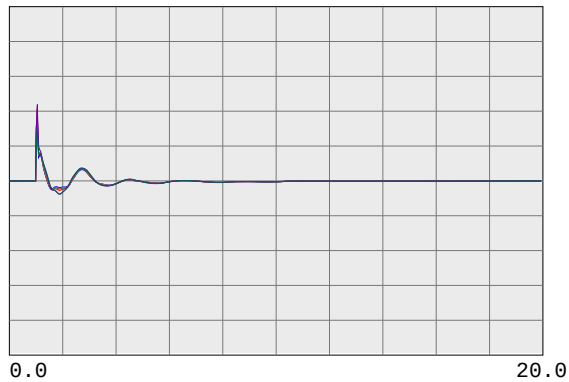
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



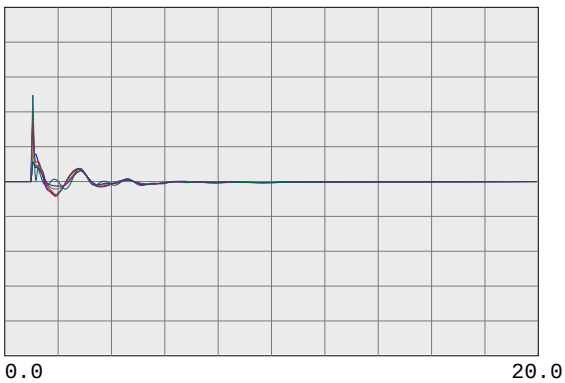
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



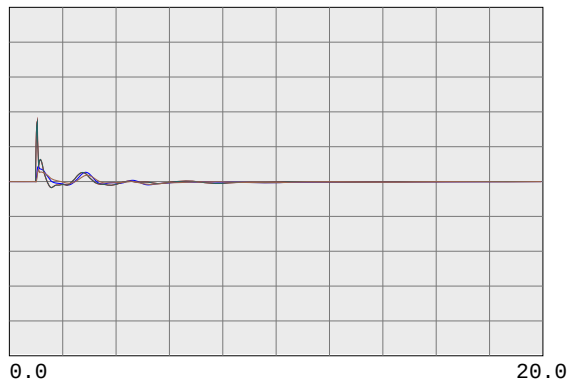
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



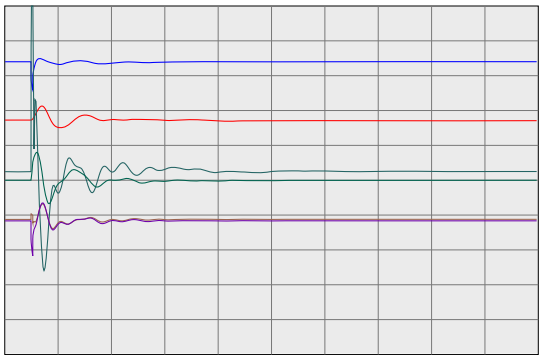
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



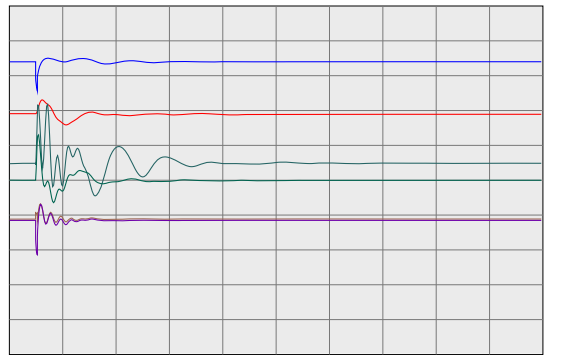
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

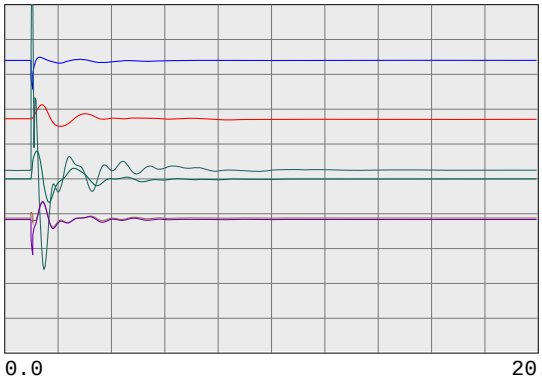
WILLOW PASS GENERATION PLANT



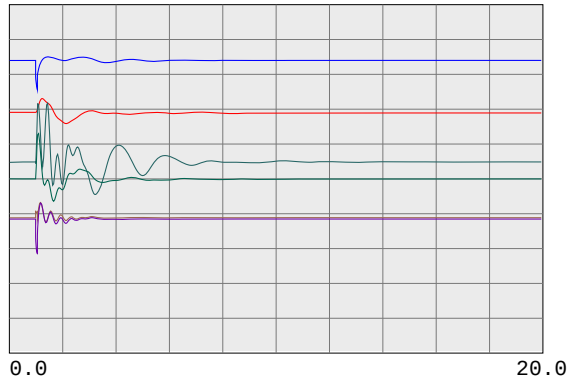
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



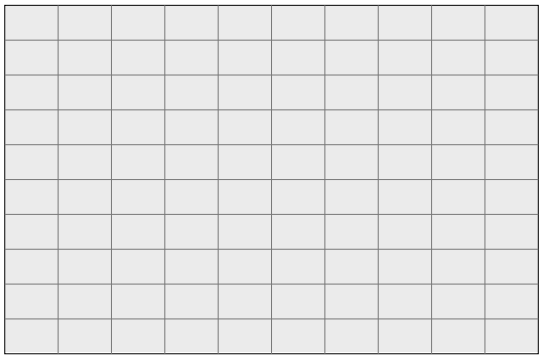
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

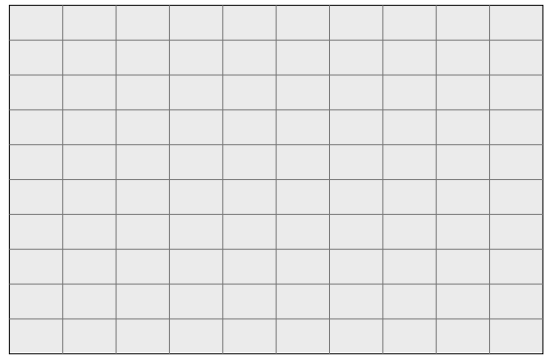


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



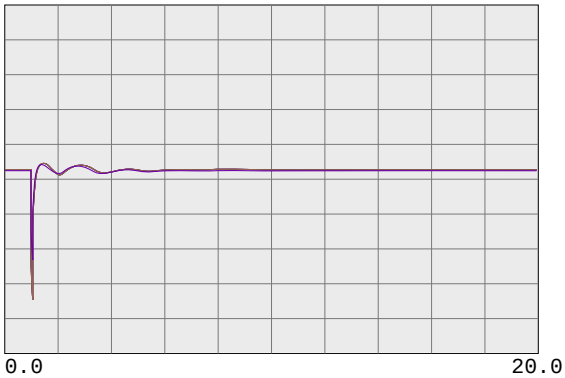
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



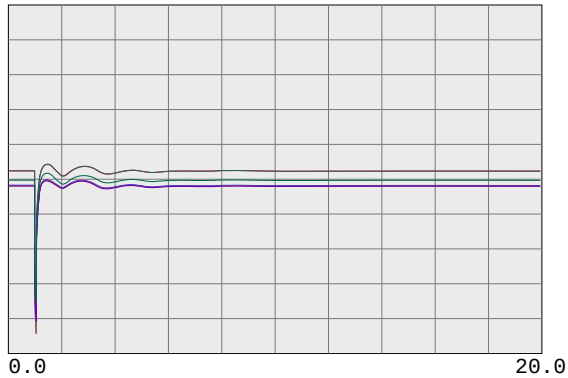


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

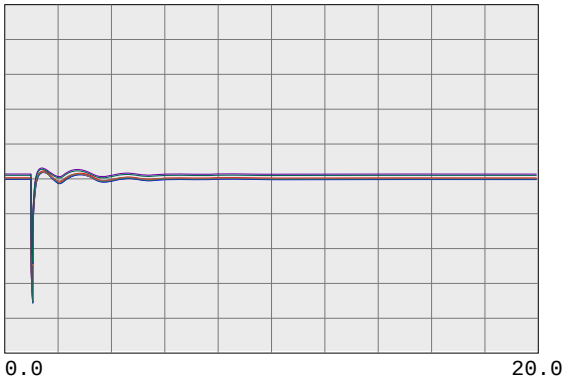
230-KV SYSTEM VOLTAGES



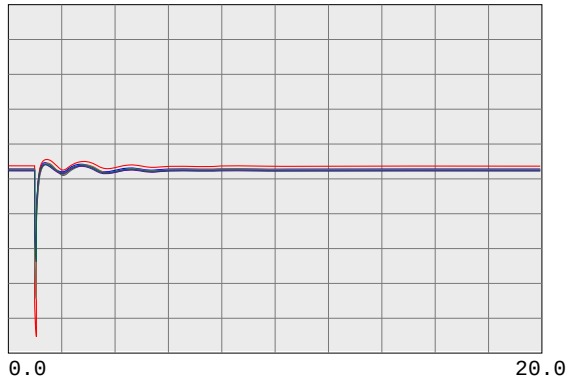
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



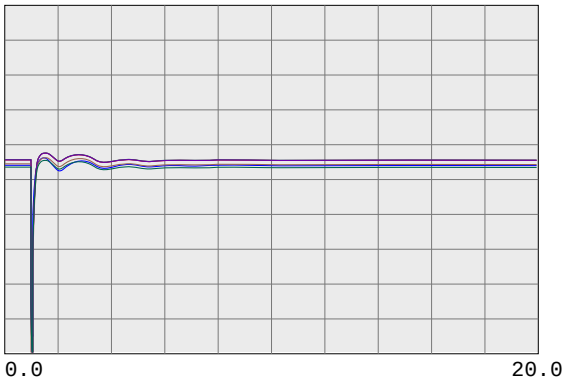
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



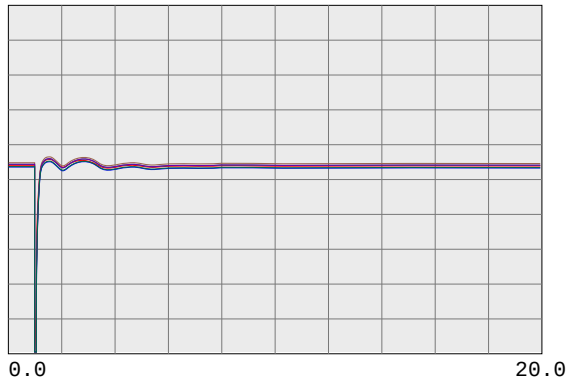
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



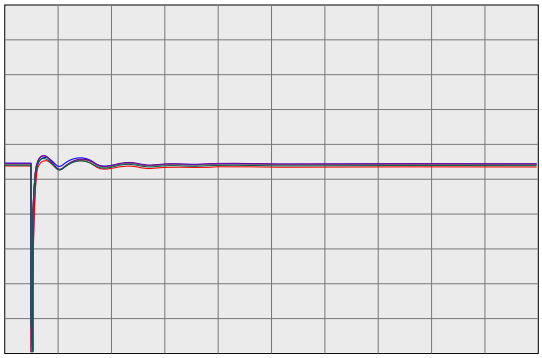
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

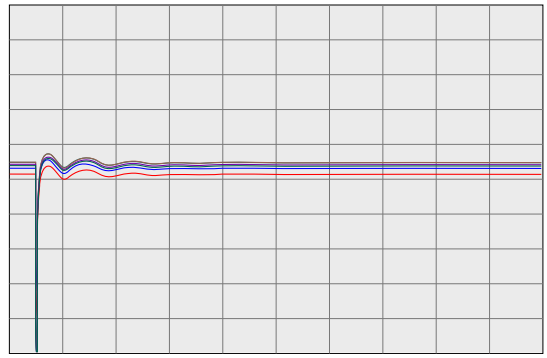
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

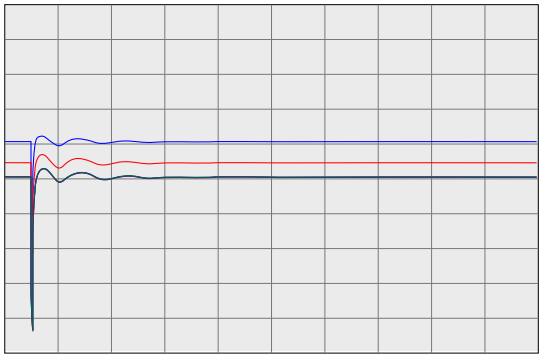
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

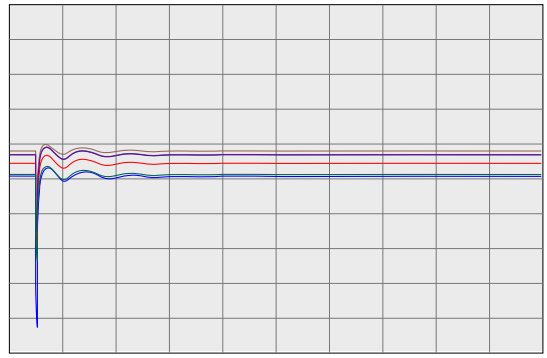
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

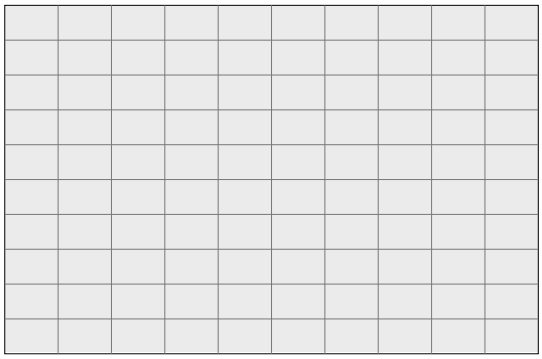
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

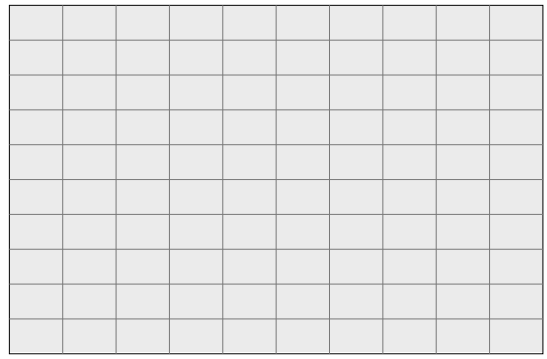


0.0 20.0

Time(sec)

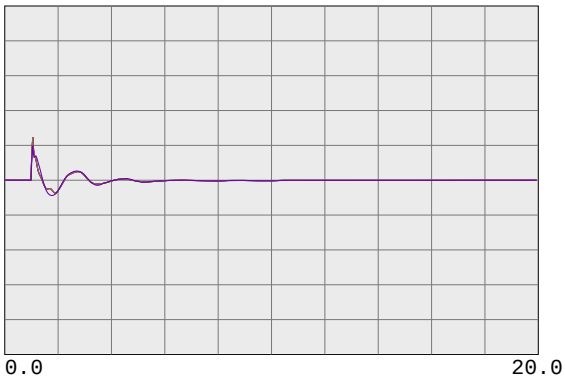
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



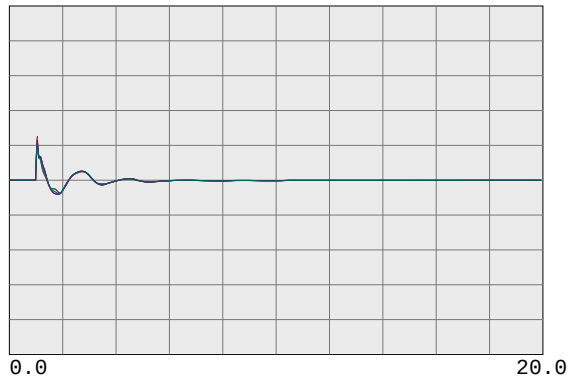


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

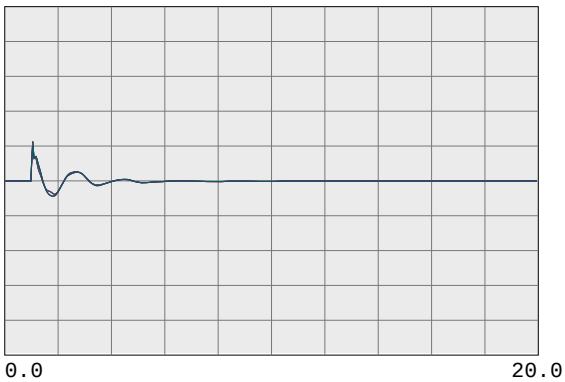
230-KV SYSTEM FREQUENCIES



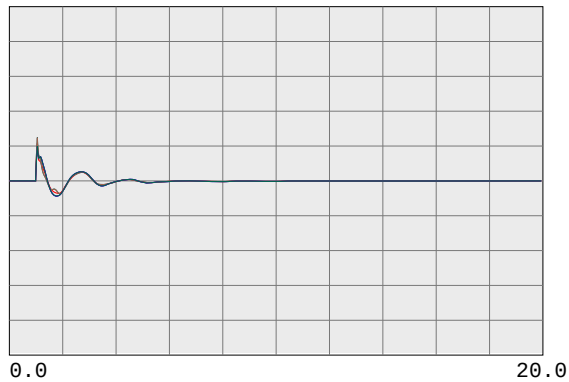
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



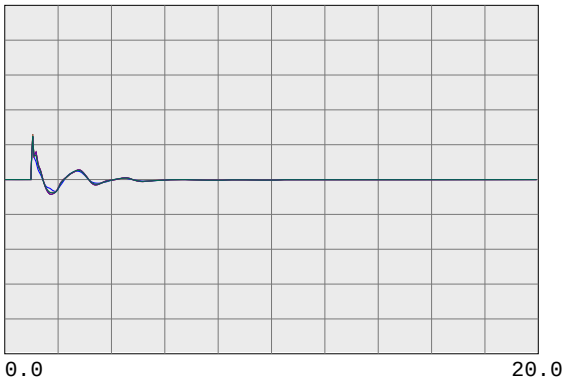
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



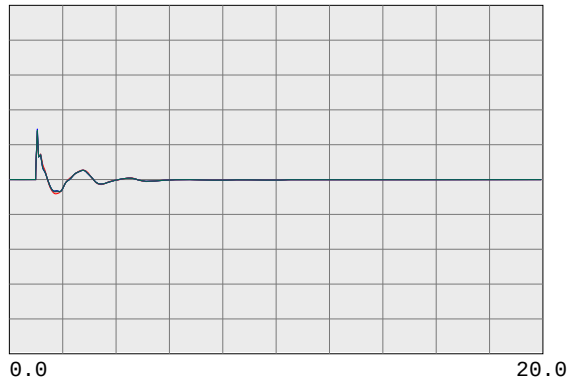
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



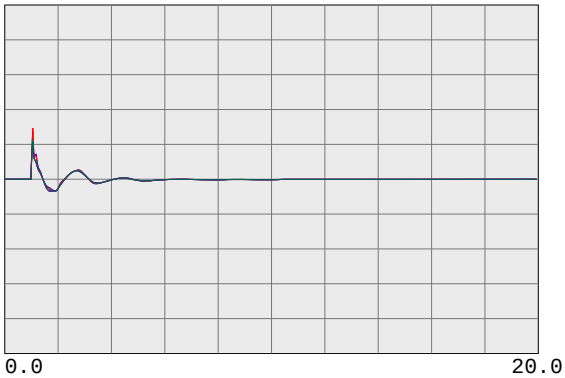
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



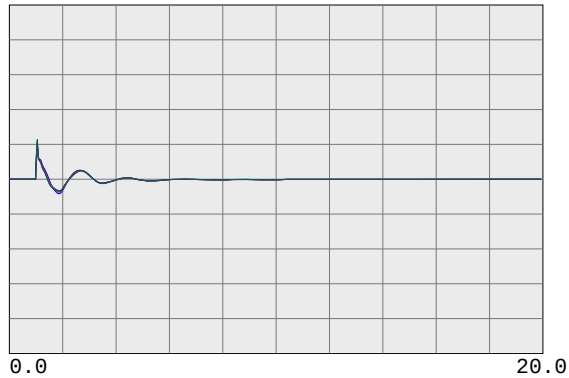
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

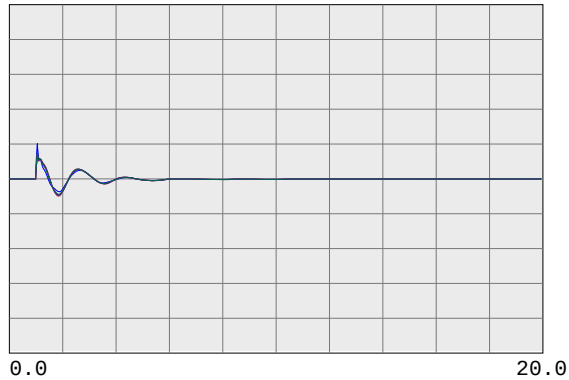


59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

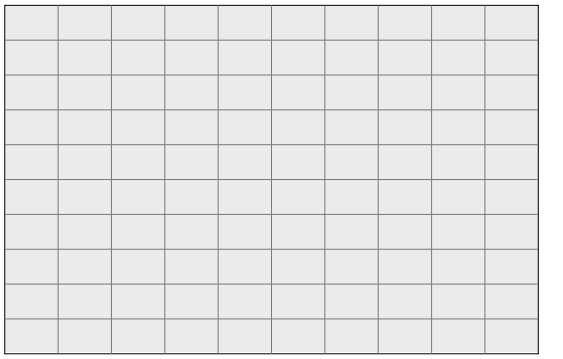


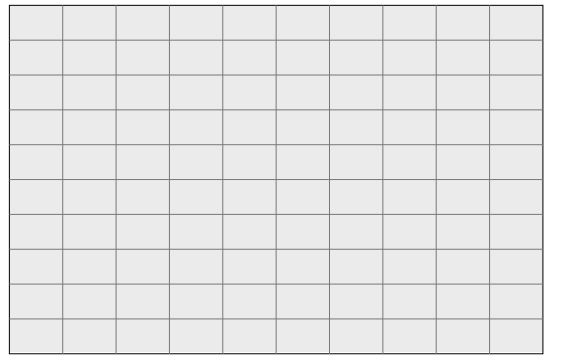
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



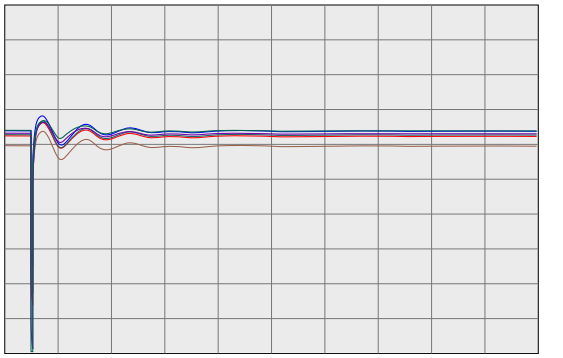
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



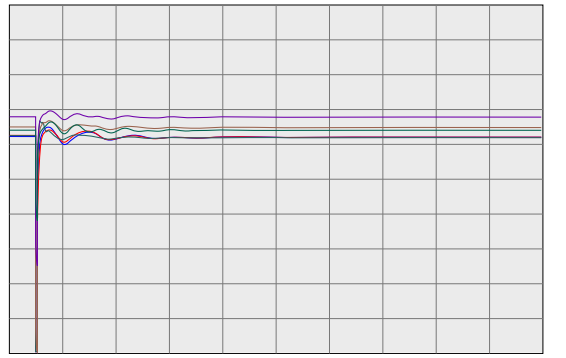


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

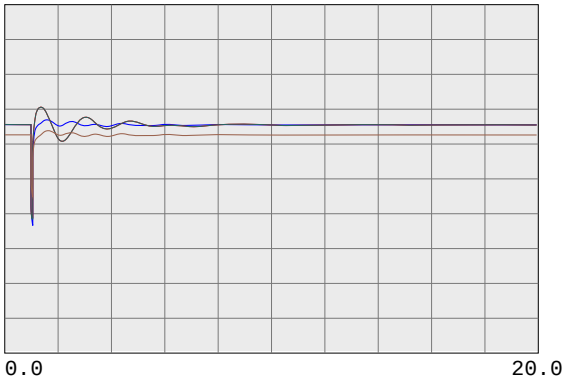
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



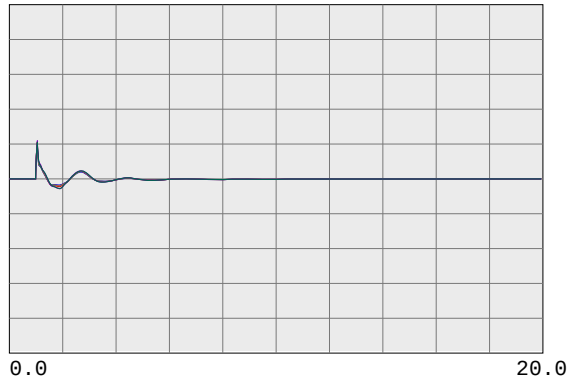
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



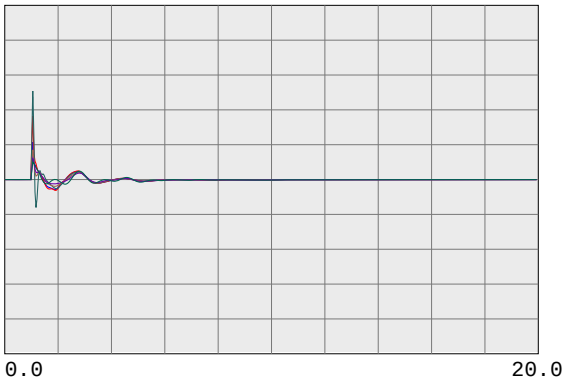
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



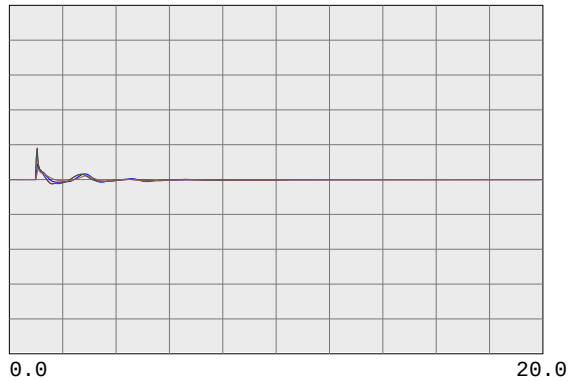
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



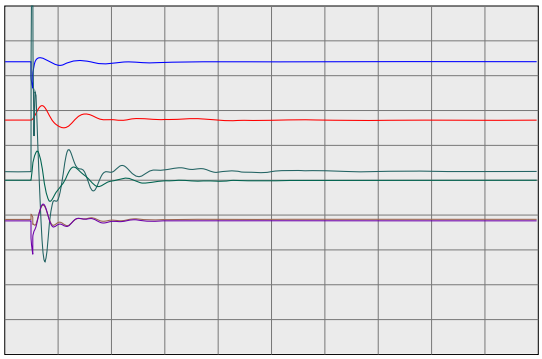
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



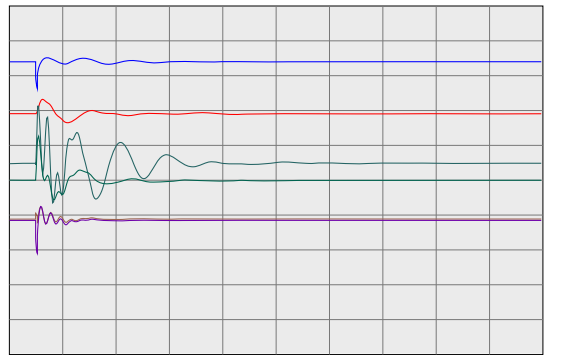
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

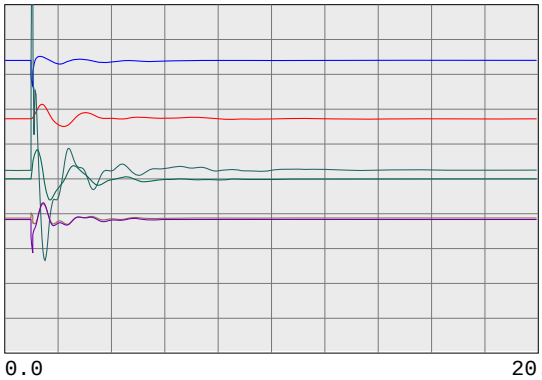
WILLOW PASS GENERATION PLANT



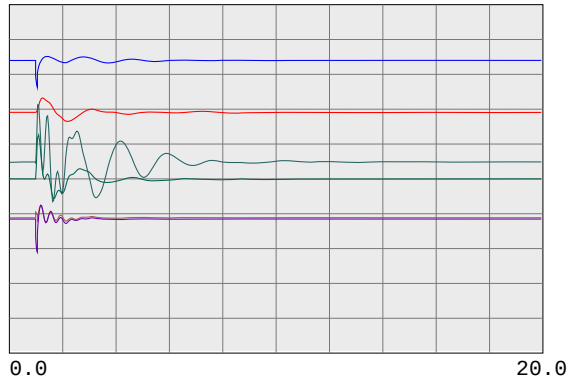
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



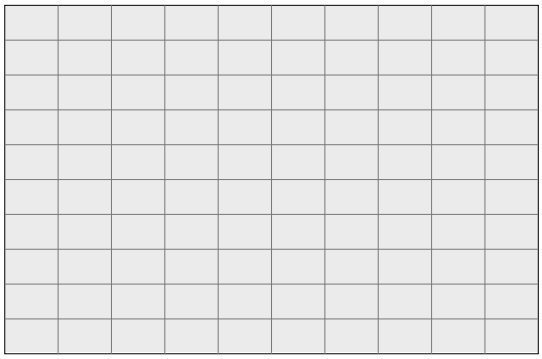
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

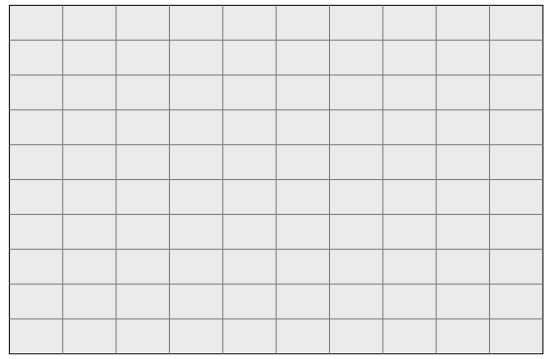


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



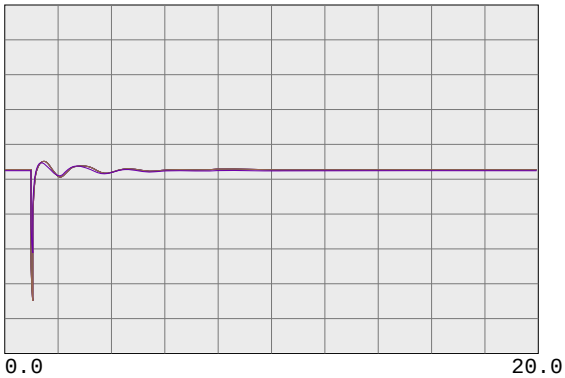
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



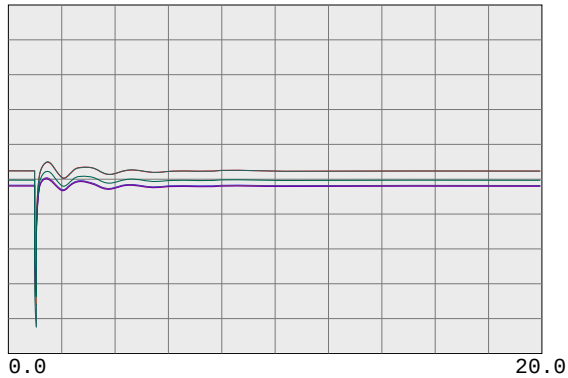


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

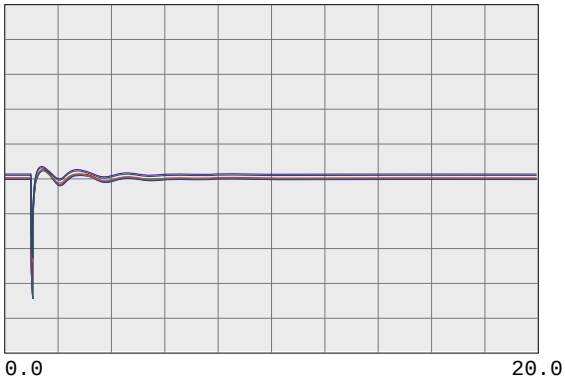
230-KV SYSTEM VOLTAGES



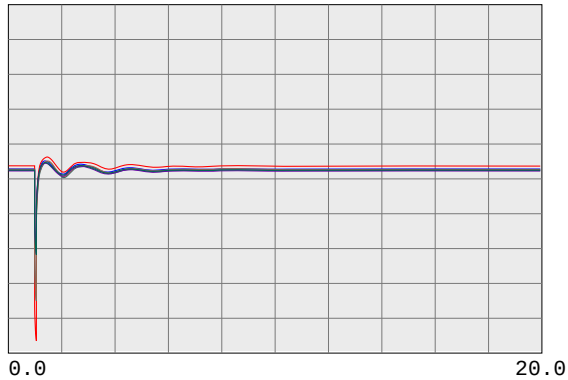
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



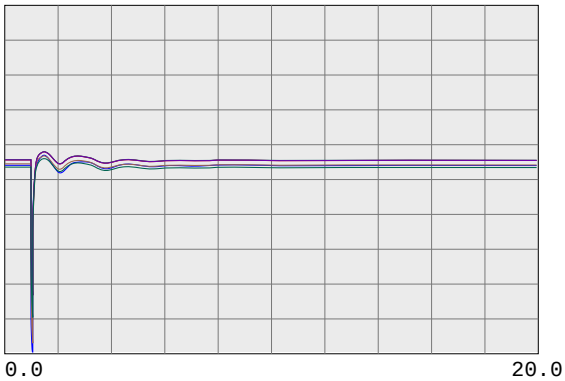
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



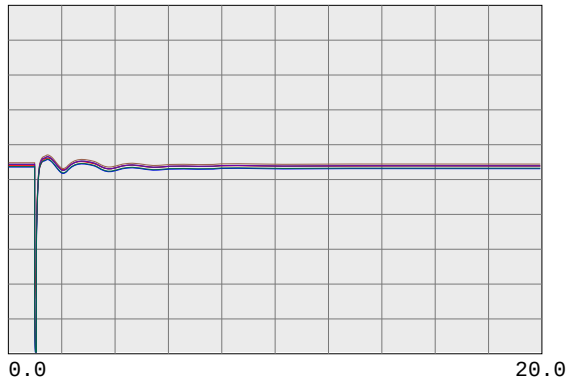
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



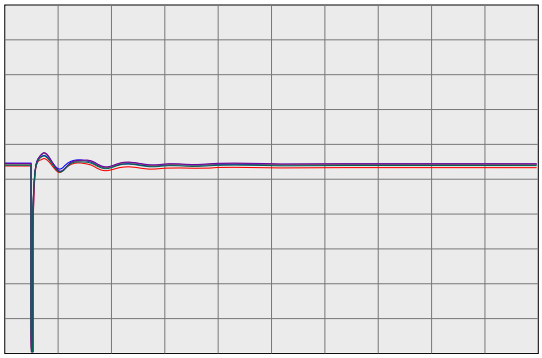
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

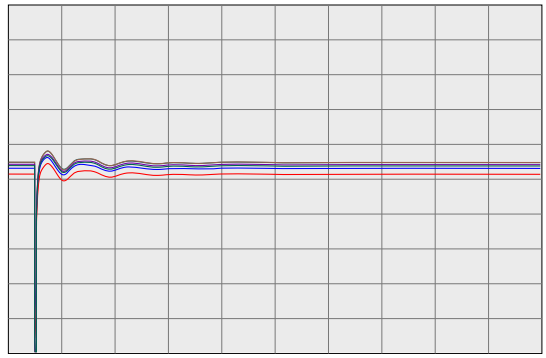
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

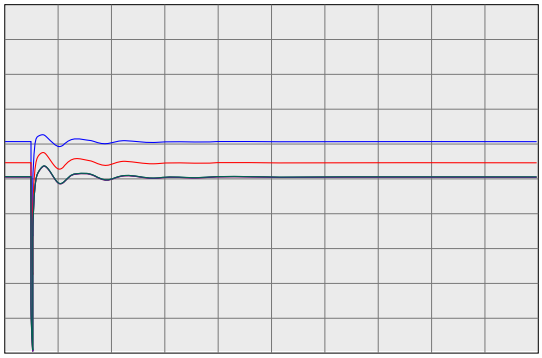
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

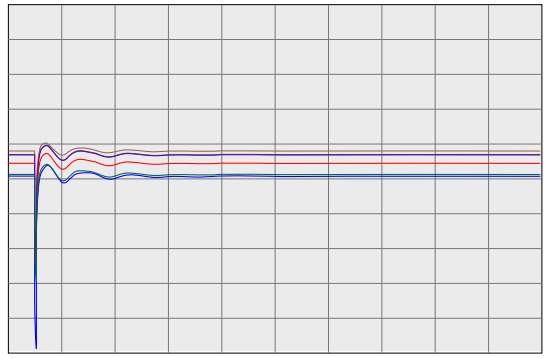
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

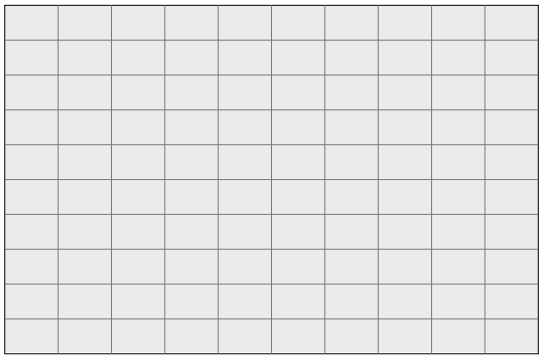
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

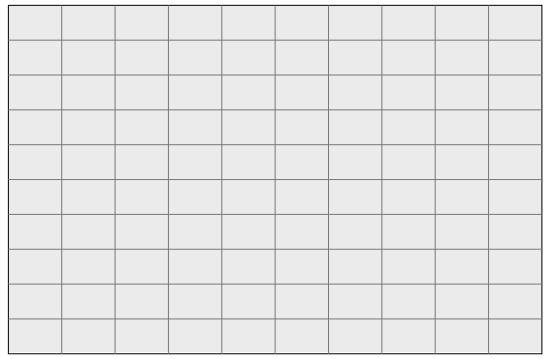


0.0 20.0

Time(sec)

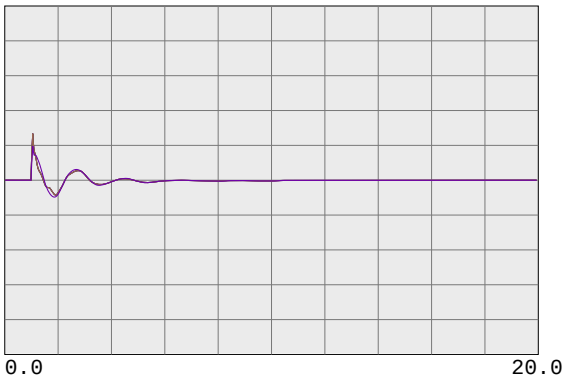
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



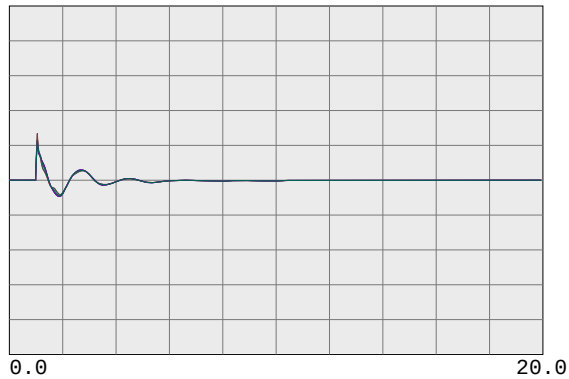


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

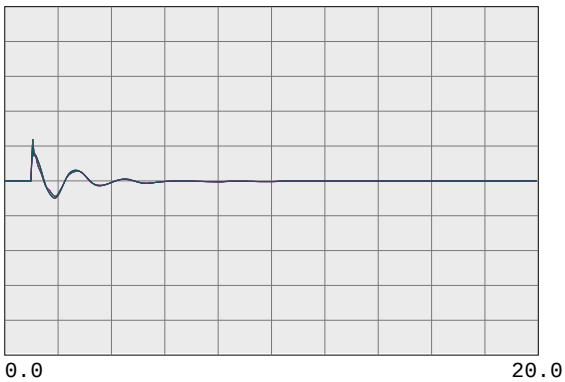
230-KV SYSTEM FREQUENCIES



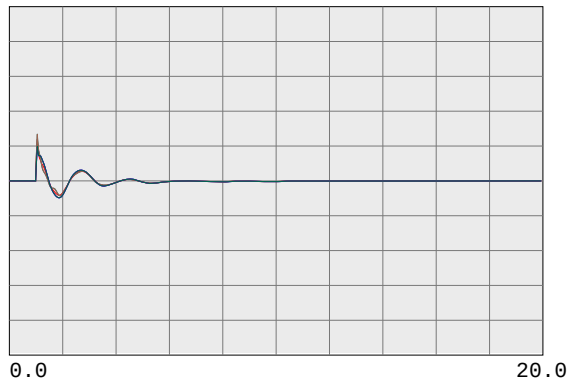
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



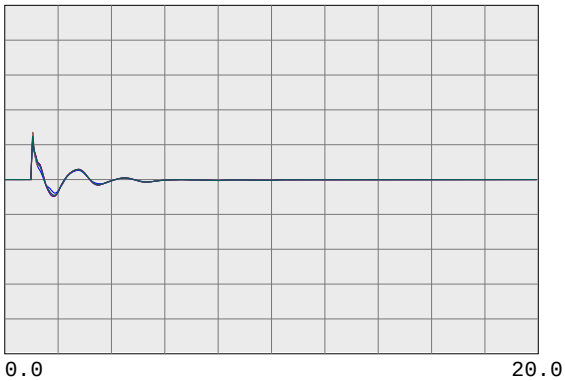
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



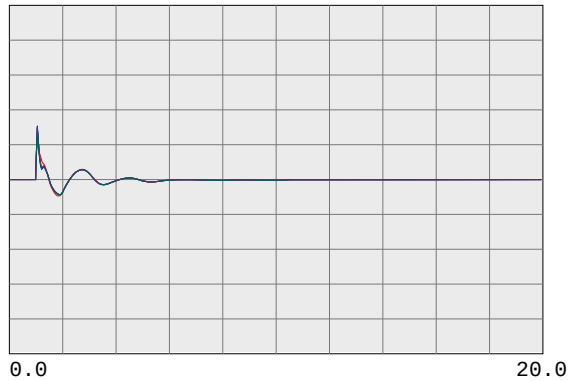
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



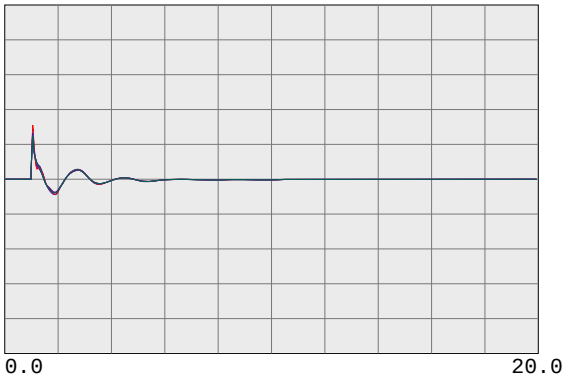
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



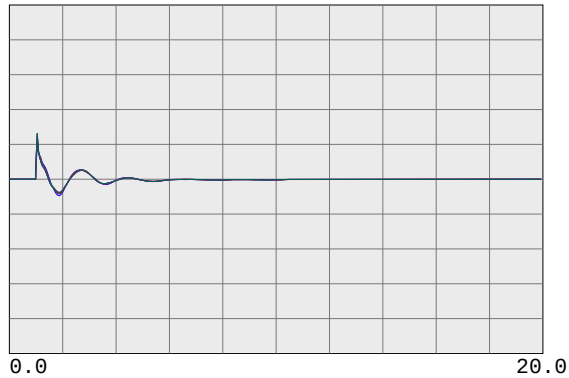
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

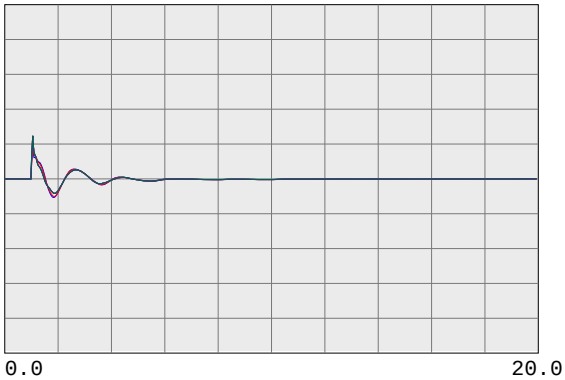
230-KV SYSTEM FREQUENCIES



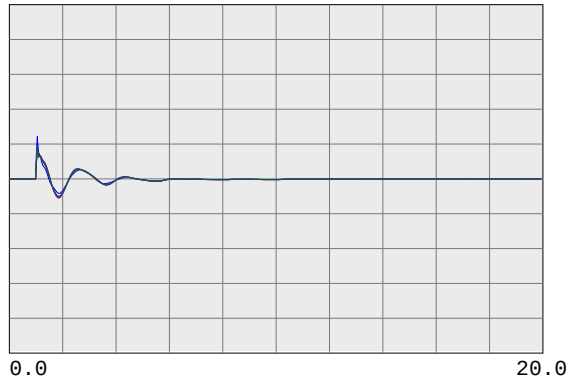
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



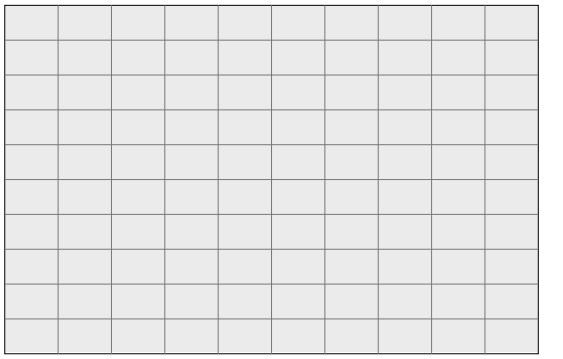
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

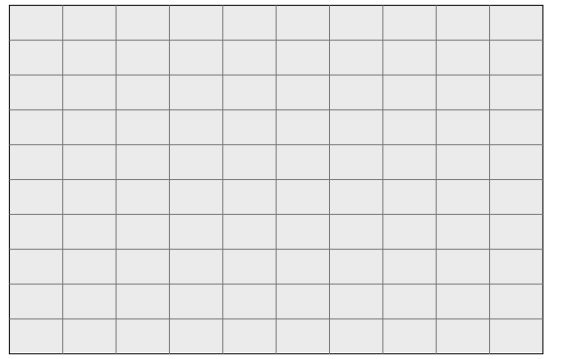


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



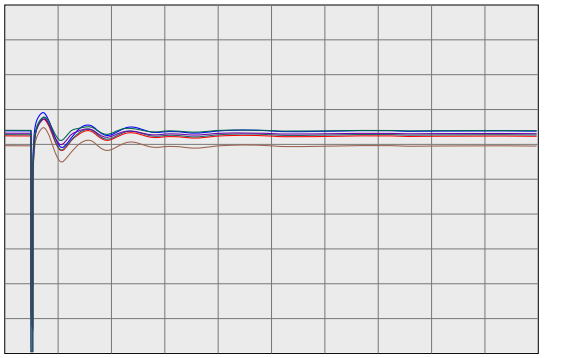
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



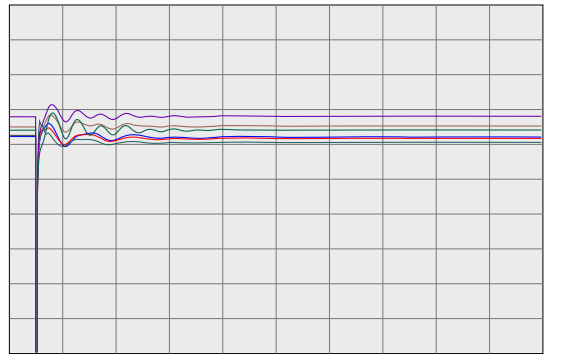


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

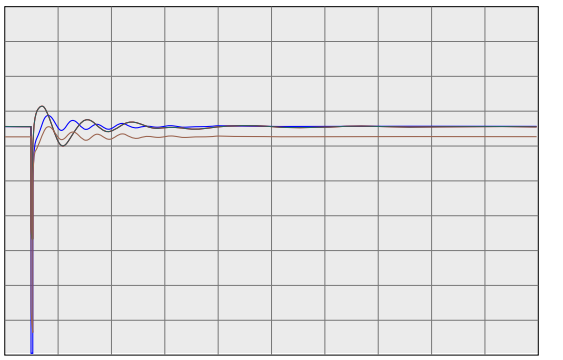
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



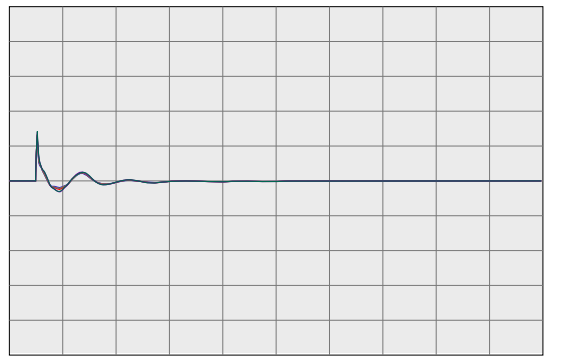
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



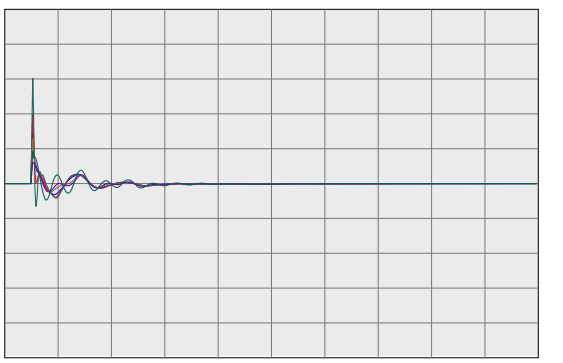
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



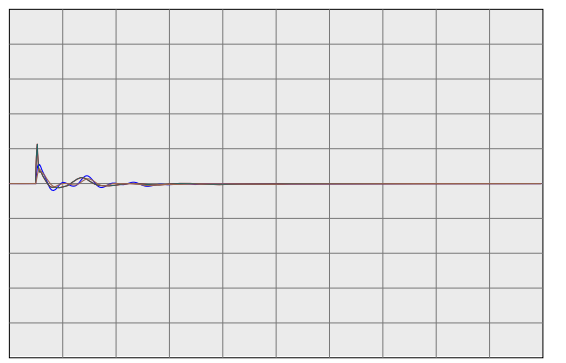
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



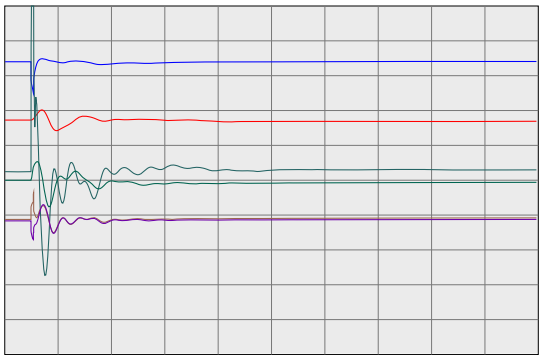
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



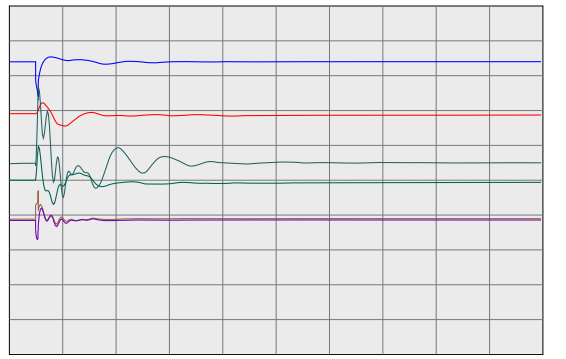
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

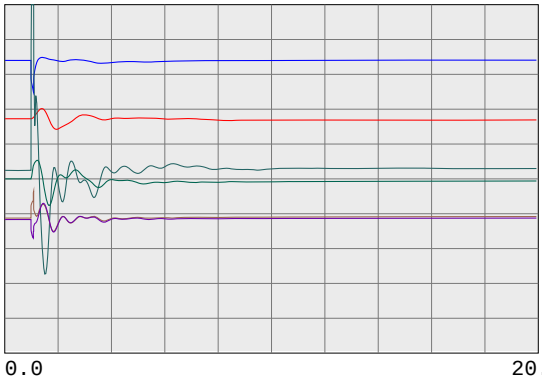
WILLOW PASS GENERATION PLANT



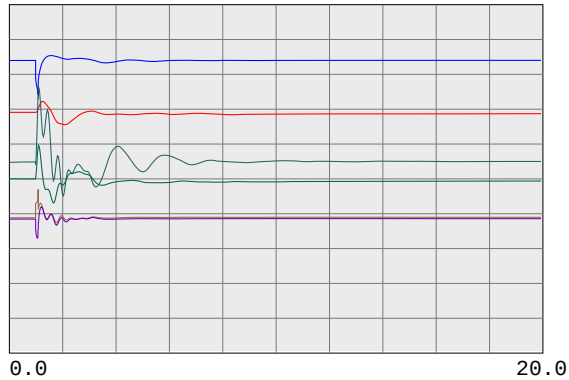
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



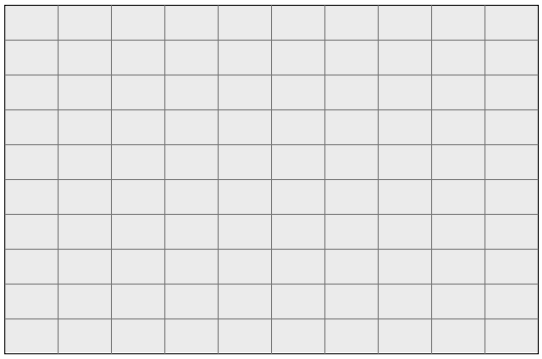
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

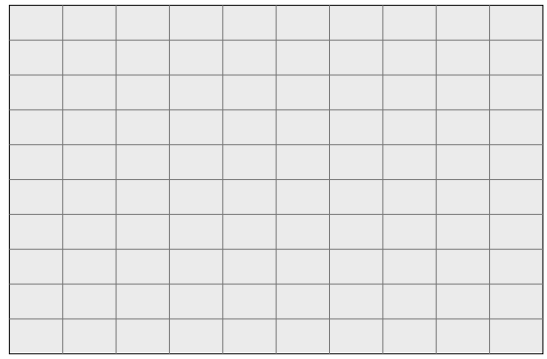


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



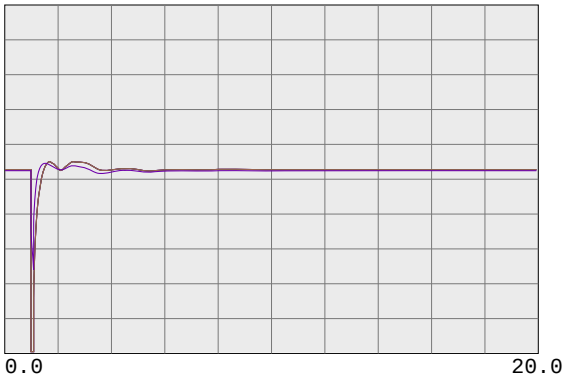
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



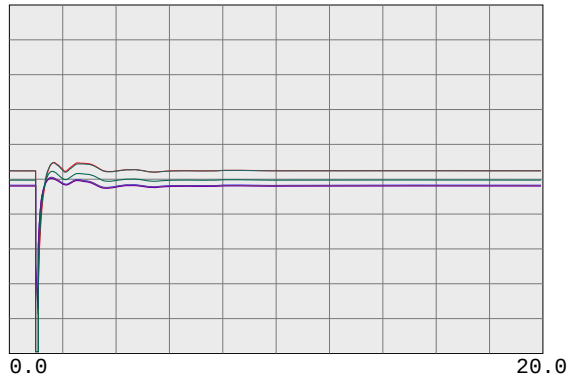


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

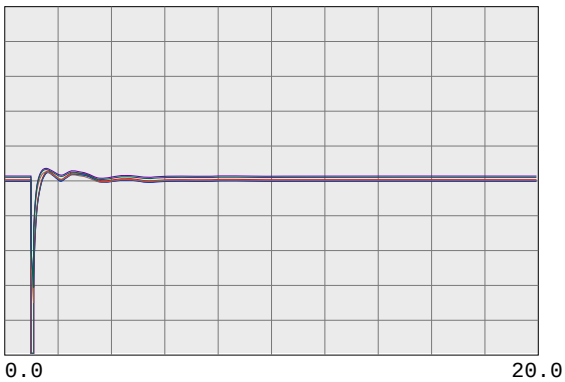
230-KV SYSTEM VOLTAGES



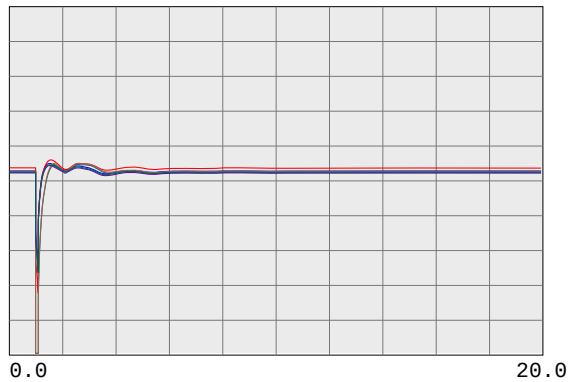
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



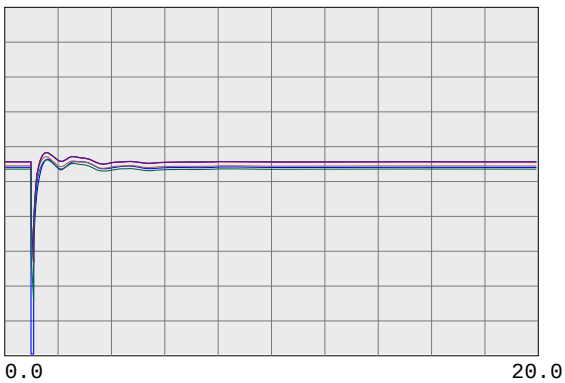
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



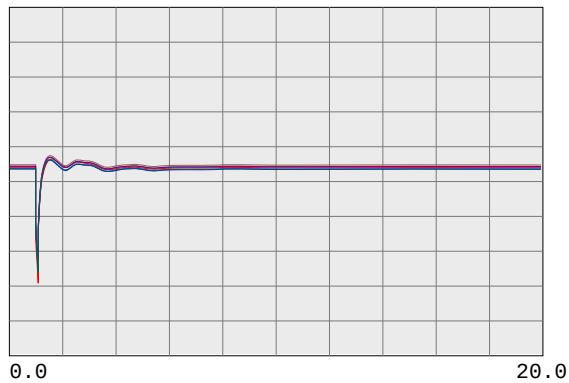
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



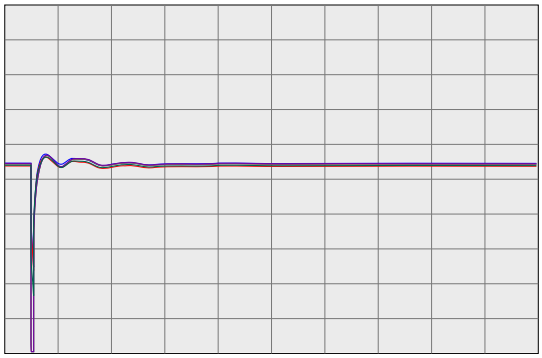
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

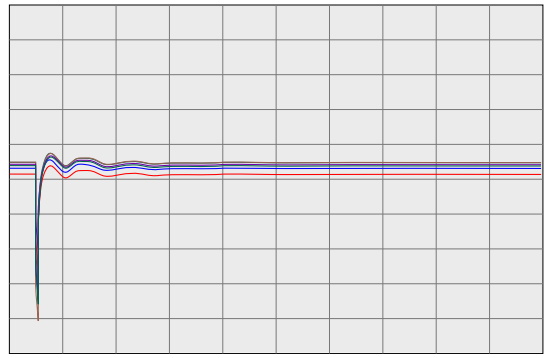
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

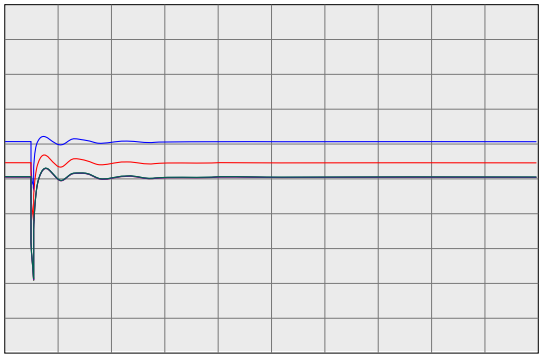
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

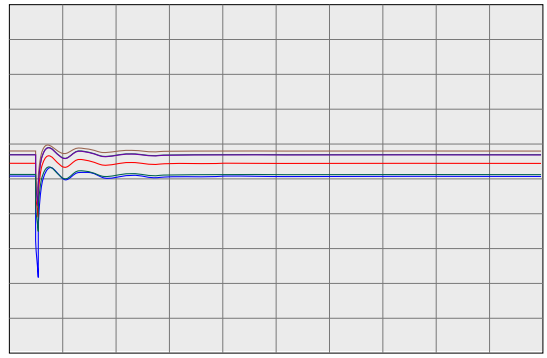
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

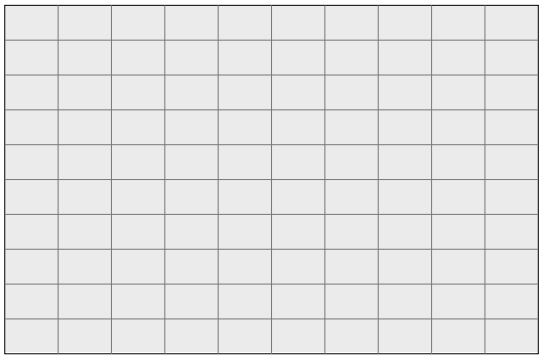
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

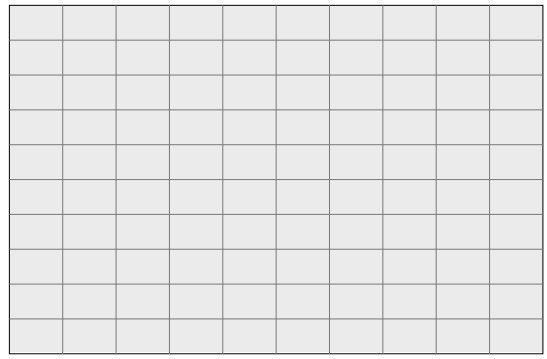


0.0 20.0

Time(sec)

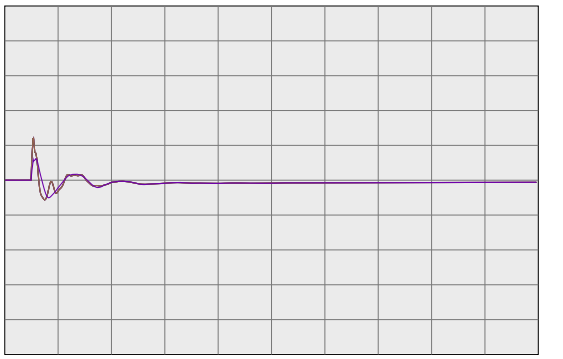
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



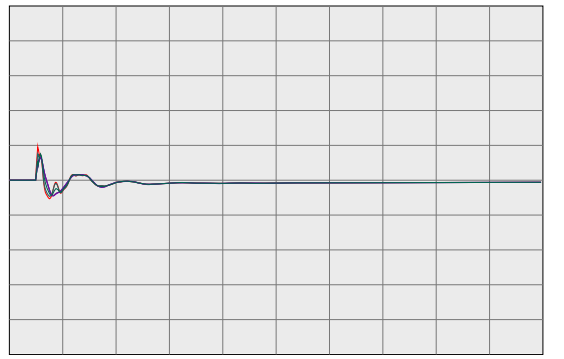


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

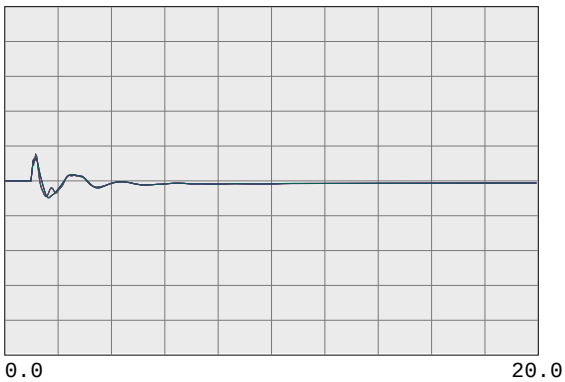
230-KV SYSTEM FREQUENCIES



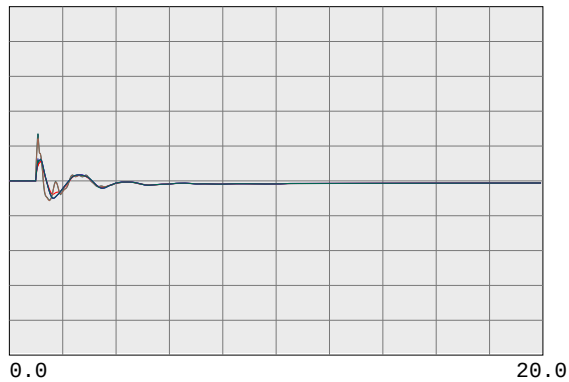
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



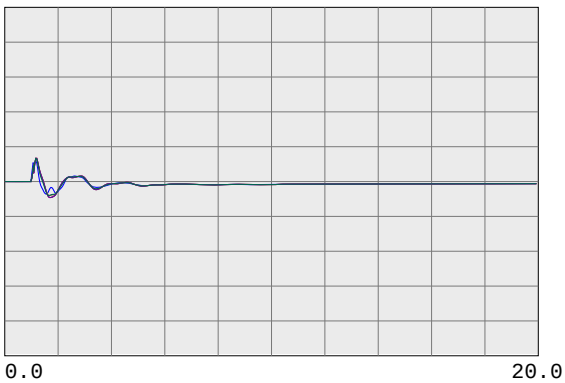
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



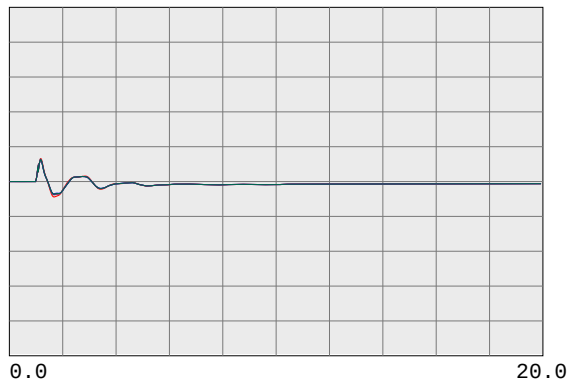
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



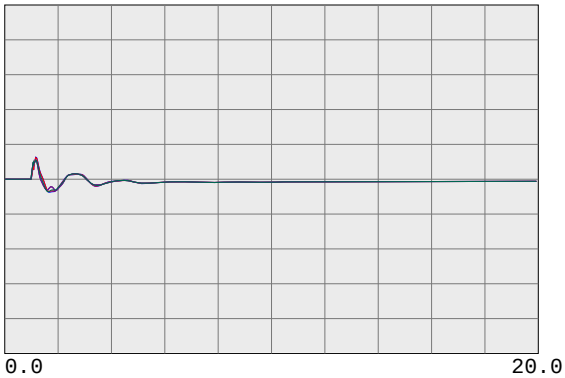
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



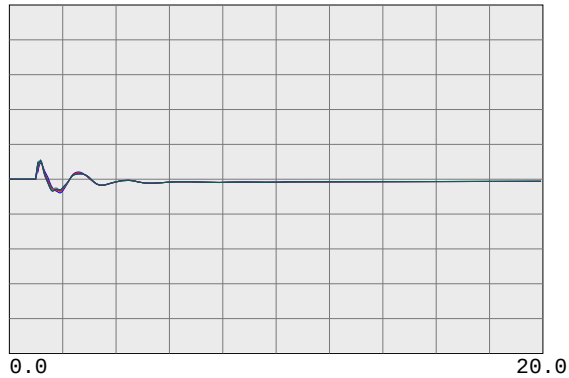
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

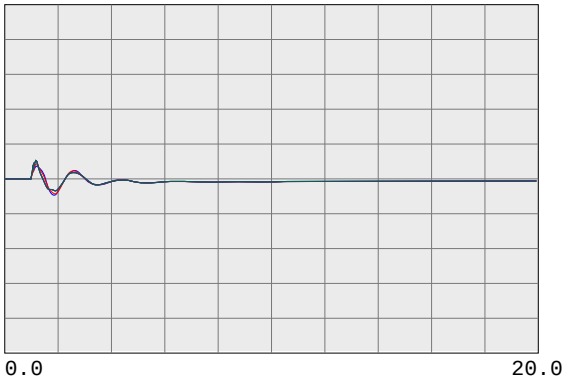
230-KV SYSTEM FREQUENCIES



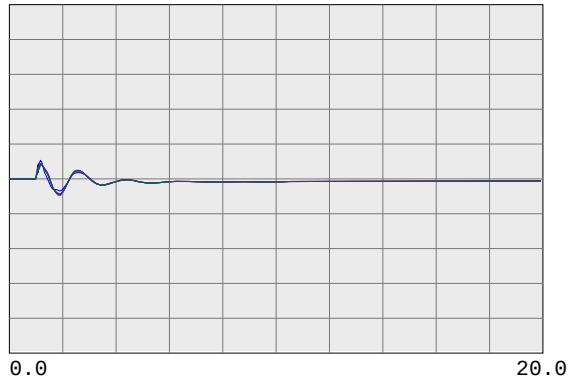
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



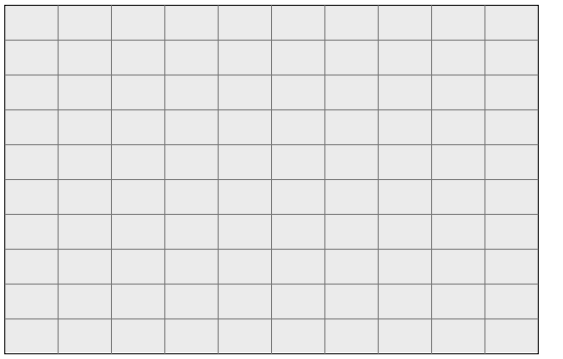
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

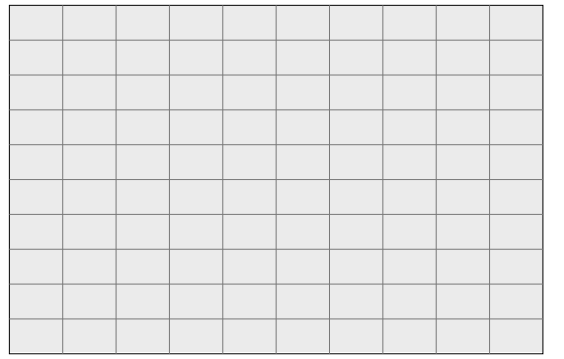


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



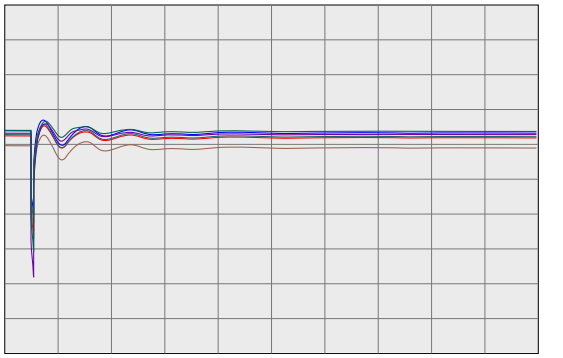
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



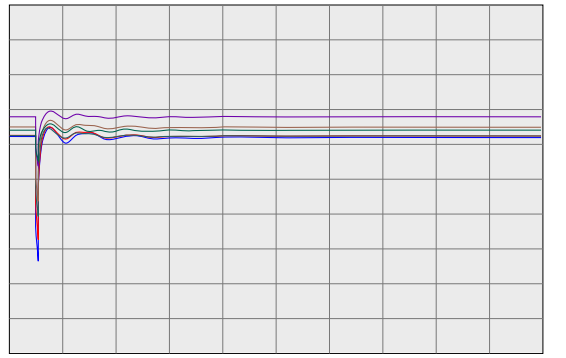


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

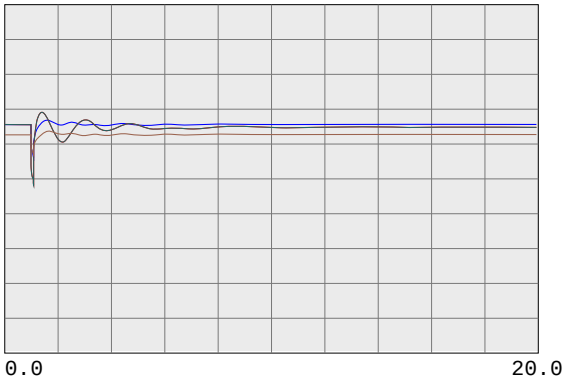
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



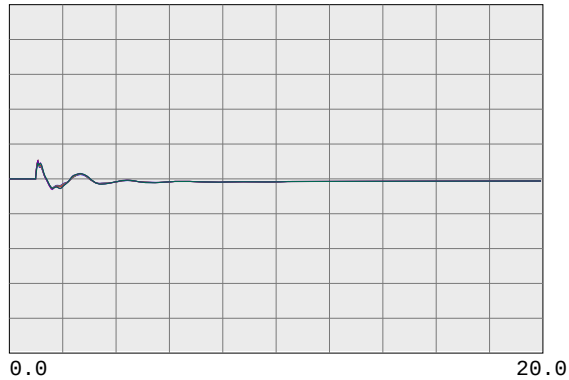
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



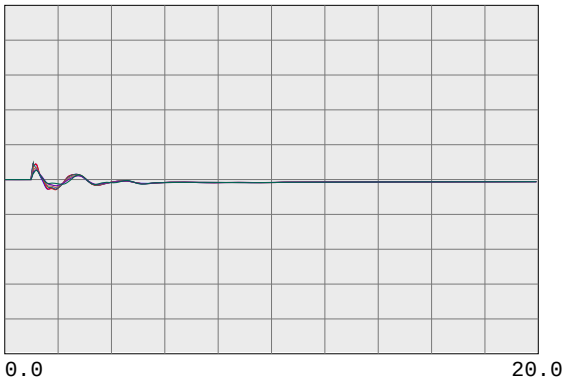
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



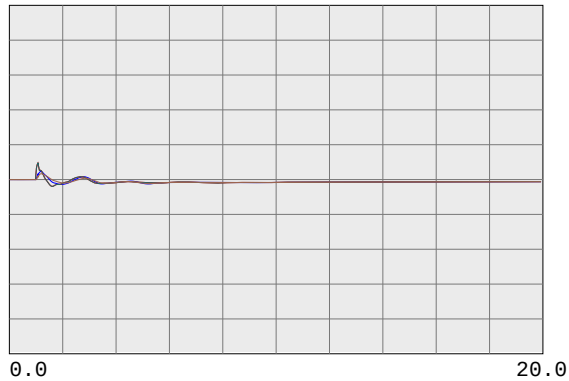
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



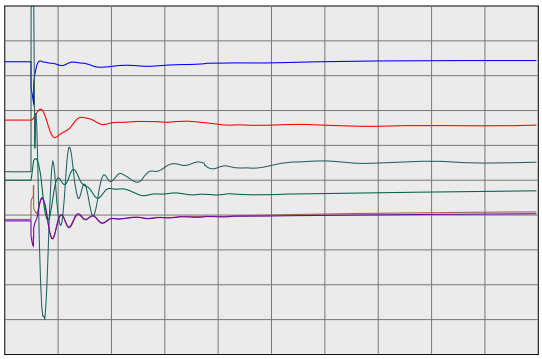
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



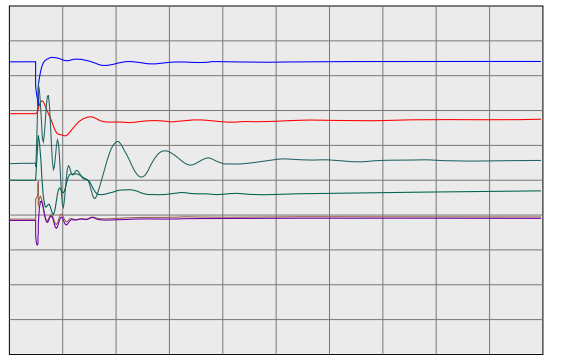
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

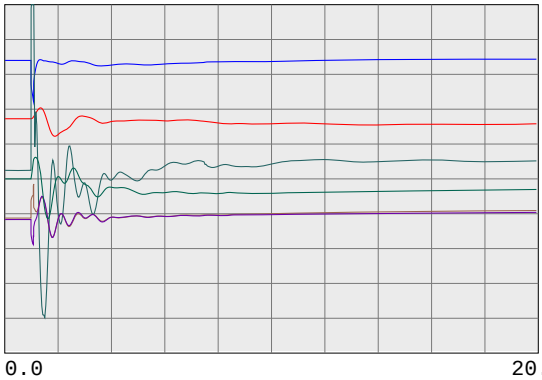
WILLOW PASS GENERATION PLANT



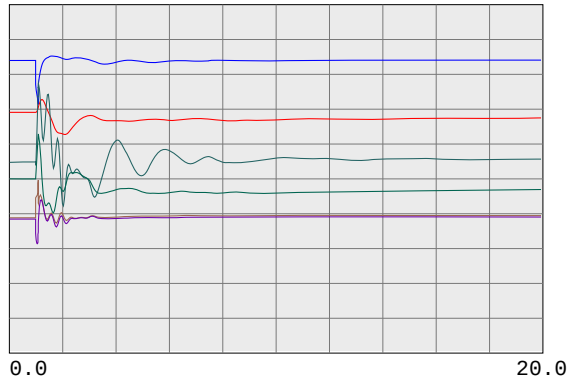
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



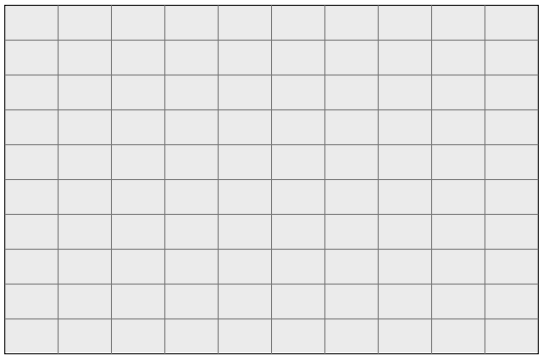
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

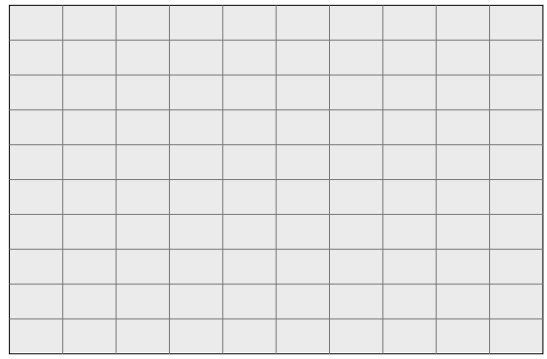


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



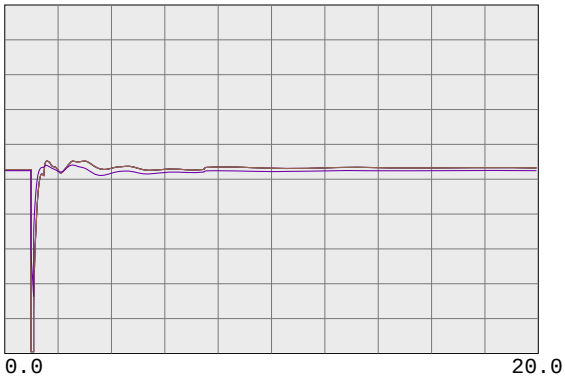
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



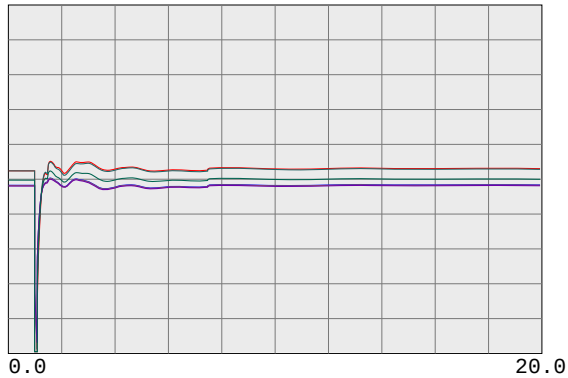


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

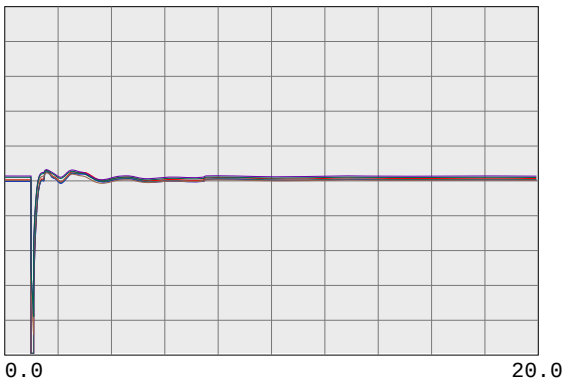
230-KV SYSTEM VOLTAGES



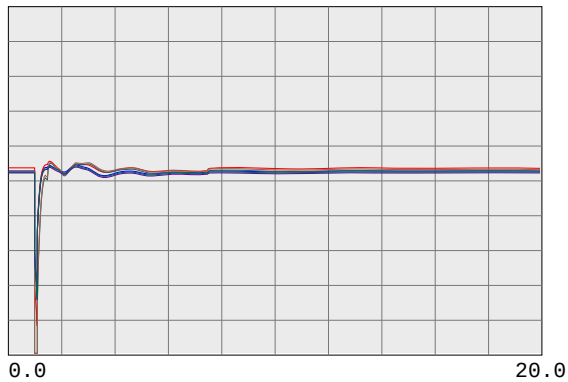
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



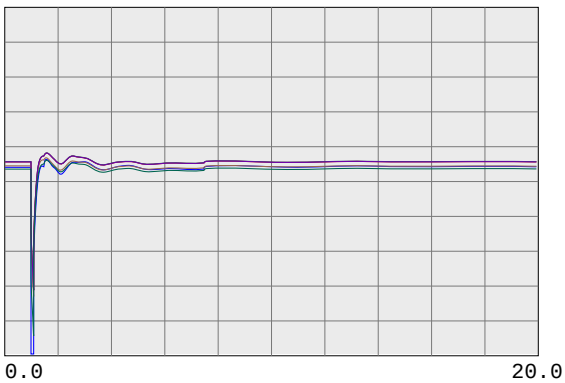
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



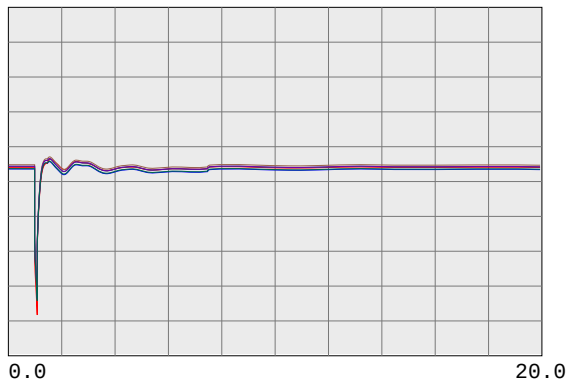
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



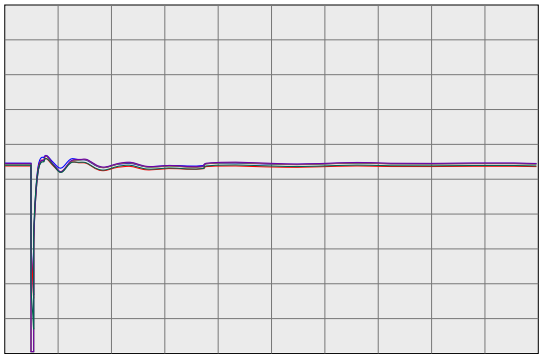
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

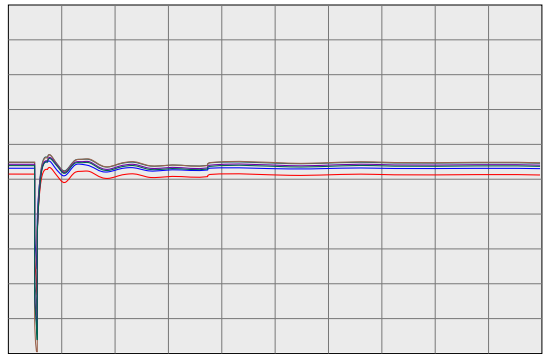
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

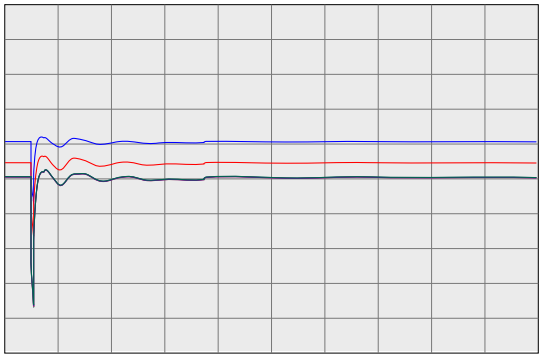
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

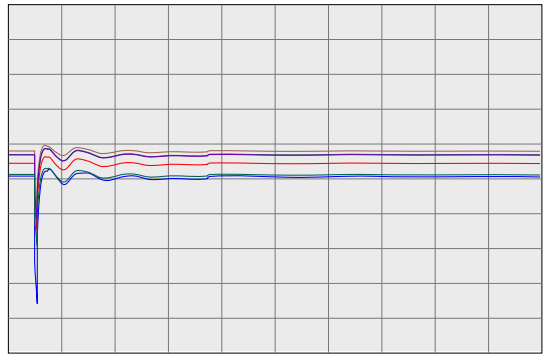
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

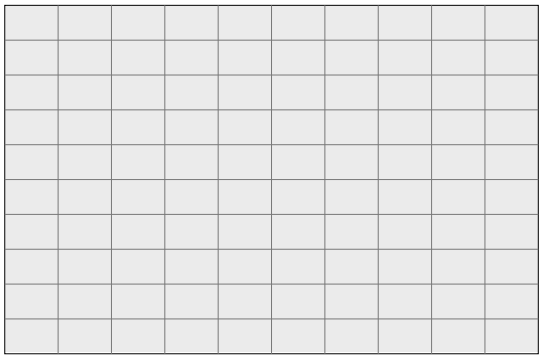
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

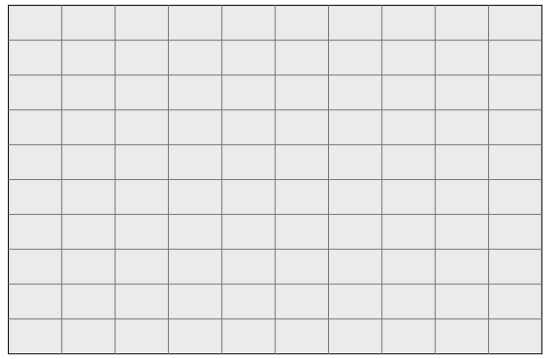


0.0 20.0

Time(sec)

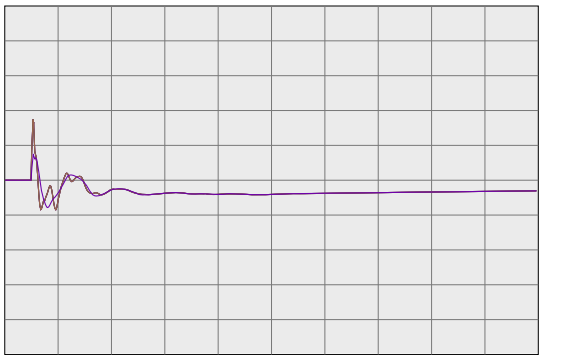
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



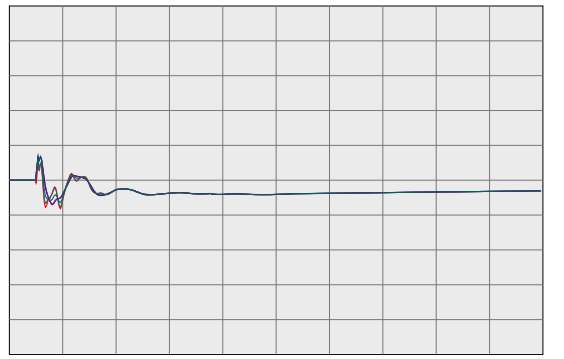


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

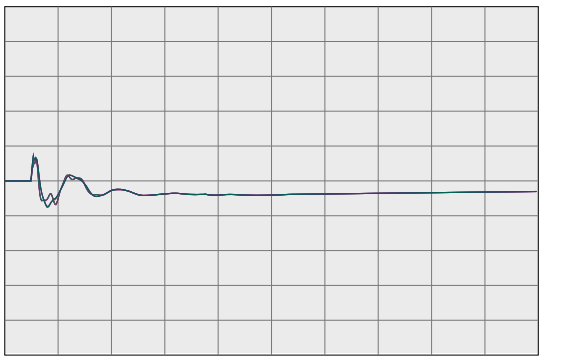
230-KV SYSTEM FREQUENCIES



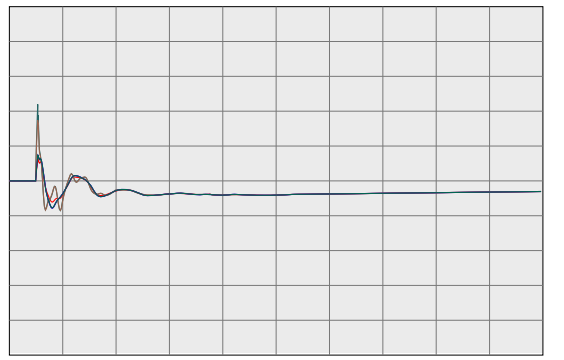
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



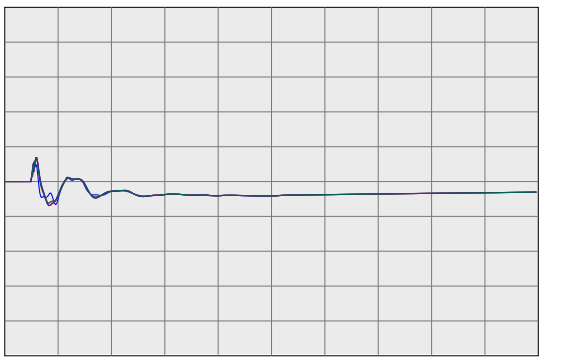
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



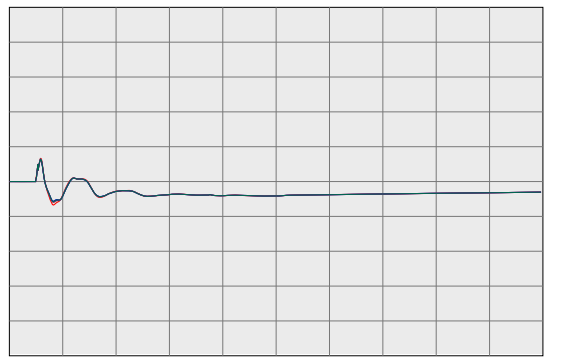
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



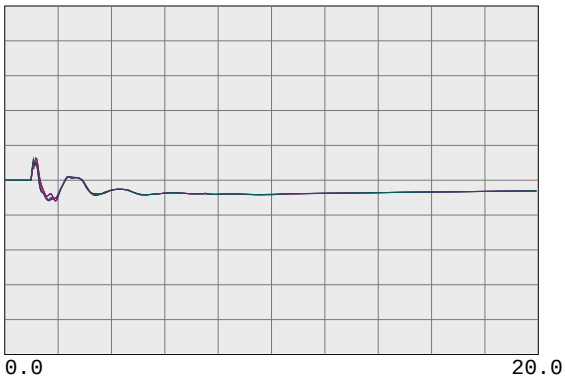
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



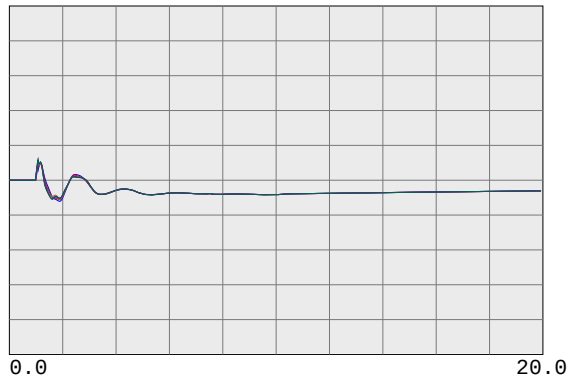
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

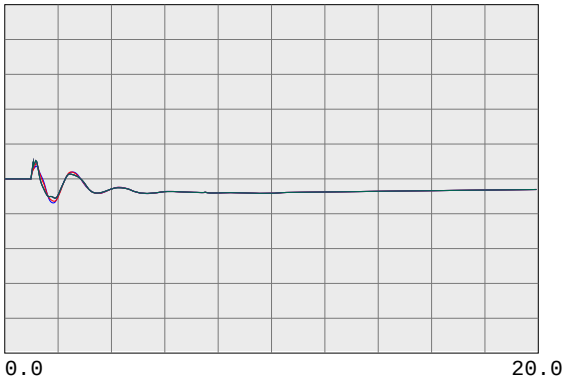
230-KV SYSTEM FREQUENCIES



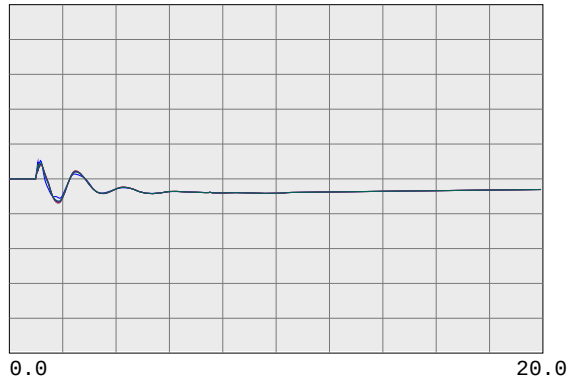
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



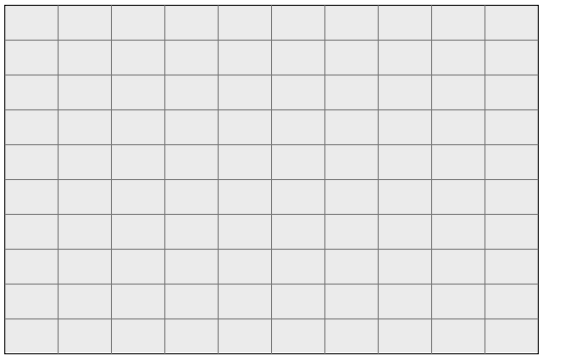
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

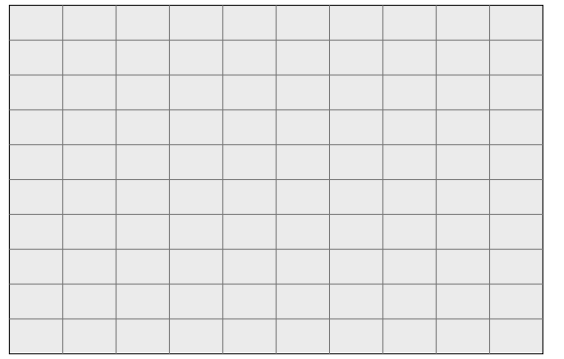


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



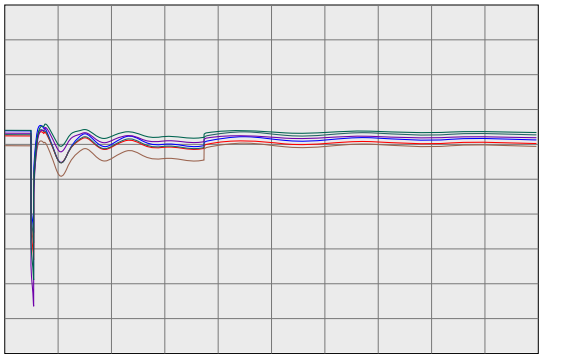
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



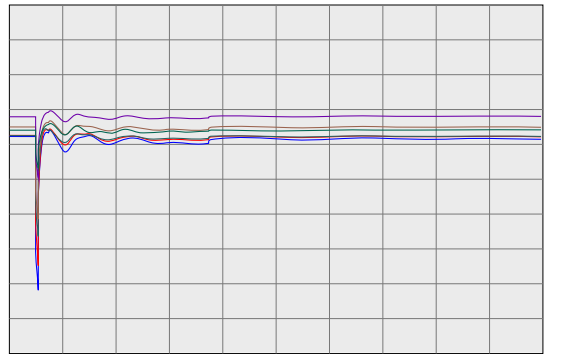


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

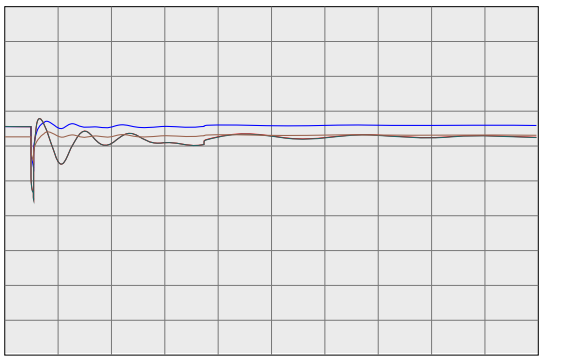
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



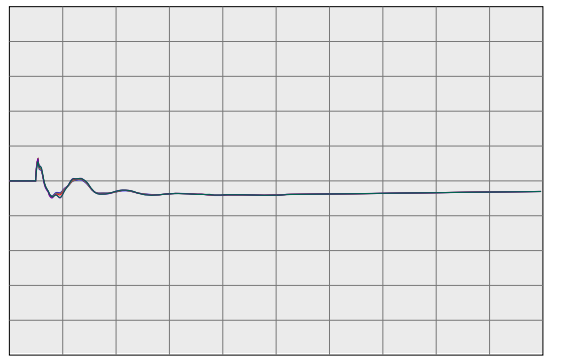
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



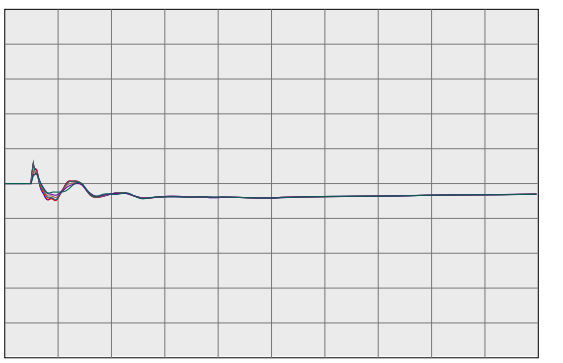
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



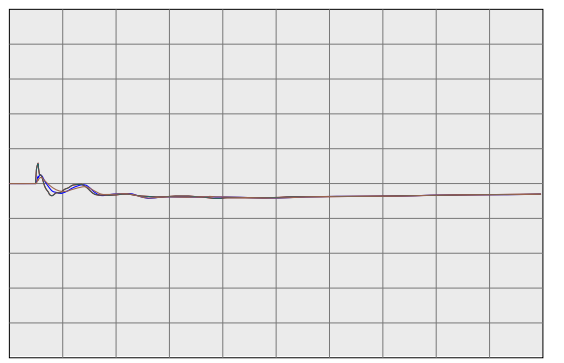
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



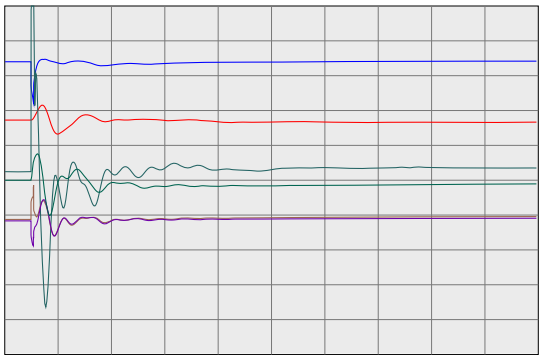
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



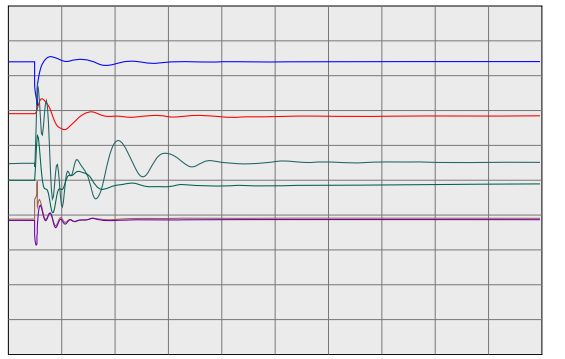
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

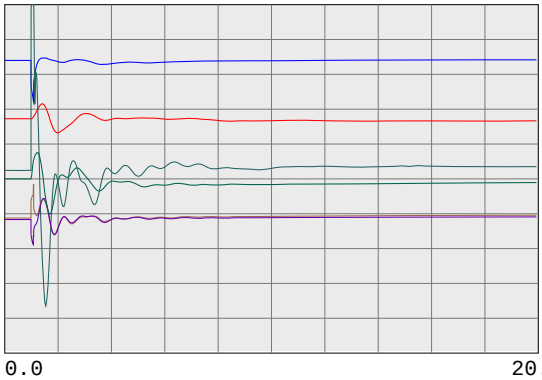
WILLOW PASS GENERATION PLANT



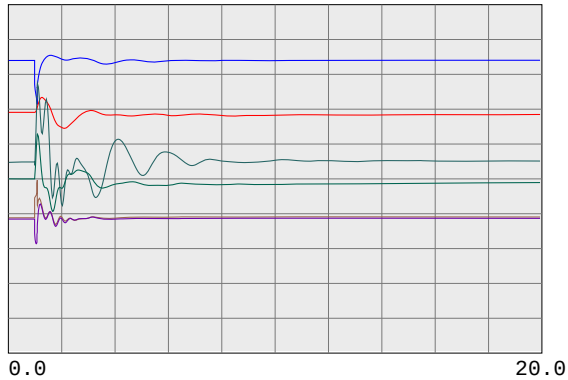
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



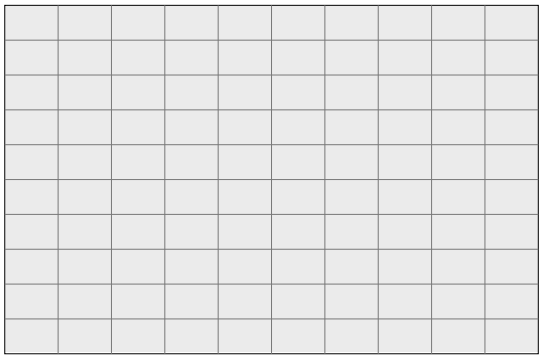
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

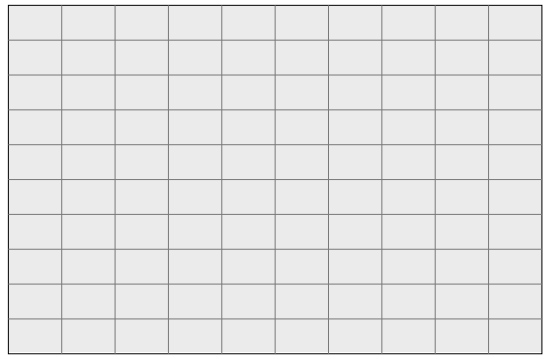


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



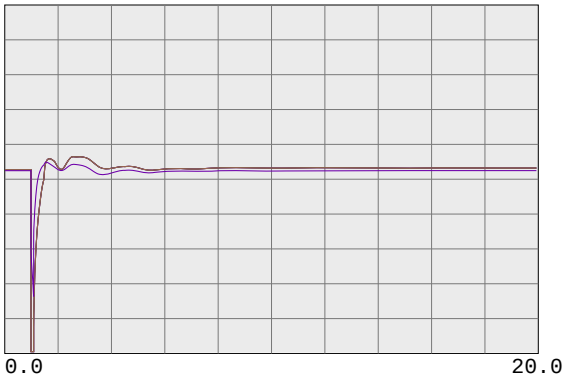
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



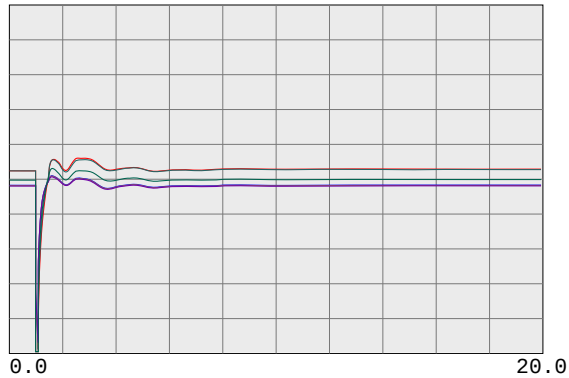


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

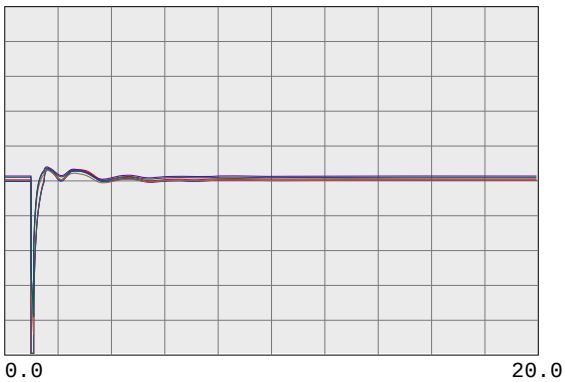
230-KV SYSTEM VOLTAGES



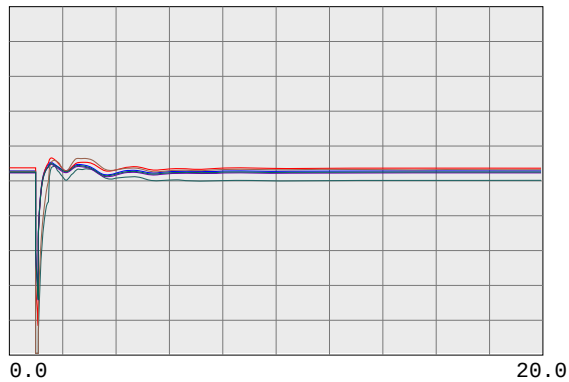
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



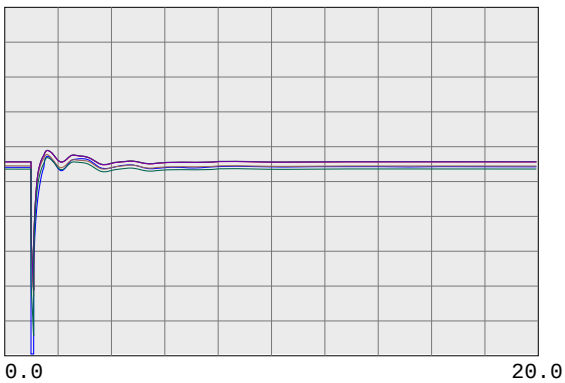
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



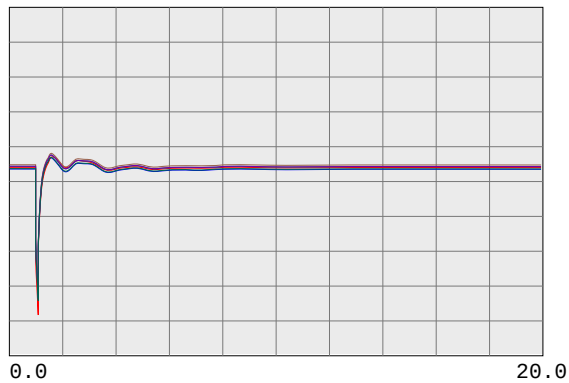
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



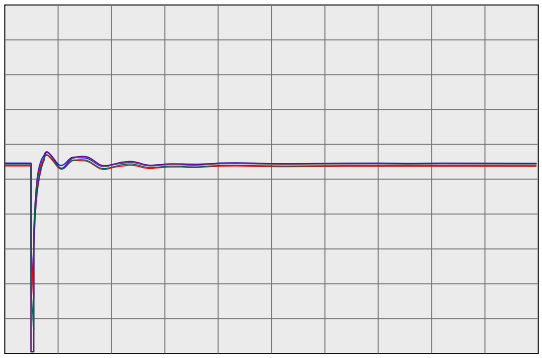
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

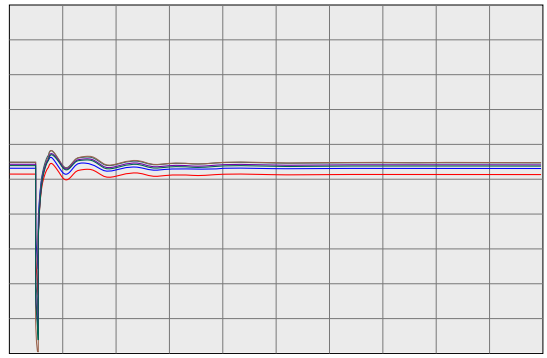
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

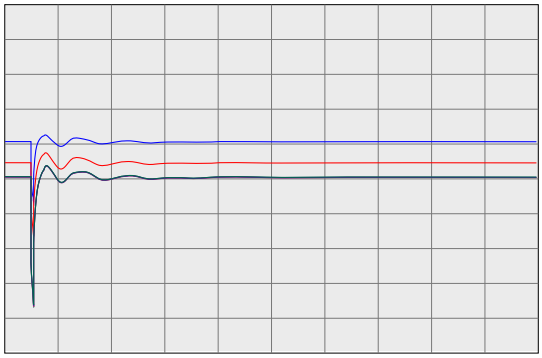
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

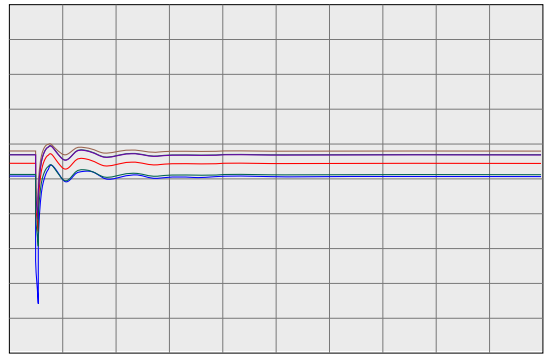
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

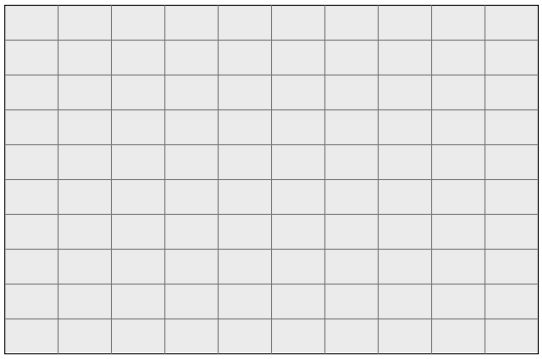
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

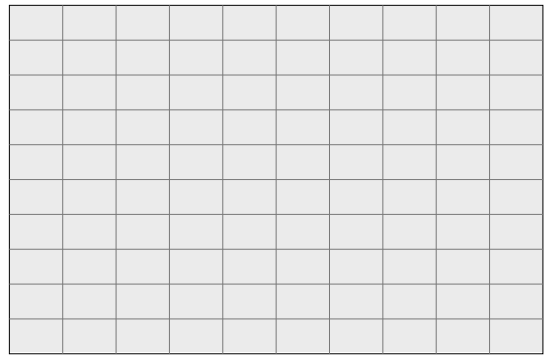


0.0 20.0

Time(sec)

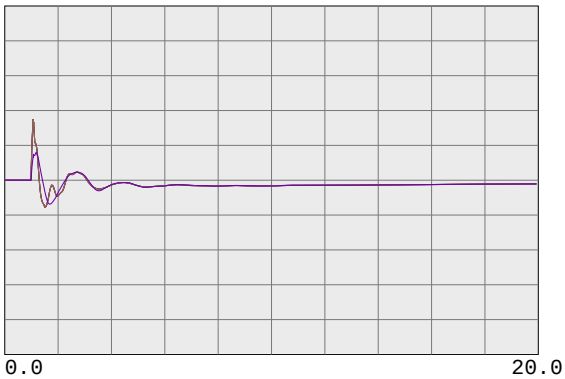
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



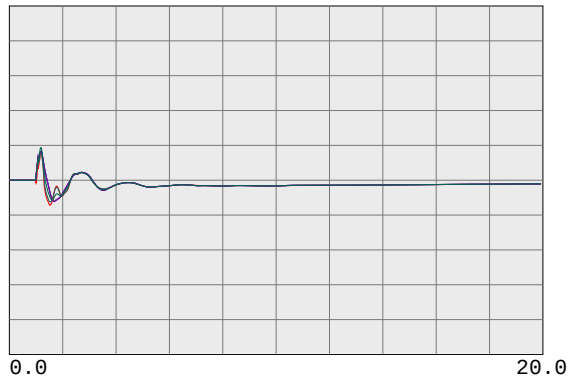


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

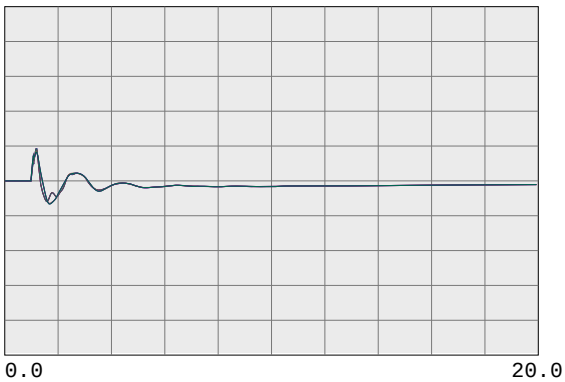
230-KV SYSTEM FREQUENCIES



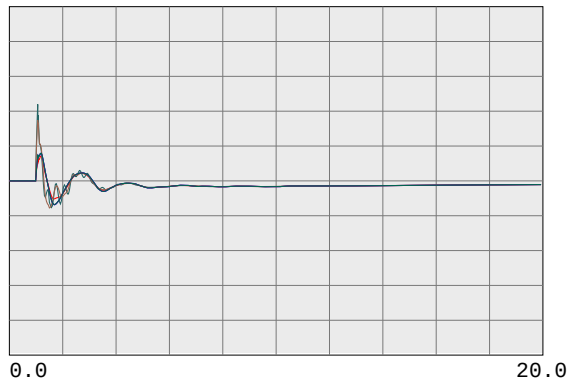
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



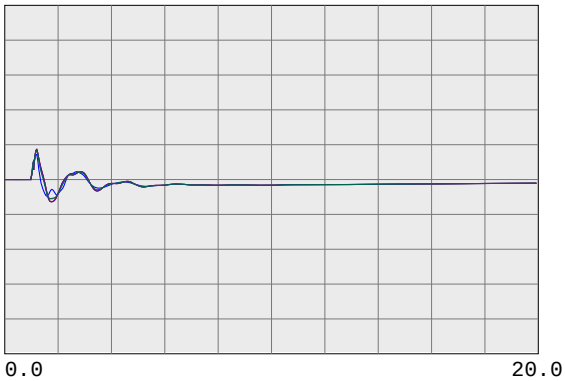
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



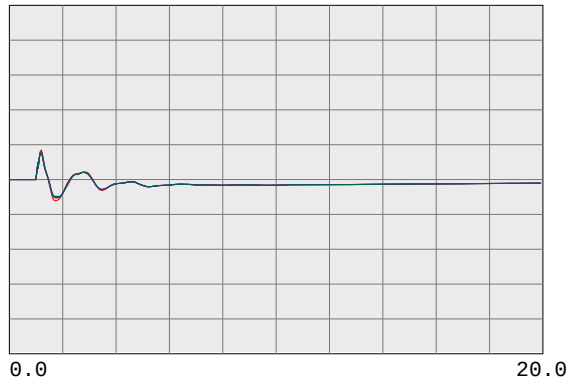
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



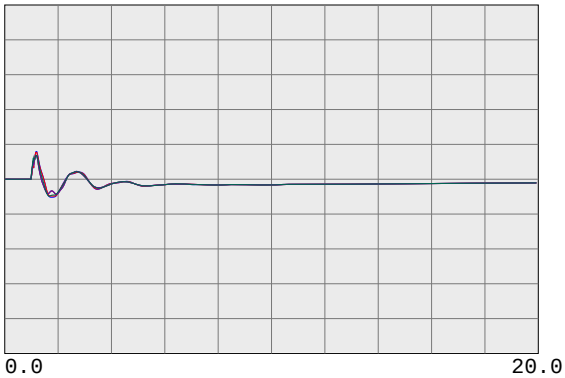
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



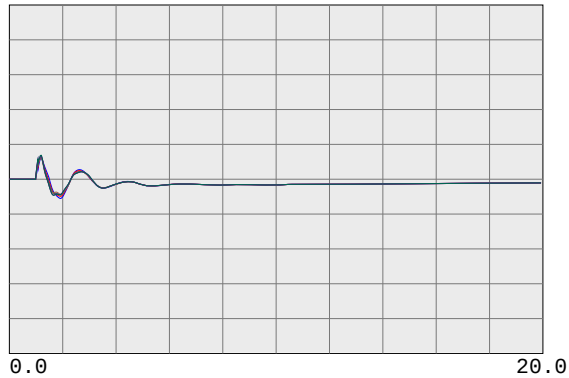
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

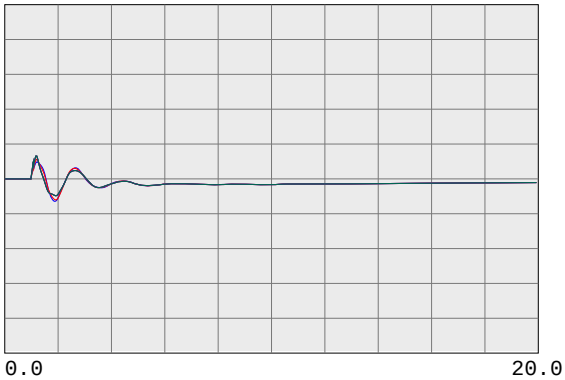
230-KV SYSTEM FREQUENCIES



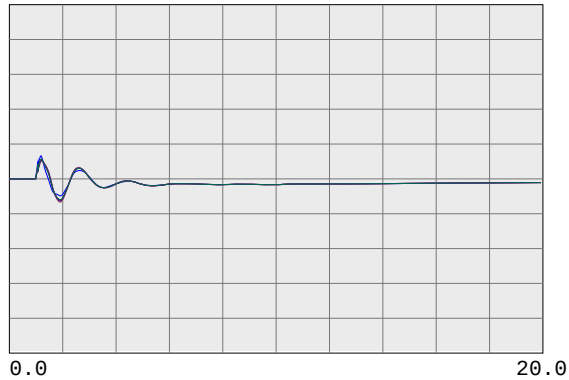
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



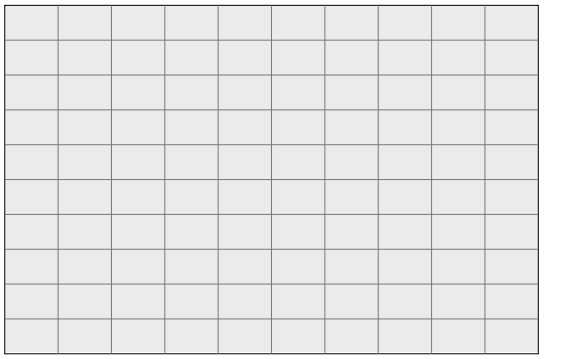
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

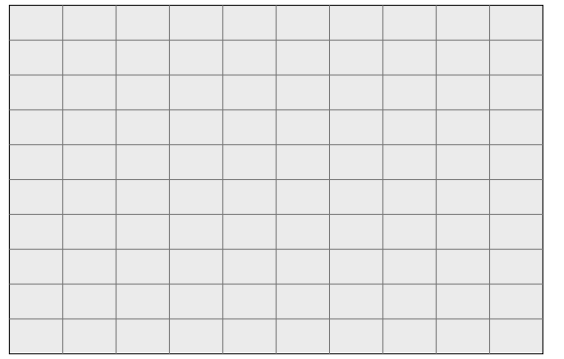


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



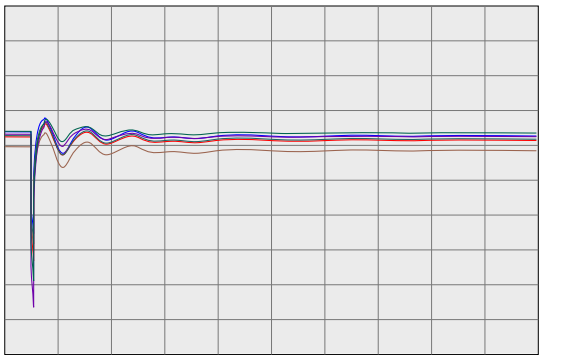
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



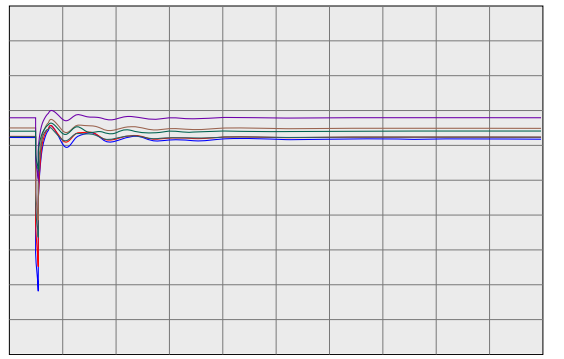


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

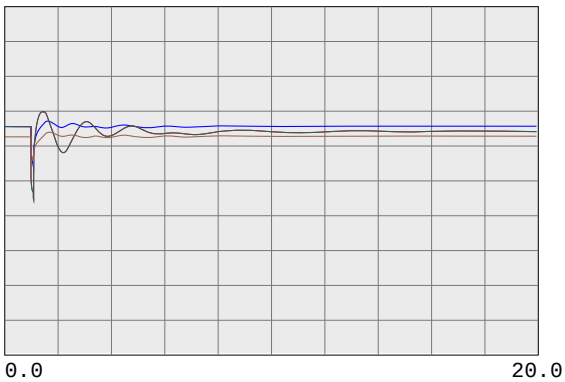
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



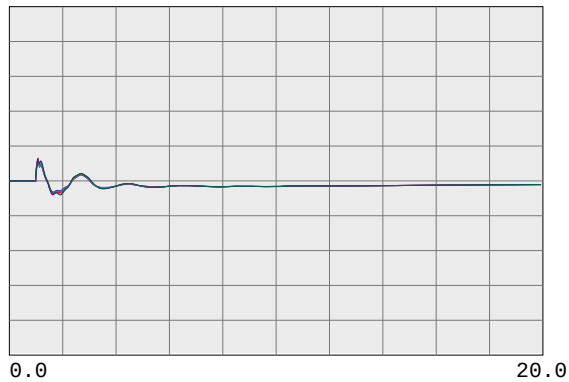
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



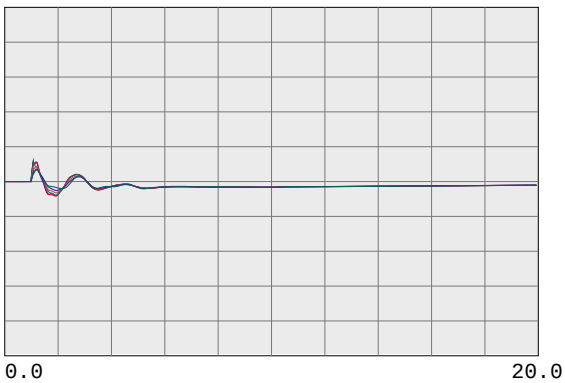
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



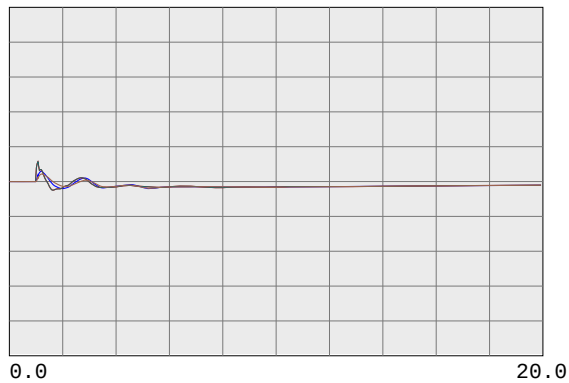
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



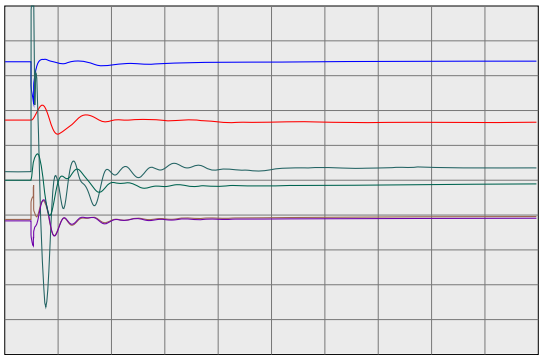
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



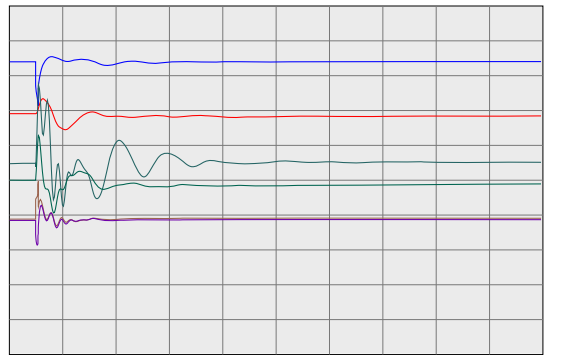
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

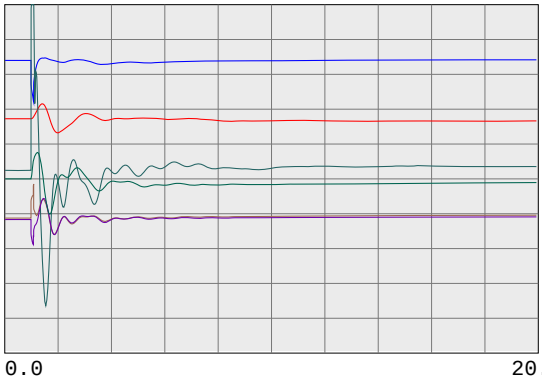
WILLOW PASS GENERATION PLANT



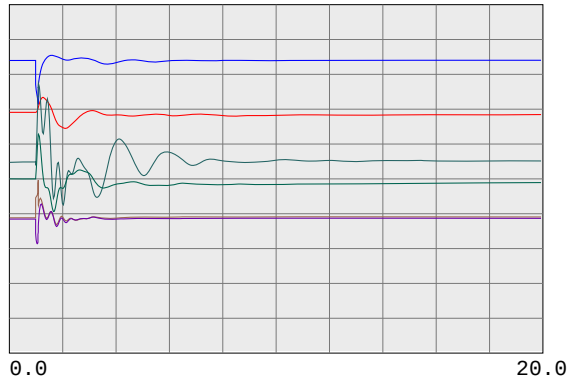
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



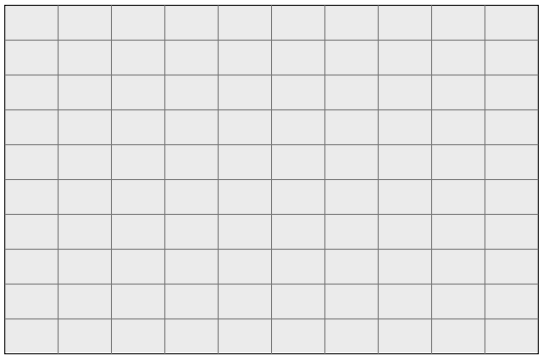
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

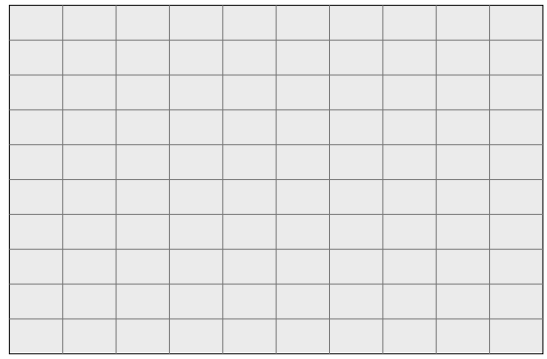


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



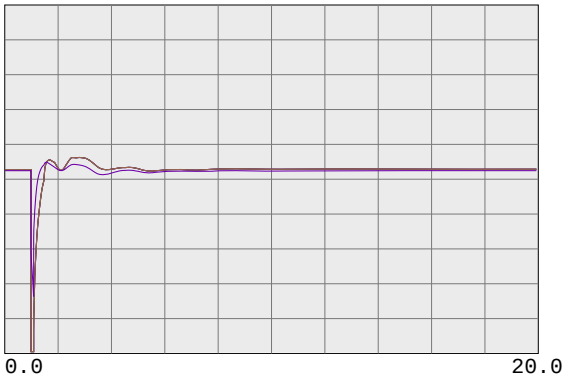
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



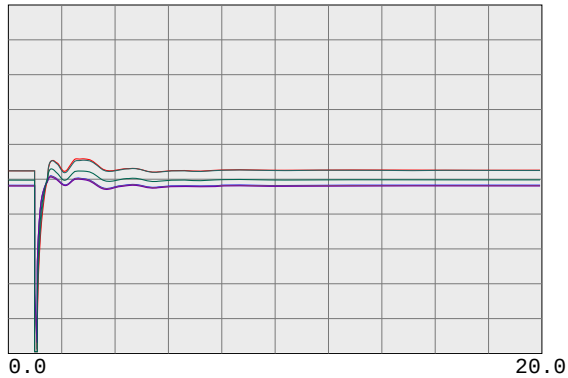


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

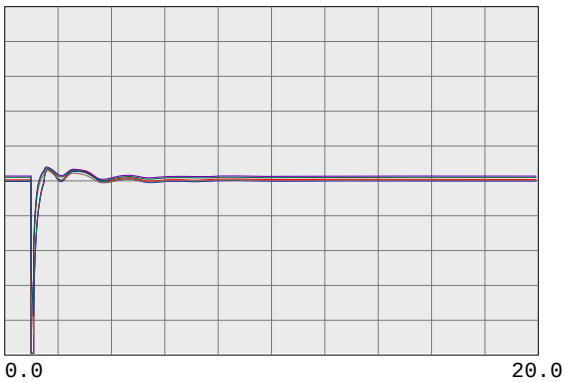
230-KV SYSTEM VOLTAGES



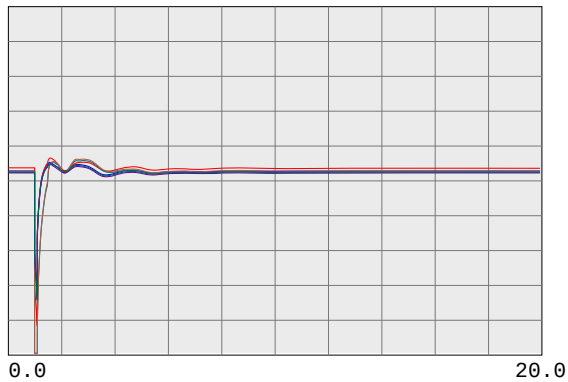
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



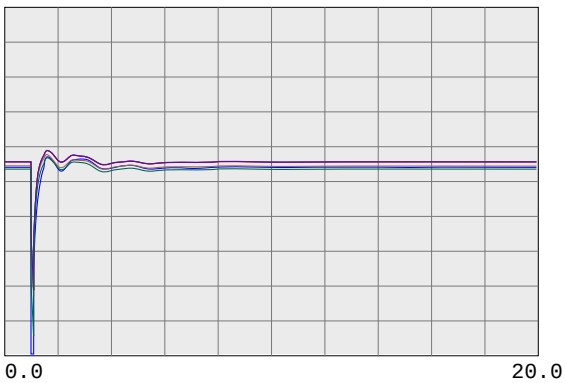
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



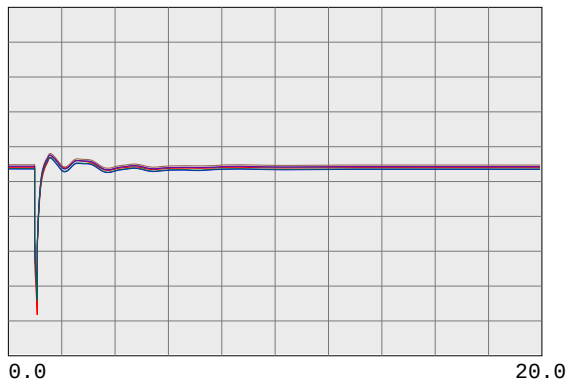
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



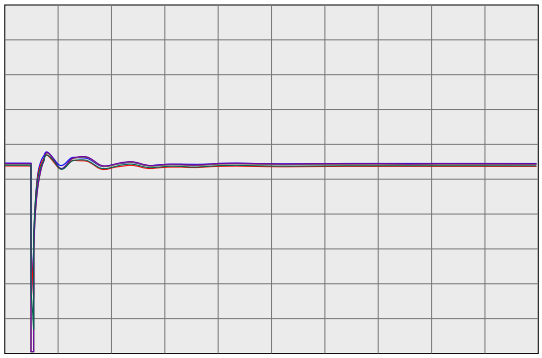
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

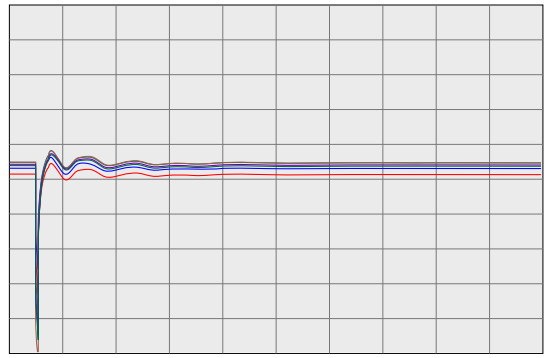
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

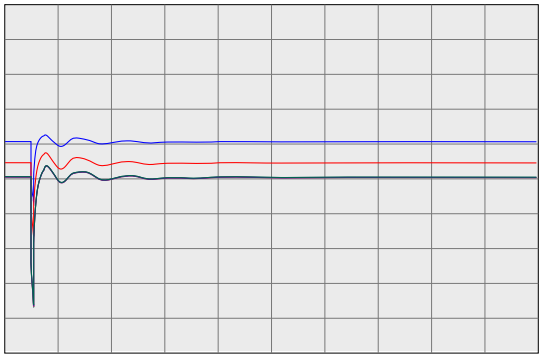
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

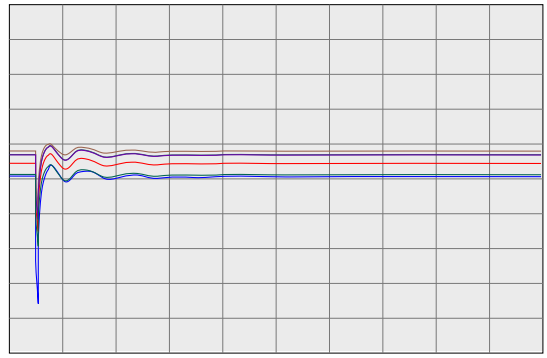
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

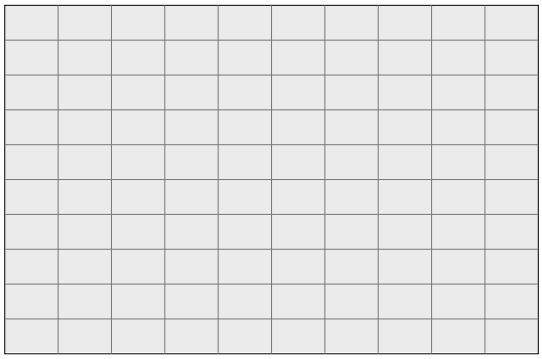
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

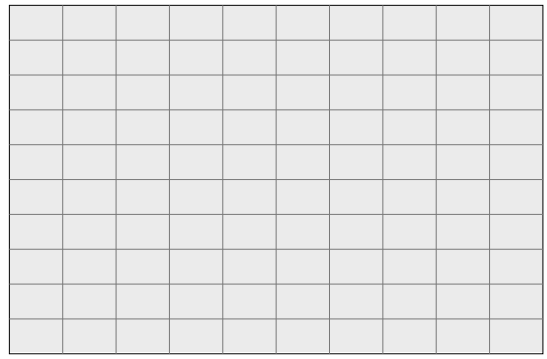


0.0 20.0

Time(sec)

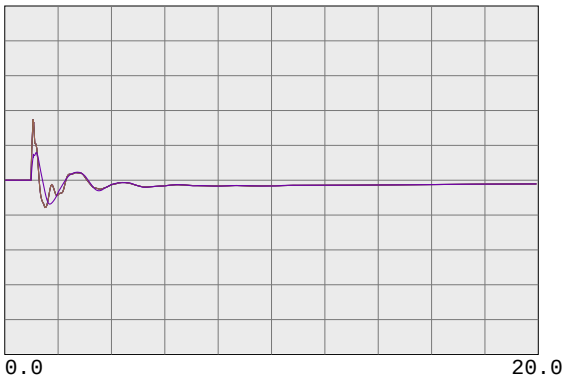
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



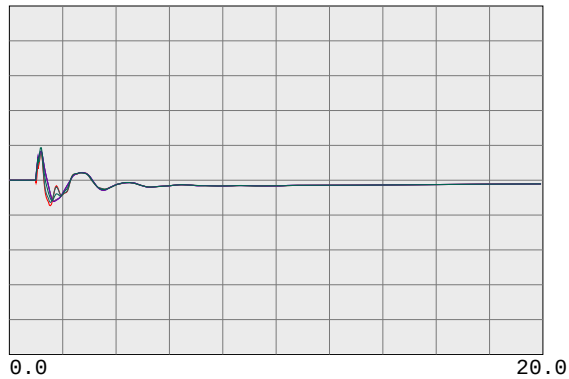


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

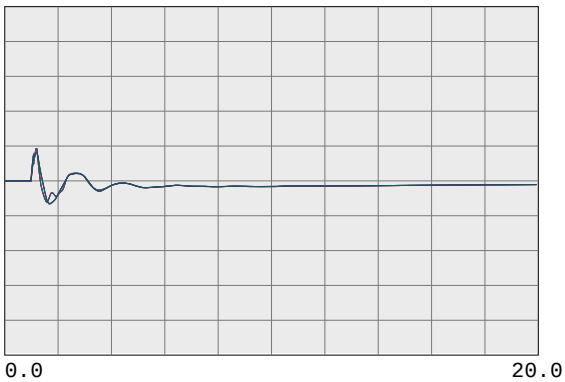
230-KV SYSTEM FREQUENCIES



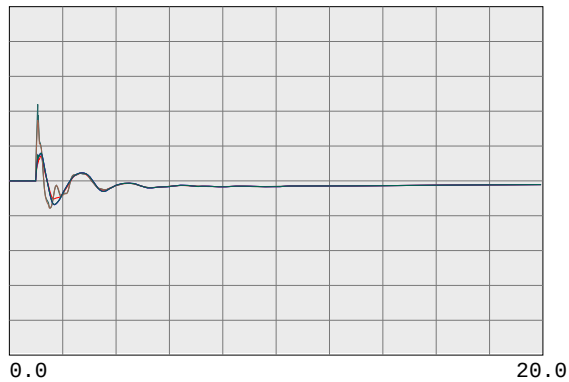
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



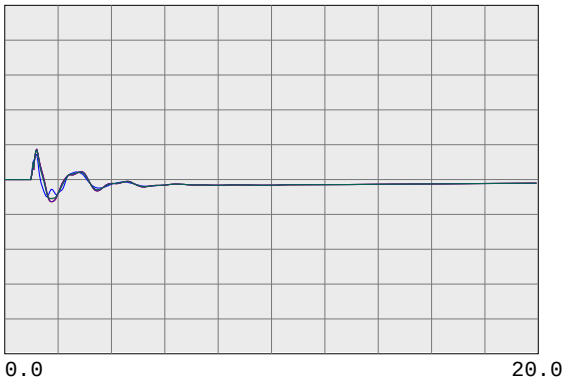
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



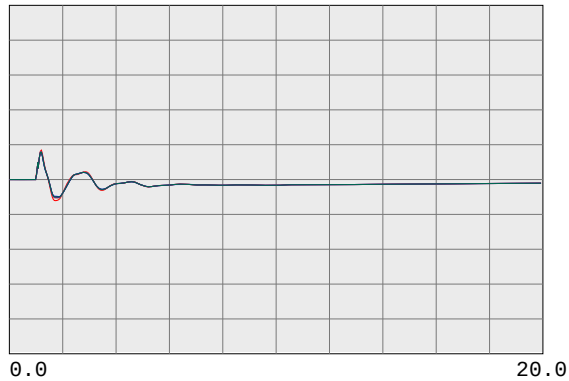
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



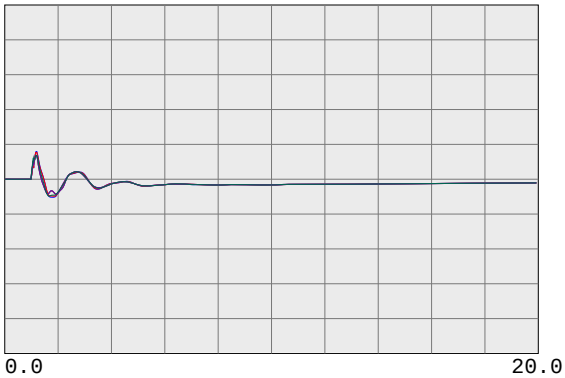
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



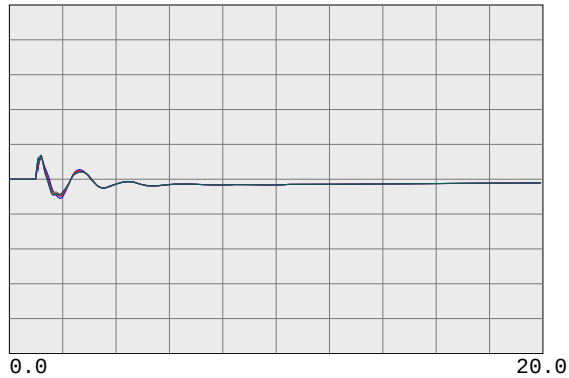
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

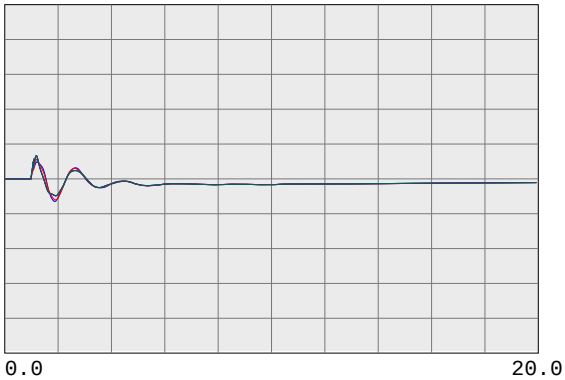
230-KV SYSTEM FREQUENCIES



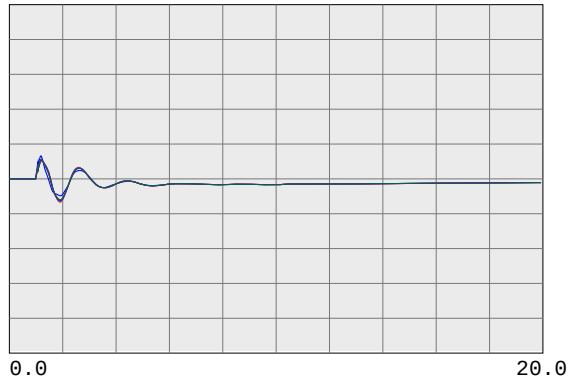
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



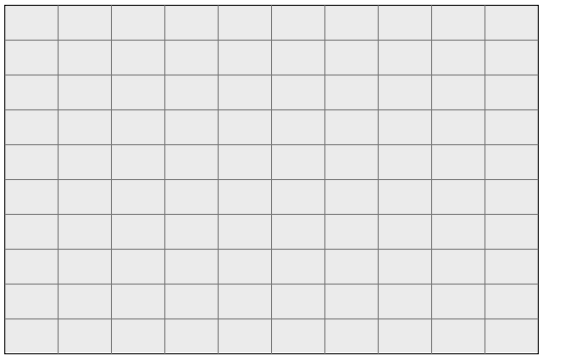
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

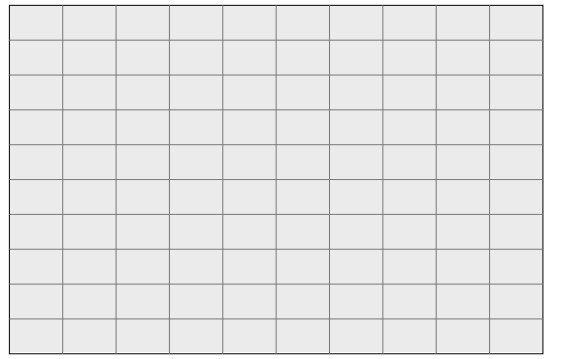


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



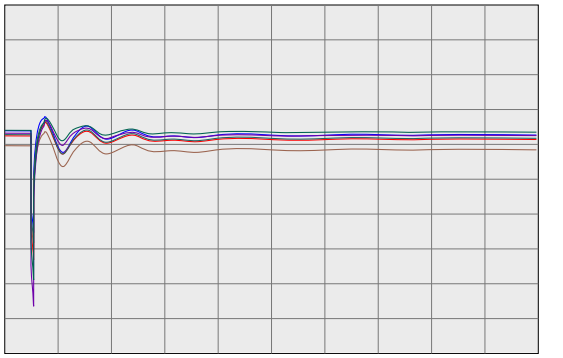
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



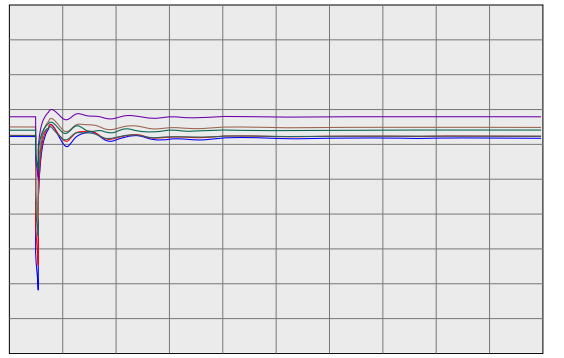


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

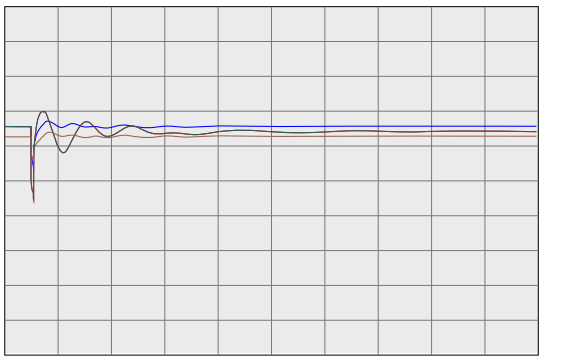
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



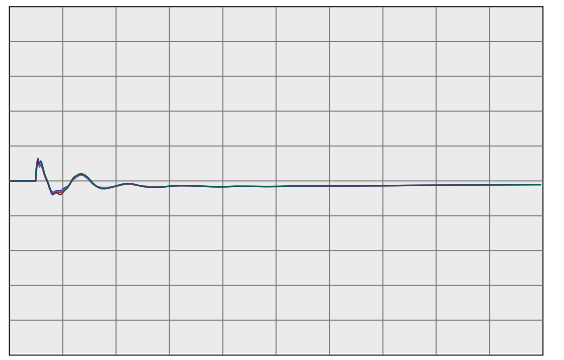
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



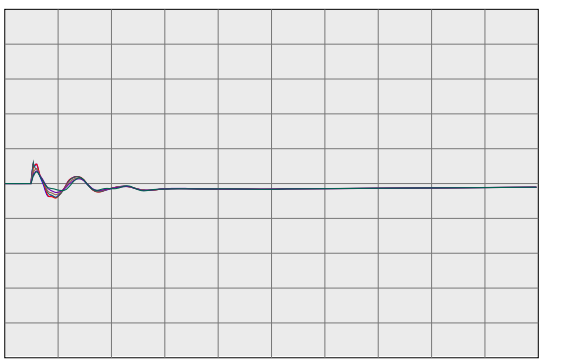
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



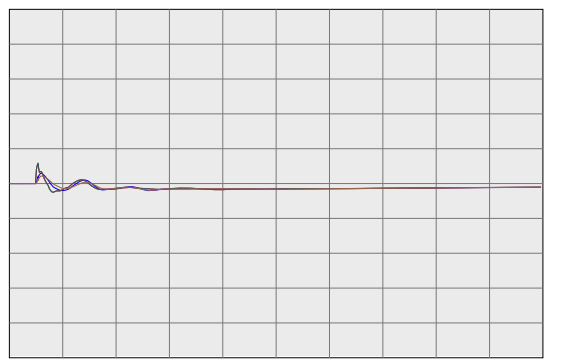
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



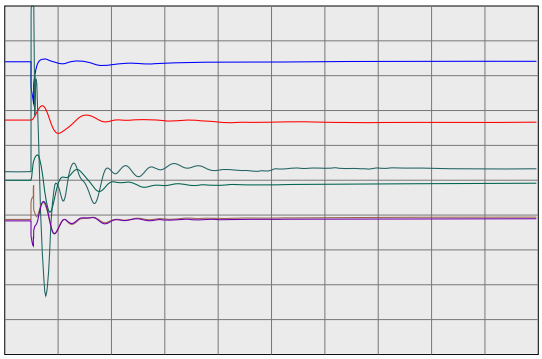
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



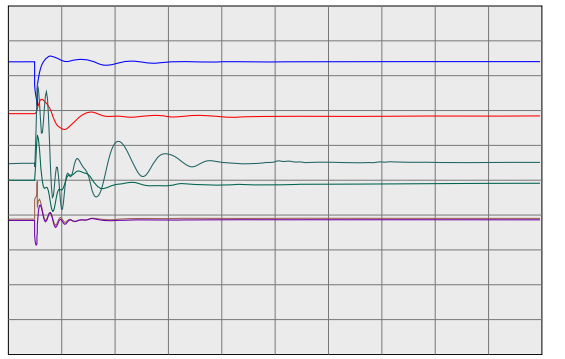
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

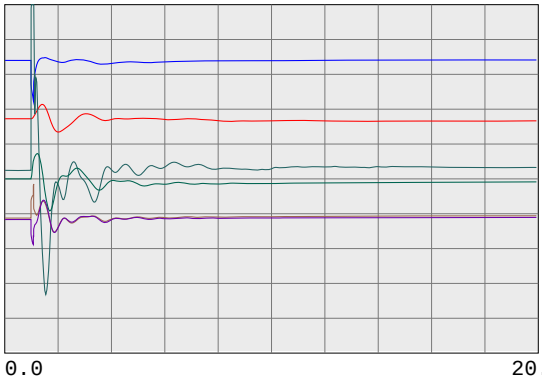
WILLOW PASS GENERATION PLANT



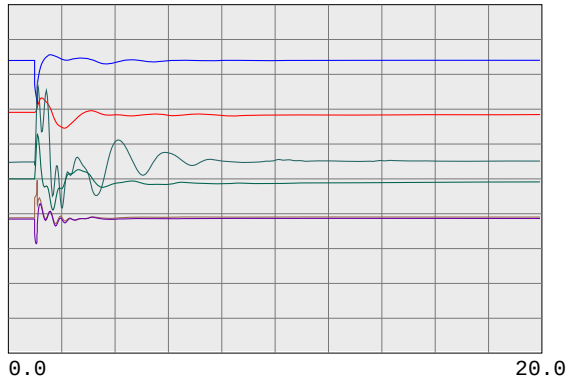
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



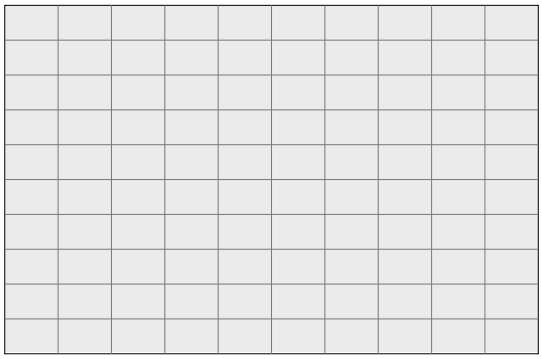
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

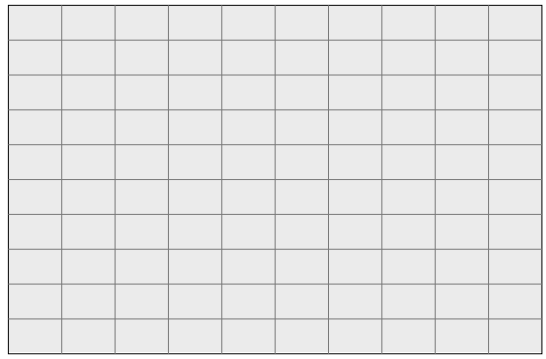


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



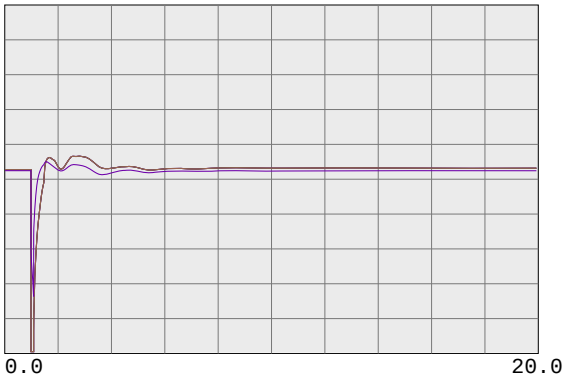
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



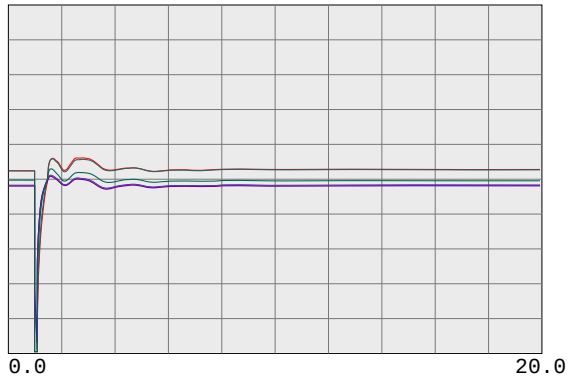


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

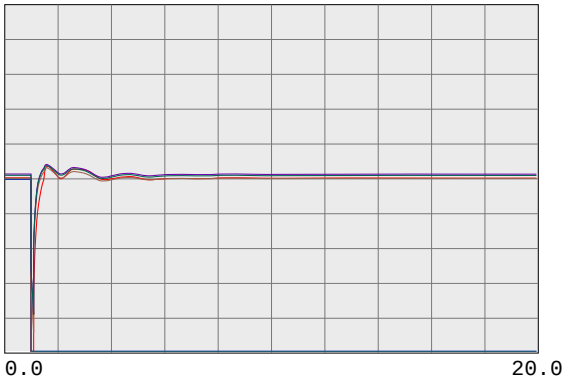
230-KV SYSTEM VOLTAGES



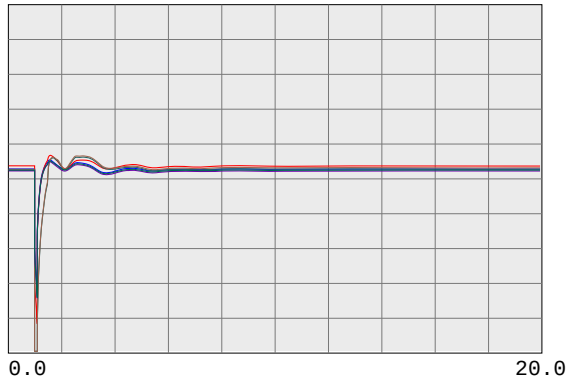
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



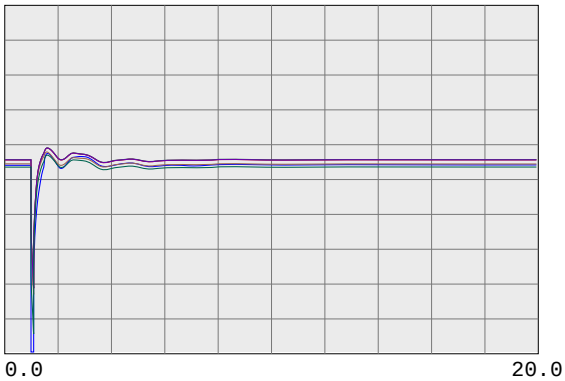
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



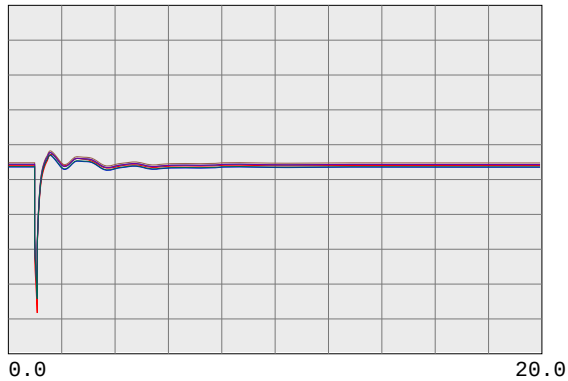
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



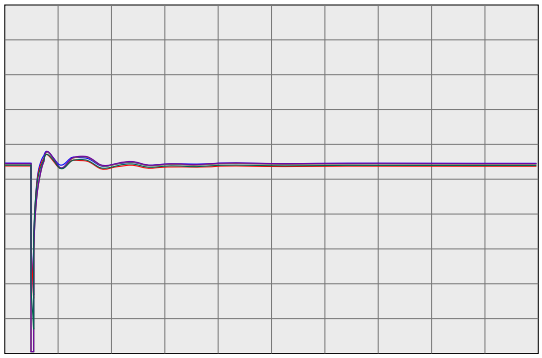
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

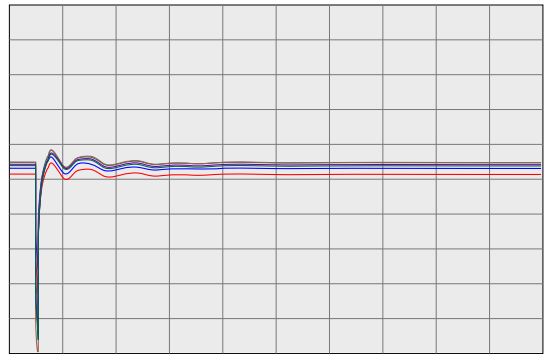
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

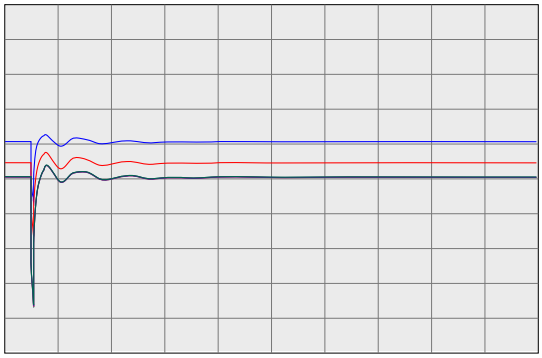
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

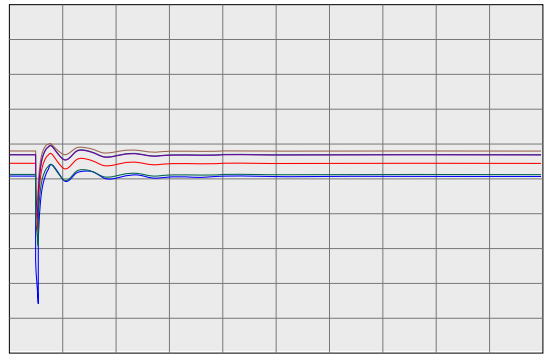
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

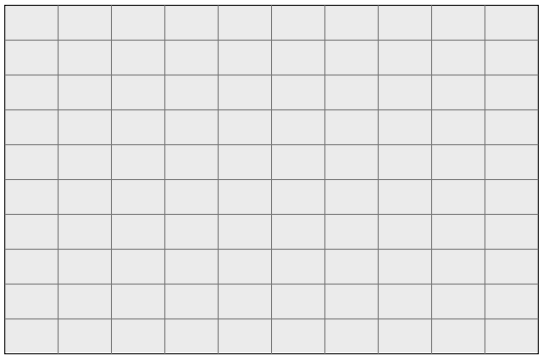
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

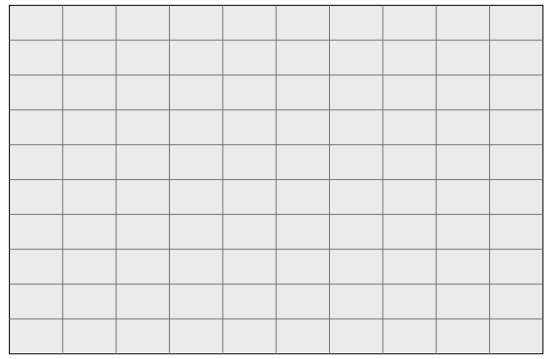


0.0 20.0

Time(sec)

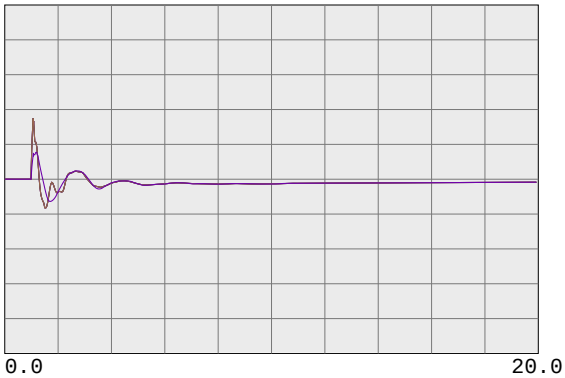
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



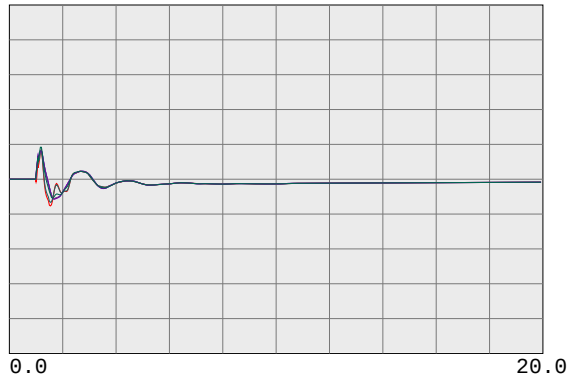


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

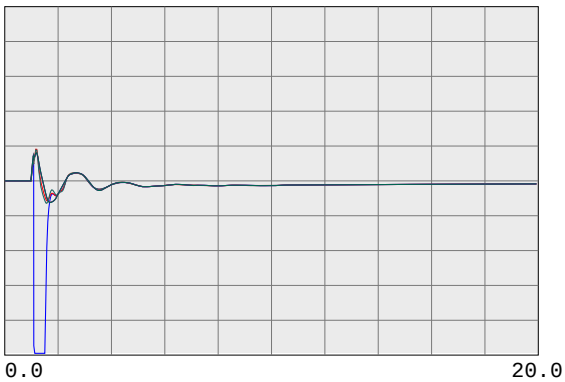
230-KV SYSTEM FREQUENCIES



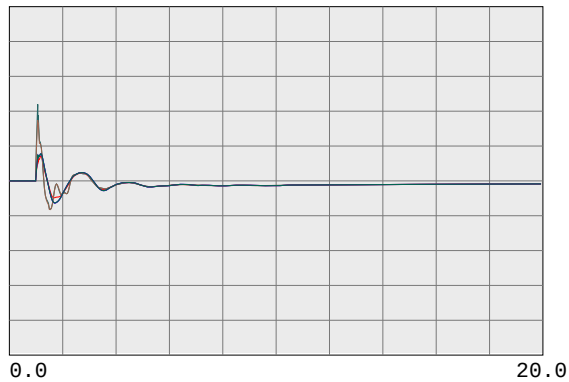
59.4000 fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000 fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000 fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000 fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000 fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



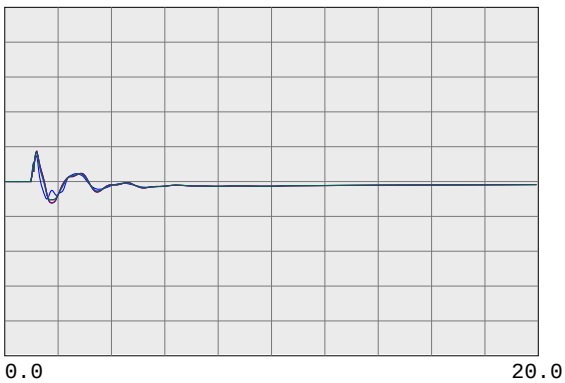
59.4000 fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



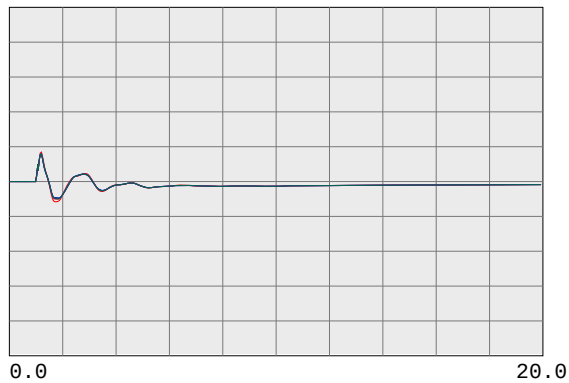
59.4000 fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000 fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



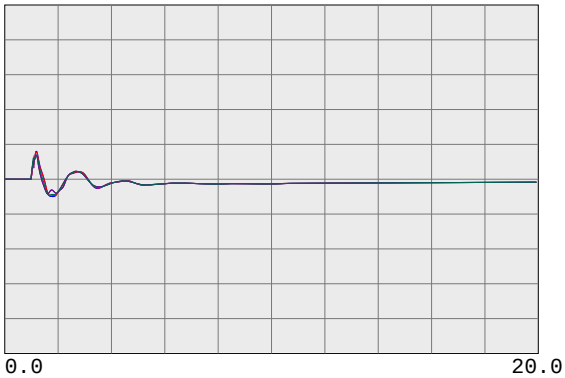
59.4000 fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000 fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



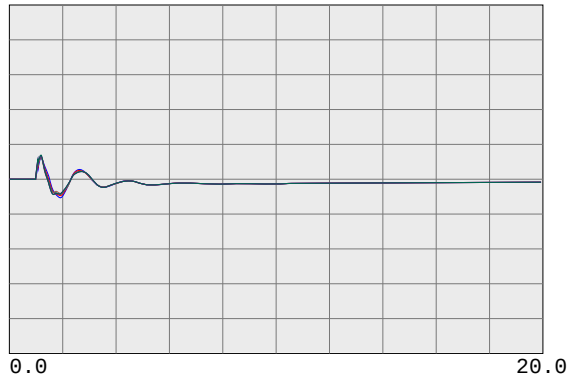
59.4000 fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000 fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

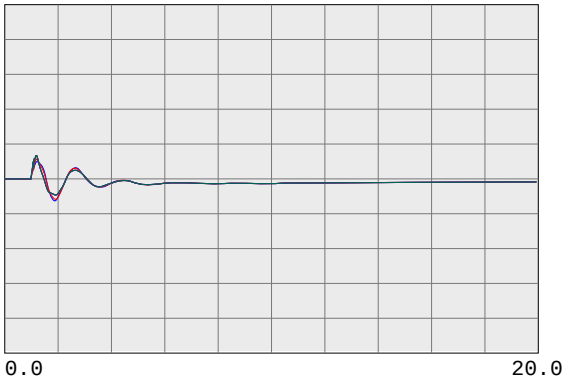
230-KV SYSTEM FREQUENCIES



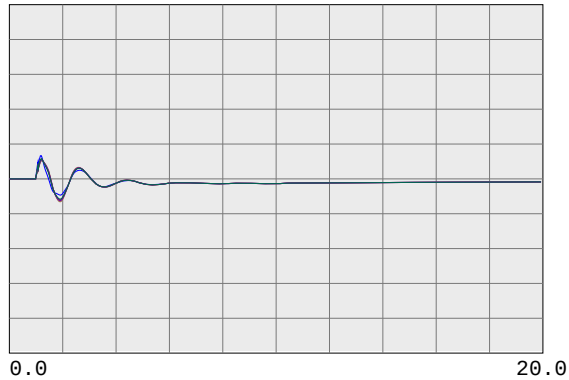
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



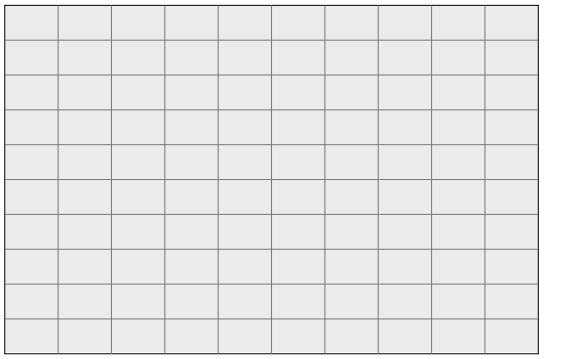
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

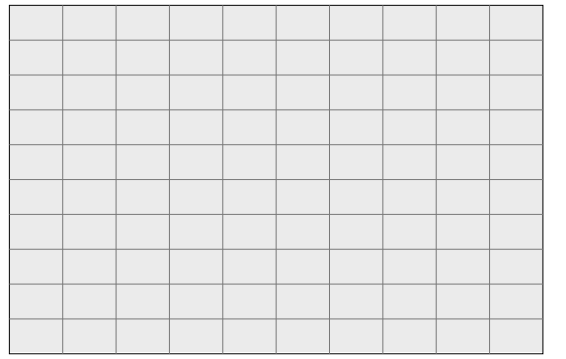


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



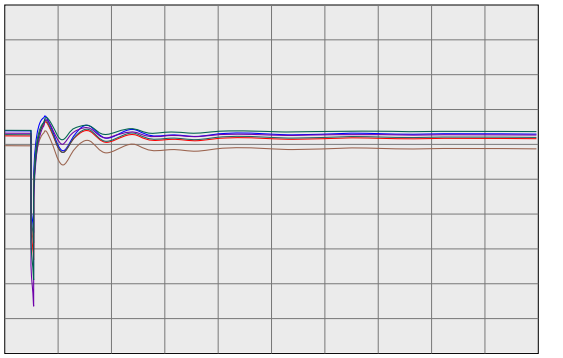
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



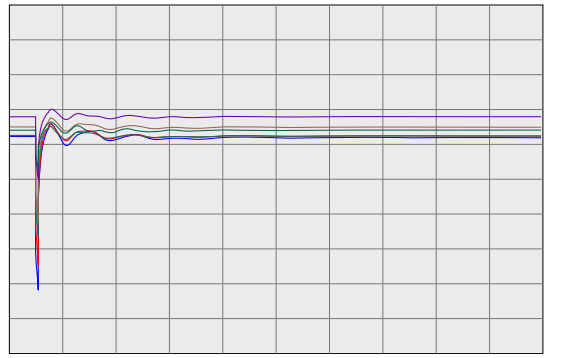


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

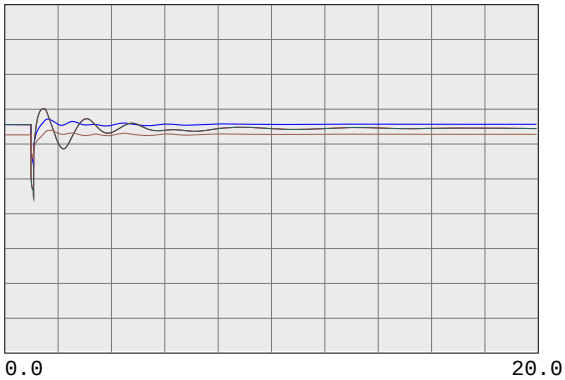
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



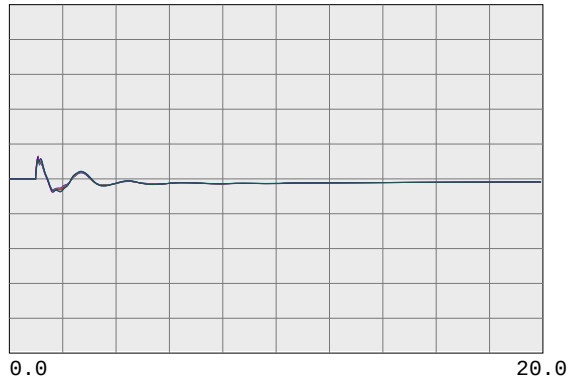
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



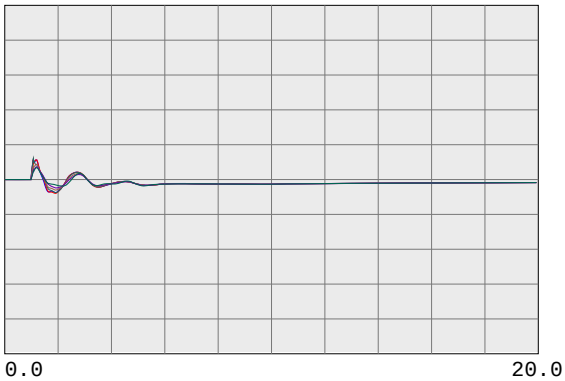
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



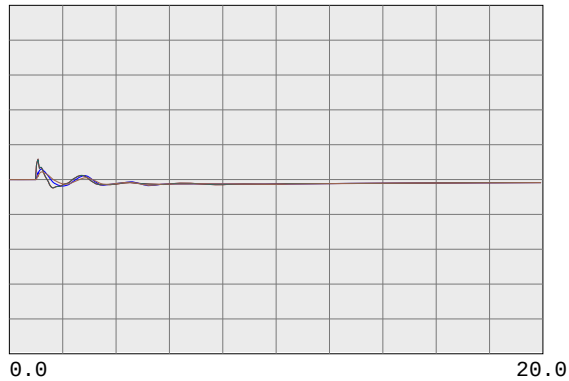
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



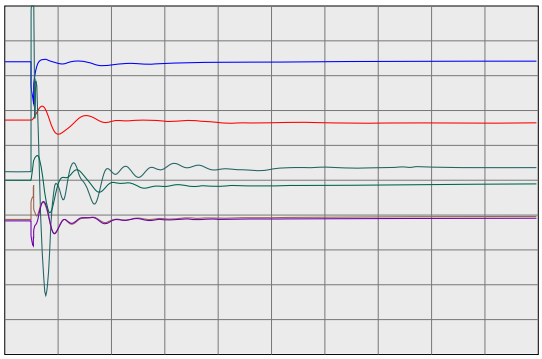
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



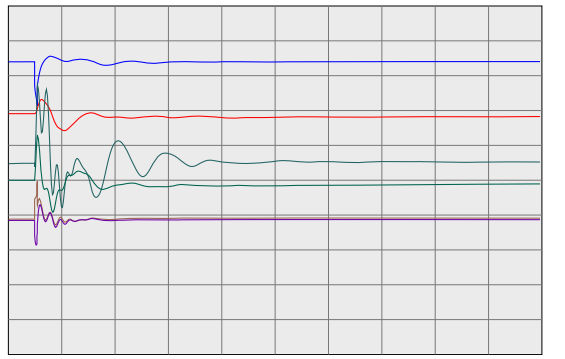
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

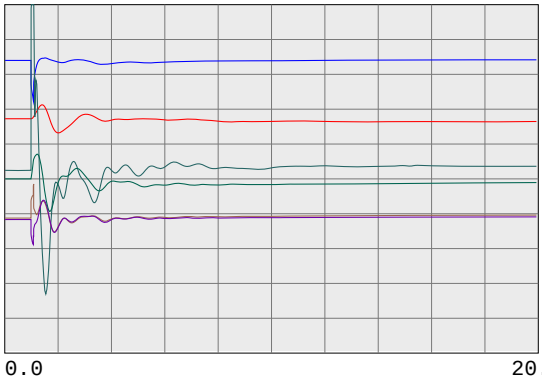
WILLOW PASS GENERATION PLANT



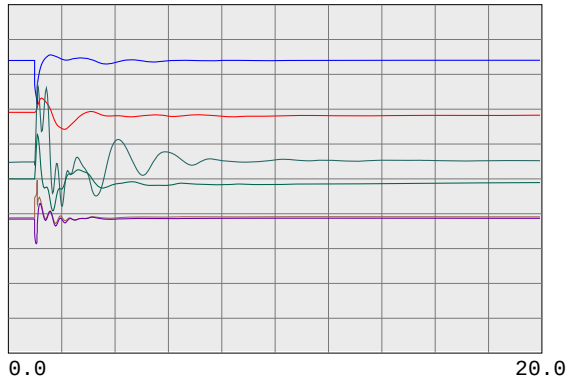
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



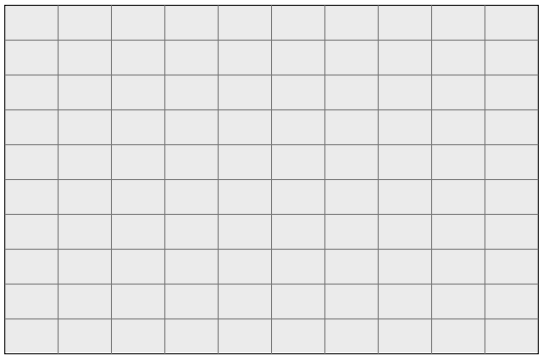
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

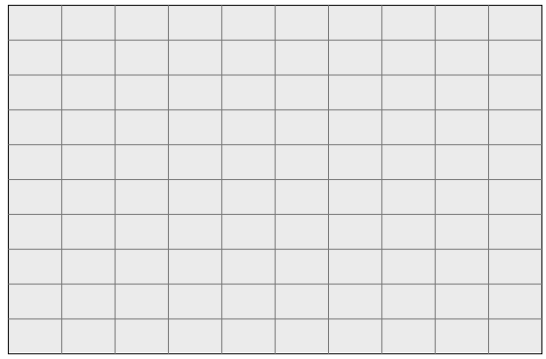


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



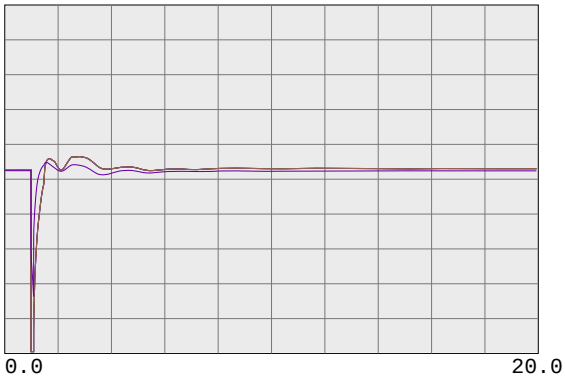
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



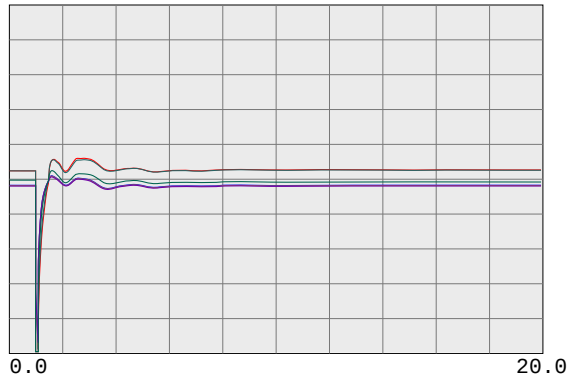


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

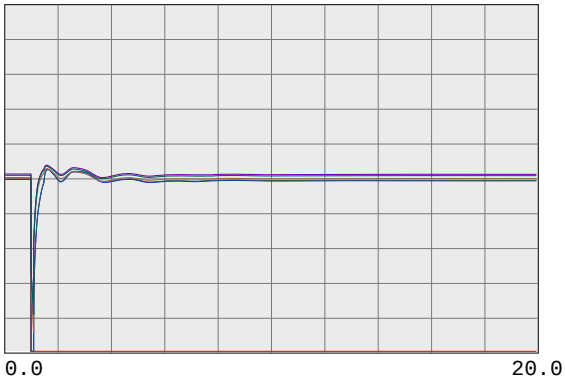
230-KV SYSTEM VOLTAGES



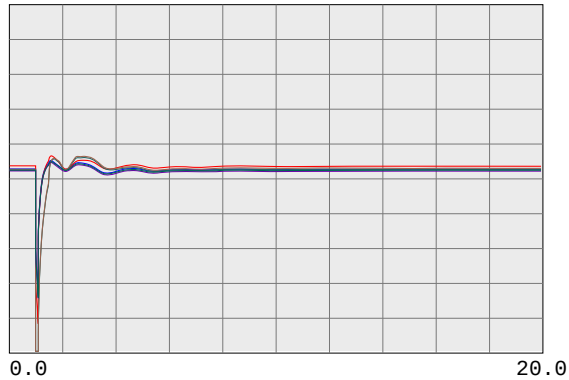
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



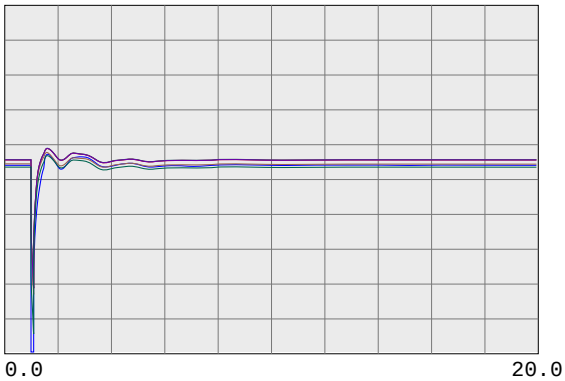
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



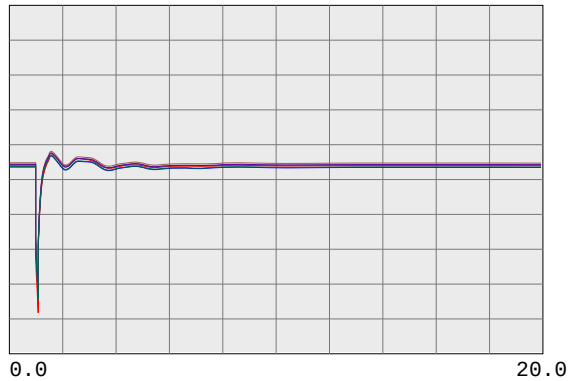
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



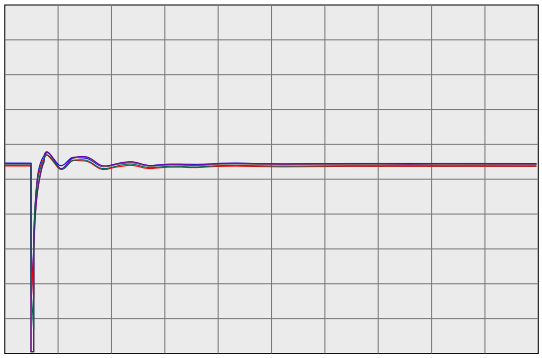
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

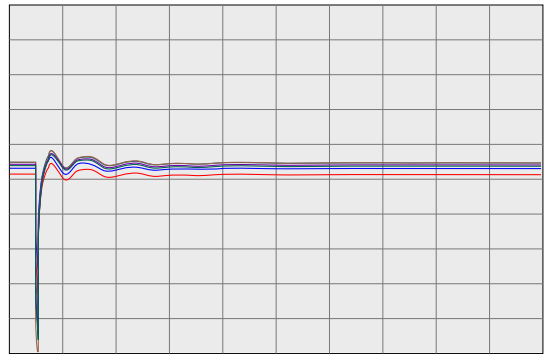
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

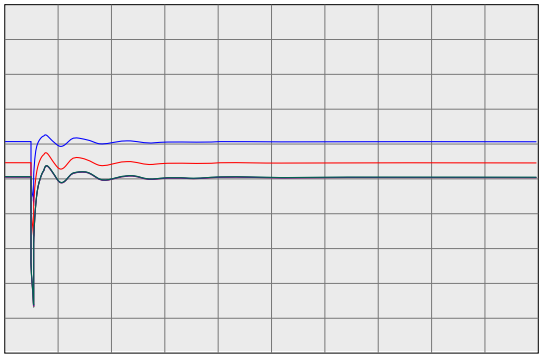
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

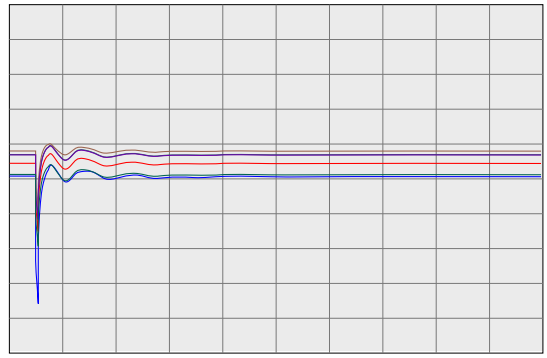
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

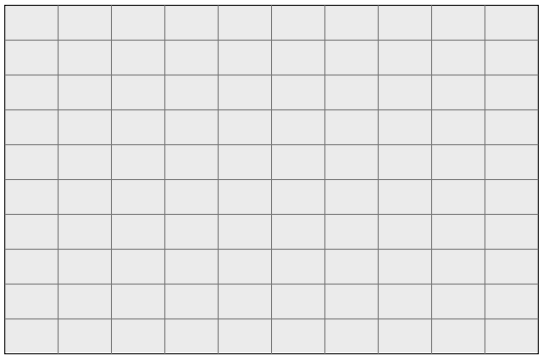
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

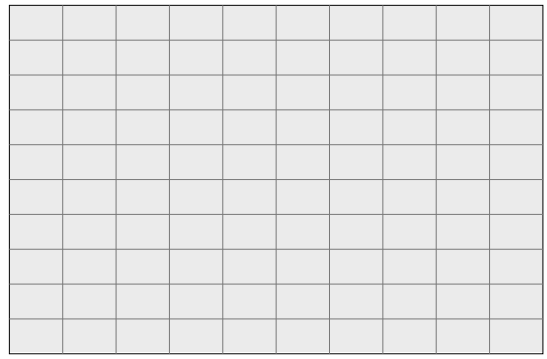


0.0 20.0

Time(sec)

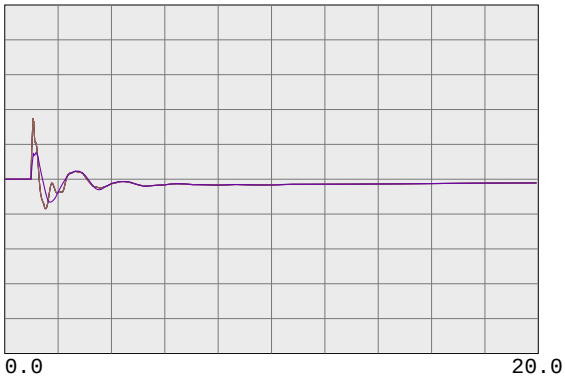
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



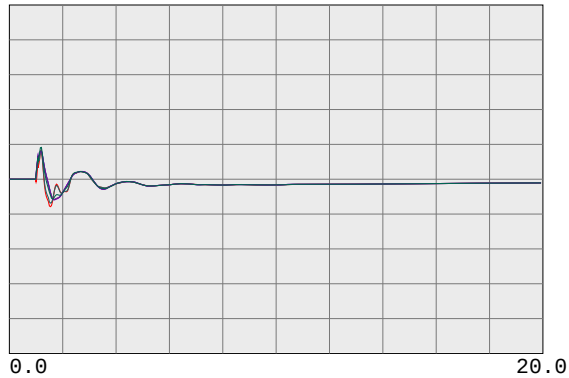


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

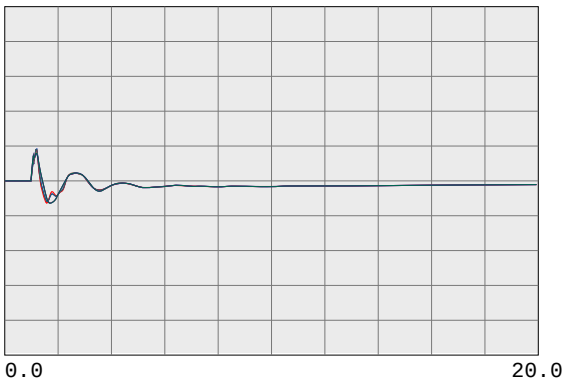
230-KV SYSTEM FREQUENCIES



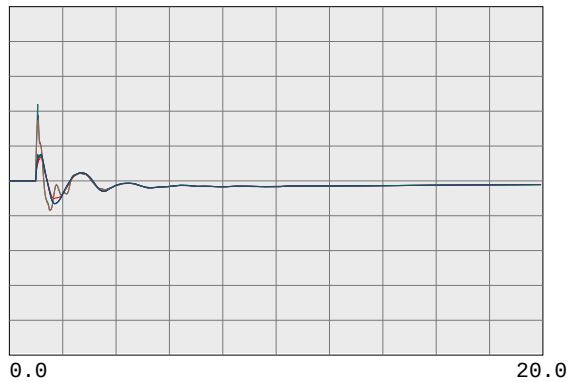
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



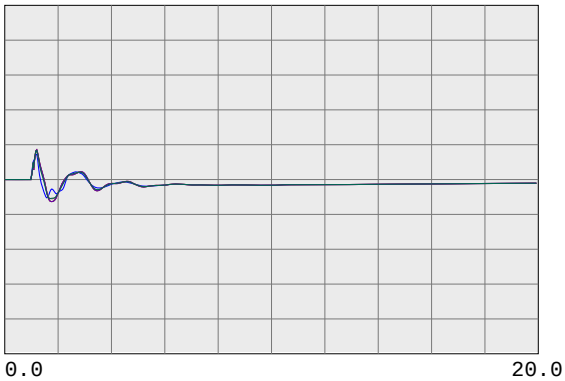
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



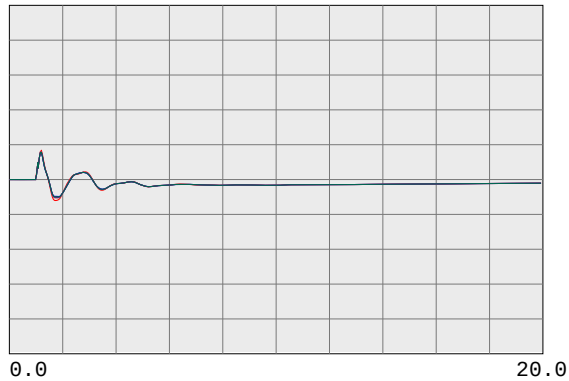
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



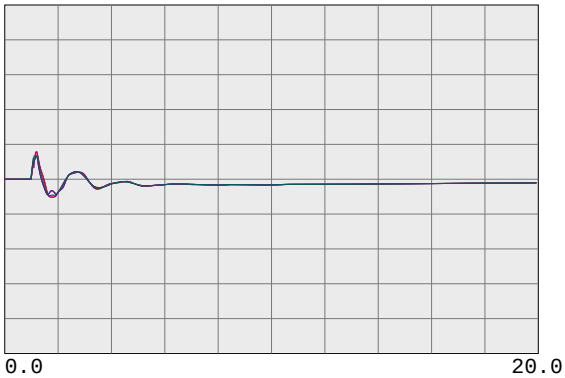
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



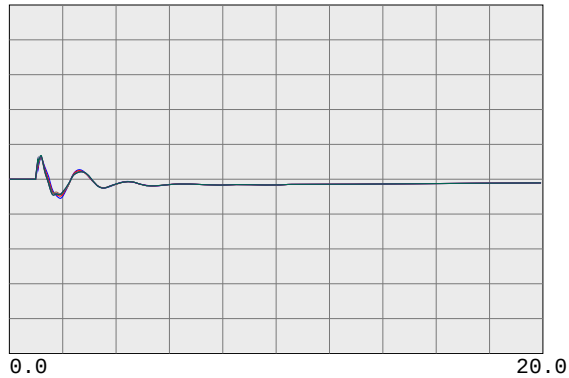
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

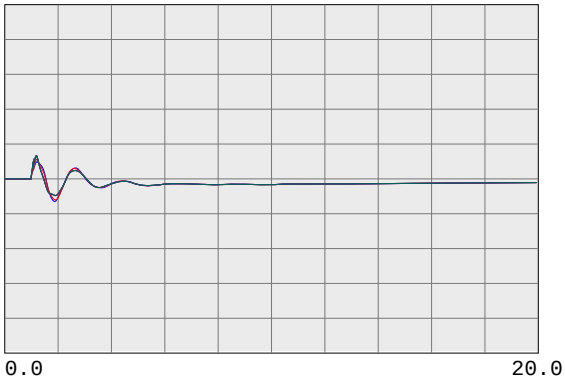
230-KV SYSTEM FREQUENCIES



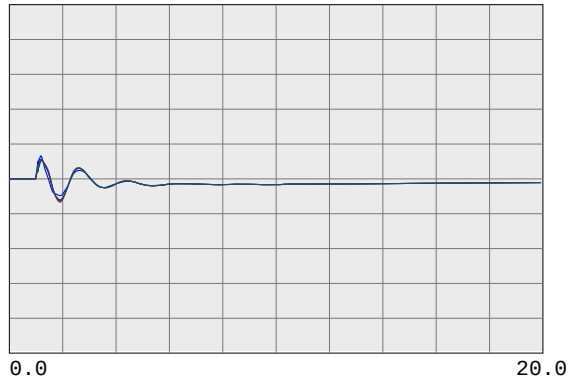
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



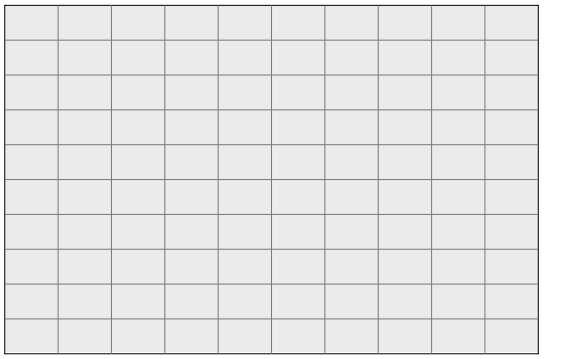
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

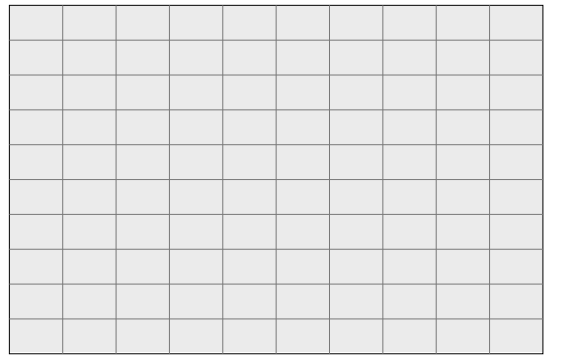


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



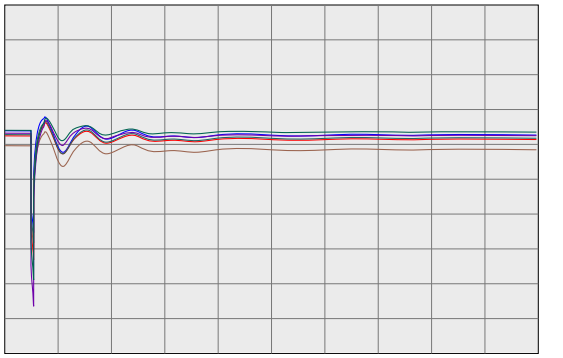
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



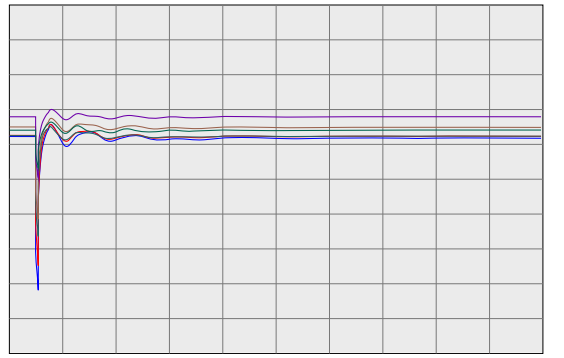


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

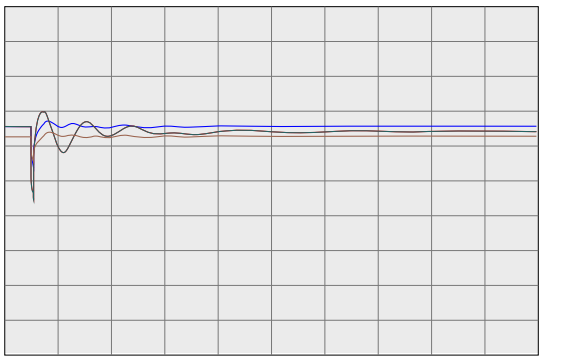
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



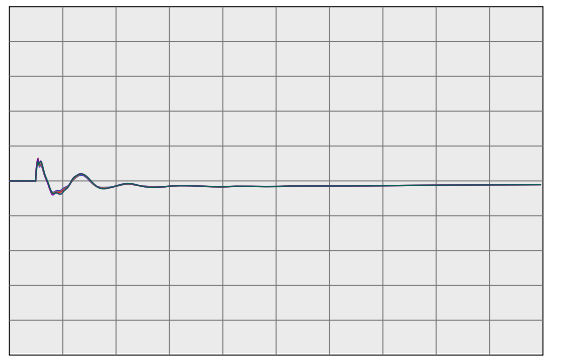
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



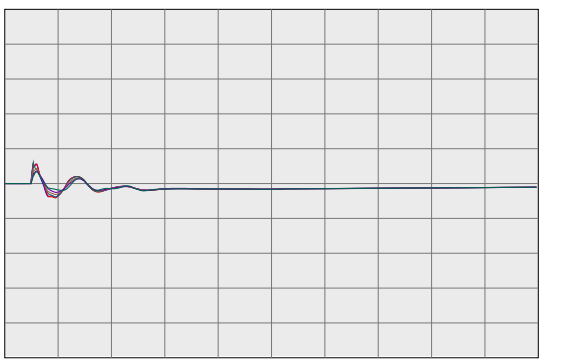
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



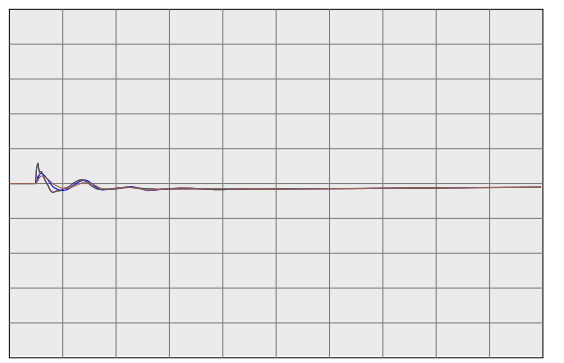
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



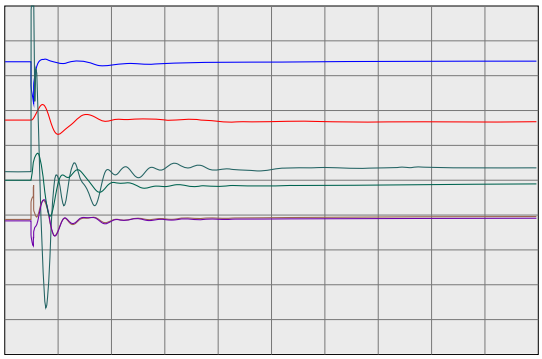
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



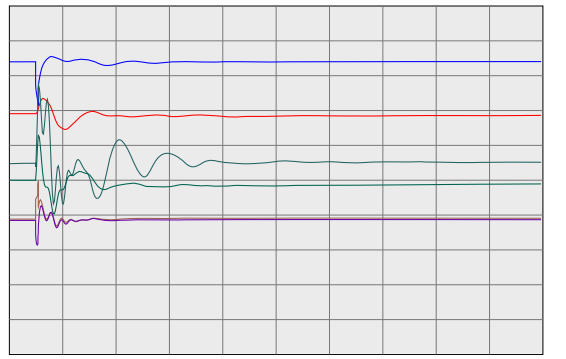
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

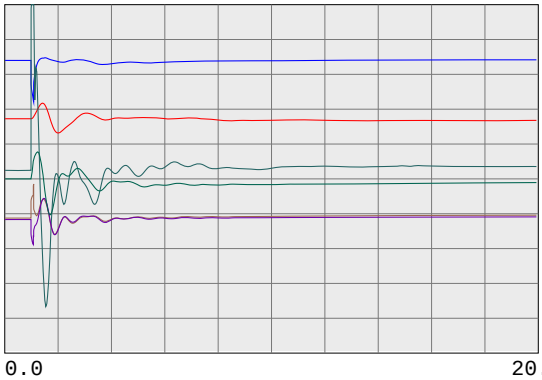
WILLOW PASS GENERATION PLANT



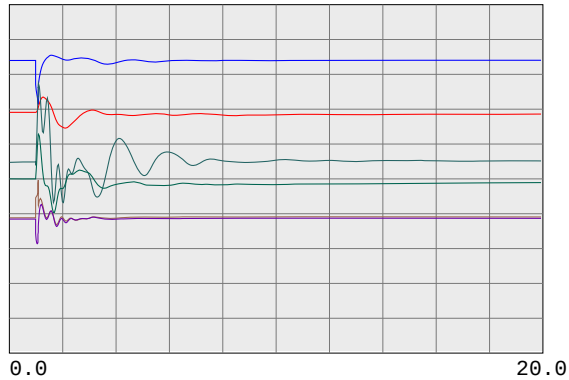
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



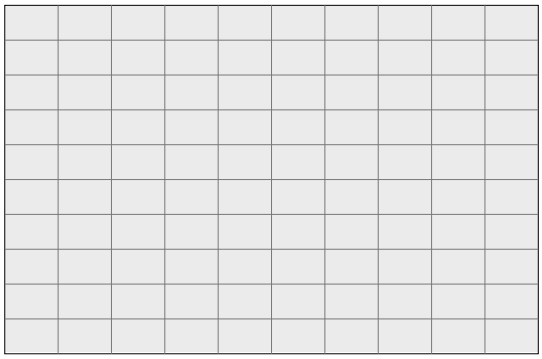
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

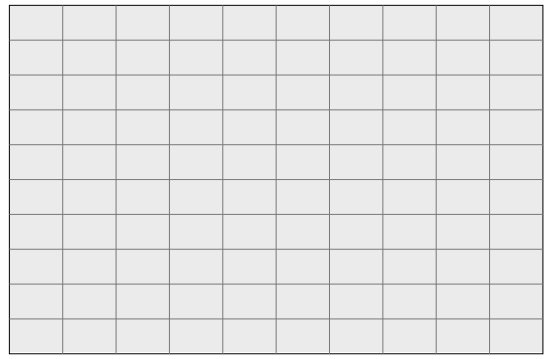


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



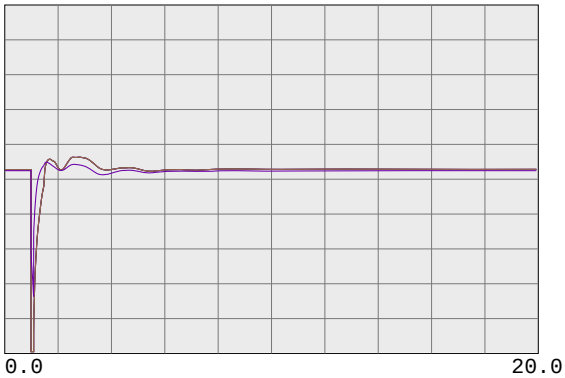
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



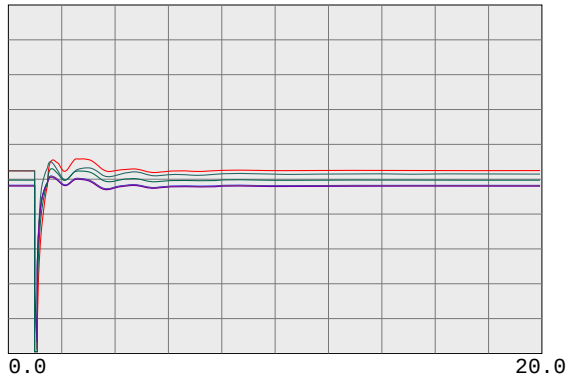


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

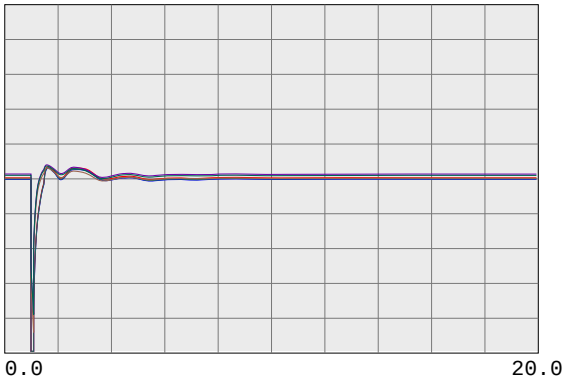
230-KV SYSTEM VOLTAGES



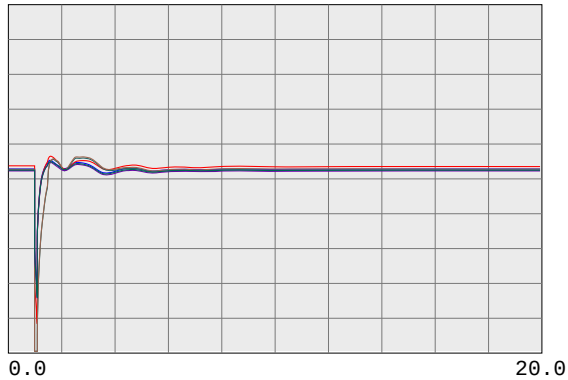
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



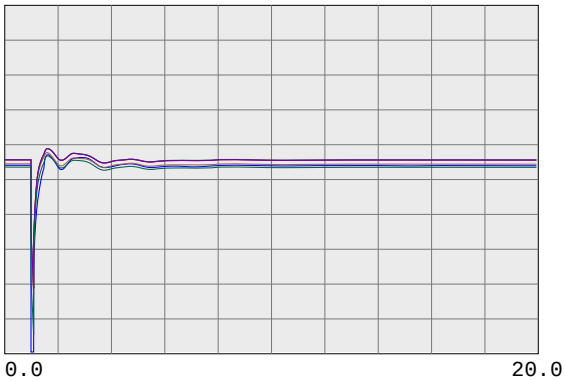
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



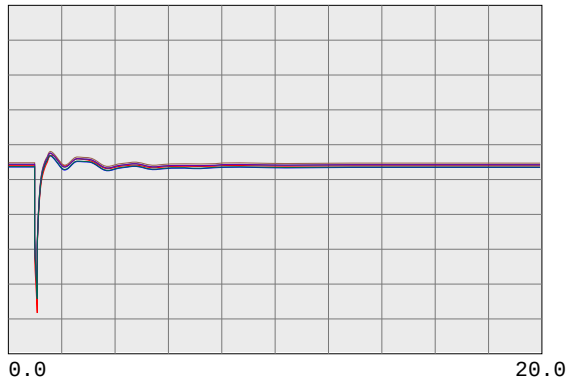
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



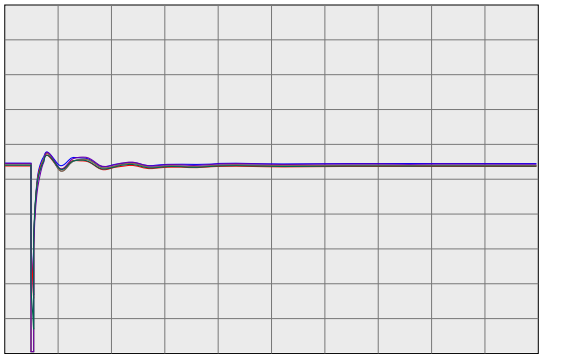
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



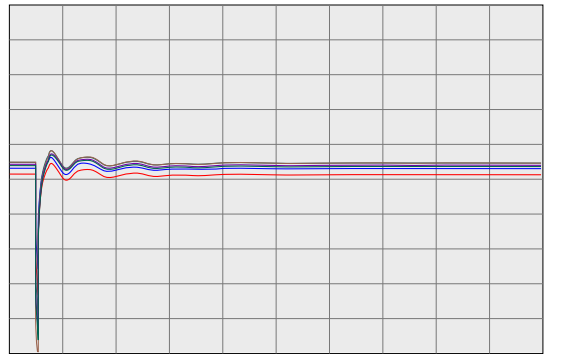
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

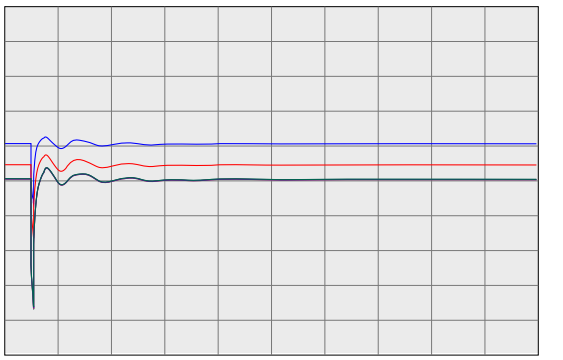
230-KV SYSTEM VOLTAGES



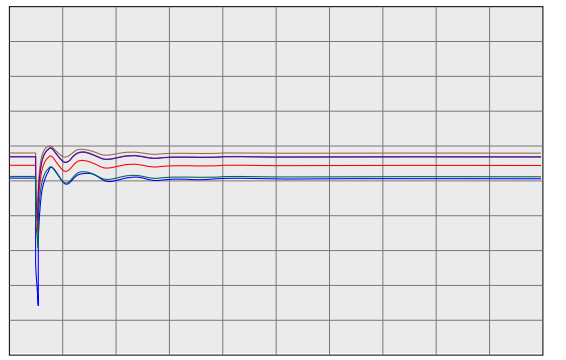
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



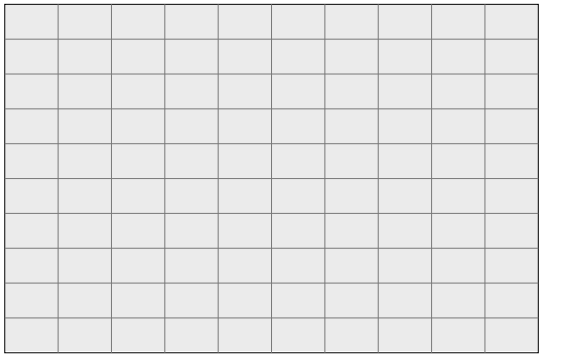
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

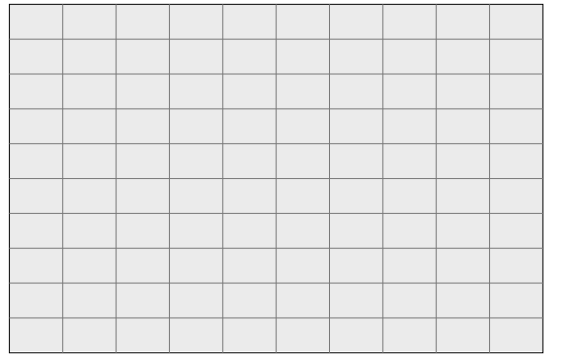


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



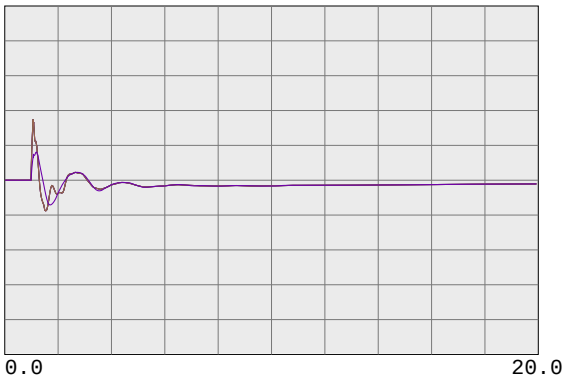
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



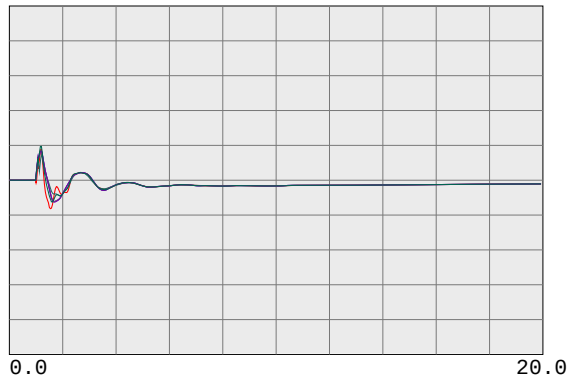


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

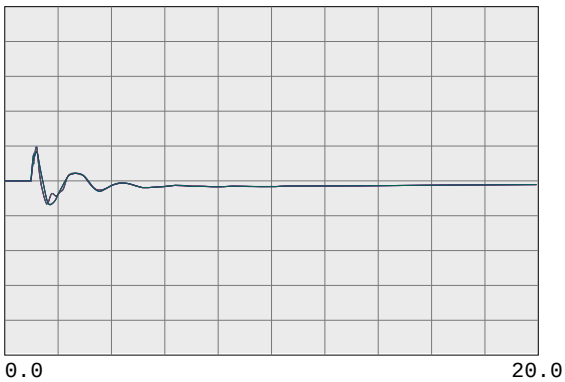
230-KV SYSTEM FREQUENCIES



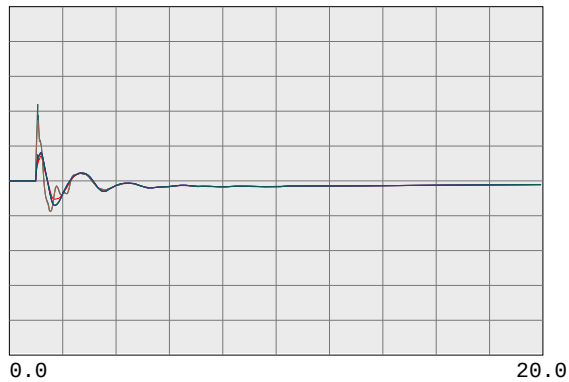
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



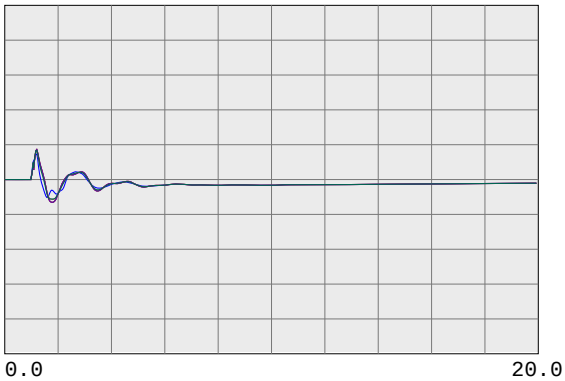
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



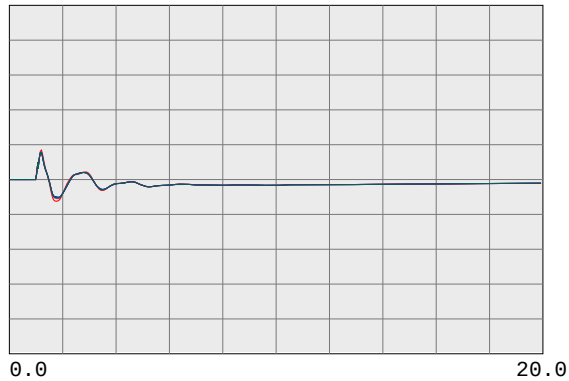
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



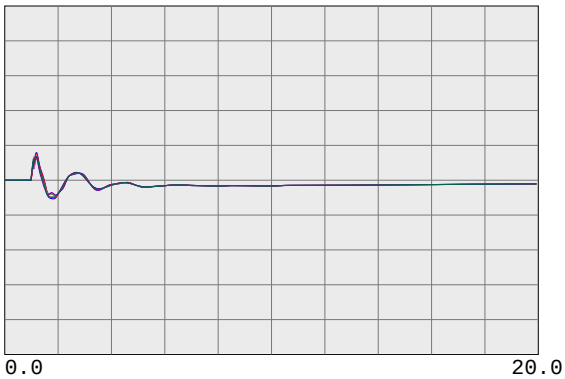
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



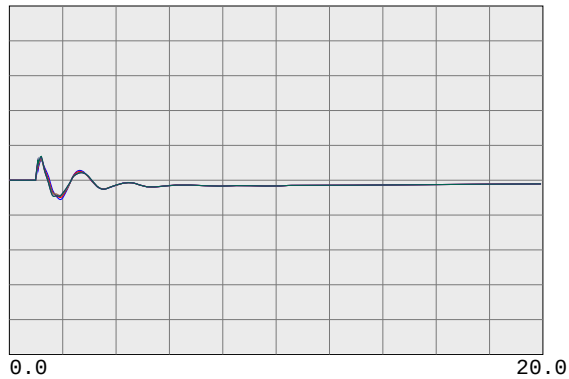
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

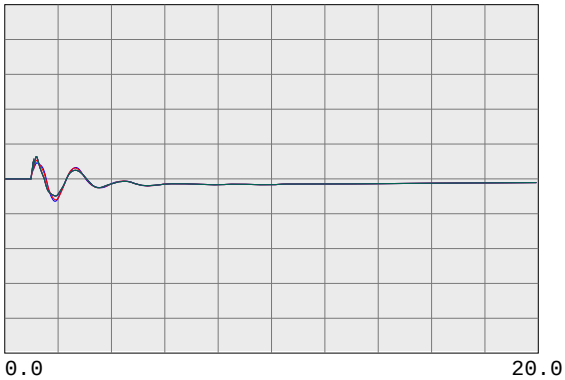
230-KV SYSTEM FREQUENCIES



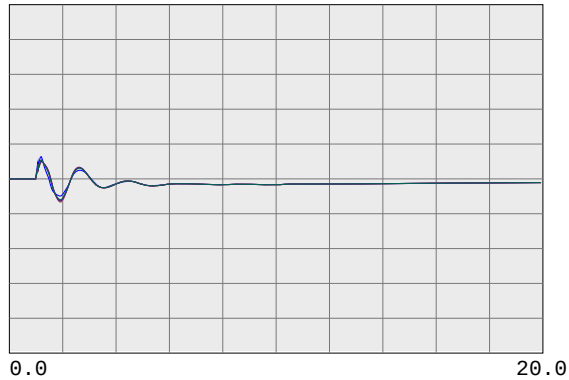
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



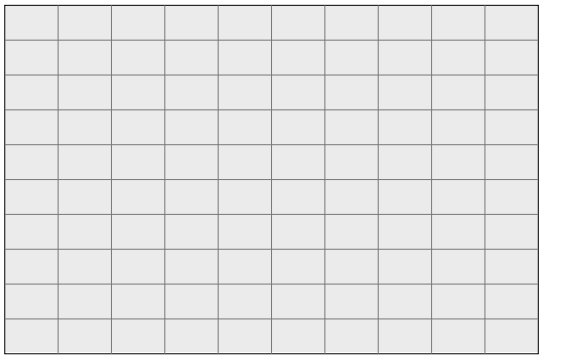
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

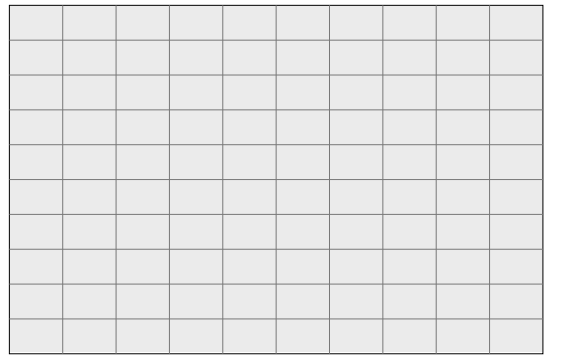


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



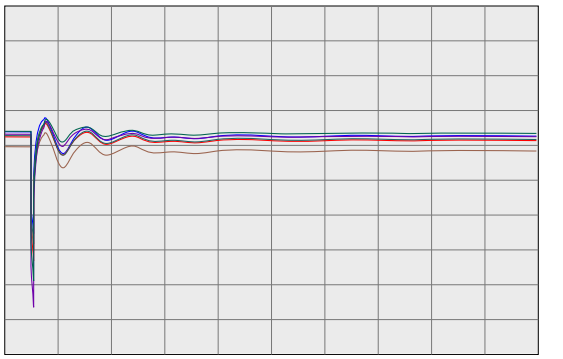
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



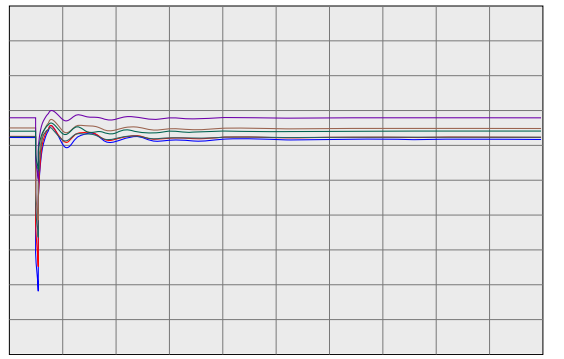


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

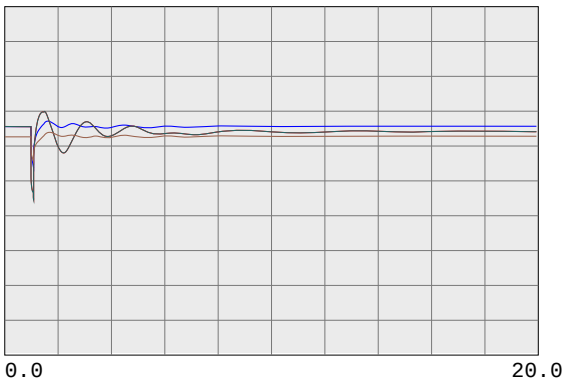
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



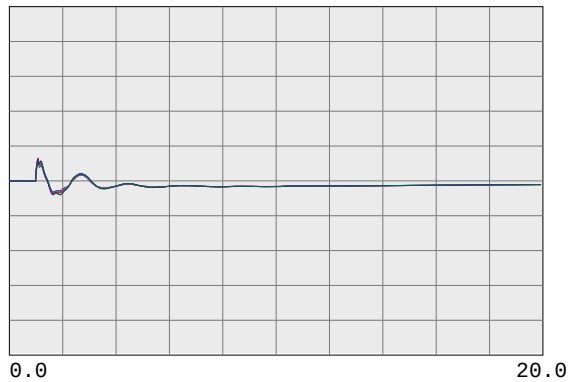
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



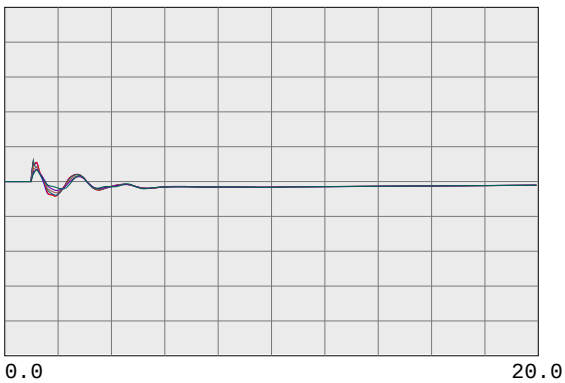
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



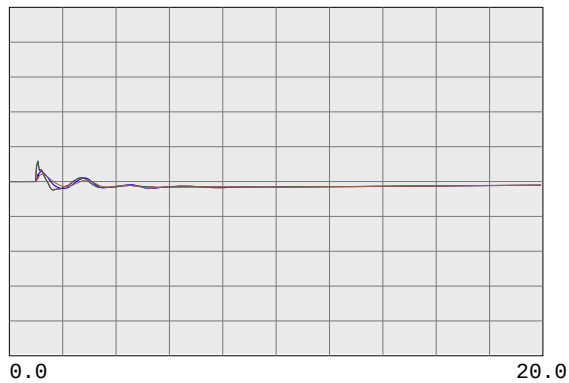
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



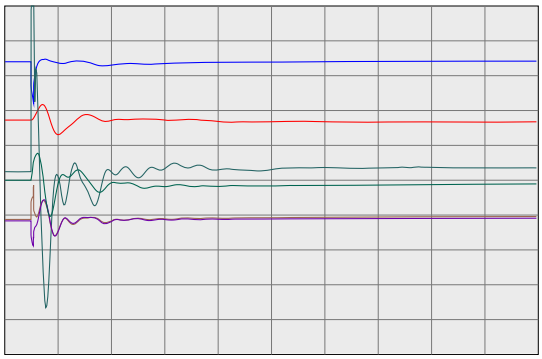
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



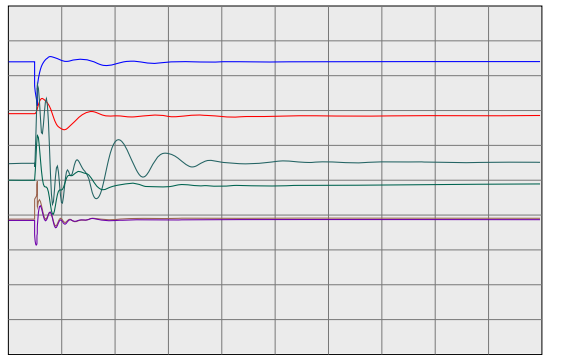
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

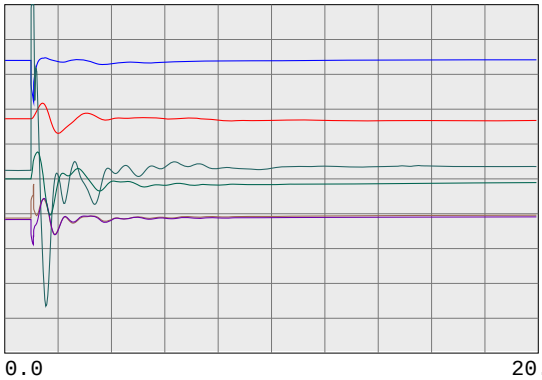
WILLOW PASS GENERATION PLANT



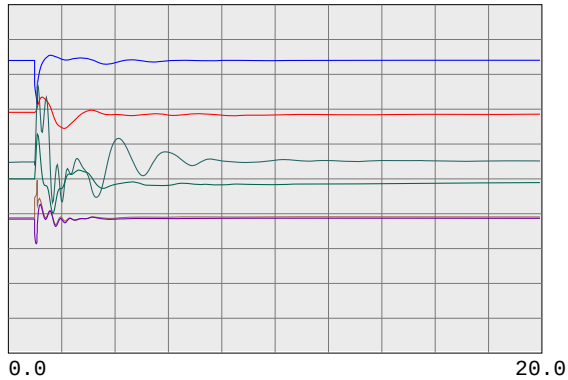
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



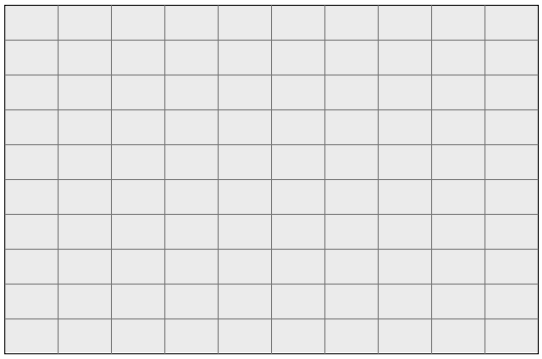
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

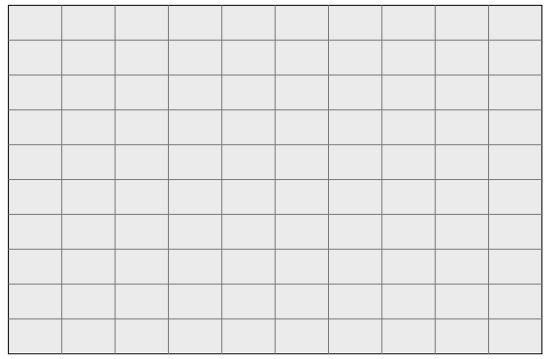


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



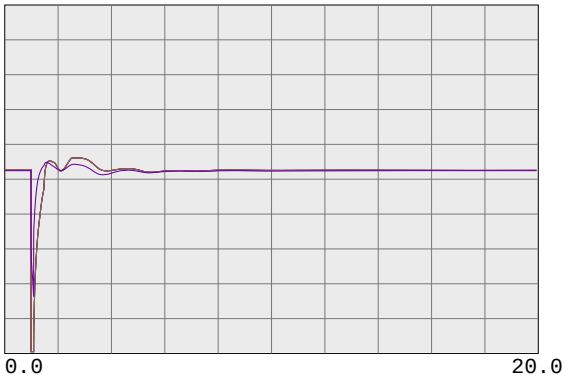
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



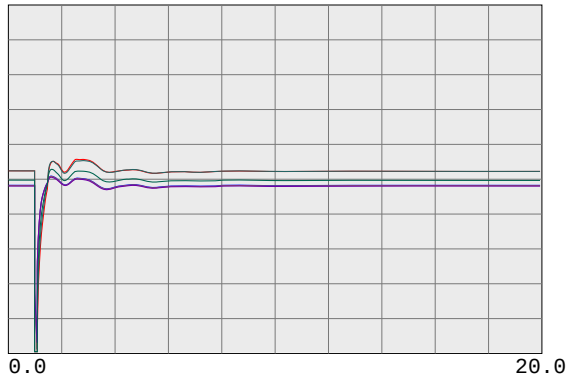


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

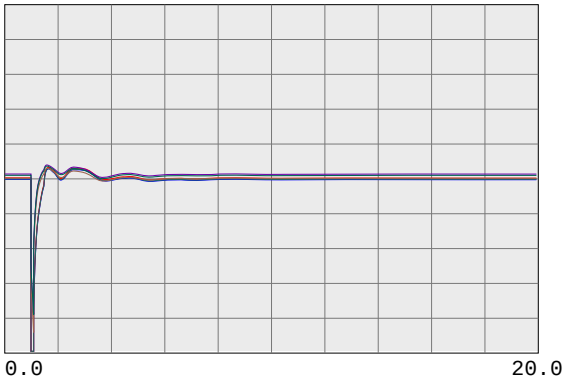
230-KV SYSTEM VOLTAGES



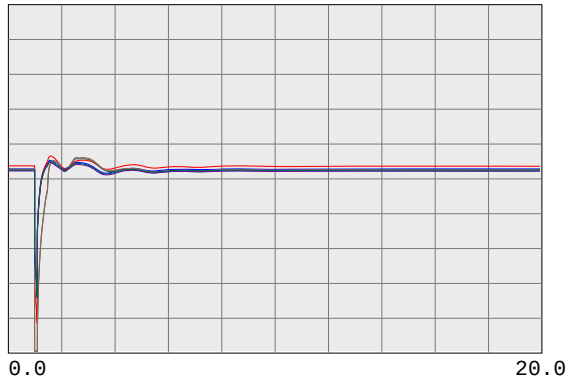
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



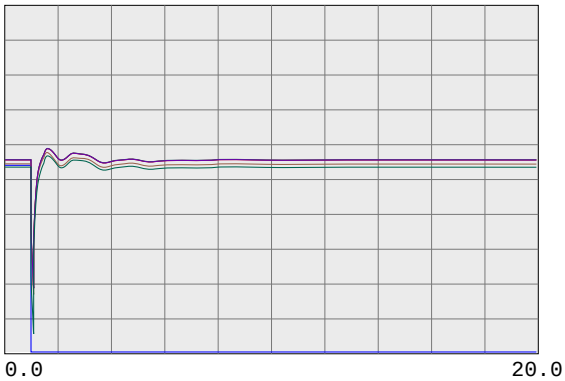
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



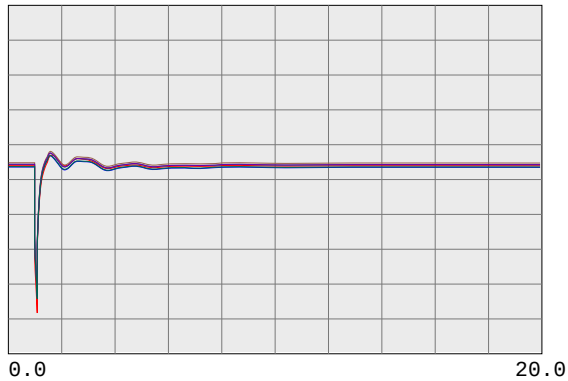
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



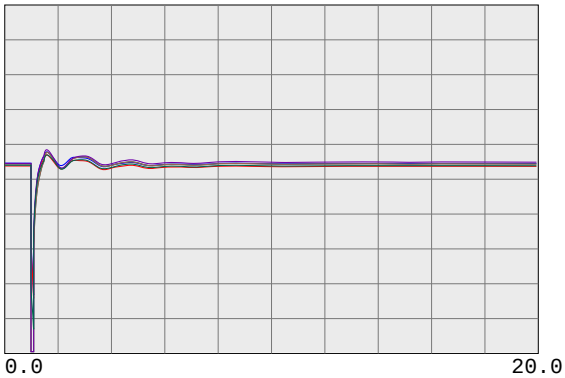
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



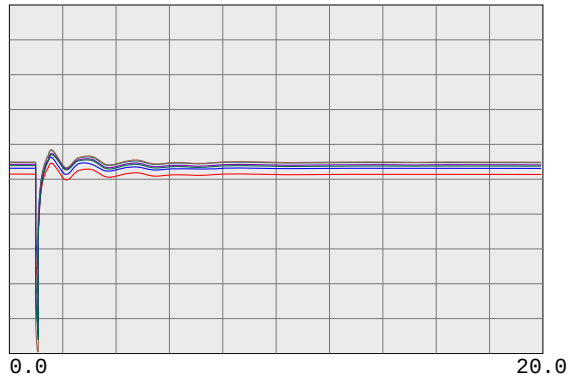
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

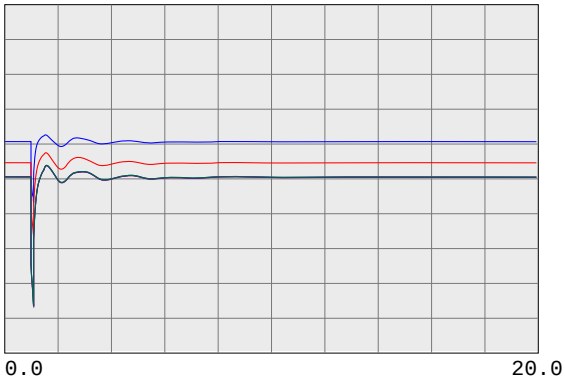
230-KV SYSTEM VOLTAGES



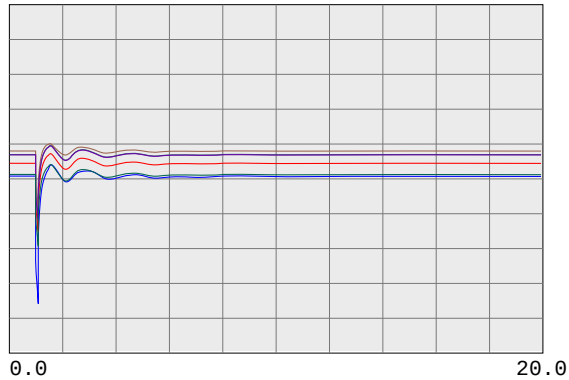
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



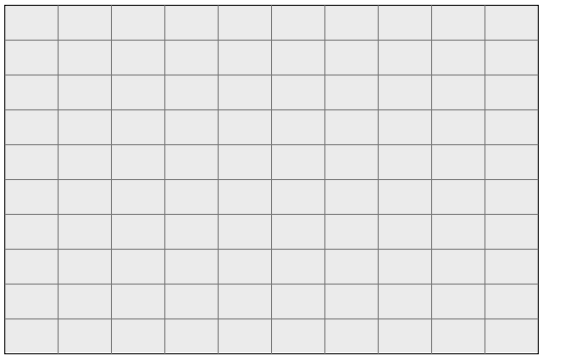
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

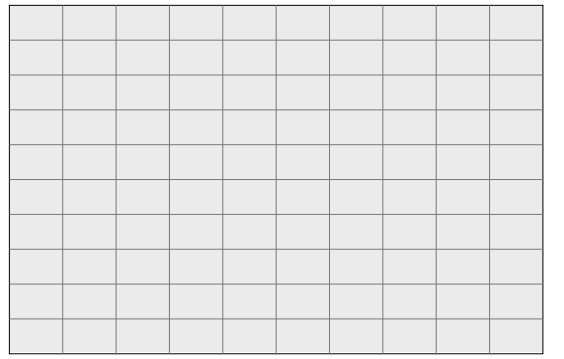


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



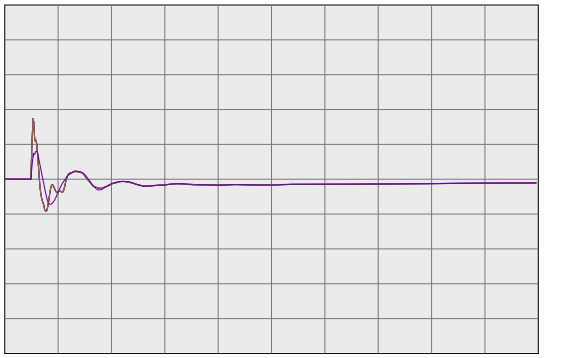
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



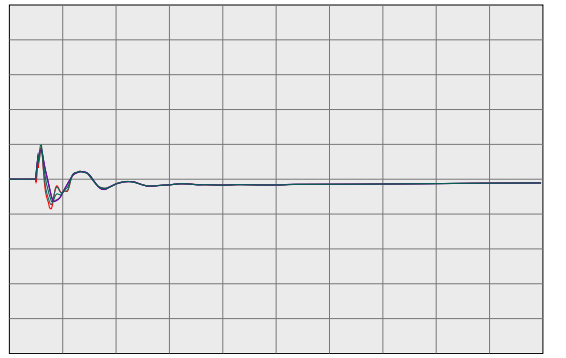


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

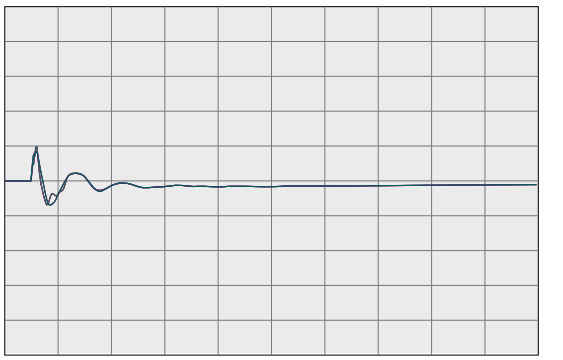
230-KV SYSTEM FREQUENCIES



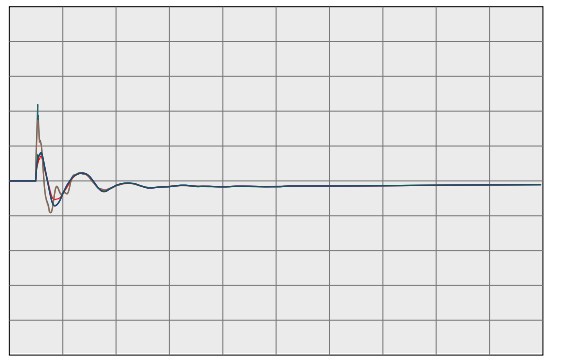
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



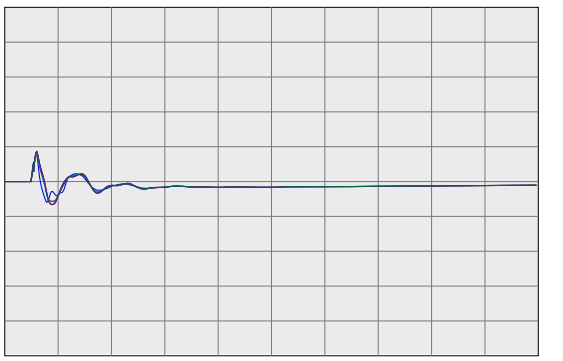
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



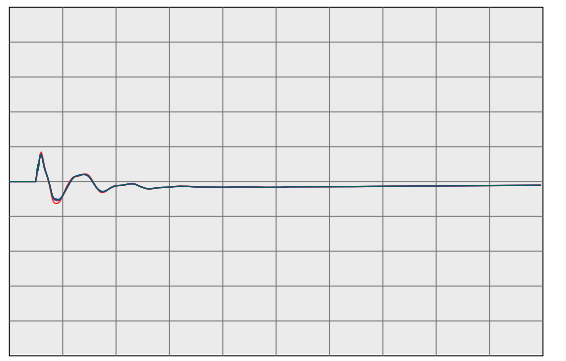
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



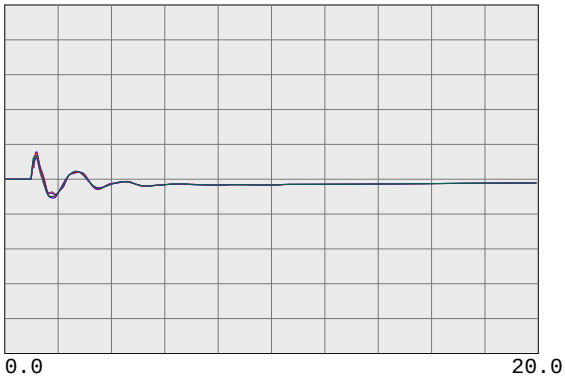
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



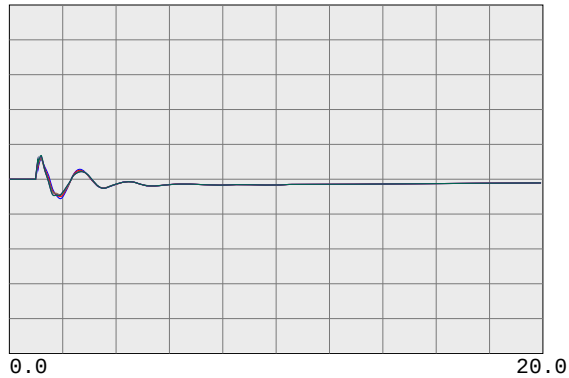
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

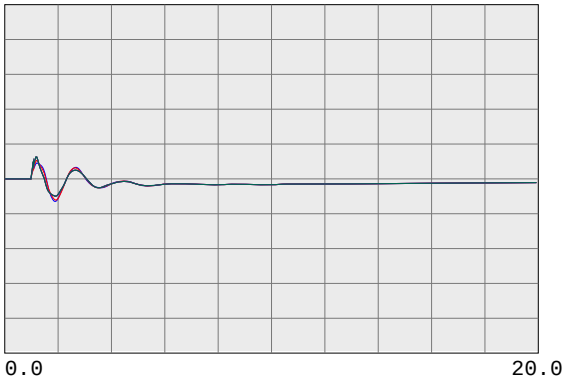
230-KV SYSTEM FREQUENCIES



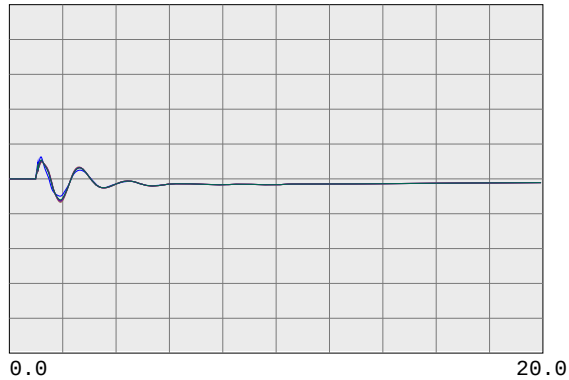
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



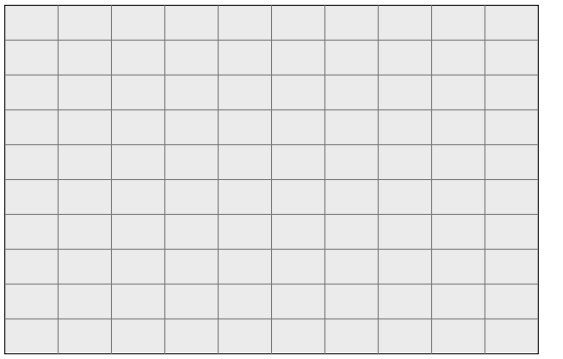
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

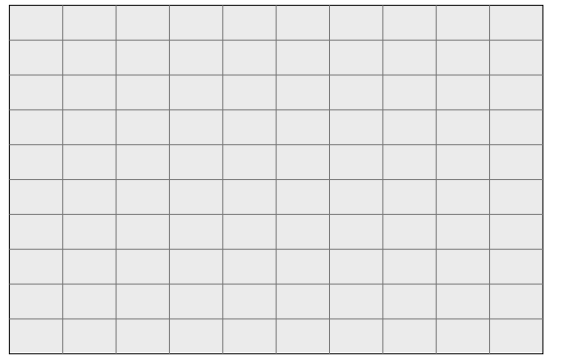


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



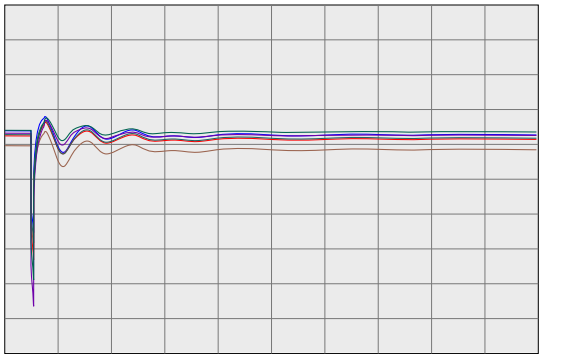
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



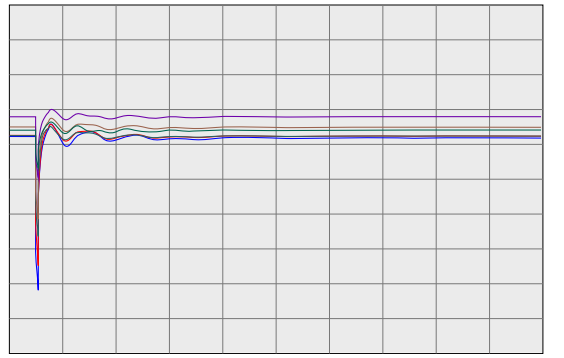


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

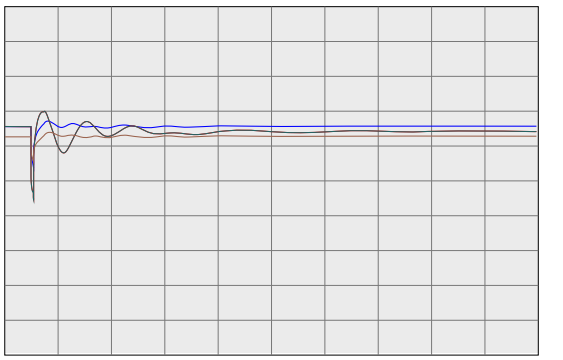
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



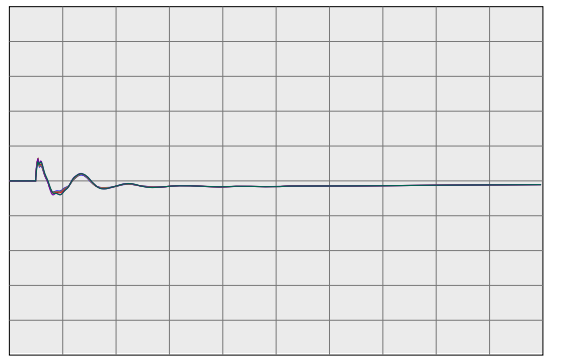
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



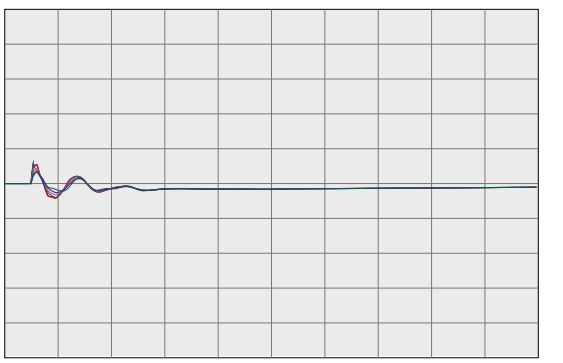
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



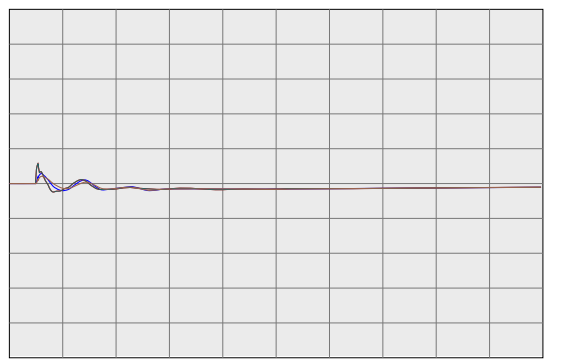
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



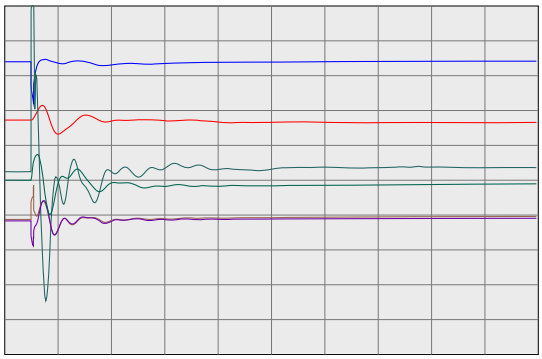
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



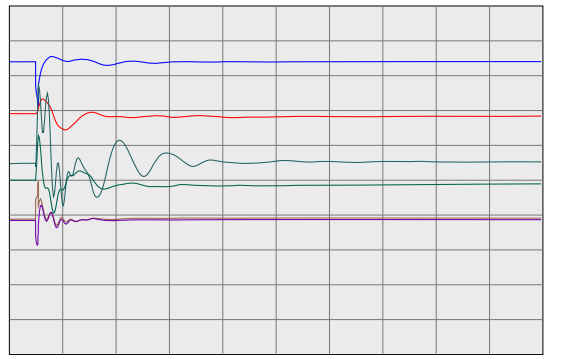
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

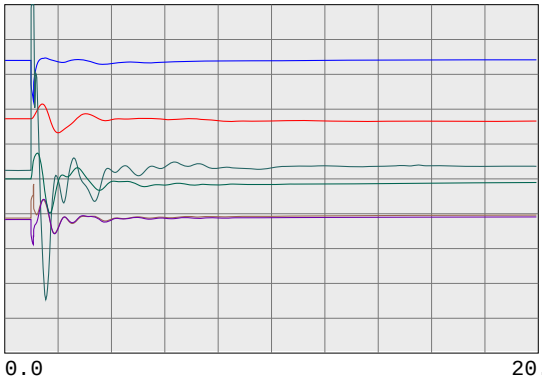
WILLOW PASS GENERATION PLANT



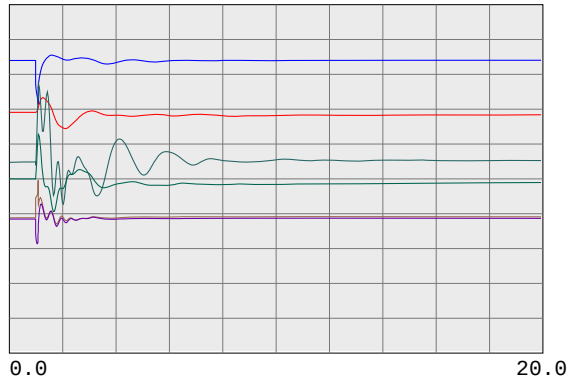
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



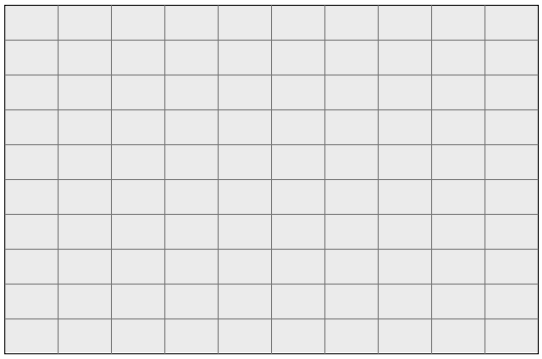
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

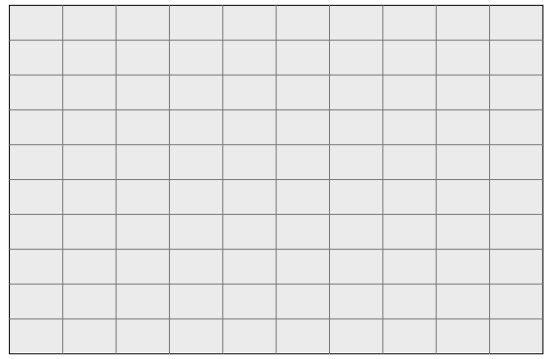


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



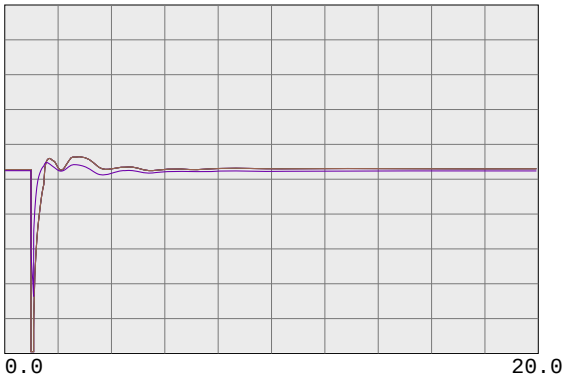
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



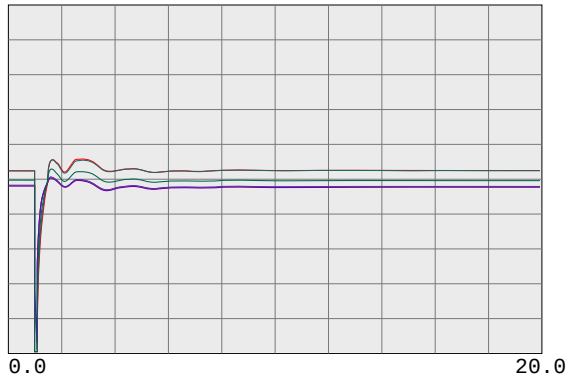


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

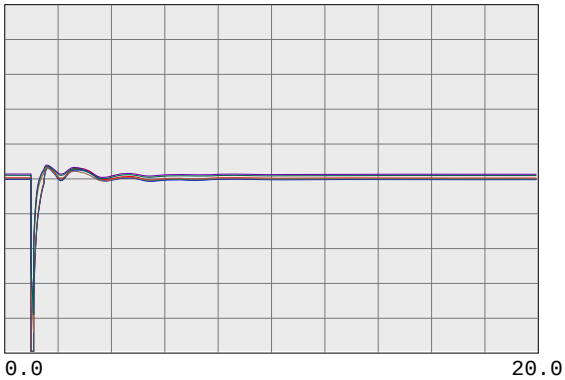
230-KV SYSTEM VOLTAGES



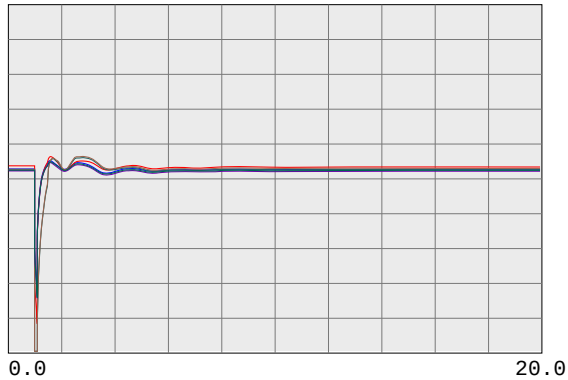
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



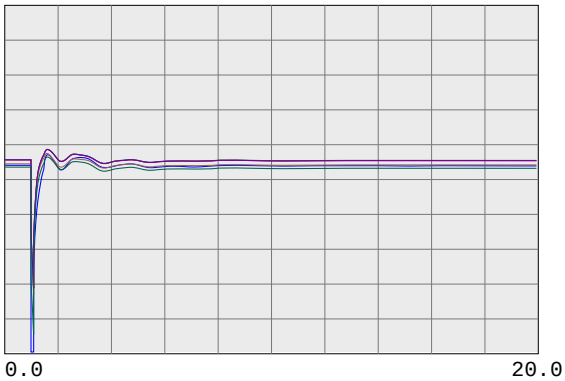
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



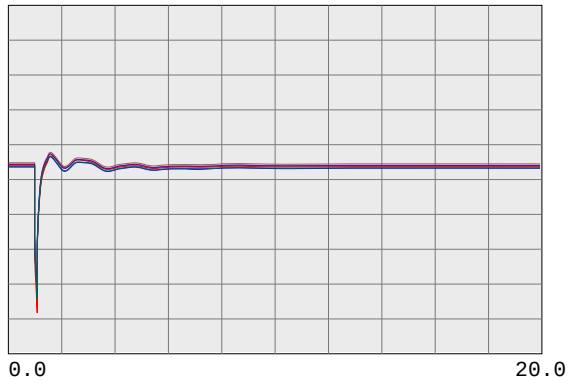
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



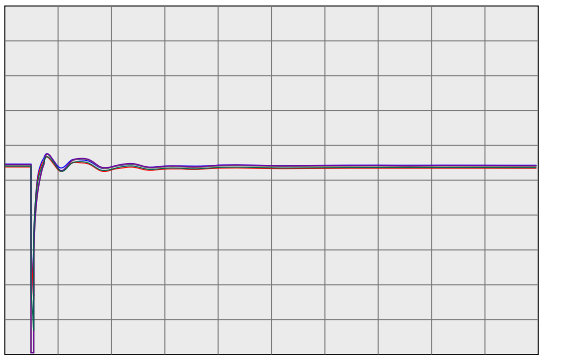
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



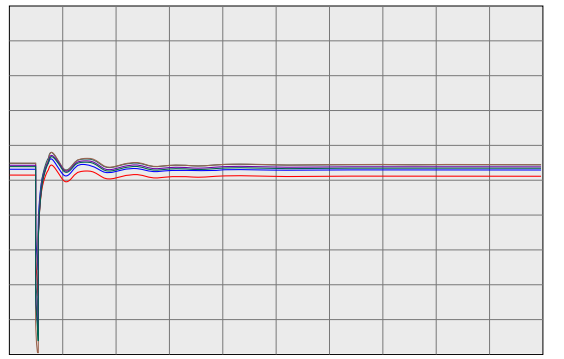
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

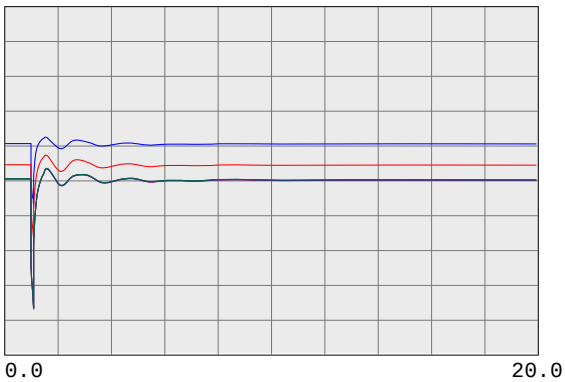
230-KV SYSTEM VOLTAGES



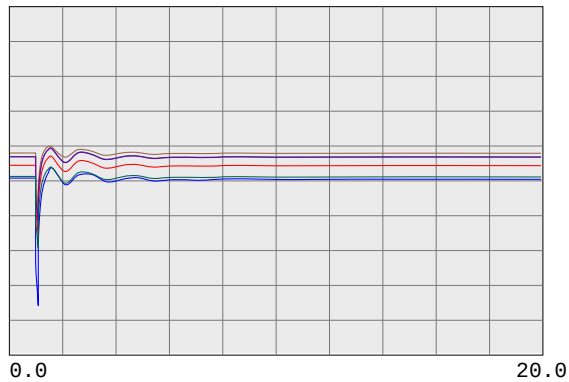
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



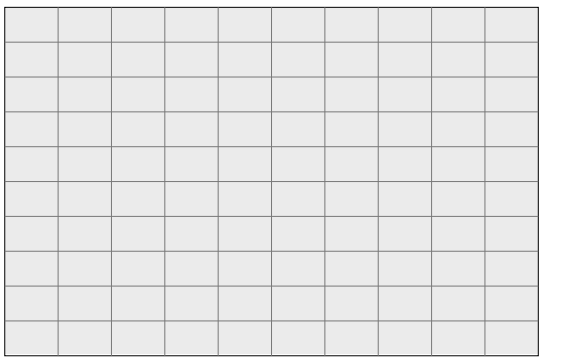
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

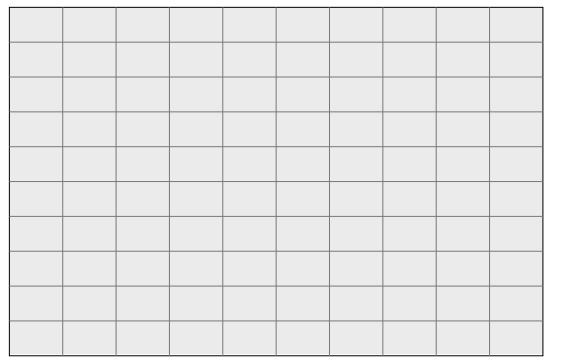


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



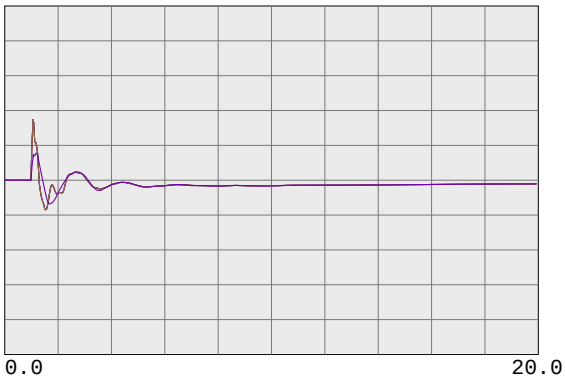
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



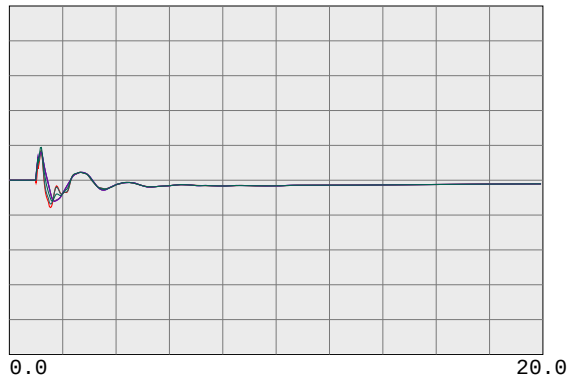


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

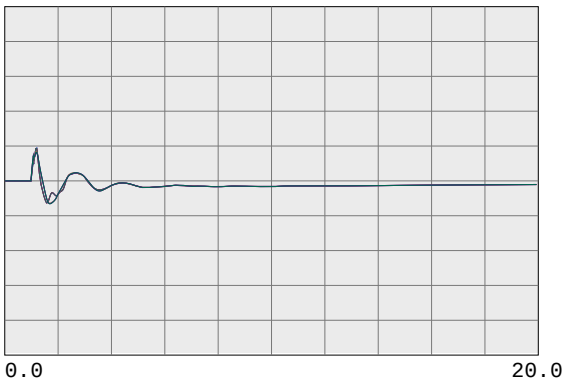
230-KV SYSTEM FREQUENCIES



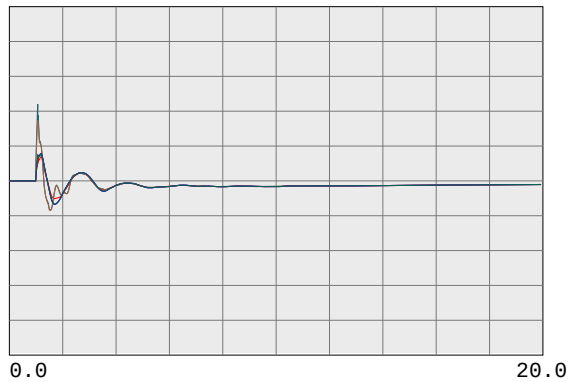
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



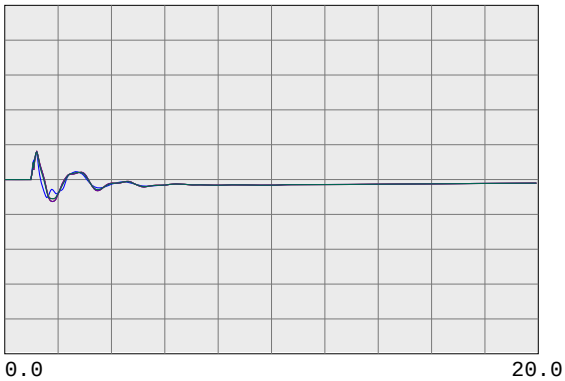
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



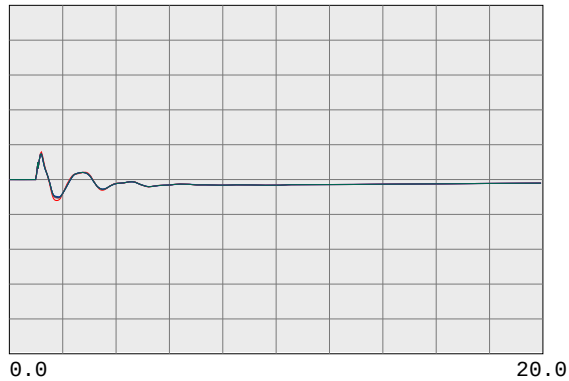
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



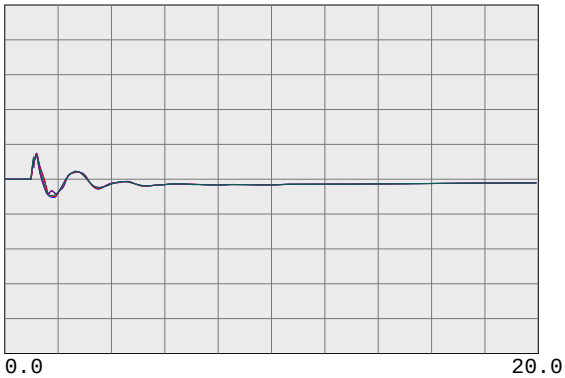
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



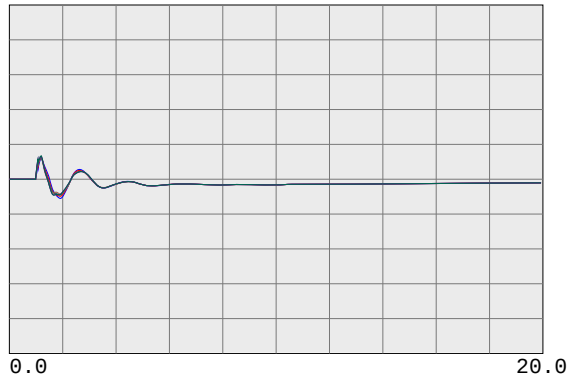
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

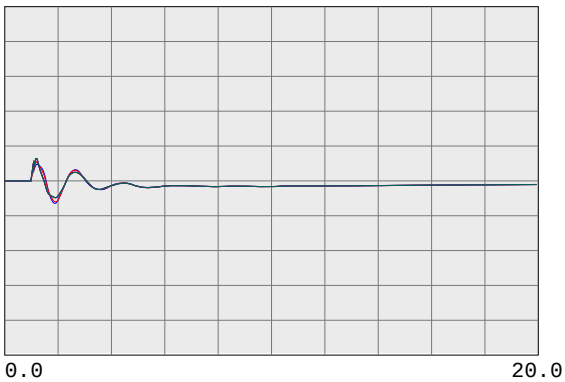
230-KV SYSTEM FREQUENCIES



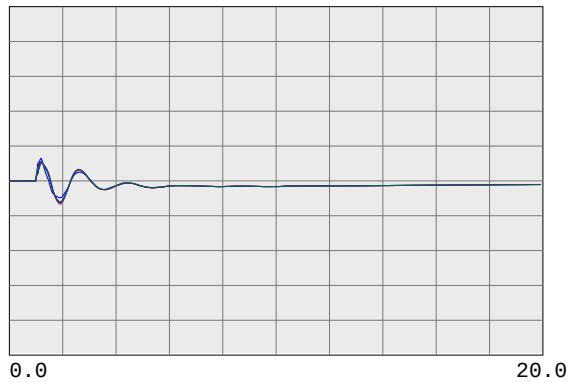
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



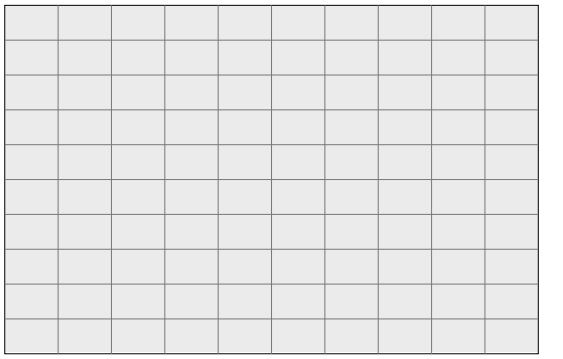
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

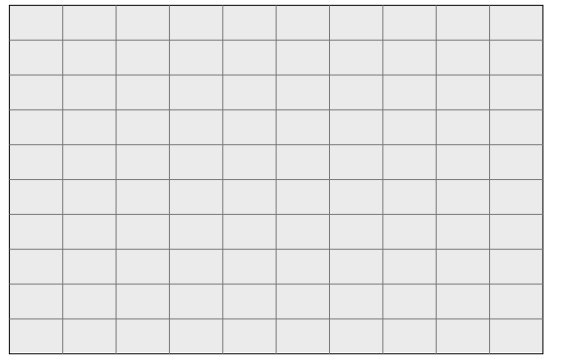


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



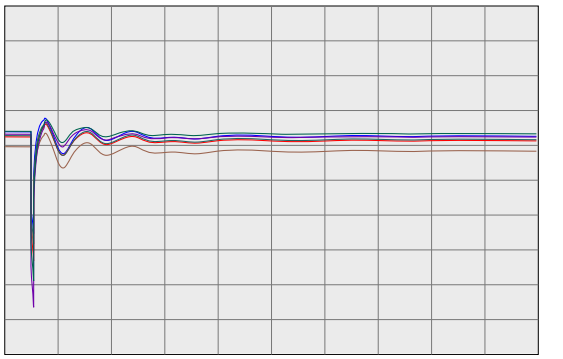
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



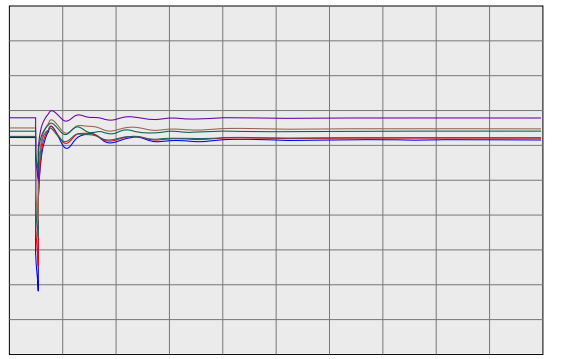


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

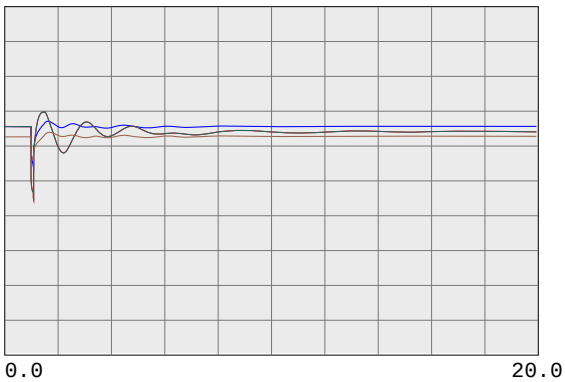
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



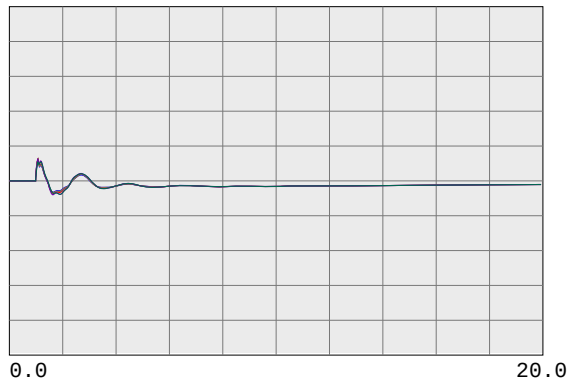
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



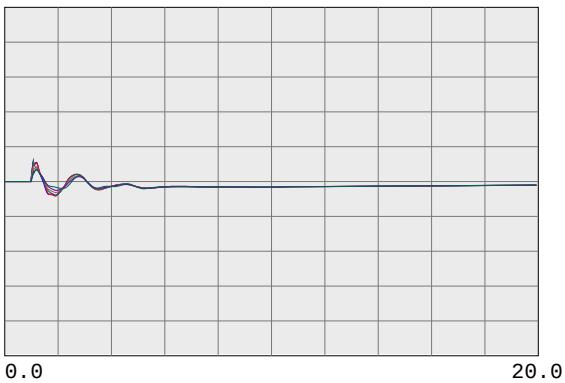
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



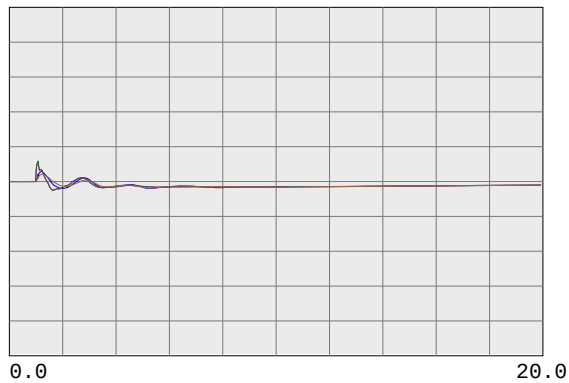
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



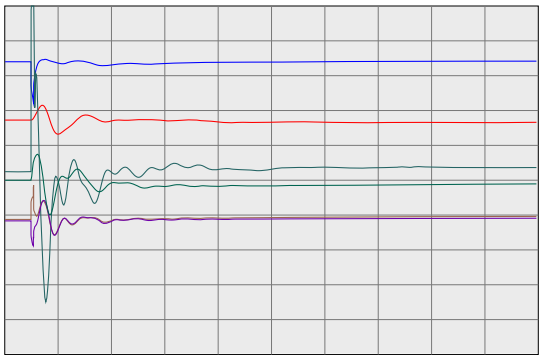
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



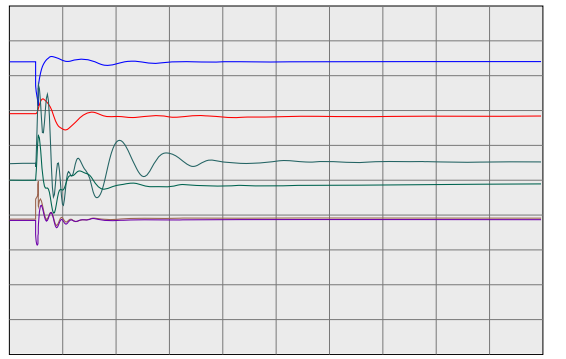
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

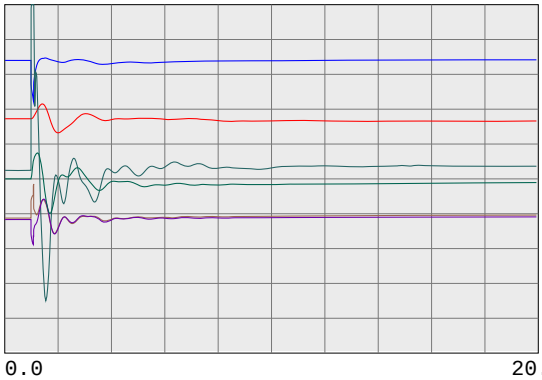
WILLOW PASS GENERATION PLANT



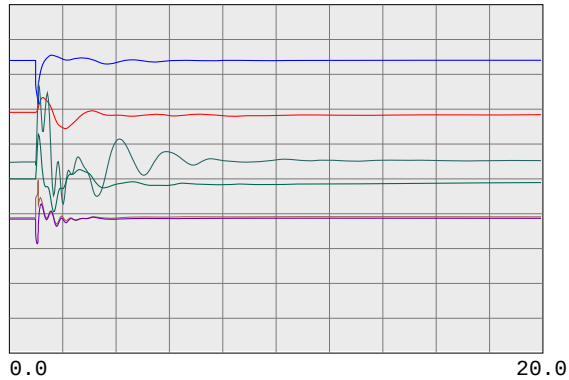
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



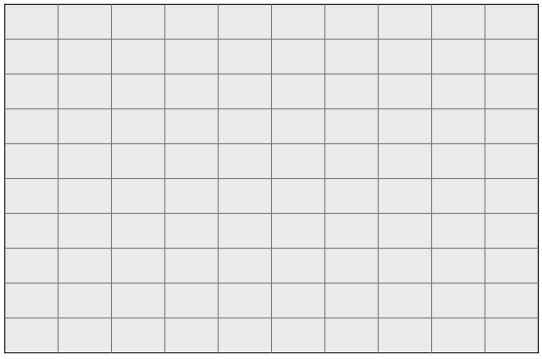
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

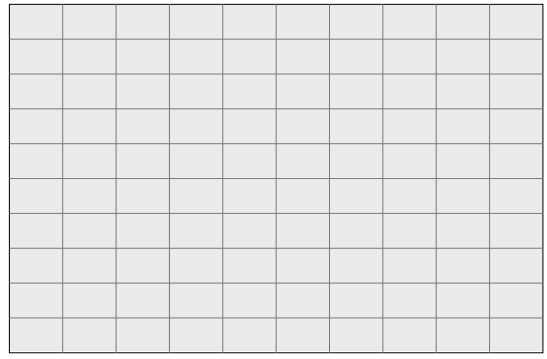


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



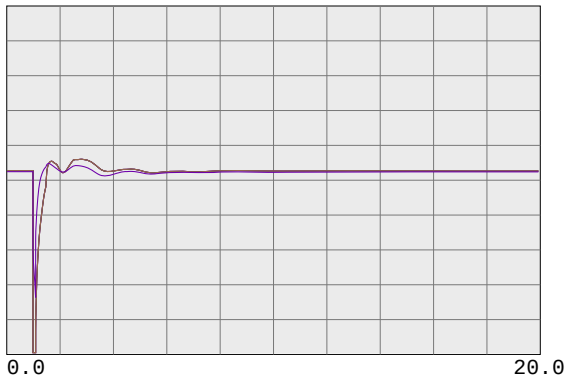
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



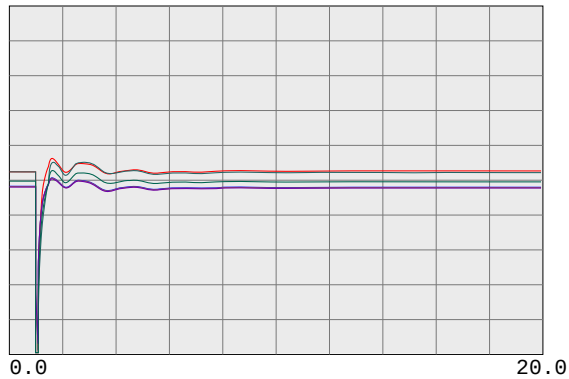


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

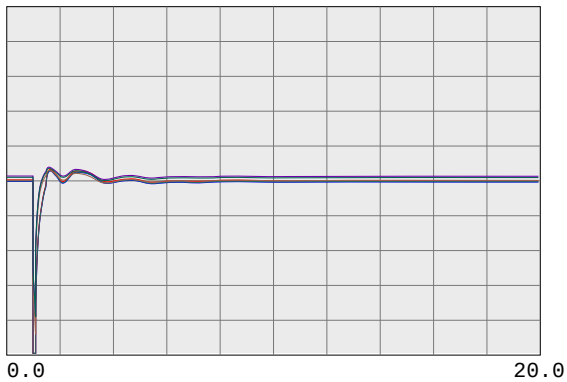
230-KV SYSTEM VOLTAGES



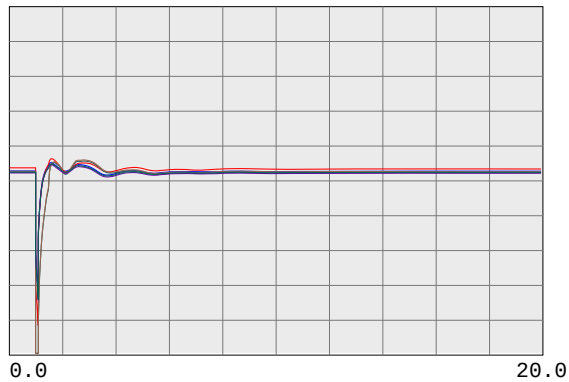
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



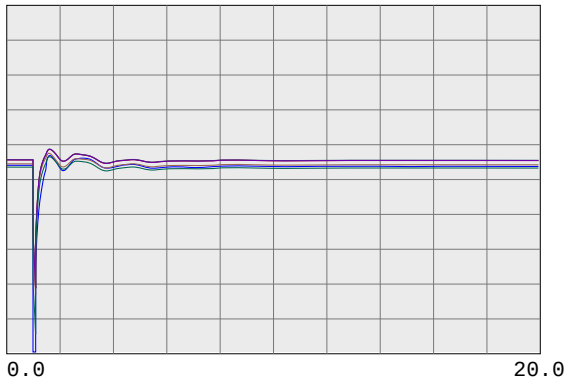
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



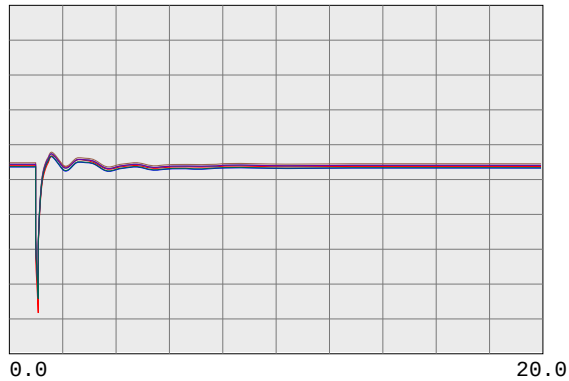
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



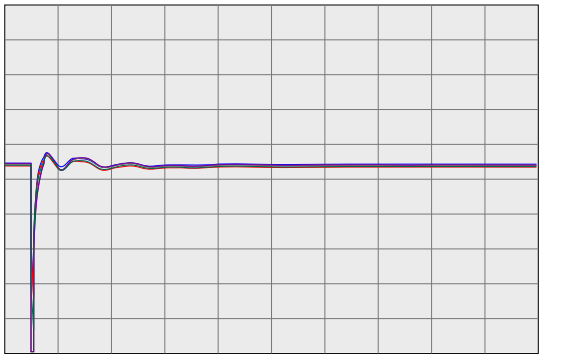
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



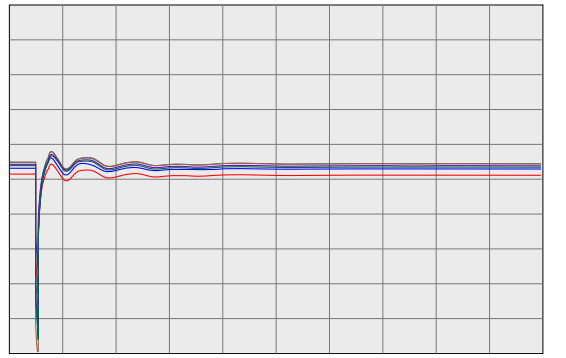
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

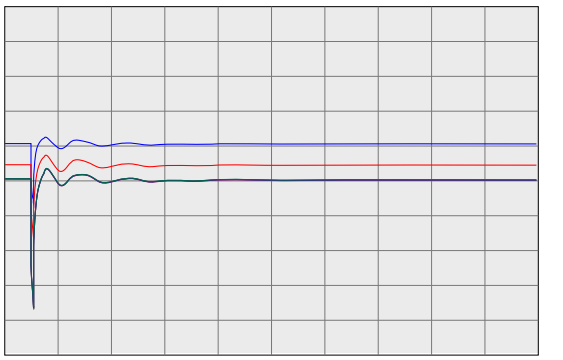
230-KV SYSTEM VOLTAGES



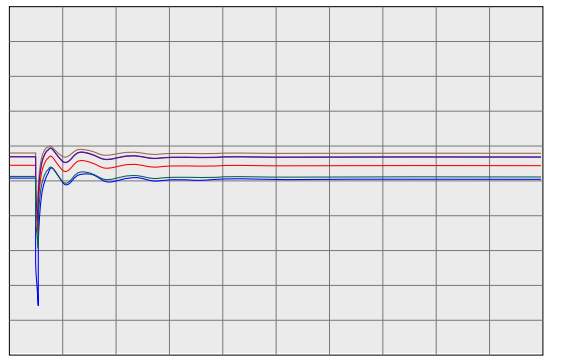
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



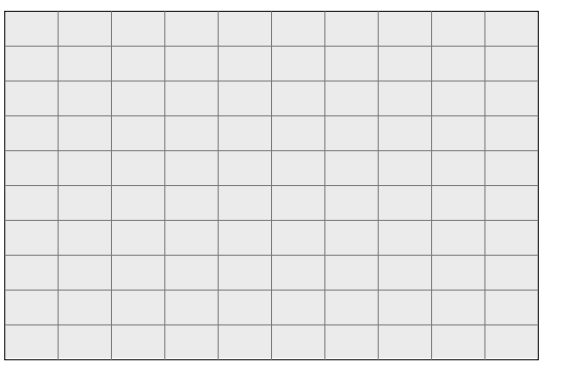
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

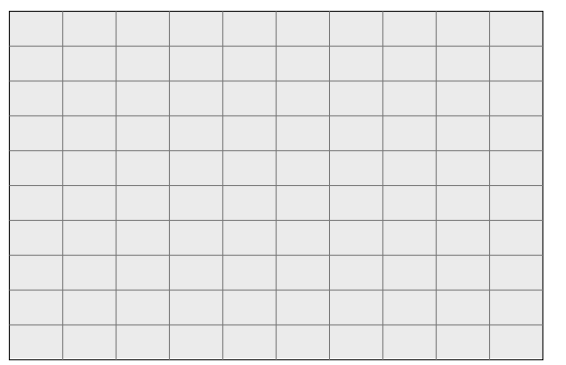


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



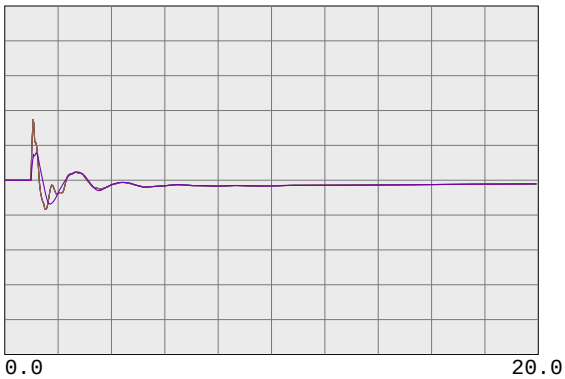
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



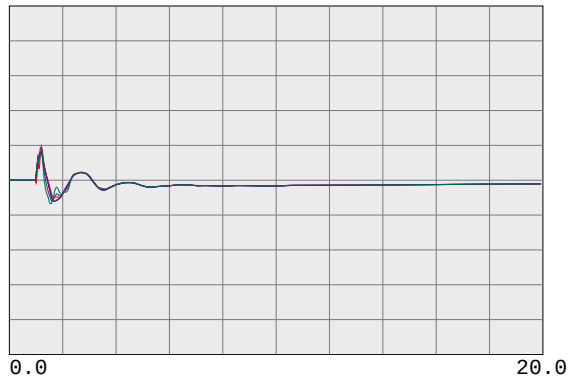


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

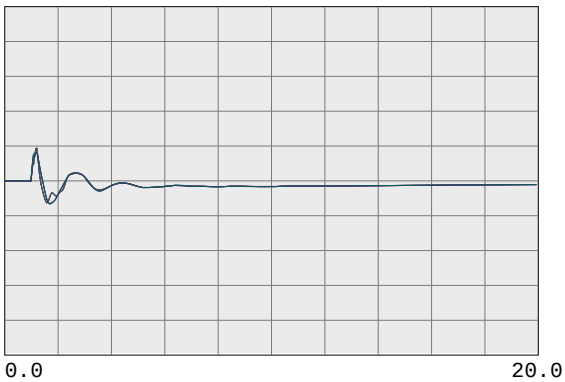
230-KV SYSTEM FREQUENCIES



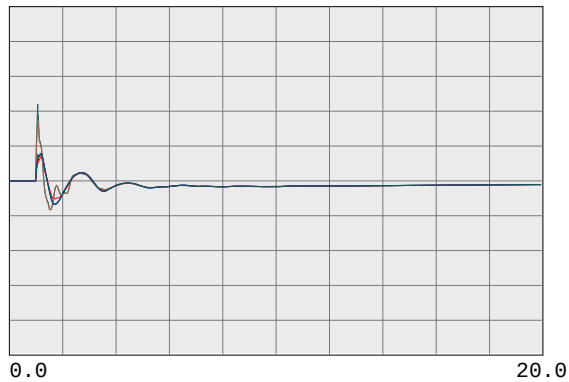
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



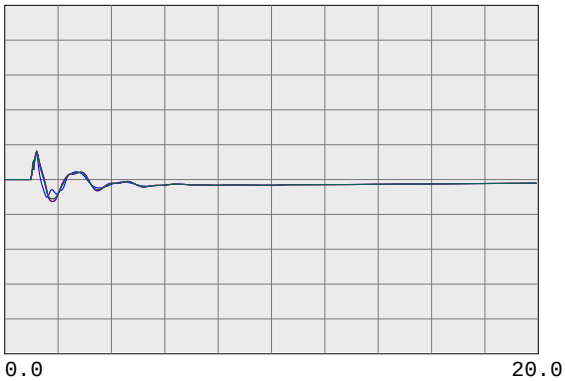
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



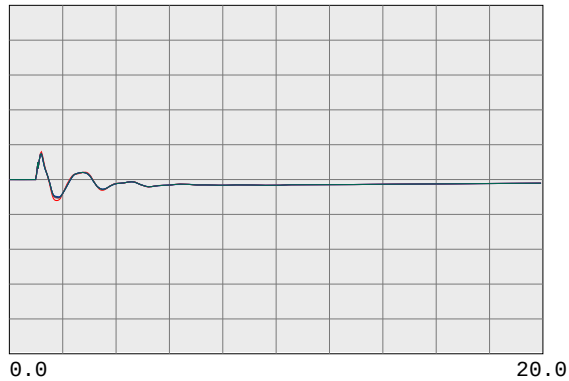
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



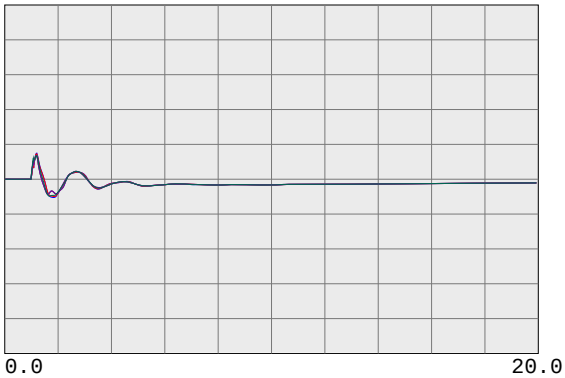
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



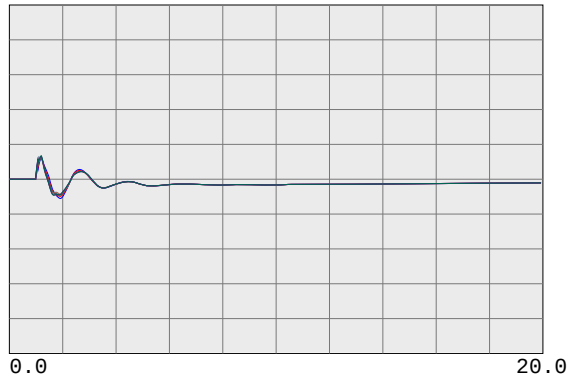
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

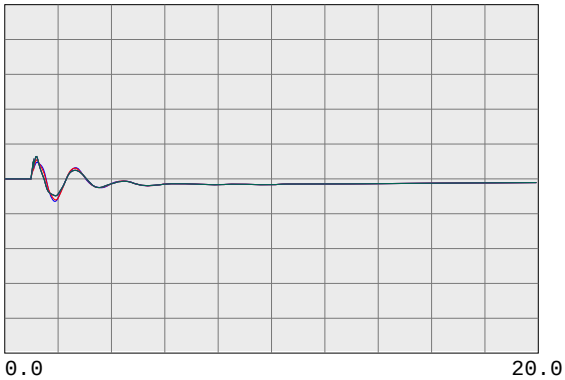
230-KV SYSTEM FREQUENCIES



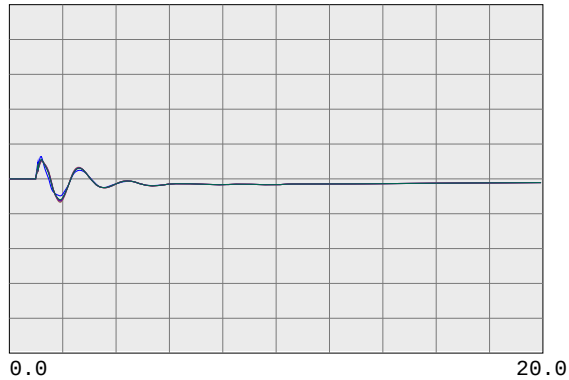
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



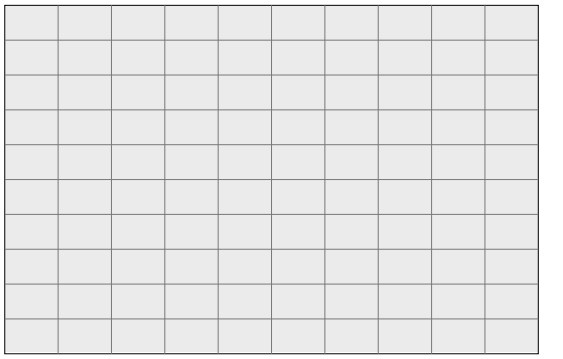
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

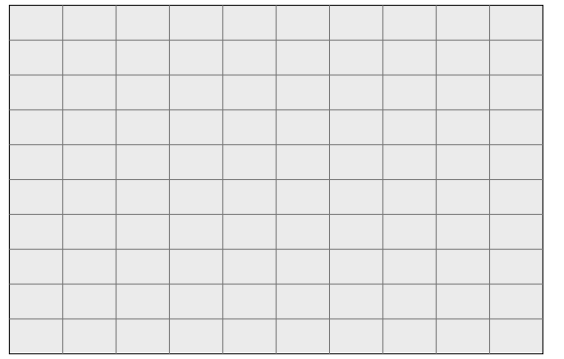


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



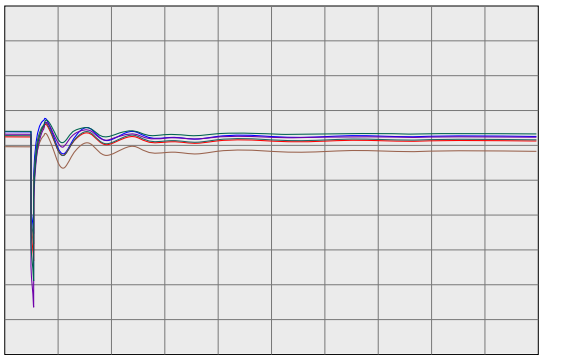
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



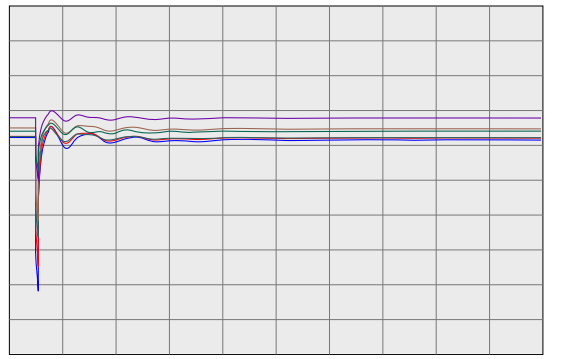


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

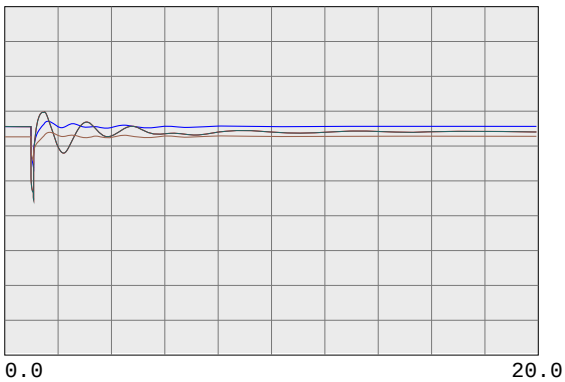
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



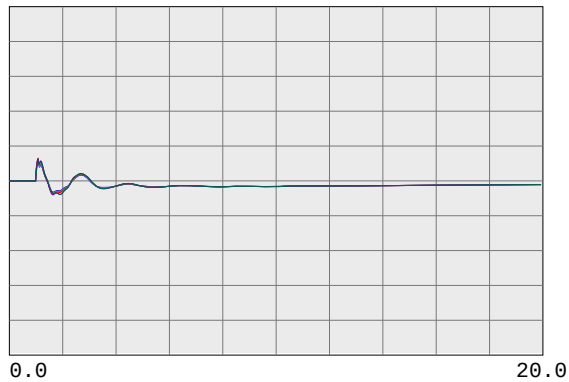
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



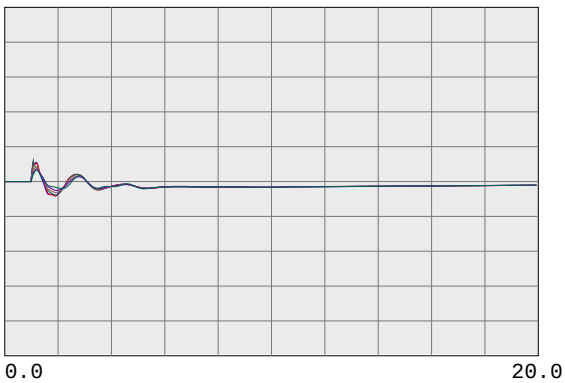
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



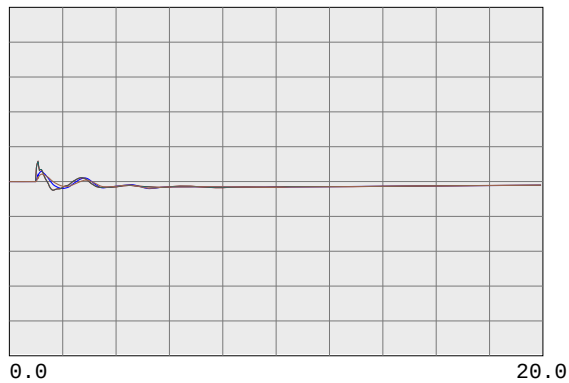
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



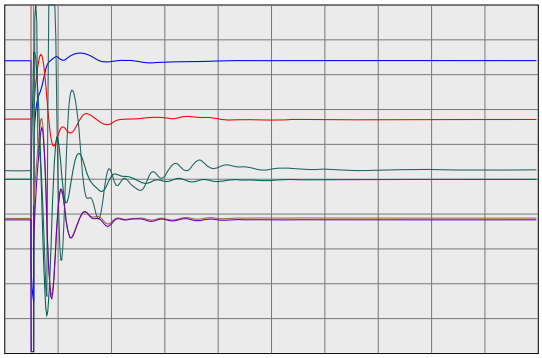
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



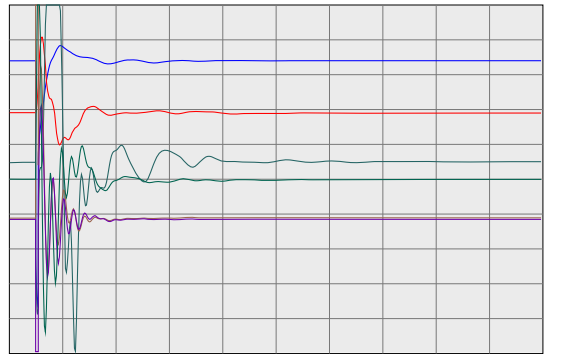
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

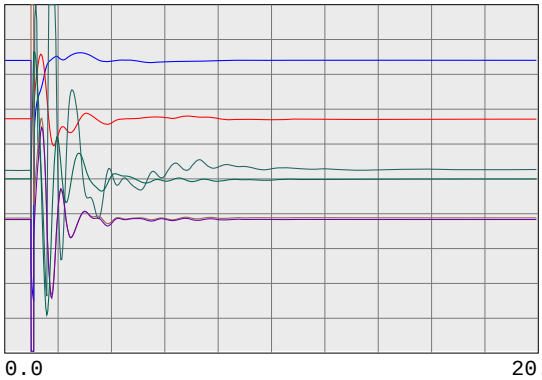
WILLOW PASS GENERATION PLANT



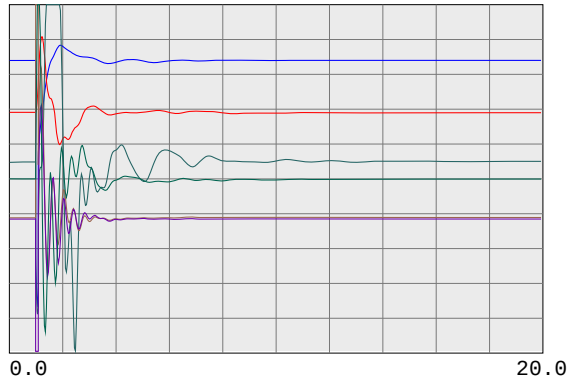
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



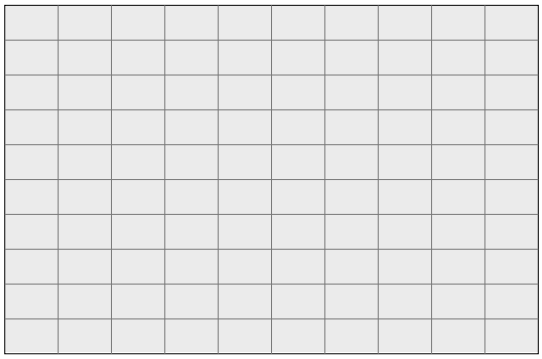
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

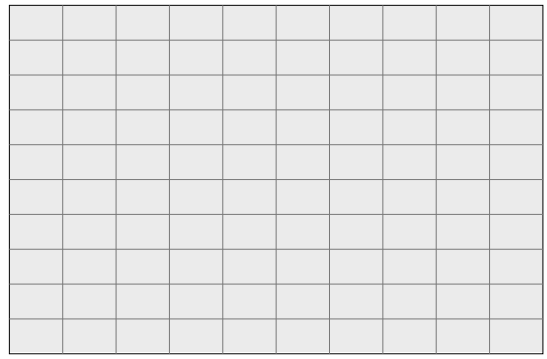


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



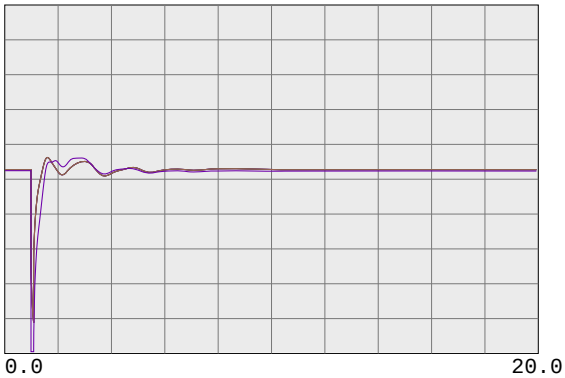
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



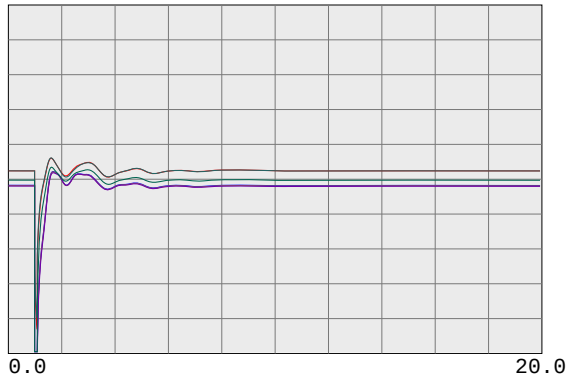


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

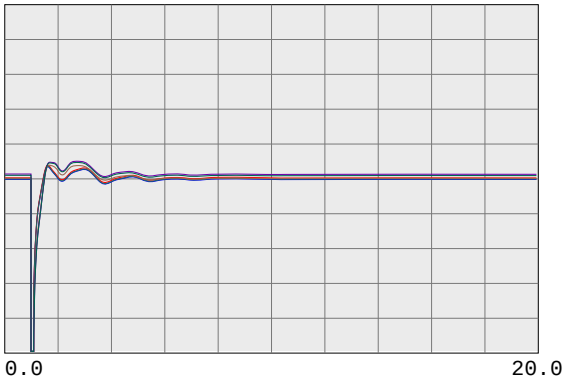
230-KV SYSTEM VOLTAGES



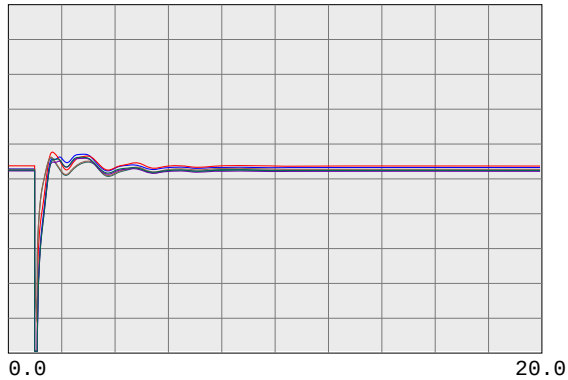
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



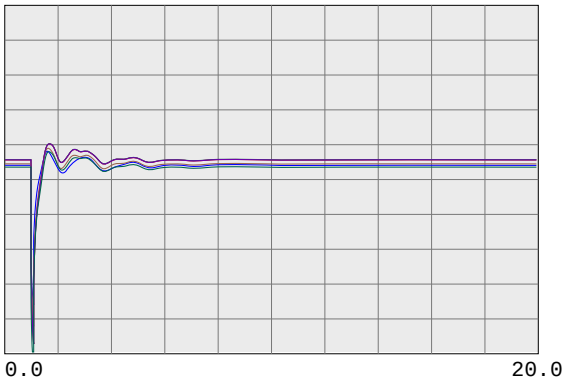
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



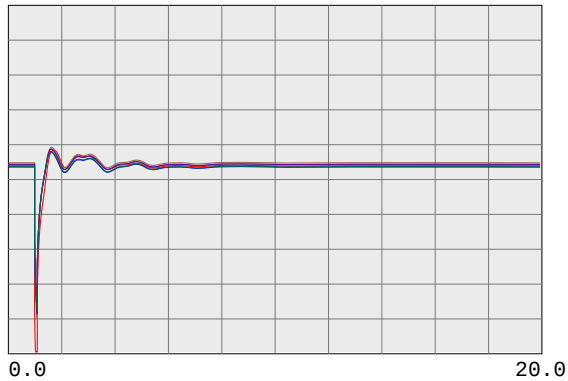
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



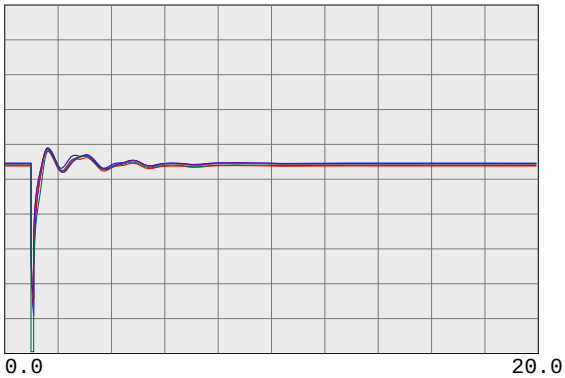
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



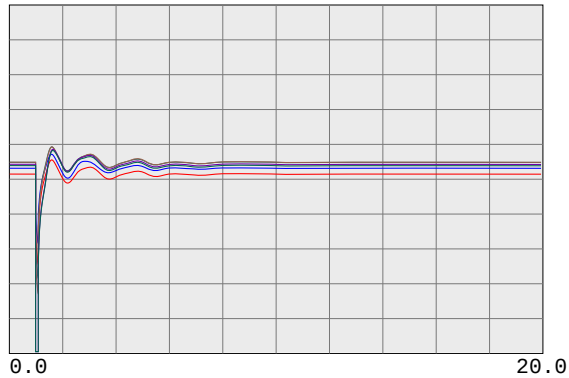
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

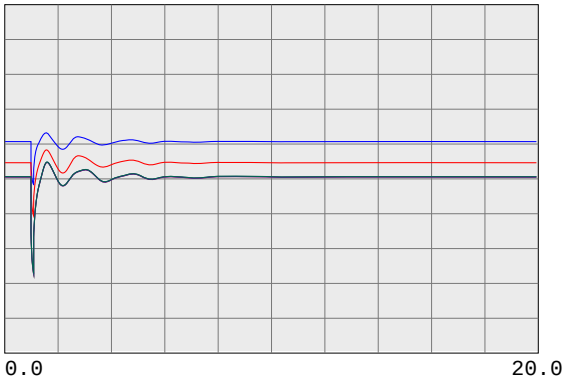
230-KV SYSTEM VOLTAGES



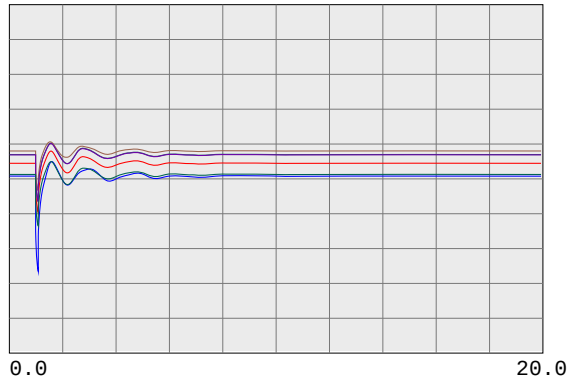
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



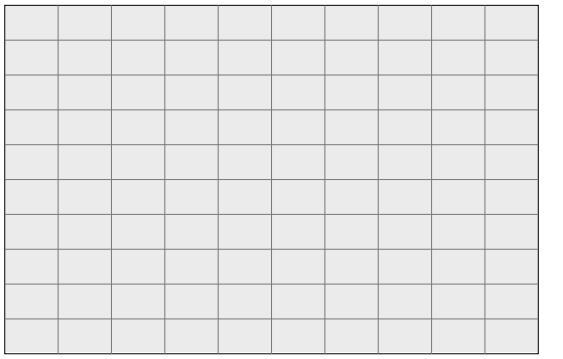
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

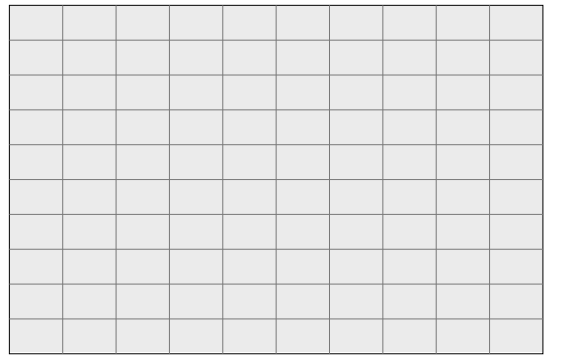


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



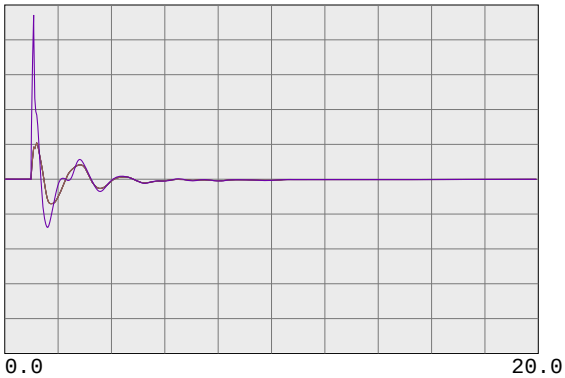
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



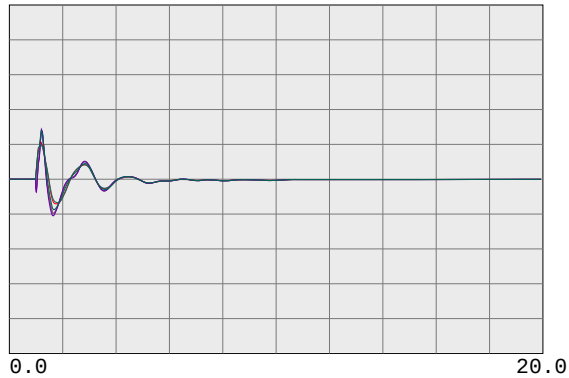


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

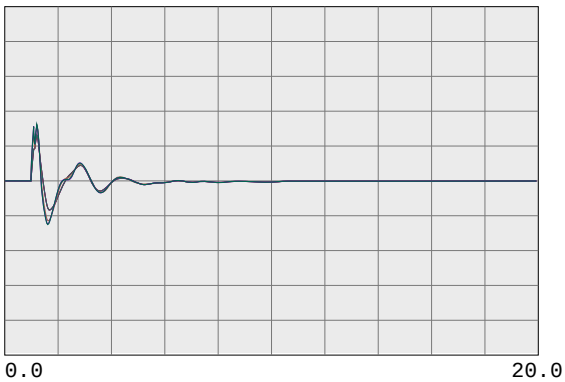
230-KV SYSTEM FREQUENCIES



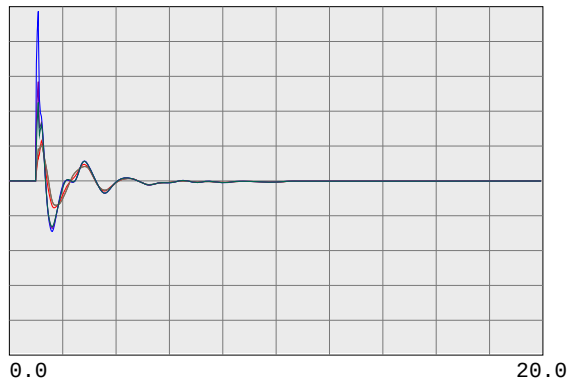
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



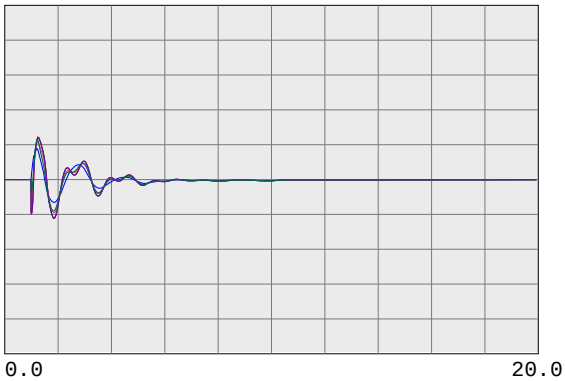
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



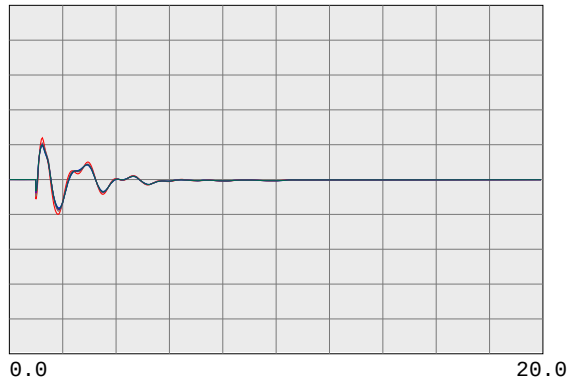
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



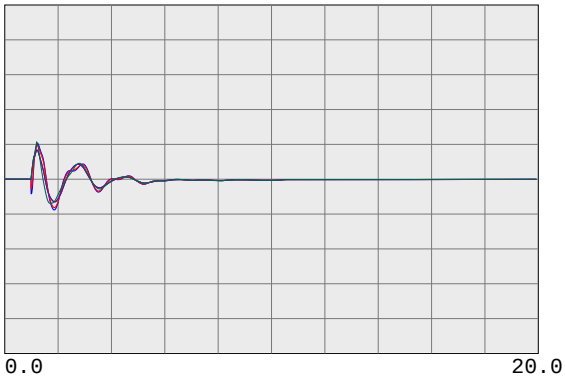
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



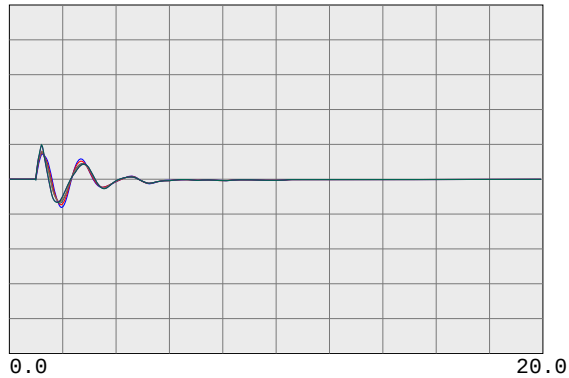
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

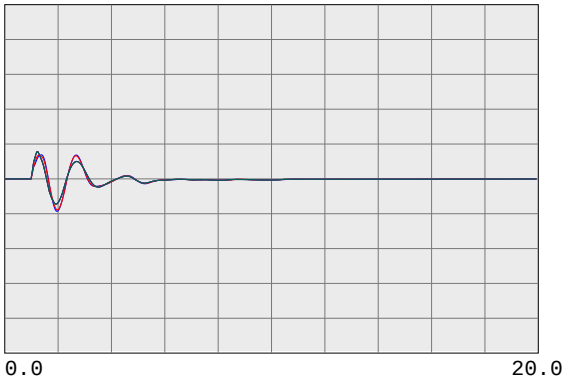
230-KV SYSTEM FREQUENCIES



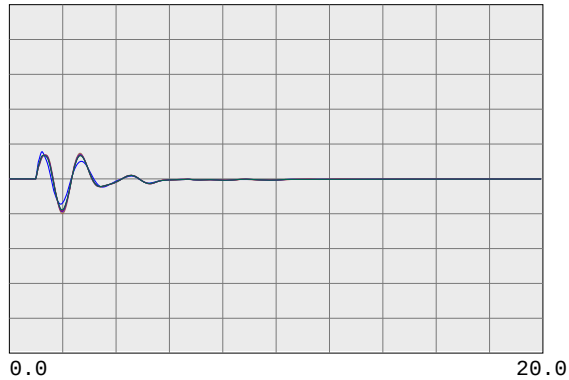
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



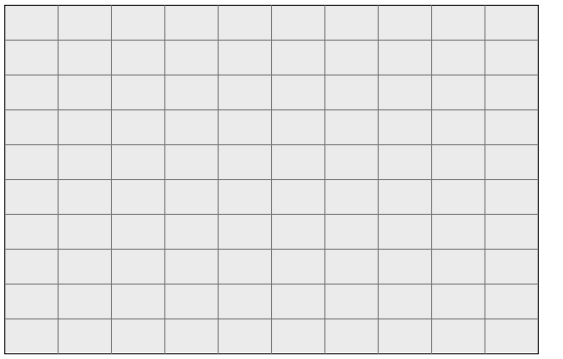
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

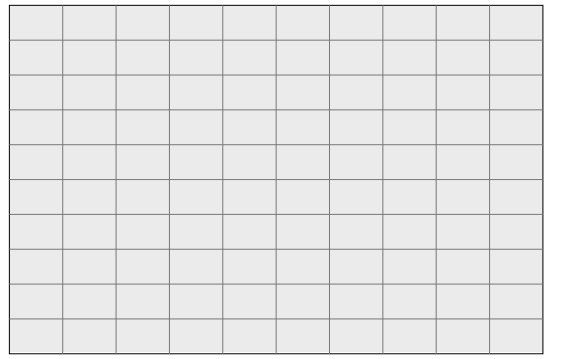


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



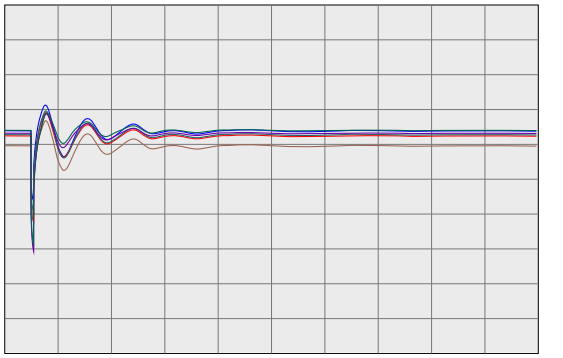
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



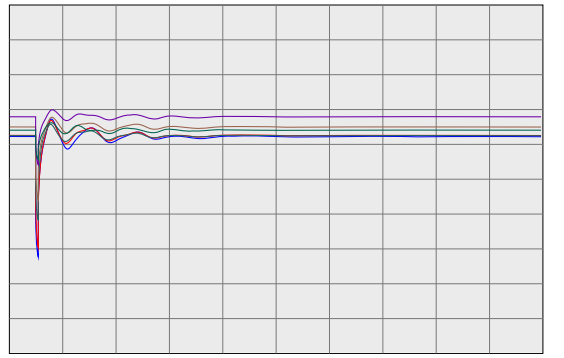


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

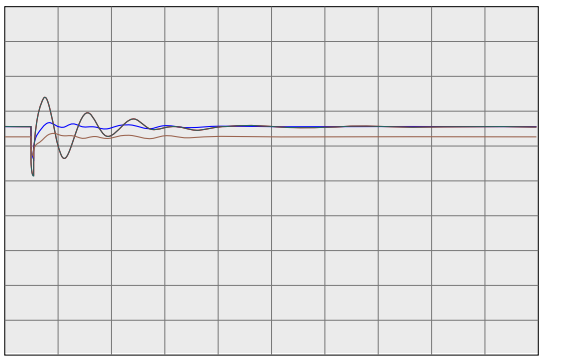
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



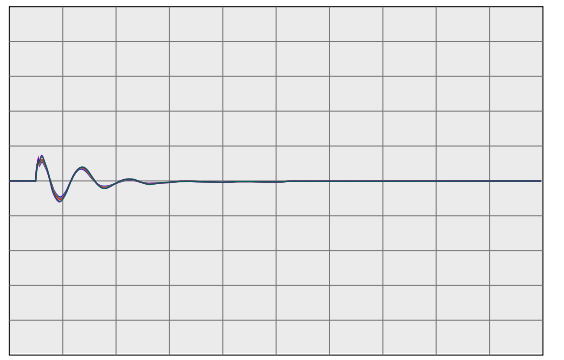
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



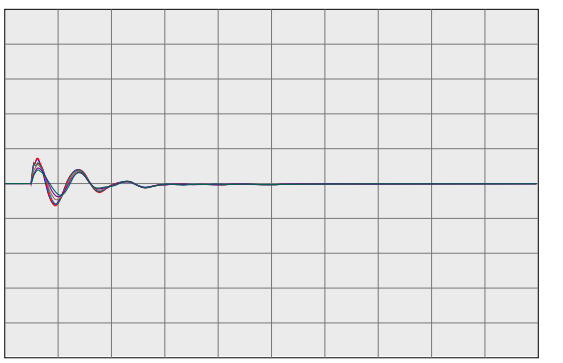
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



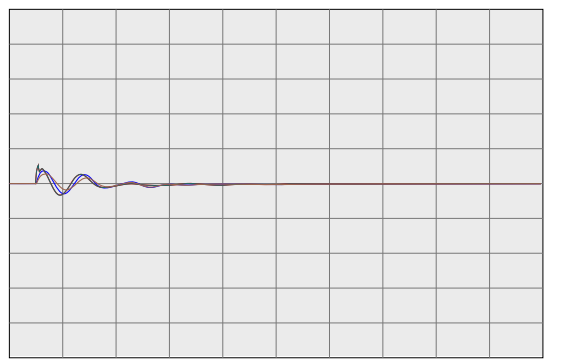
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



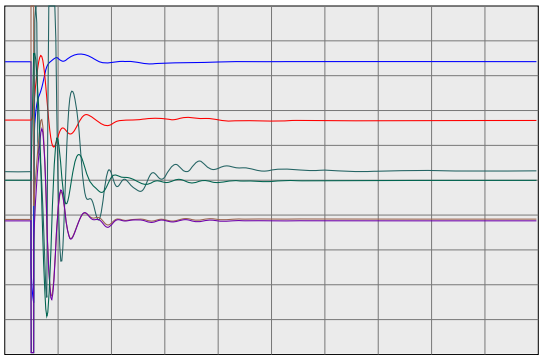
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



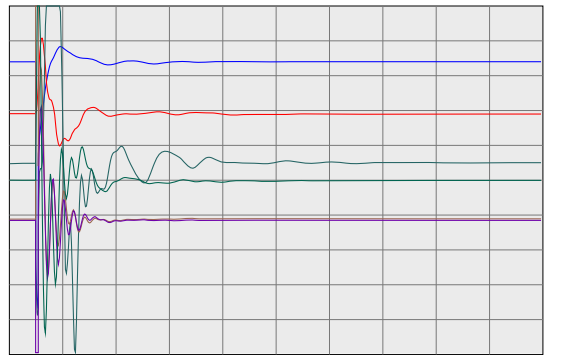
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

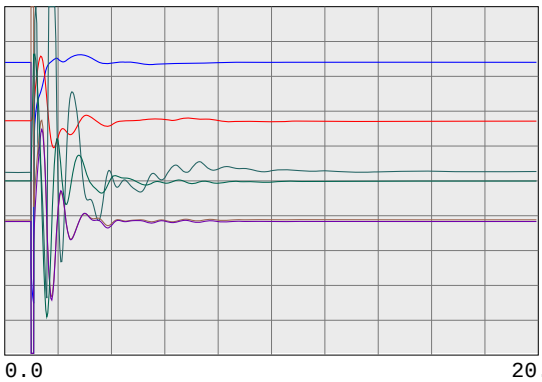
WILLOW PASS GENERATION PLANT



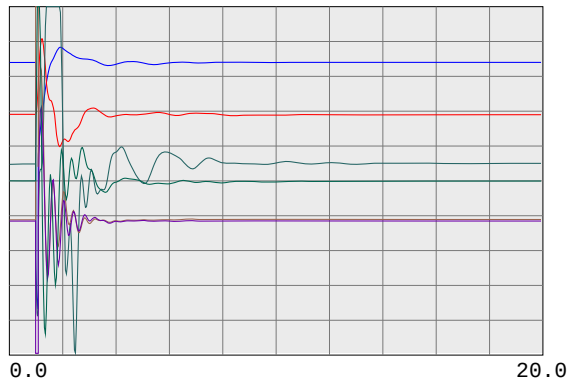
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



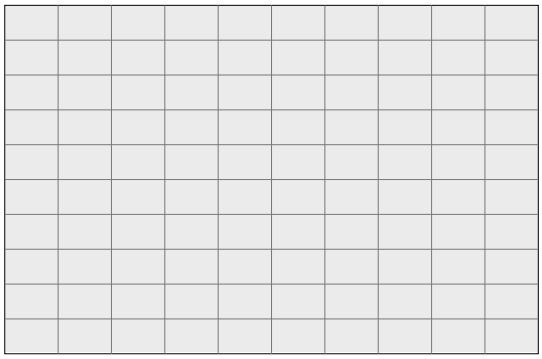
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

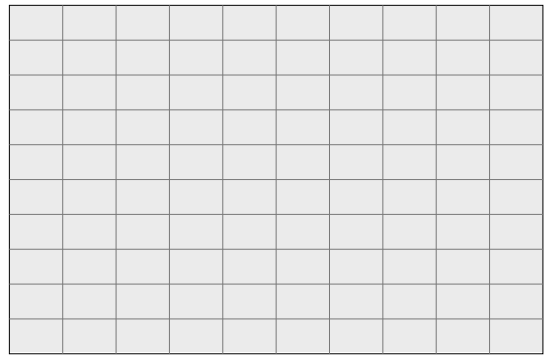


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



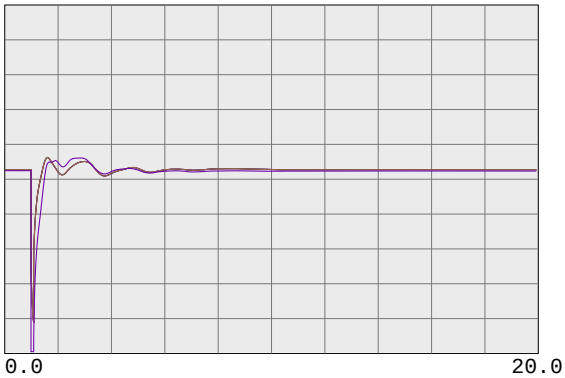
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



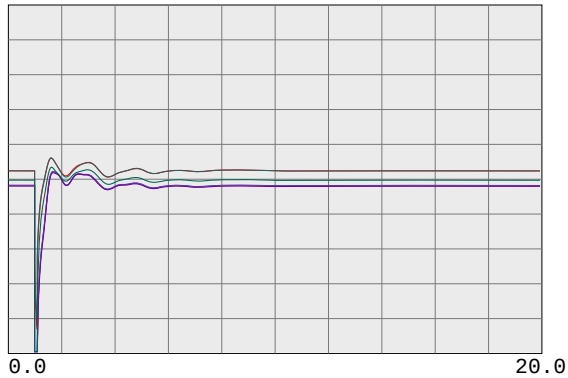


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

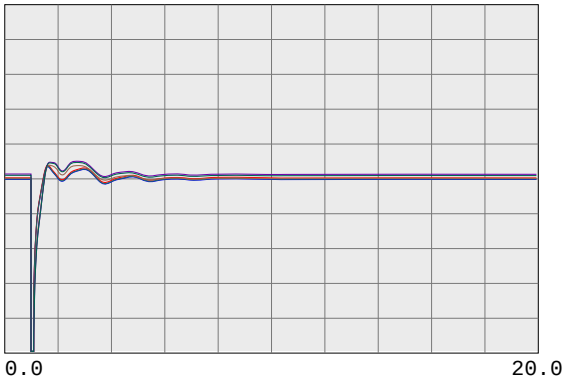
230-KV SYSTEM VOLTAGES



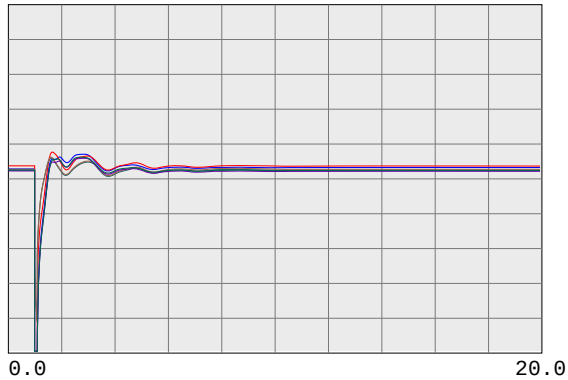
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



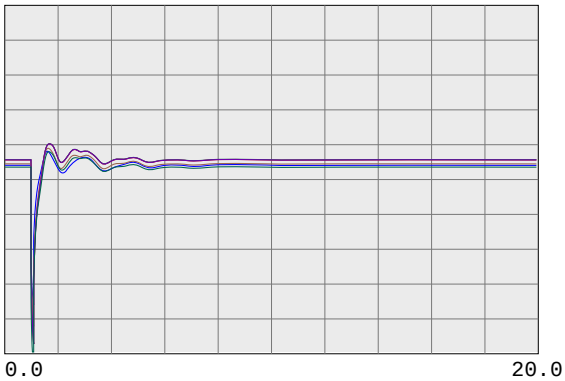
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



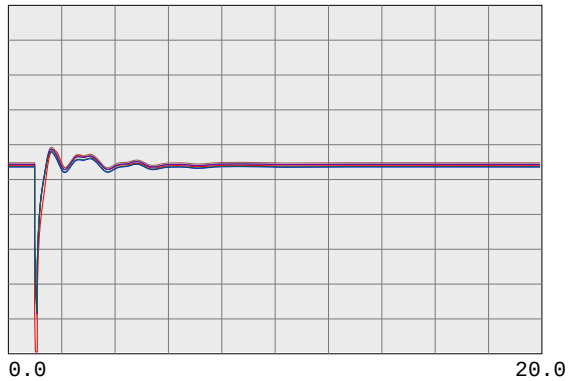
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



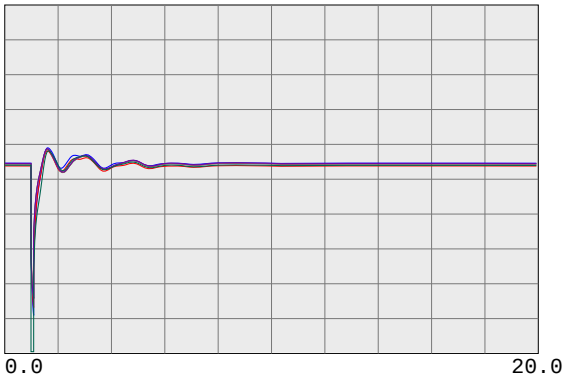
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



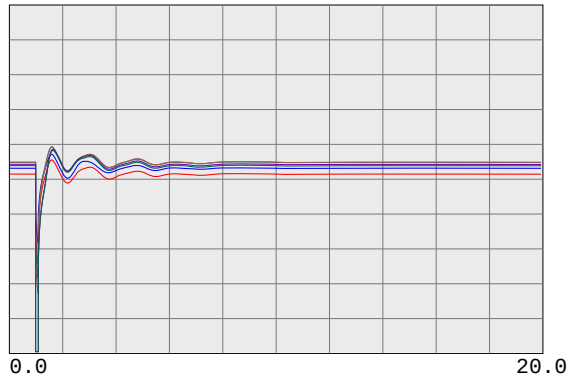
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

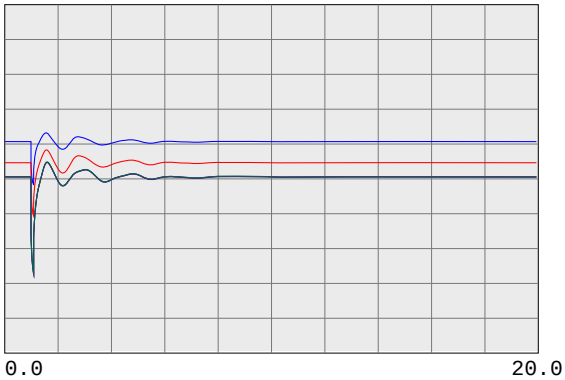
230-KV SYSTEM VOLTAGES



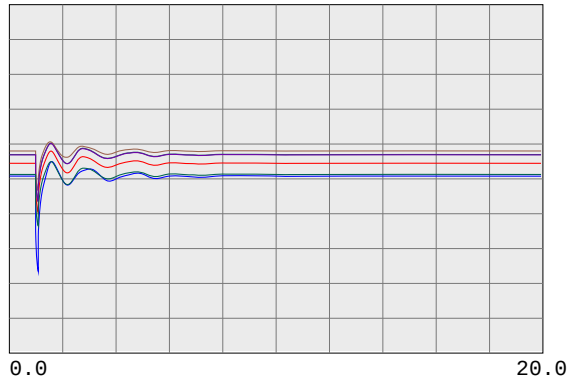
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



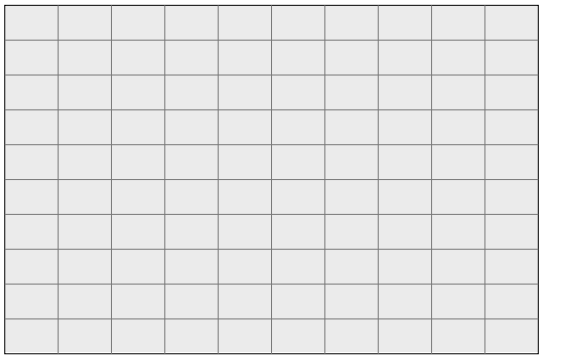
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

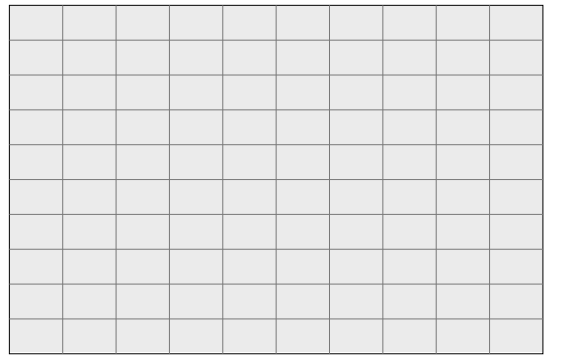


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



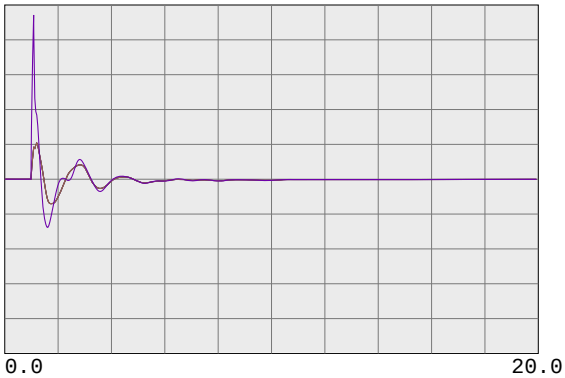
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



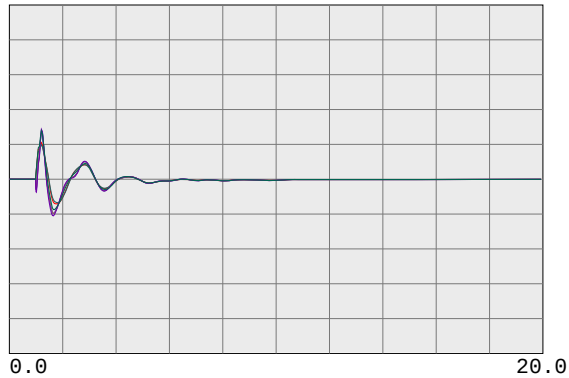


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

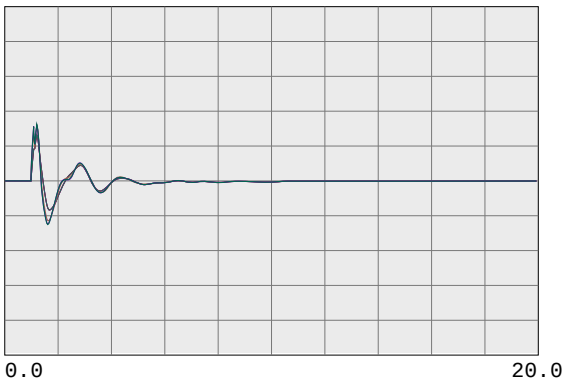
230-KV SYSTEM FREQUENCIES



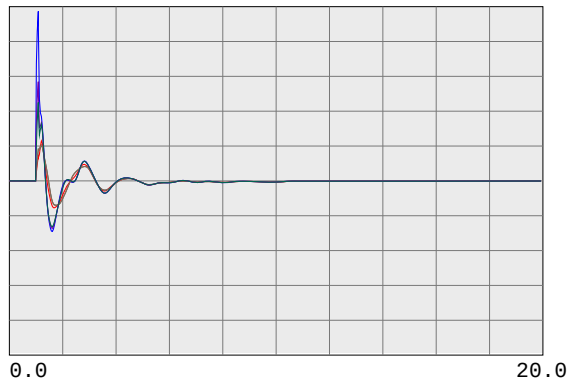
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



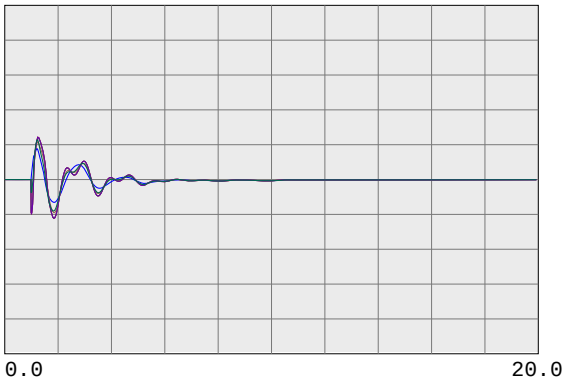
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



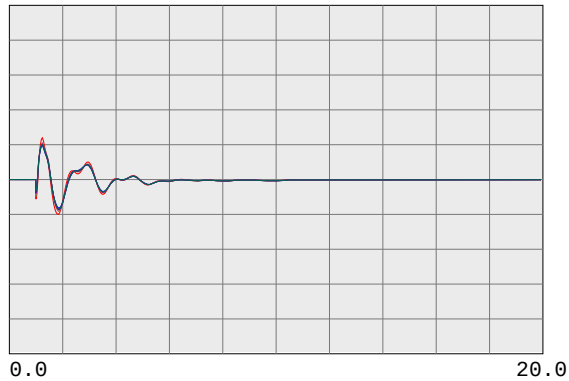
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



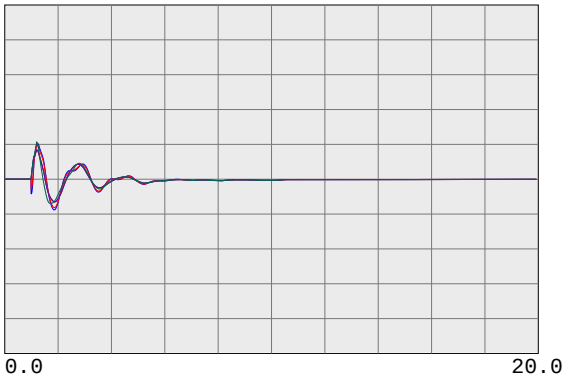
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



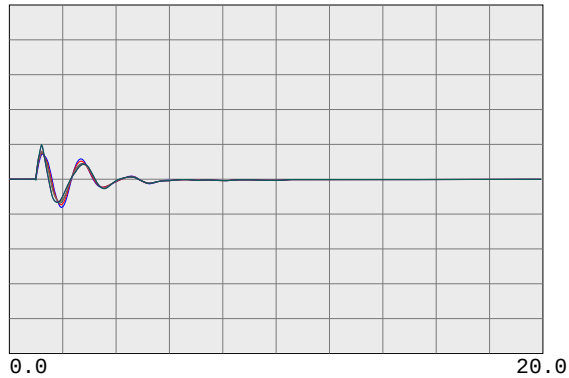
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

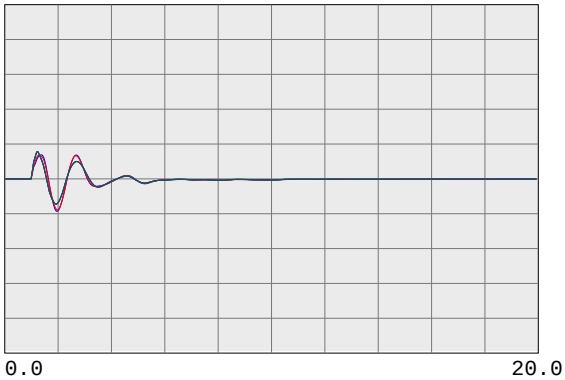
230-KV SYSTEM FREQUENCIES



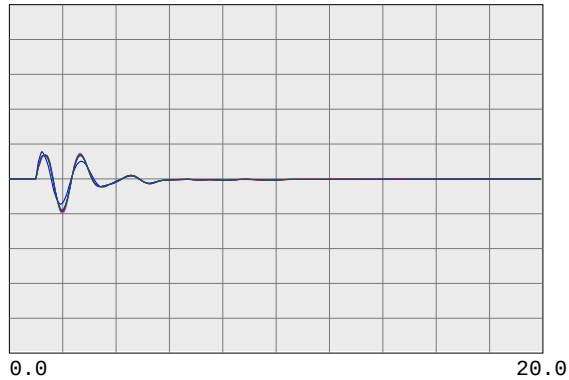
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



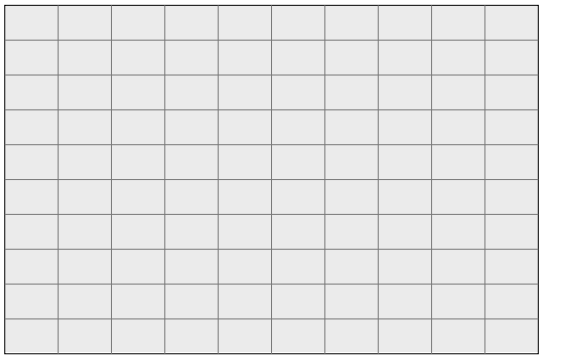
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

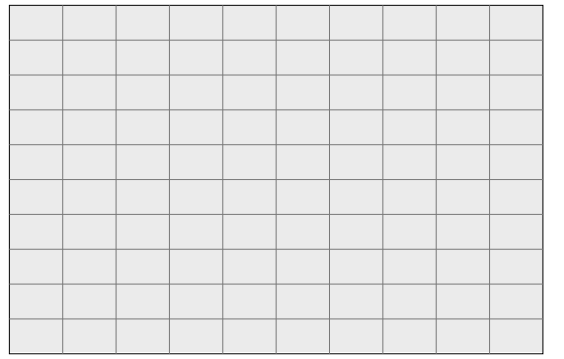


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



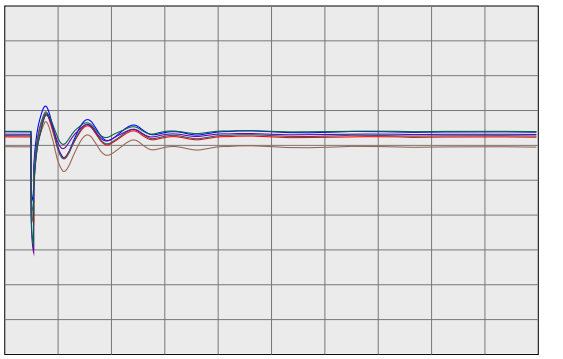
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



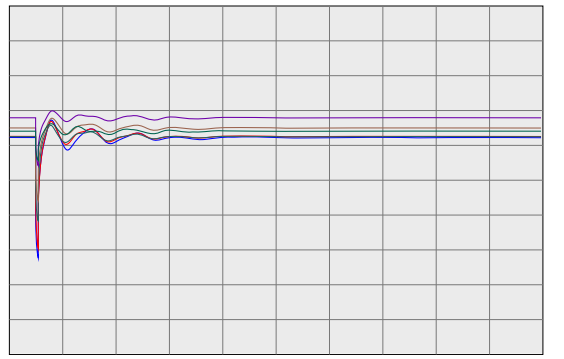


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

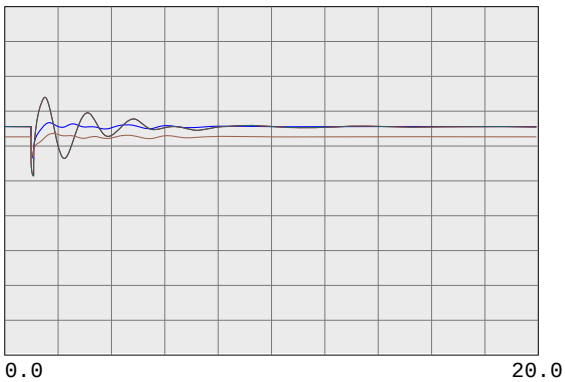
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



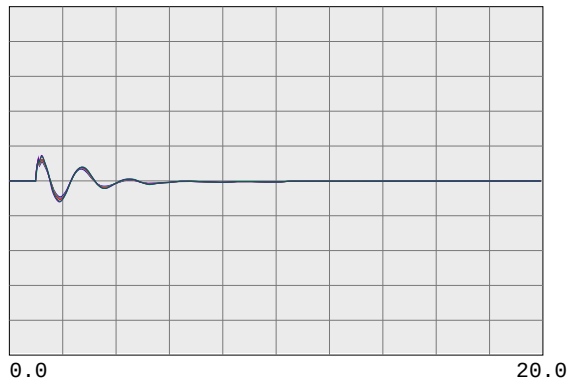
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



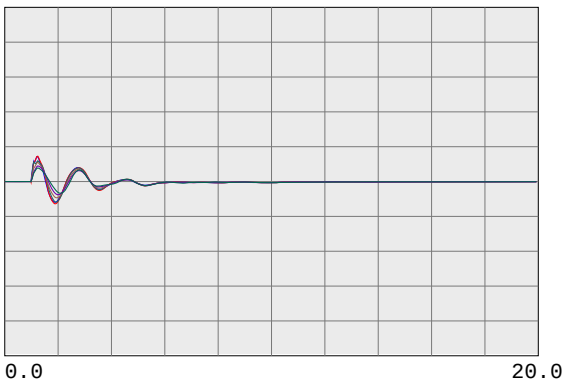
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



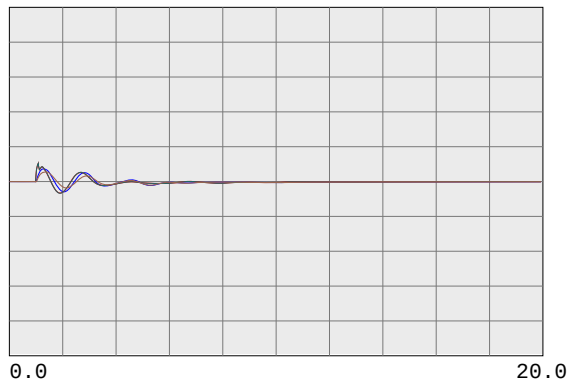
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



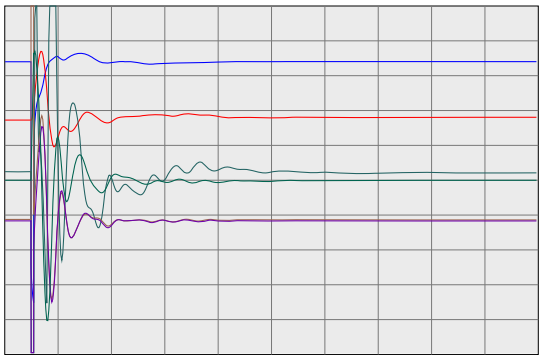
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



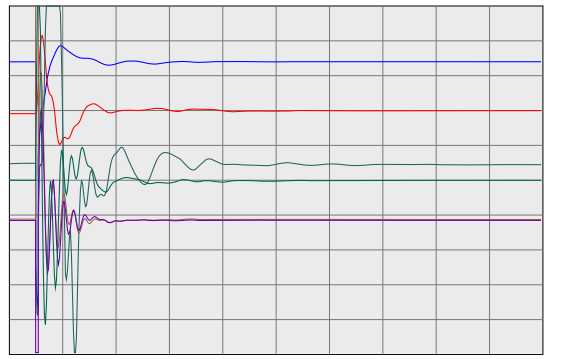
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

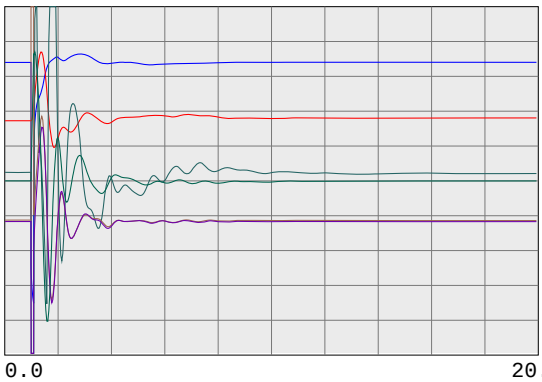
WILLOW PASS GENERATION PLANT



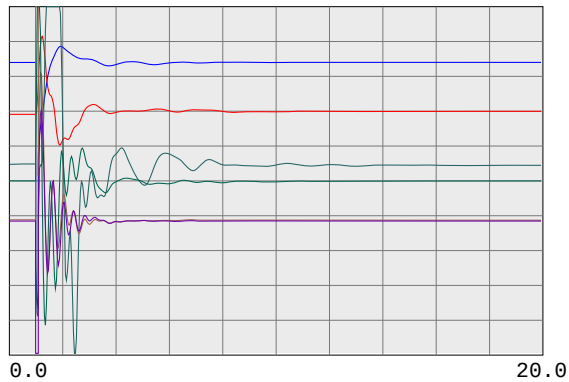
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



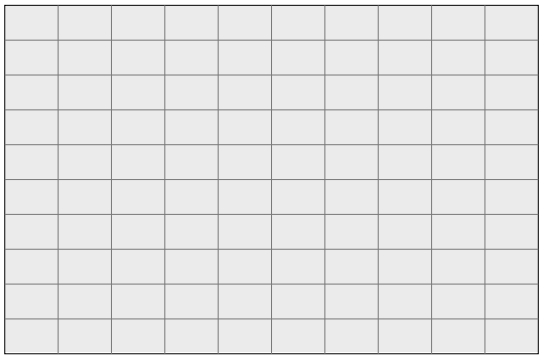
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

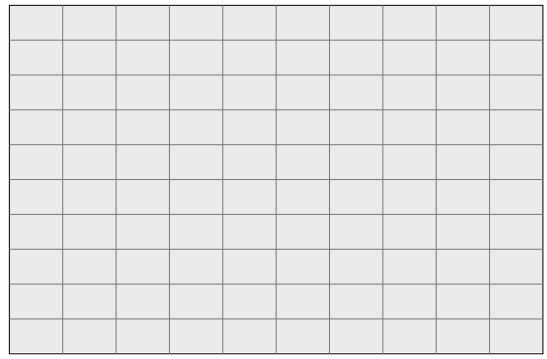


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

HS13_PST_WLLW_PSS_B-141_N-1_PITSBRG_D-SANRAMON_230.chf

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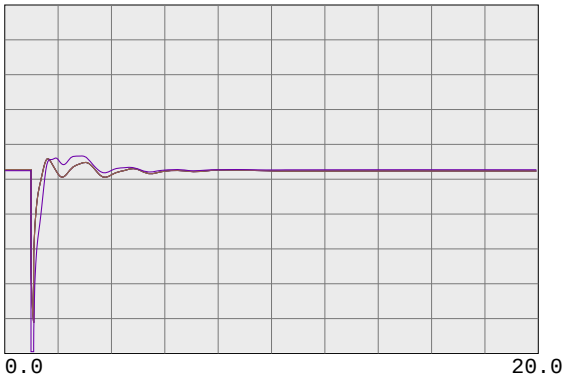
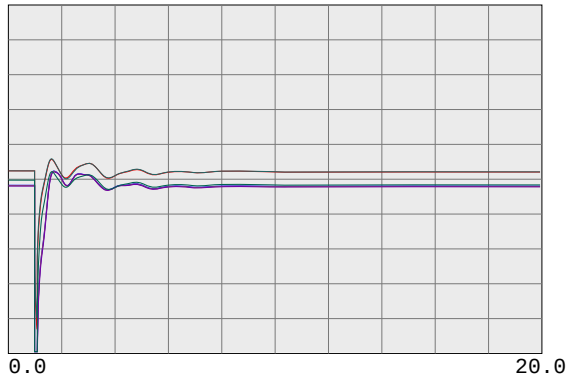
Thu Feb 26 20:12:17 2009

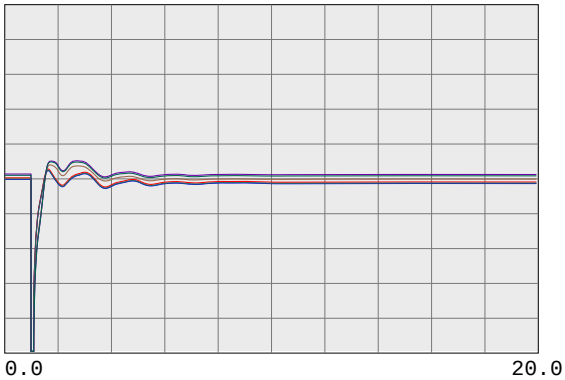
230-KV SYSTEM VOLTAGES



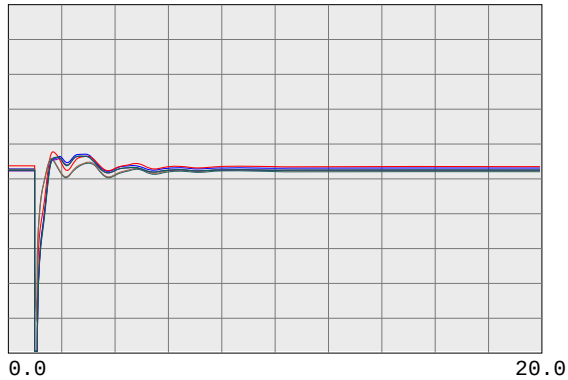
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



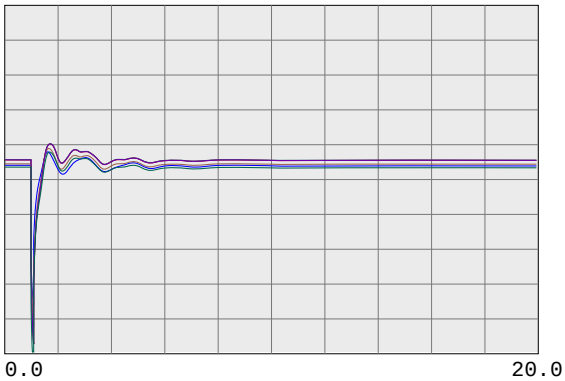
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



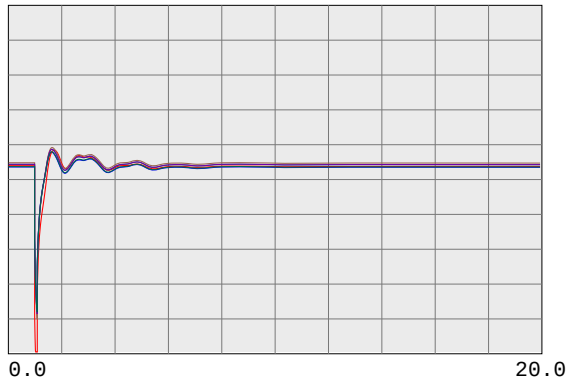
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



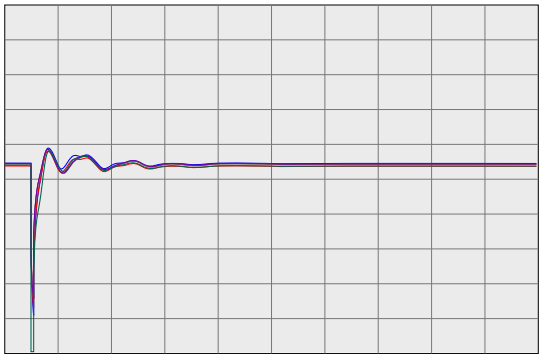
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

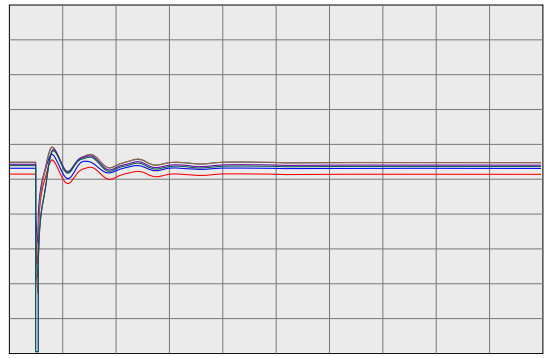
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

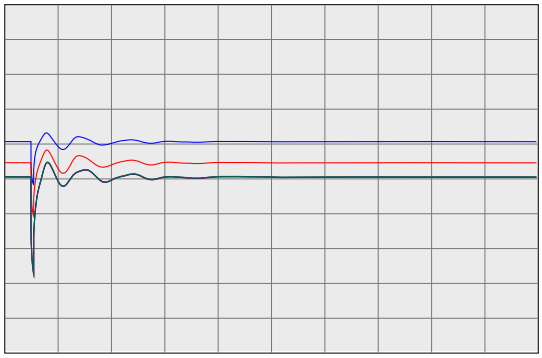
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

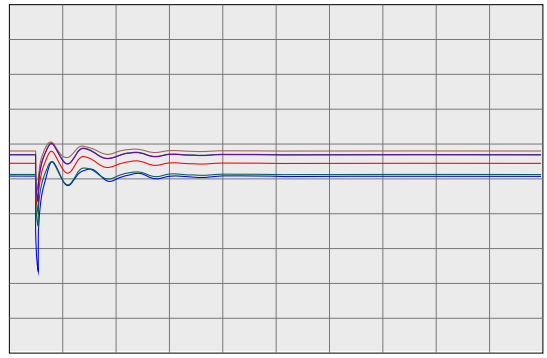
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

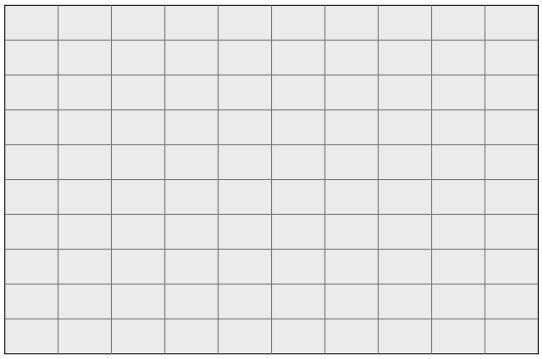
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

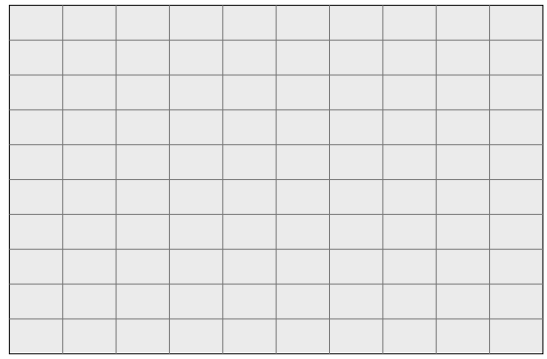


0.0 20.0

Time(sec)

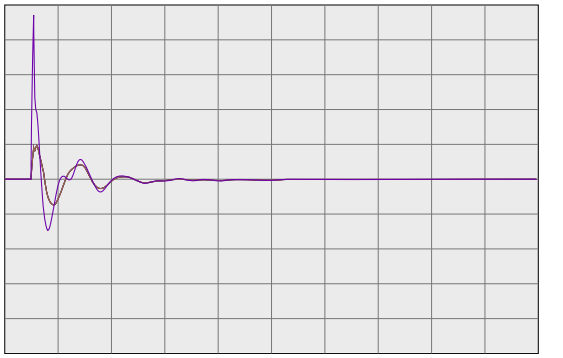
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



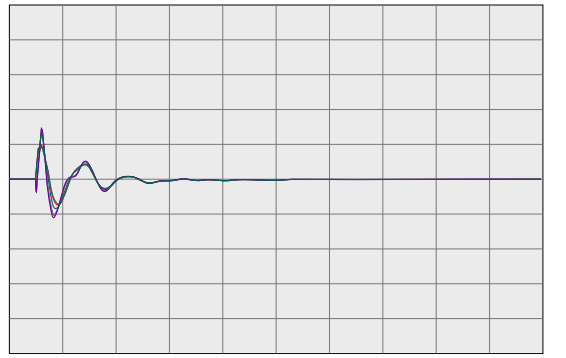


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

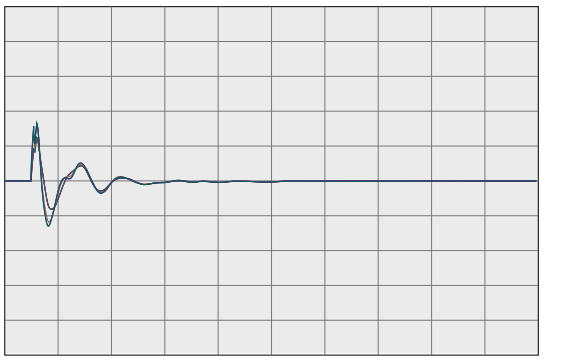
230-KV SYSTEM FREQUENCIES



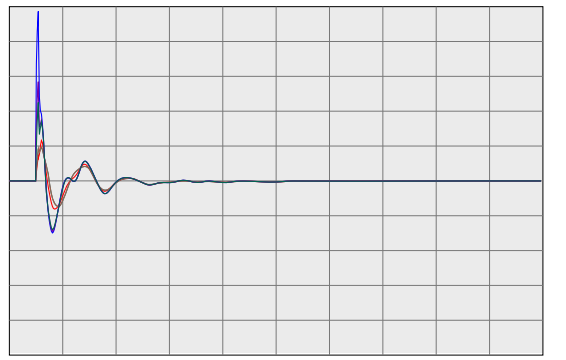
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



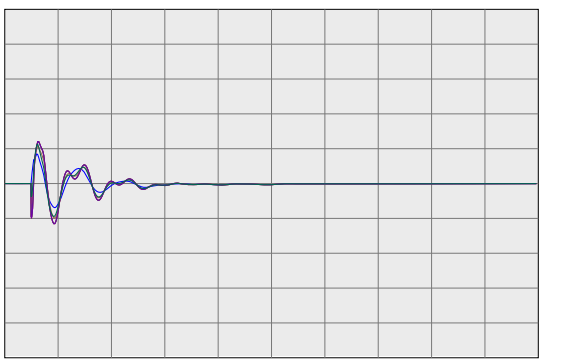
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



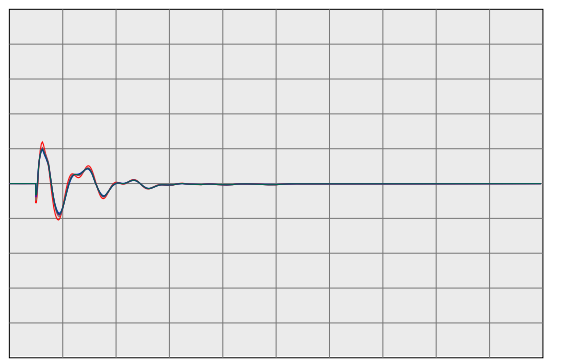
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



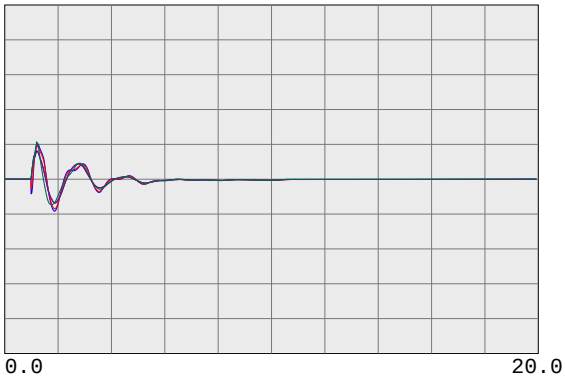
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



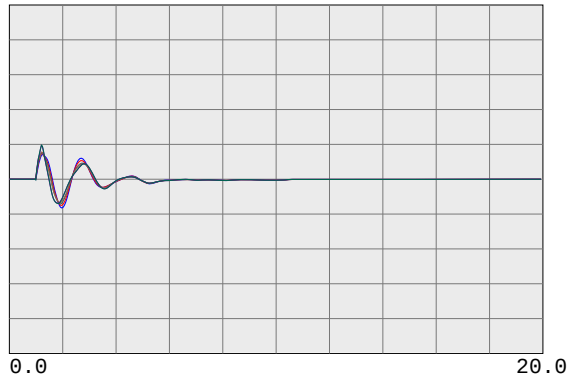
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

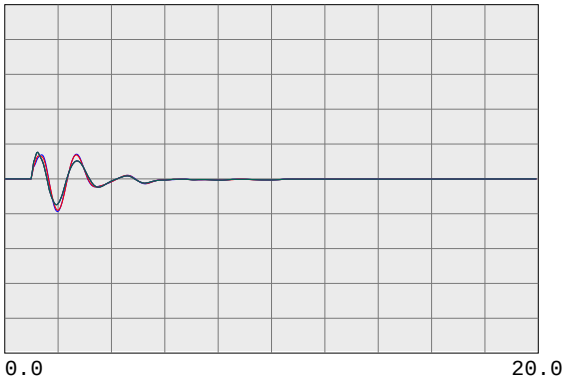
230-KV SYSTEM FREQUENCIES



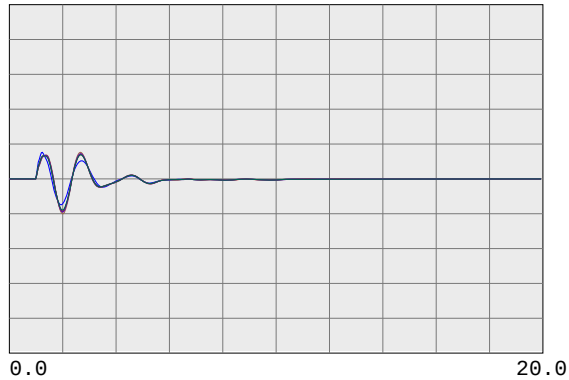
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



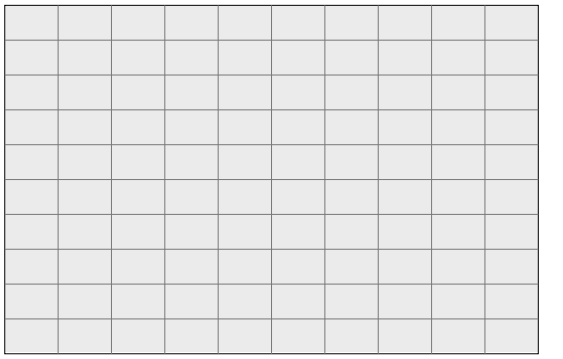
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

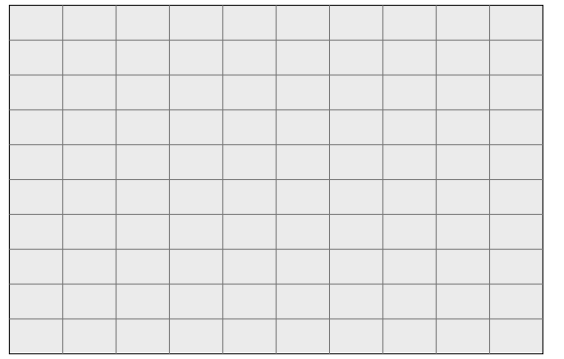


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



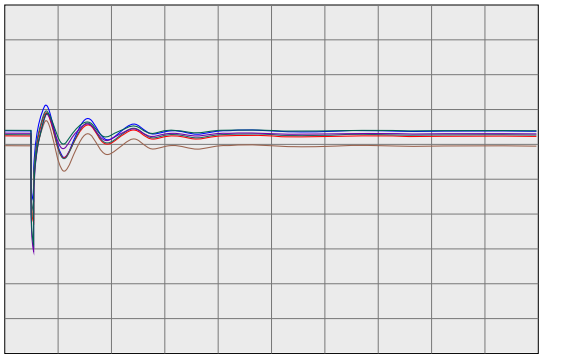
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



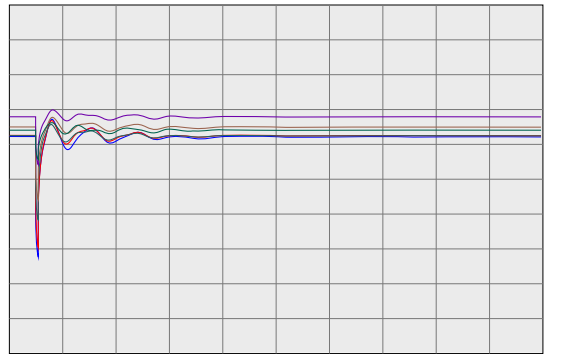


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

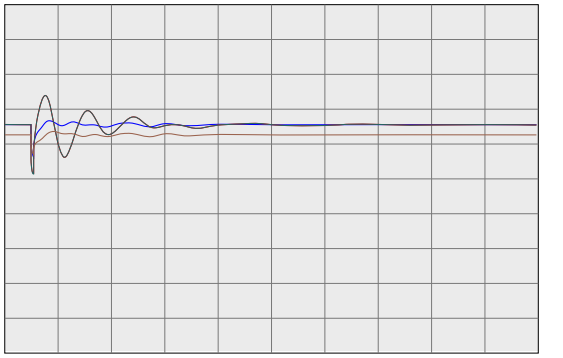
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



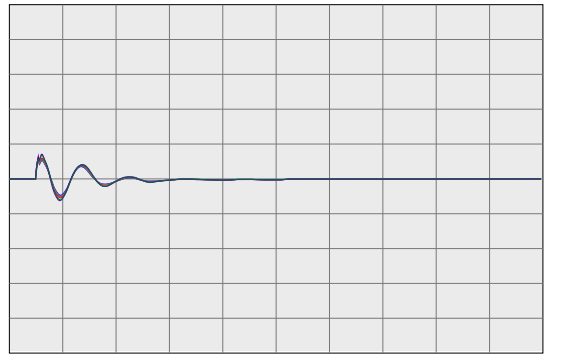
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



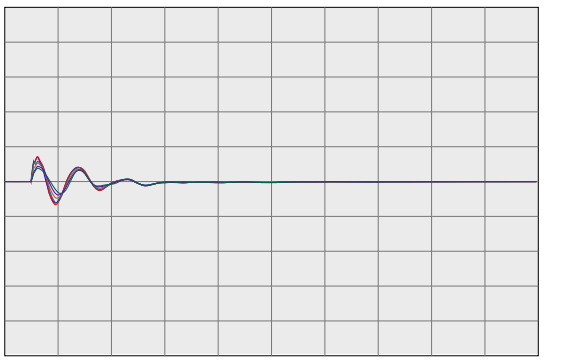
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



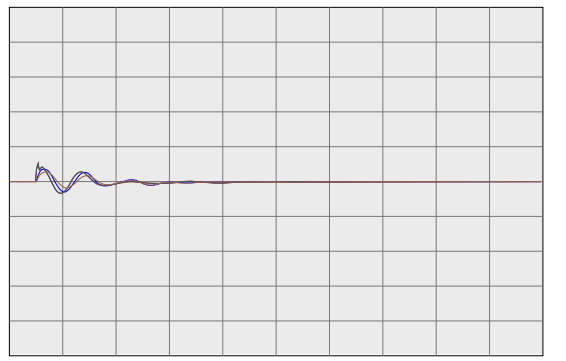
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



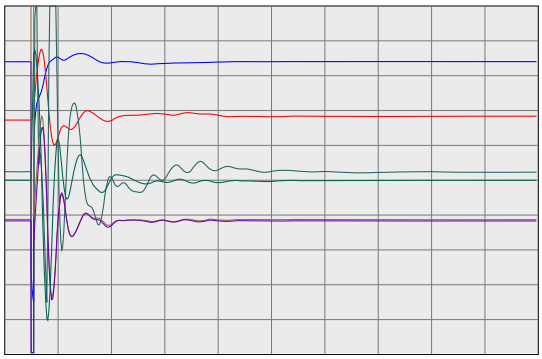
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



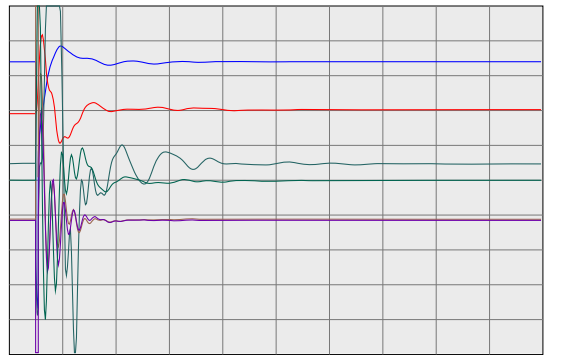
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

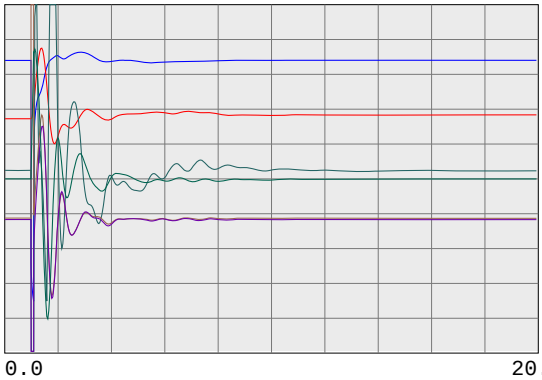
WILLOW PASS GENERATION PLANT



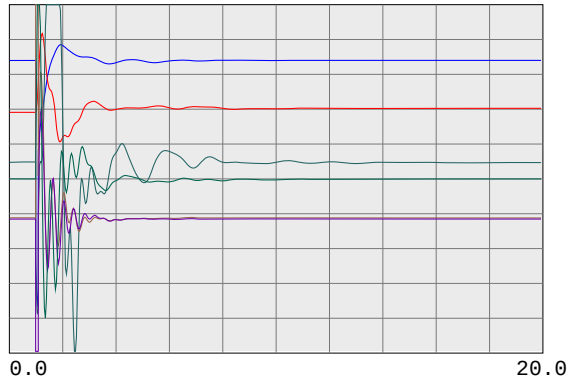
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



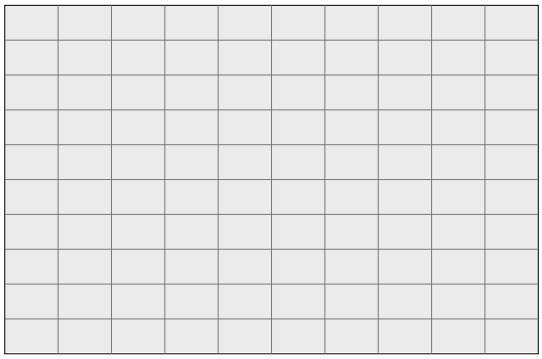
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

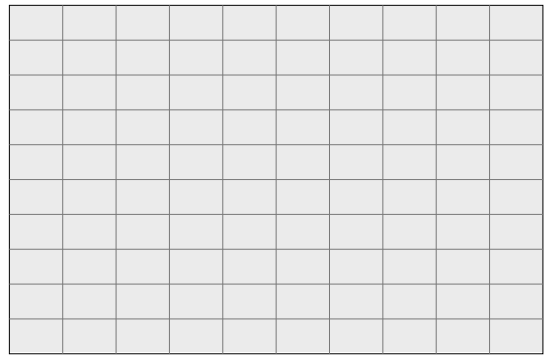


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



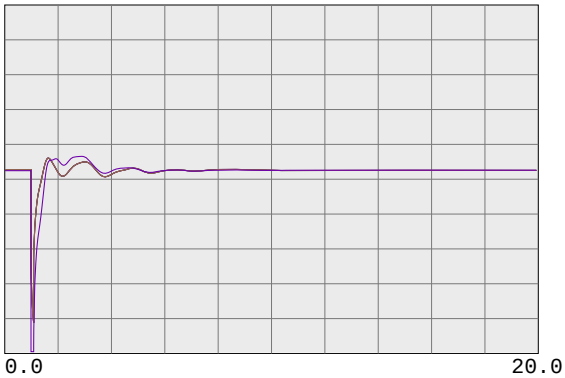
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



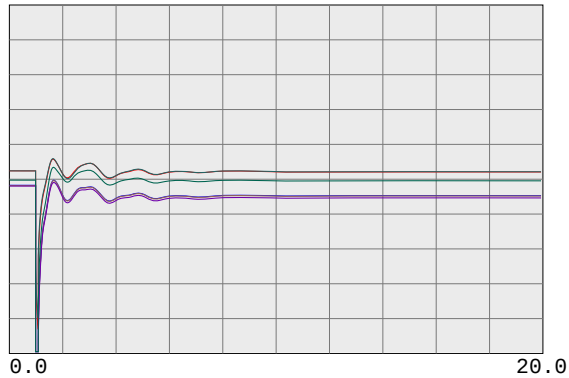


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

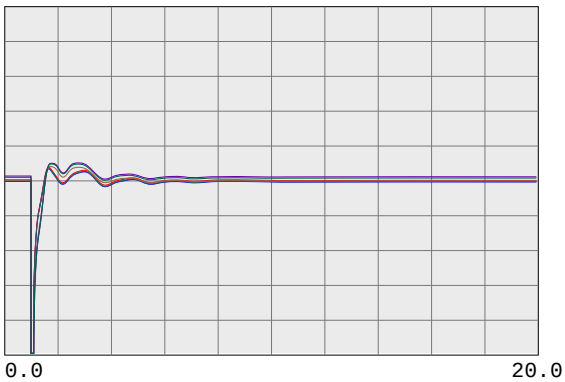
230-KV SYSTEM VOLTAGES



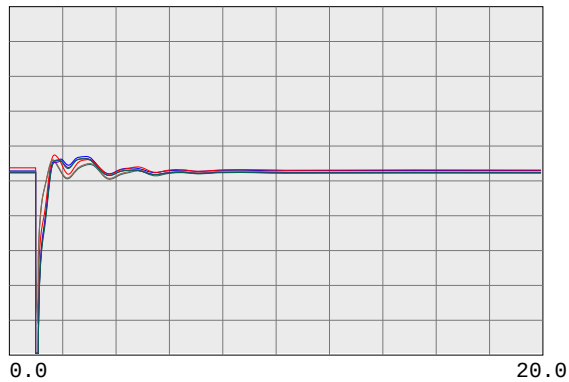
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



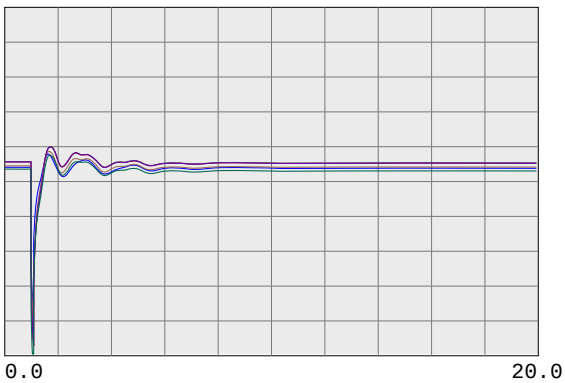
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



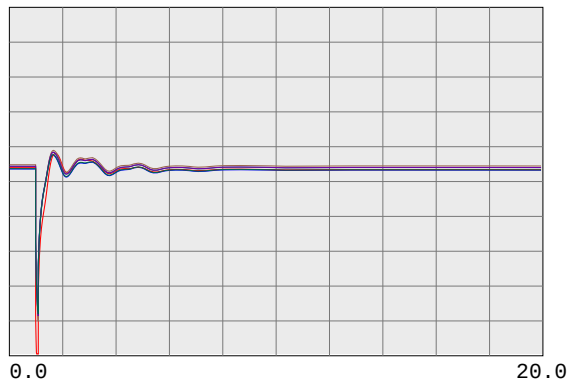
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



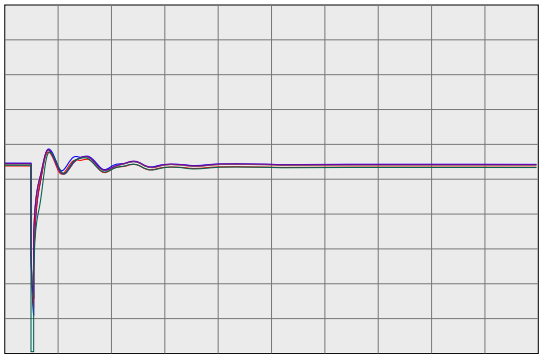
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

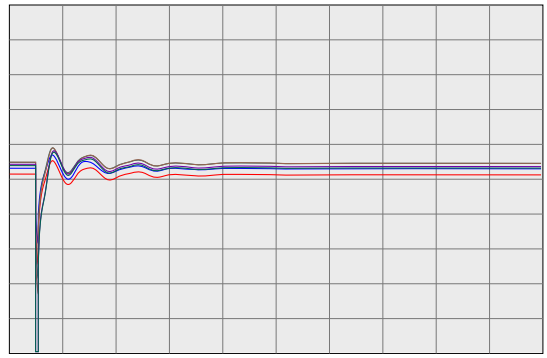
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

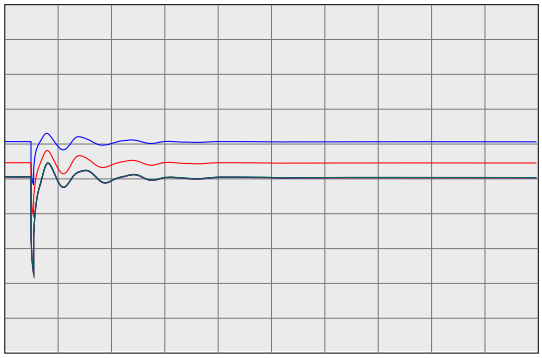
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

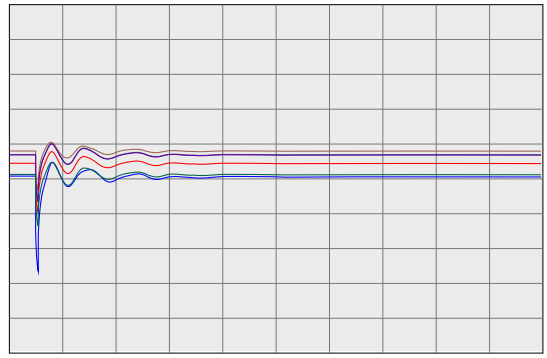
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

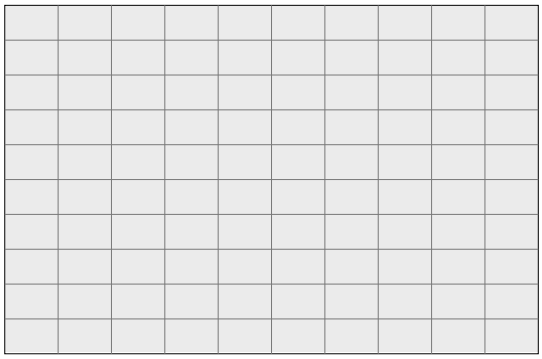
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

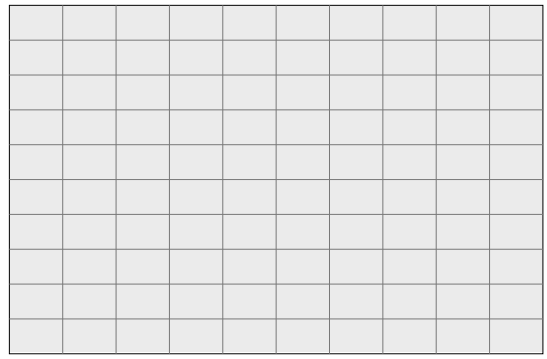


0.0 20.0

Time(sec)

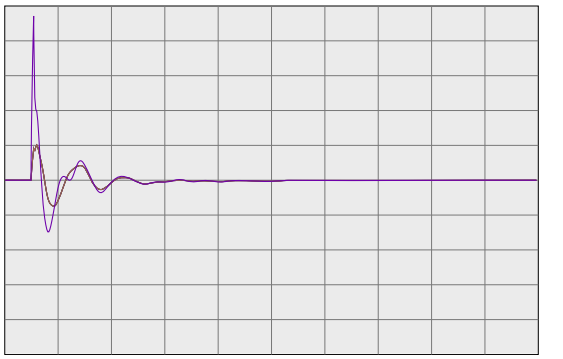
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



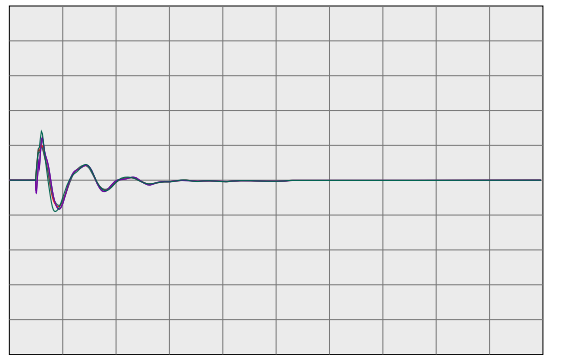


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

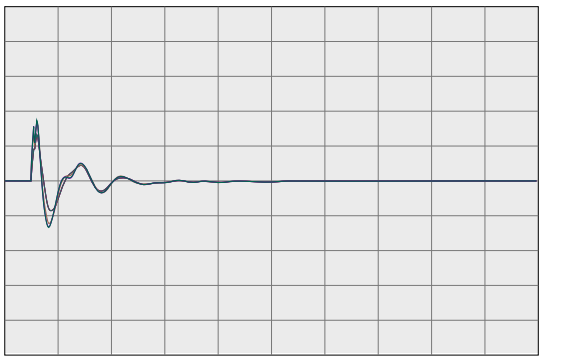
230-KV SYSTEM FREQUENCIES



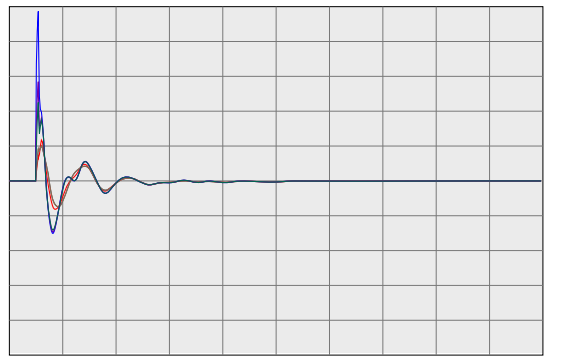
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



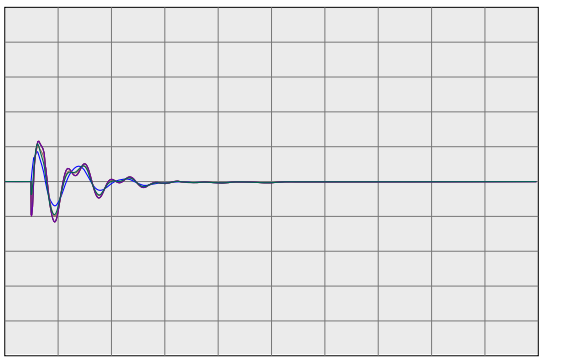
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



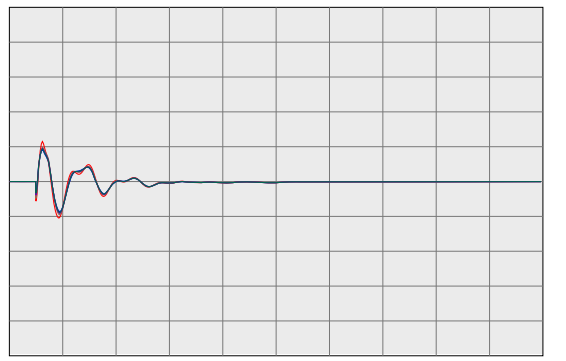
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



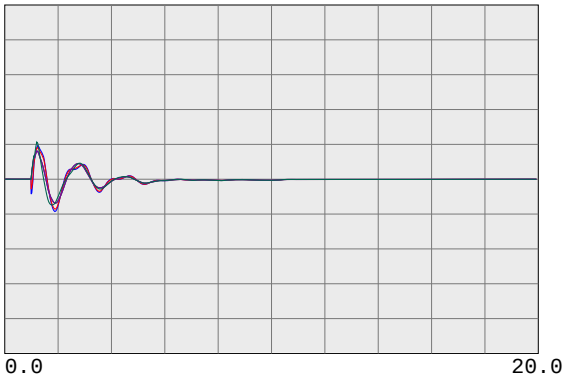
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



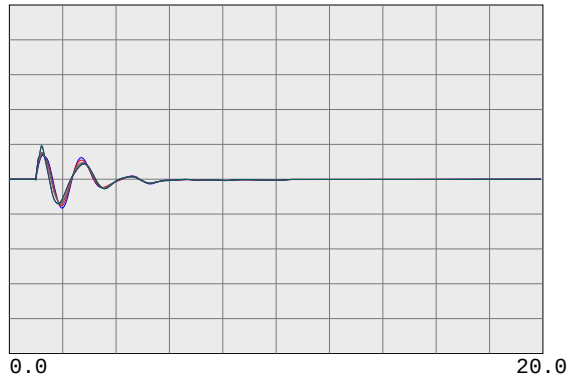
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

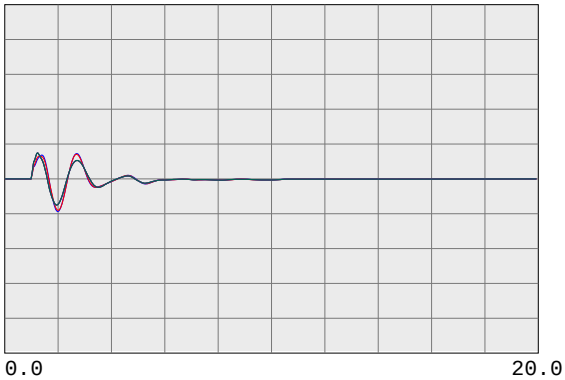
230-KV SYSTEM FREQUENCIES



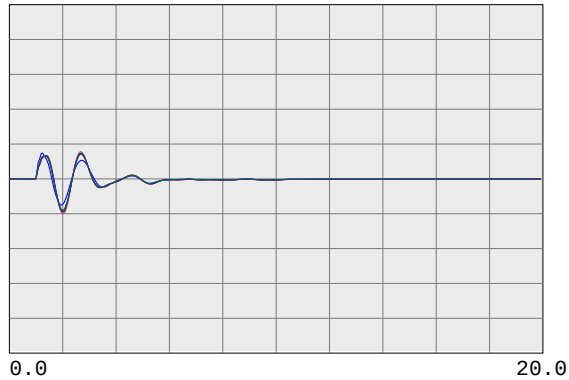
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



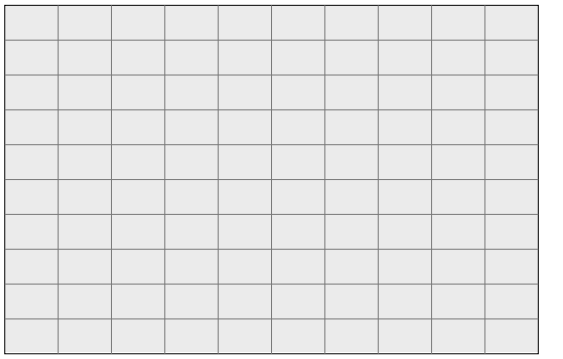
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

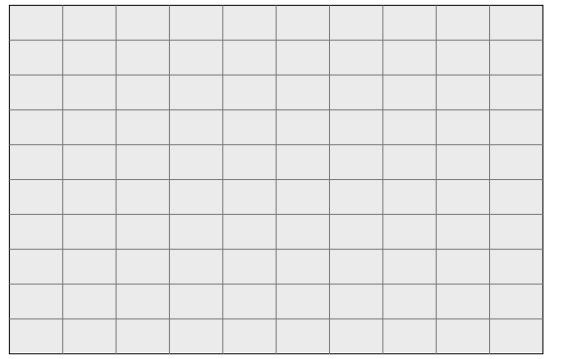


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



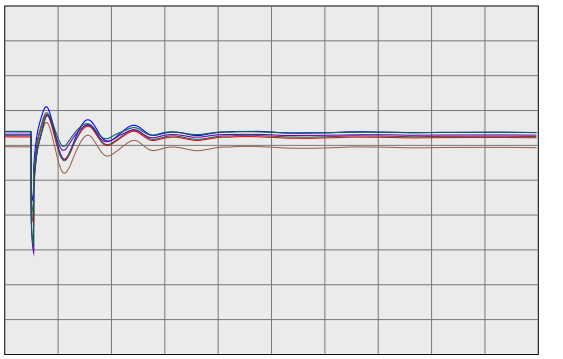
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



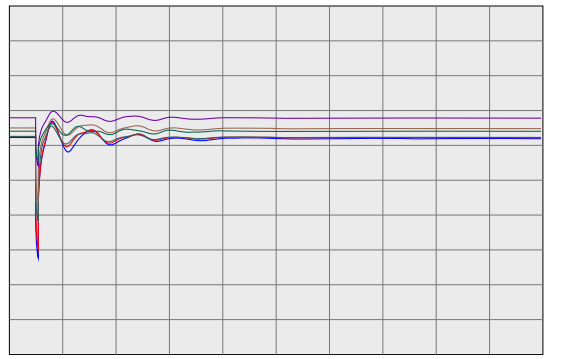


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

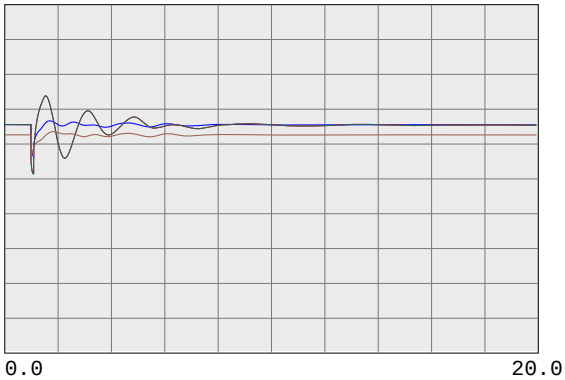
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



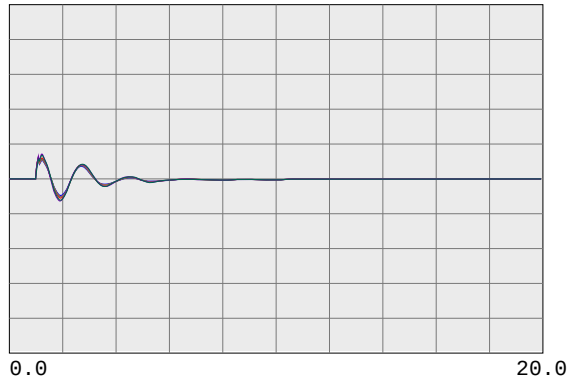
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



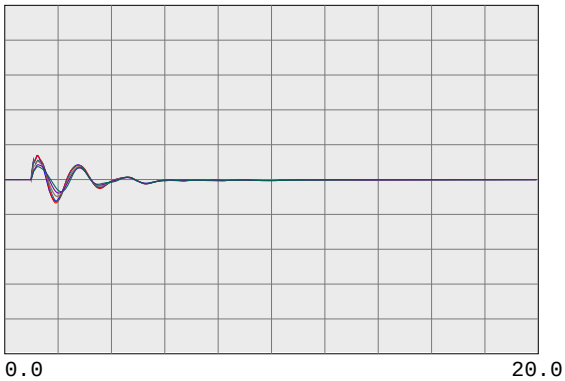
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



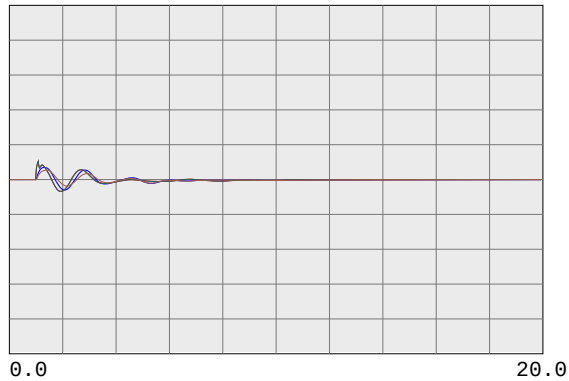
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



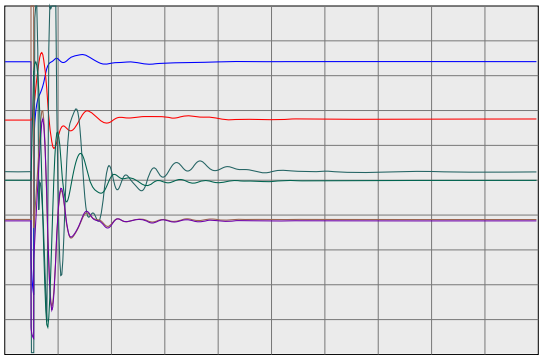
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



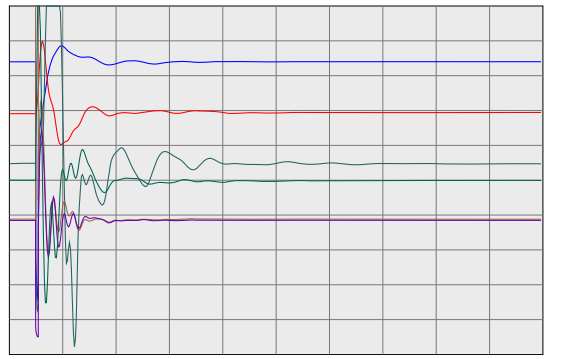
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

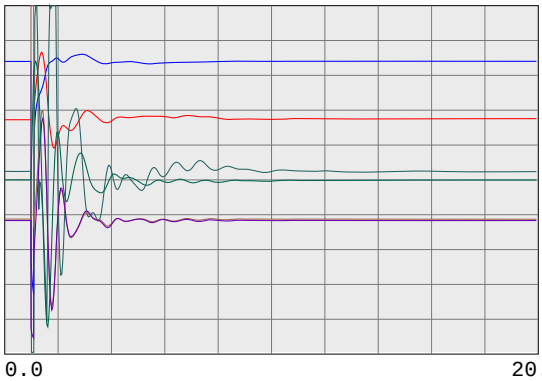
WILLOW PASS GENERATION PLANT



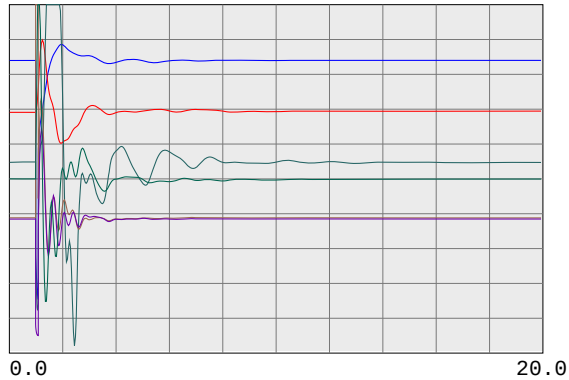
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



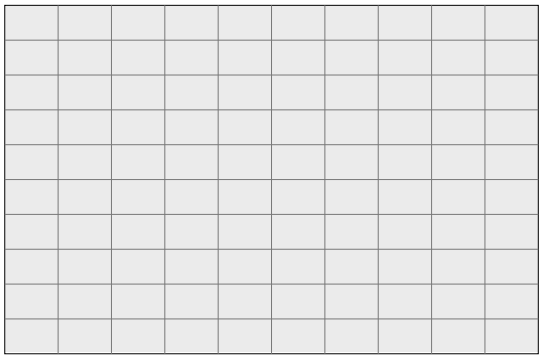
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

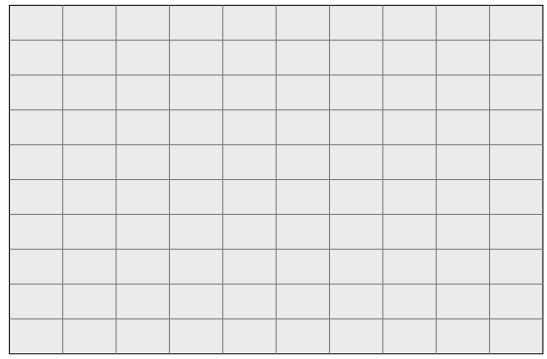


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

HS13_PST_WLLW_PSS_B-143_N-1_PITSBRG_E-TIDEWATR_230.chf

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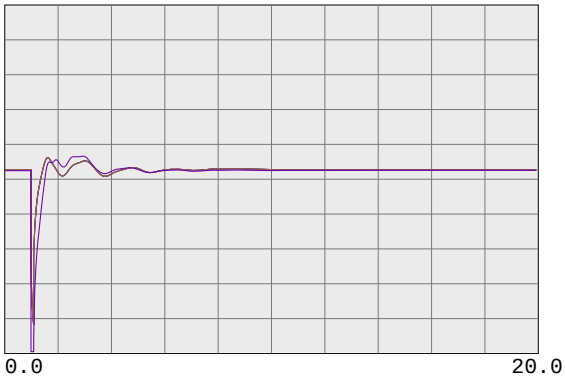
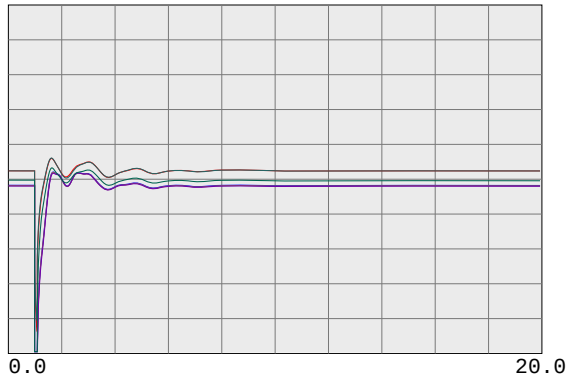
Thu Feb 26 20:20:47 2009

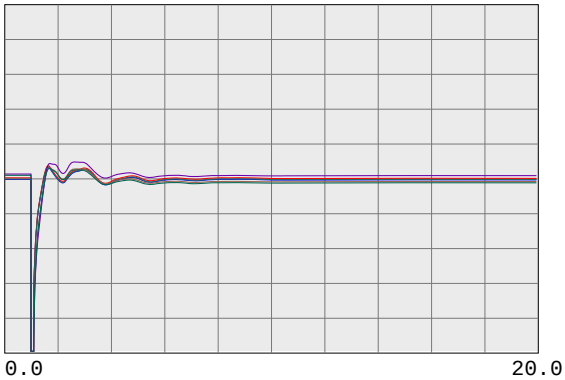
230-KV SYSTEM VOLTAGES



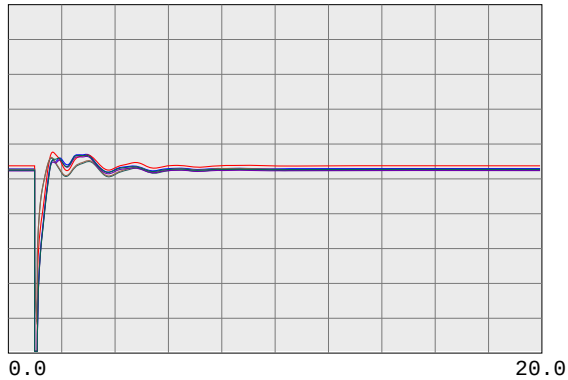
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



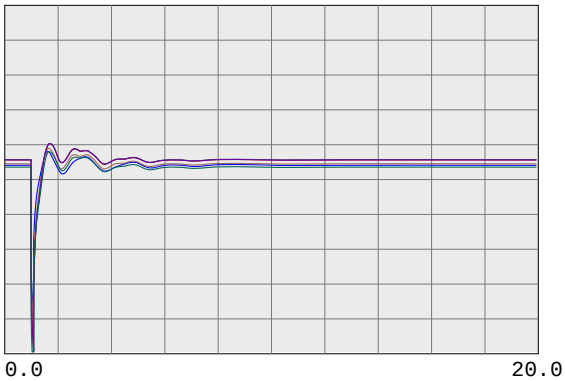
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



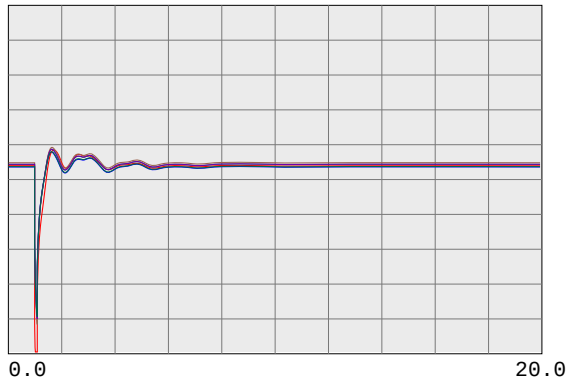
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



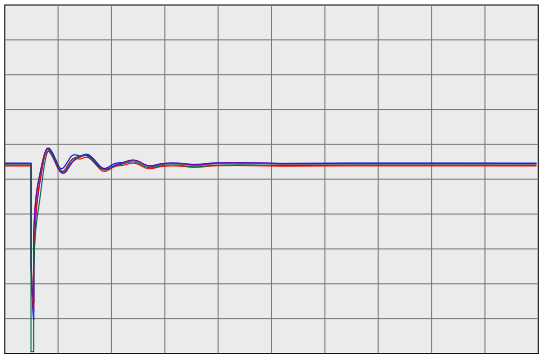
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

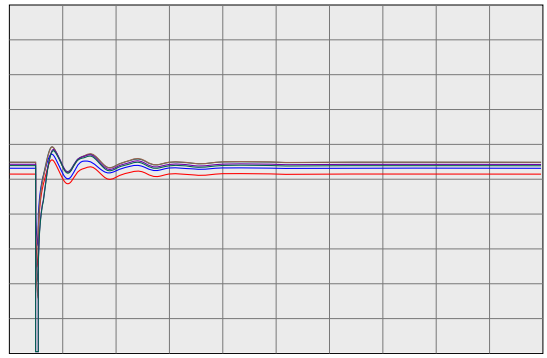
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

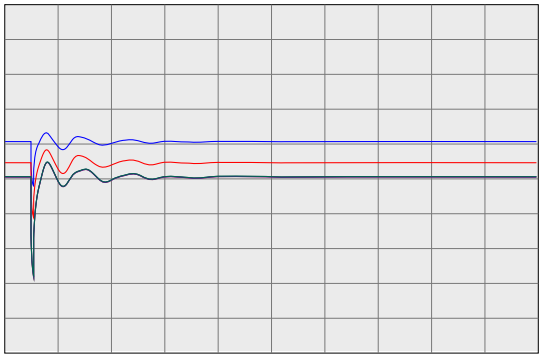
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

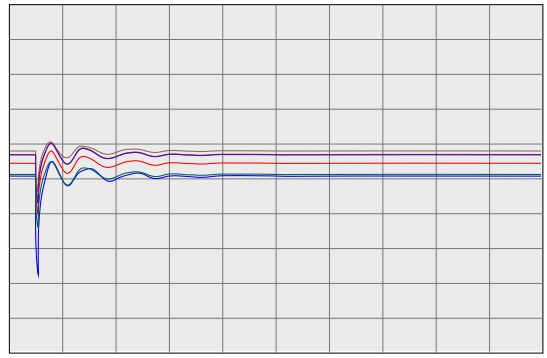
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

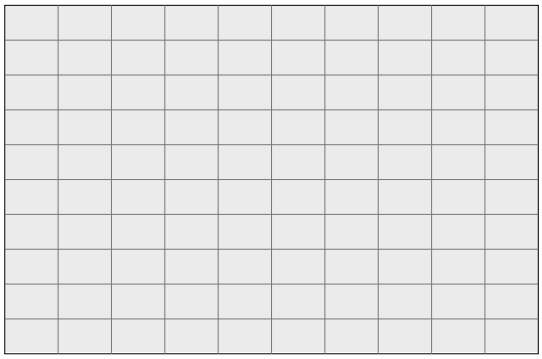
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

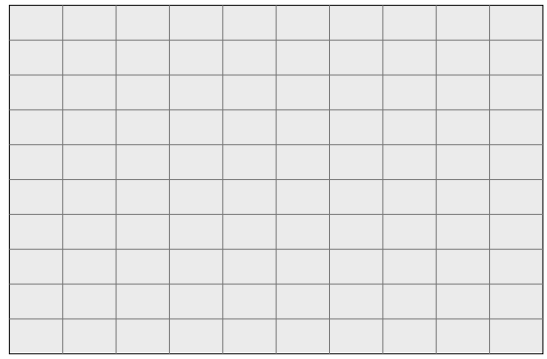


0.0 20.0

Time(sec)

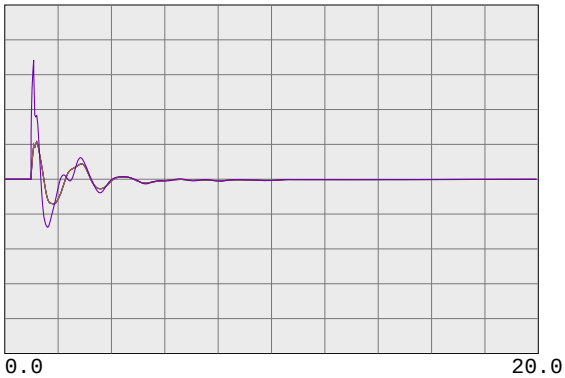
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



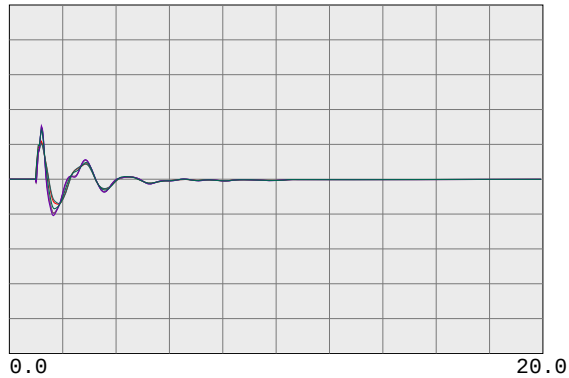


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

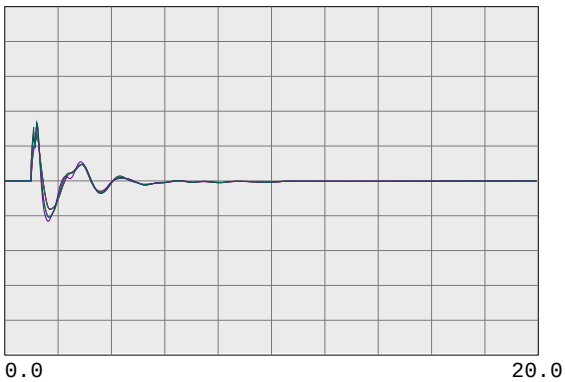
230-KV SYSTEM FREQUENCIES



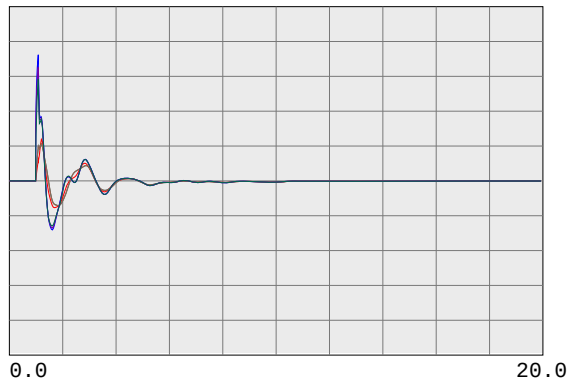
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



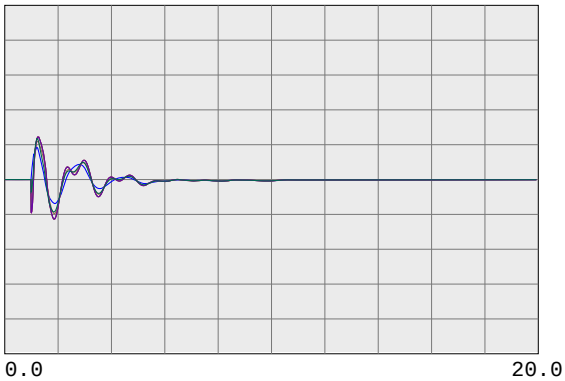
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



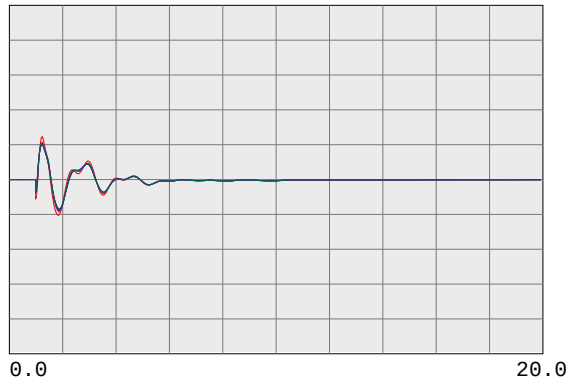
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



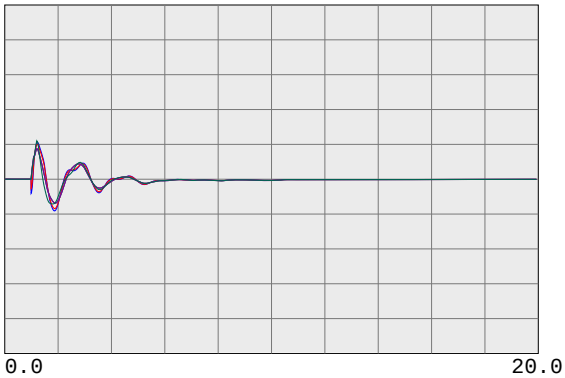
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



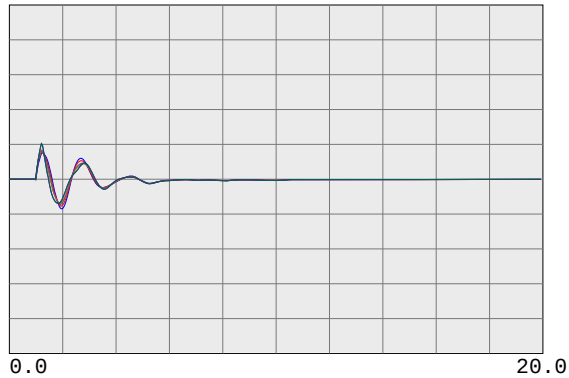
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

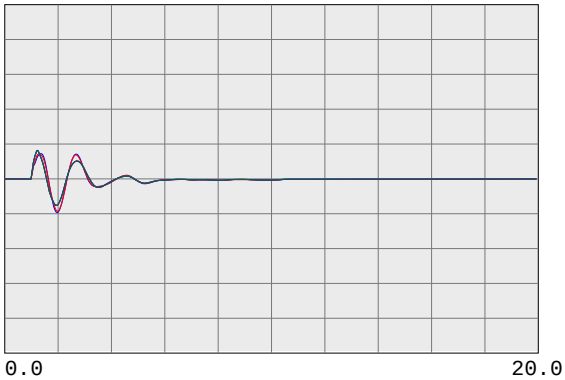
230-KV SYSTEM FREQUENCIES



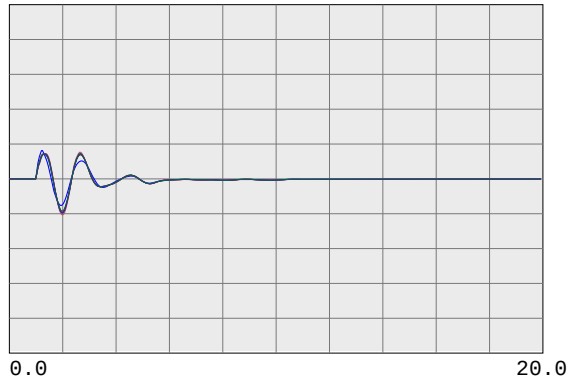
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



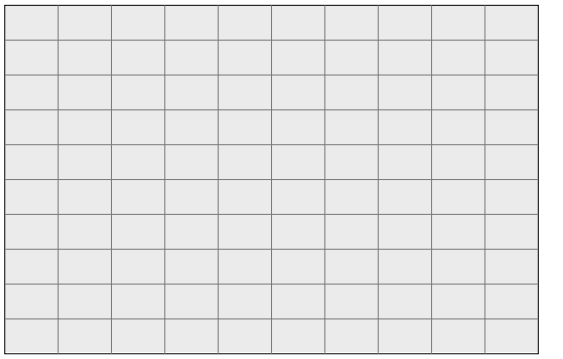
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

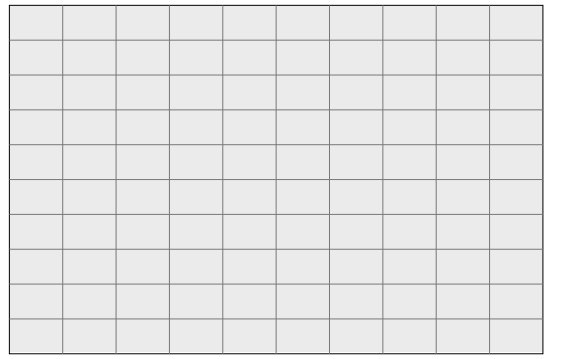


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



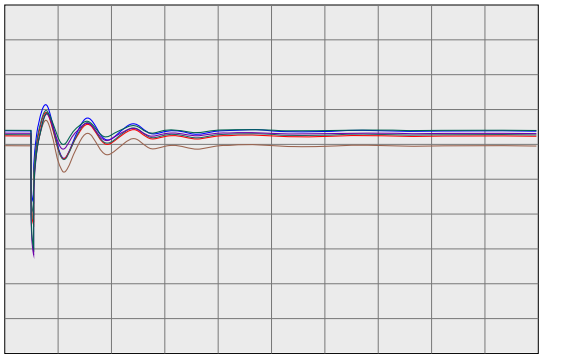
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



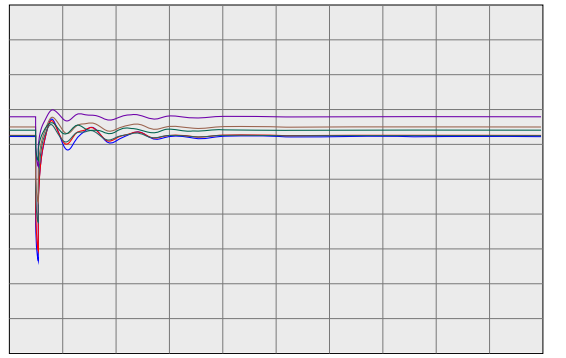


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

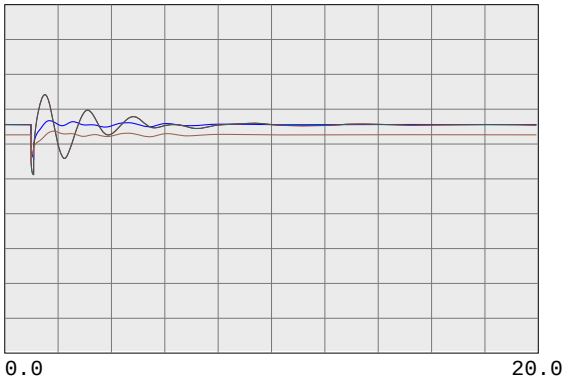
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



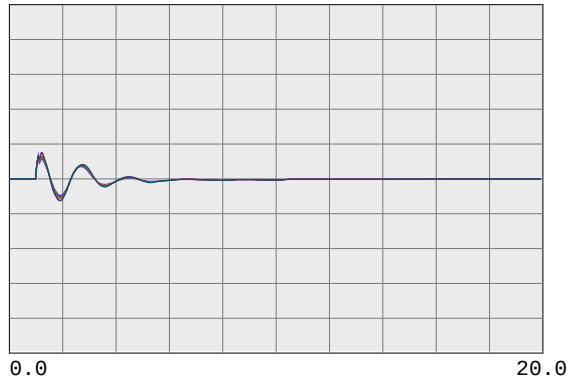
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



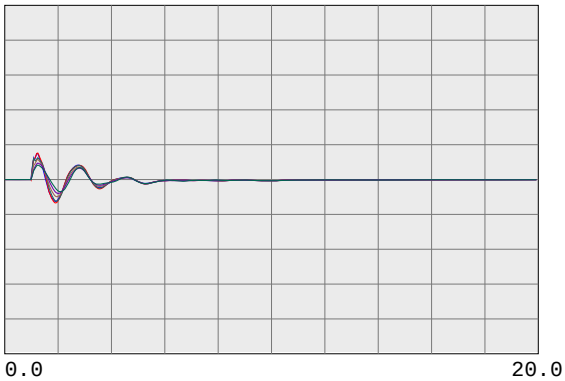
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



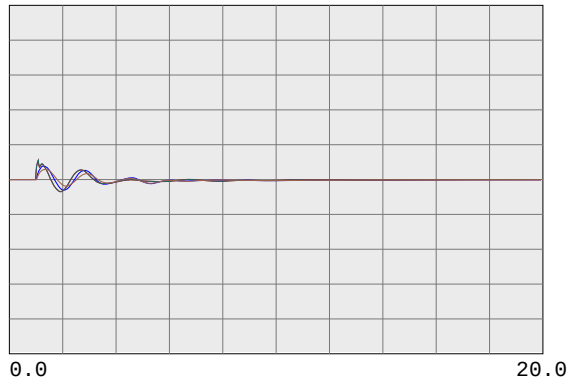
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



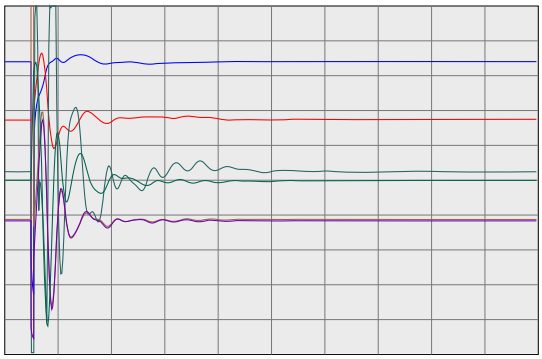
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



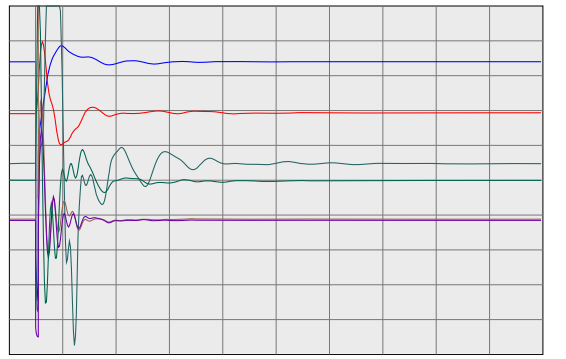
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

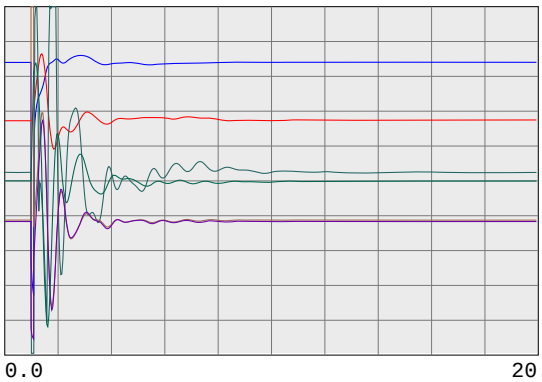
WILLOW PASS GENERATION PLANT



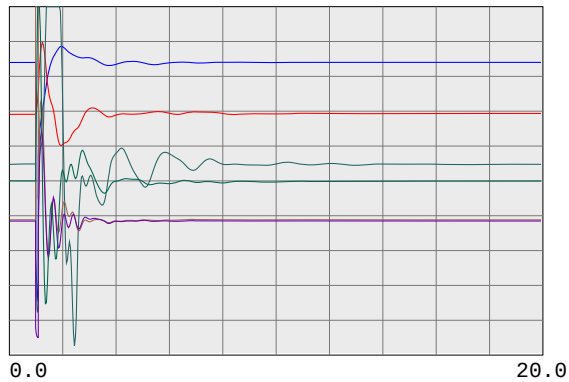
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



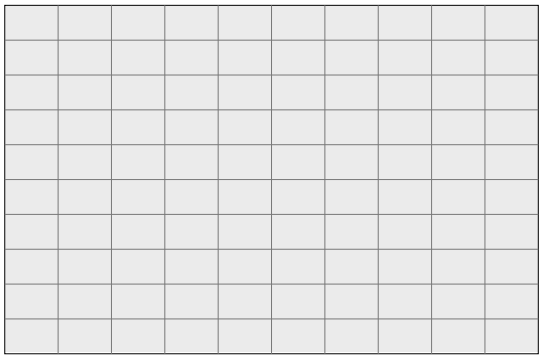
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

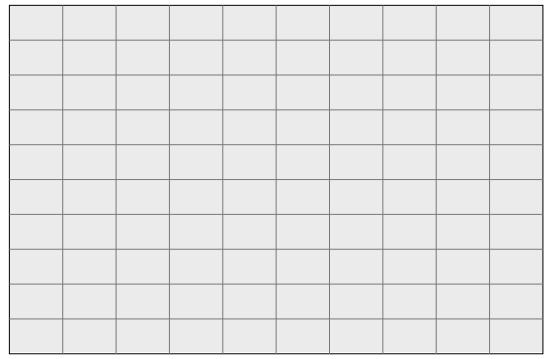


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



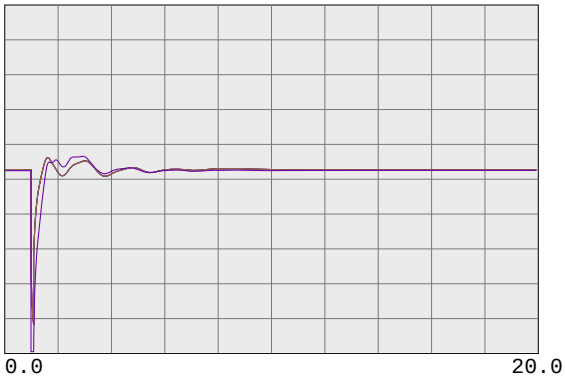
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



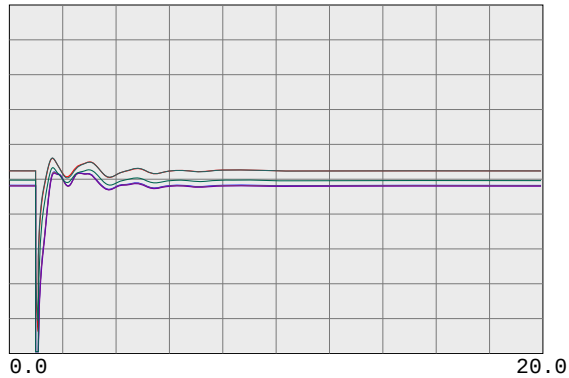


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

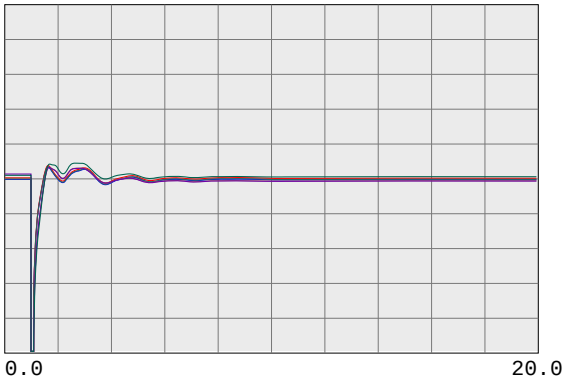
230-KV SYSTEM VOLTAGES



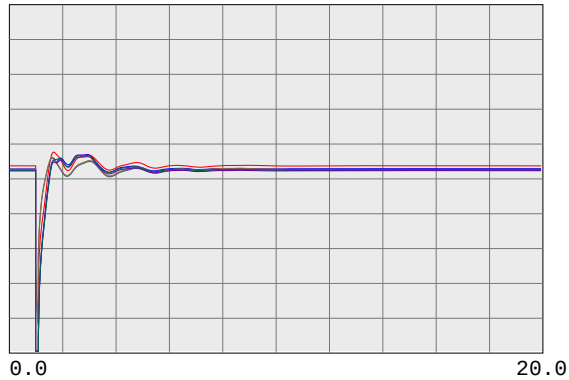
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



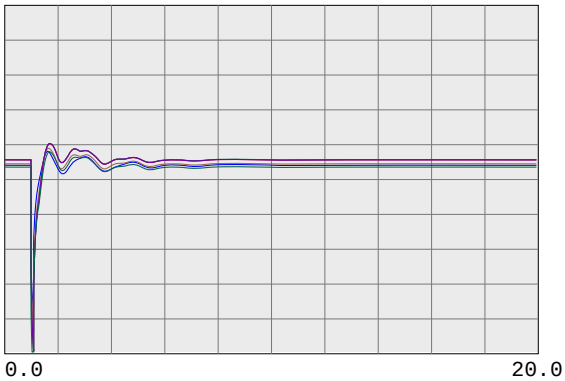
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



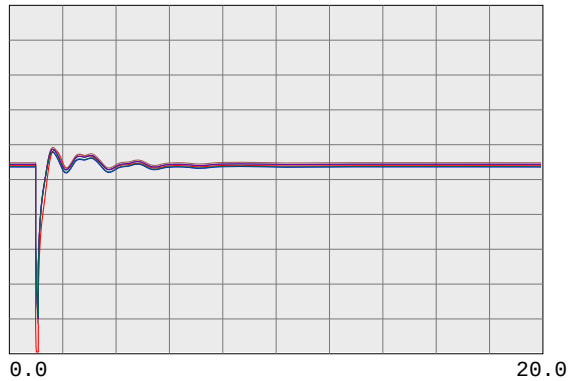
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



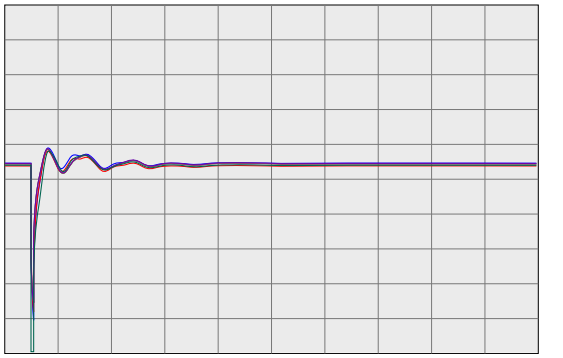
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



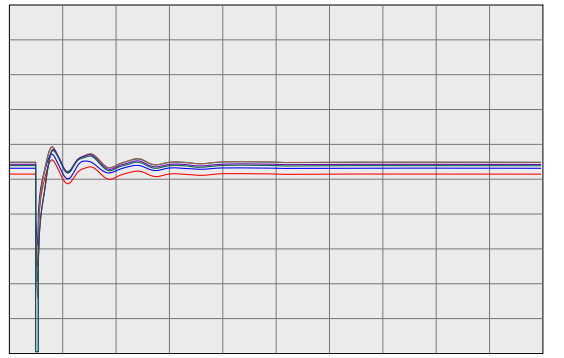
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

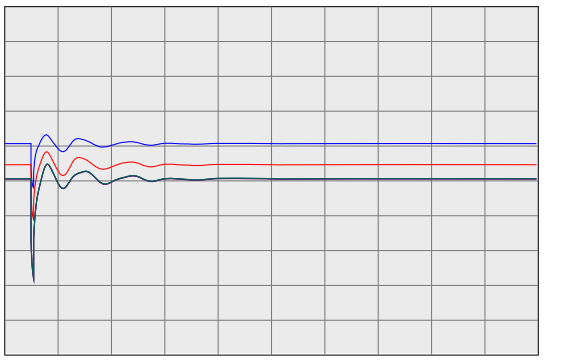
230-KV SYSTEM VOLTAGES



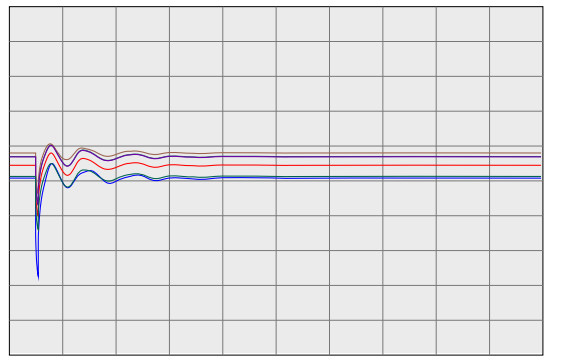
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



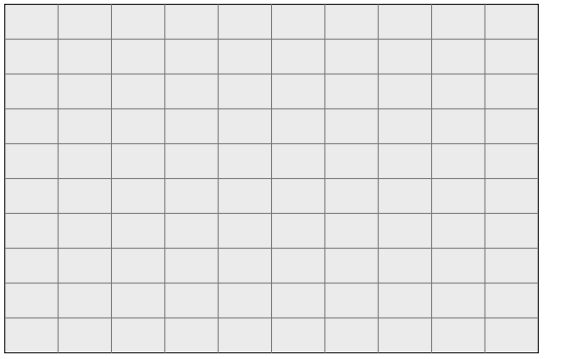
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

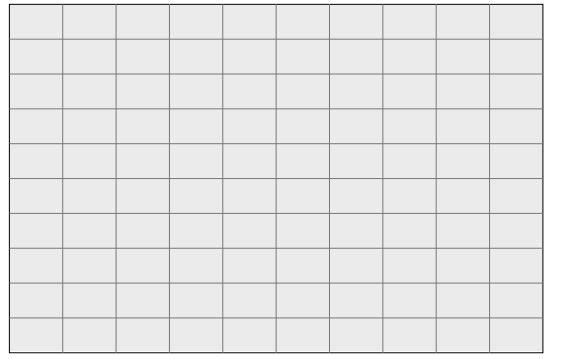


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



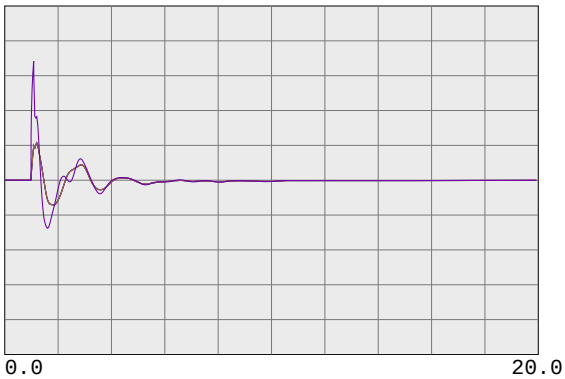
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



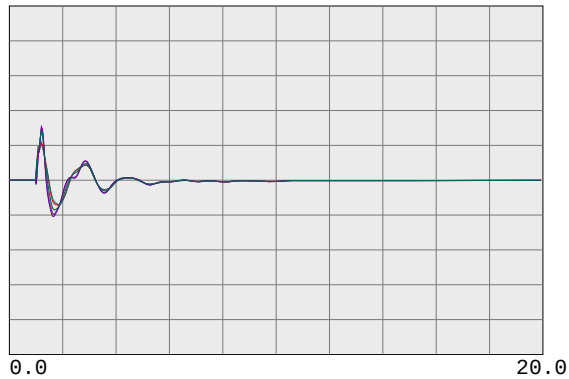


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

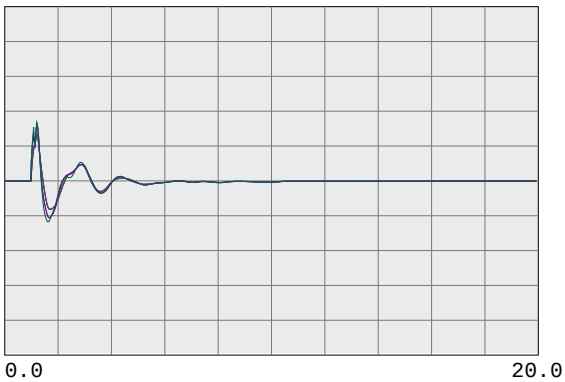
230-KV SYSTEM FREQUENCIES



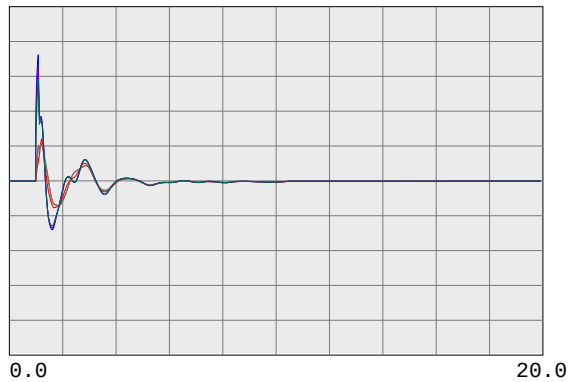
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



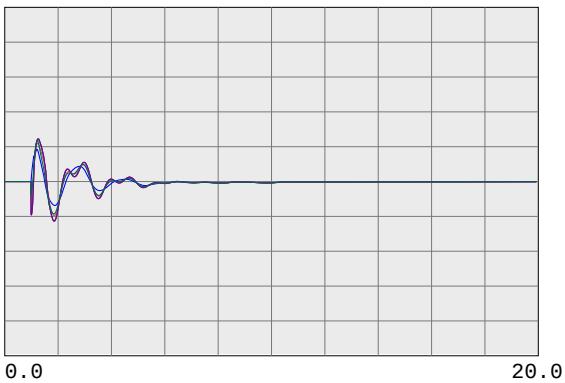
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



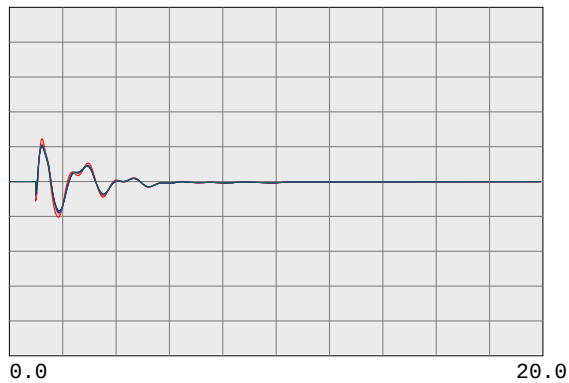
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



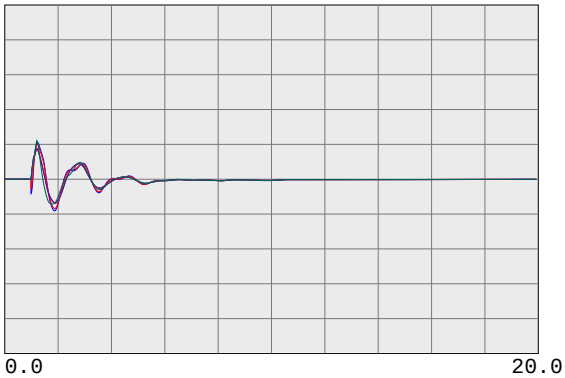
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



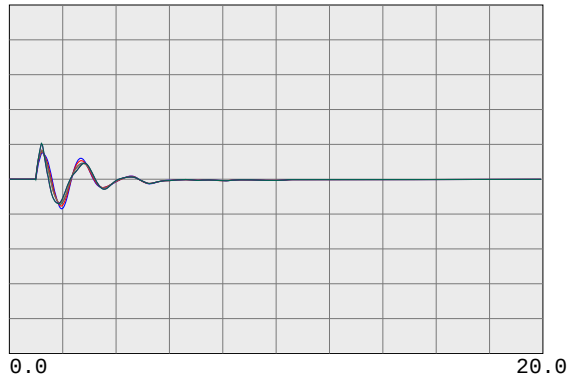
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

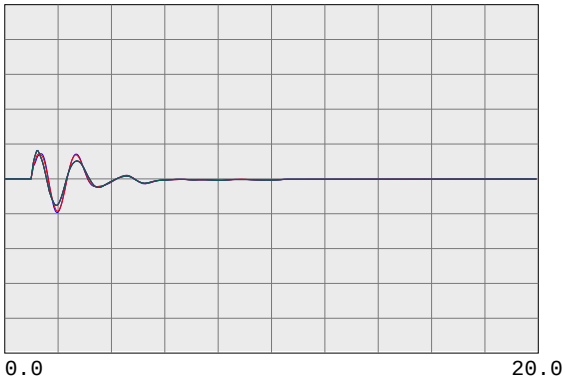
230-KV SYSTEM FREQUENCIES



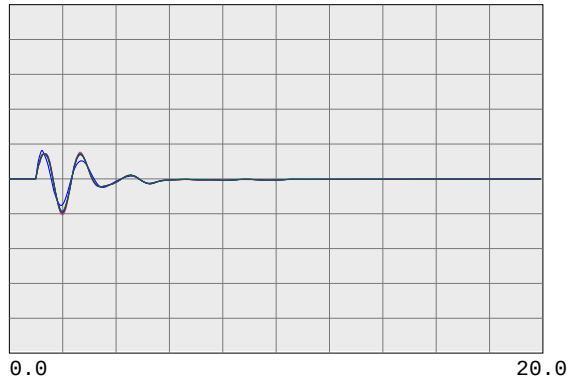
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



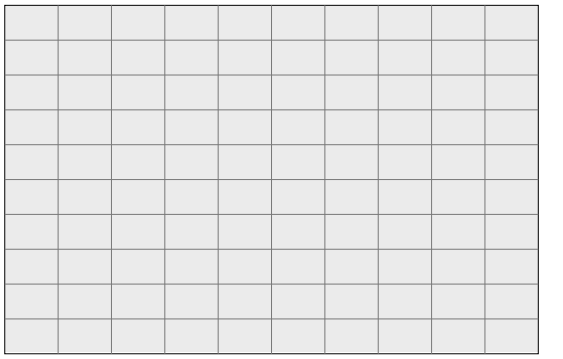
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

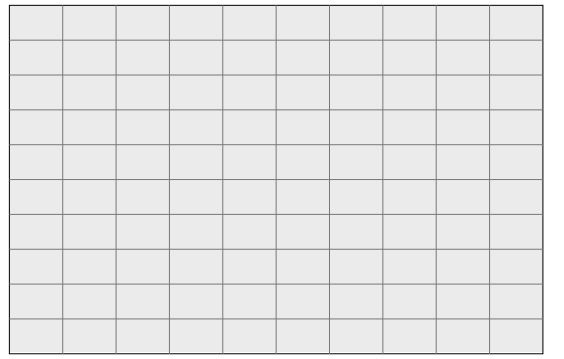


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



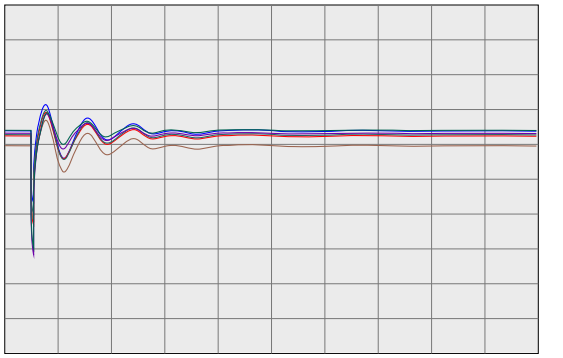
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



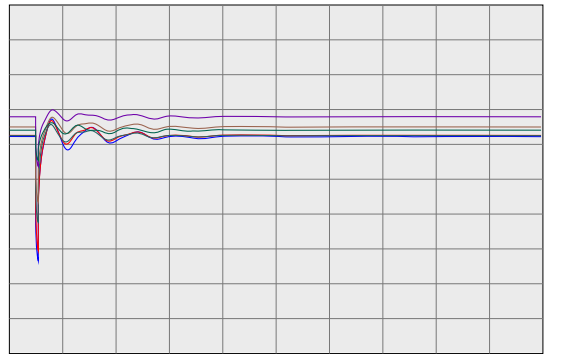


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

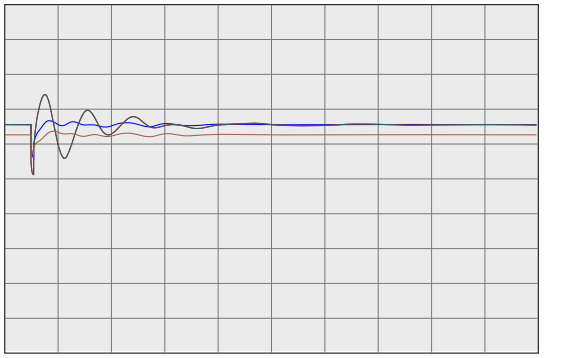
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



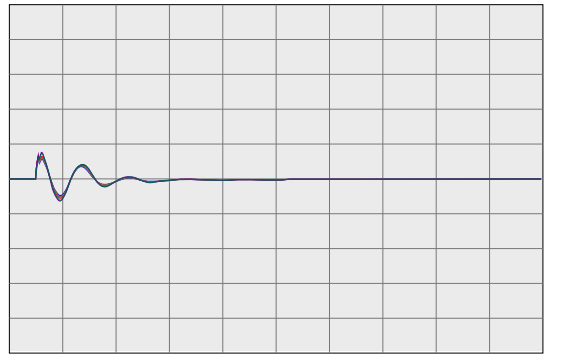
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



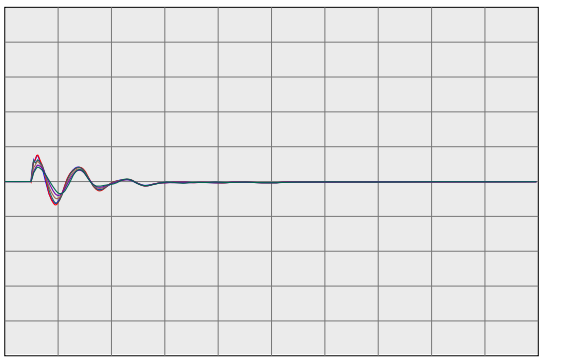
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



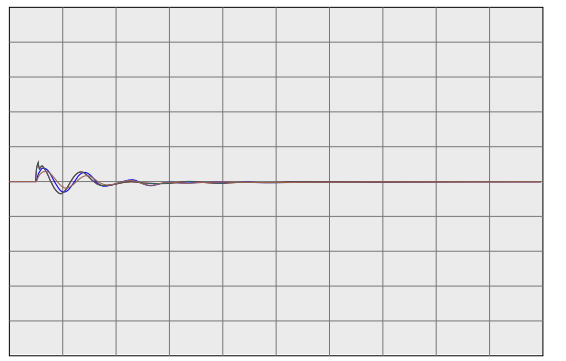
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



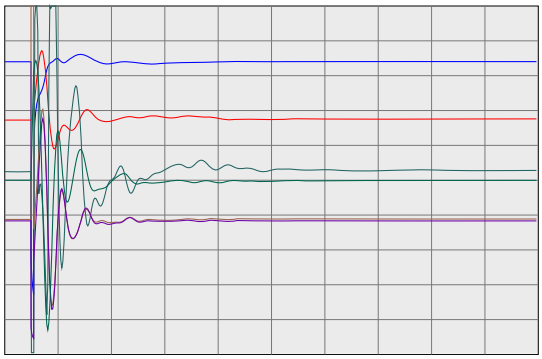
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



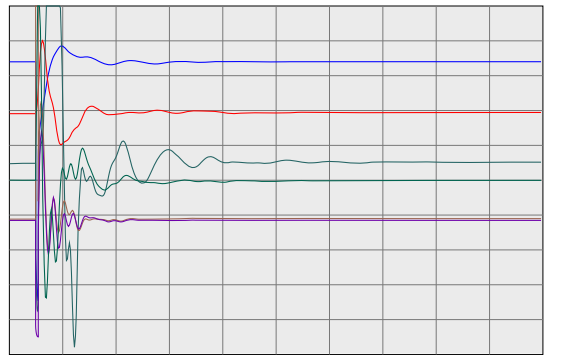
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

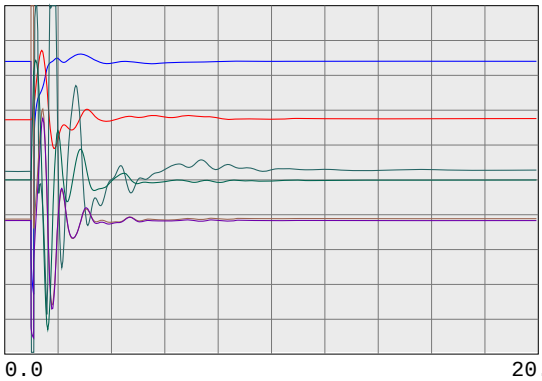
WILLOW PASS GENERATION PLANT



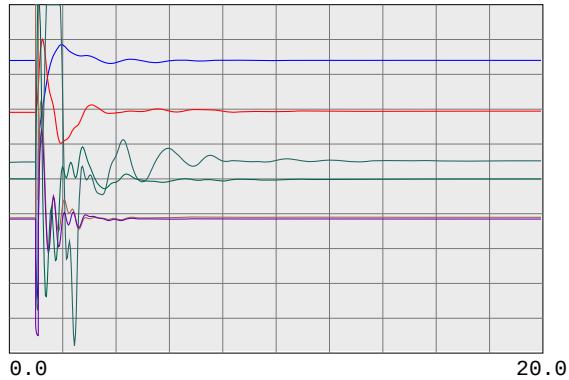
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



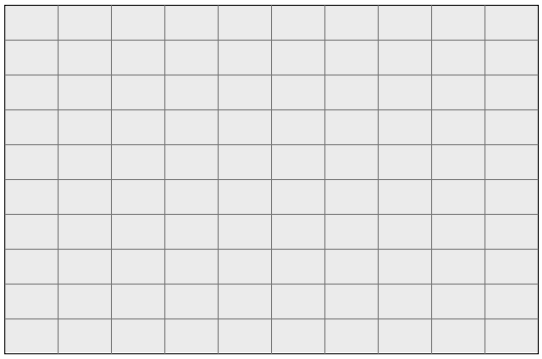
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

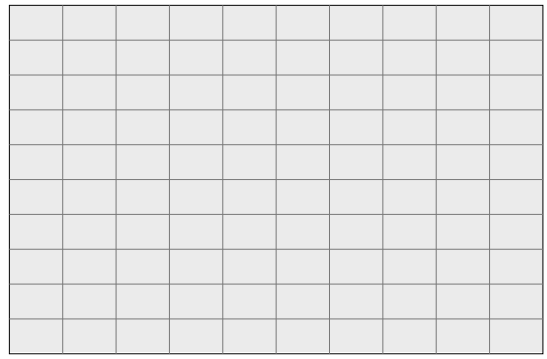


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



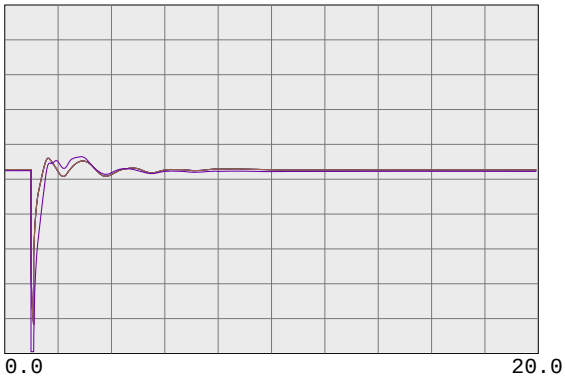
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



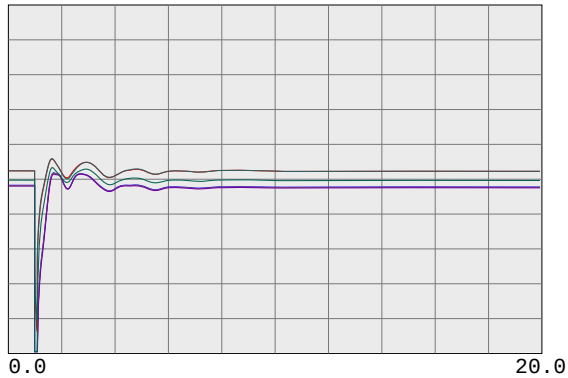


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

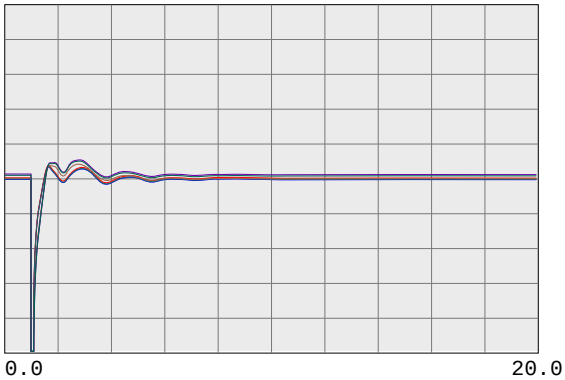
230-KV SYSTEM VOLTAGES



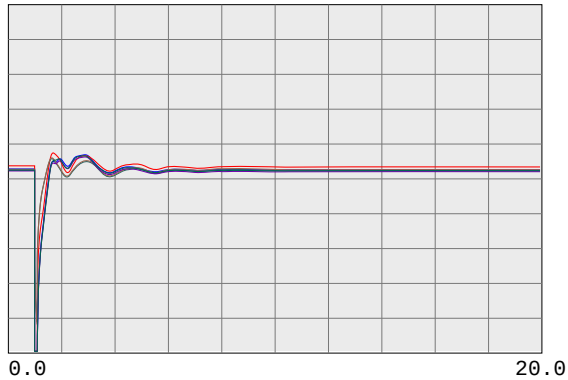
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



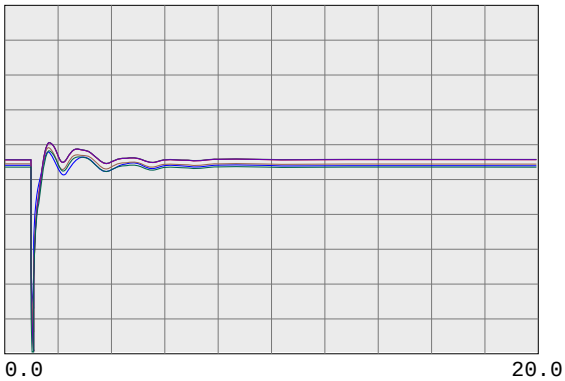
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



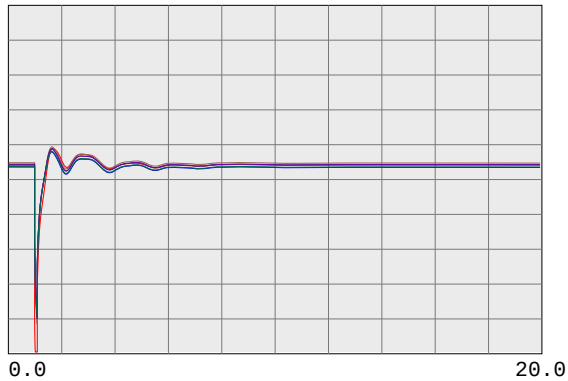
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



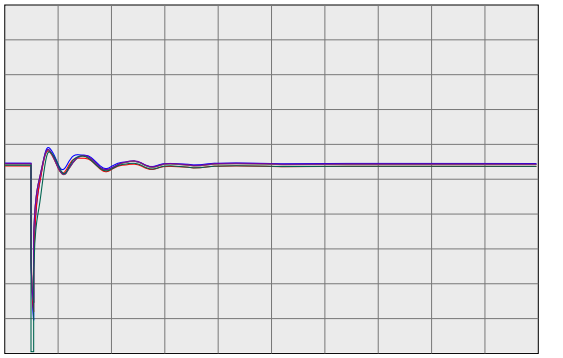
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



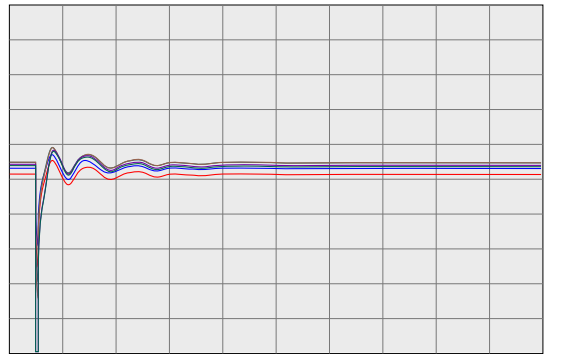
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

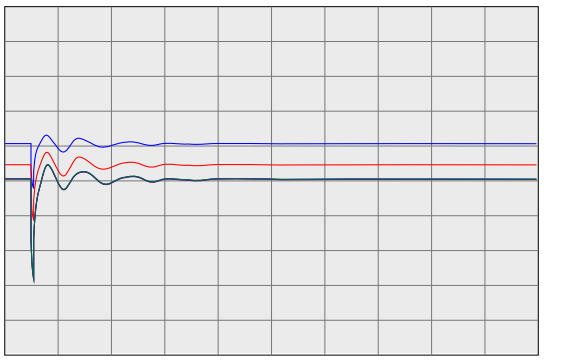
230-KV SYSTEM VOLTAGES



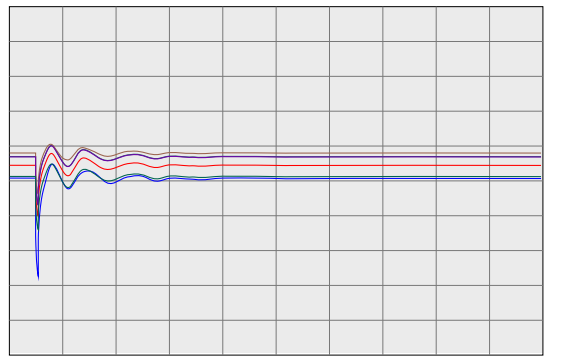
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



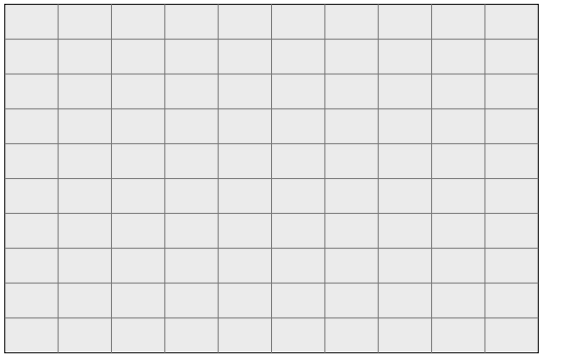
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

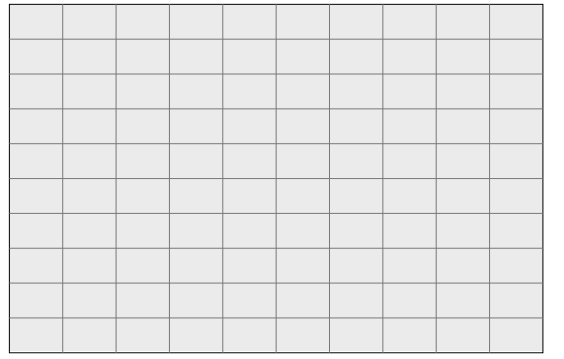


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



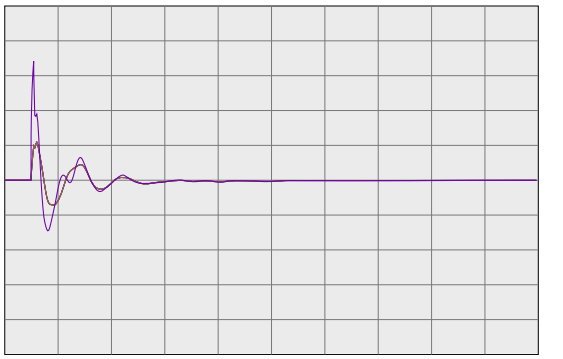
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



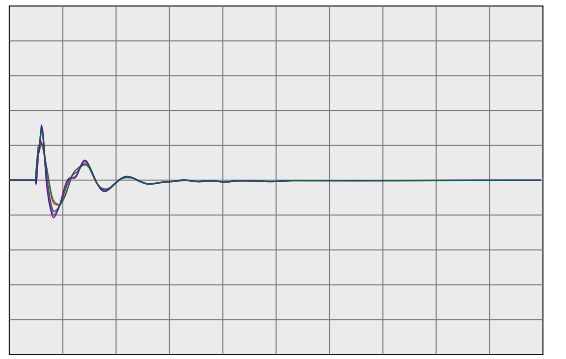


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

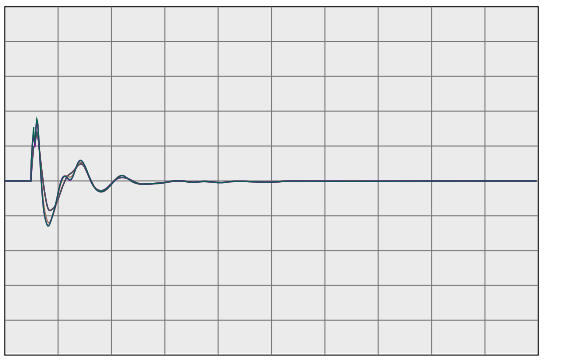
230-KV SYSTEM FREQUENCIES



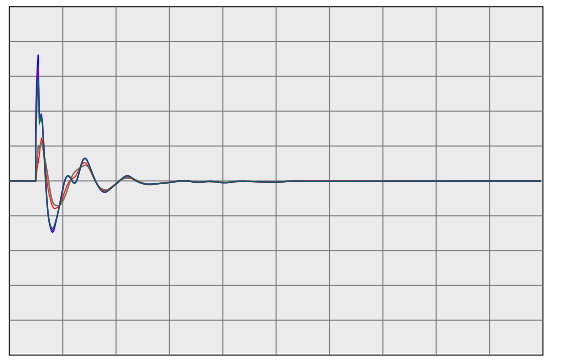
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



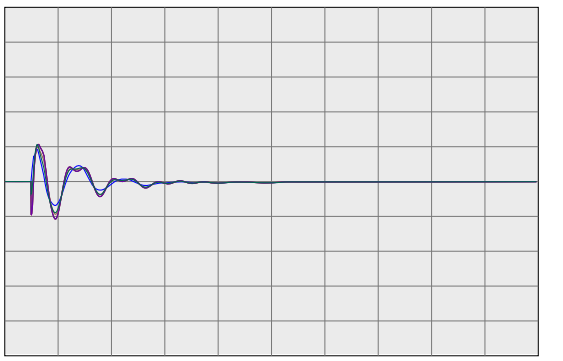
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



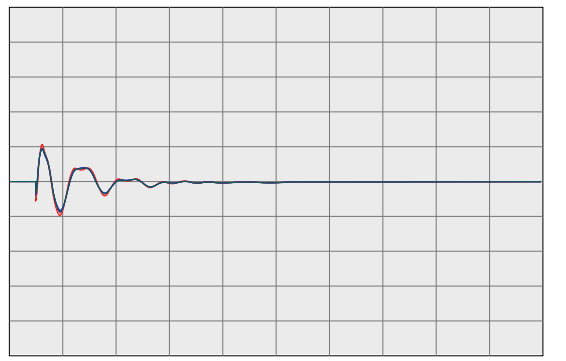
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



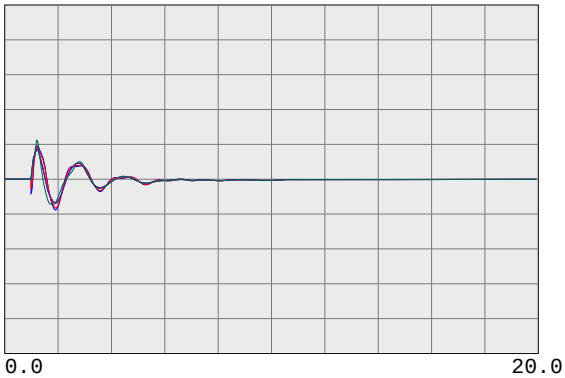
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



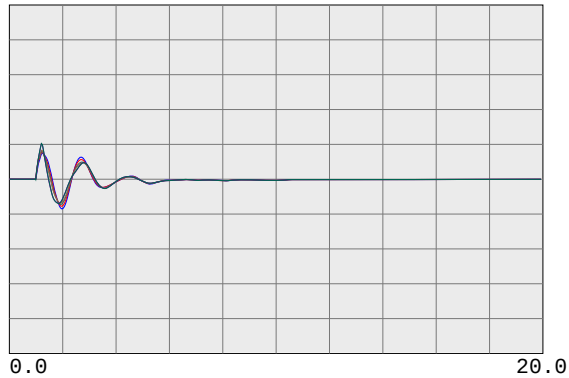
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

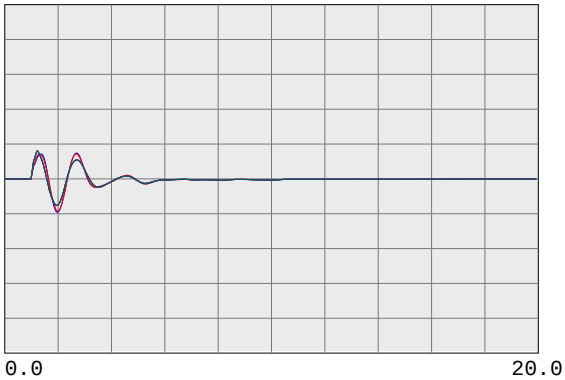
230-KV SYSTEM FREQUENCIES



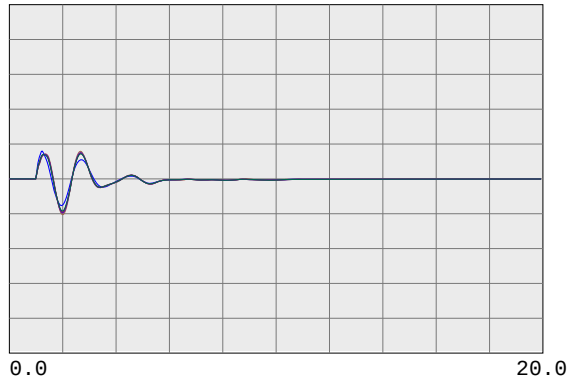
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



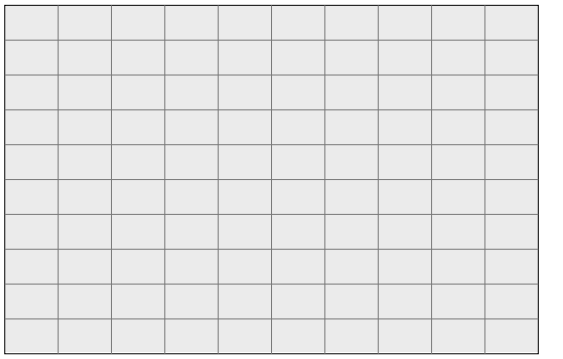
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

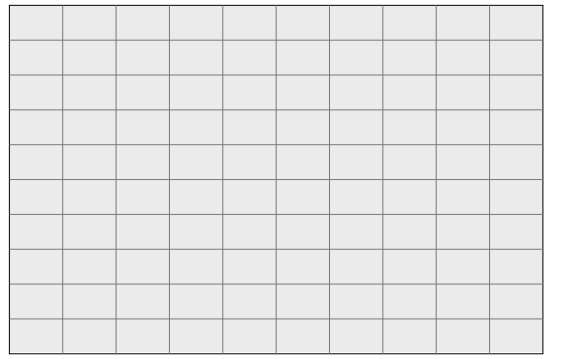


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



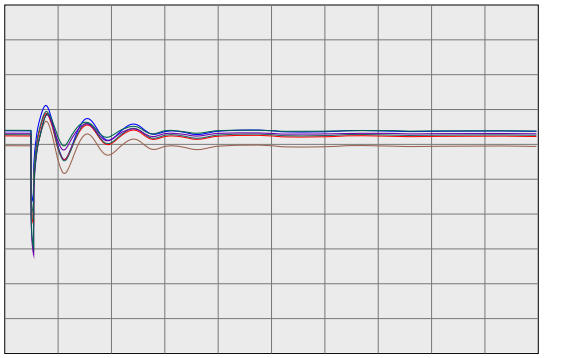
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



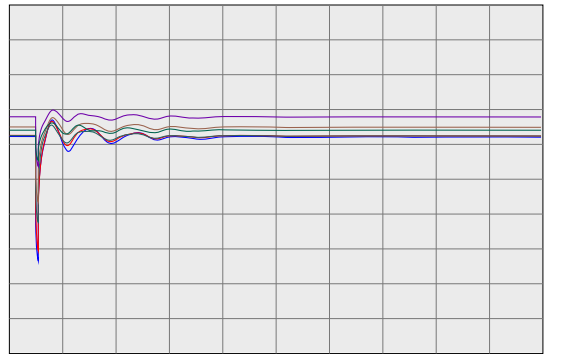


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

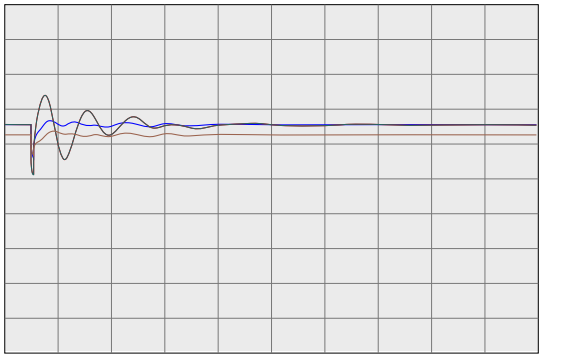
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



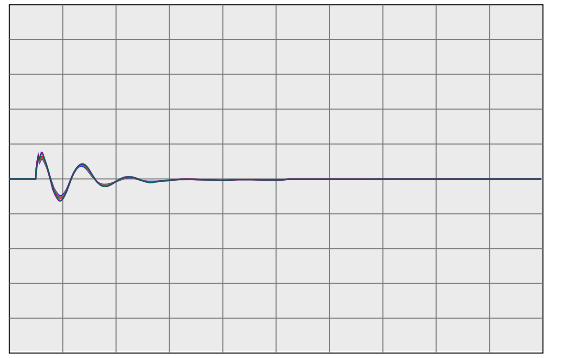
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



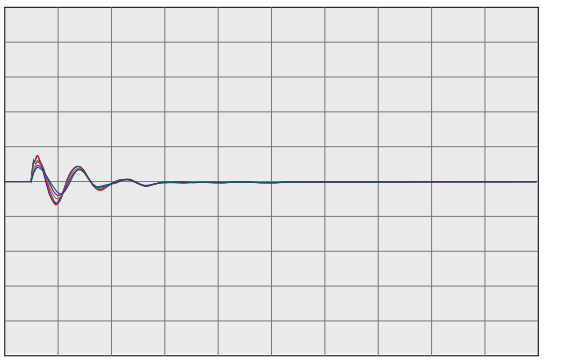
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



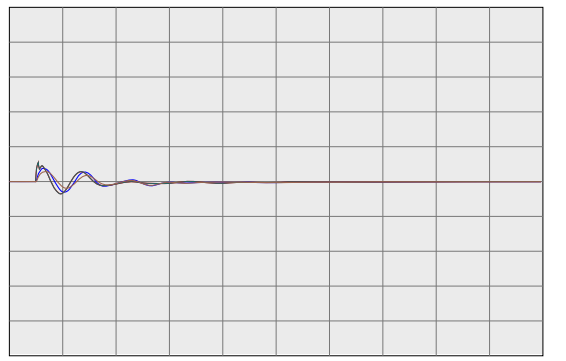
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



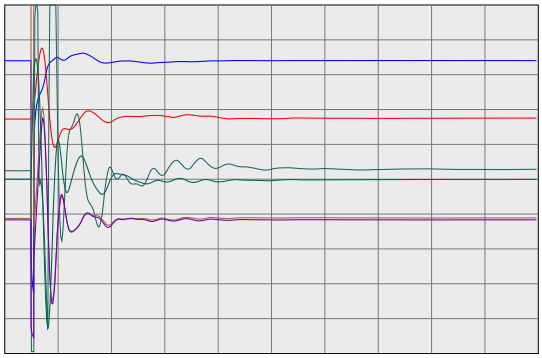
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



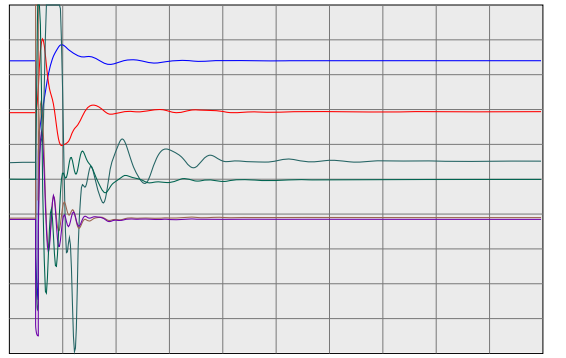
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

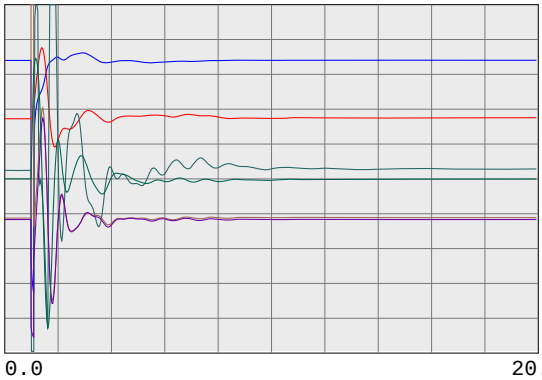
WILLOW PASS GENERATION PLANT



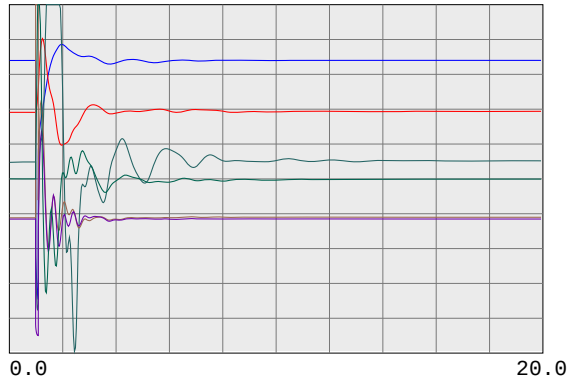
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



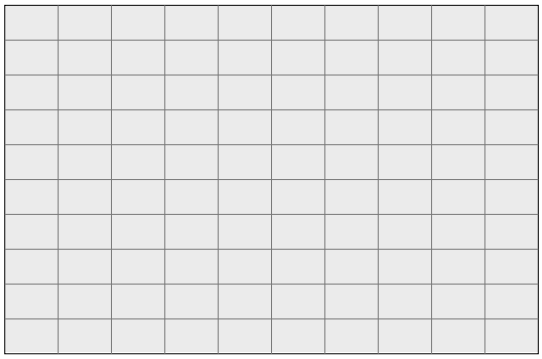
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

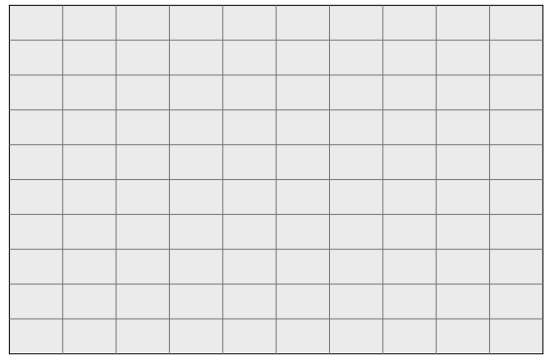


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



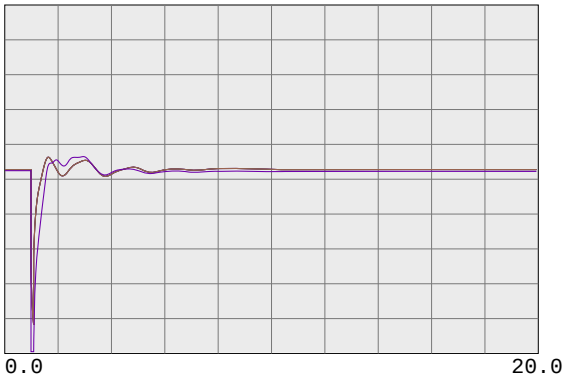
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



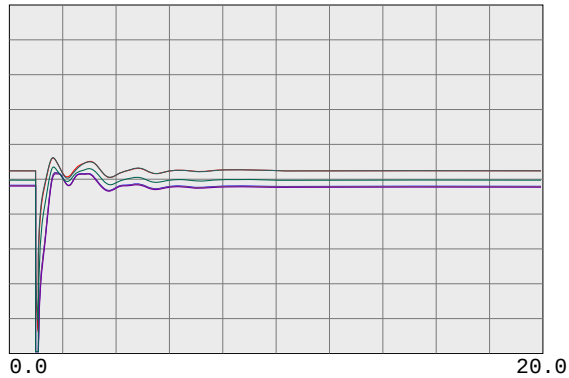


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

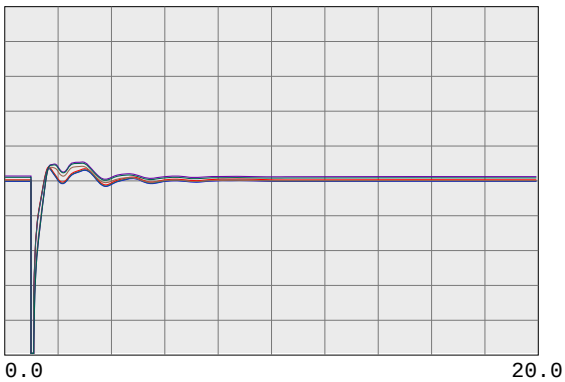
230-KV SYSTEM VOLTAGES



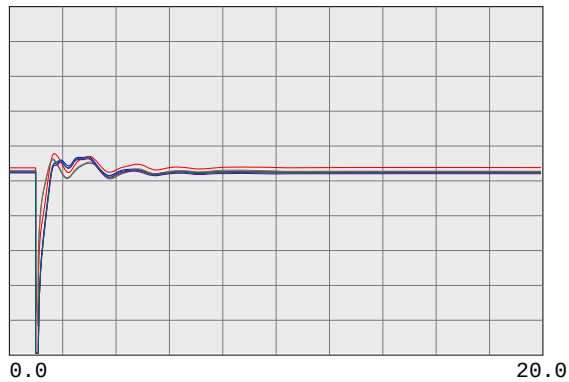
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



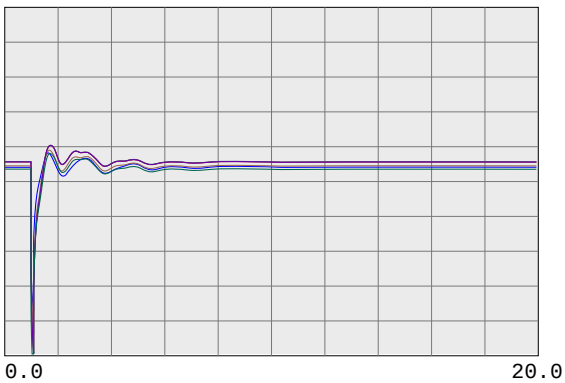
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



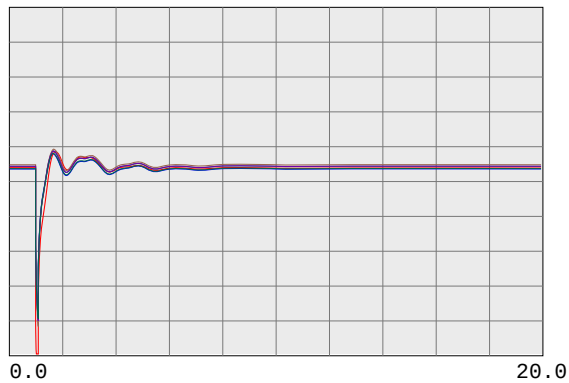
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



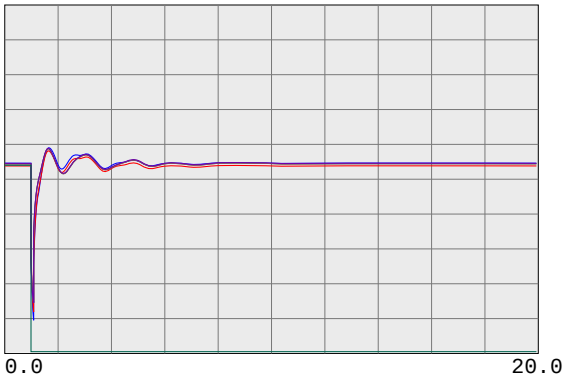
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



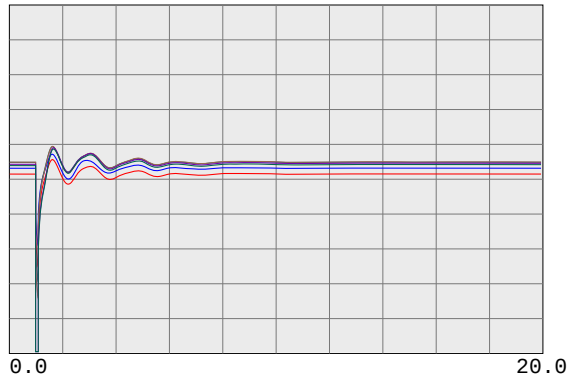
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

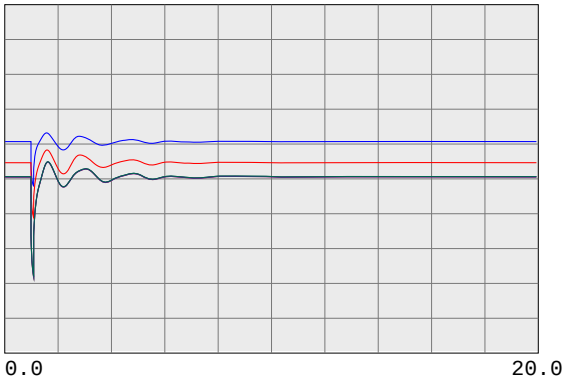
230-KV SYSTEM VOLTAGES



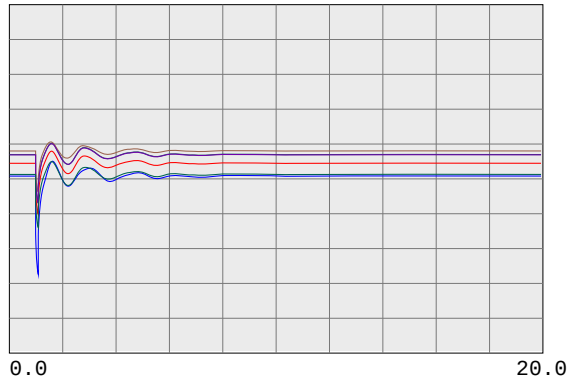
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



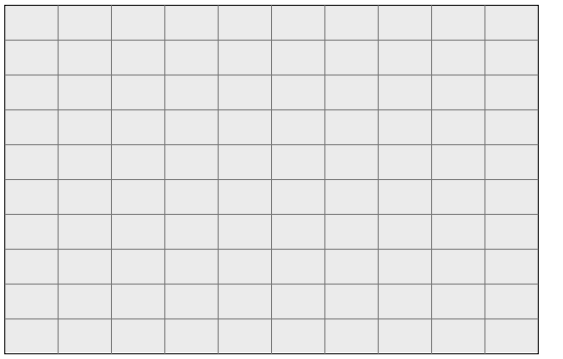
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

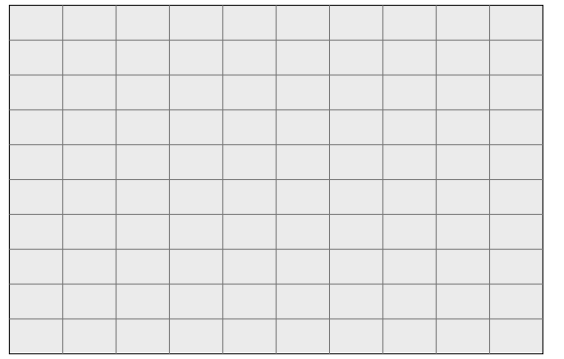


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



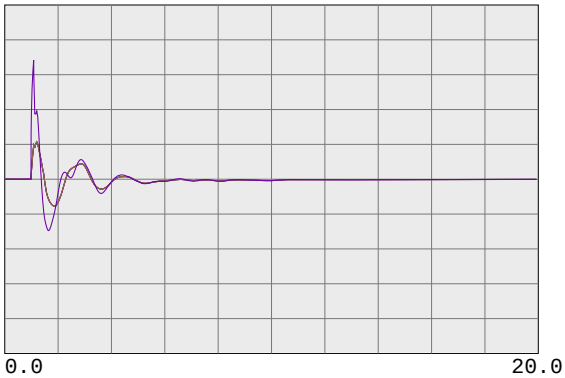
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



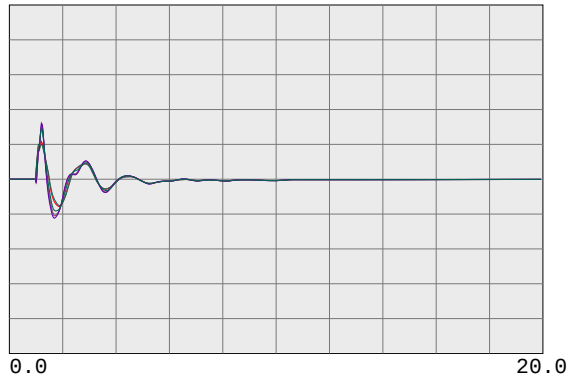


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

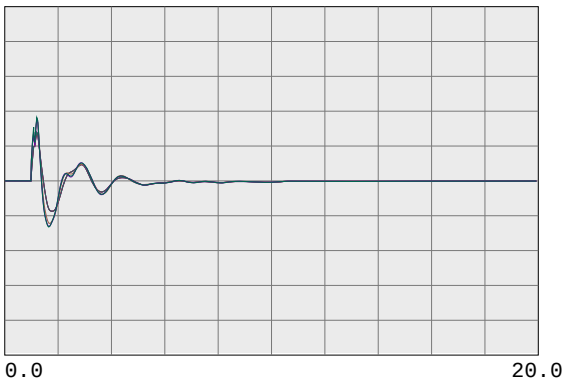
230-KV SYSTEM FREQUENCIES



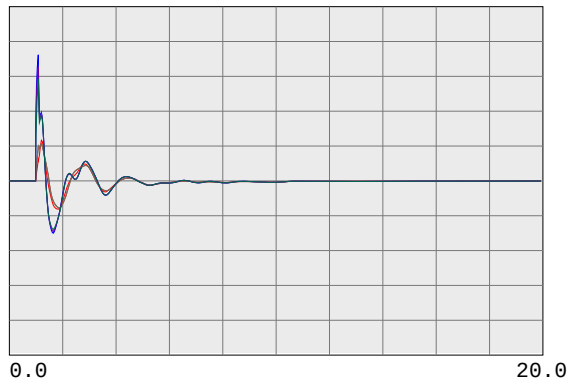
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



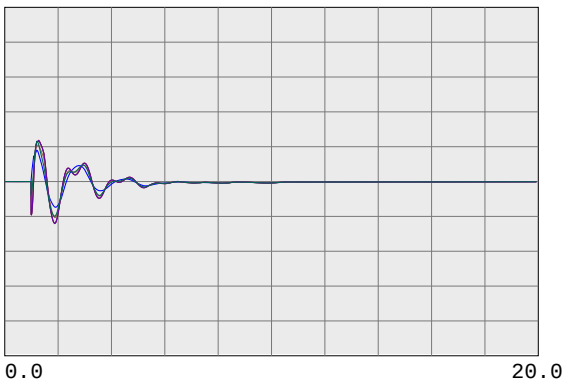
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



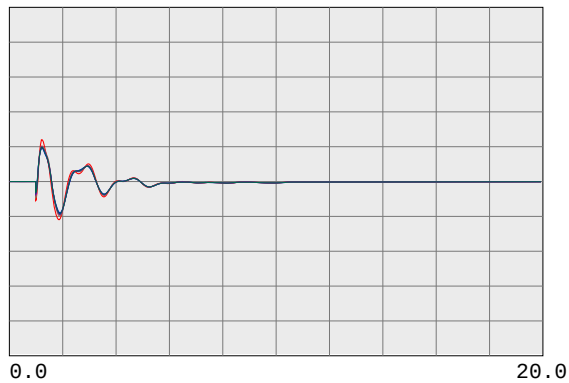
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



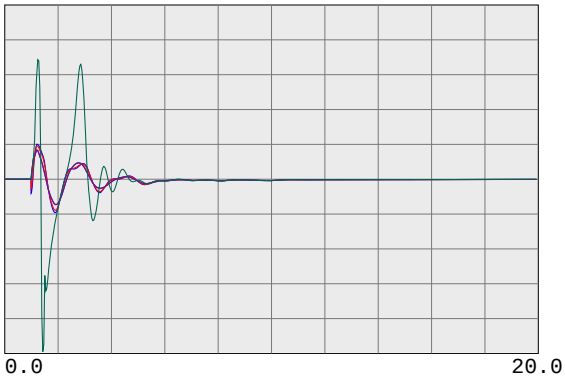
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



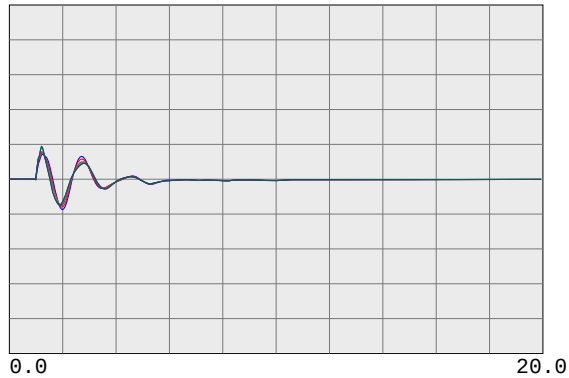
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

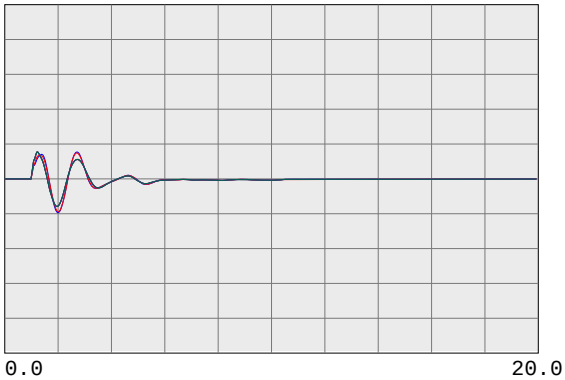
230-KV SYSTEM FREQUENCIES



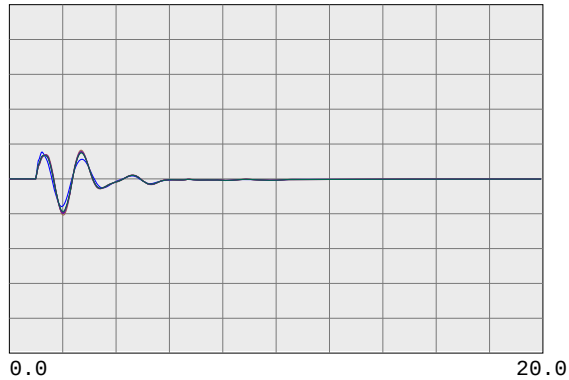
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



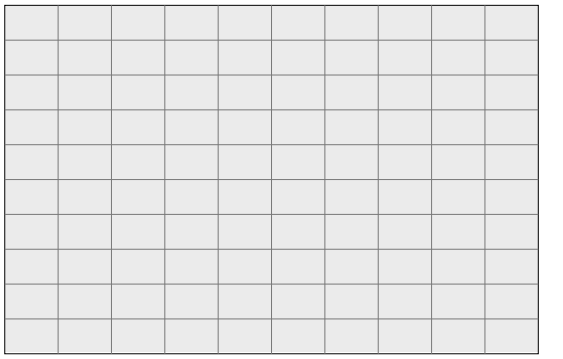
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

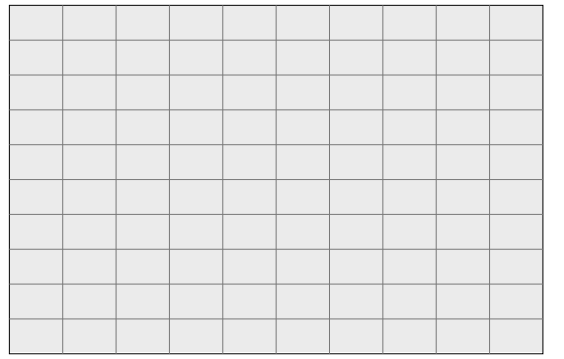


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



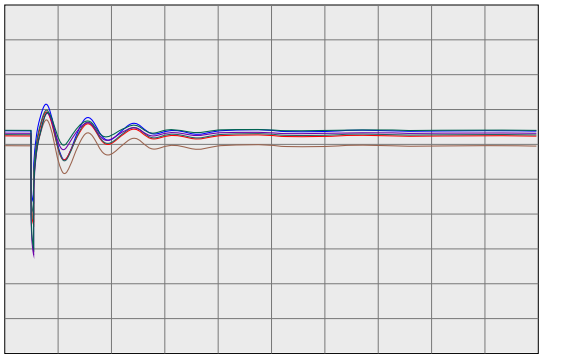
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



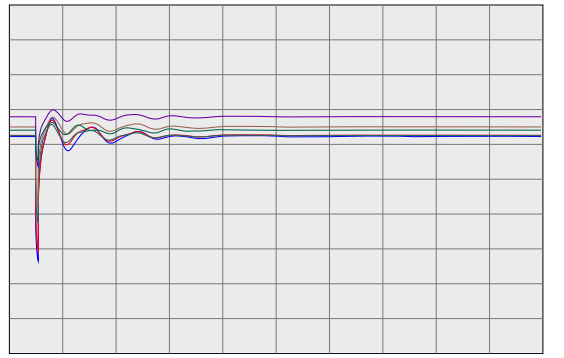


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

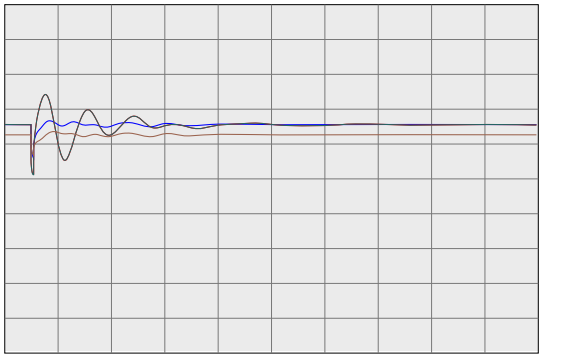
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



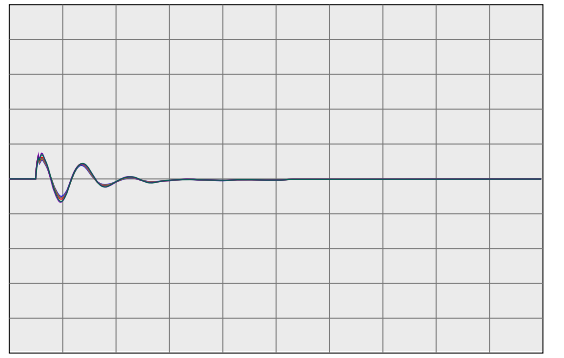
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



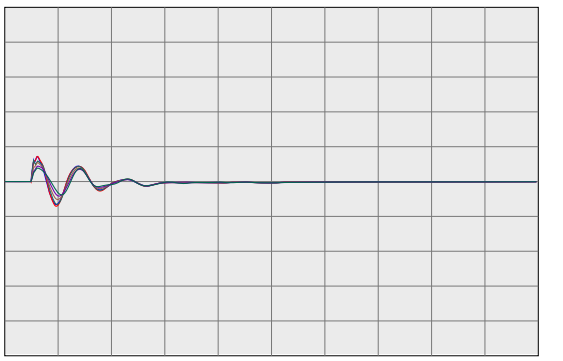
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



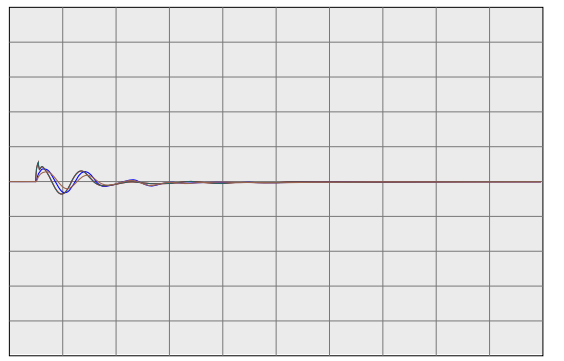
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



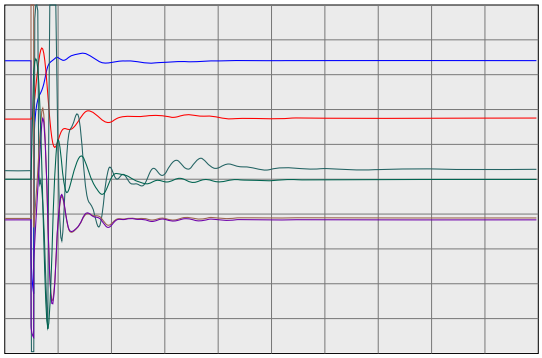
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



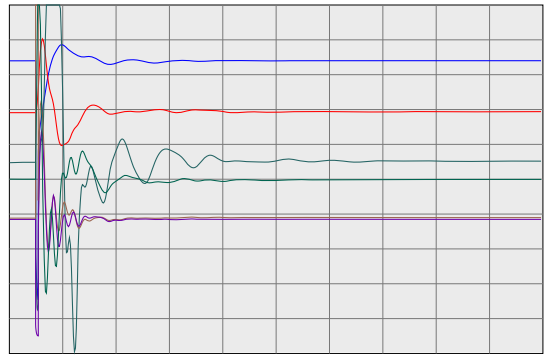
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

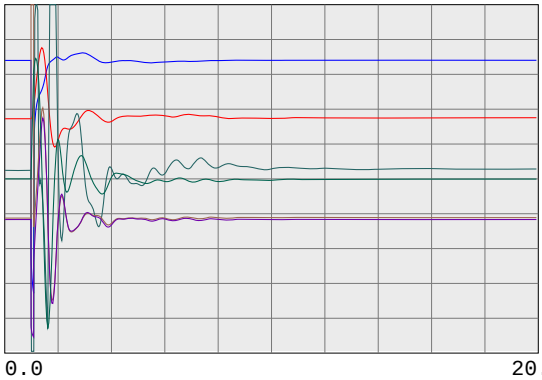
WILLOW PASS GENERATION PLANT



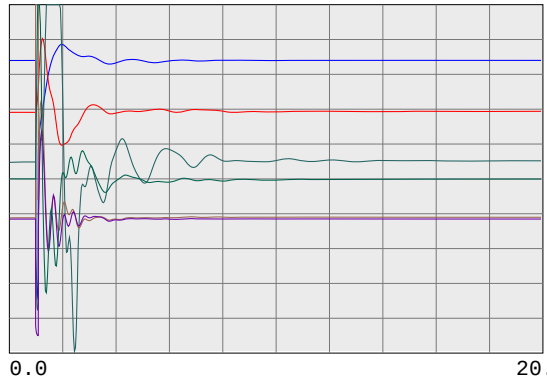
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



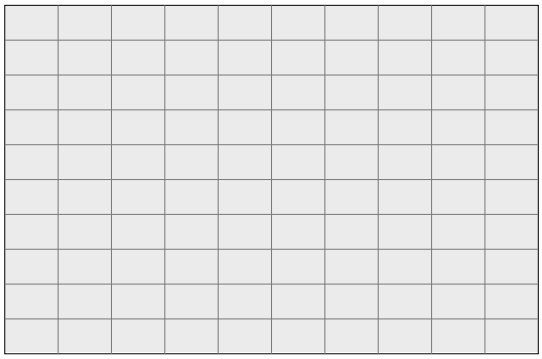
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

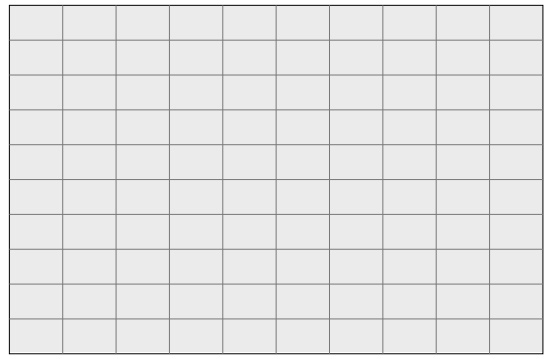


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



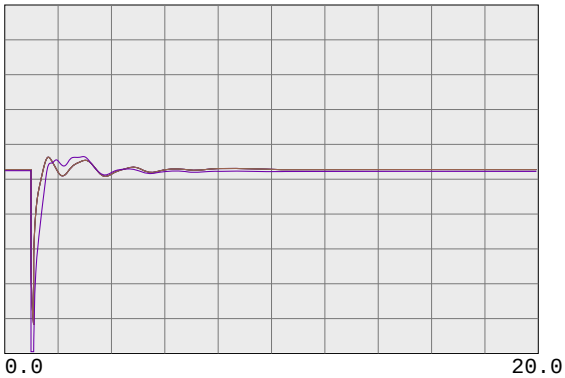
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



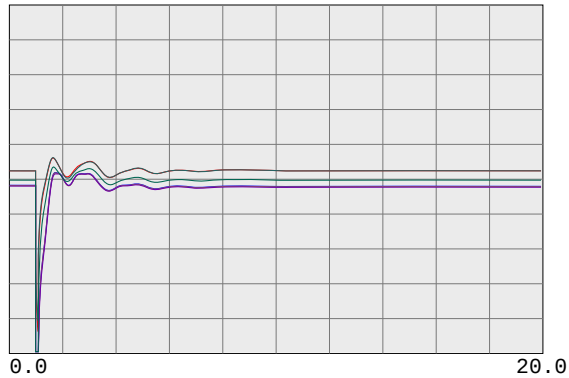


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

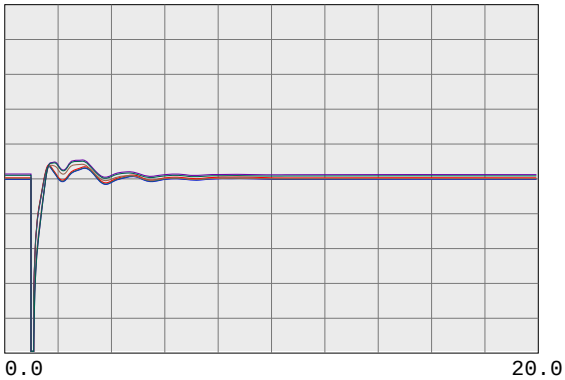
230-KV SYSTEM VOLTAGES



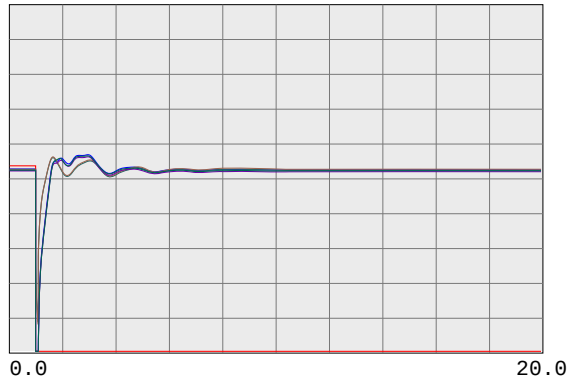
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



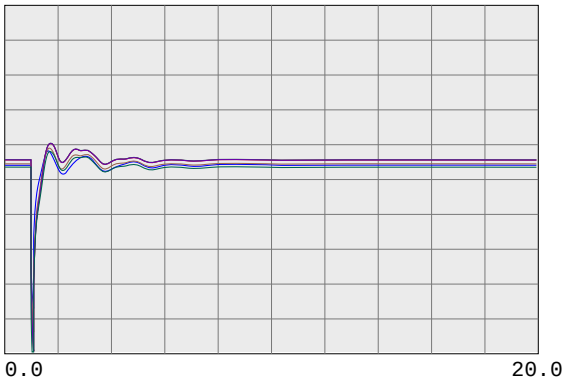
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



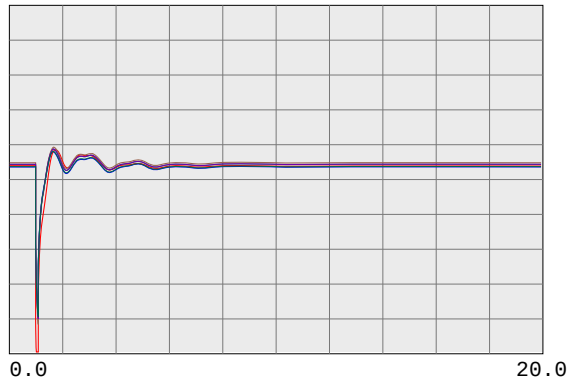
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



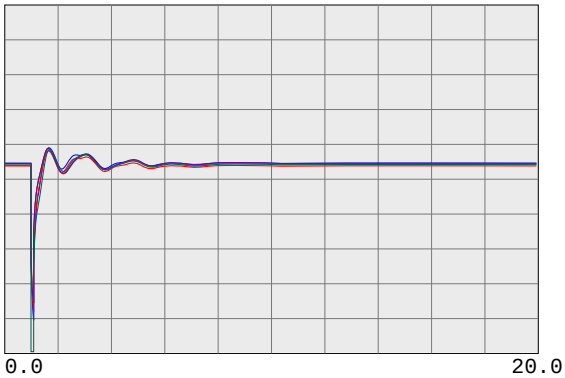
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



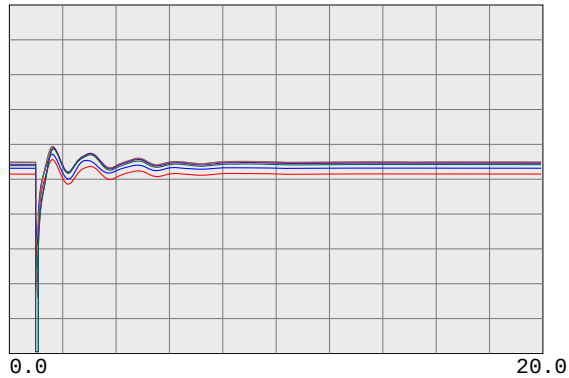
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

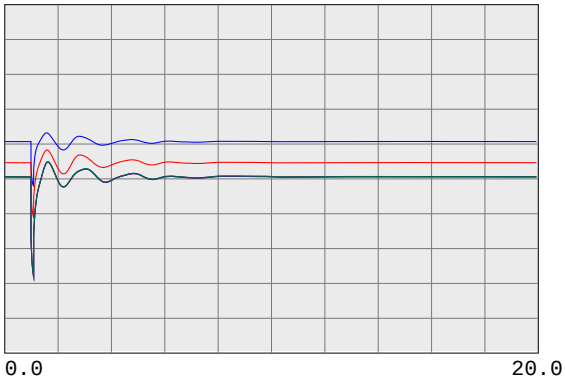
230-KV SYSTEM VOLTAGES



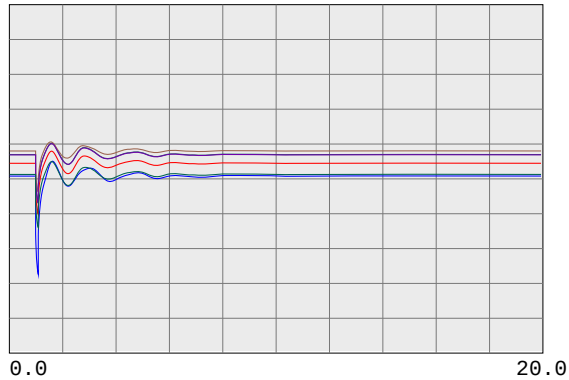
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



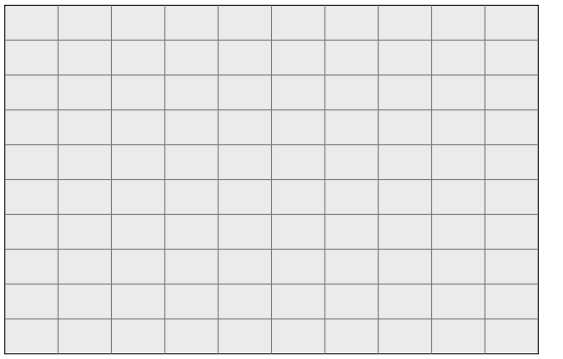
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

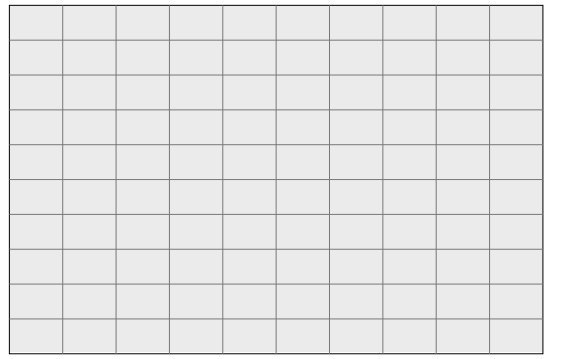


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



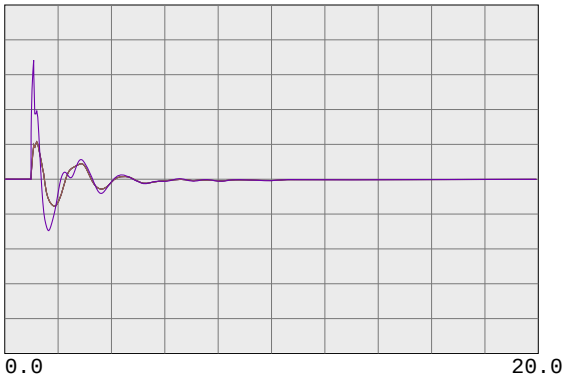
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



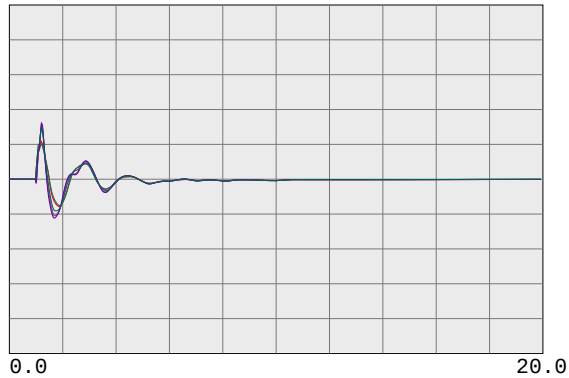


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

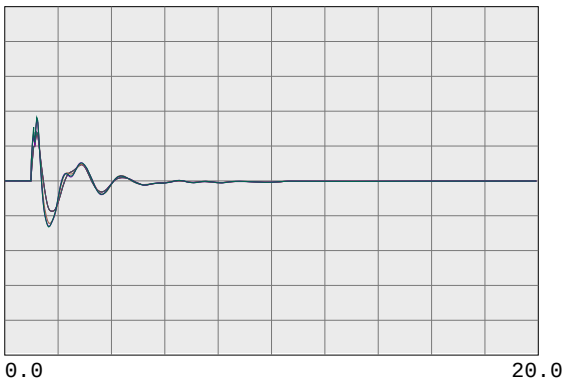
230-KV SYSTEM FREQUENCIES



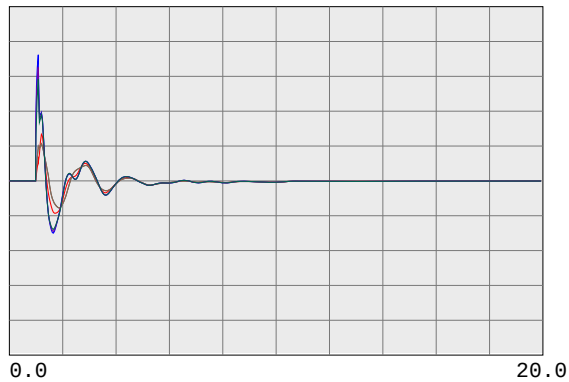
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



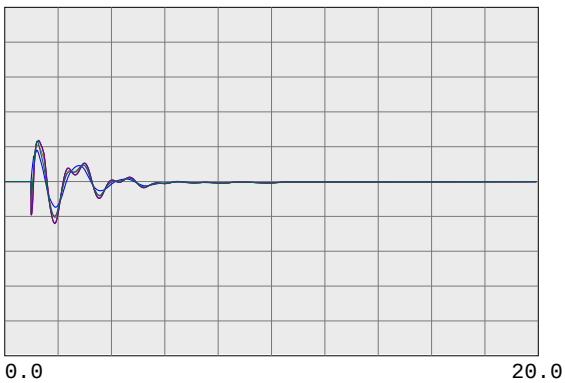
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



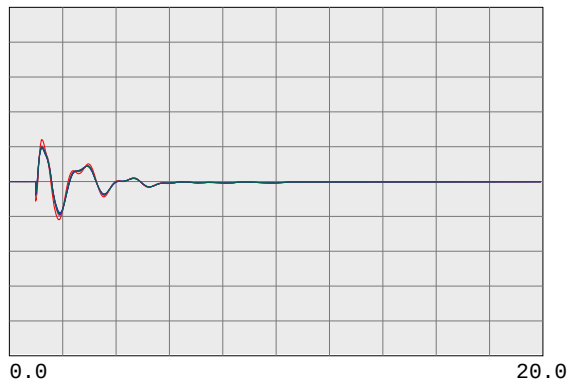
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



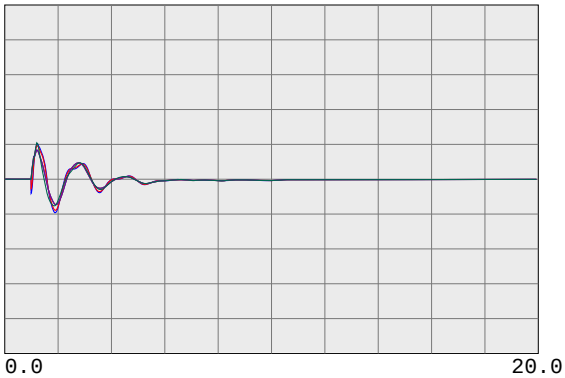
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



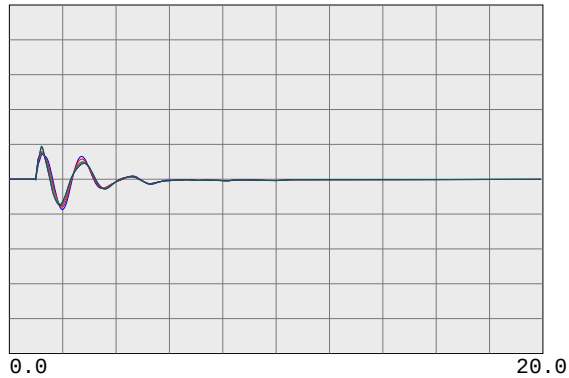
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

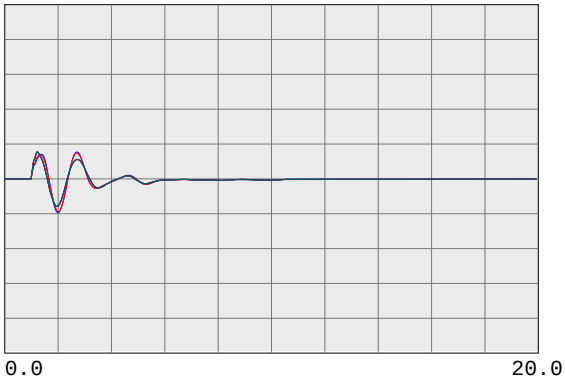
230-KV SYSTEM FREQUENCIES



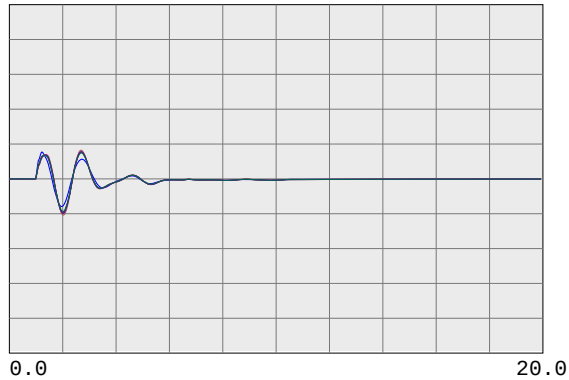
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



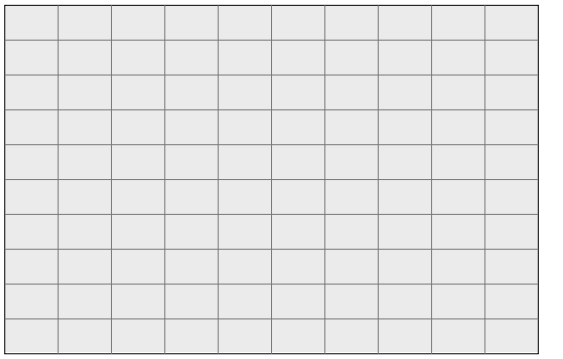
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

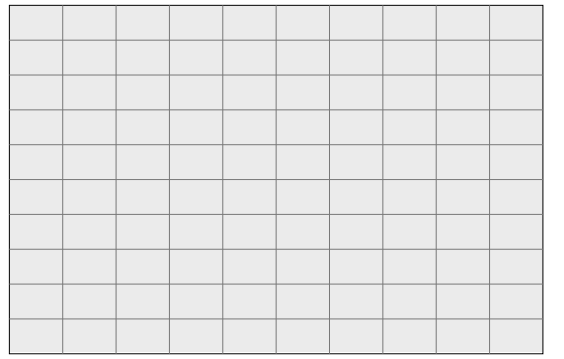


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



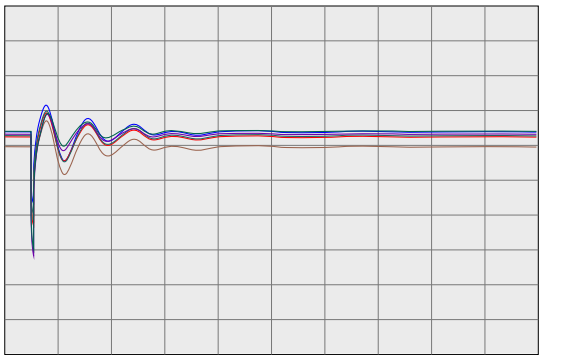
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



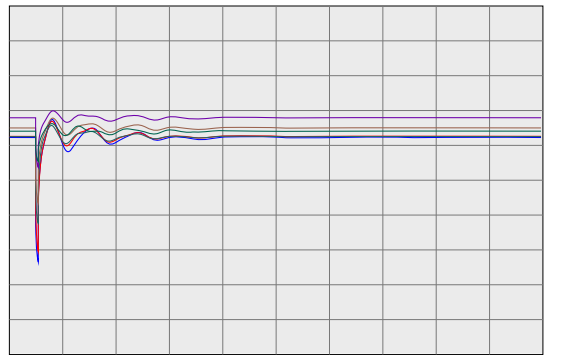


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

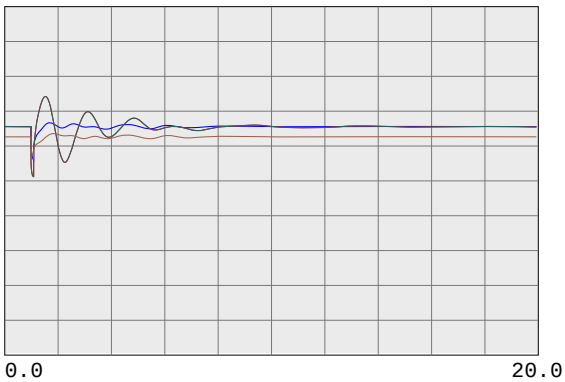
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



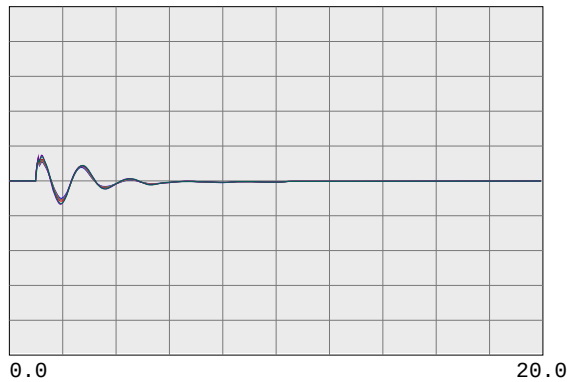
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



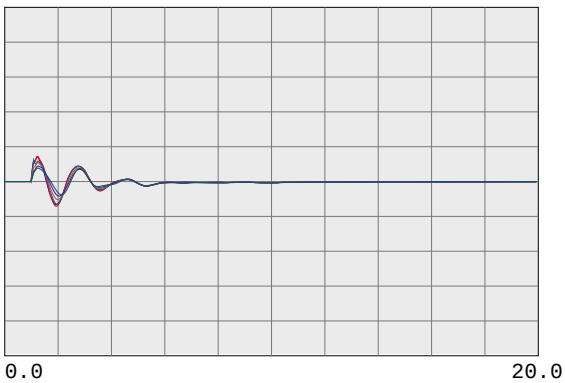
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



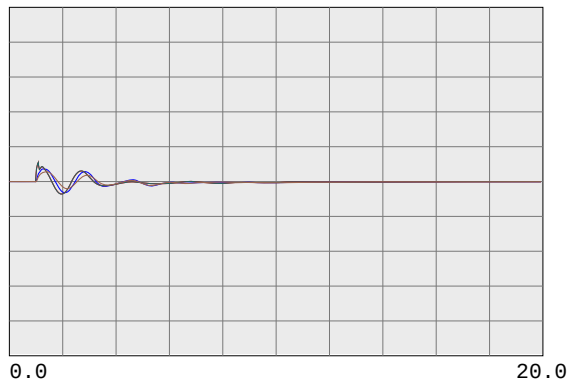
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



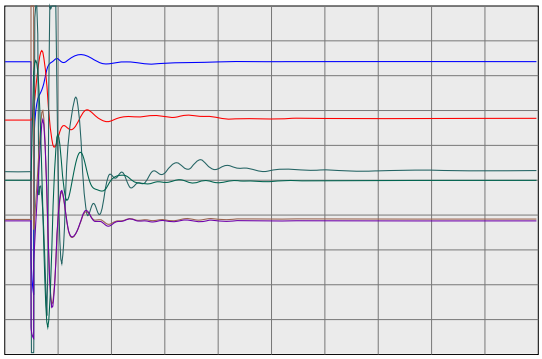
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



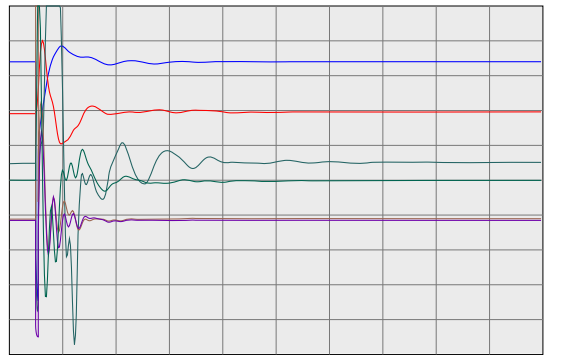
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

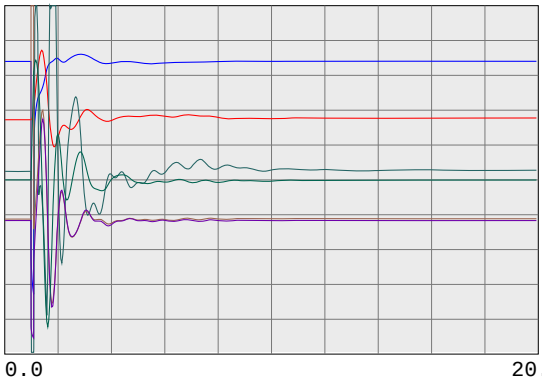
WILLOW PASS GENERATION PLANT



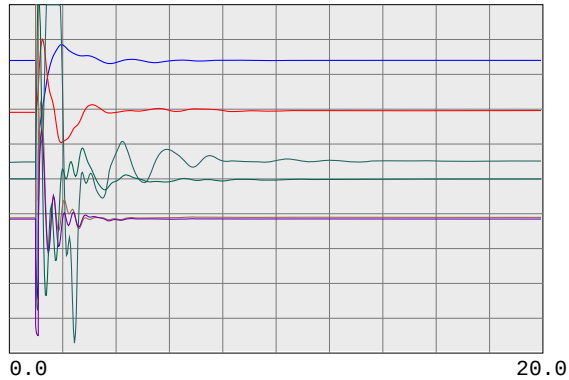
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



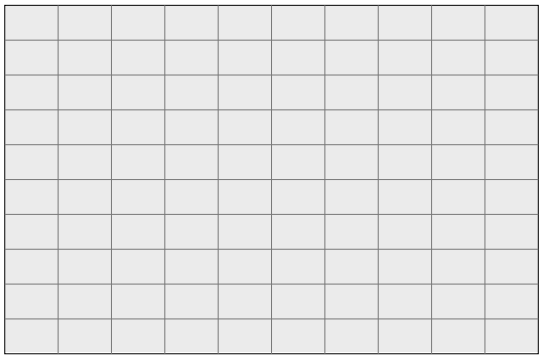
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

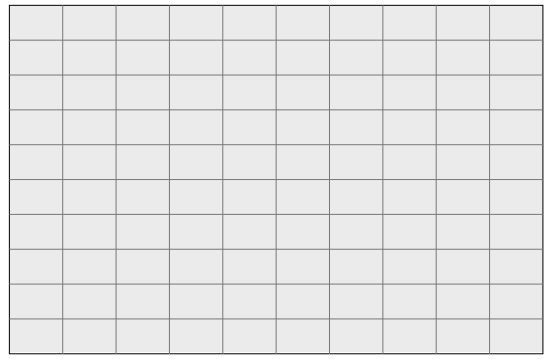


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



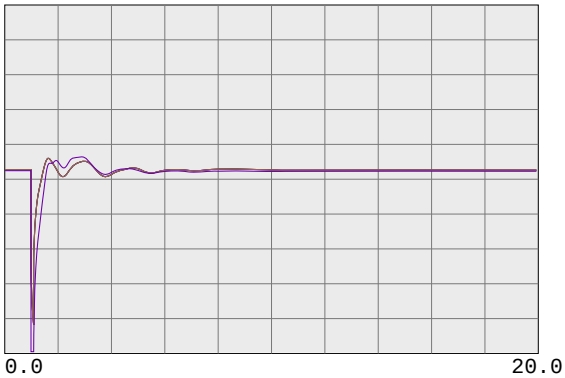
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



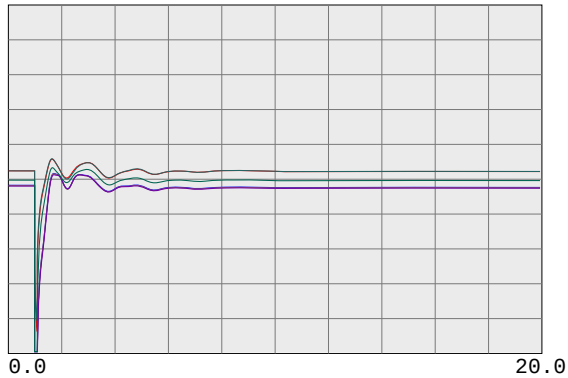


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

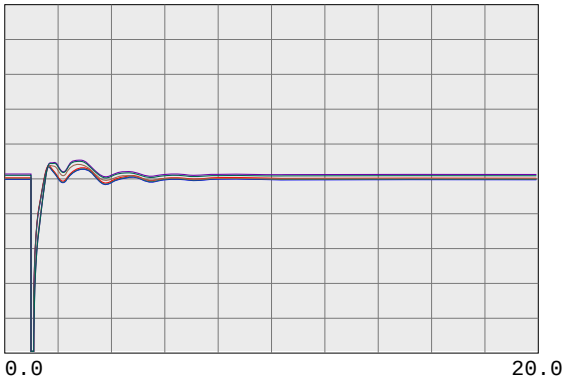
230-KV SYSTEM VOLTAGES



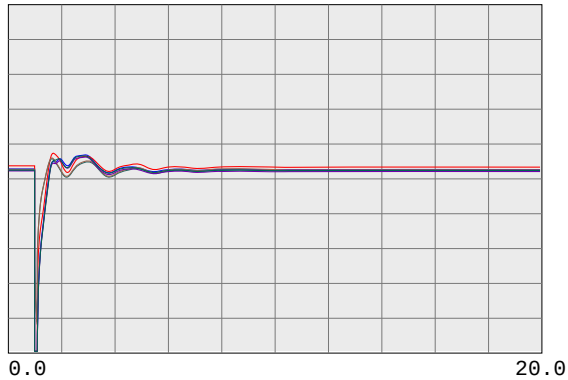
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



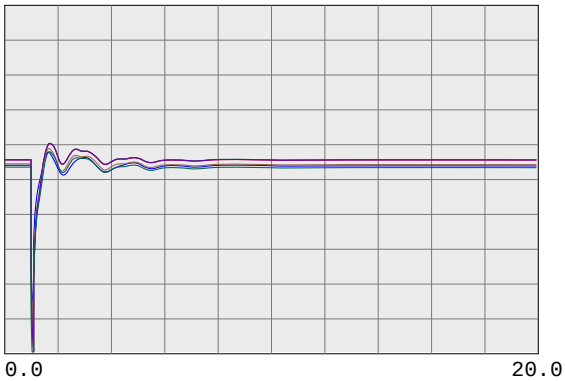
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



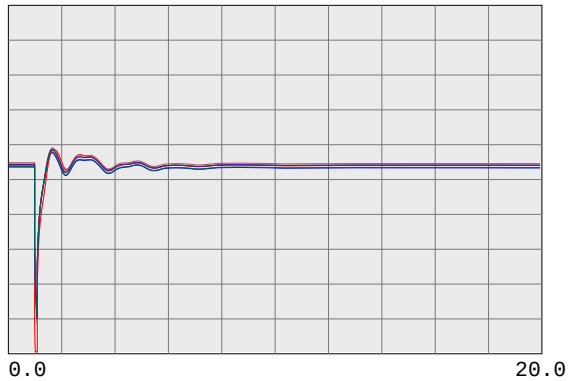
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



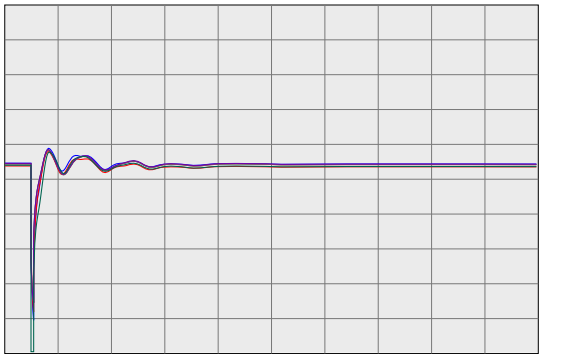
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



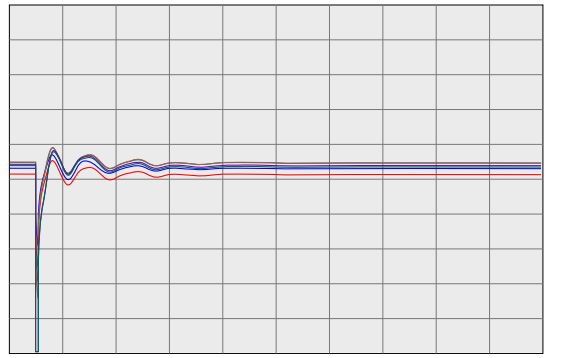
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

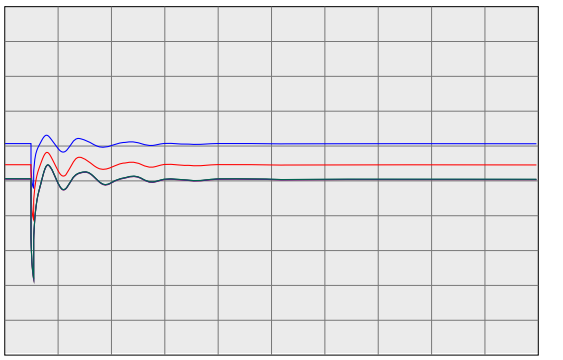
230-KV SYSTEM VOLTAGES



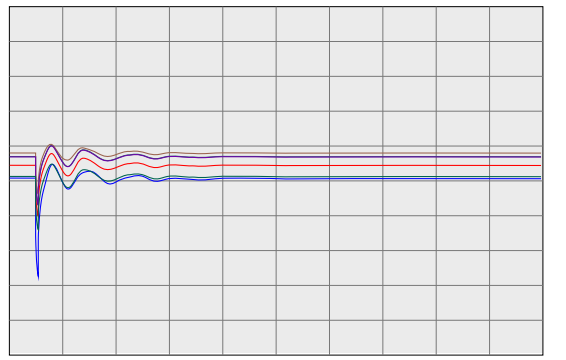
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



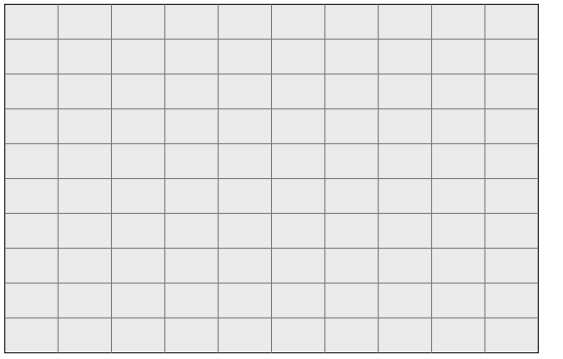
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

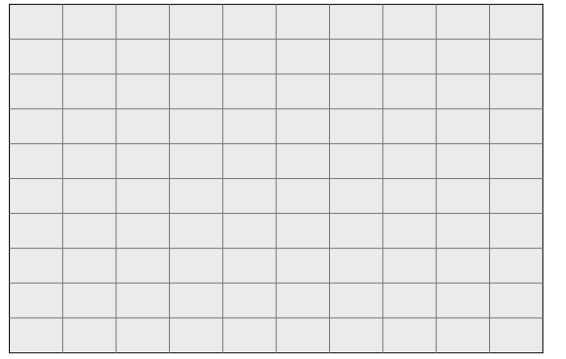


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



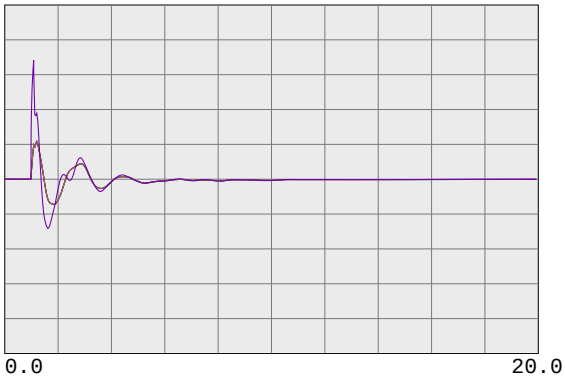
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



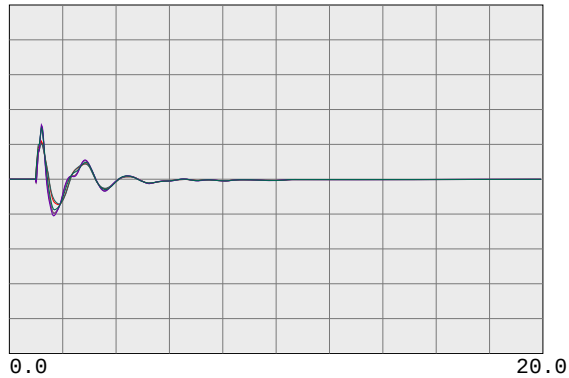


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

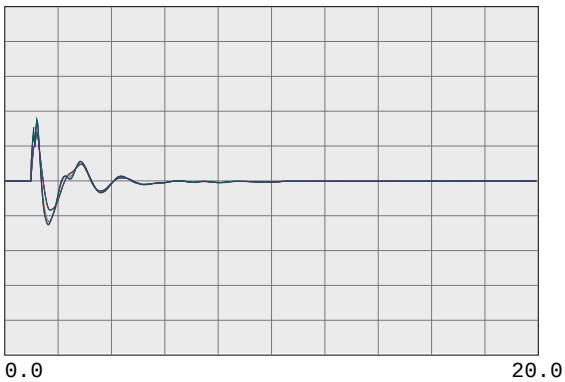
230-KV SYSTEM FREQUENCIES



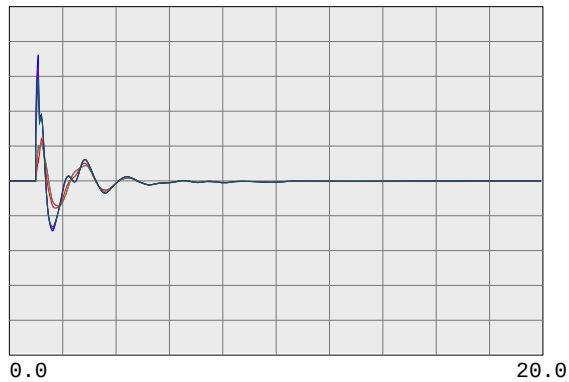
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



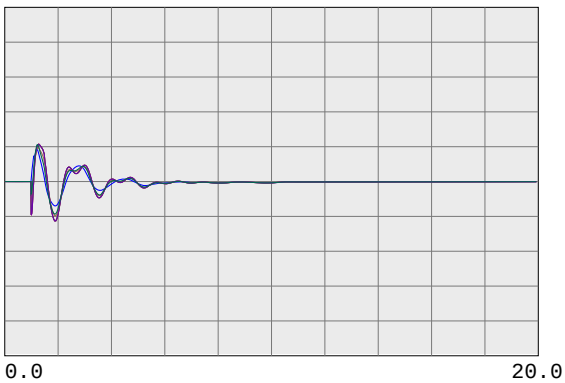
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



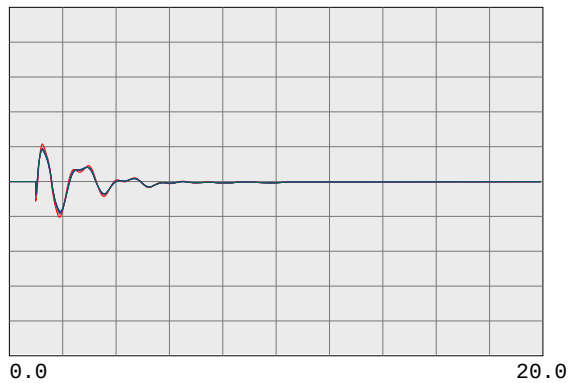
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



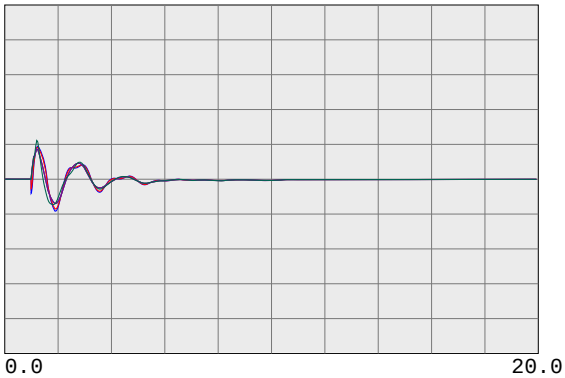
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



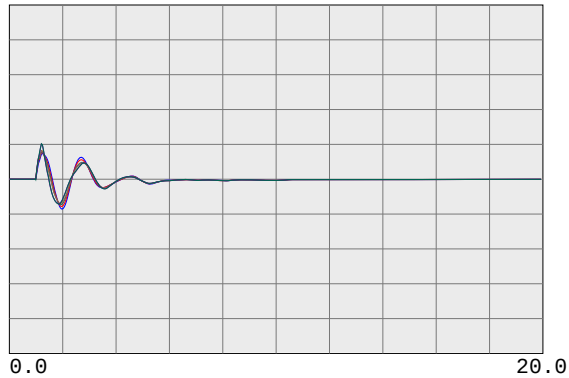
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

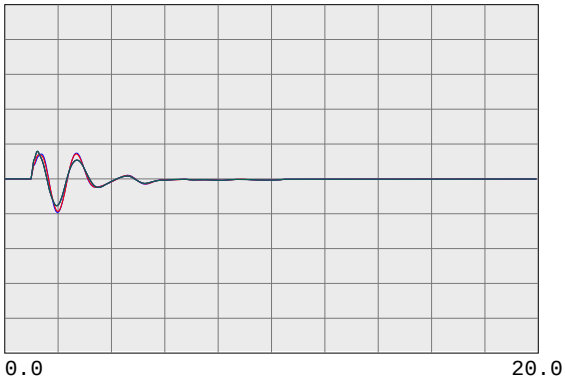
230-KV SYSTEM FREQUENCIES



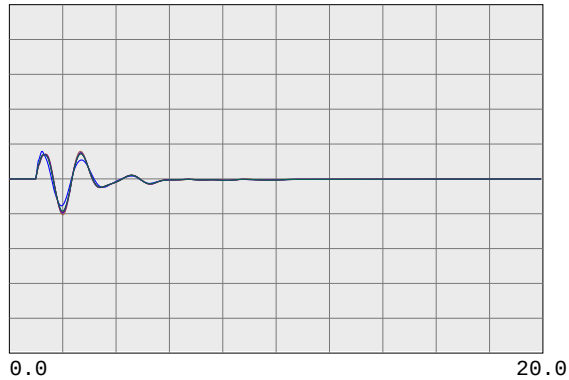
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



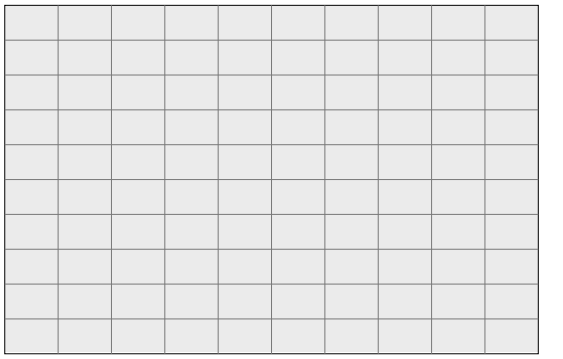
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

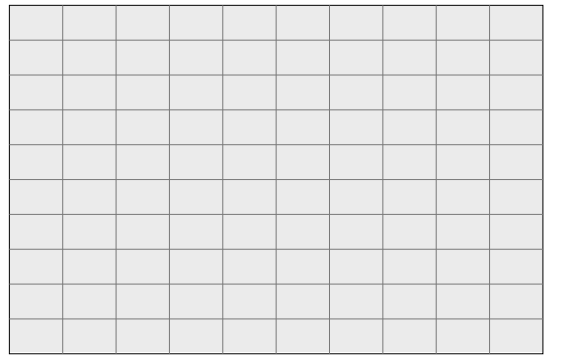


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



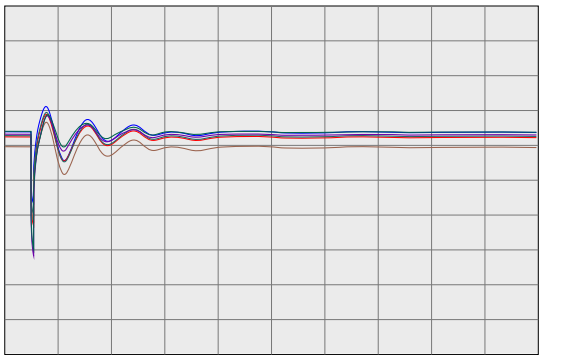
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



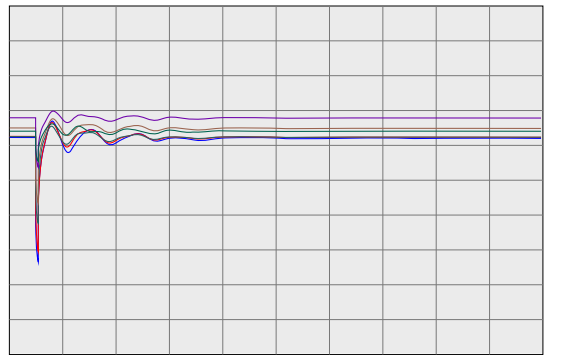


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

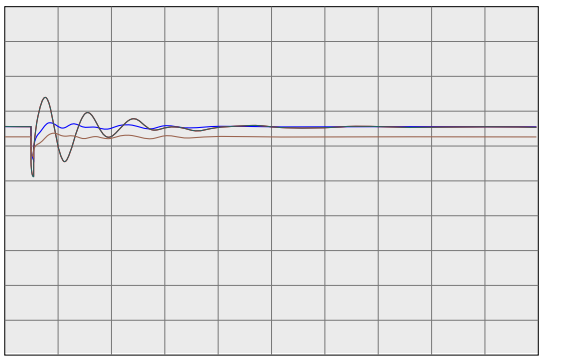
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



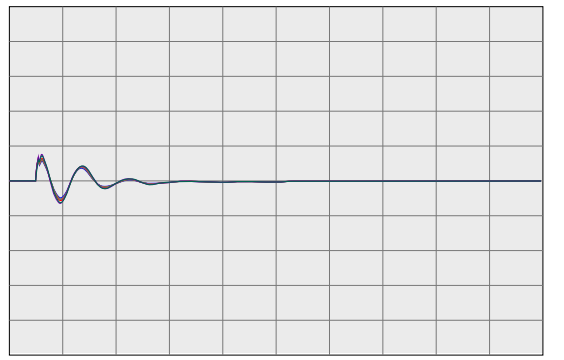
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



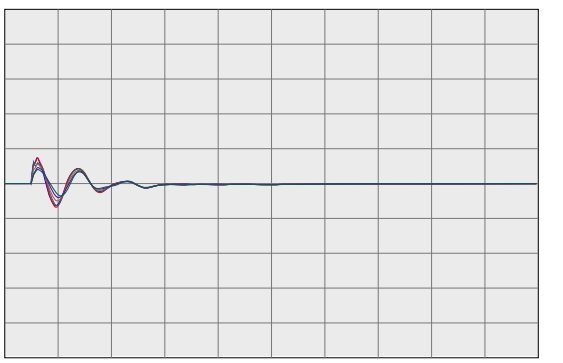
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



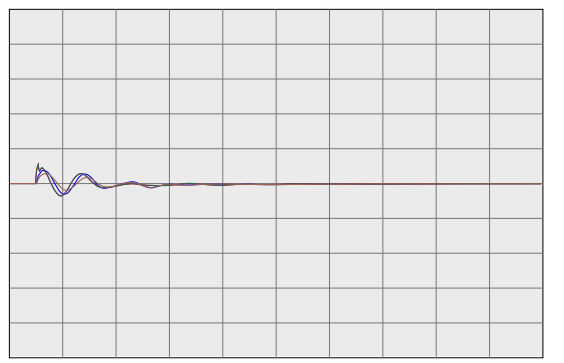
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



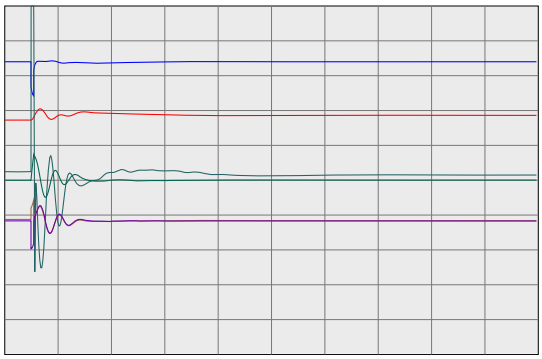
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



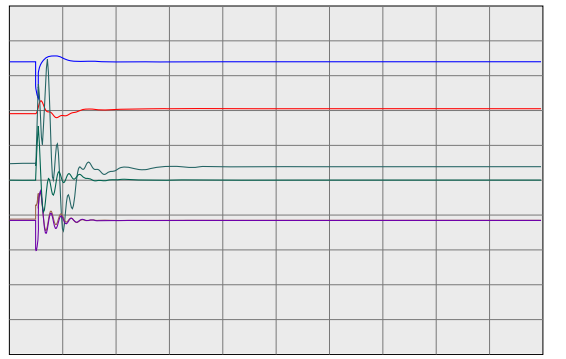
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

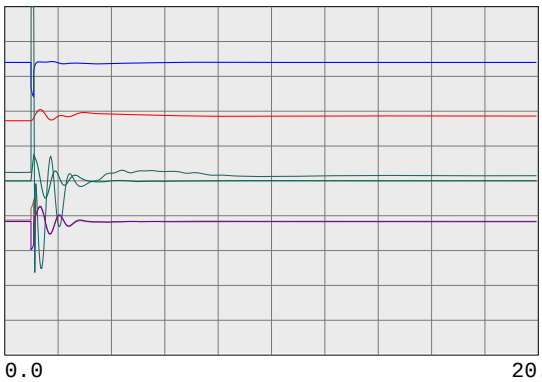
WILLOW PASS GENERATION PLANT



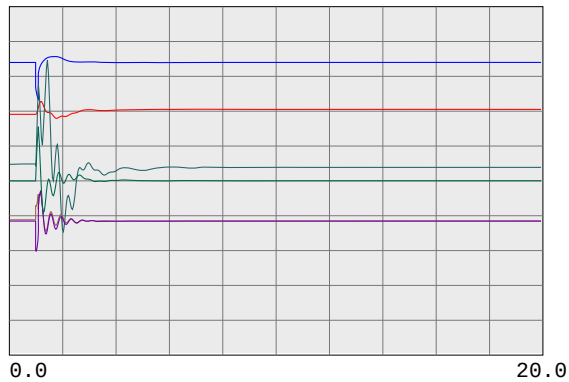
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



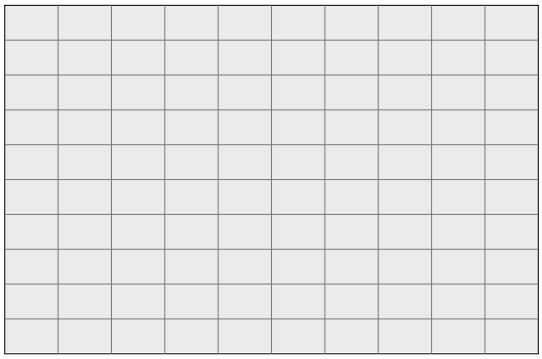
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

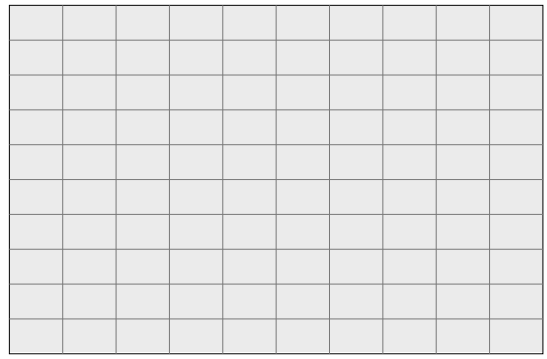


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



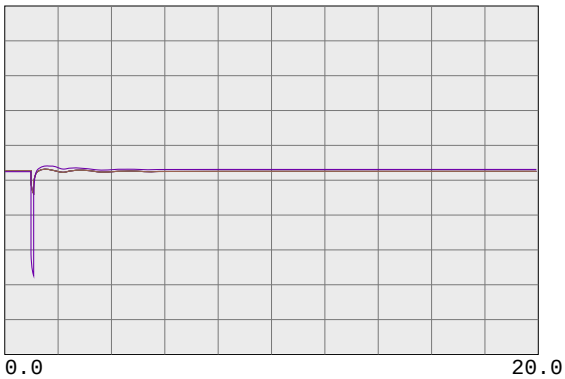
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



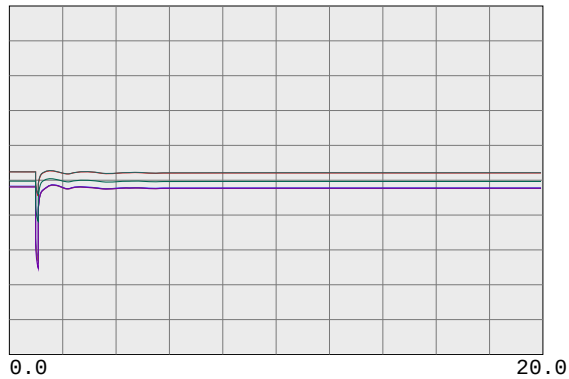


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

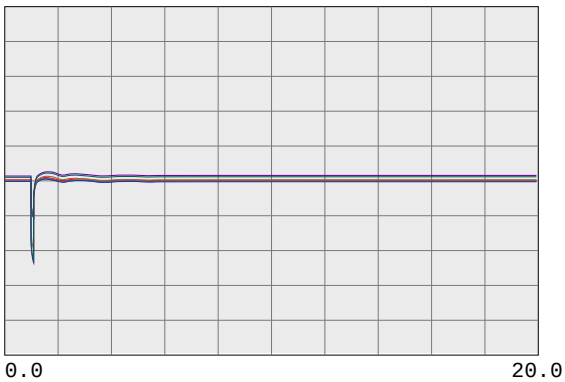
230-KV SYSTEM VOLTAGES



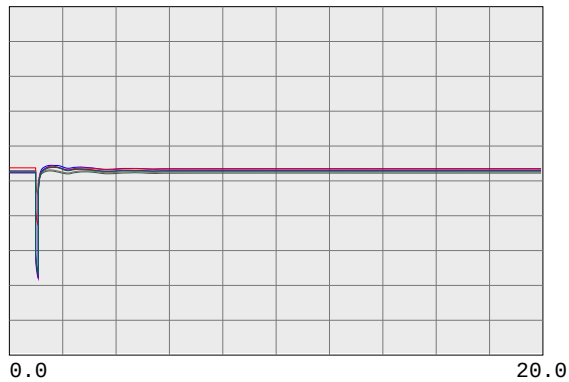
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



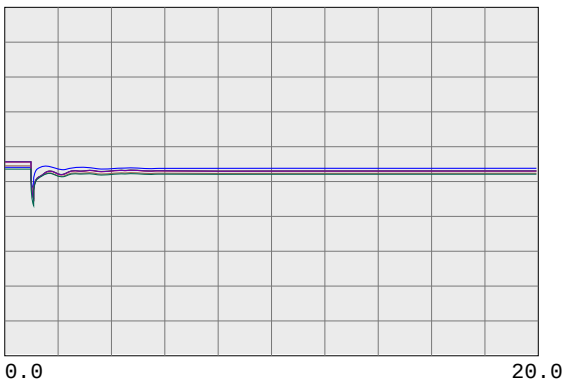
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



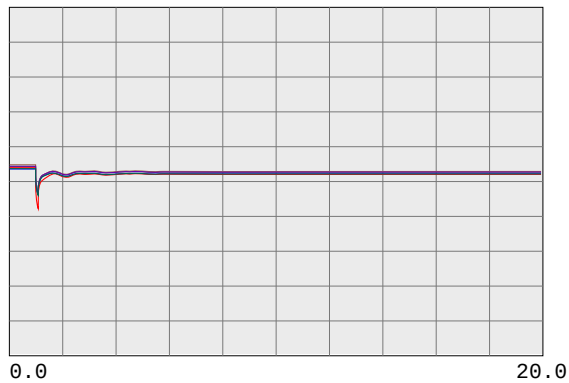
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



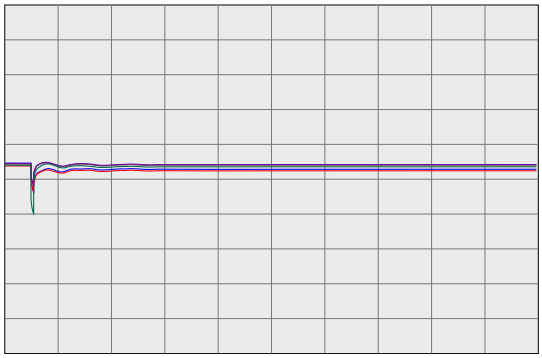
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

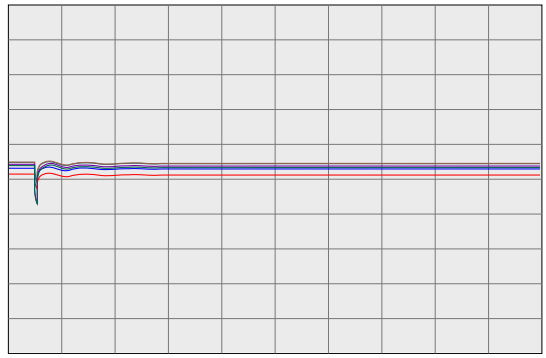
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

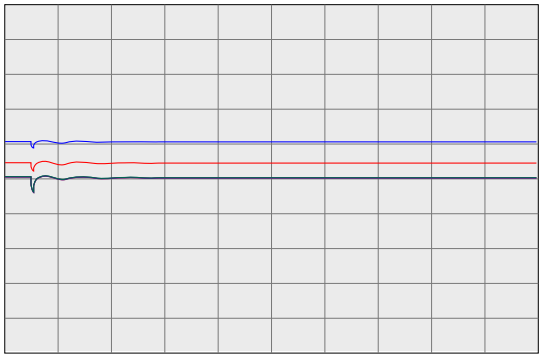
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

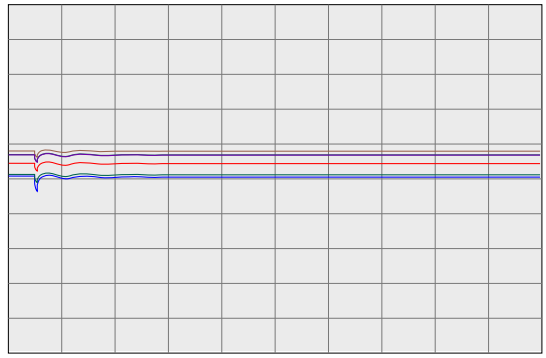
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

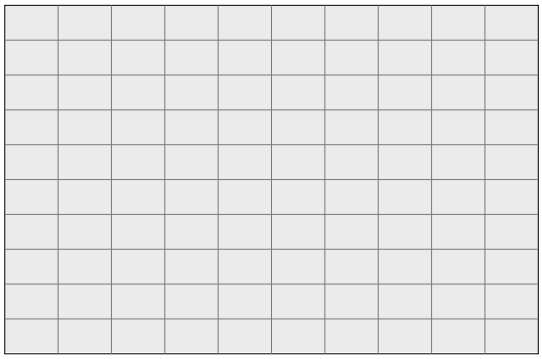
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

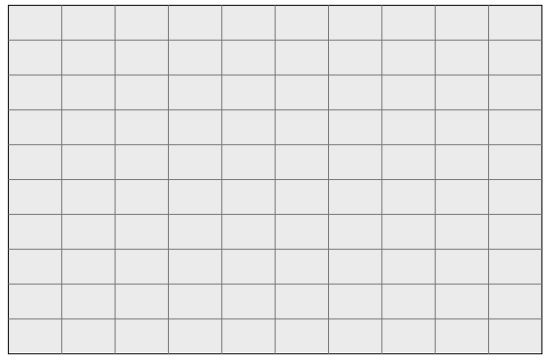


0.0 20.0

Time(sec)

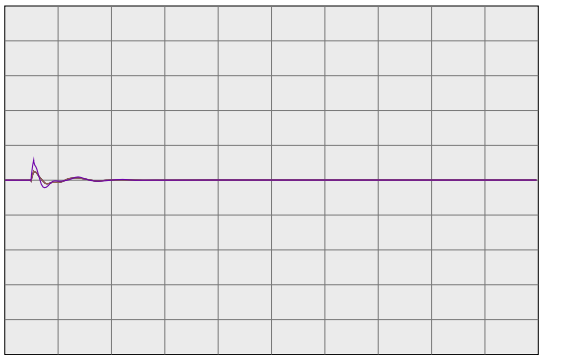
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



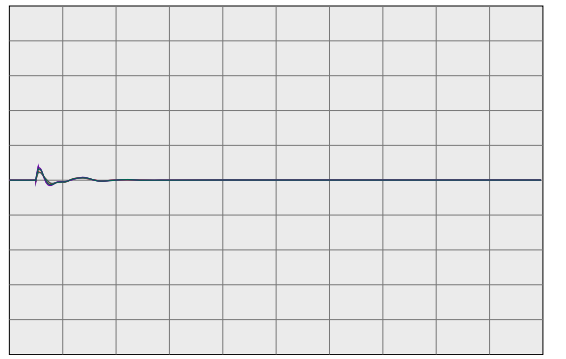


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

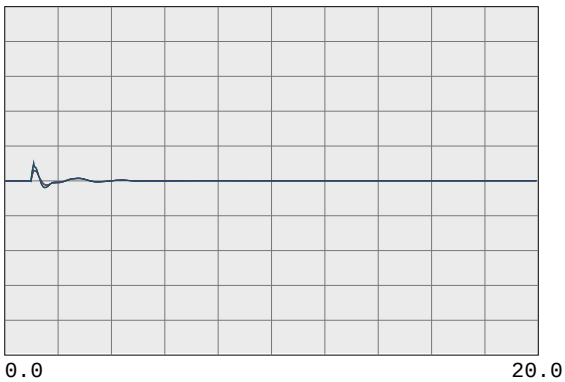
230-KV SYSTEM FREQUENCIES



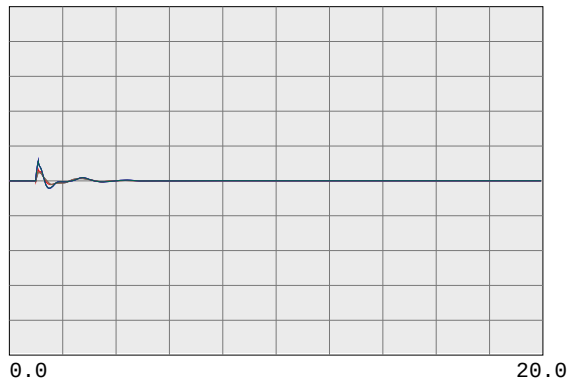
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

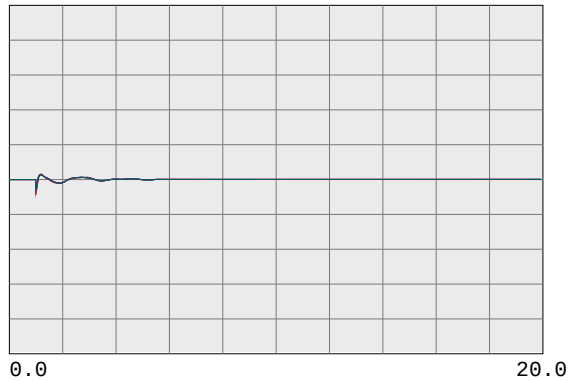


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

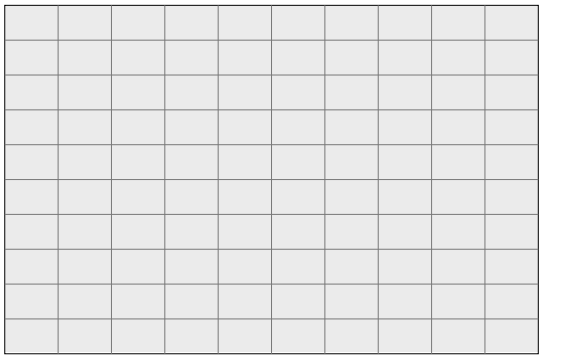
230-KV SYSTEM FREQUENCIES

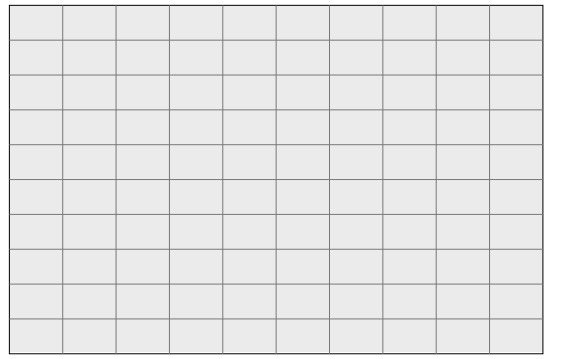
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

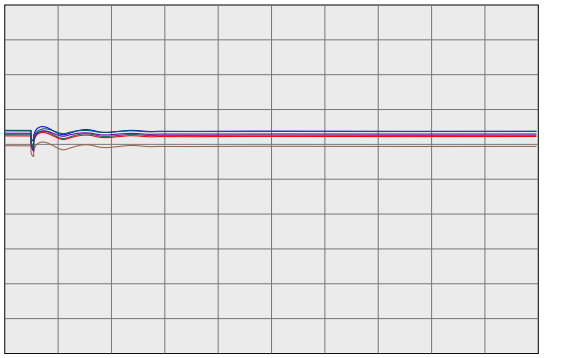
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



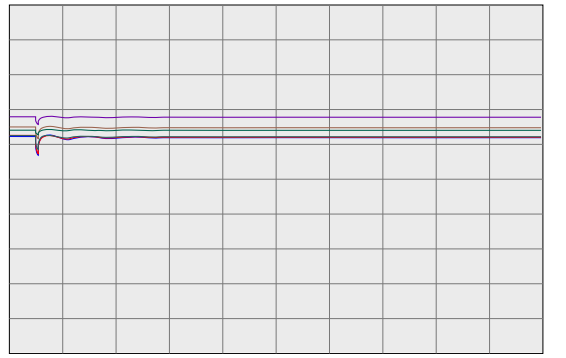


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

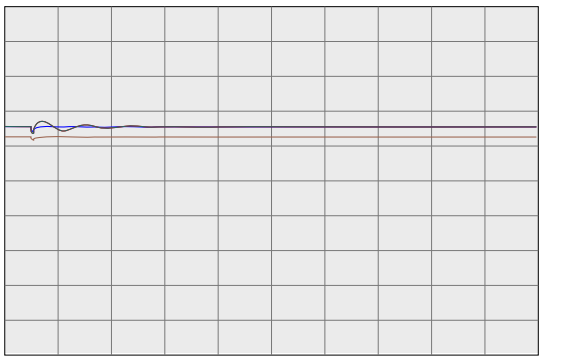
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



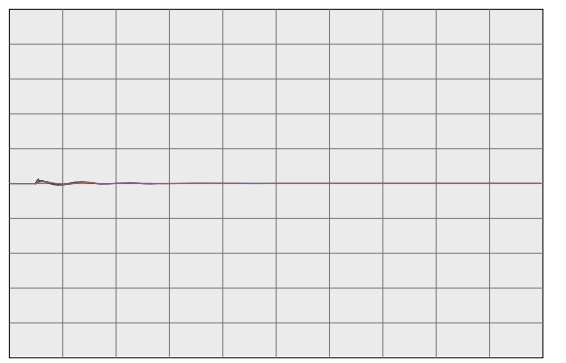
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

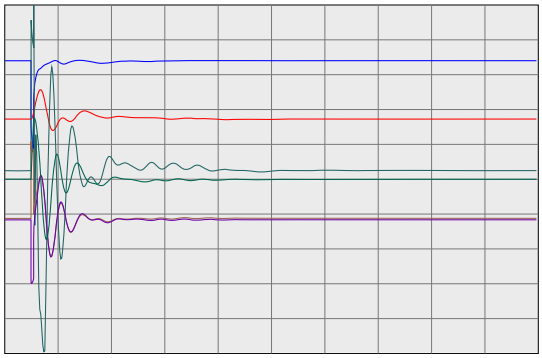
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

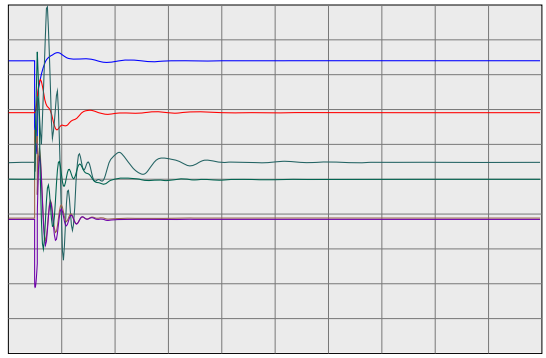
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

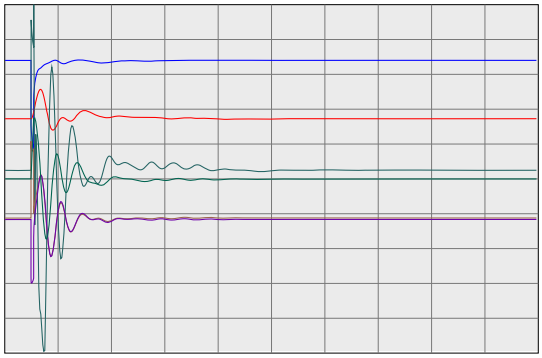
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

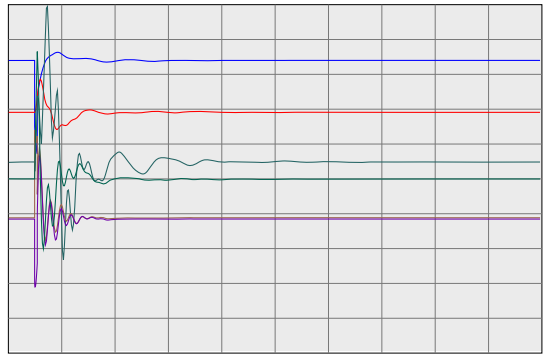
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

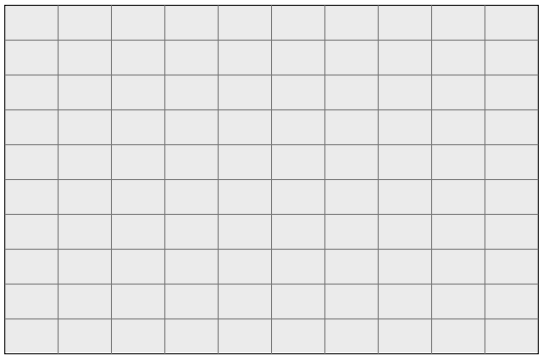
0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

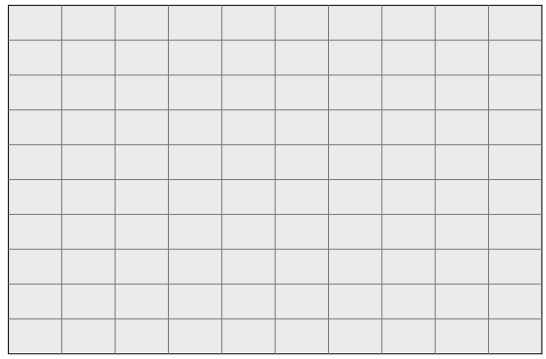


0.0 20.0

Time(sec)

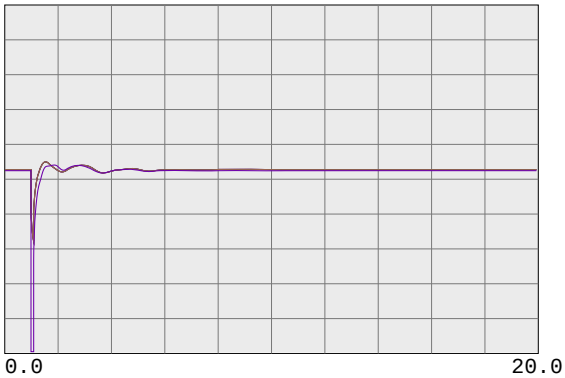
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



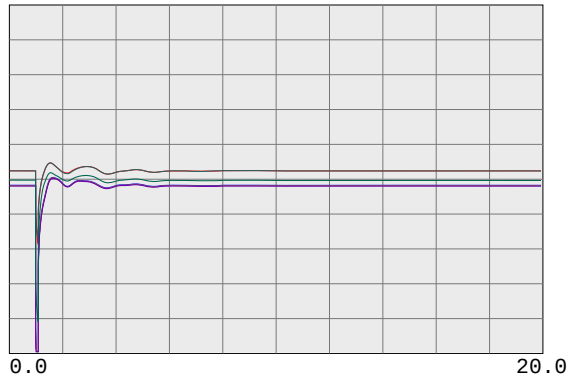


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

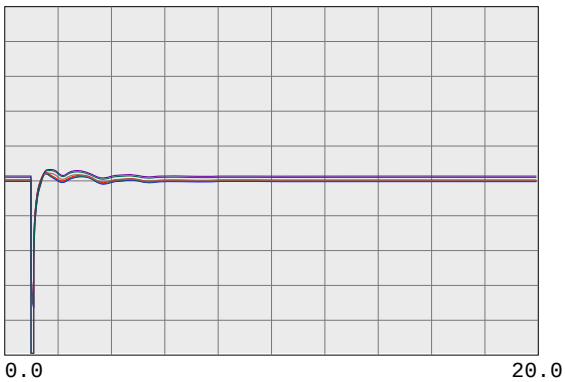
230-KV SYSTEM VOLTAGES



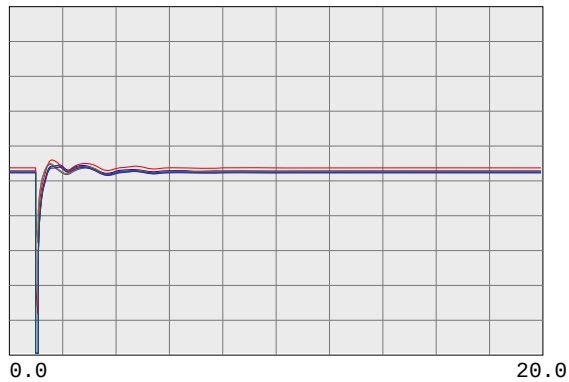
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



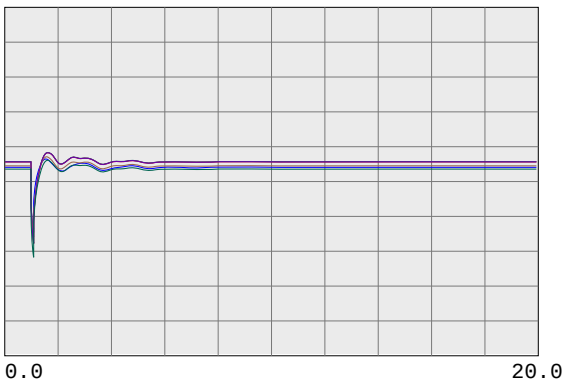
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



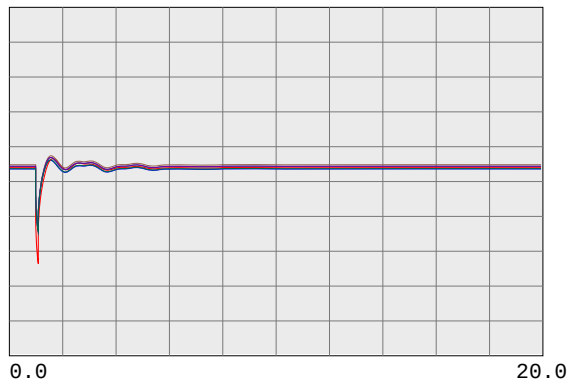
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



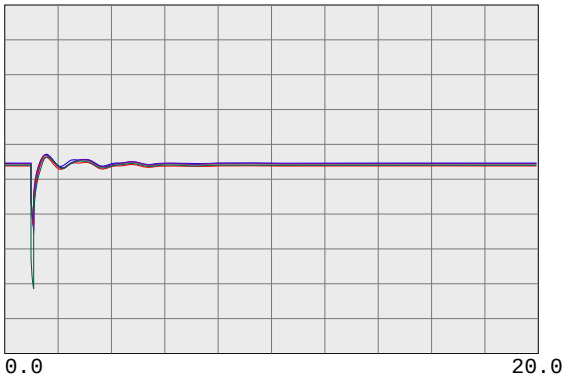
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



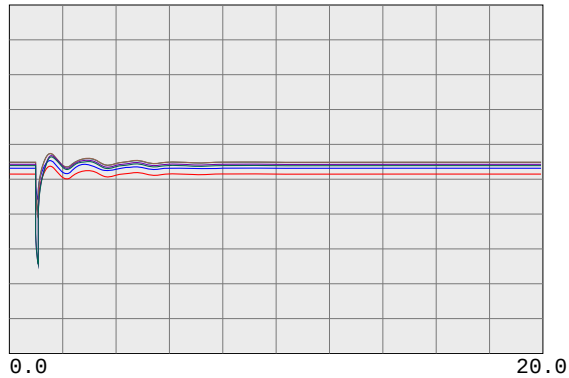
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

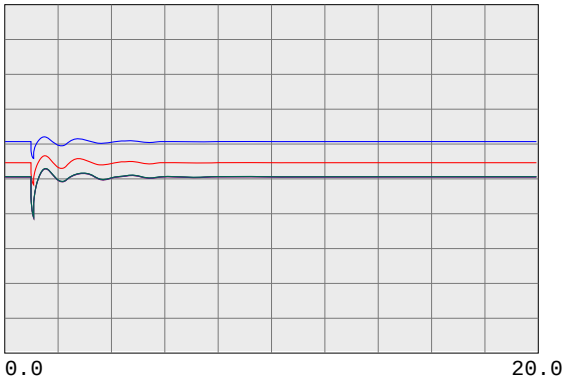
230-KV SYSTEM VOLTAGES



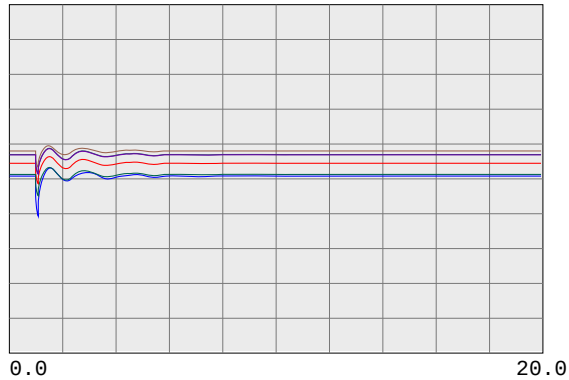
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



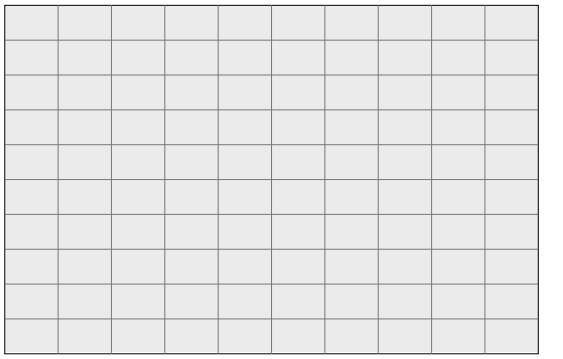
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

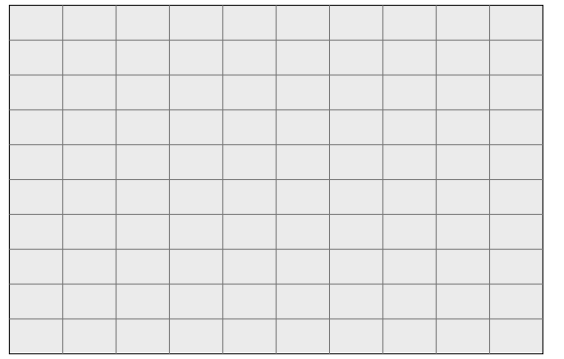


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



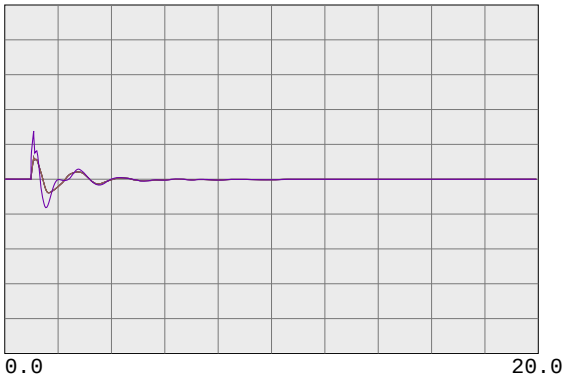
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



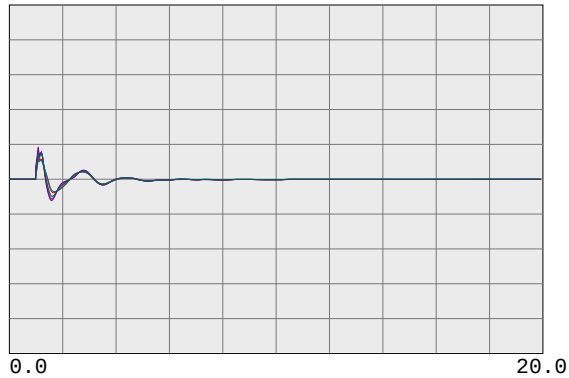


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

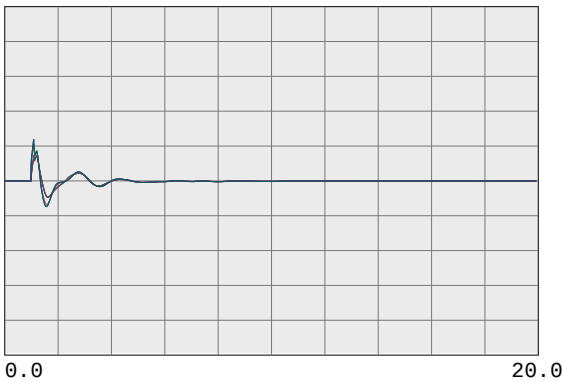
230-KV SYSTEM FREQUENCIES



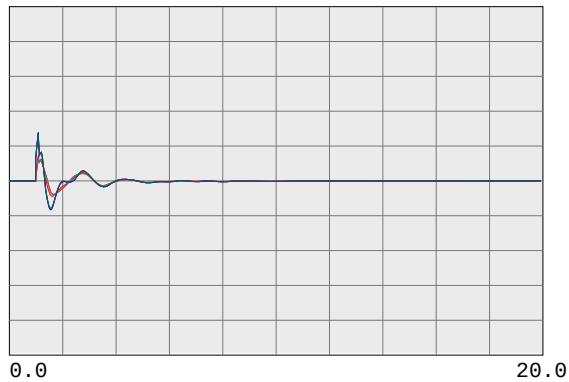
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



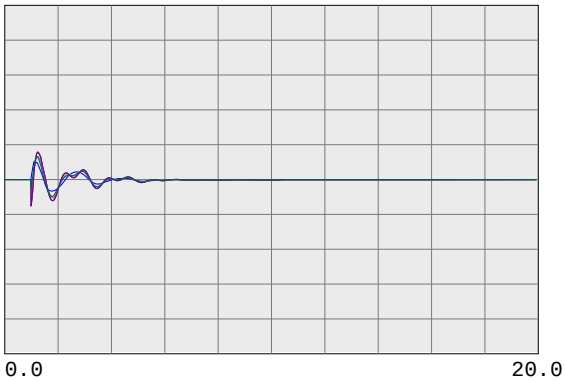
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



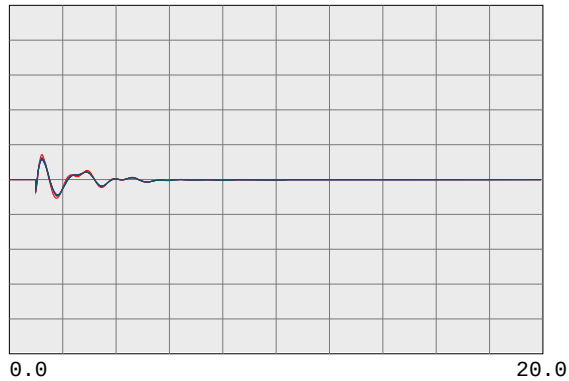
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



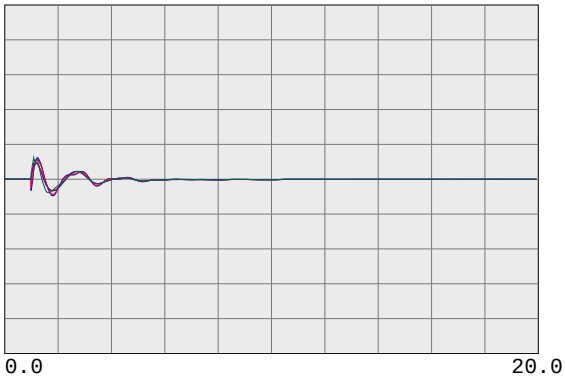
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



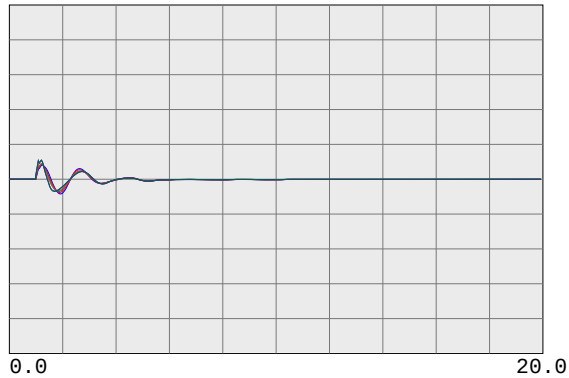
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

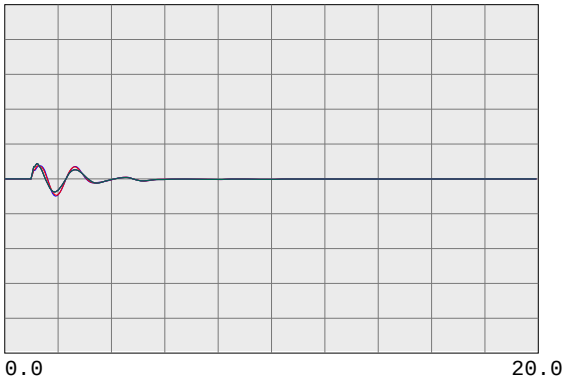
230-KV SYSTEM FREQUENCIES



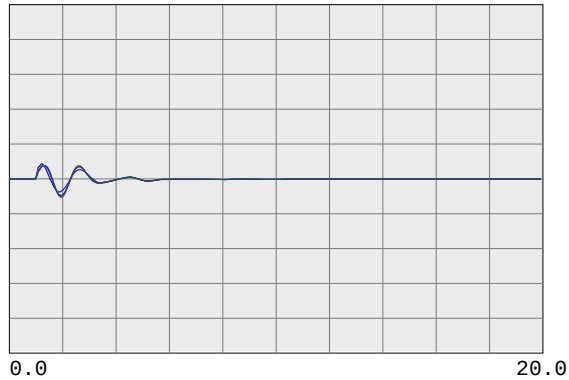
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



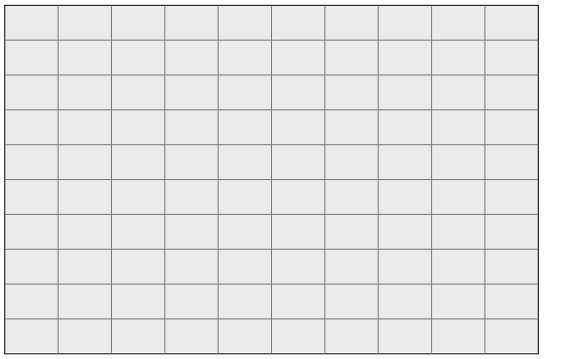
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

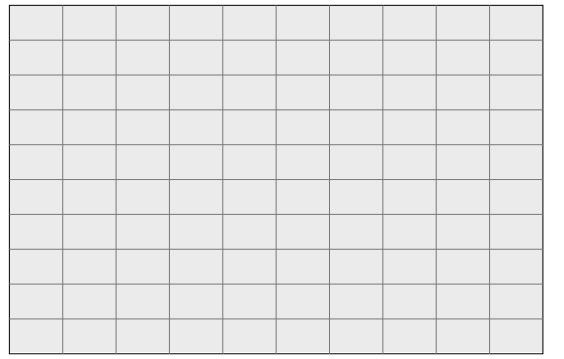


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



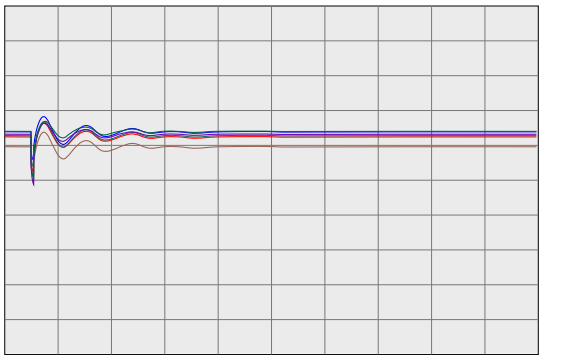
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



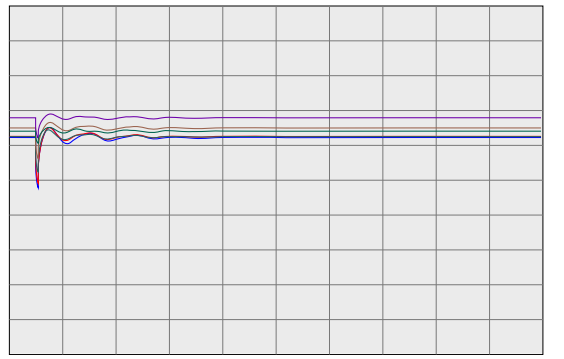


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

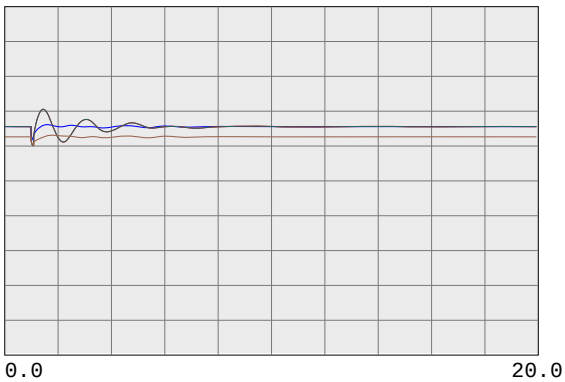
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



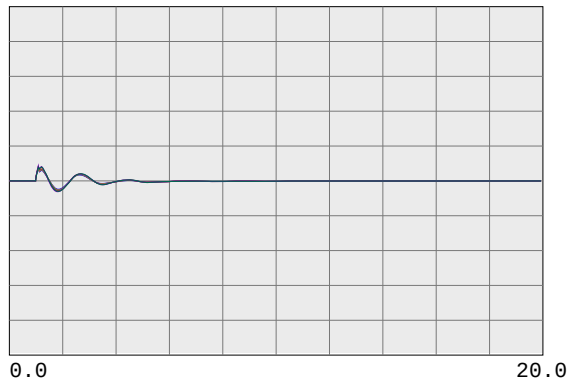
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



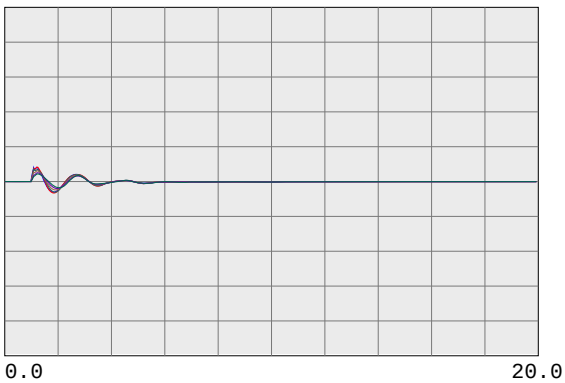
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



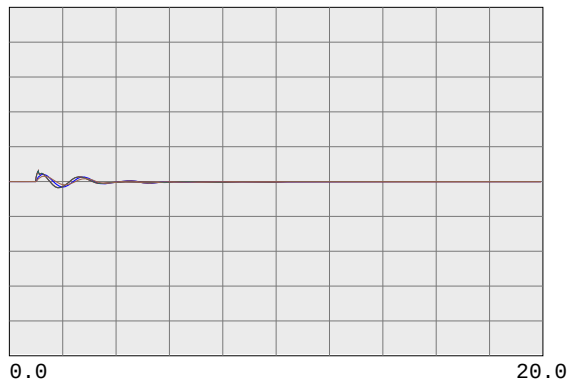
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



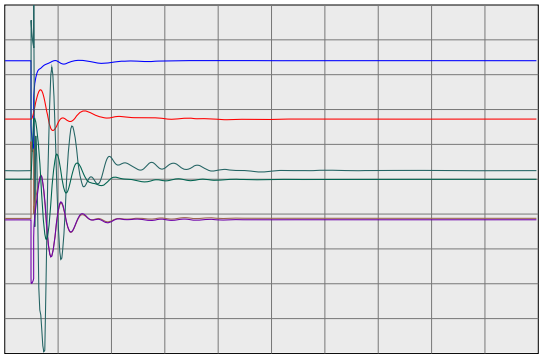
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



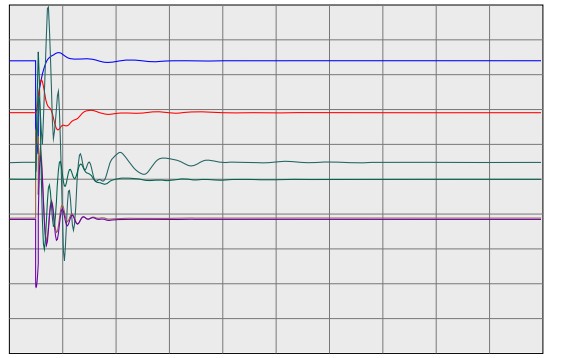
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

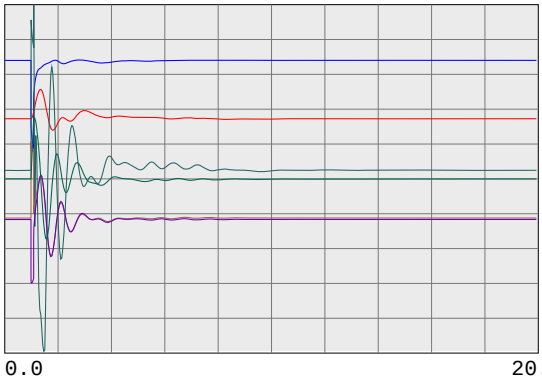
WILLOW PASS GENERATION PLANT



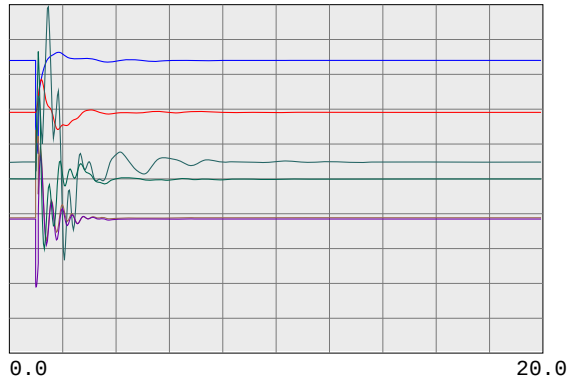
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



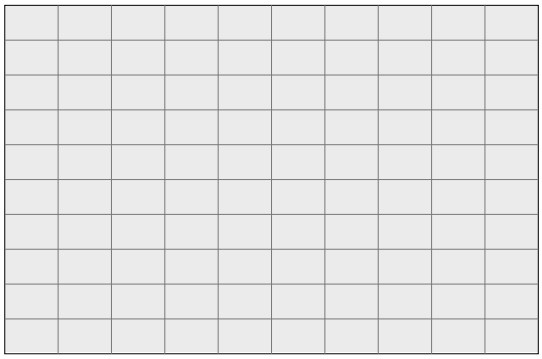
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

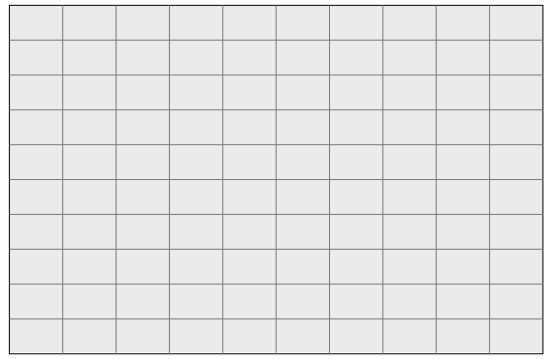


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



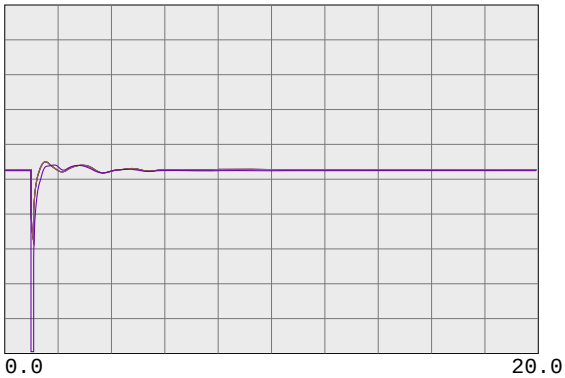
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



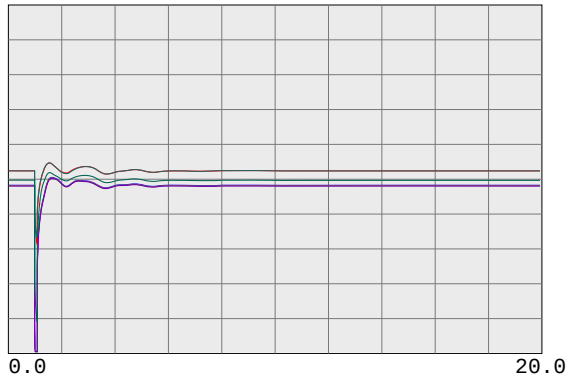


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

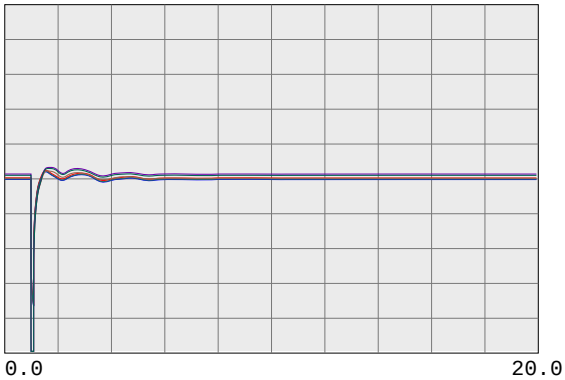
230-KV SYSTEM VOLTAGES



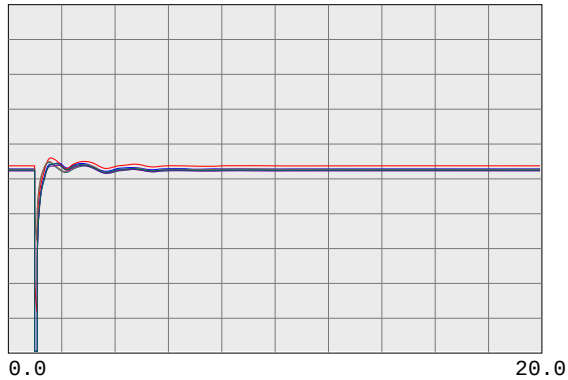
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



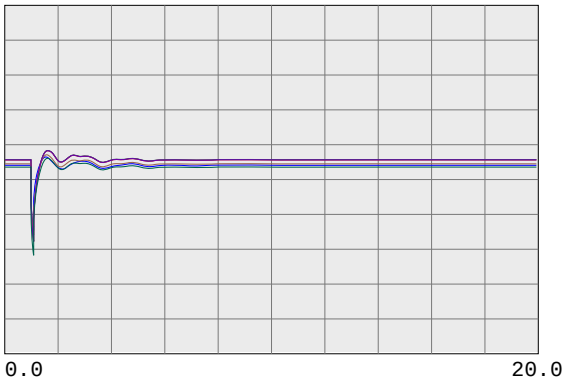
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



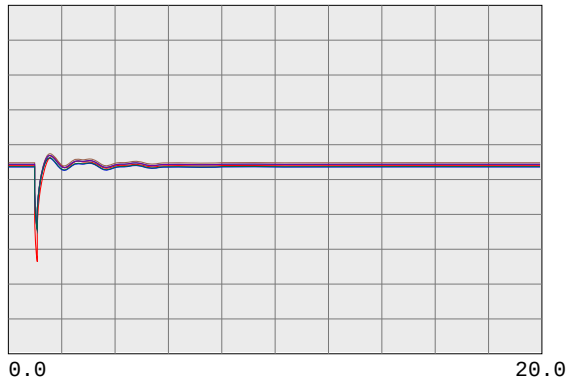
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



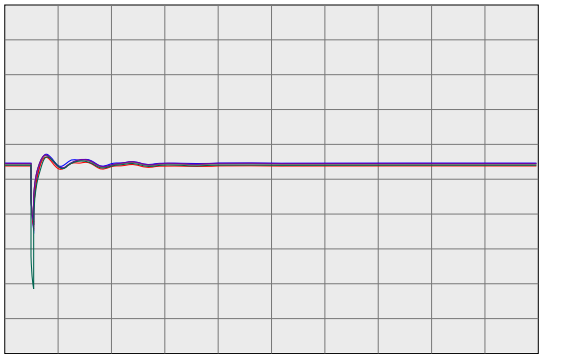
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



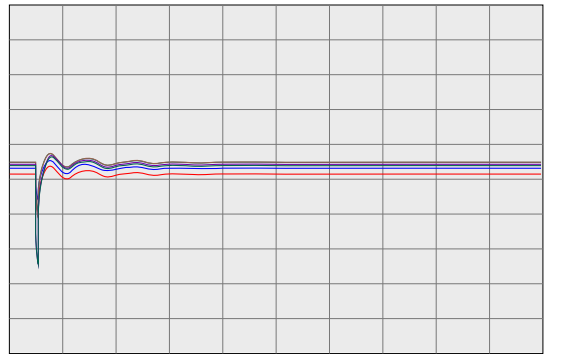
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

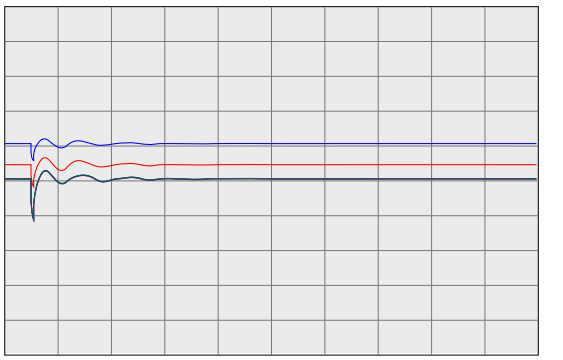
230-KV SYSTEM VOLTAGES



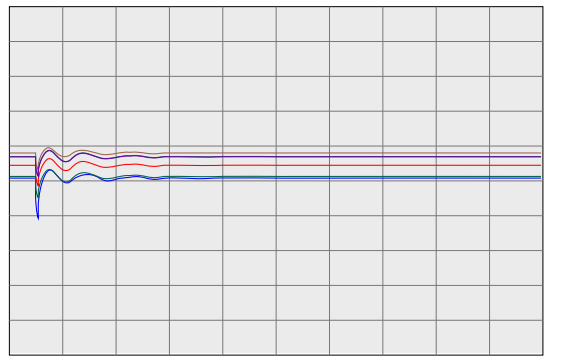
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



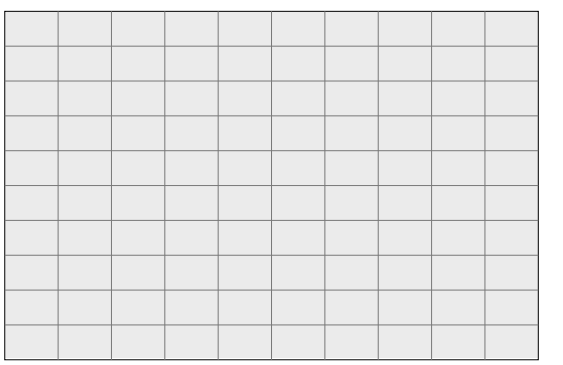
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

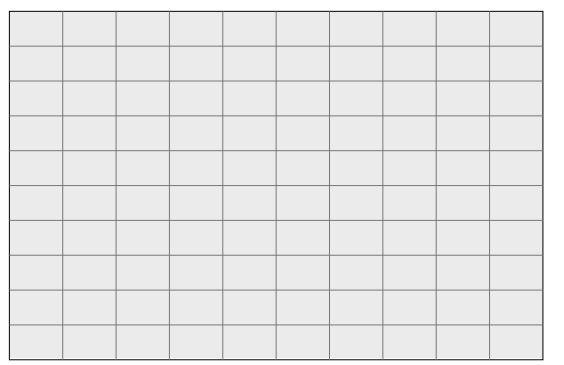


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



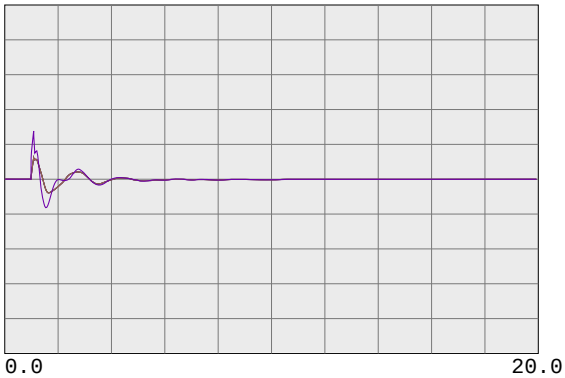
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



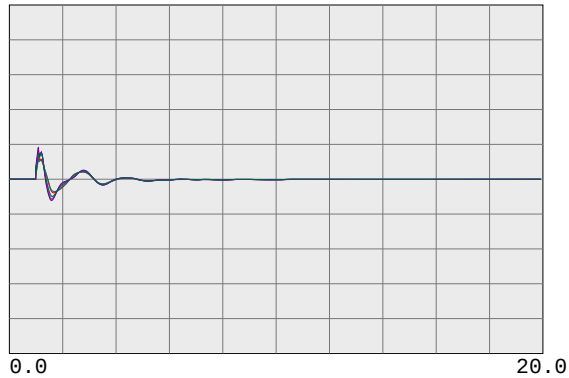


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

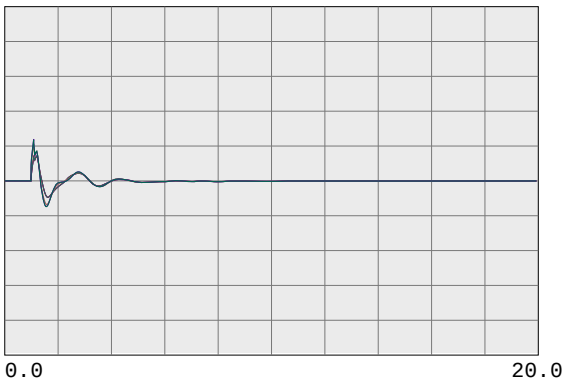
230-KV SYSTEM FREQUENCIES



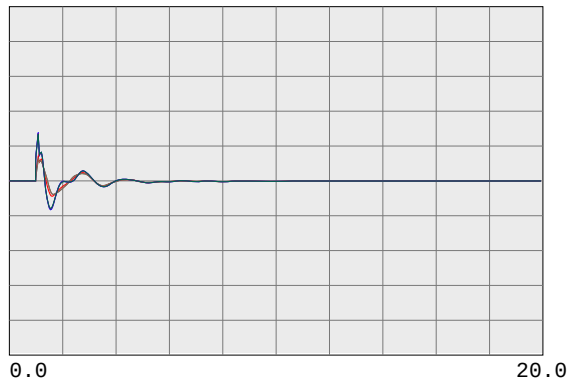
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



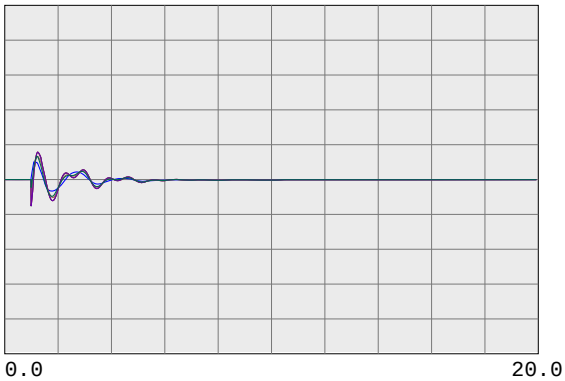
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



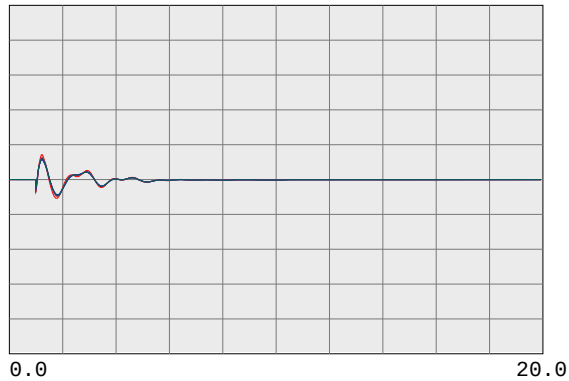
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



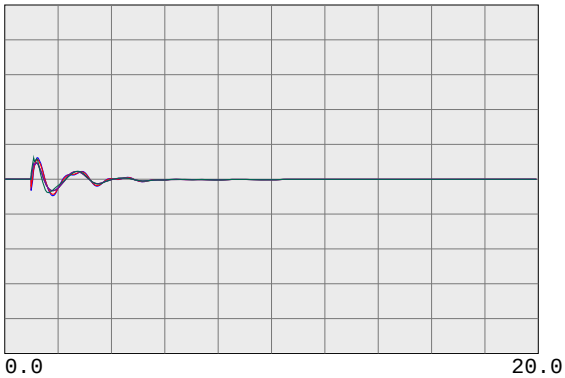
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



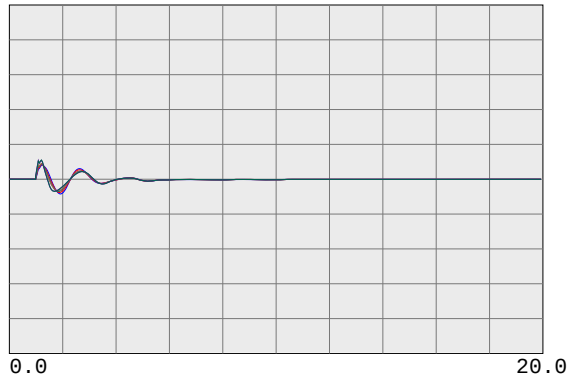
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

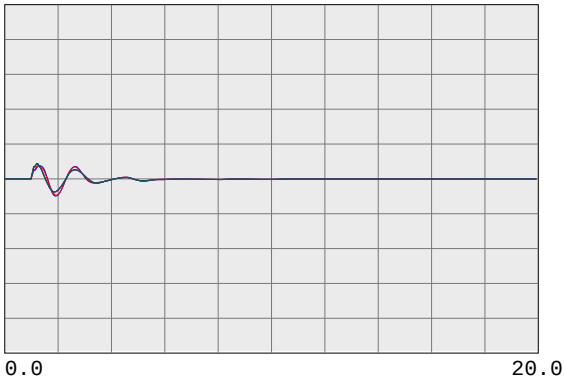
230-KV SYSTEM FREQUENCIES



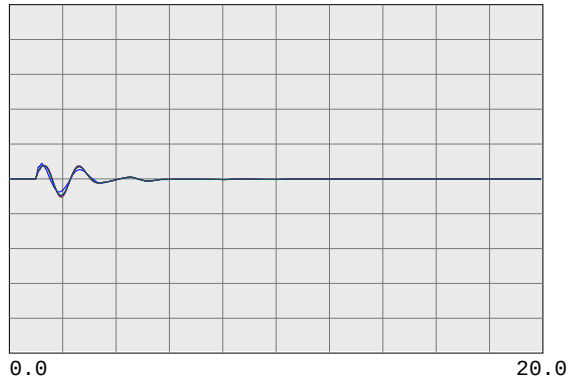
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



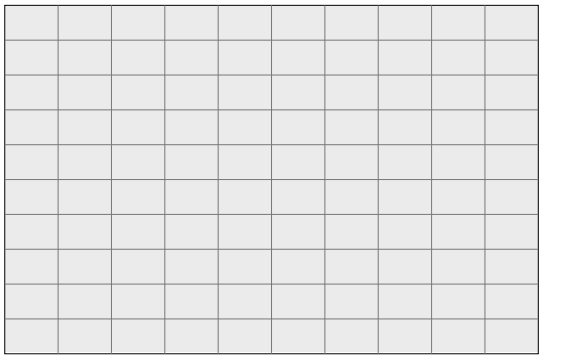
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

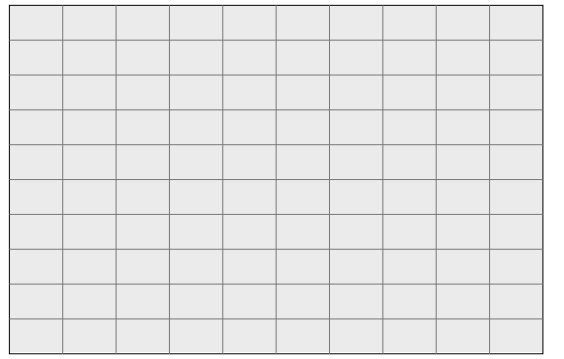


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



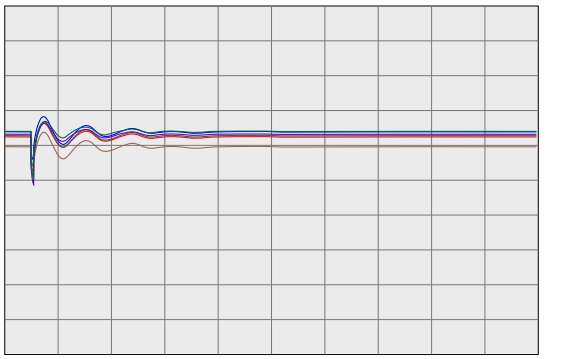
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



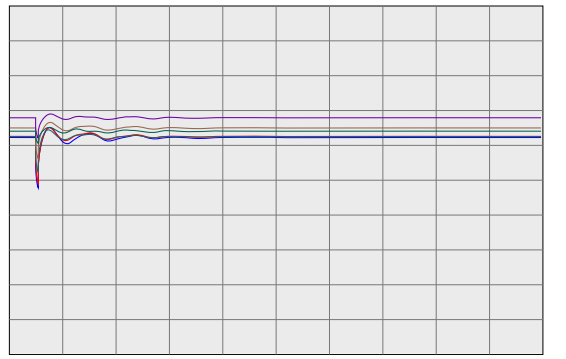


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

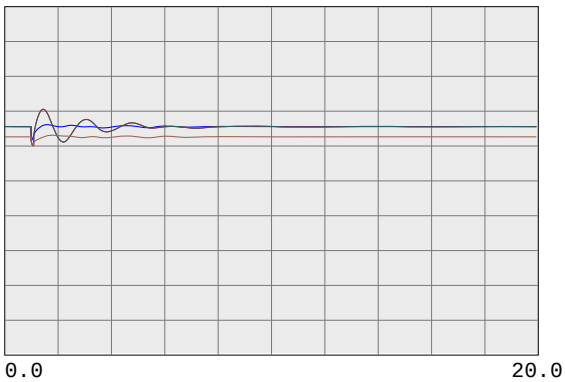
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



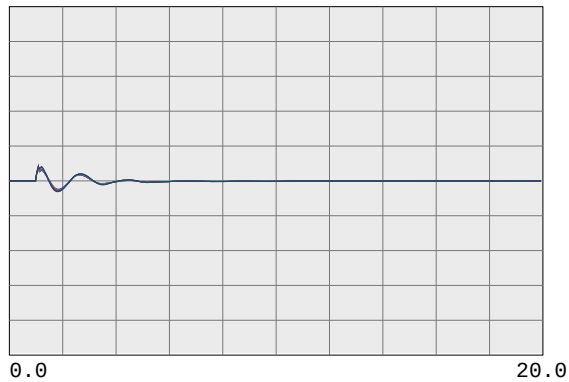
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



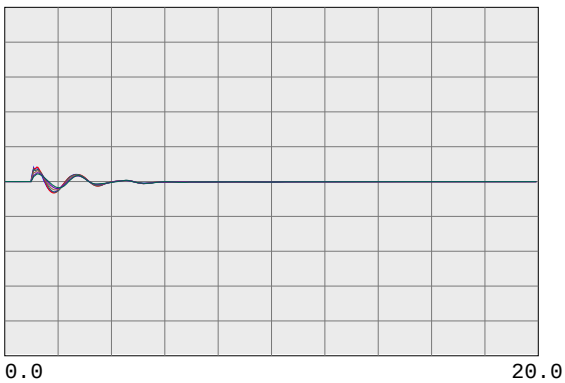
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



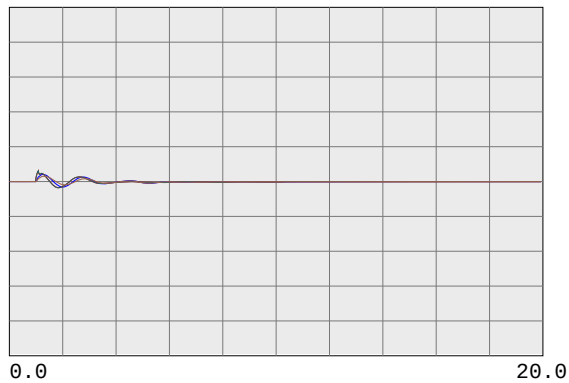
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



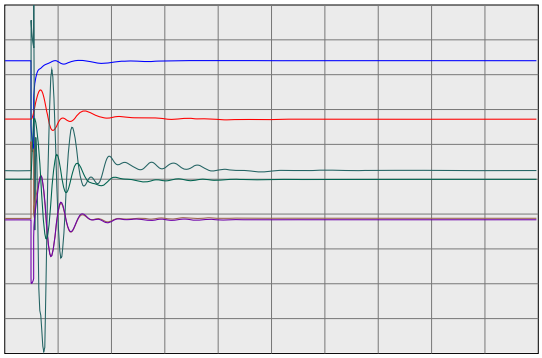
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



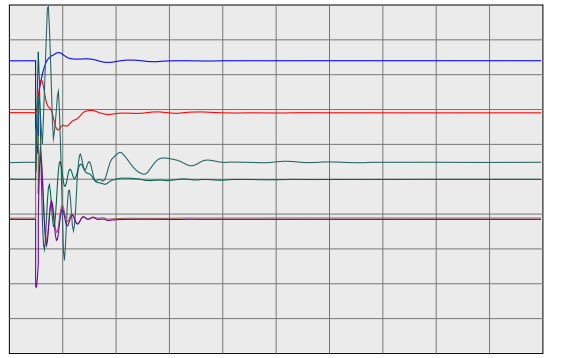
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

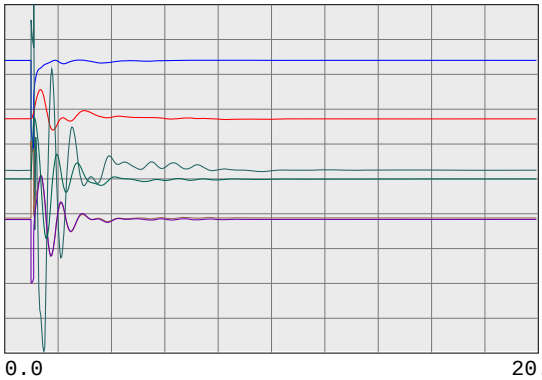
WILLOW PASS GENERATION PLANT



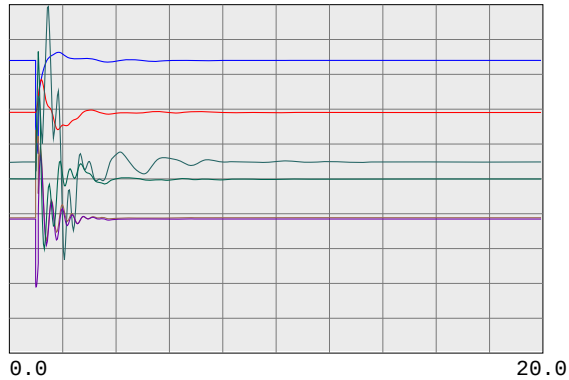
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



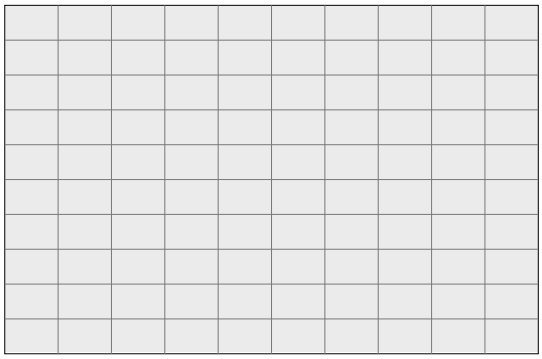
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

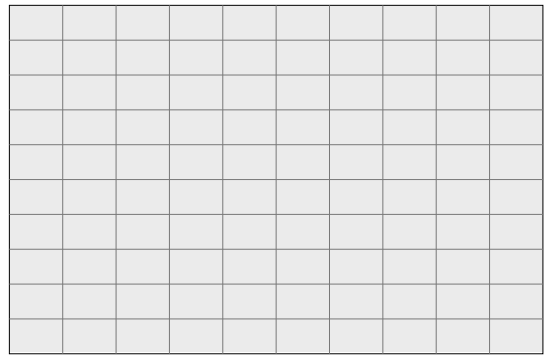


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



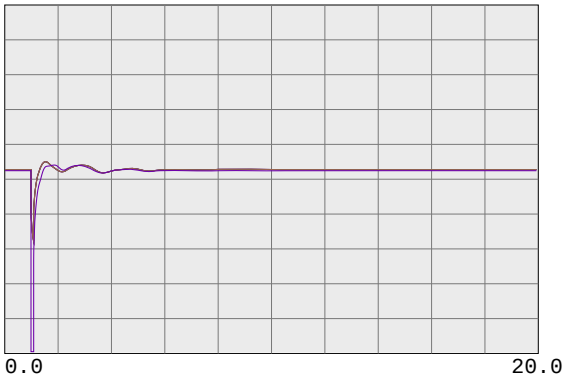
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



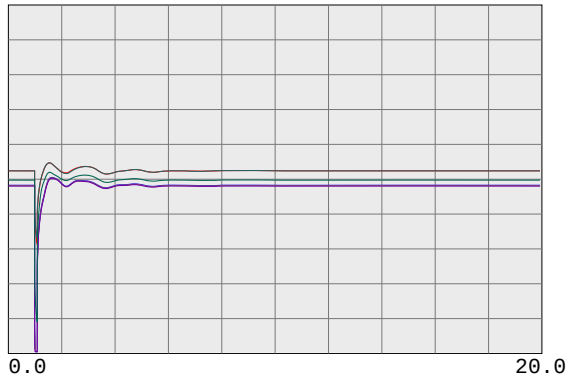


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

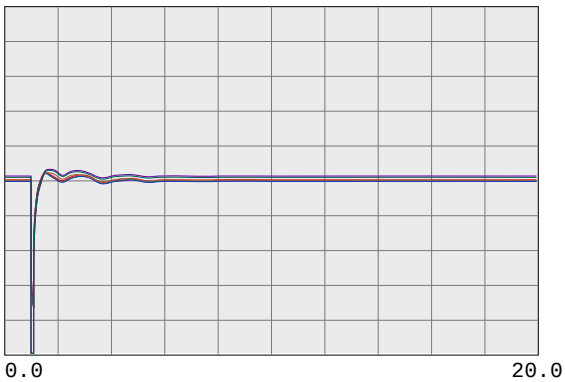
230-KV SYSTEM VOLTAGES



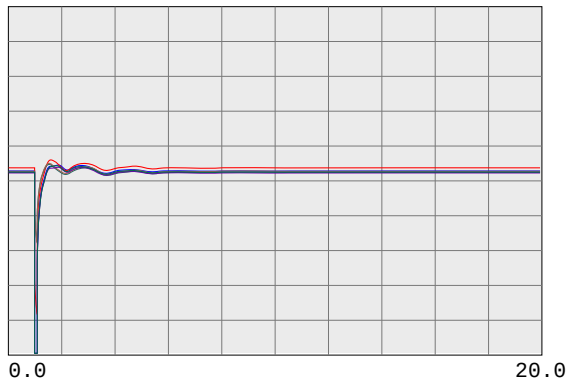
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



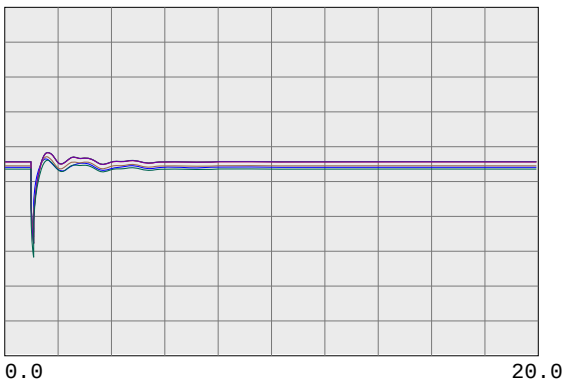
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



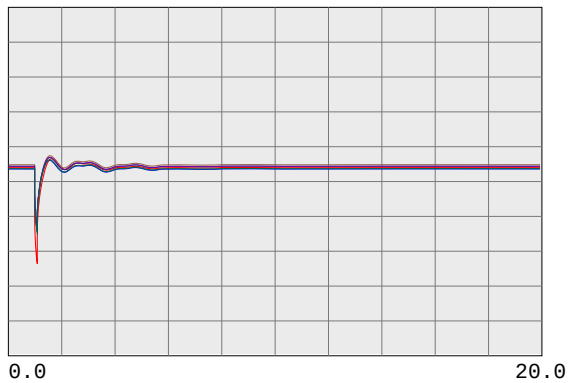
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



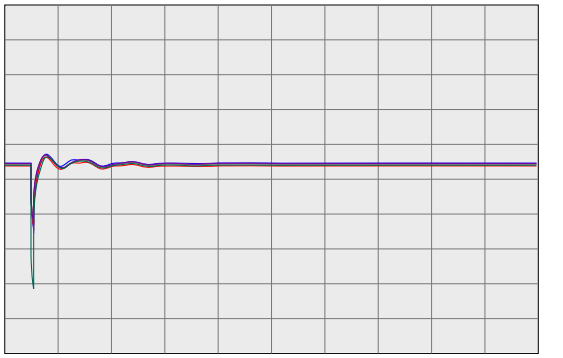
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



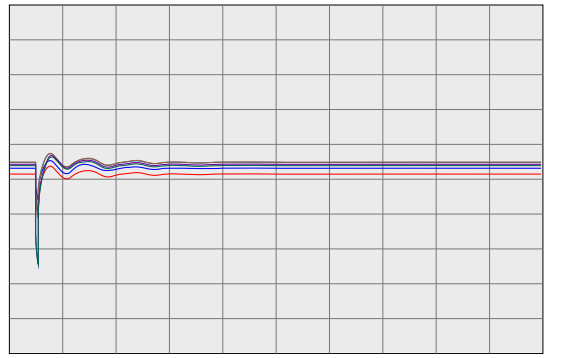
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

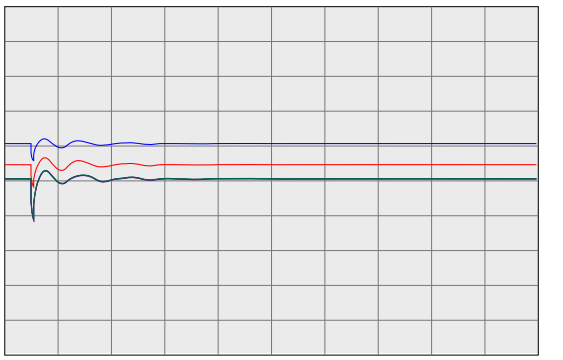
230-KV SYSTEM VOLTAGES



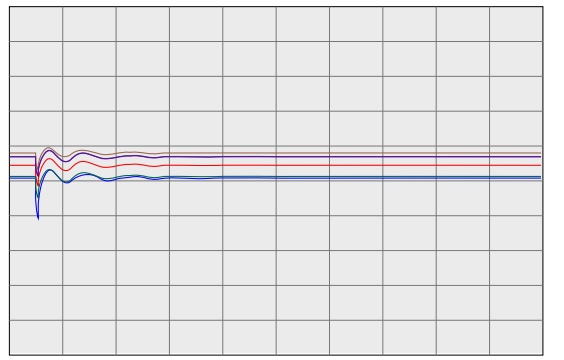
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



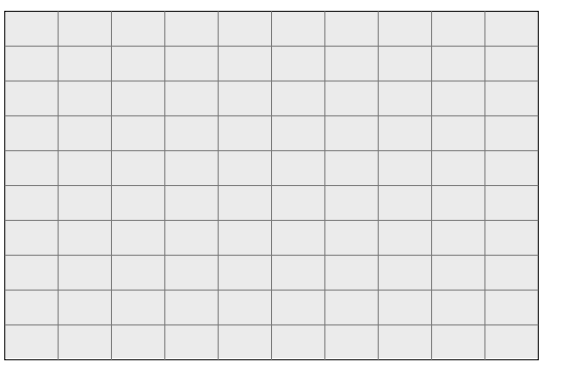
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

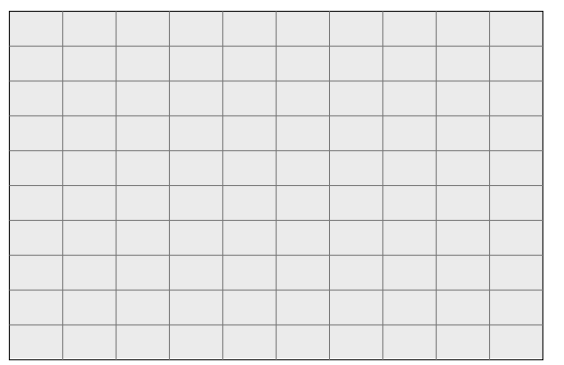


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



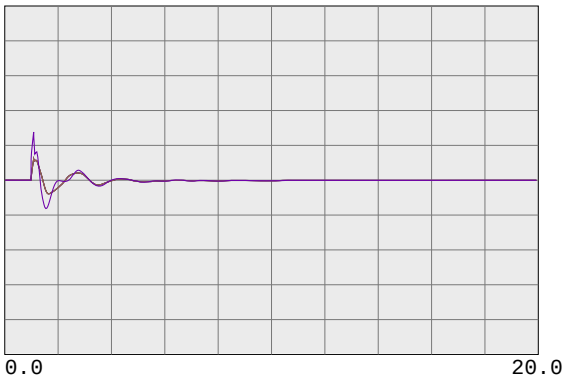
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



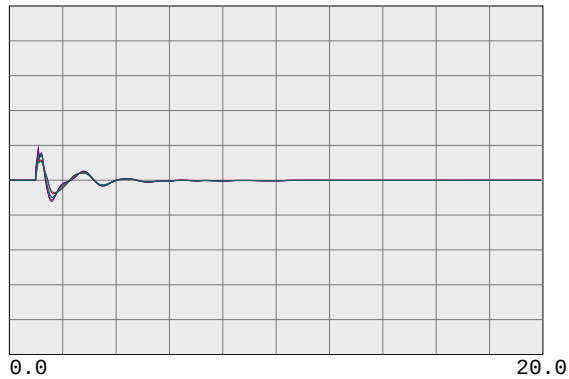


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

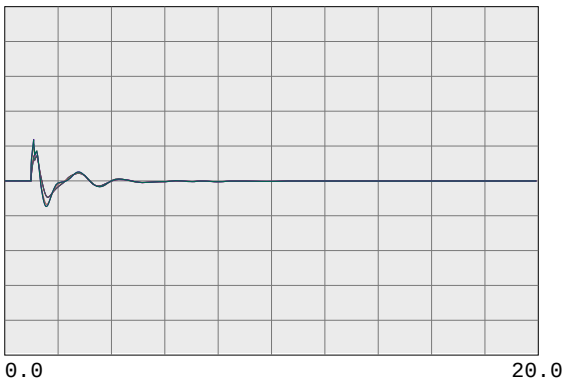
230-KV SYSTEM FREQUENCIES



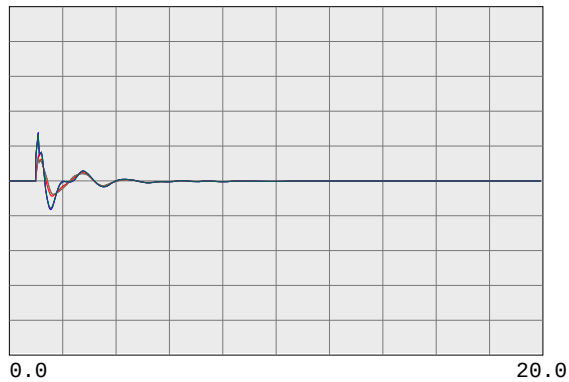
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



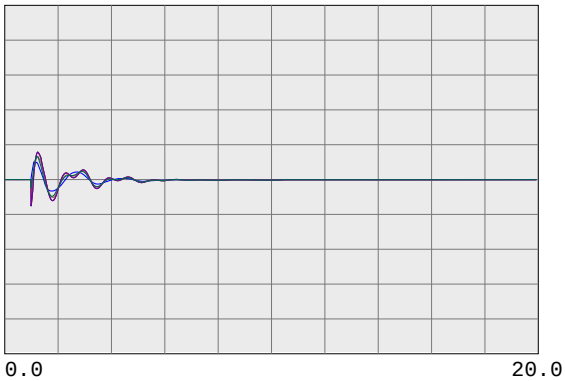
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



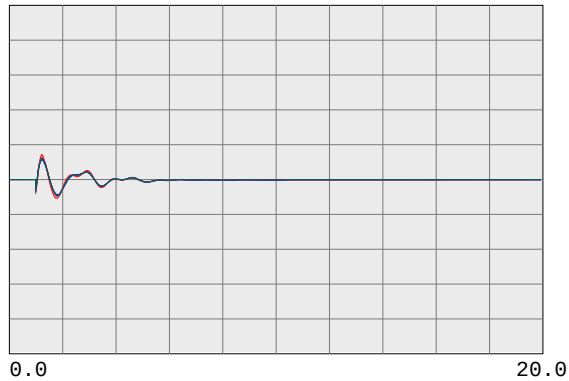
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



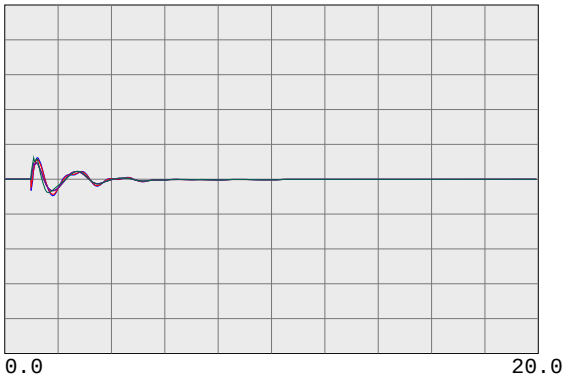
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



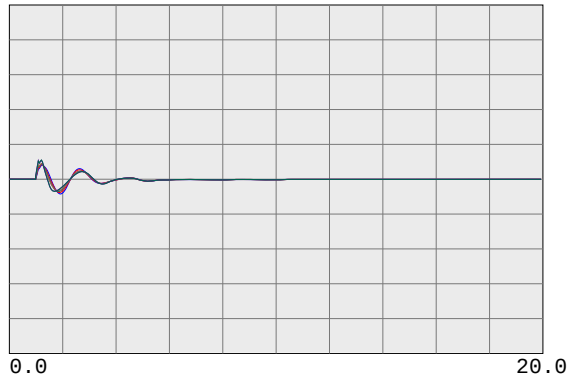
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

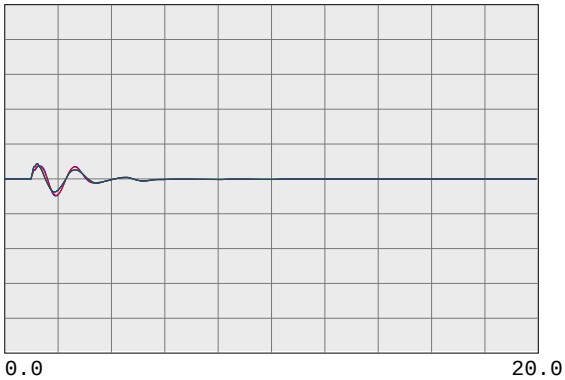
230-KV SYSTEM FREQUENCIES



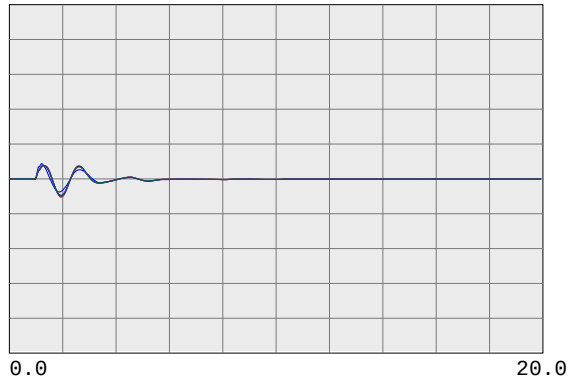
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



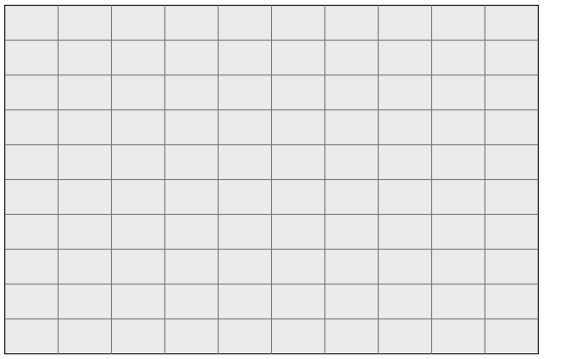
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

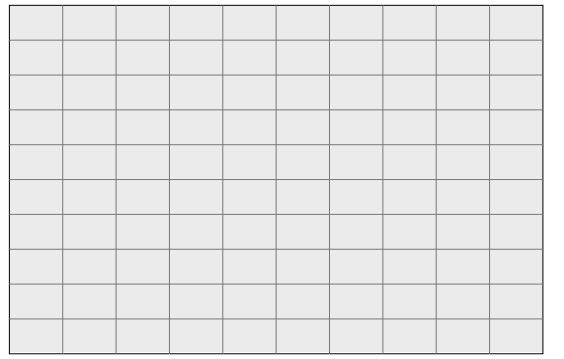


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



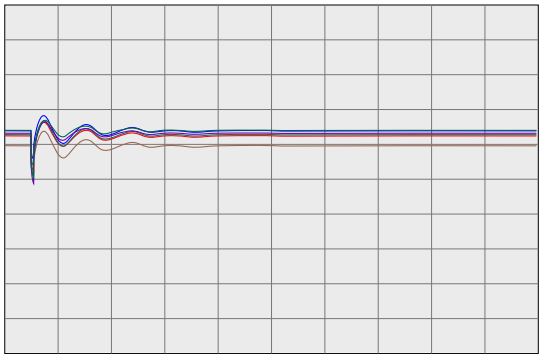
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

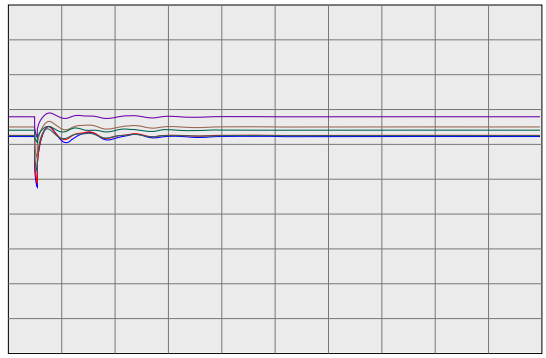
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.0 20.0

Time(sec)

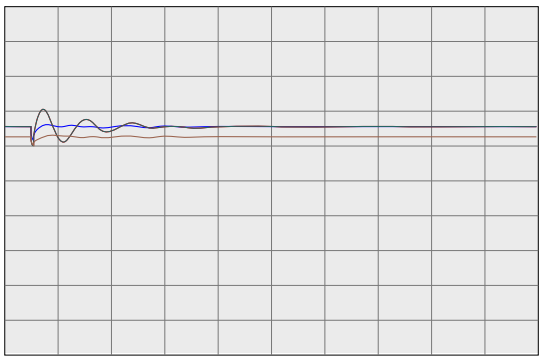
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

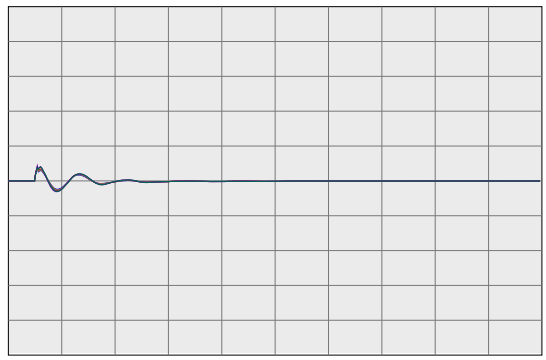
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

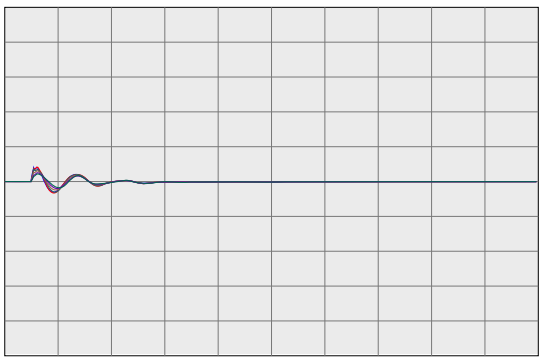
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

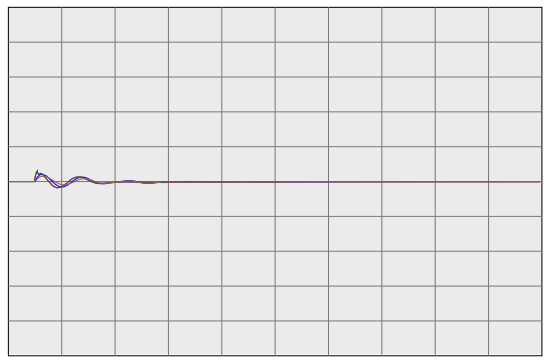
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



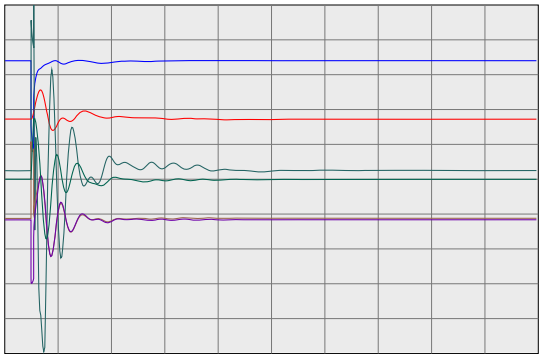
0.0 20.0

Time(sec)

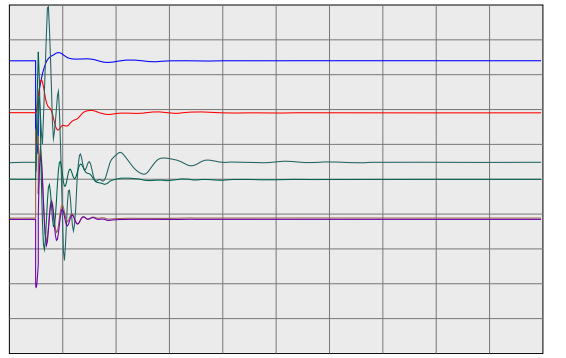
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

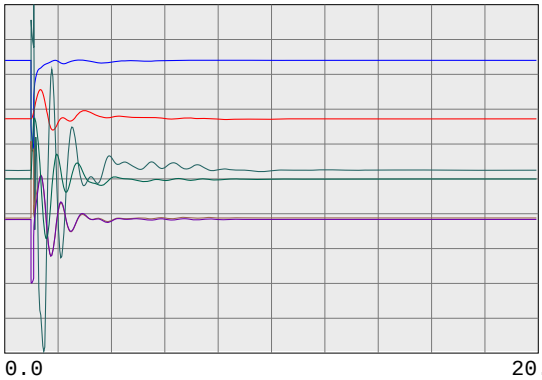
WILLOW PASS GENERATION PLANT



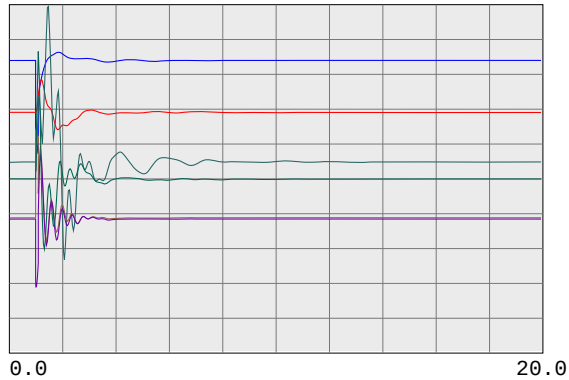
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



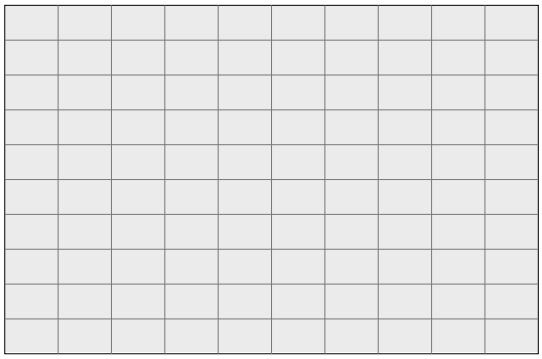
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

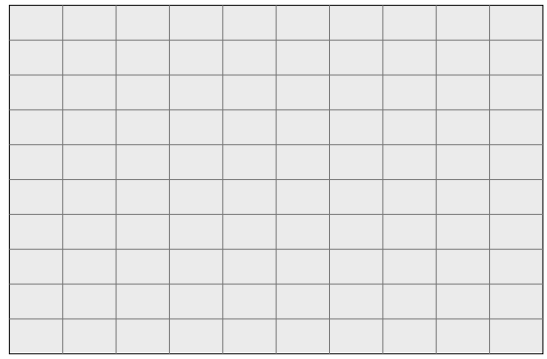


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



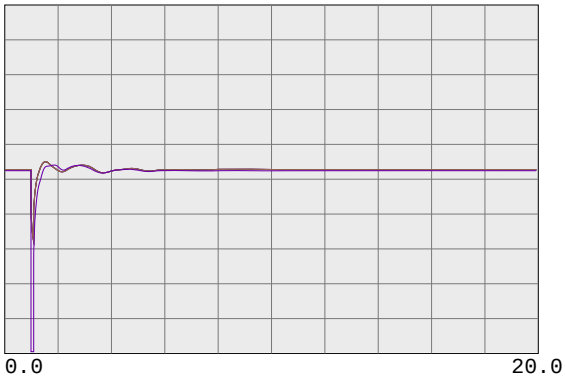
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



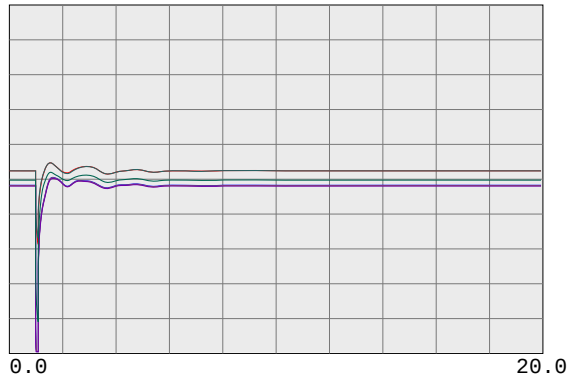


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

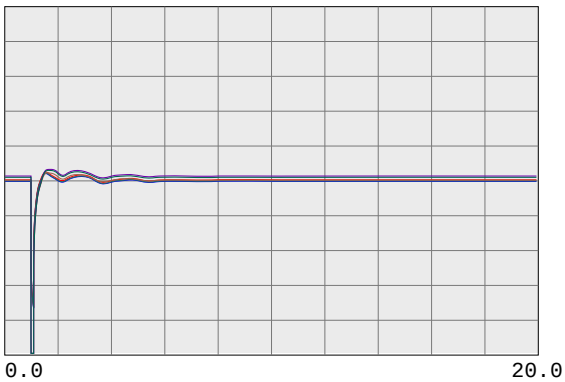
230-KV SYSTEM VOLTAGES



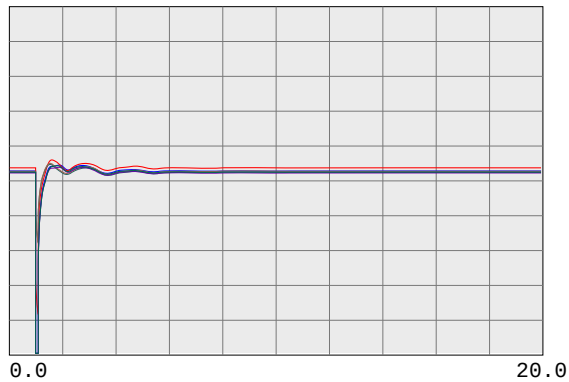
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



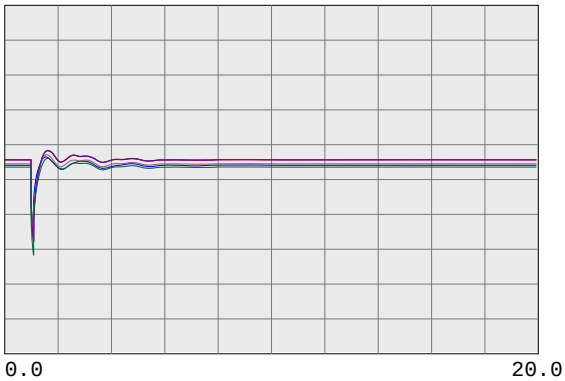
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



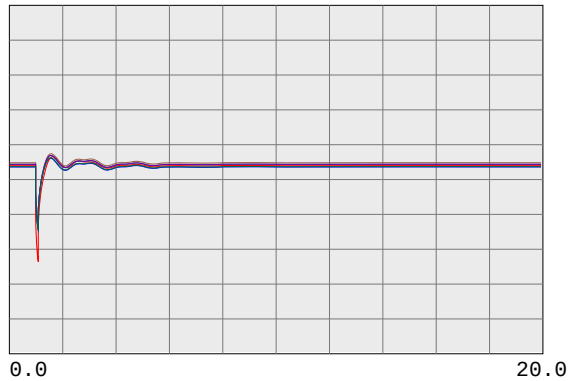
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



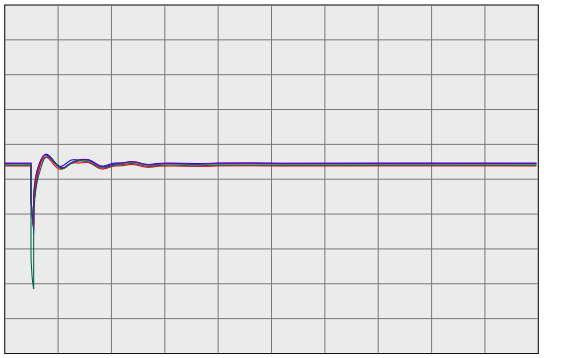
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



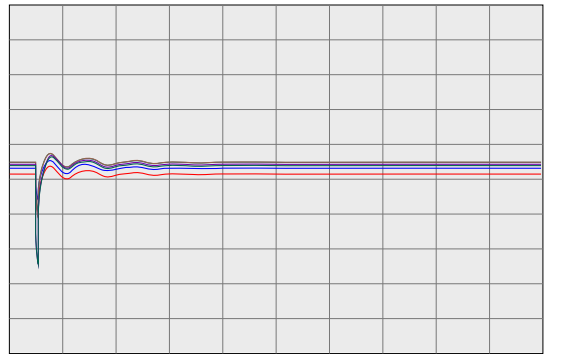
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

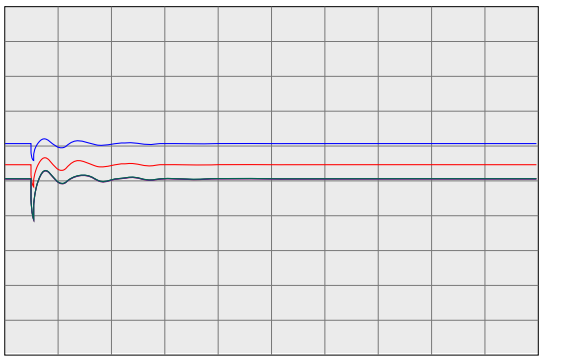
230-KV SYSTEM VOLTAGES



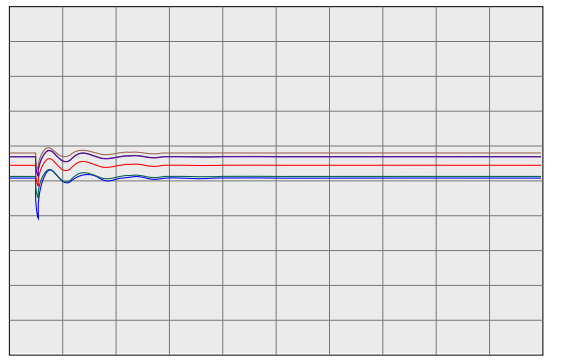
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



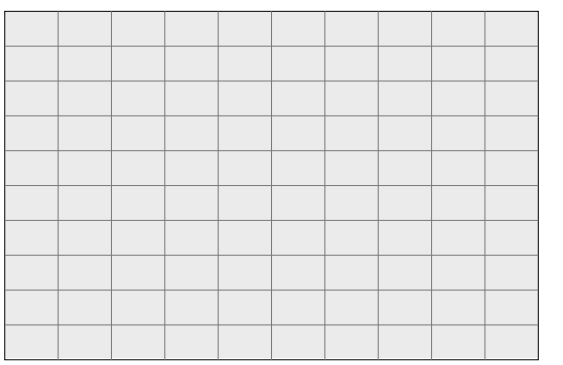
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

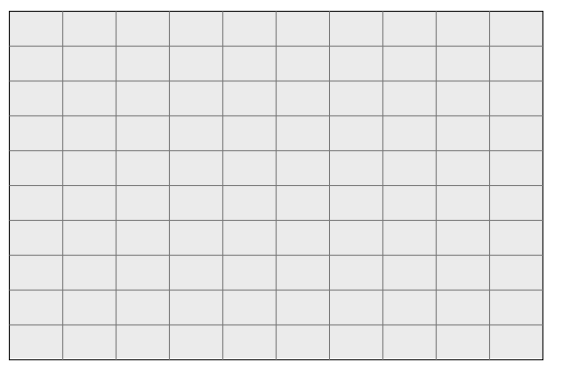


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



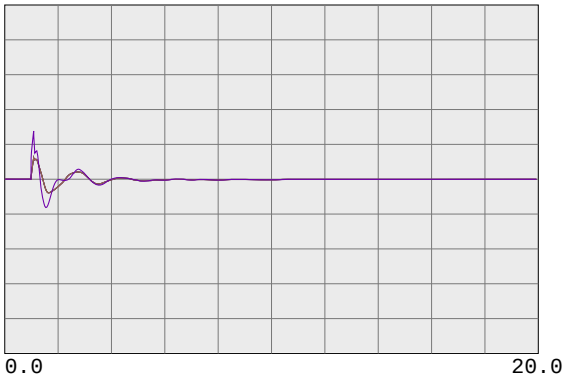
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



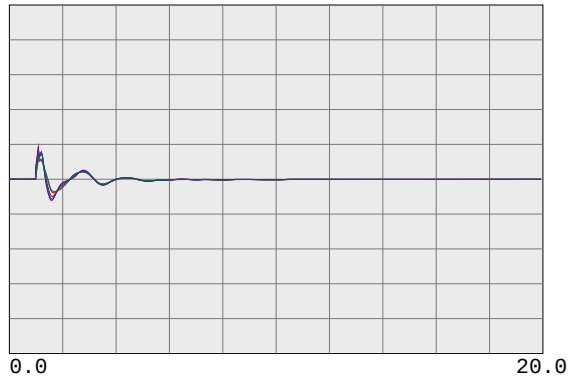


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

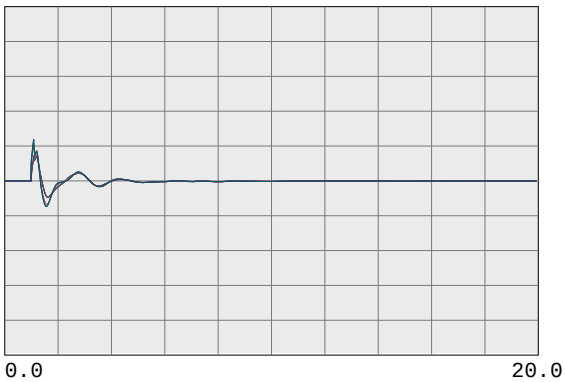
230-KV SYSTEM FREQUENCIES



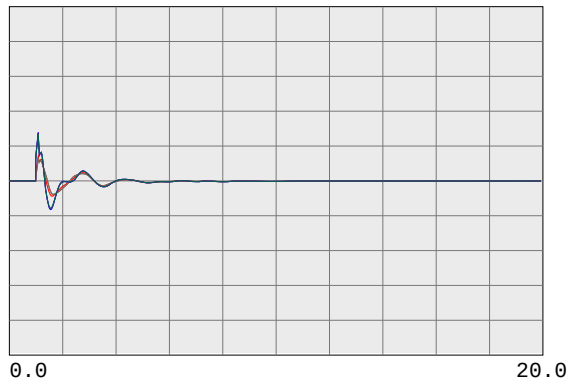
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



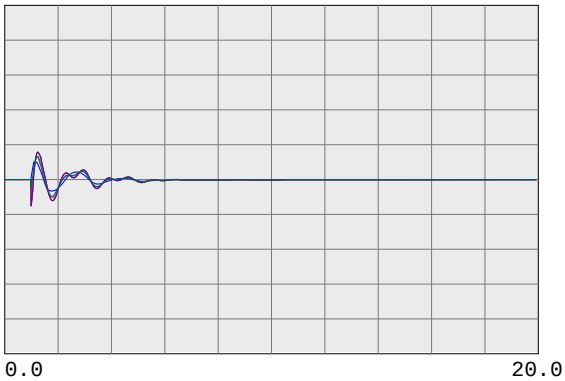
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



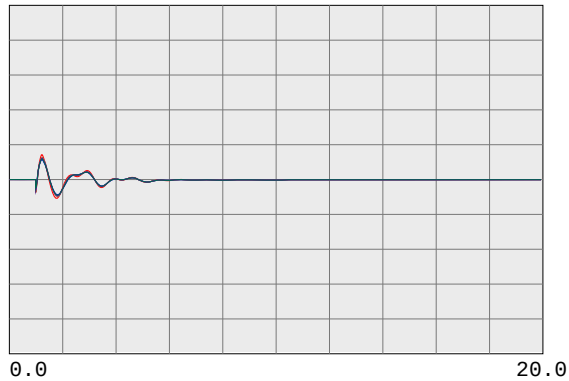
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



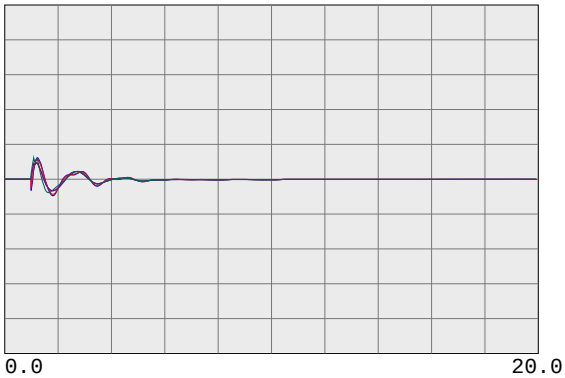
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



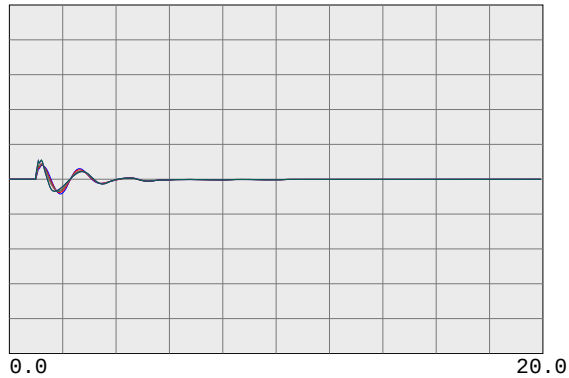
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

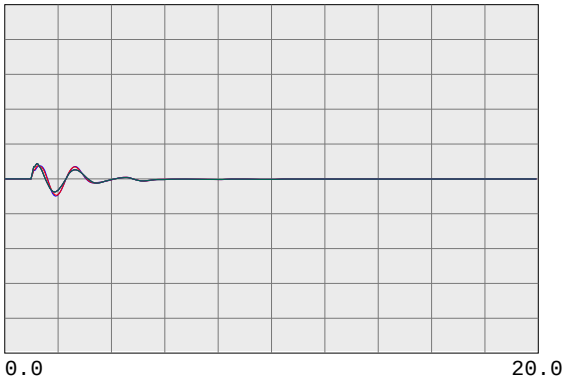
230-KV SYSTEM FREQUENCIES



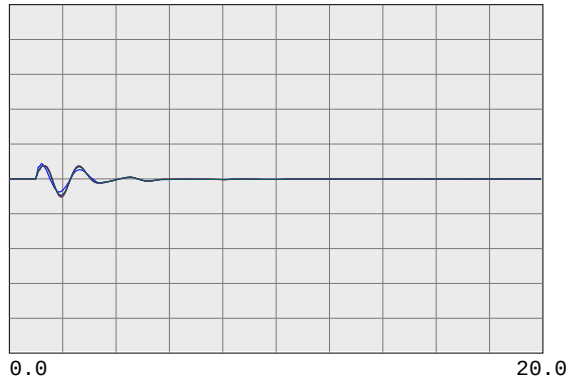
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



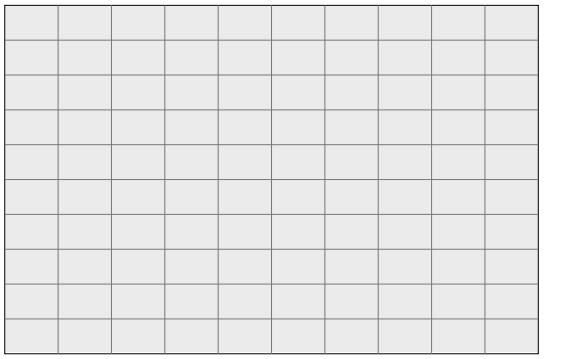
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

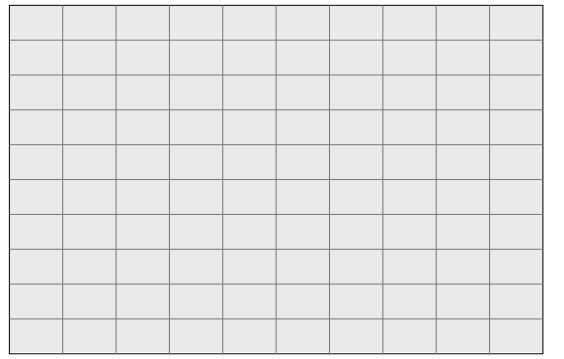


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



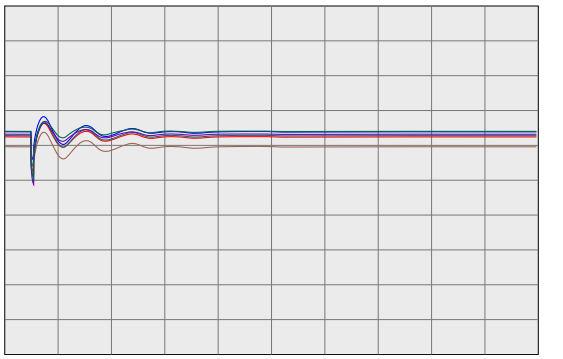
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



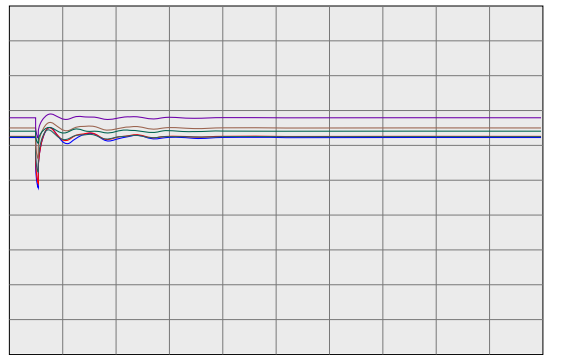


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

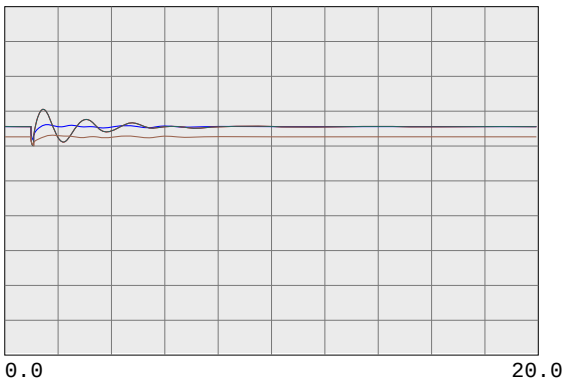
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



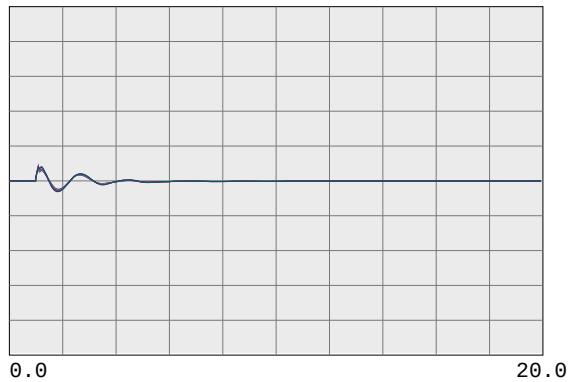
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



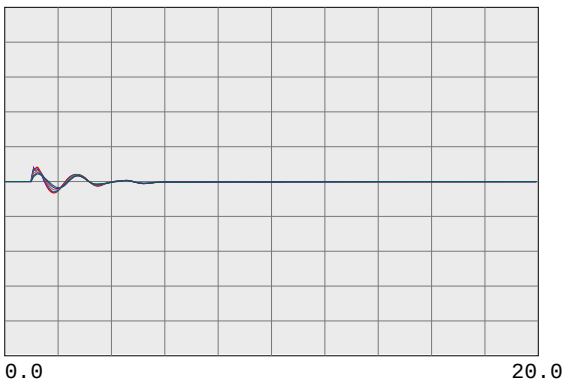
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



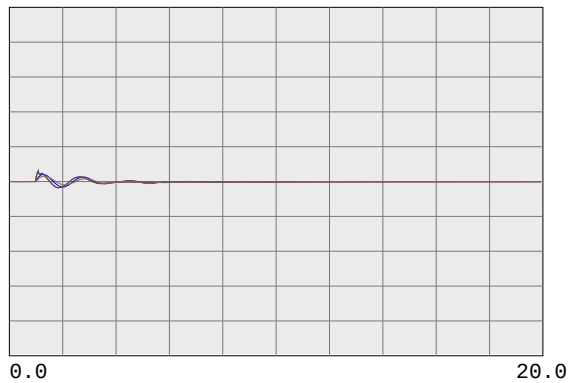
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



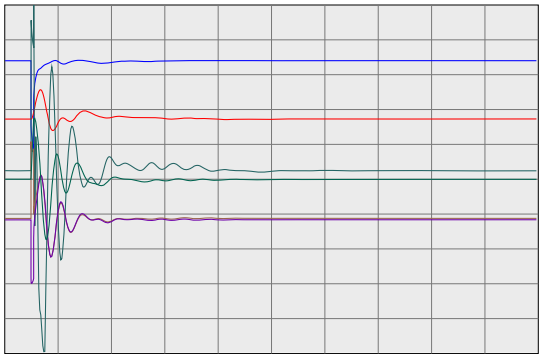
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



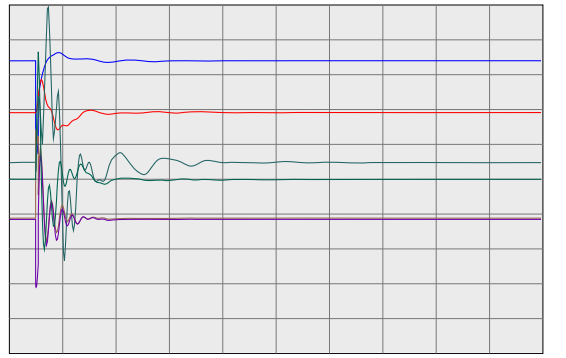
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

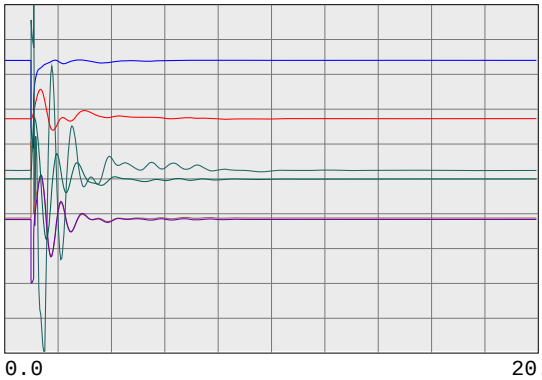
WILLOW PASS GENERATION PLANT



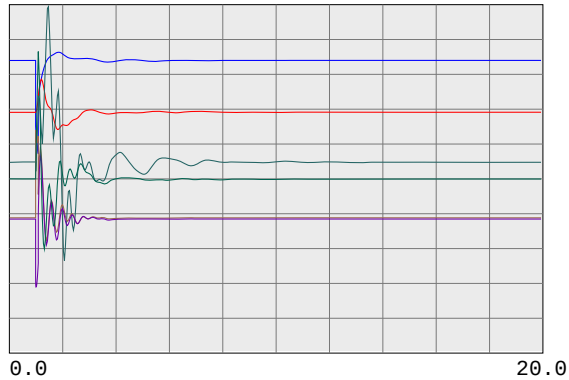
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



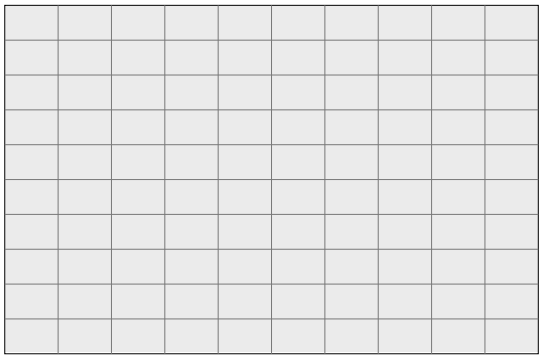
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

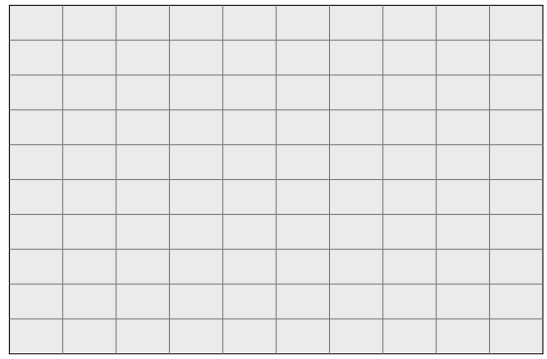


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



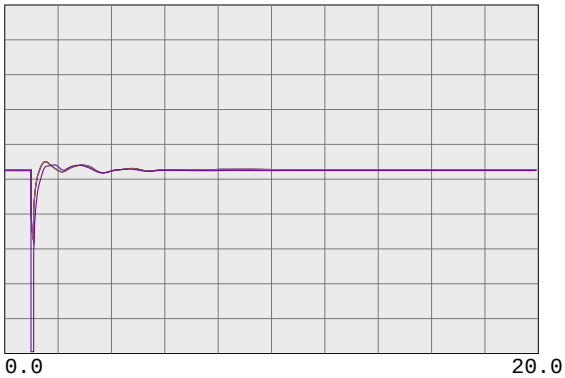
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



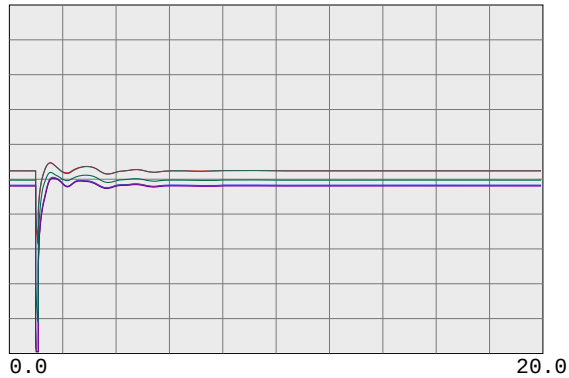


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

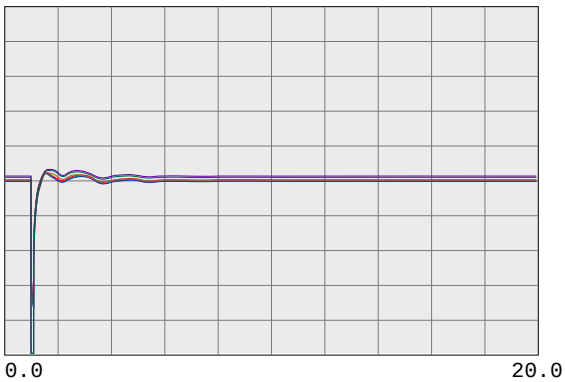
230-KV SYSTEM VOLTAGES



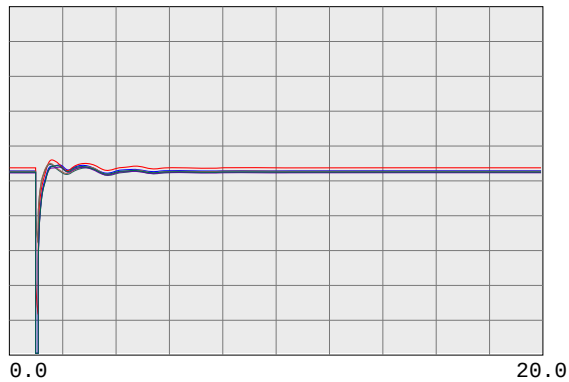
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



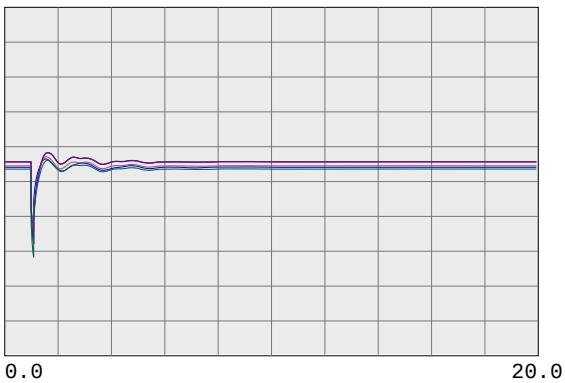
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



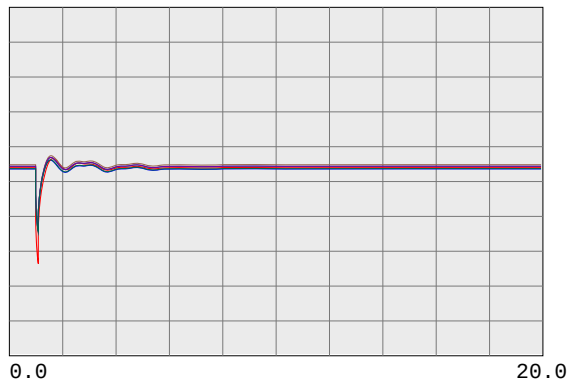
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



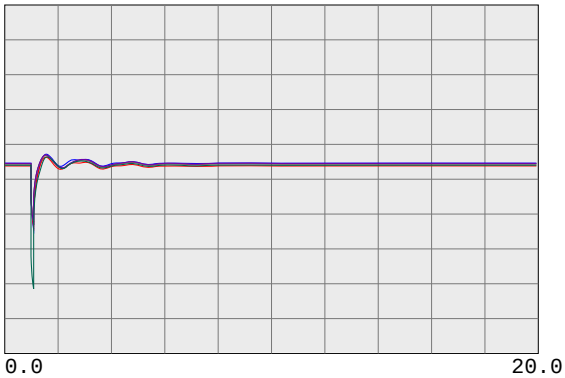
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



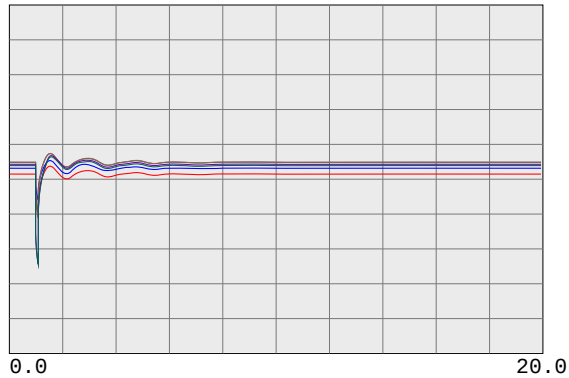
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

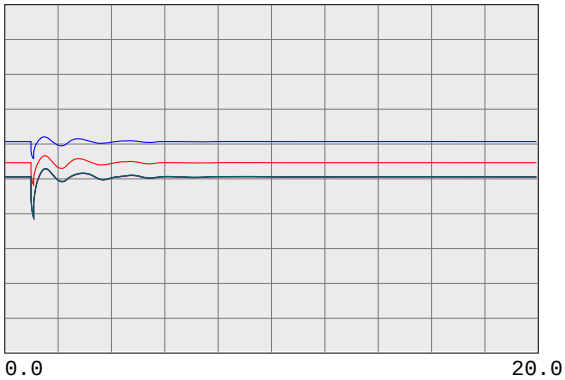
230-KV SYSTEM VOLTAGES



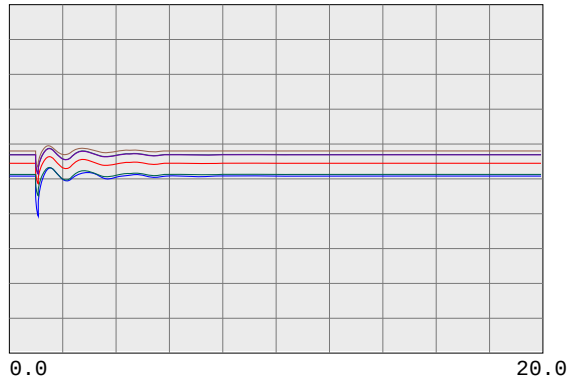
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



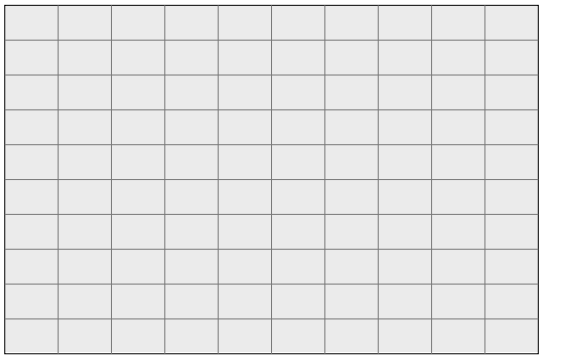
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

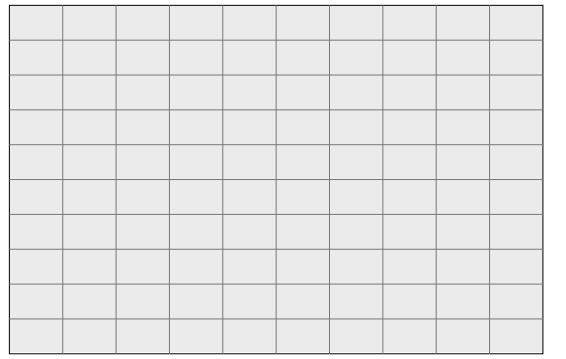


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



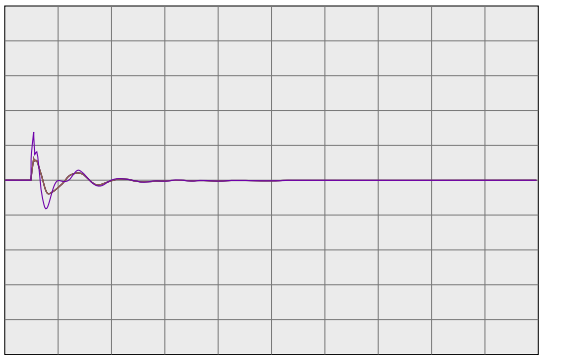
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



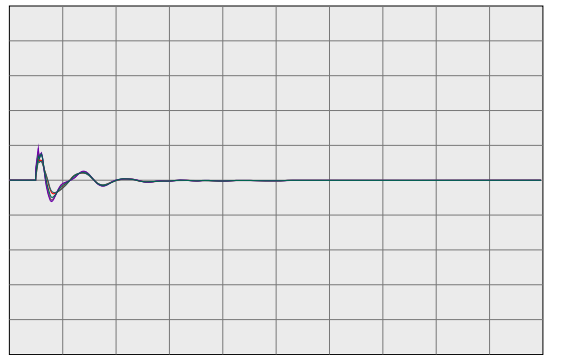


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

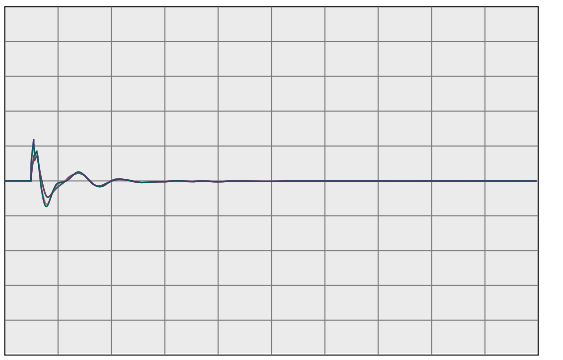
230-KV SYSTEM FREQUENCIES



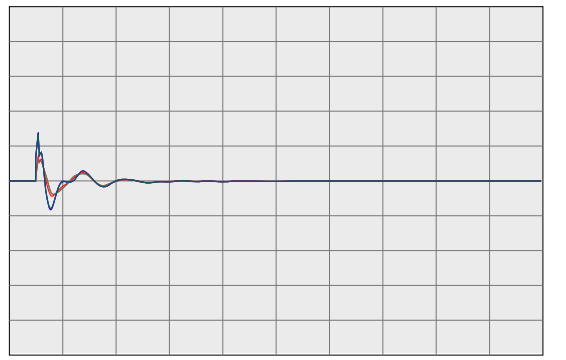
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



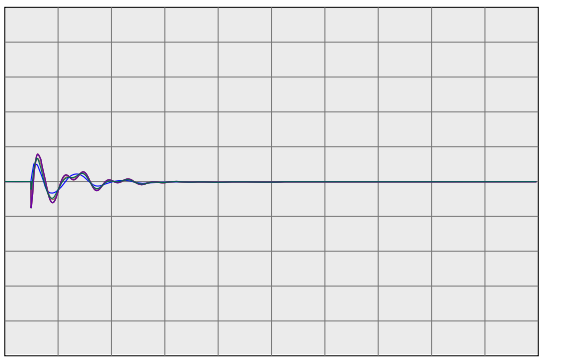
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



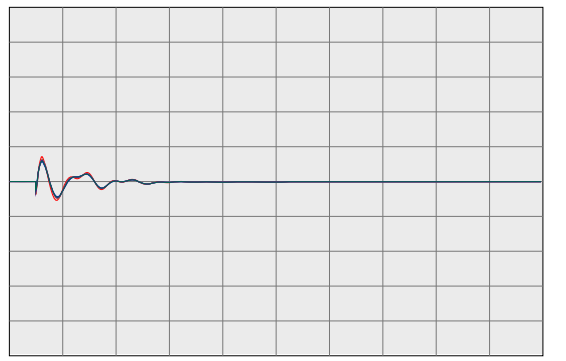
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



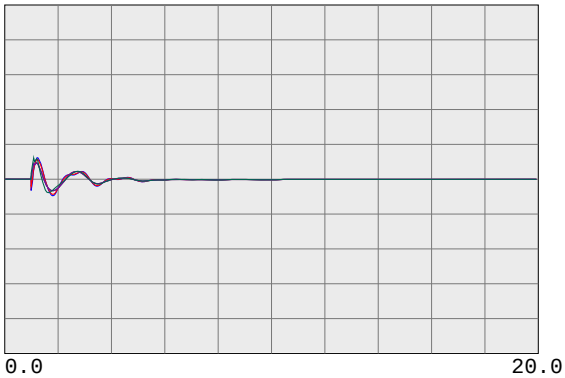
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



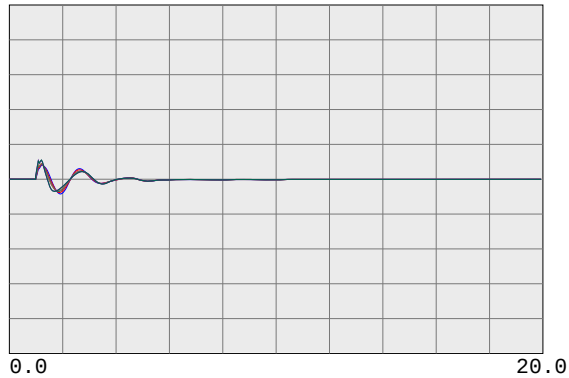
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

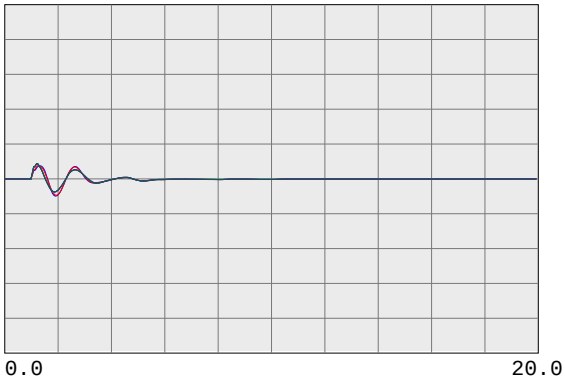
230-KV SYSTEM FREQUENCIES



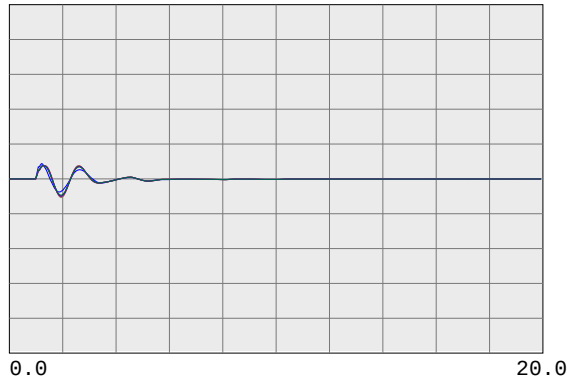
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



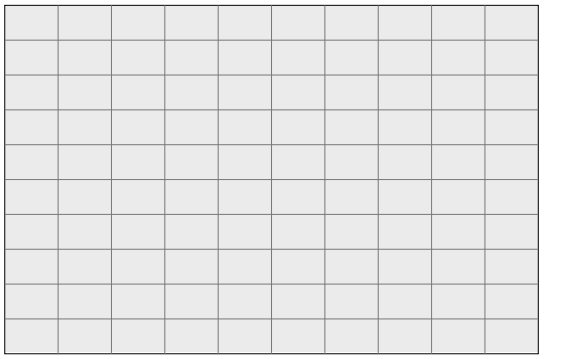
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

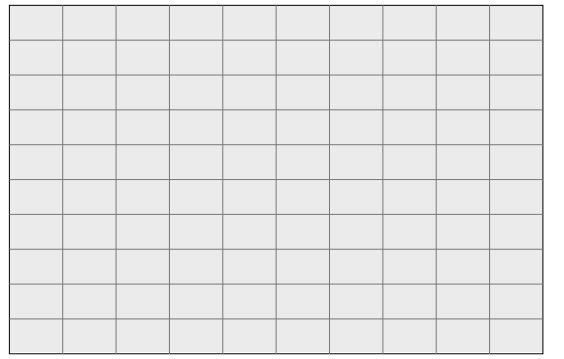


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



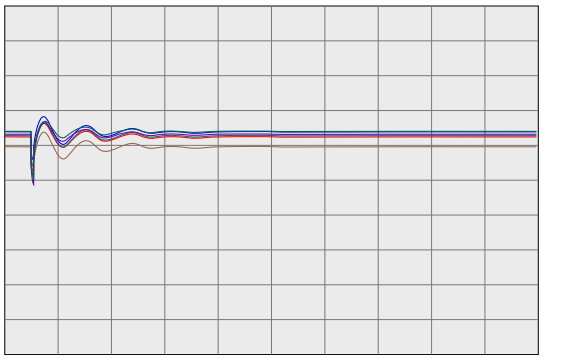
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



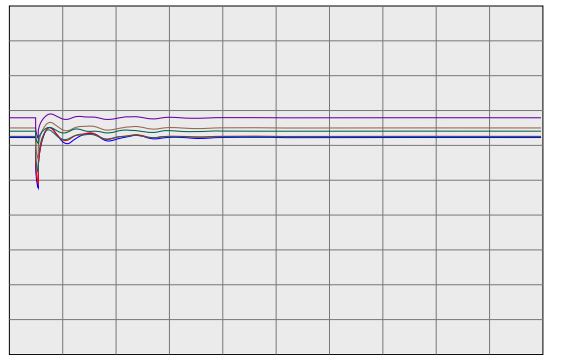


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

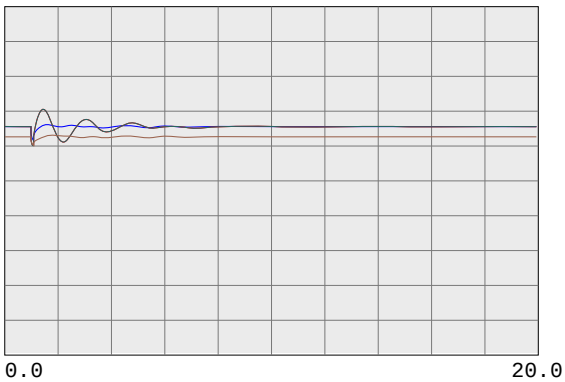
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



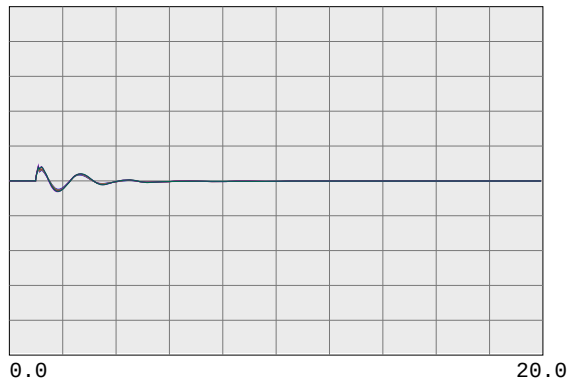
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



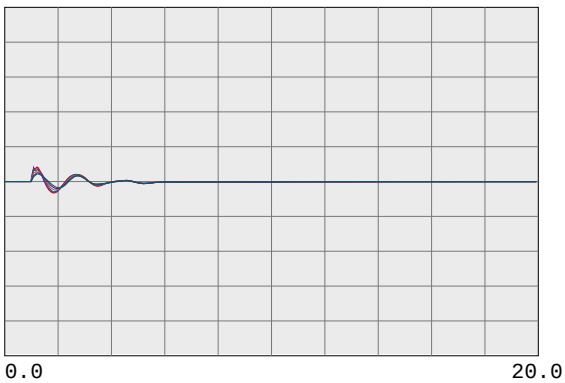
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



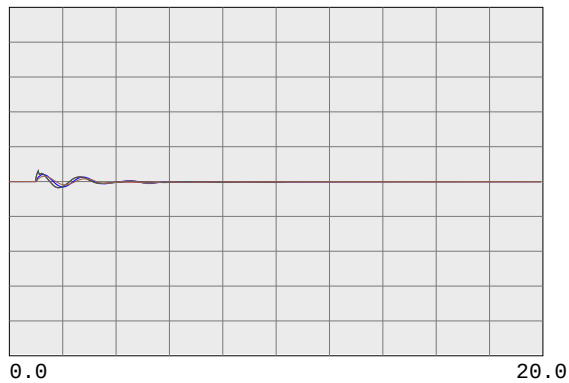
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



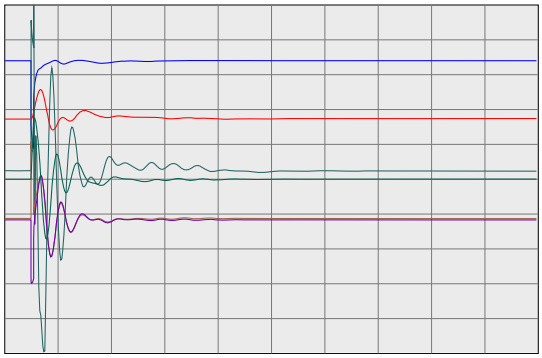
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



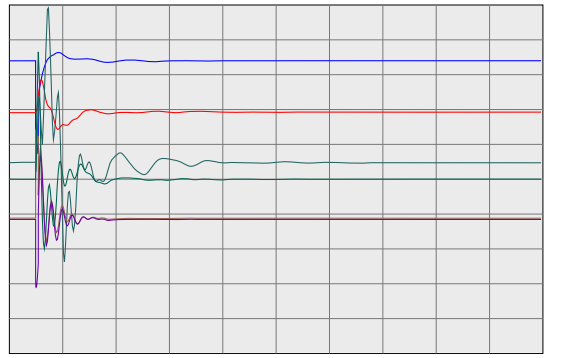
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

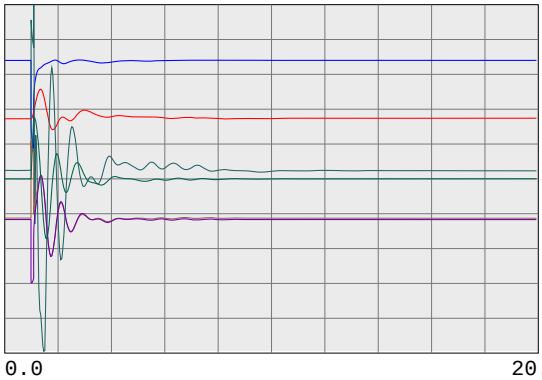
WILLOW PASS GENERATION PLANT



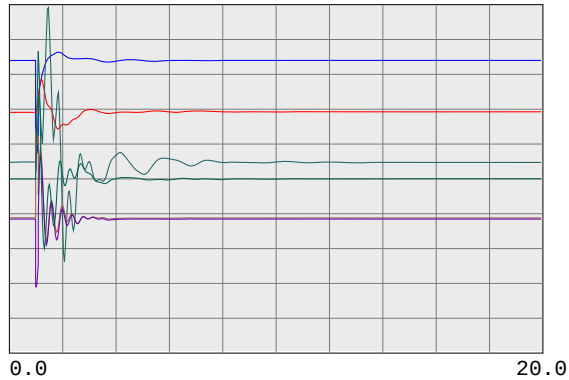
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



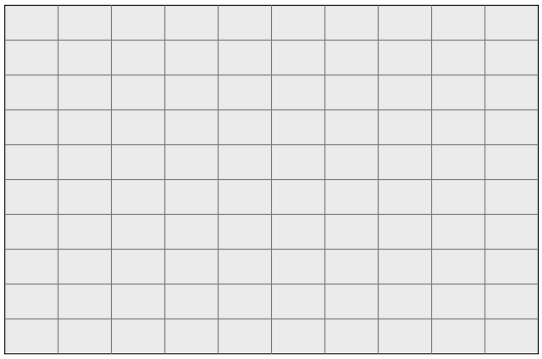
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

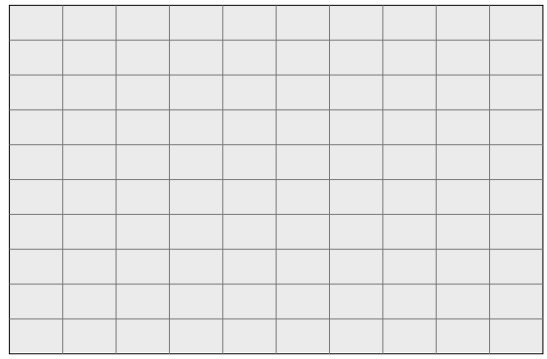


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



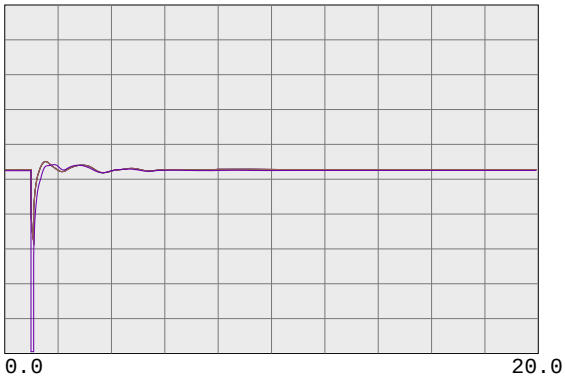
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



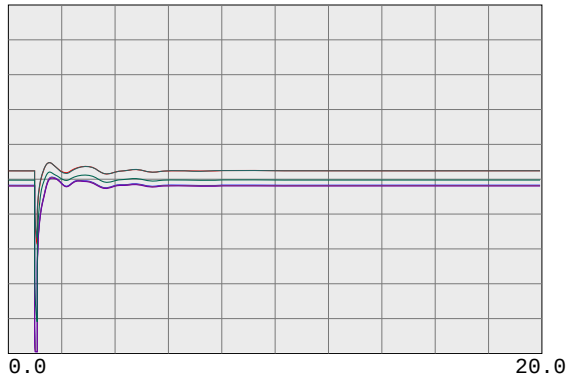


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

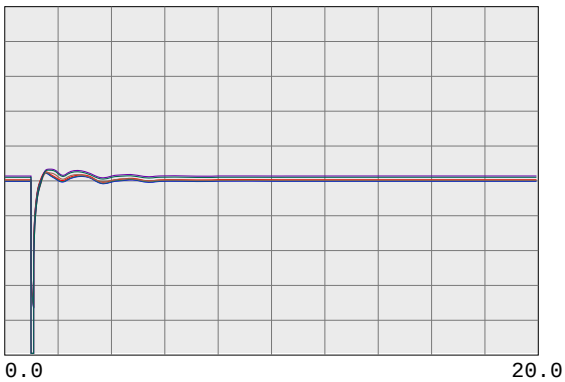
230-KV SYSTEM VOLTAGES



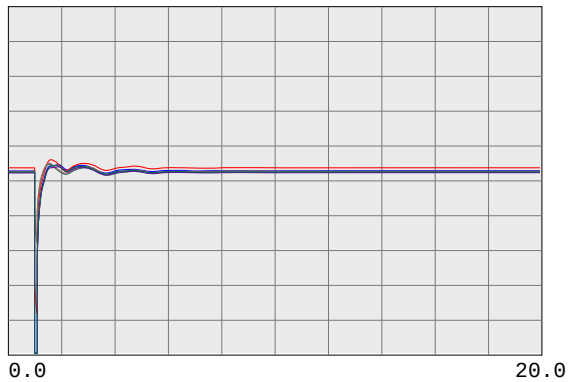
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



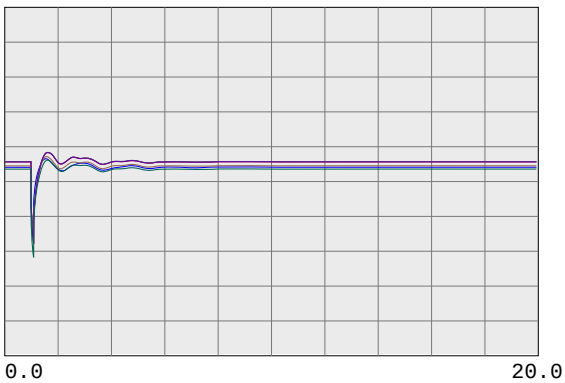
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



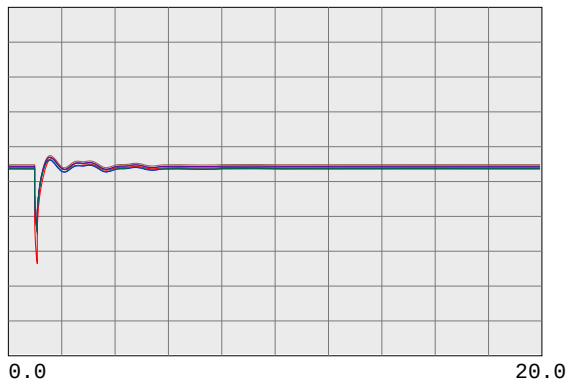
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



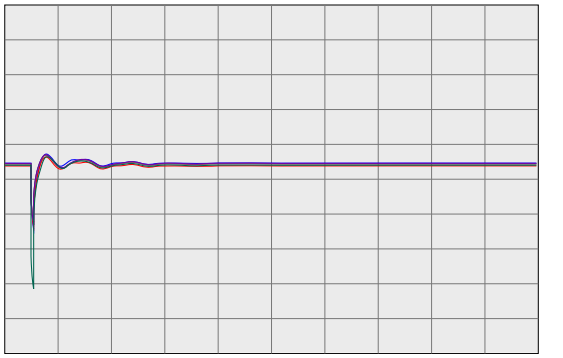
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



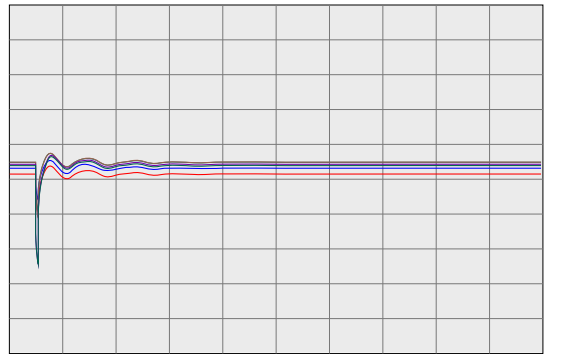
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

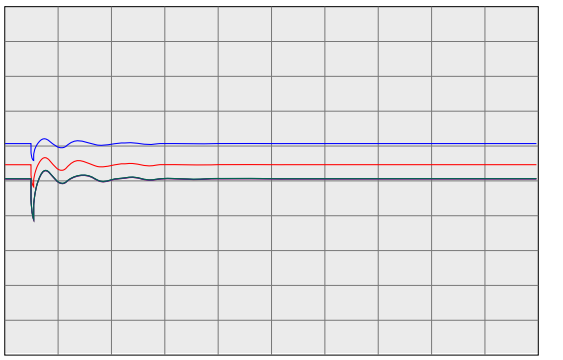
230-KV SYSTEM VOLTAGES



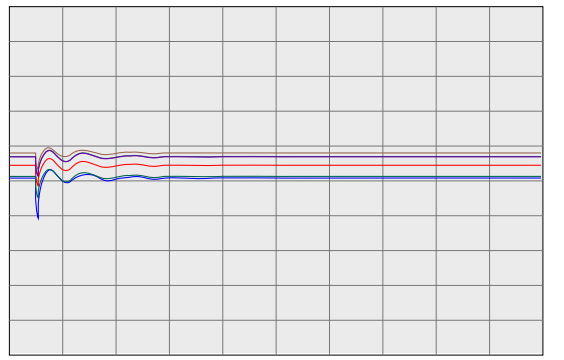
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



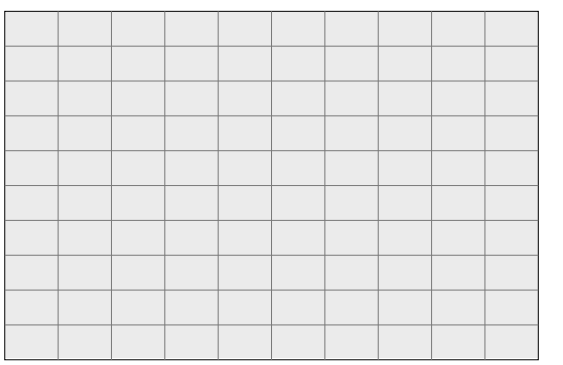
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

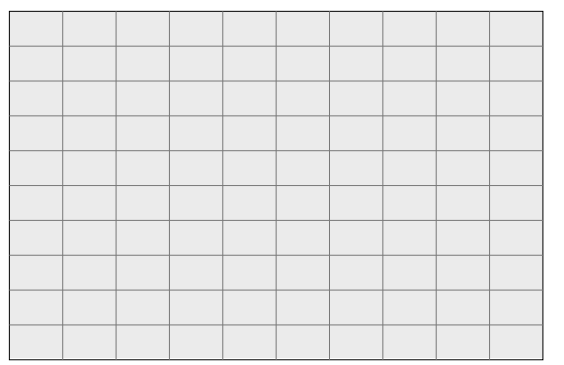


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



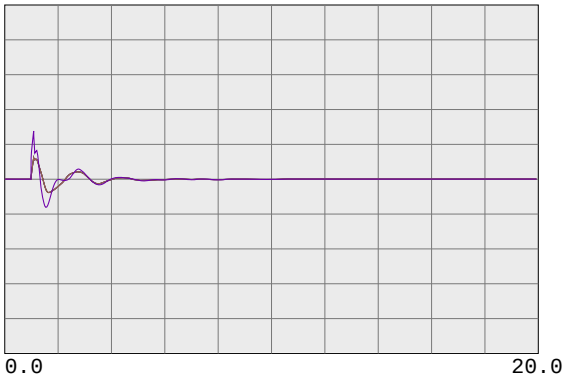
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



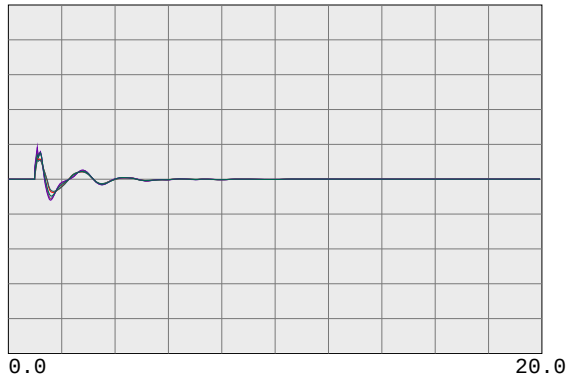


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

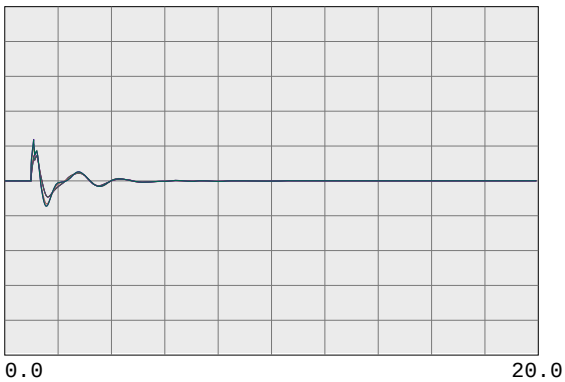
230-KV SYSTEM FREQUENCIES



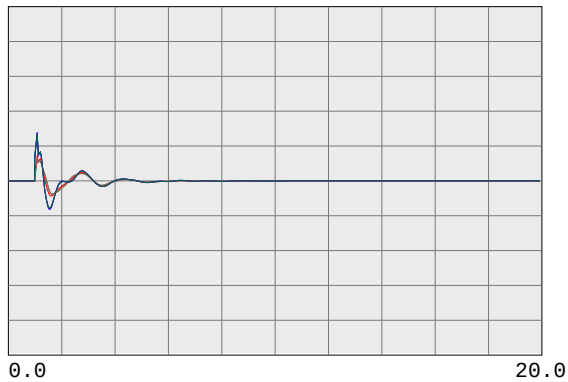
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



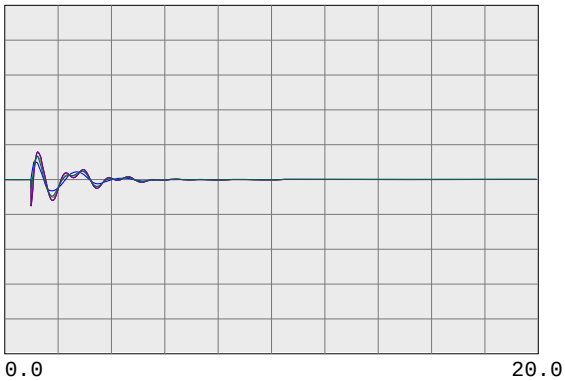
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



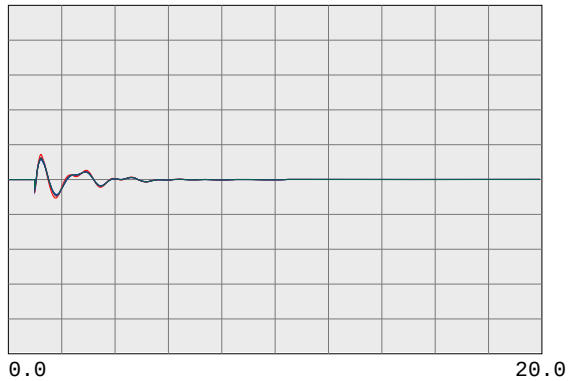
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



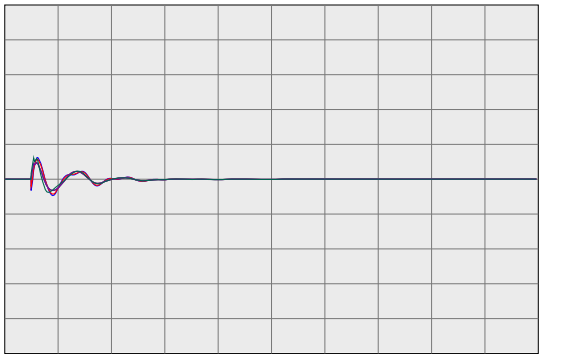
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



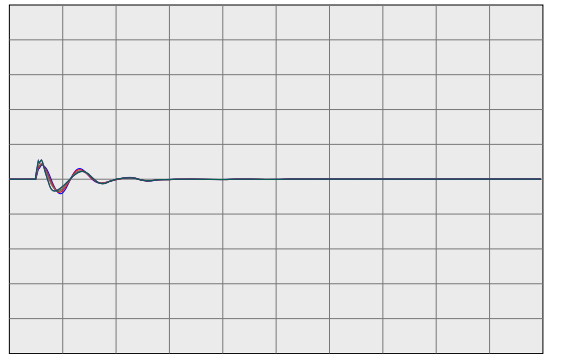
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

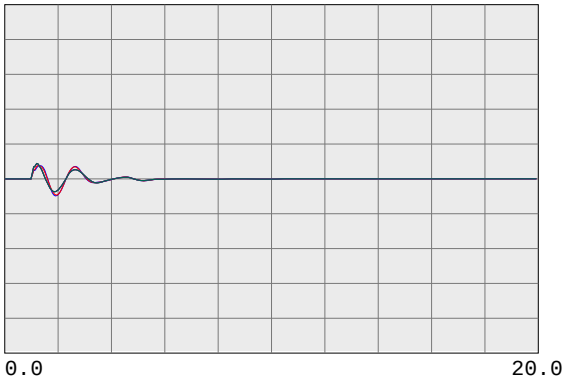
230-KV SYSTEM FREQUENCIES



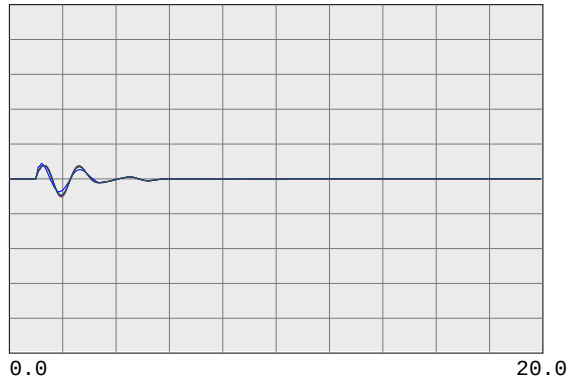
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



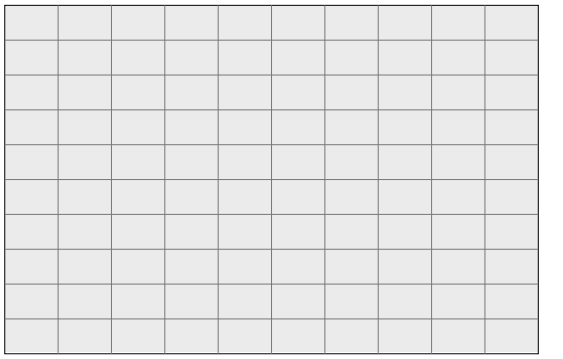
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

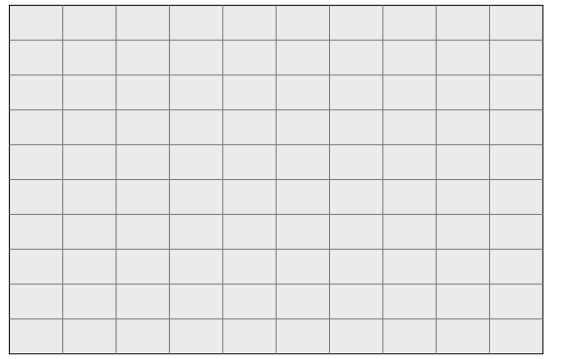


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



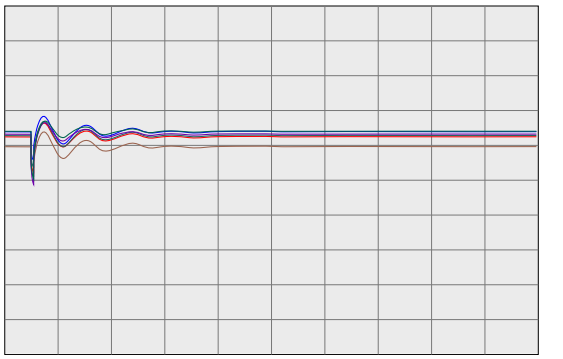
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



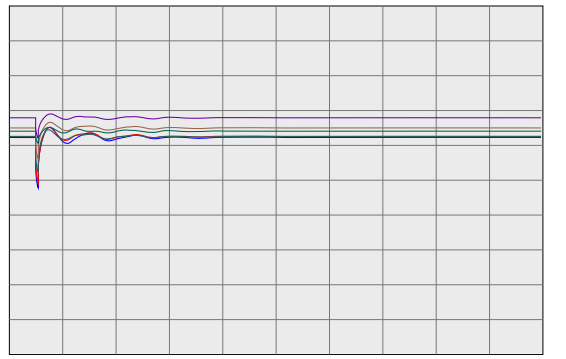


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

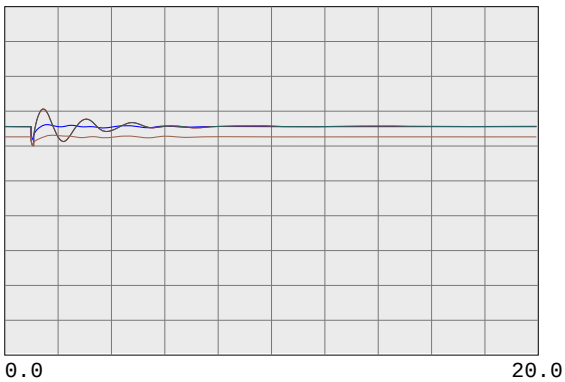
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



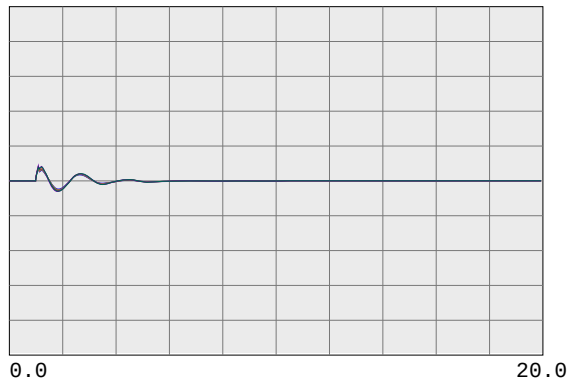
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



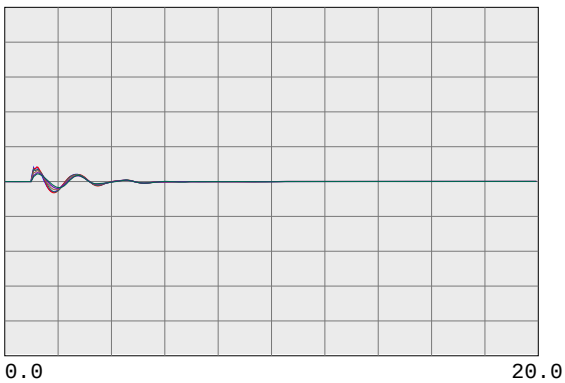
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



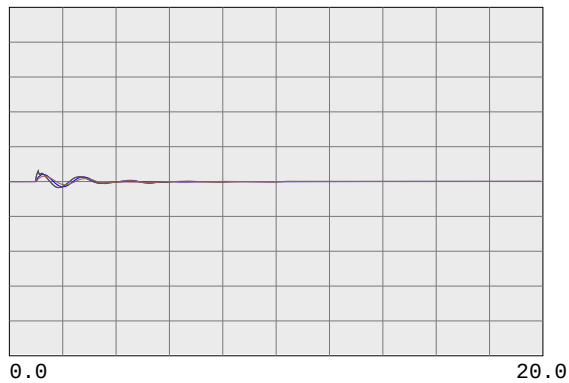
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



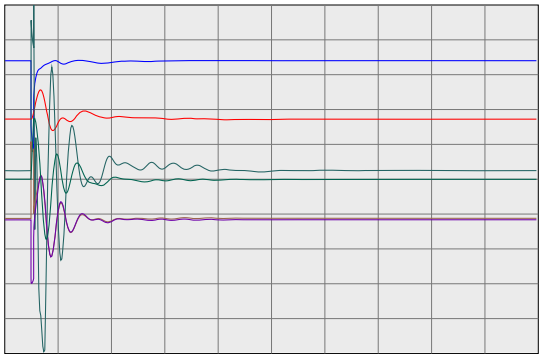
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



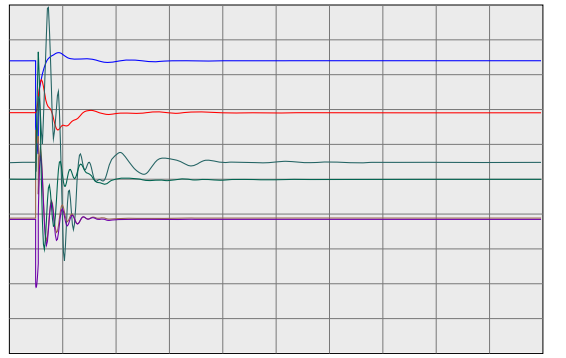
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

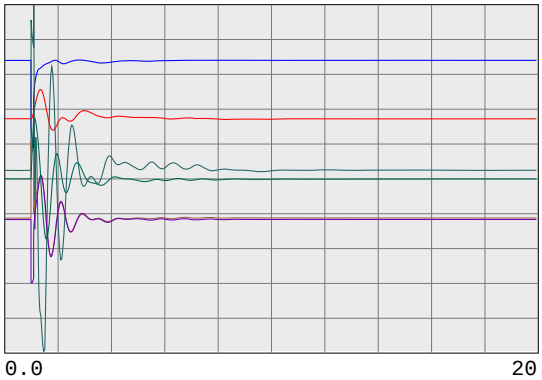
WILLOW PASS GENERATION PLANT



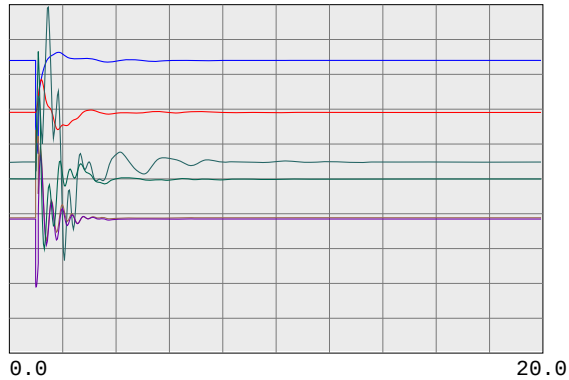
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



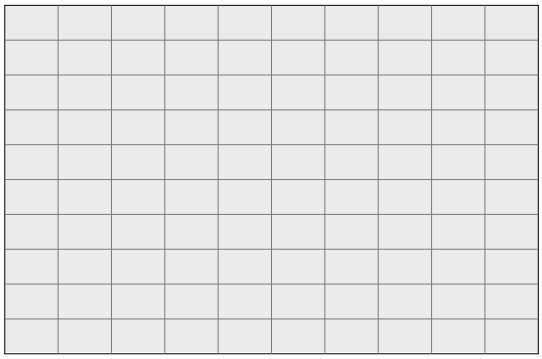
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

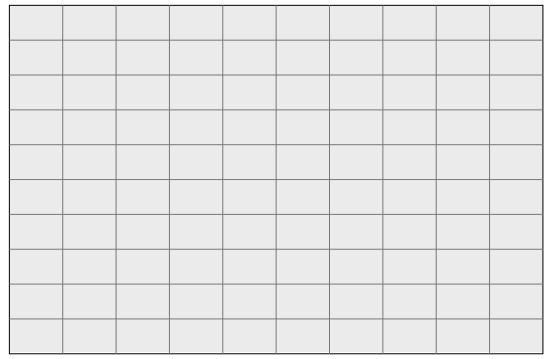


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



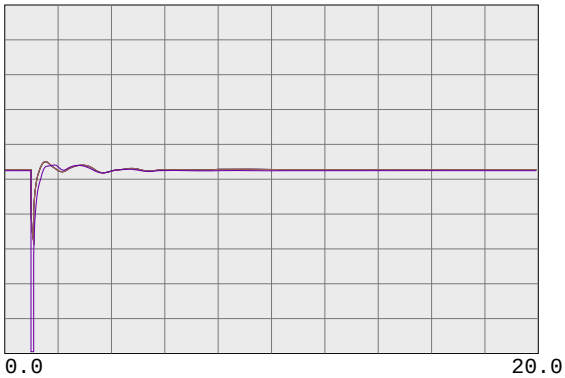
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



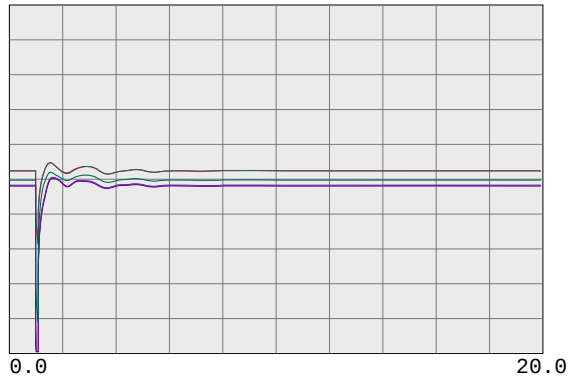


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

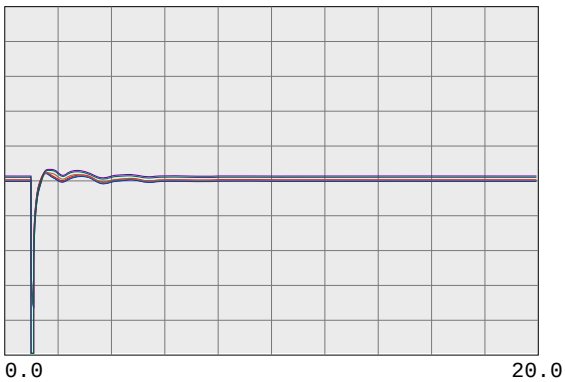
230-KV SYSTEM VOLTAGES



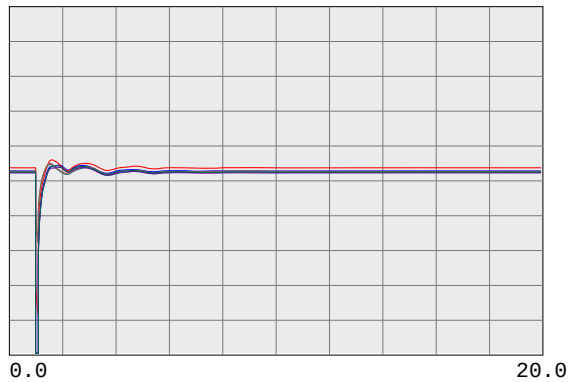
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



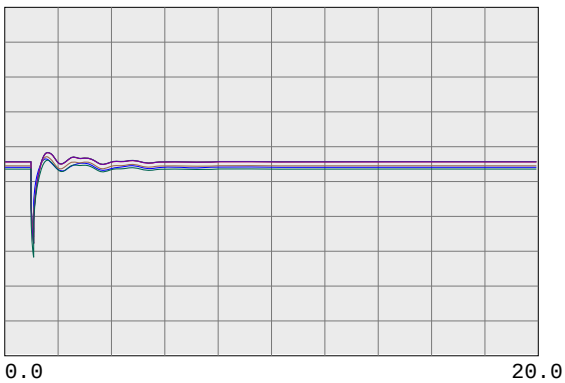
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



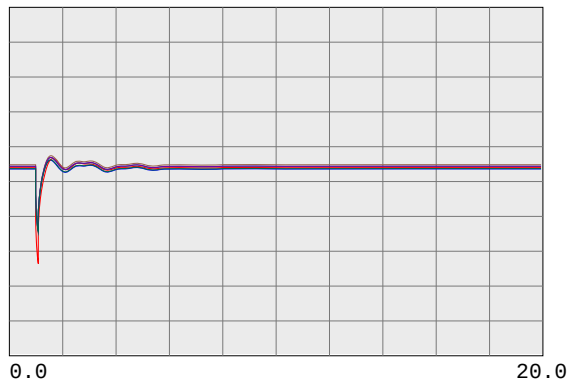
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



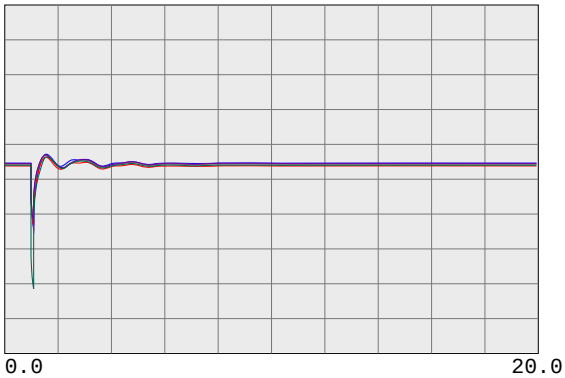
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



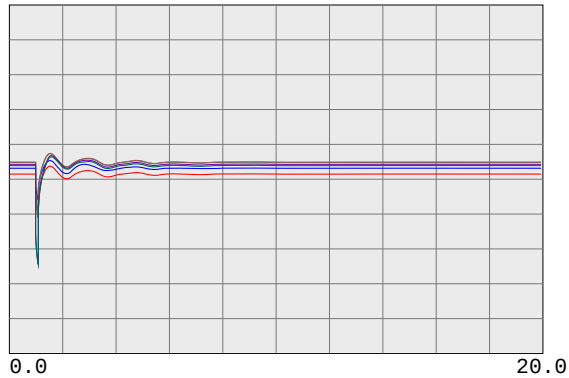
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

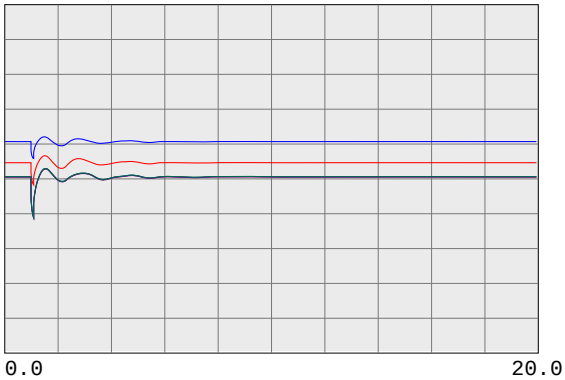
230-KV SYSTEM VOLTAGES



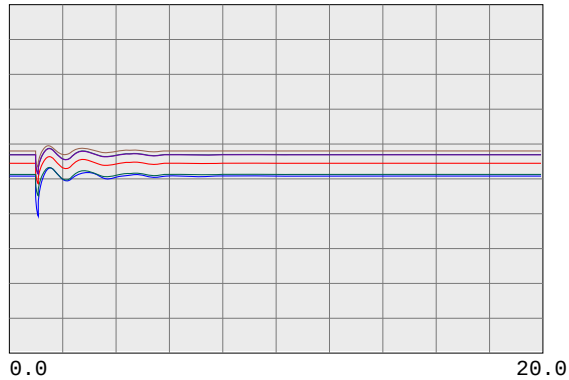
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



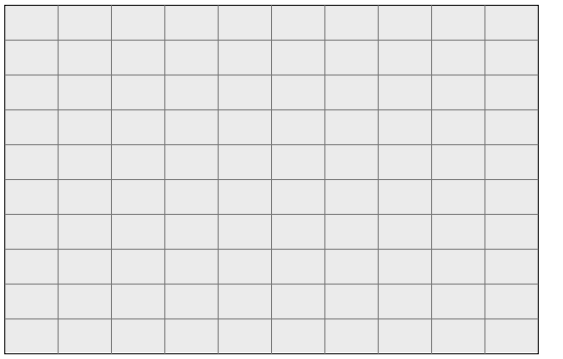
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

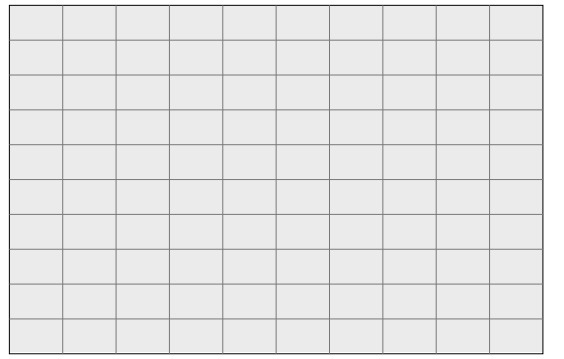


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



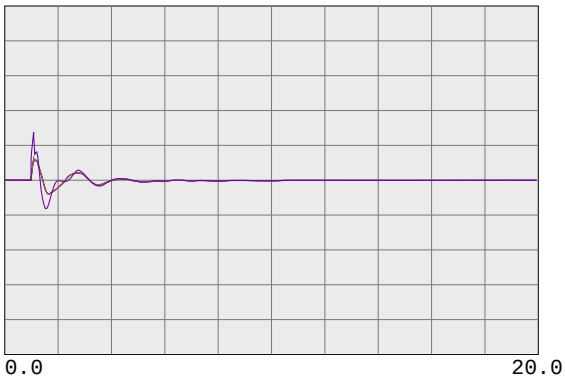
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



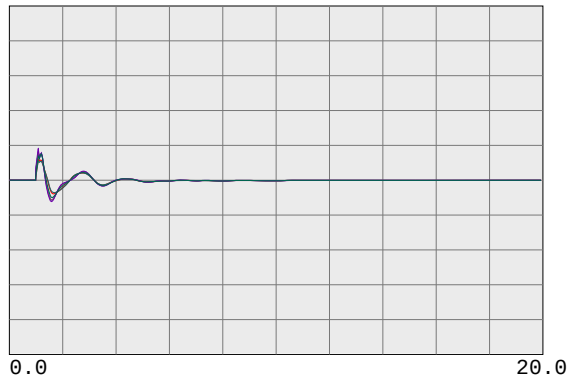


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

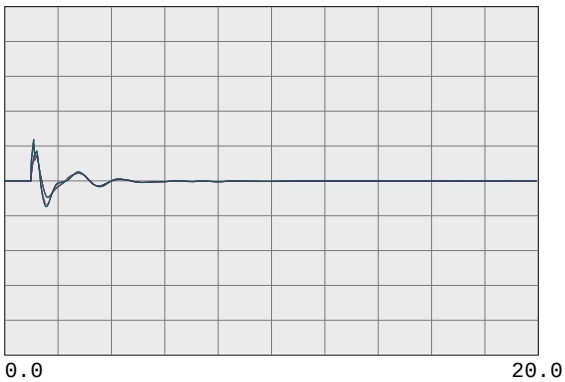
230-KV SYSTEM FREQUENCIES



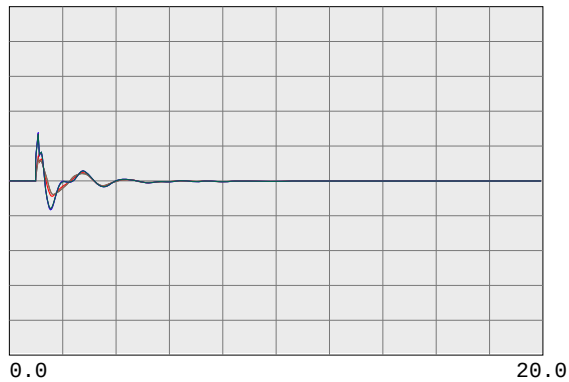
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



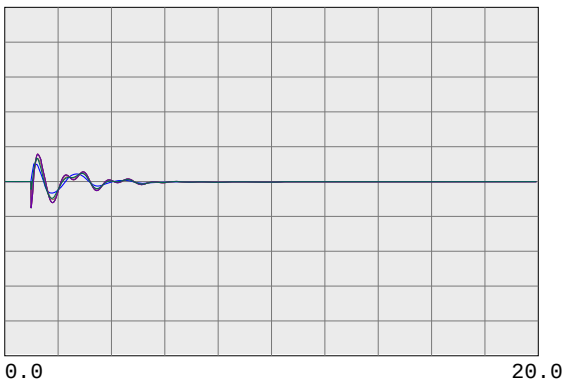
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



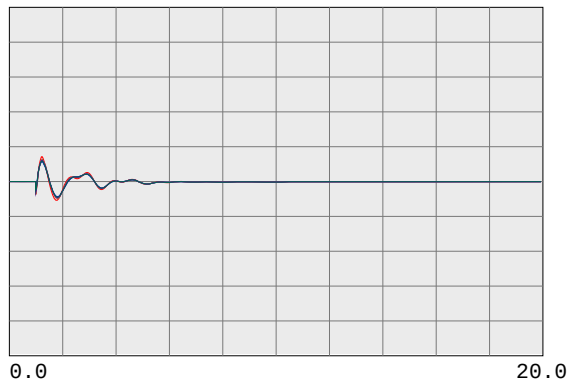
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



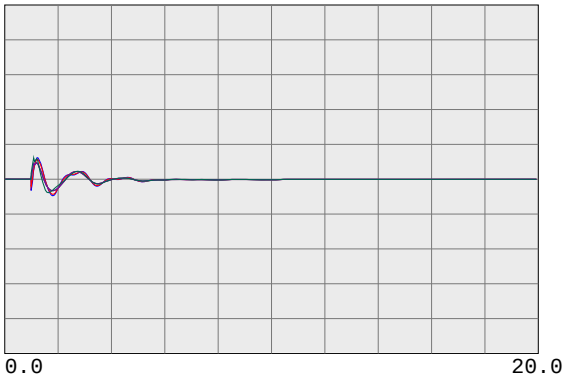
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



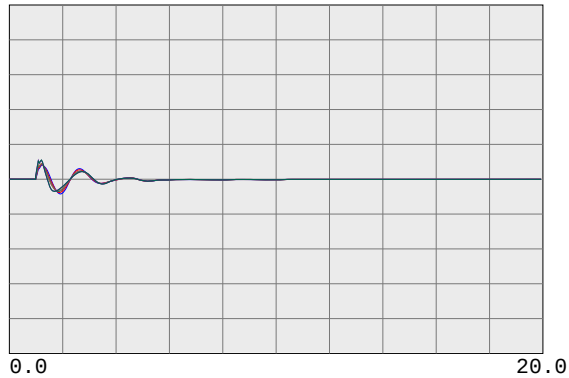
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

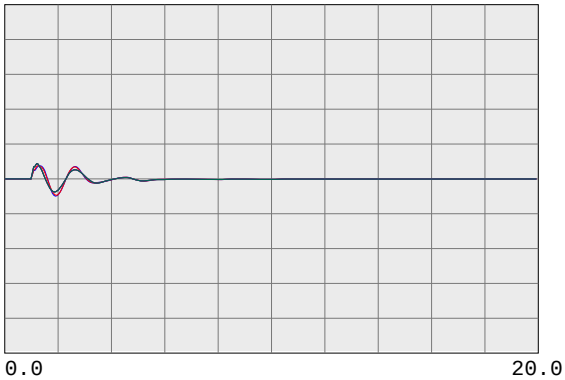
230-KV SYSTEM FREQUENCIES



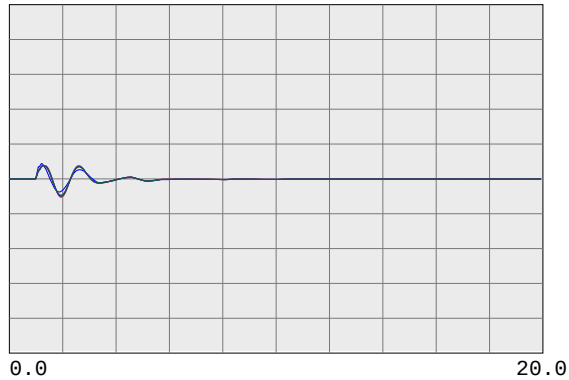
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



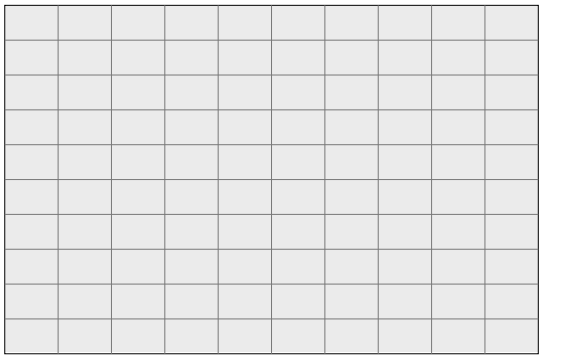
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

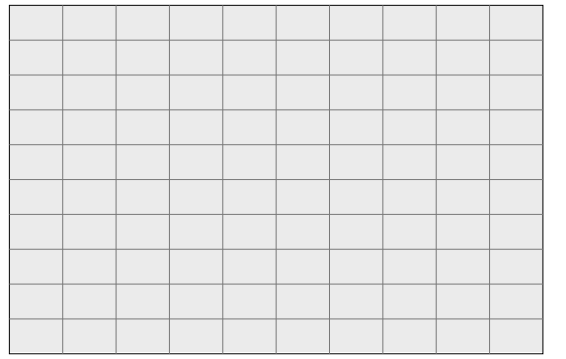


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



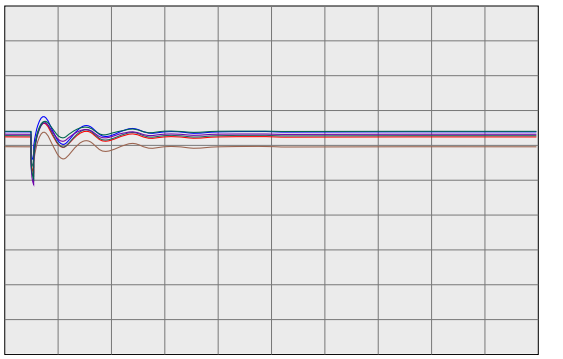
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



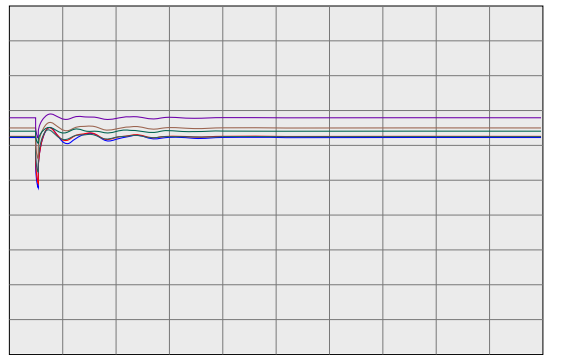


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

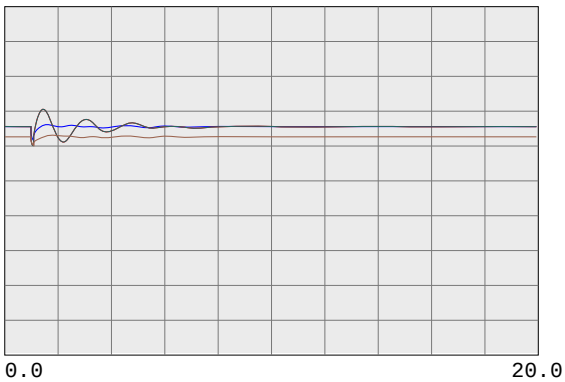
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



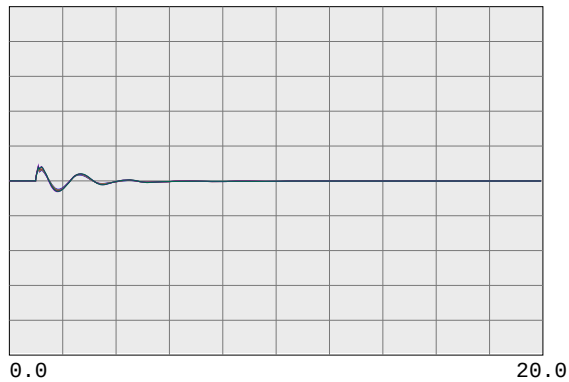
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



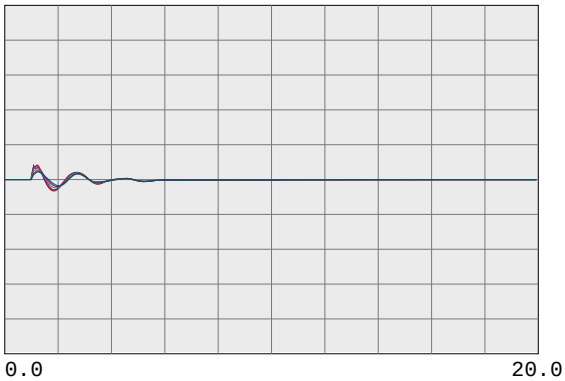
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



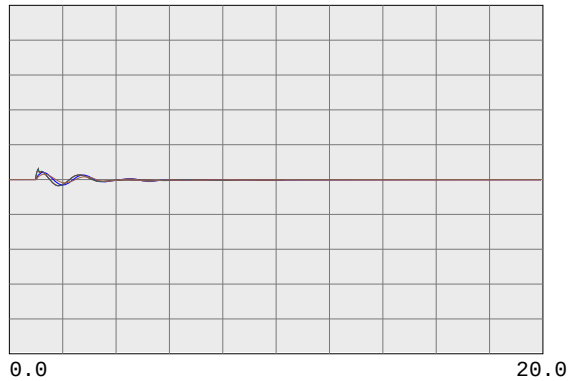
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



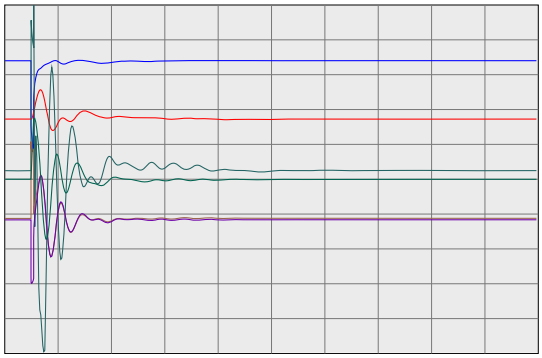
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



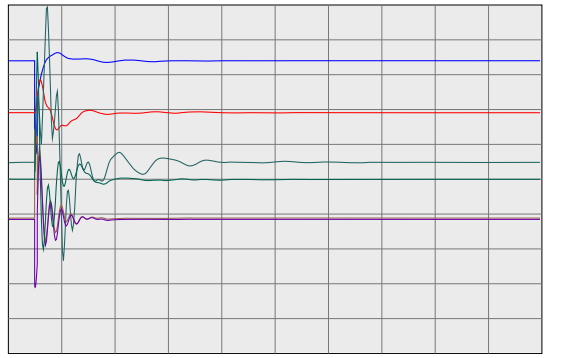
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

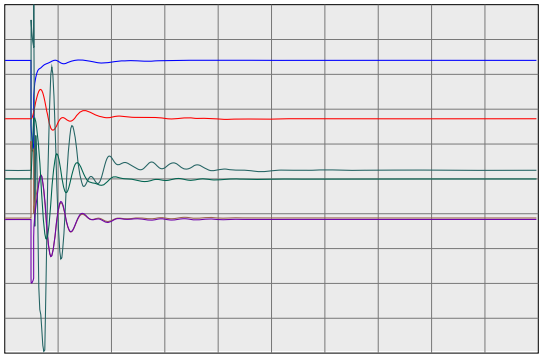
WILLOW PASS GENERATION PLANT



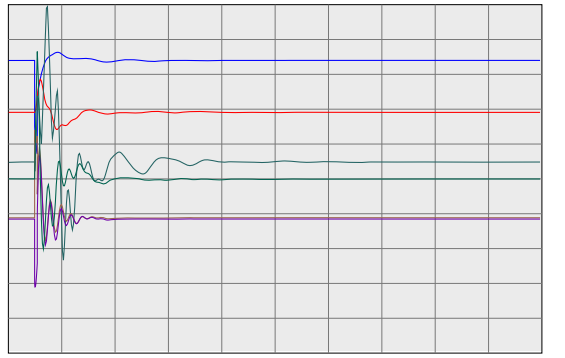
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



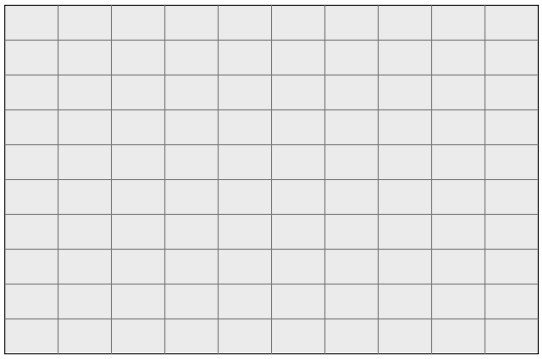
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

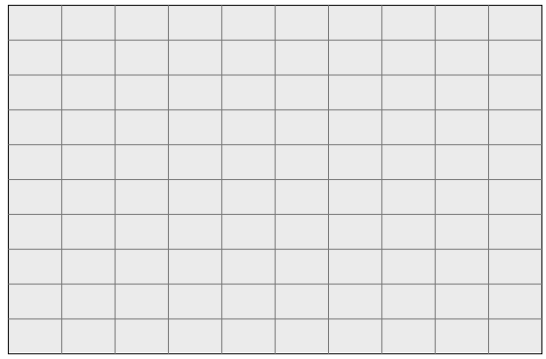


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



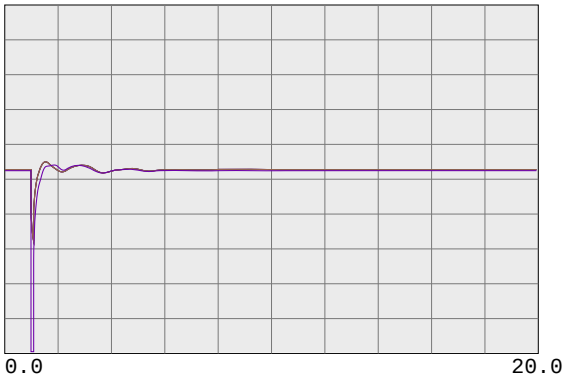
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



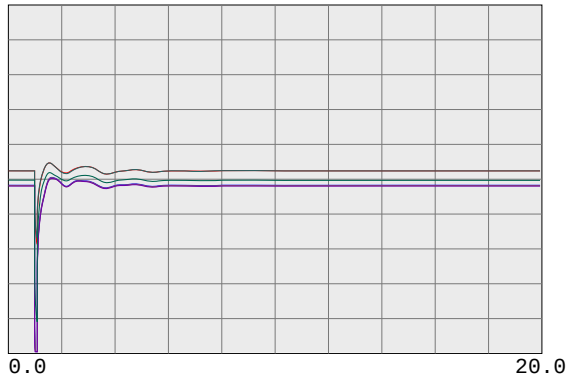


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

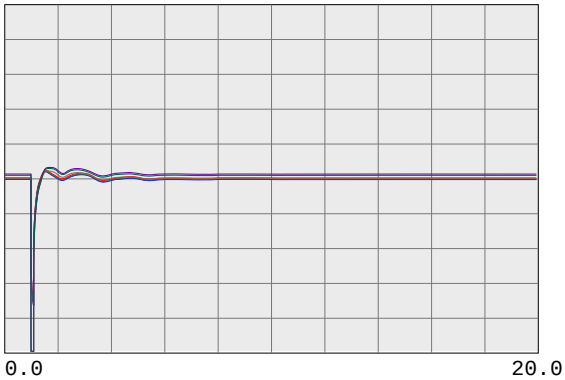
230-KV SYSTEM VOLTAGES



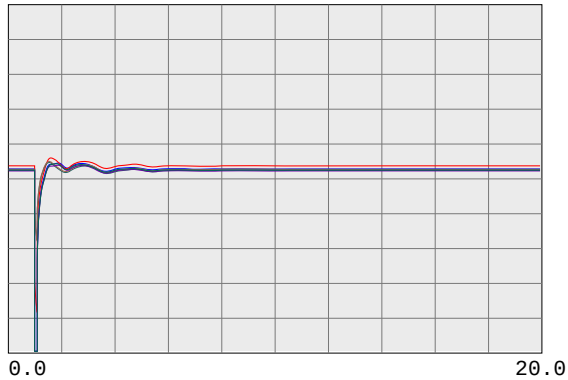
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



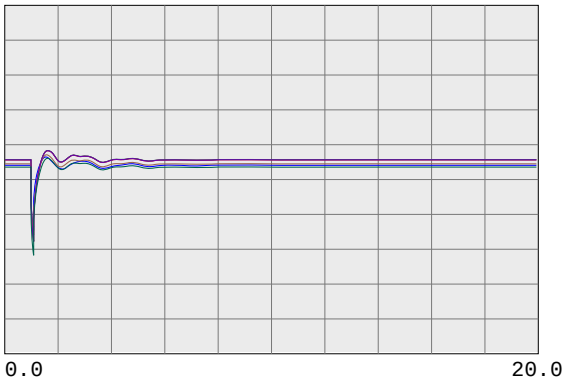
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



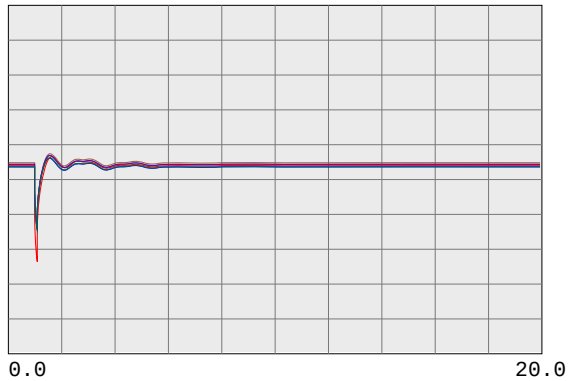
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



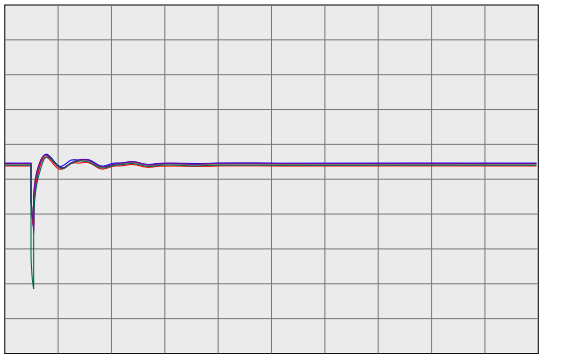
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



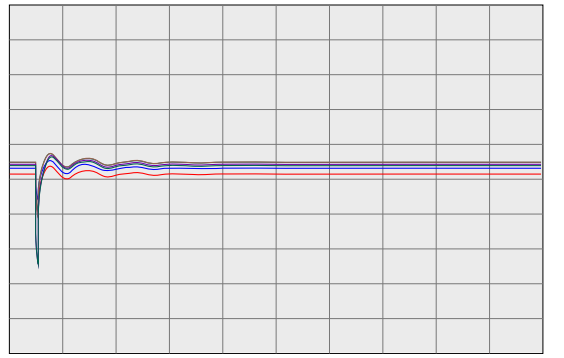
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

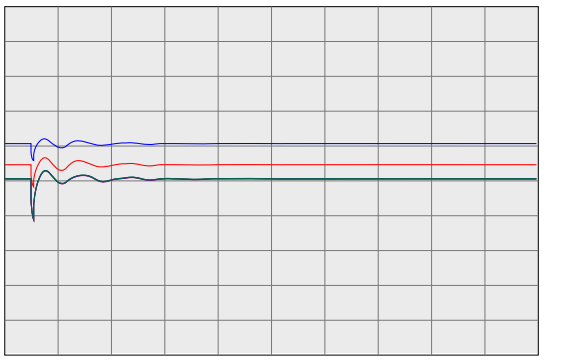
230-KV SYSTEM VOLTAGES



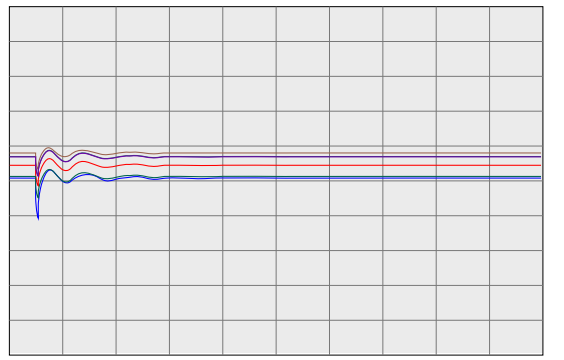
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



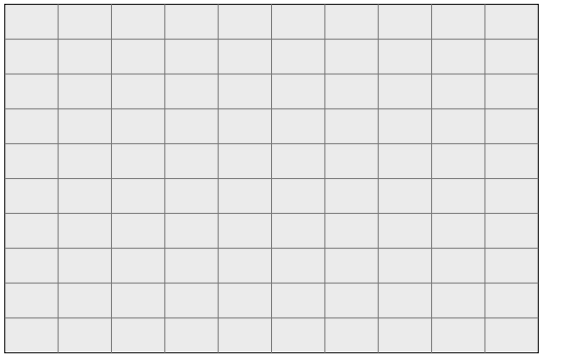
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

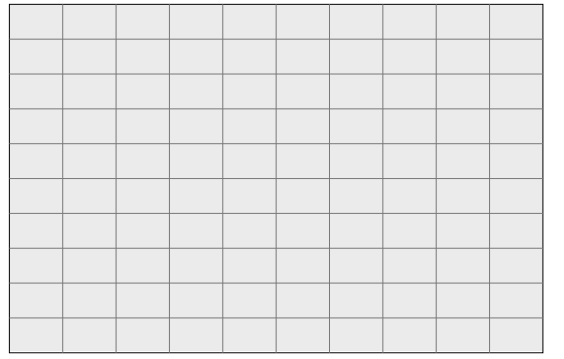


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



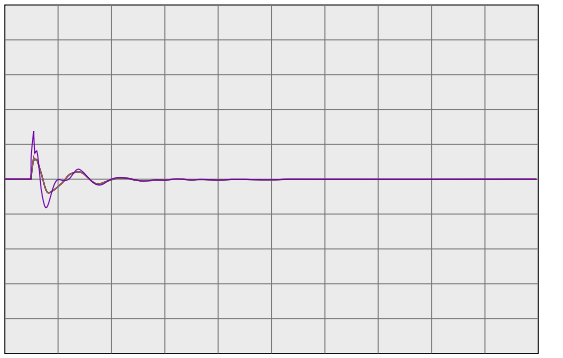
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



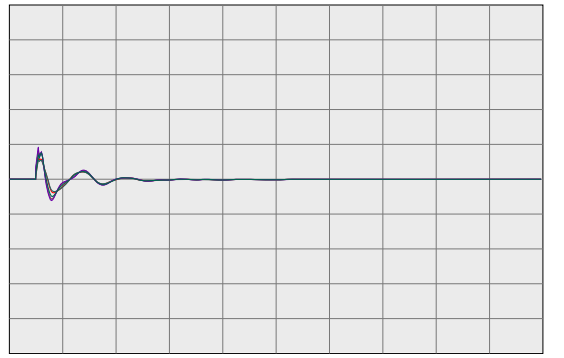


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

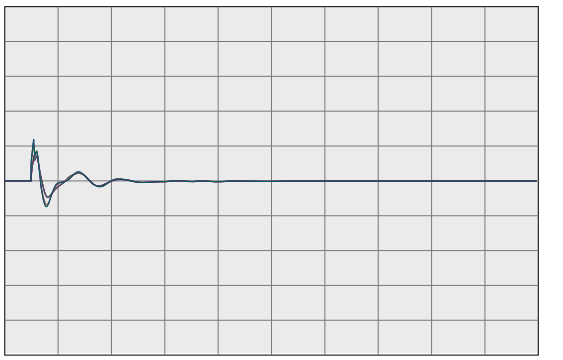
230-KV SYSTEM FREQUENCIES



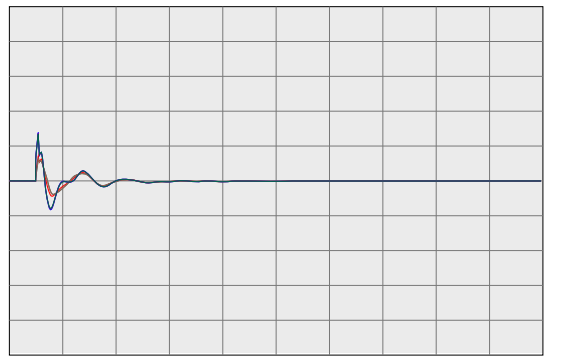
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



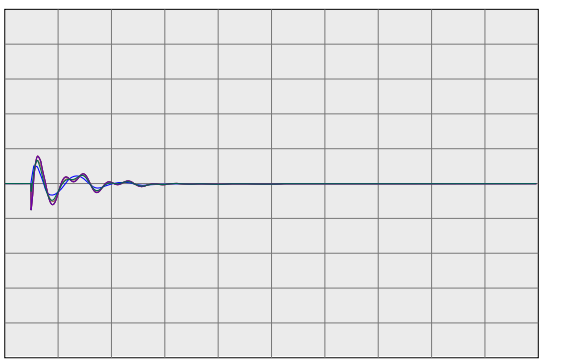
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



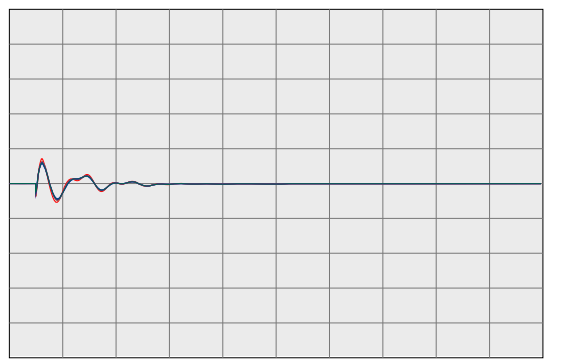
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



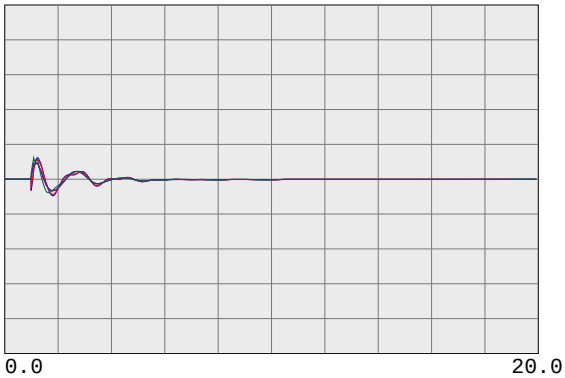
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



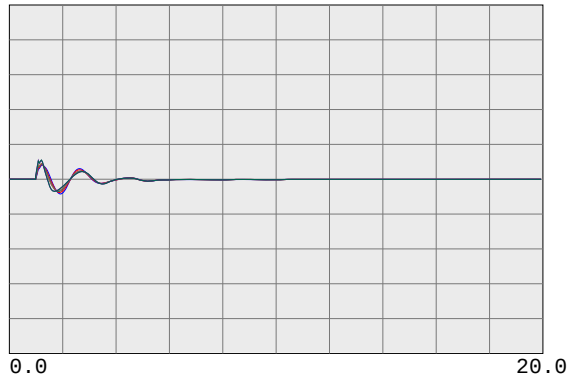
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

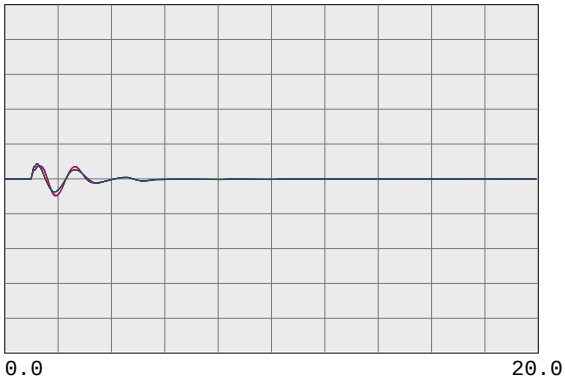
230-KV SYSTEM FREQUENCIES



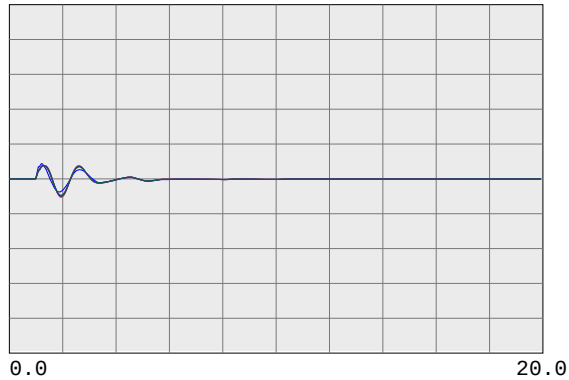
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



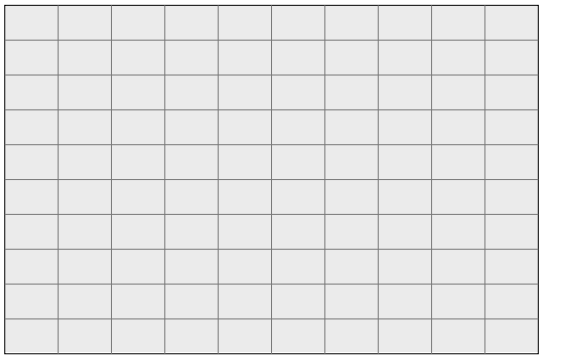
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

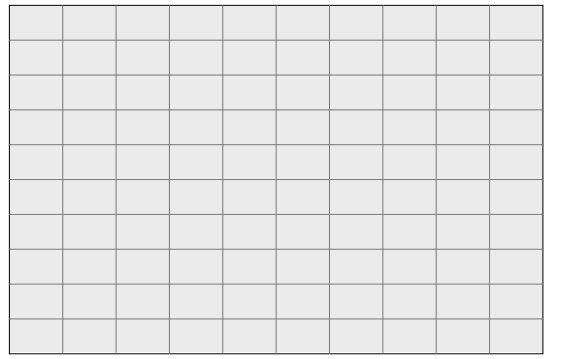


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



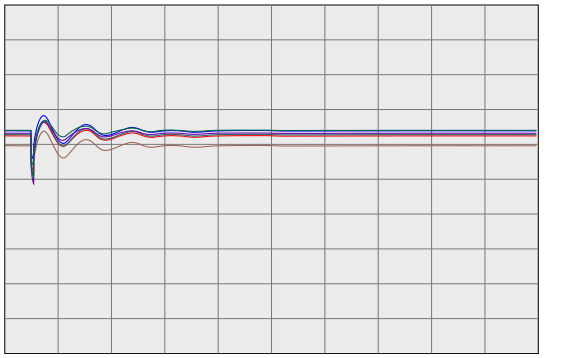
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



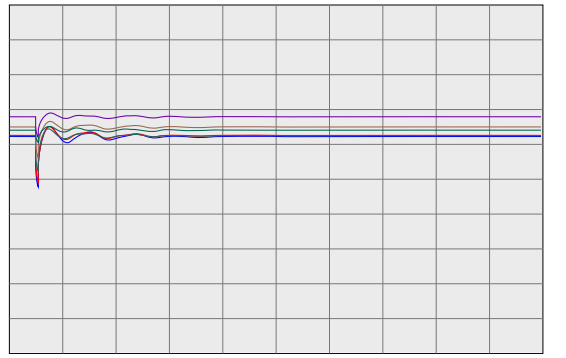


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

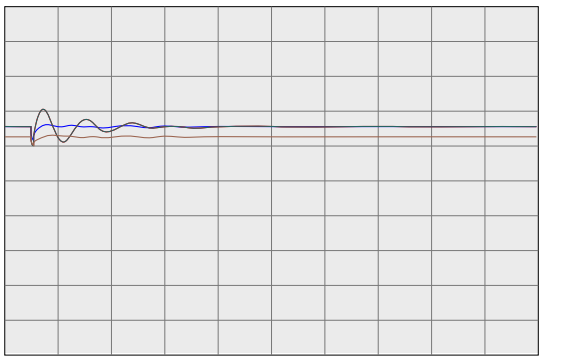
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



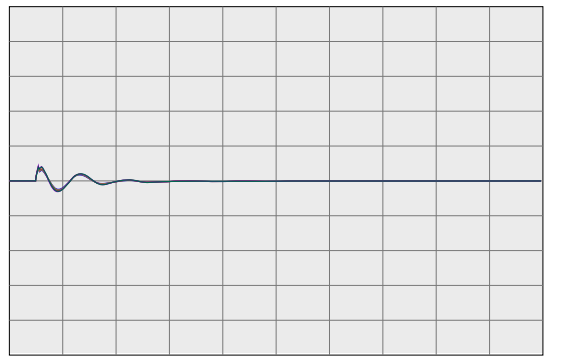
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



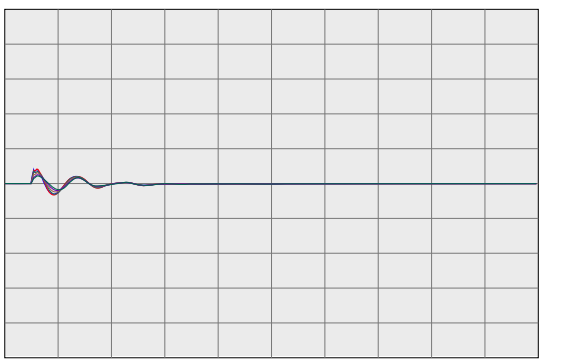
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



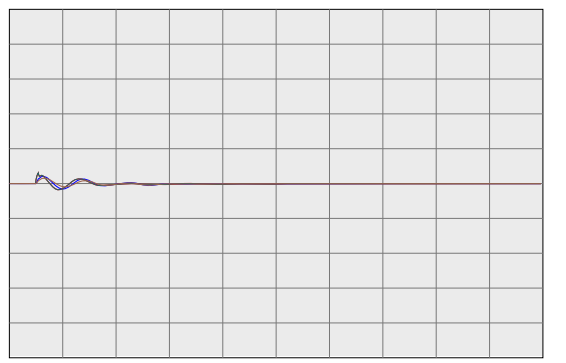
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



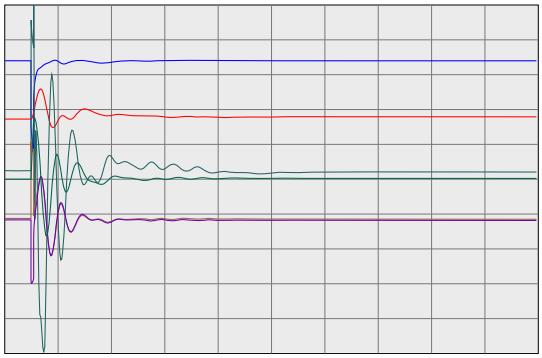
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



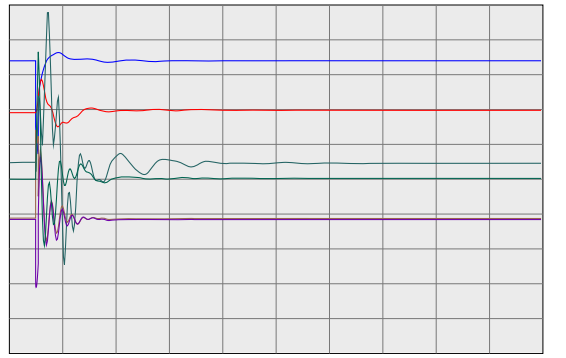
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

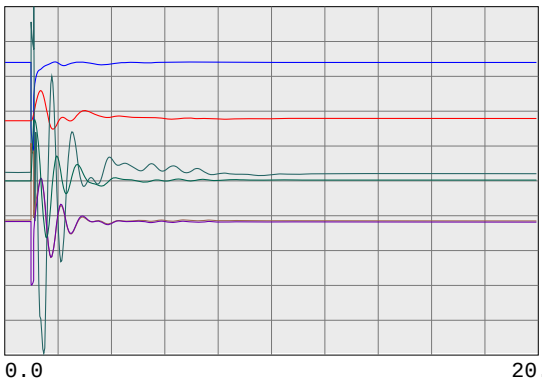
WILLOW PASS GENERATION PLANT



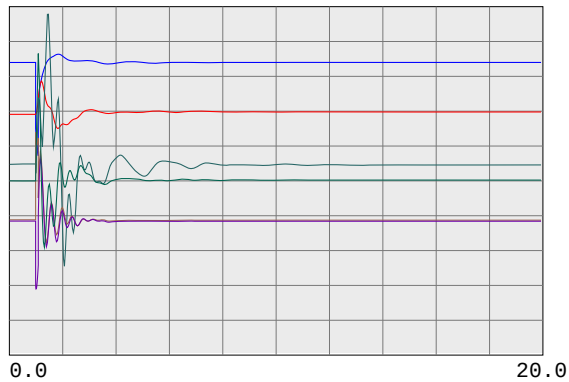
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



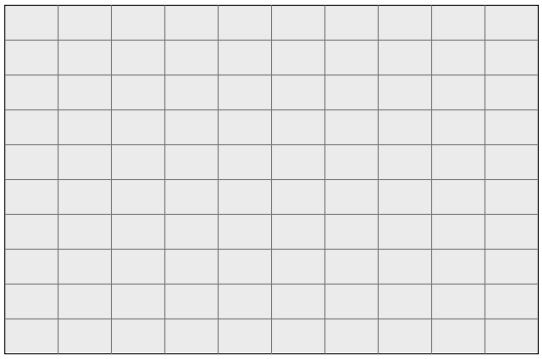
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

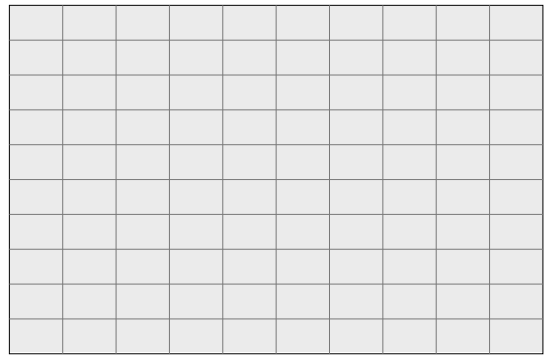


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



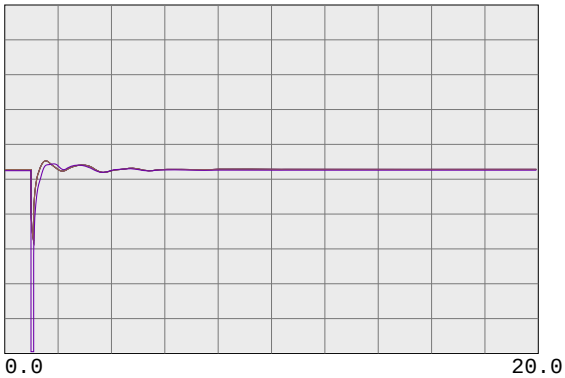
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



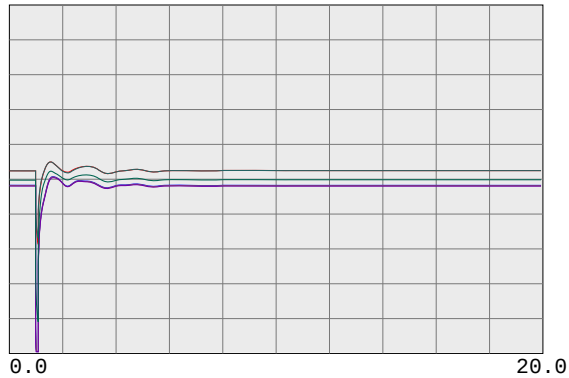


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

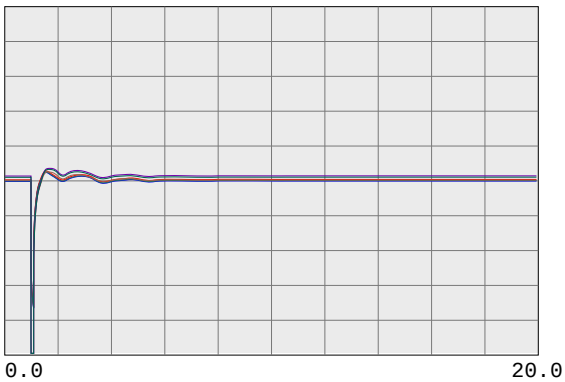
230-KV SYSTEM VOLTAGES



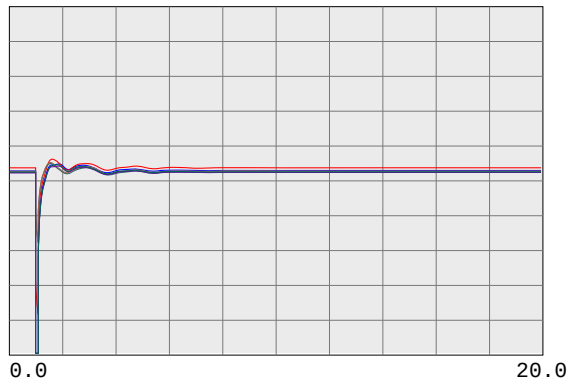
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



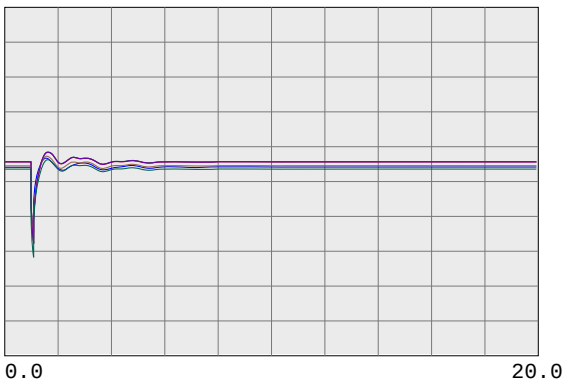
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



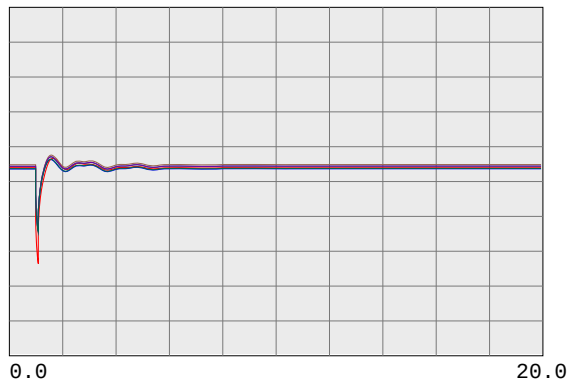
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



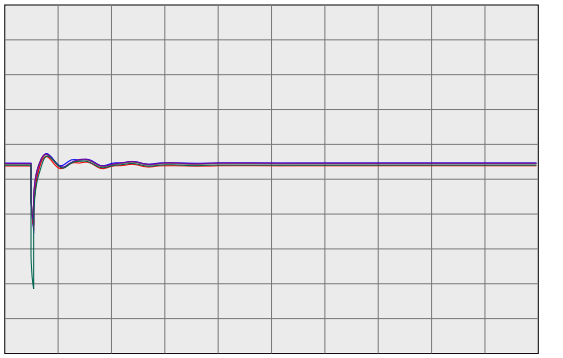
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



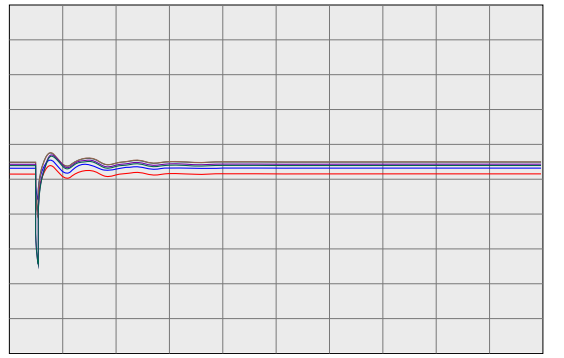
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

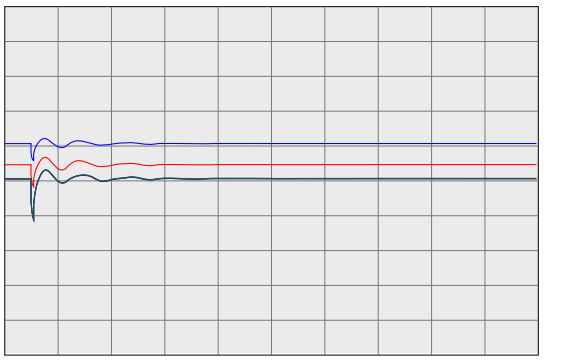
230-KV SYSTEM VOLTAGES



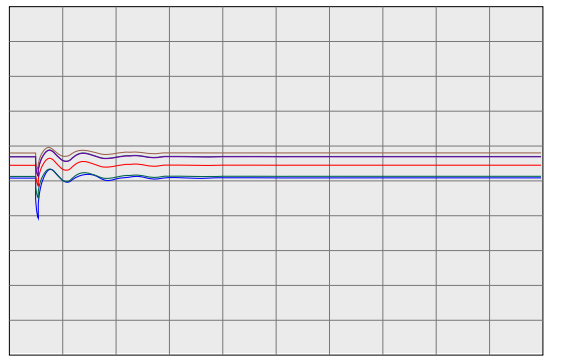
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



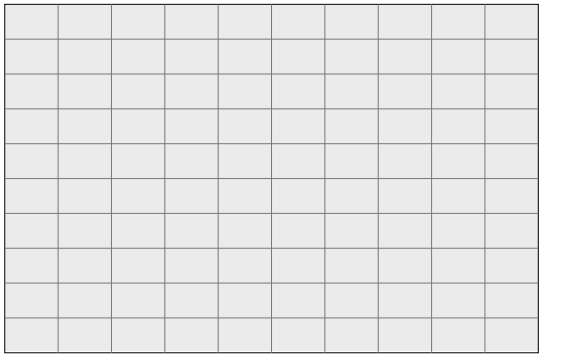
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

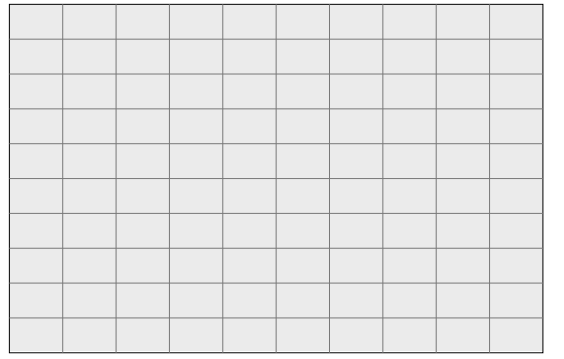


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



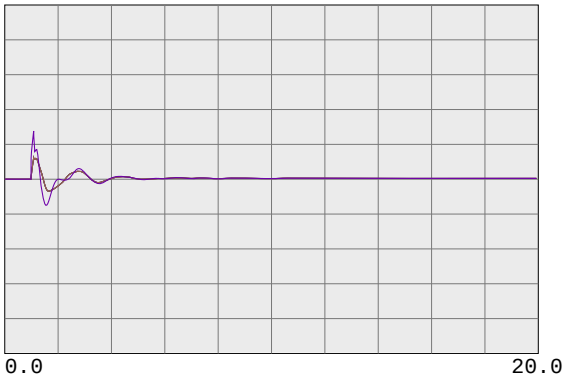
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



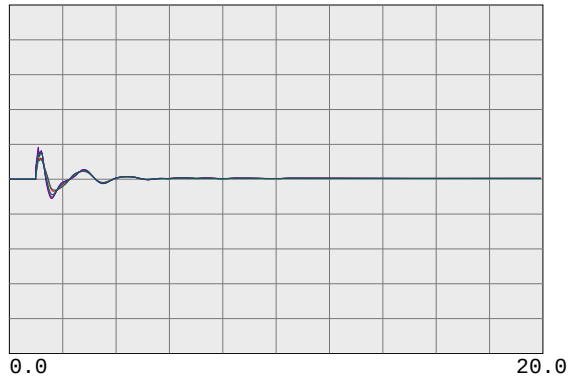


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

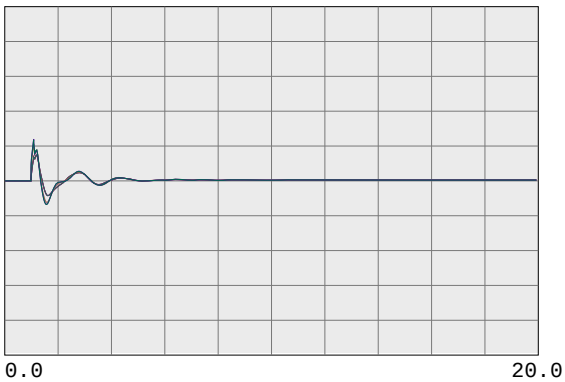
230-KV SYSTEM FREQUENCIES



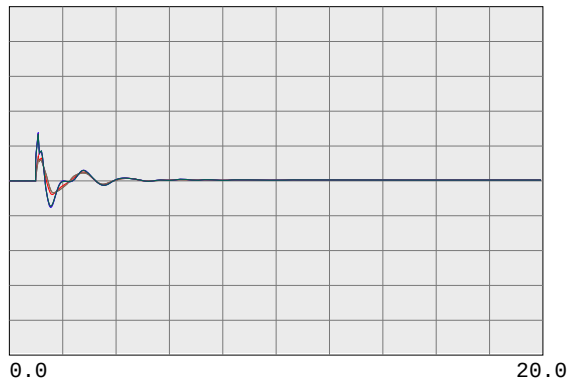
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



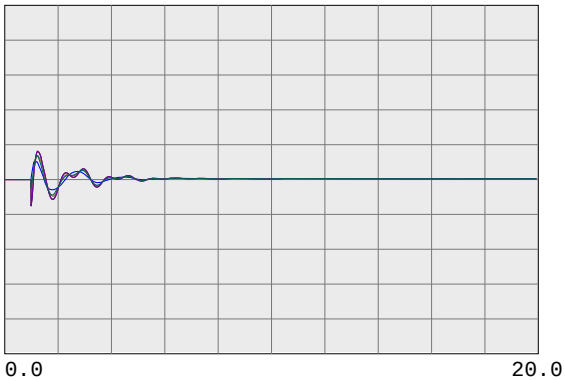
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



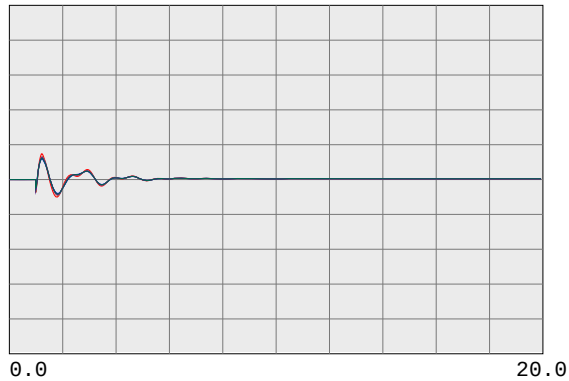
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



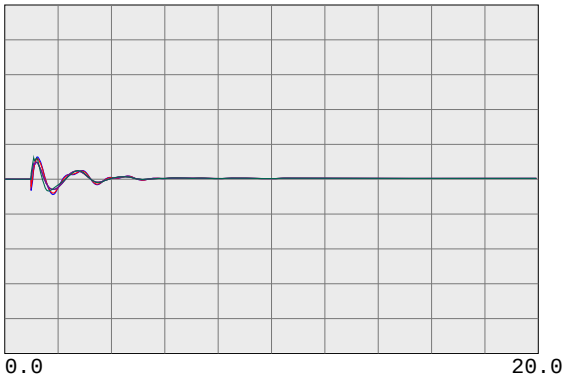
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



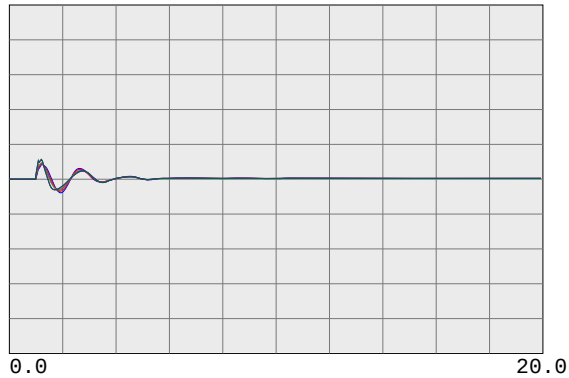
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

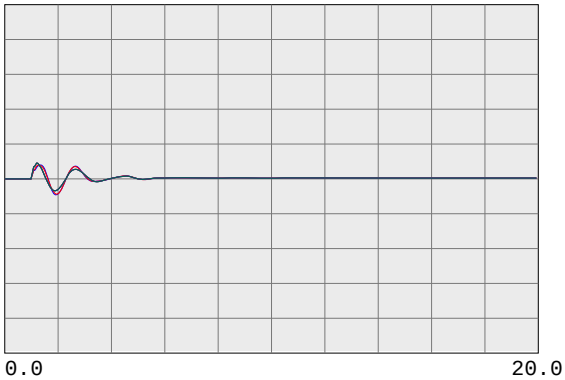
230-KV SYSTEM FREQUENCIES



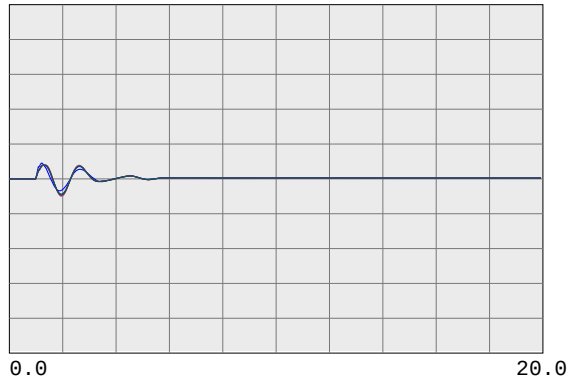
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



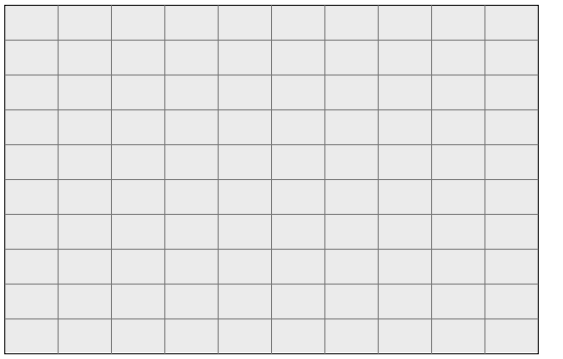
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

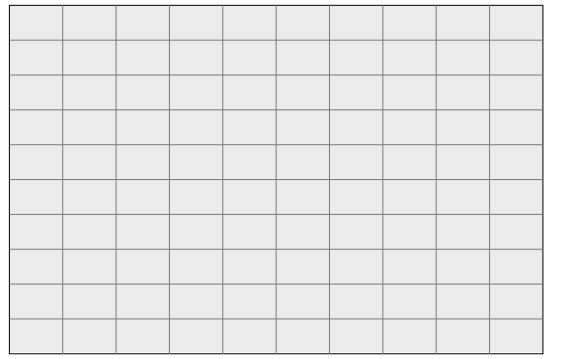


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



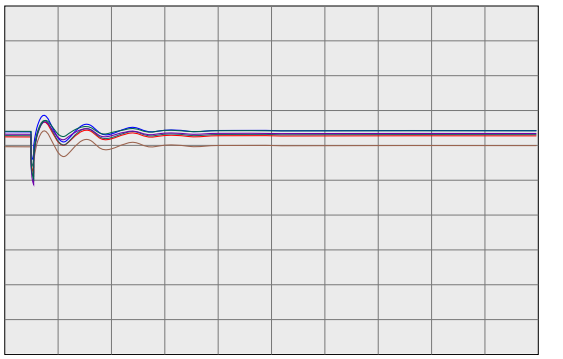
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



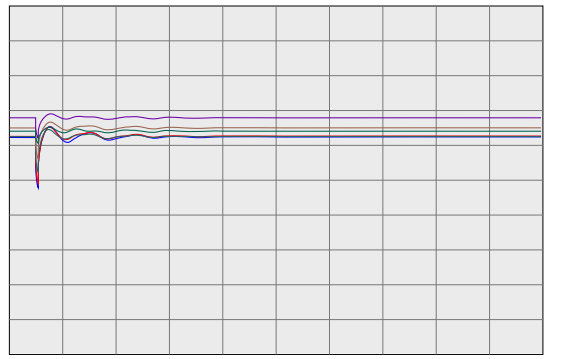


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

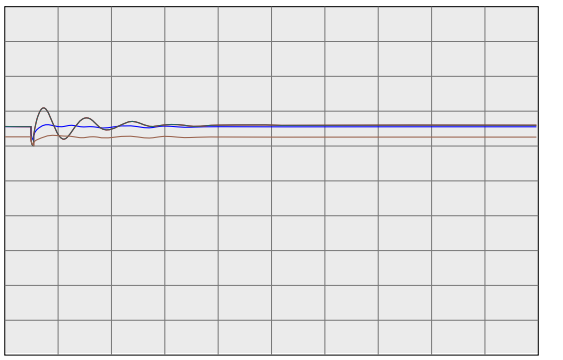
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



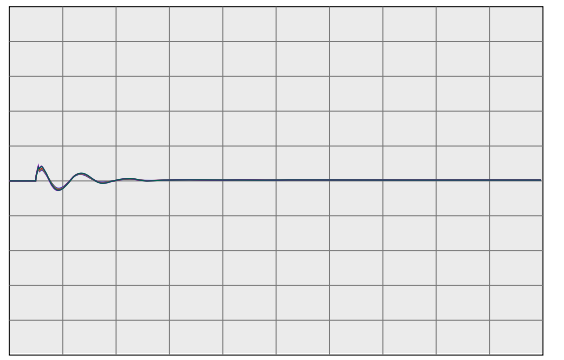
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



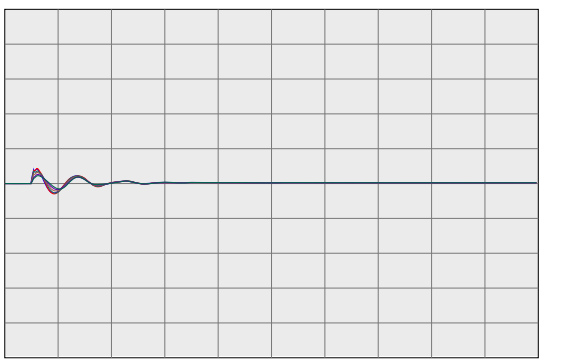
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



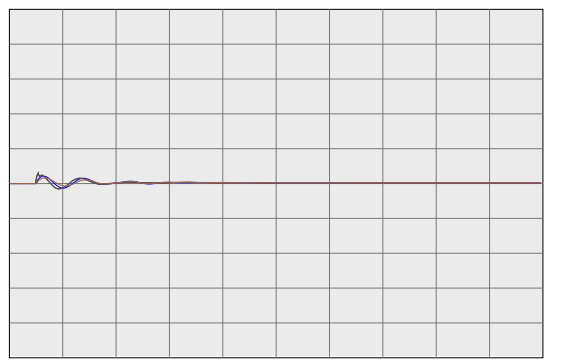
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



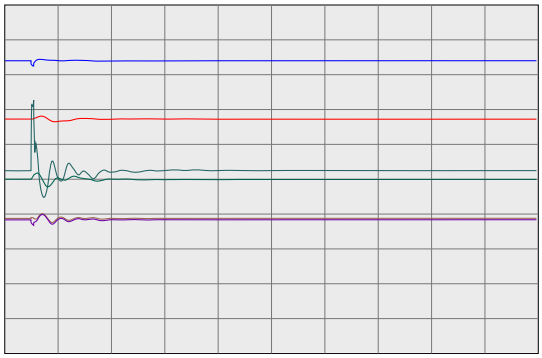
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

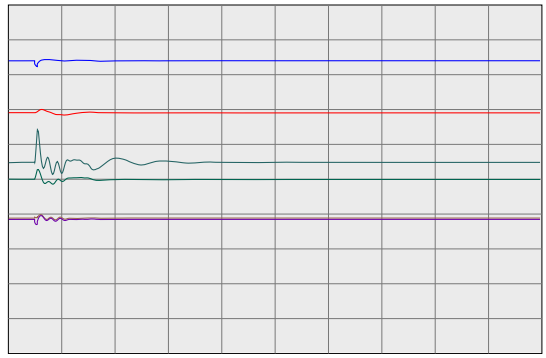
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

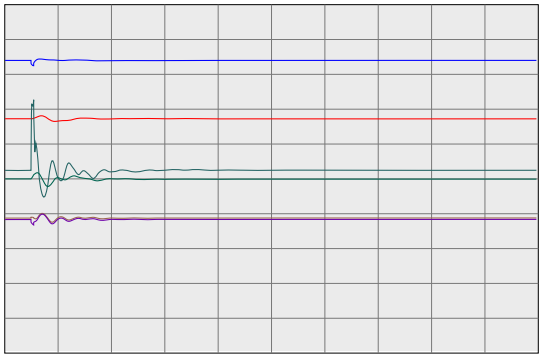
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

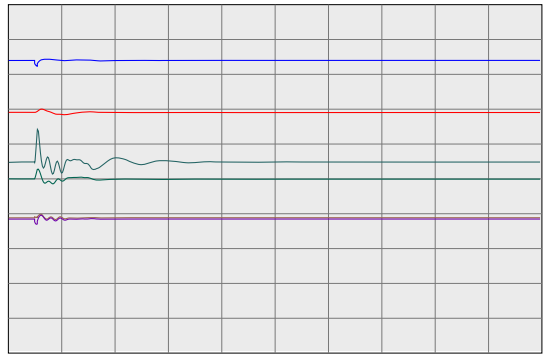
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

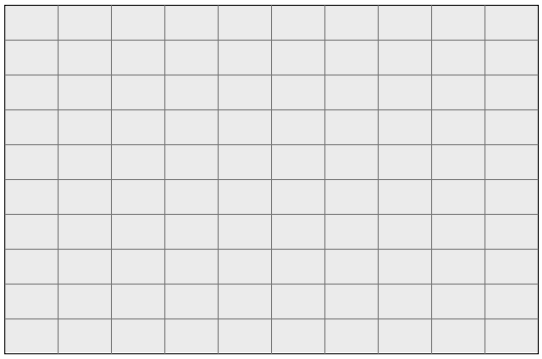
0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

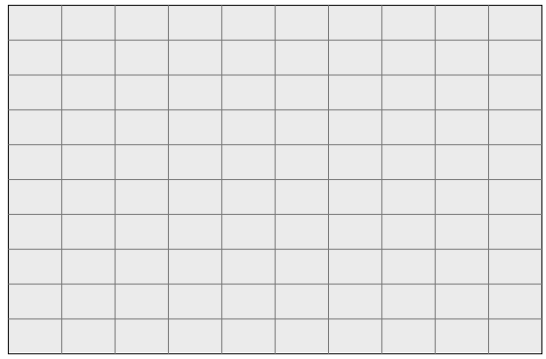


0.0 20.0

Time(sec)

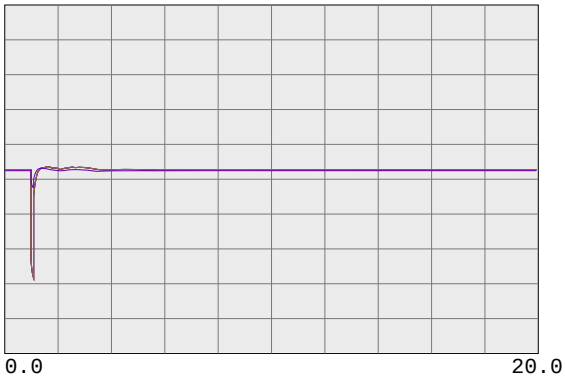
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



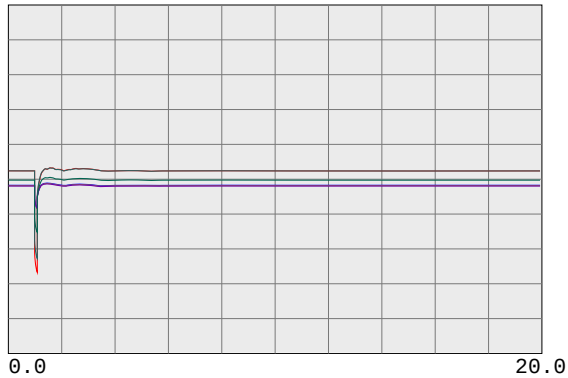


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

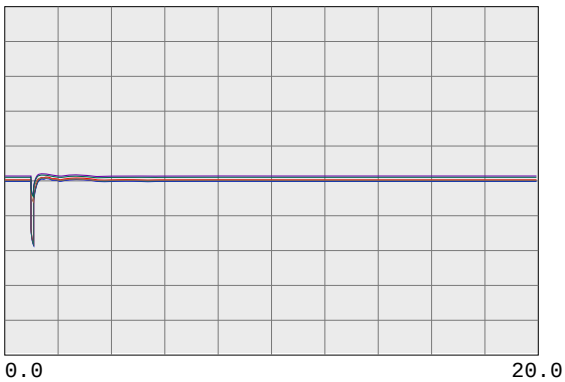
230-KV SYSTEM VOLTAGES



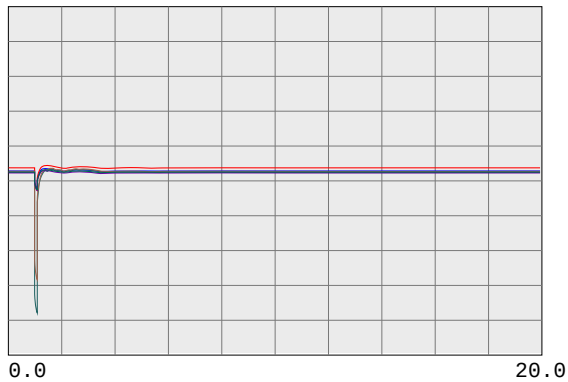
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



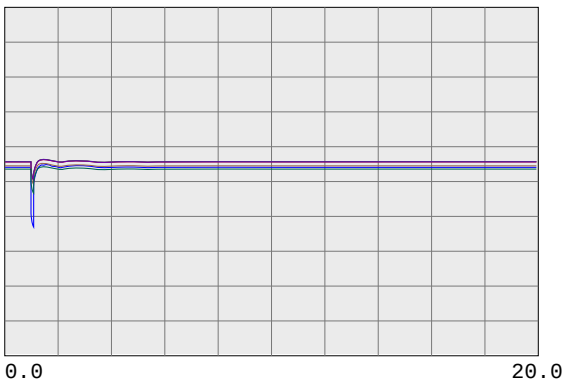
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



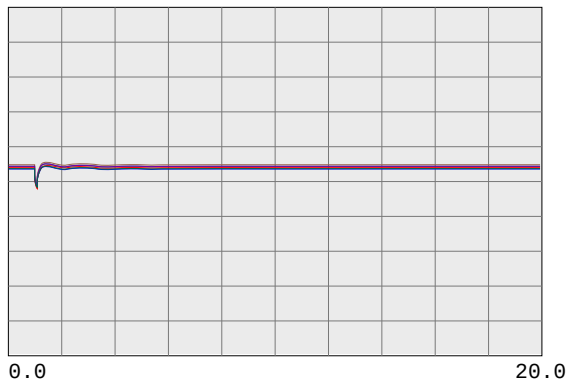
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



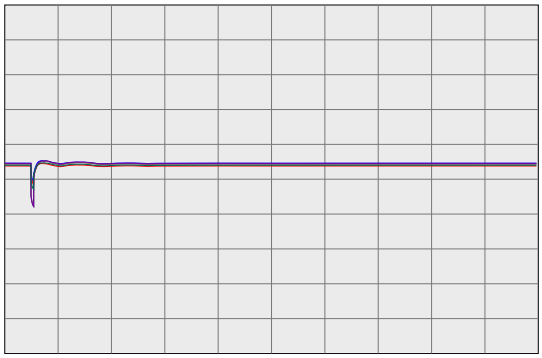
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

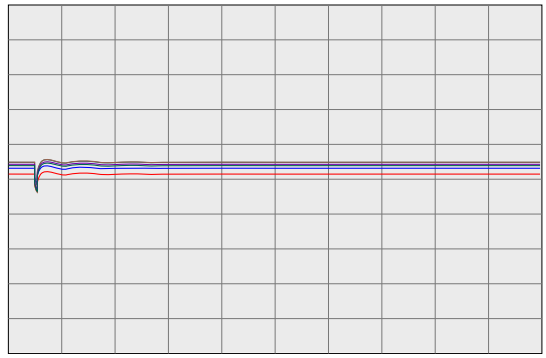
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

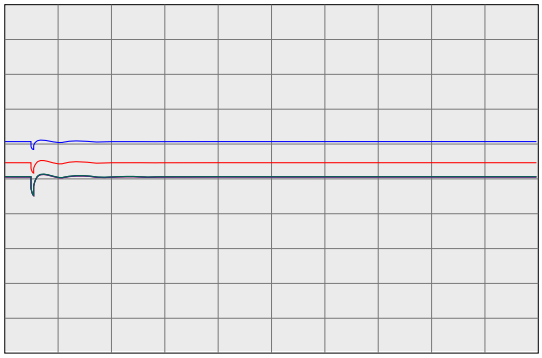
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

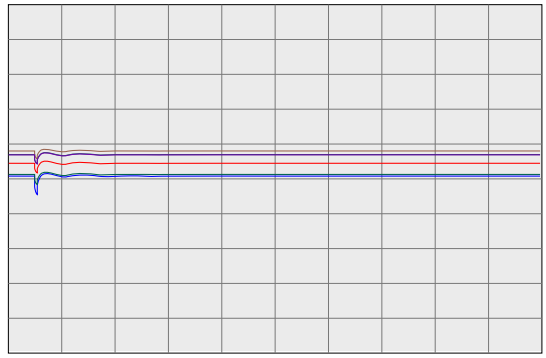
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

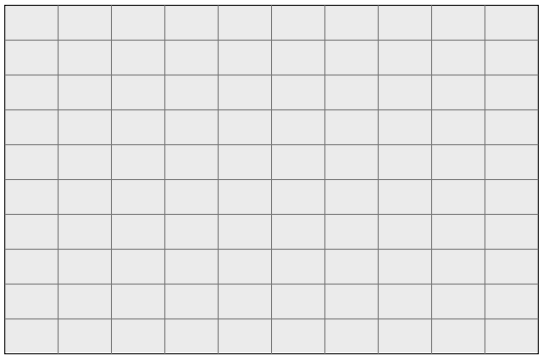
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

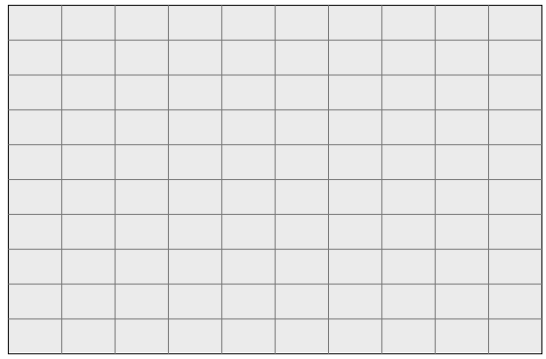


0.0 20.0

Time(sec)

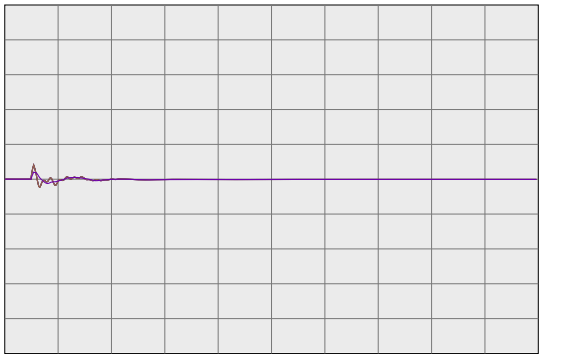
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

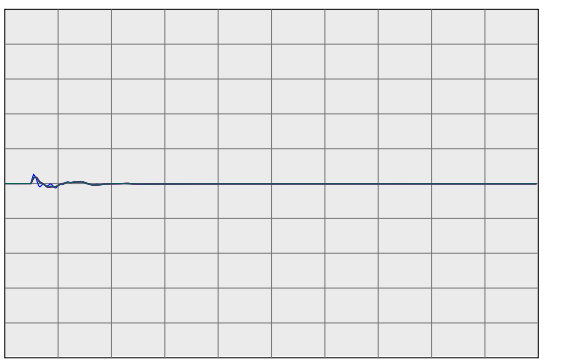


59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

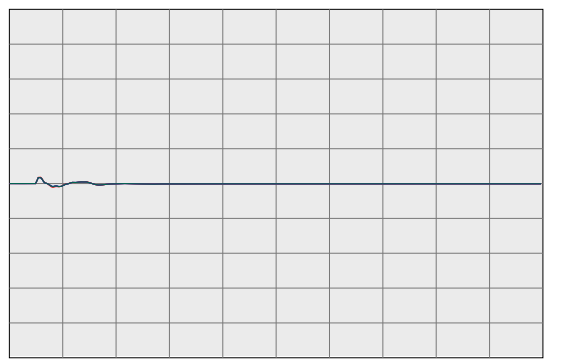
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



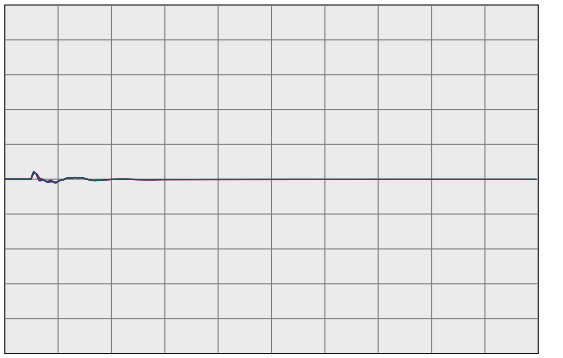
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



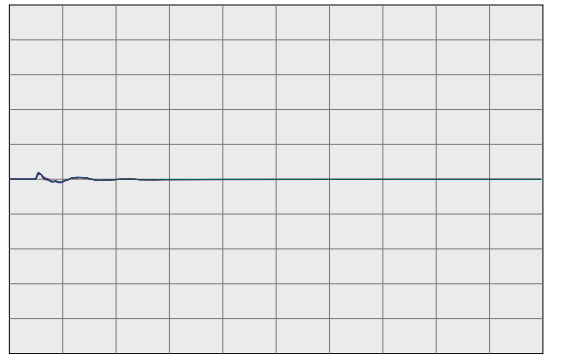
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



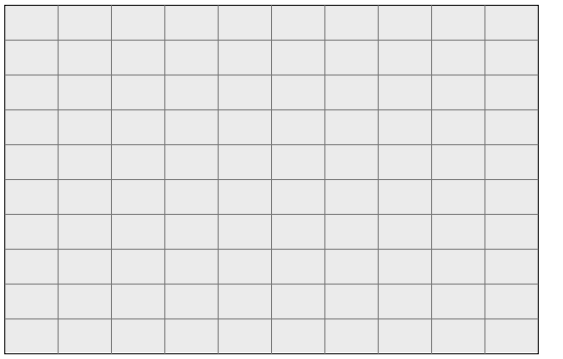
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

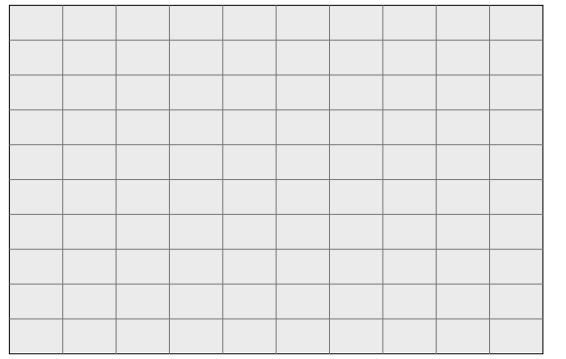


59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

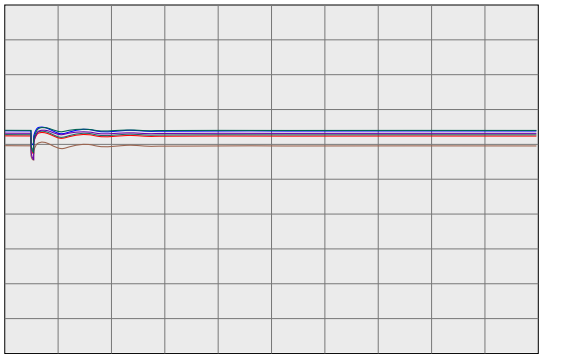
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



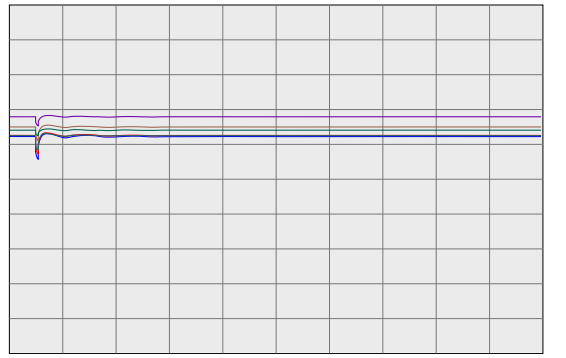


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

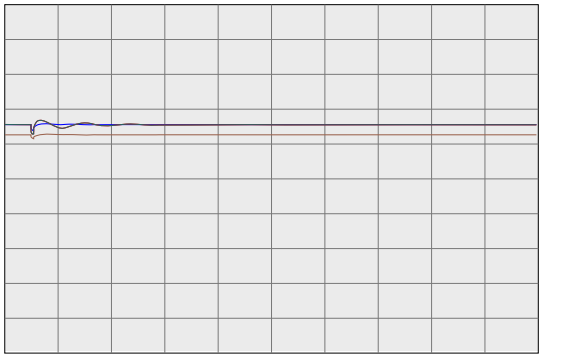
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



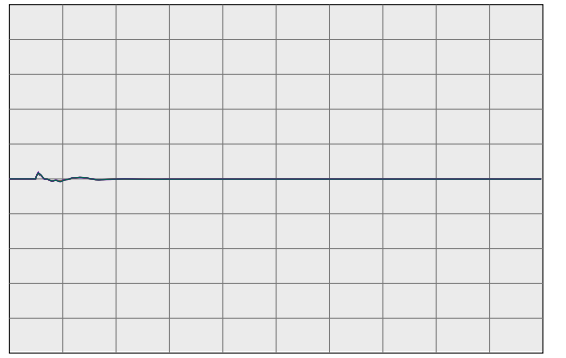
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



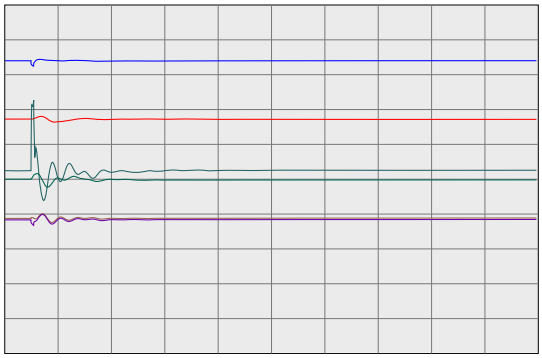
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

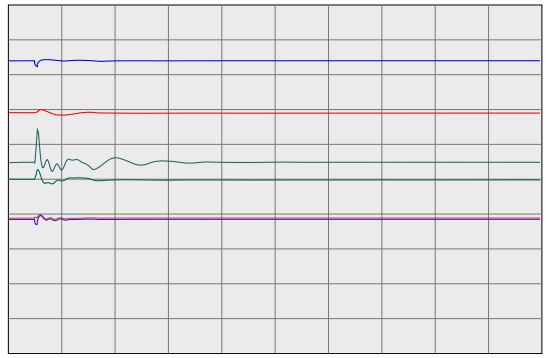
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

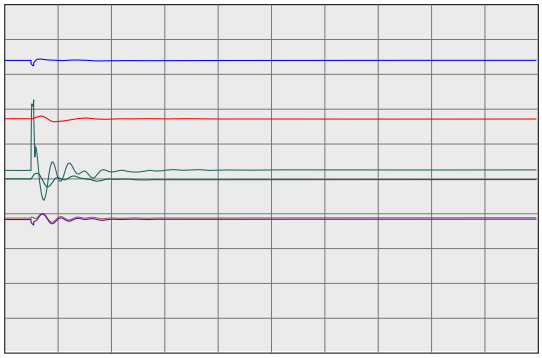
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

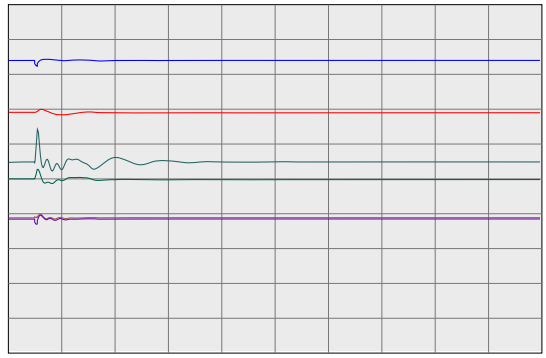
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

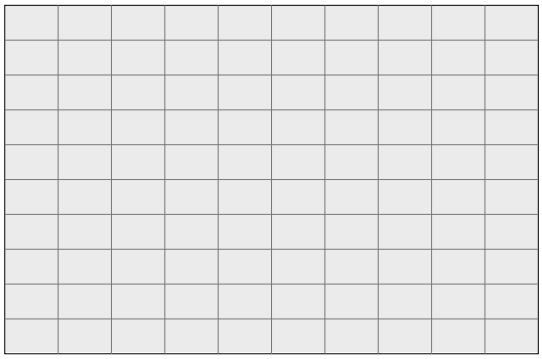
0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

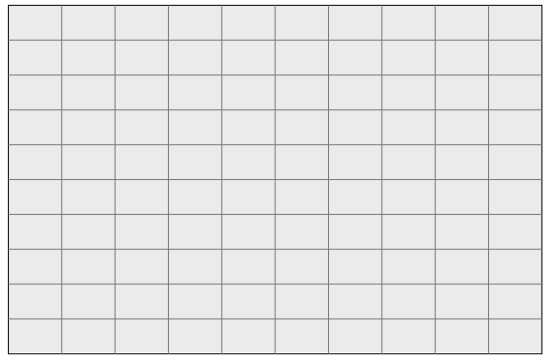


0.0 20.0

Time(sec)

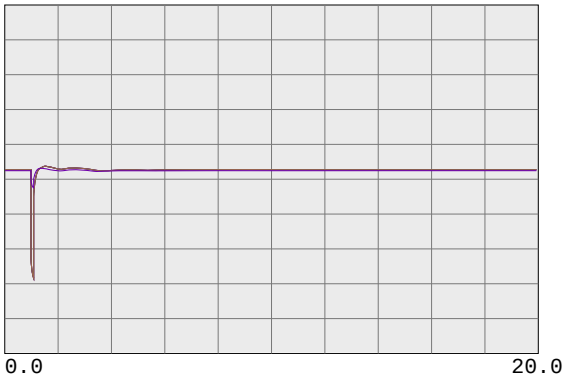
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



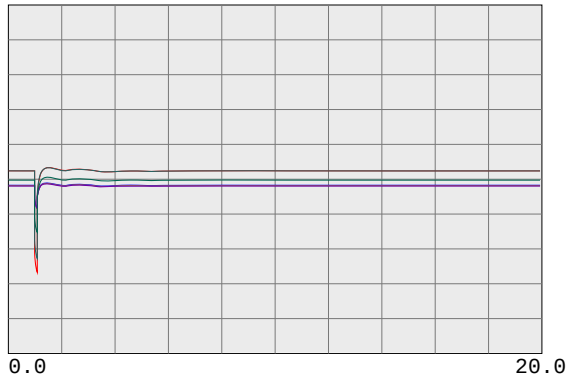


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

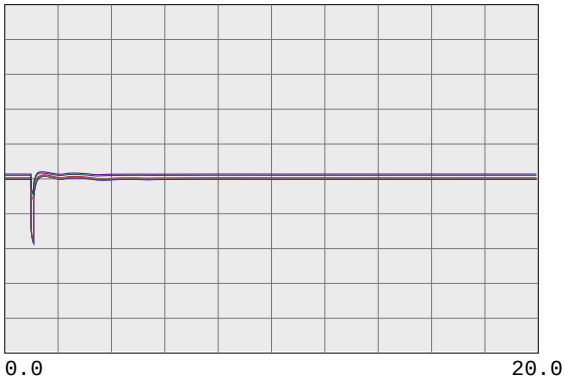
230-KV SYSTEM VOLTAGES



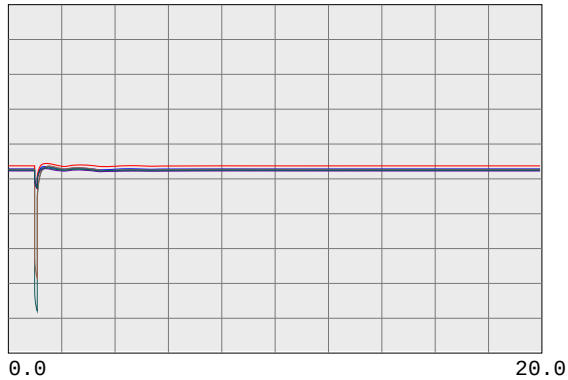
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



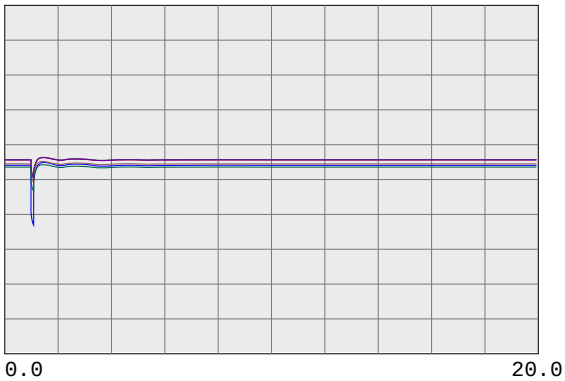
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

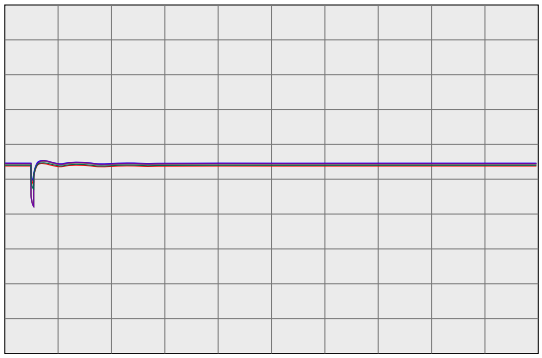


0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

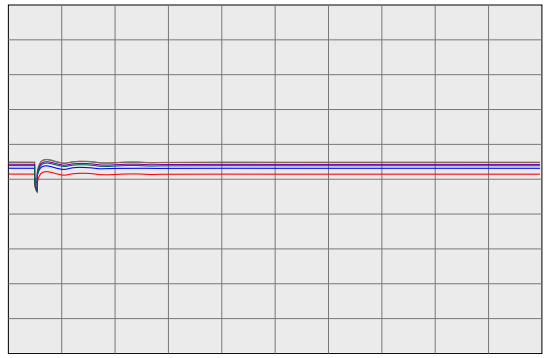
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

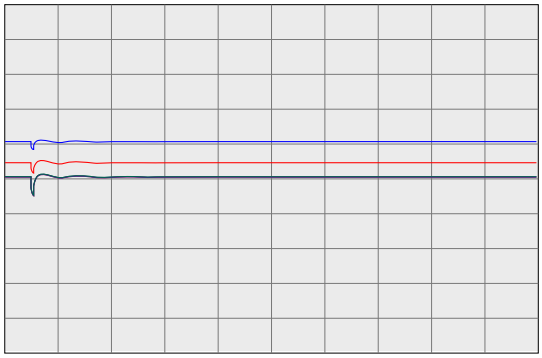
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

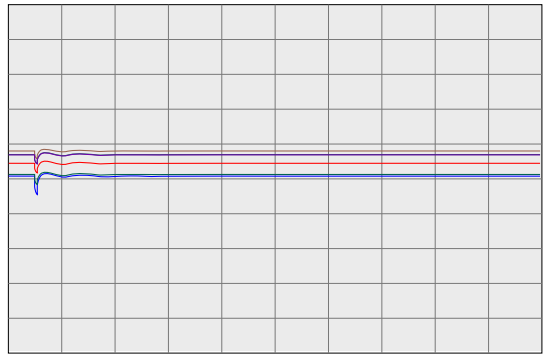
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

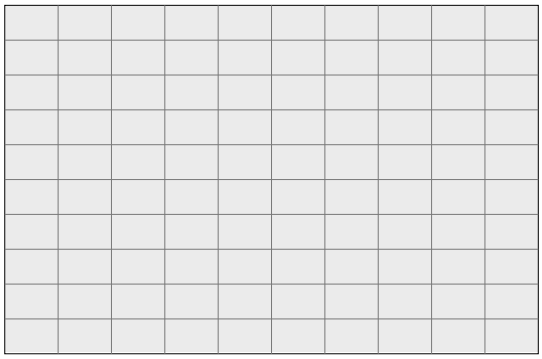
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

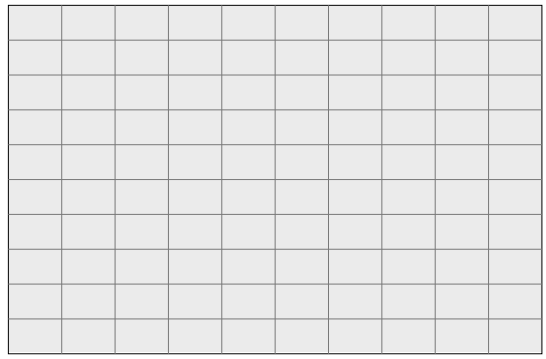


0.0 20.0

Time(sec)

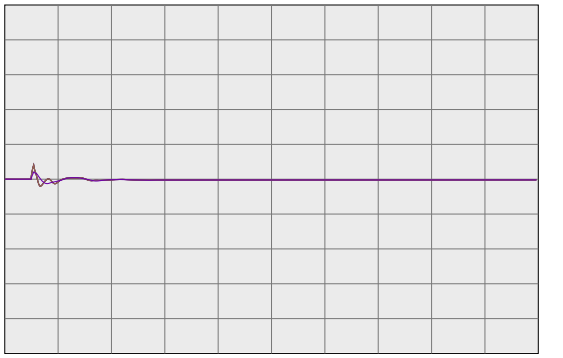
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

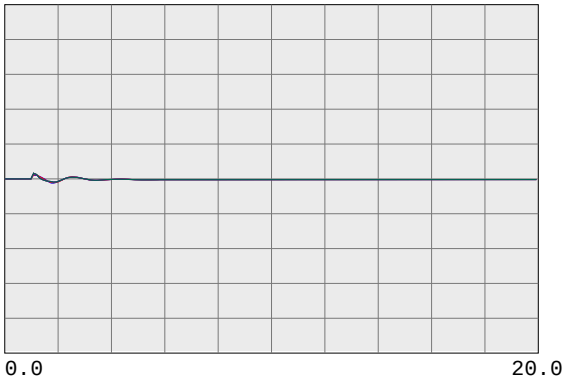
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

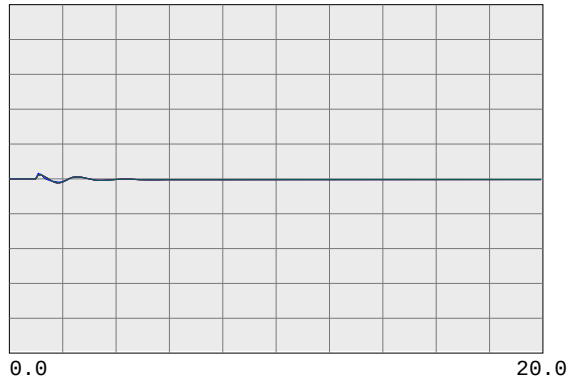
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

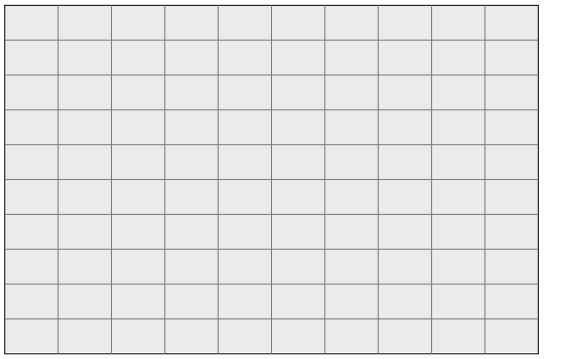
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

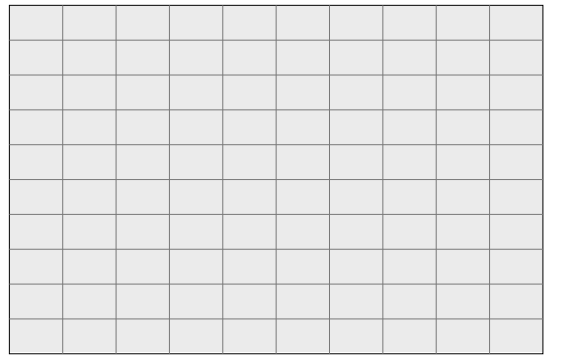


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



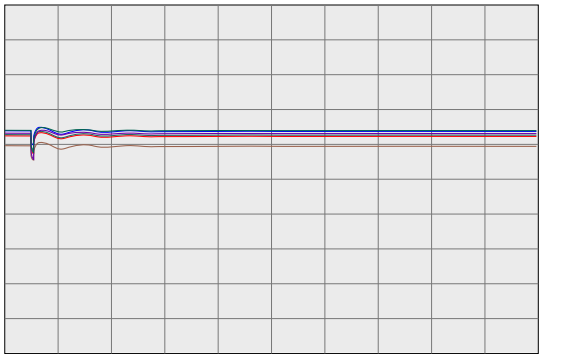
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



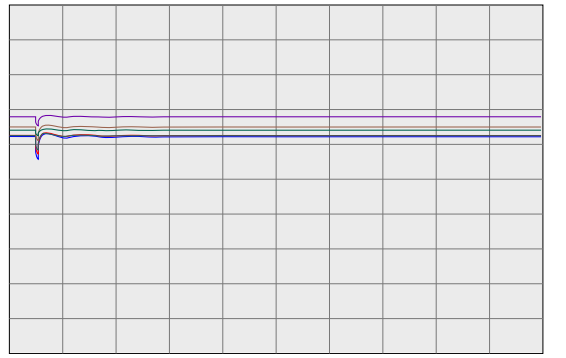


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

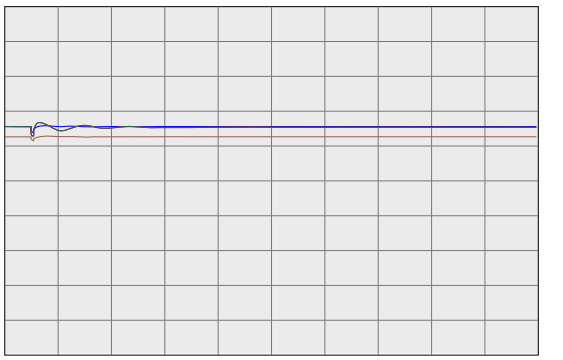
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

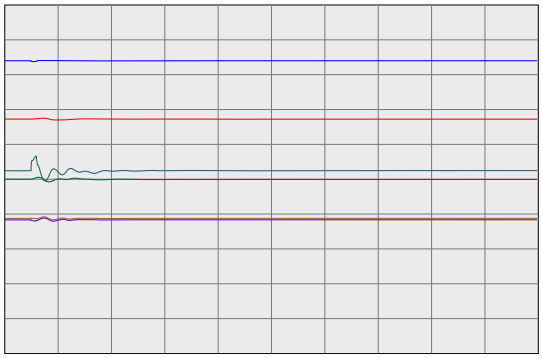
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

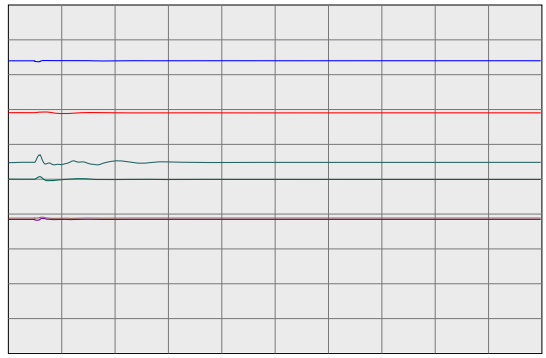
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

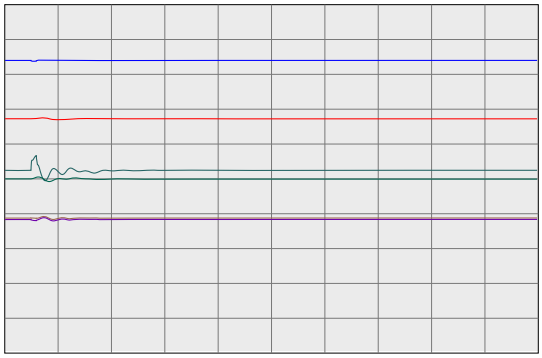
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

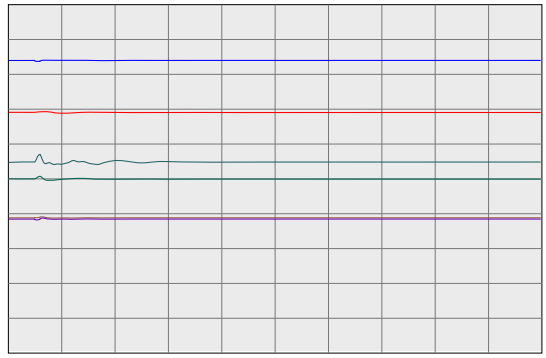
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

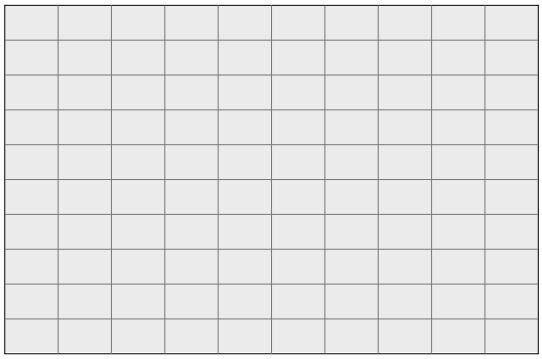
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

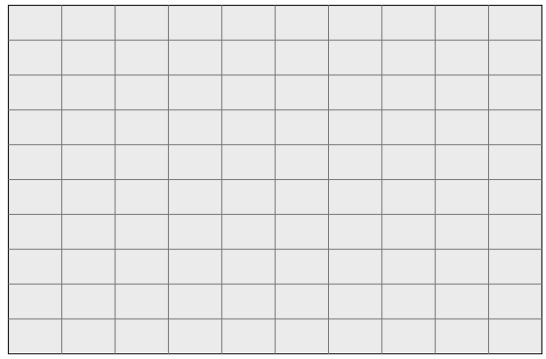


0.0 20.0

Time(sec)

0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100

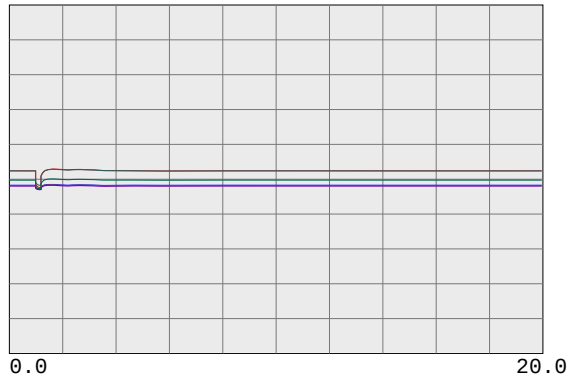




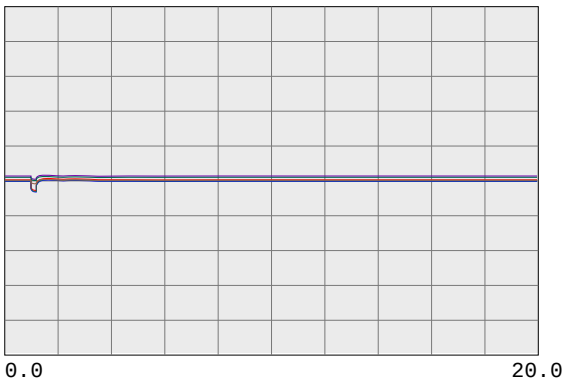
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM VOLTAGES

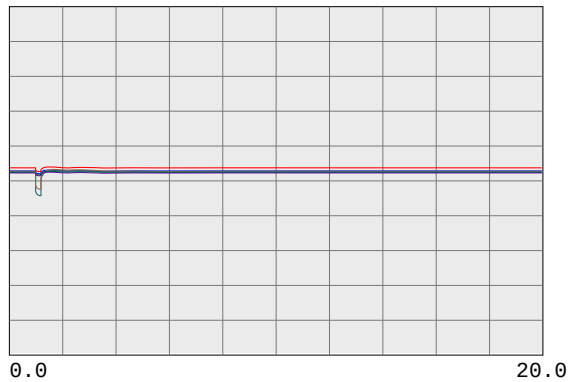
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



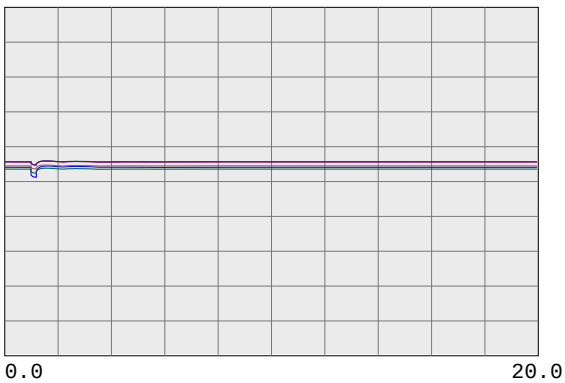
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

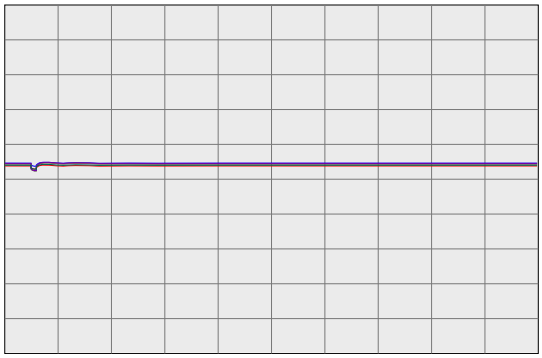


0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

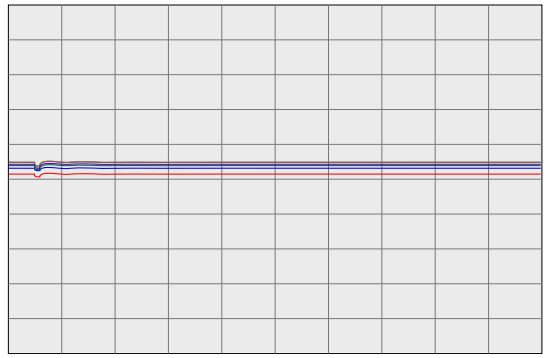
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

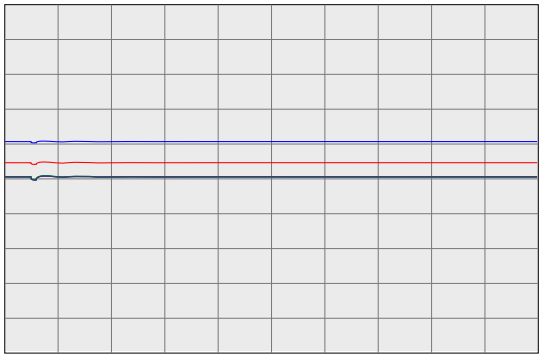
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

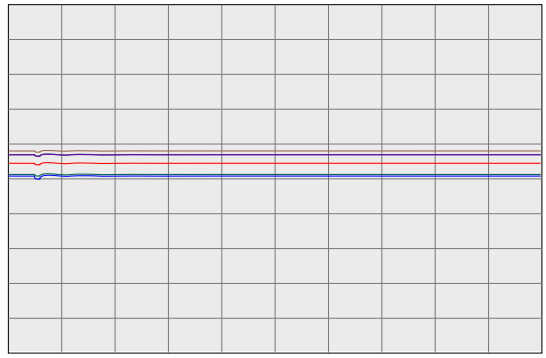
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

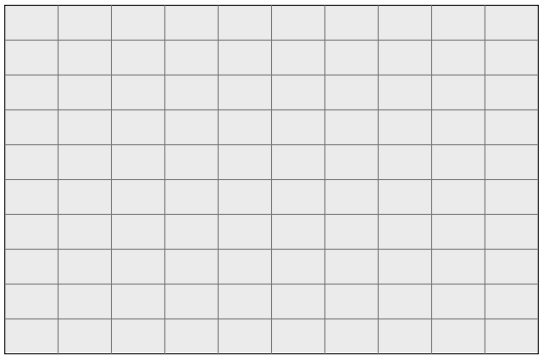
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

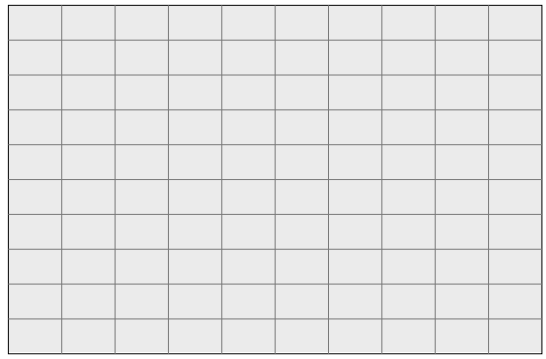


0.0 20.0

Time(sec)

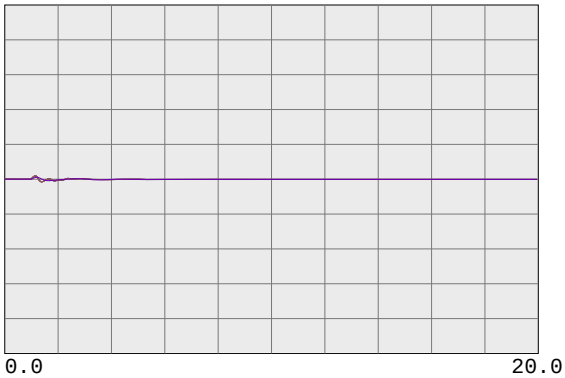
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





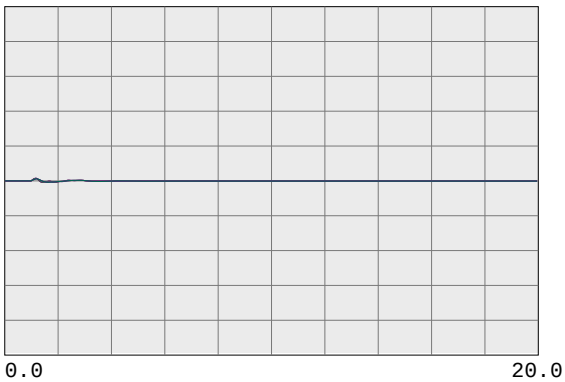
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

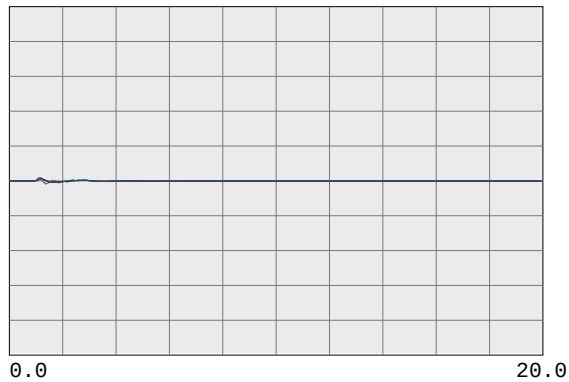


59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

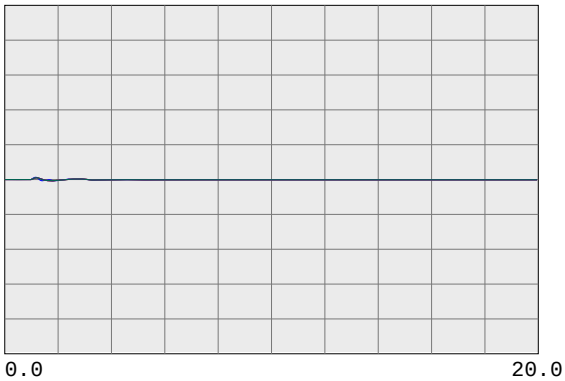
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



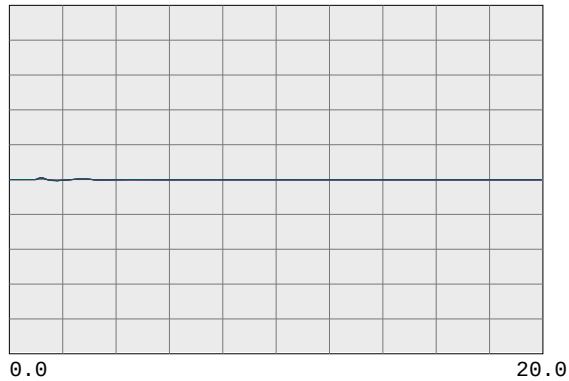
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



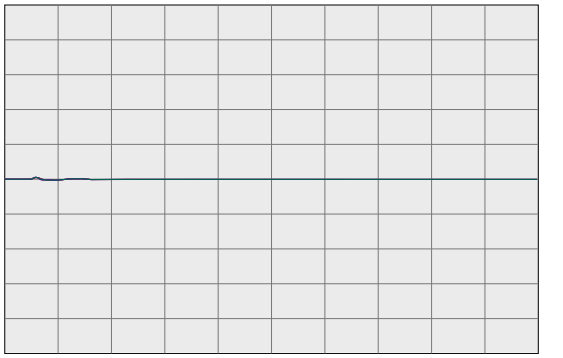
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



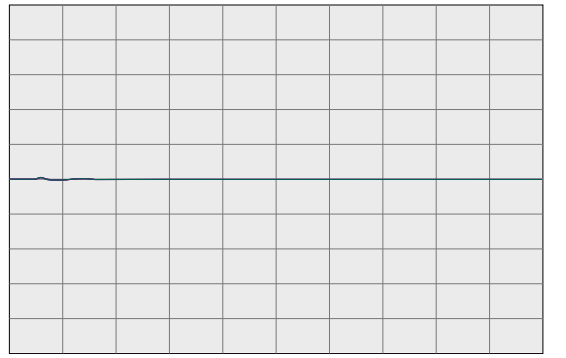
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

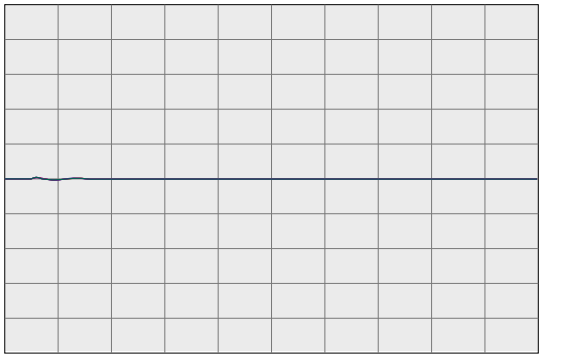
230-KV SYSTEM FREQUENCIES



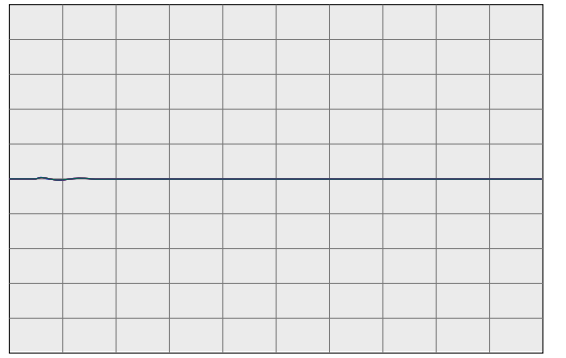
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



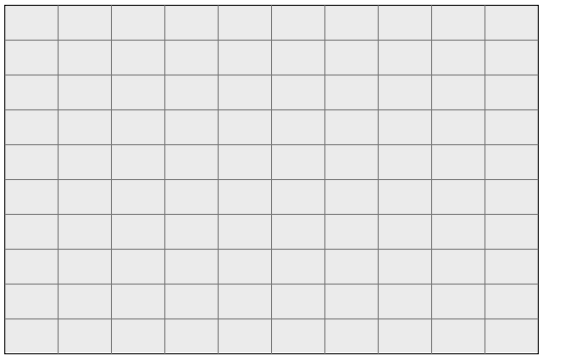
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

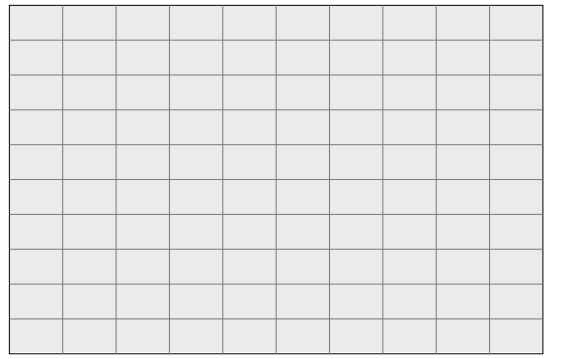


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



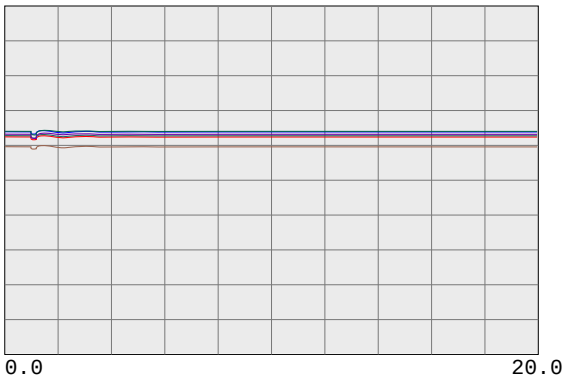
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



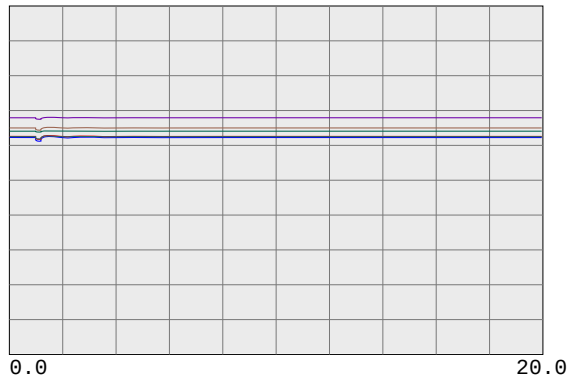


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

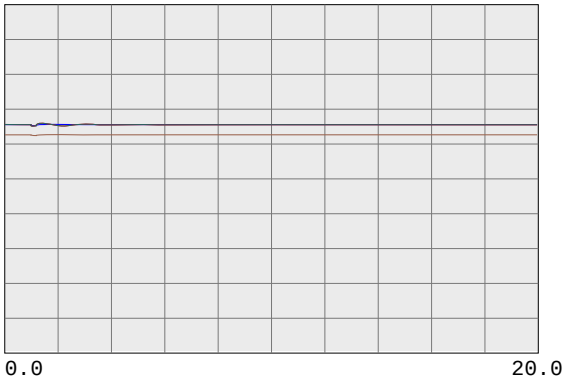
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



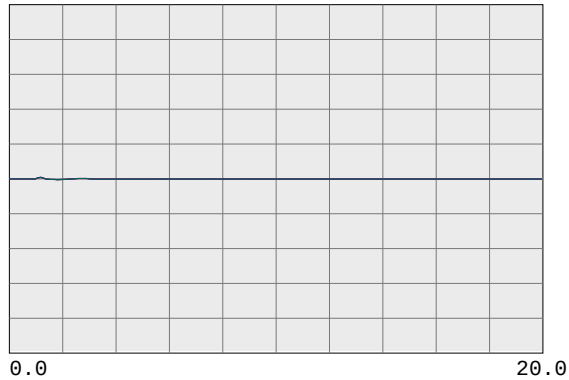
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



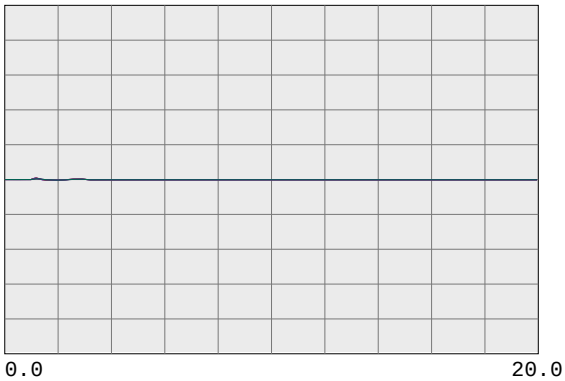
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



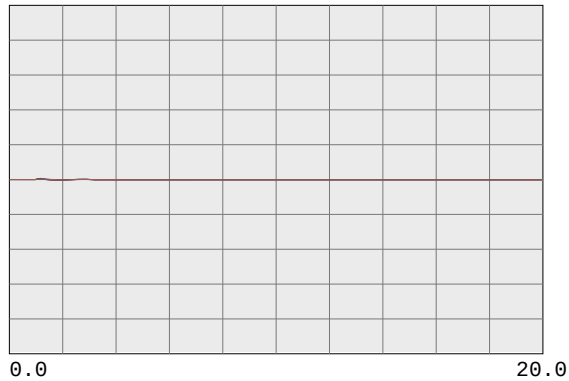
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



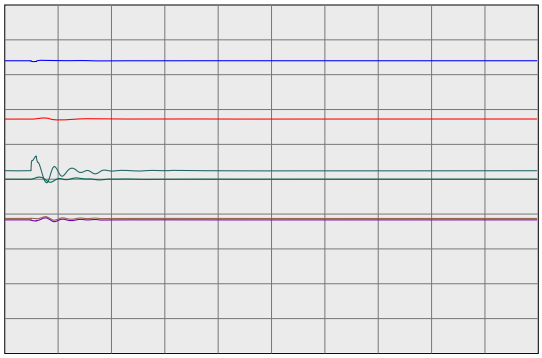
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



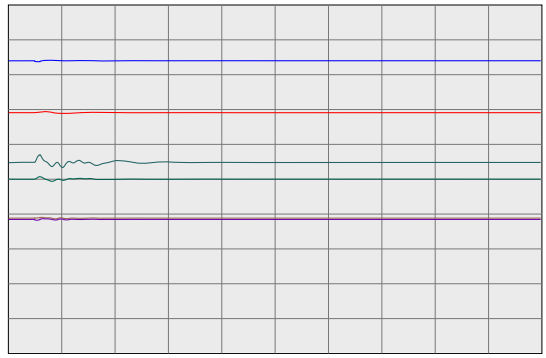
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

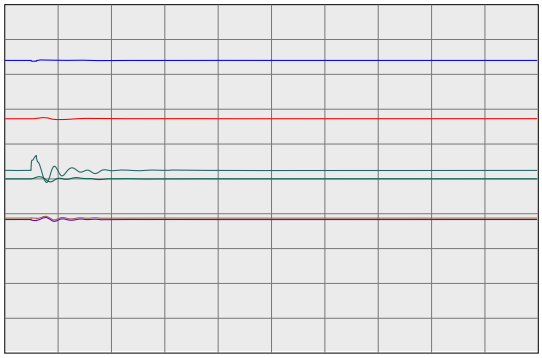
WILLOW PASS GENERATION PLANT



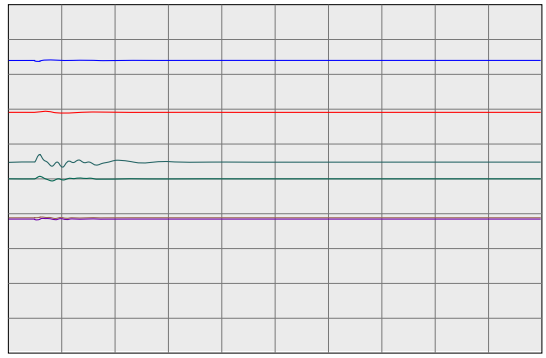
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



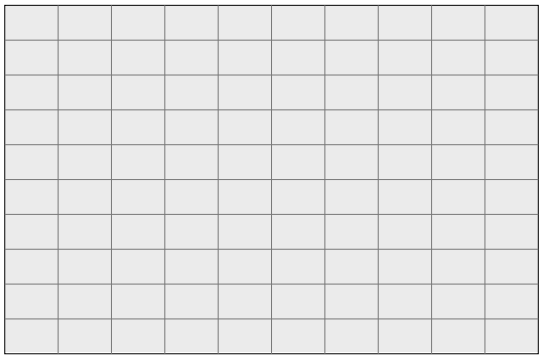
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

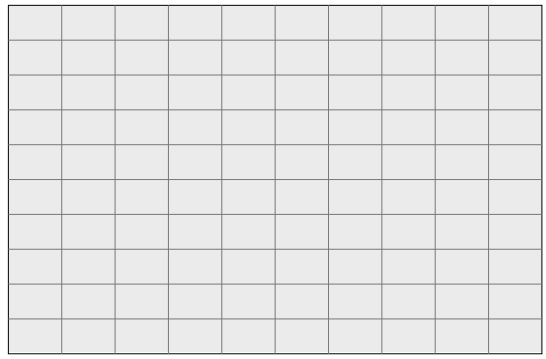


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



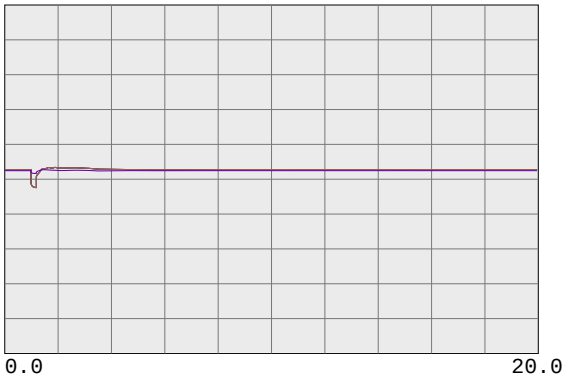
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



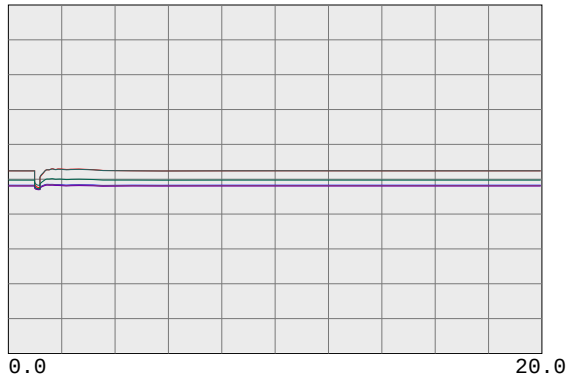


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

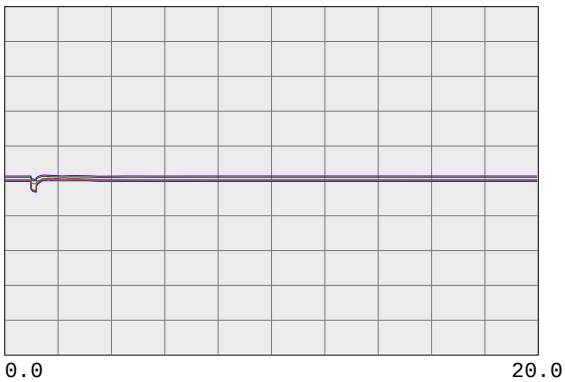
230-KV SYSTEM VOLTAGES



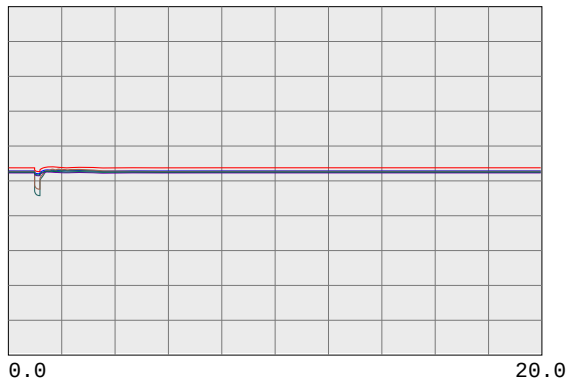
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



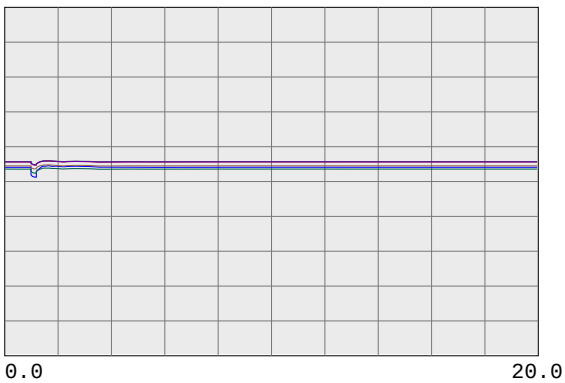
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



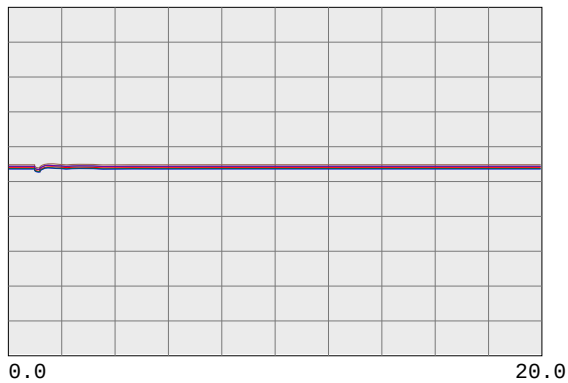
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



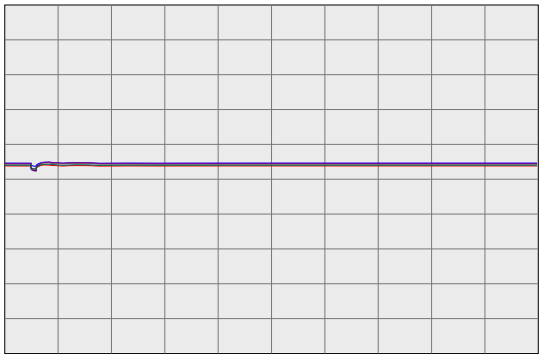
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

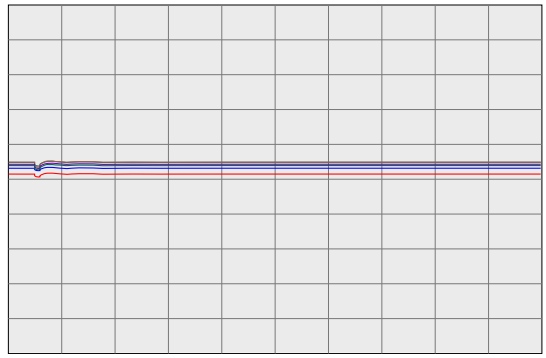
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

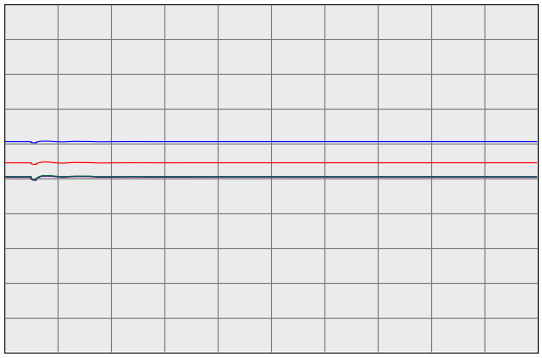
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

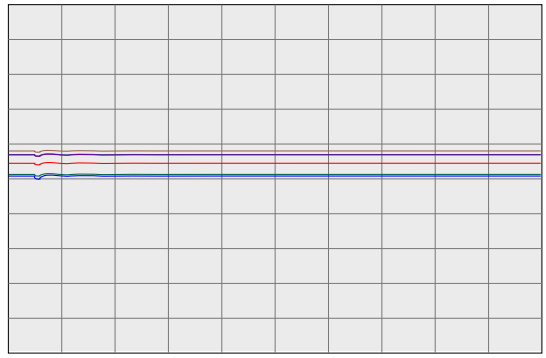
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

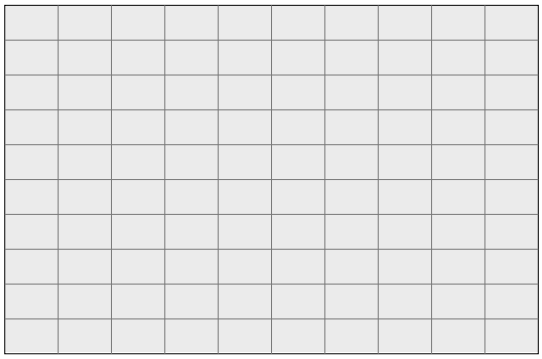
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

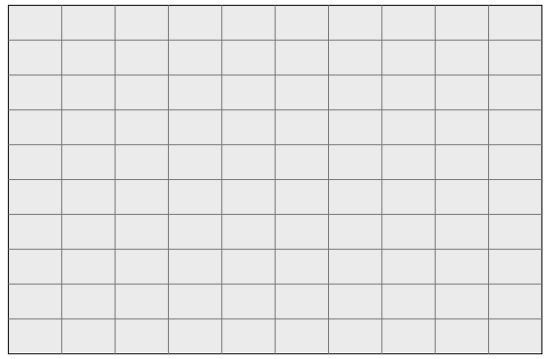


0.0 20.0

Time(sec)

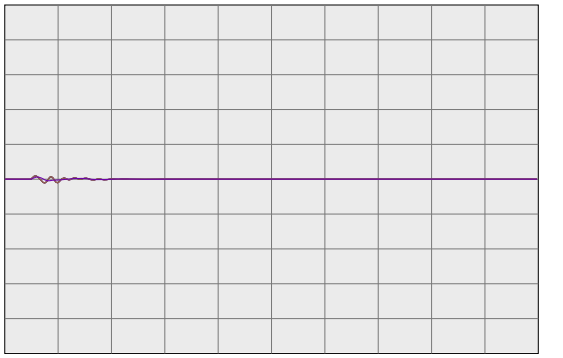
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



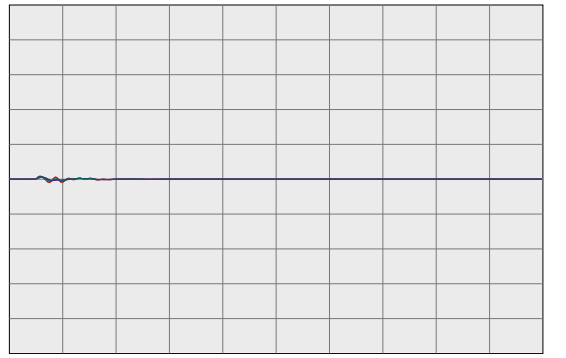


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

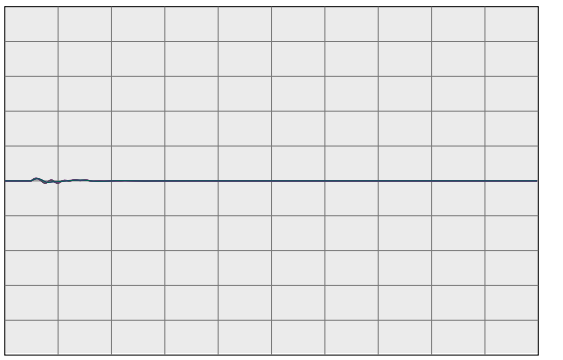
230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

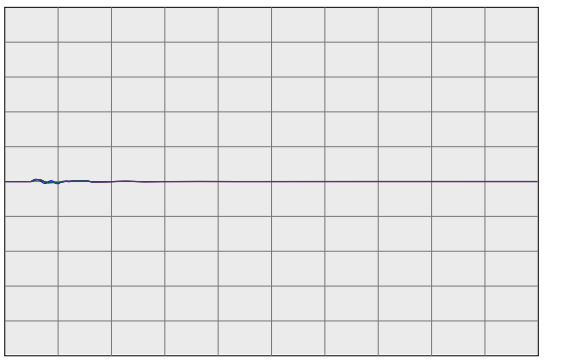


59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

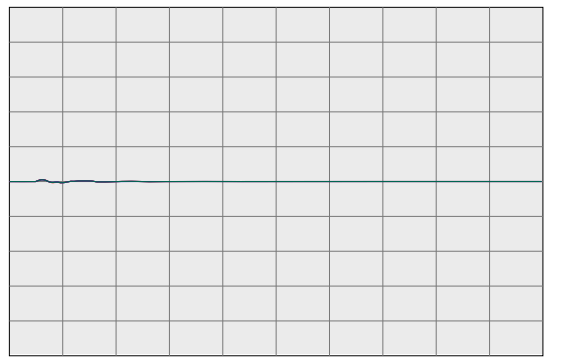


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



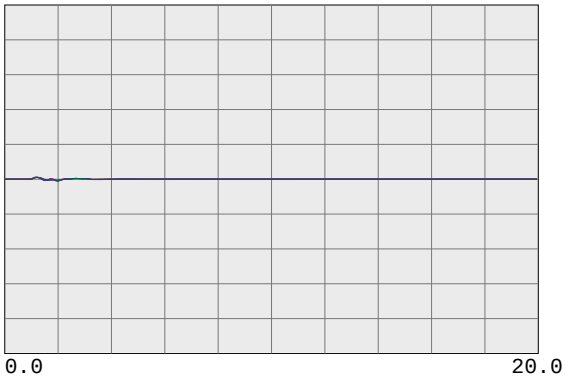
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



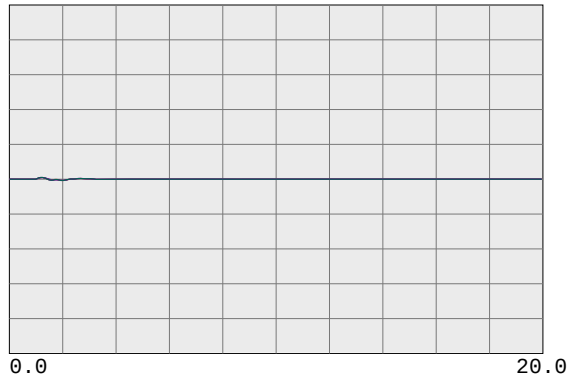
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

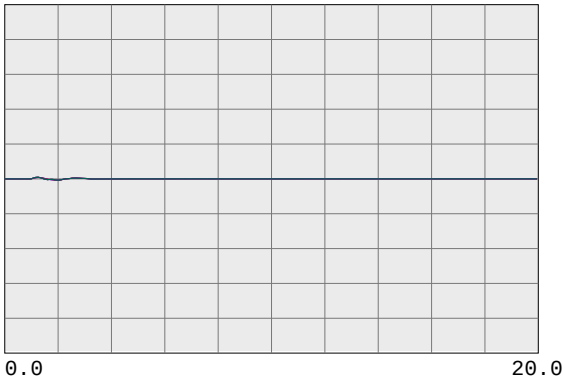
230-KV SYSTEM FREQUENCIES



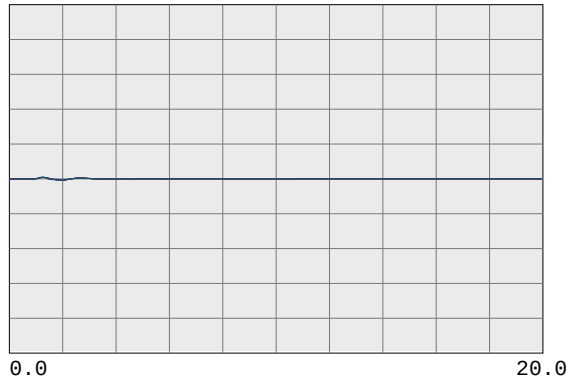
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



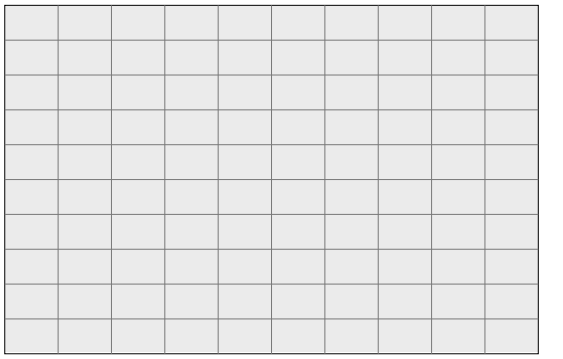
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

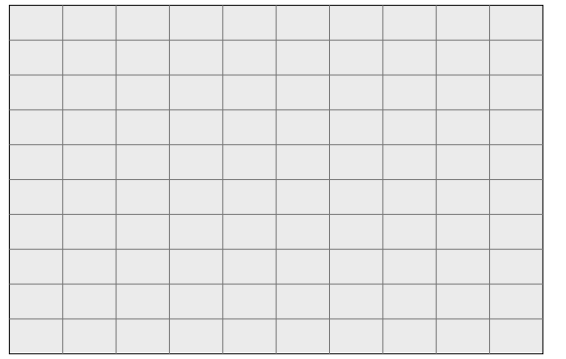


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



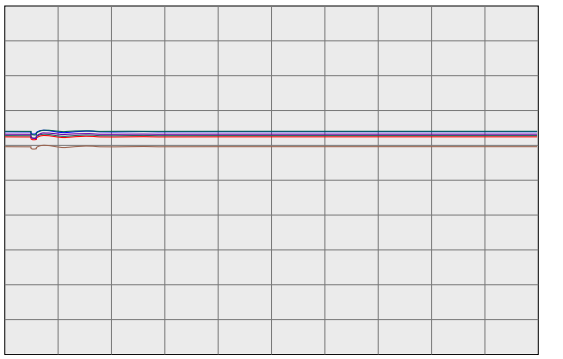
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



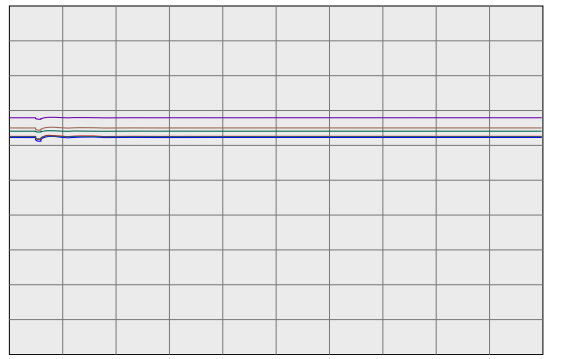


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

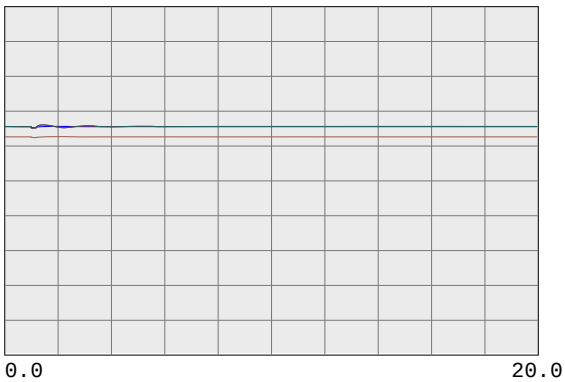
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



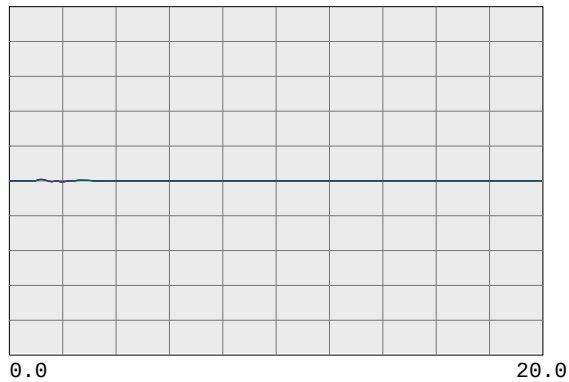
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500

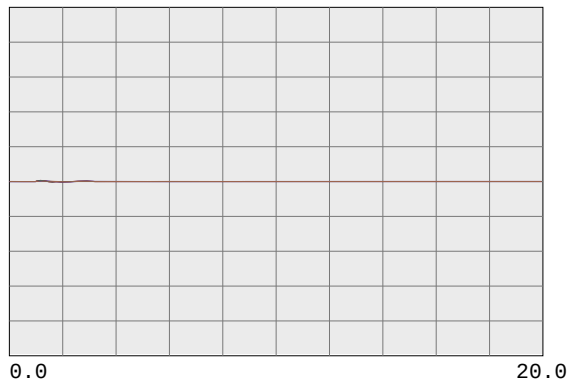


0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

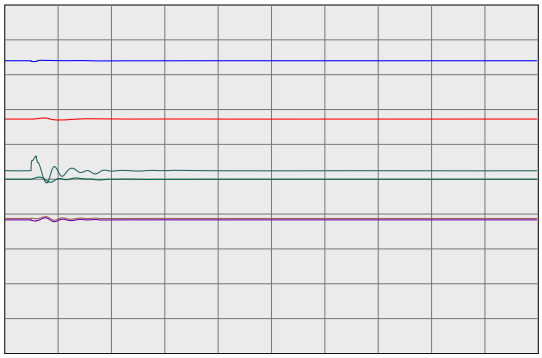
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



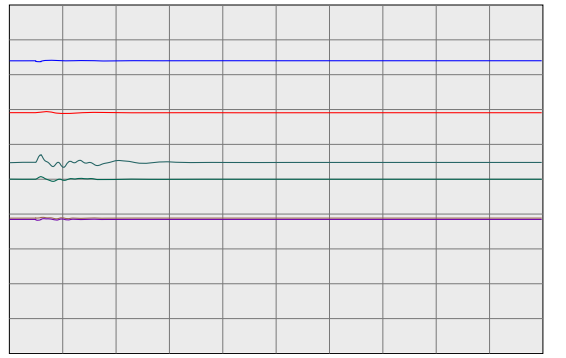
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

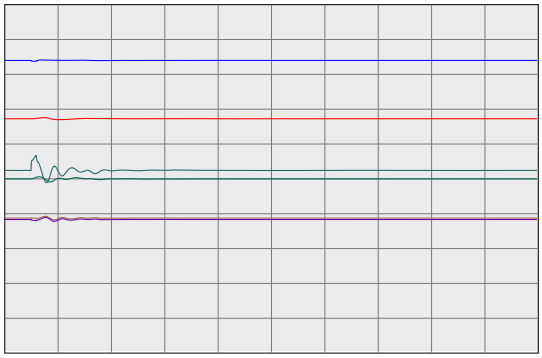
WILLOW PASS GENERATION PLANT



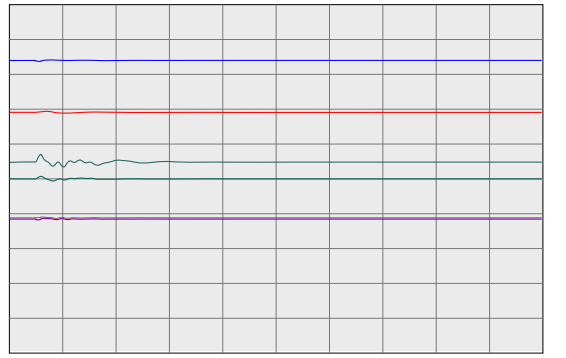
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



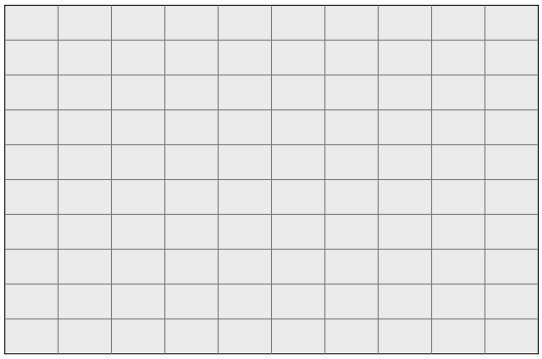
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

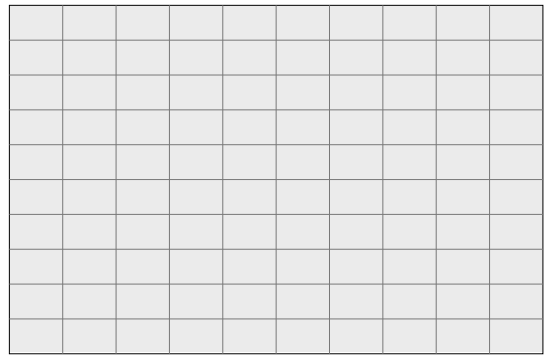


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



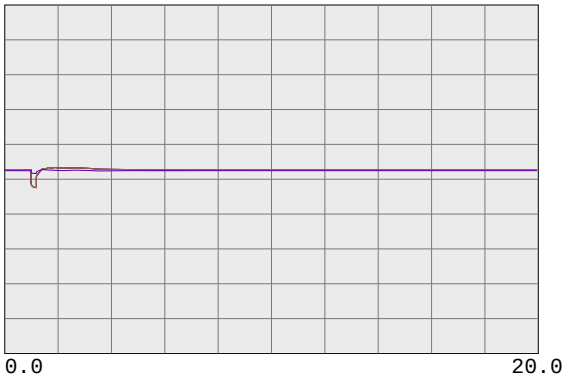
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



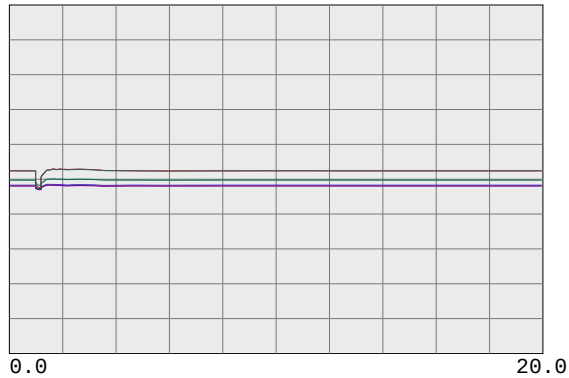


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

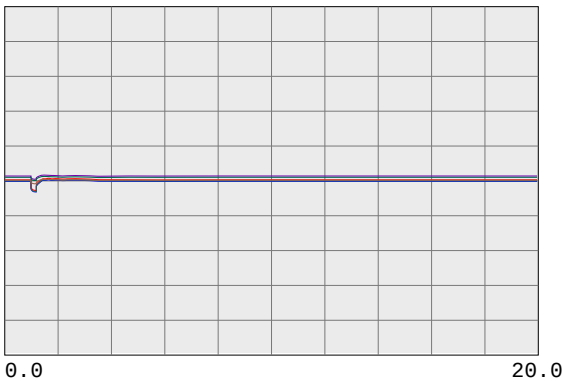
230-KV SYSTEM VOLTAGES



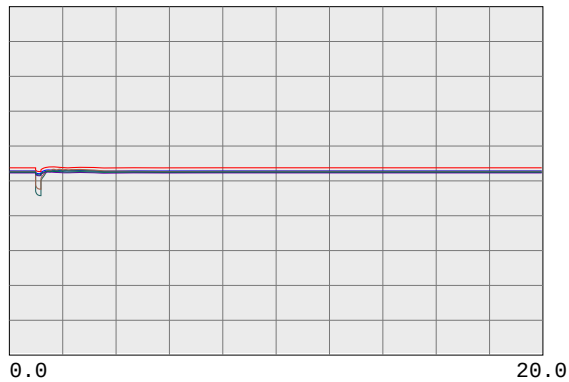
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500

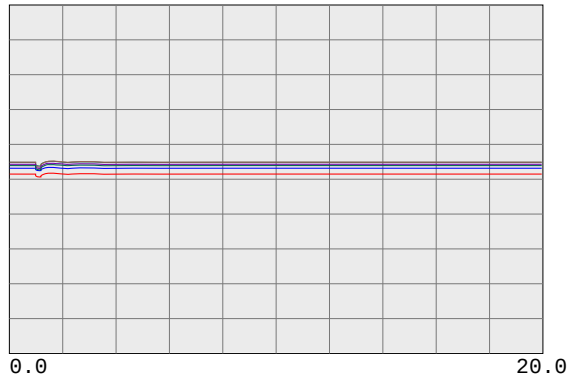
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500

0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

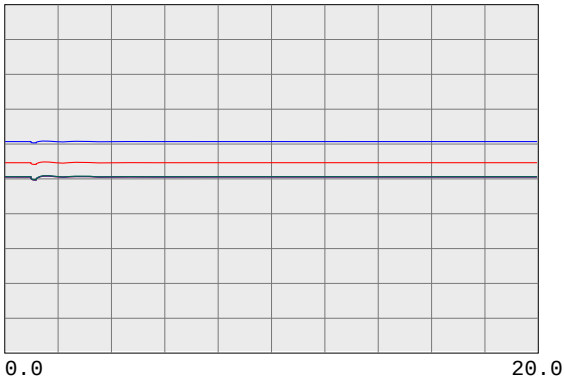
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM VOLTAGES

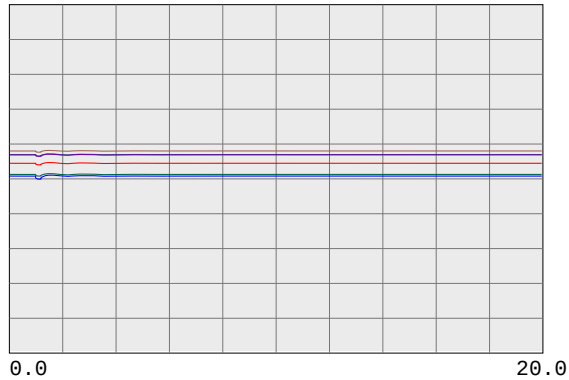
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



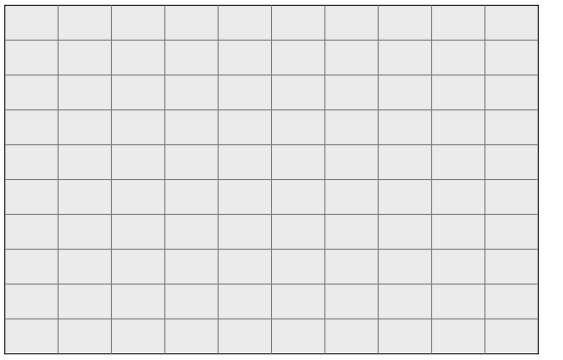
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

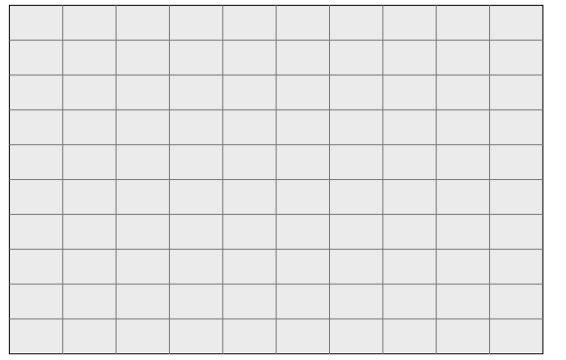


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



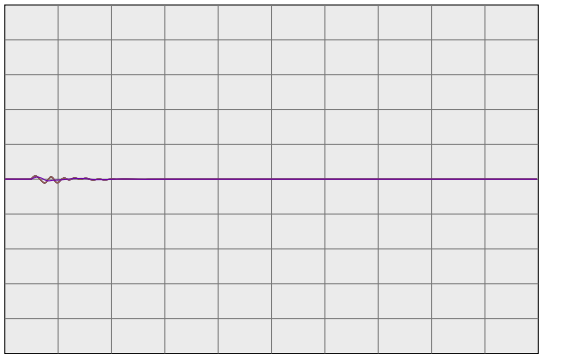
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



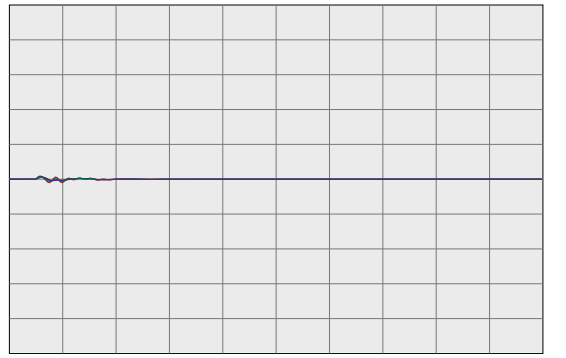


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

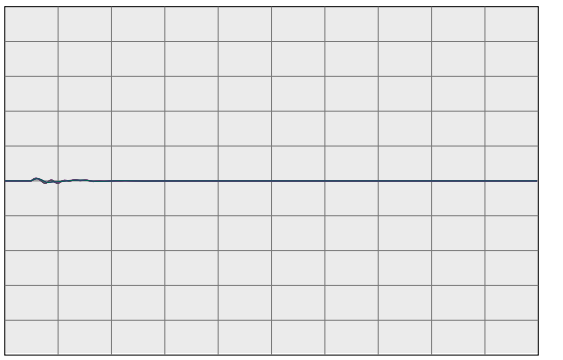
230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

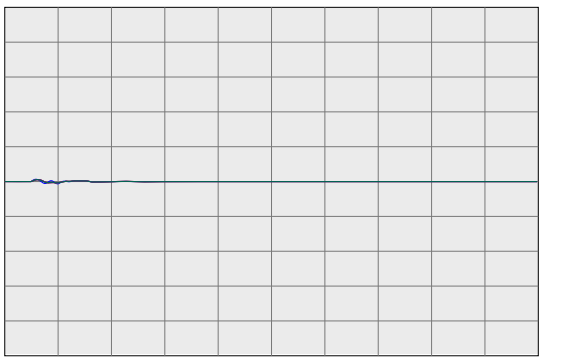


59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

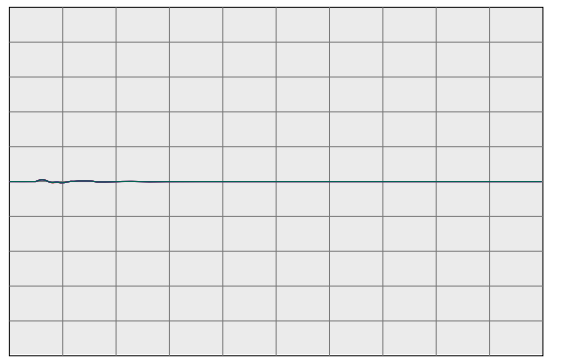


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



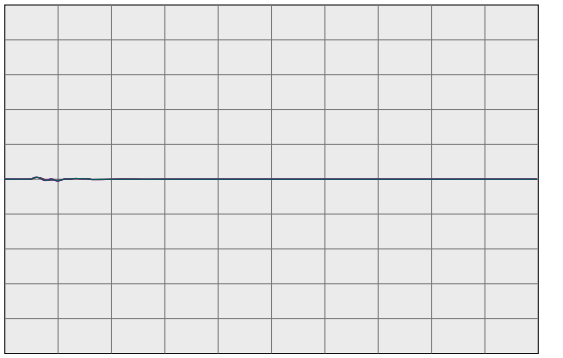
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



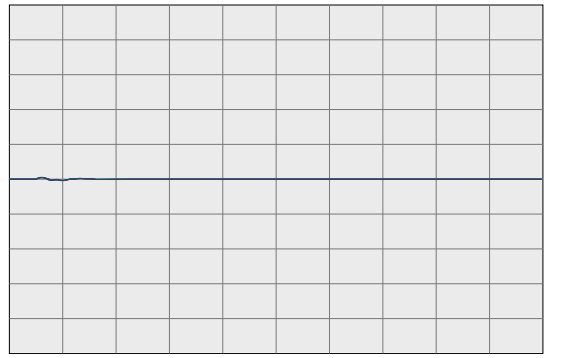
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

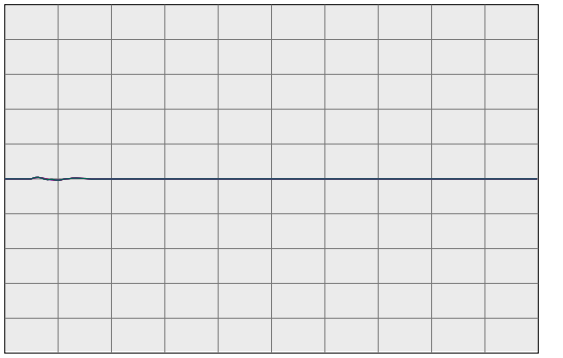
230-KV SYSTEM FREQUENCIES



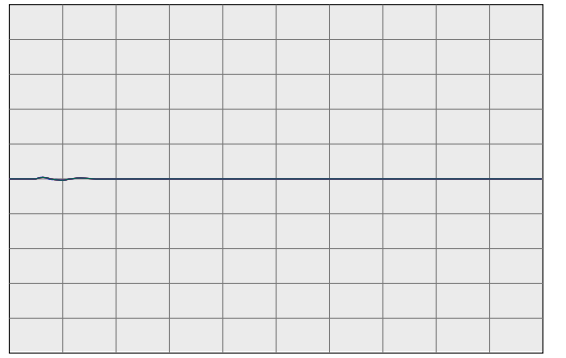
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



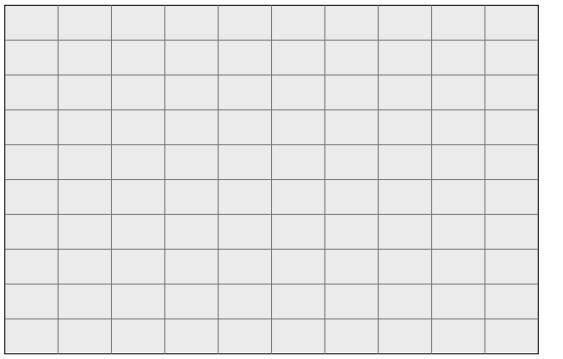
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

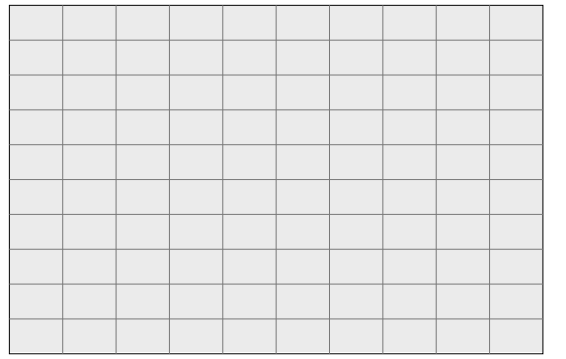


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



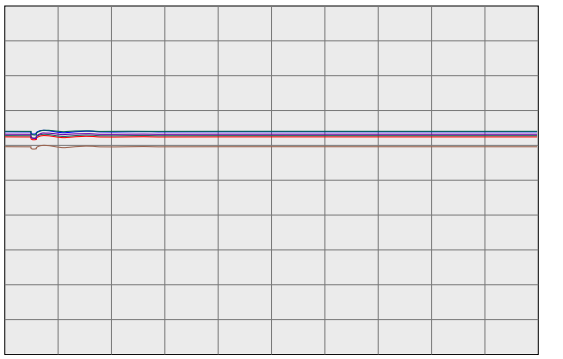
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



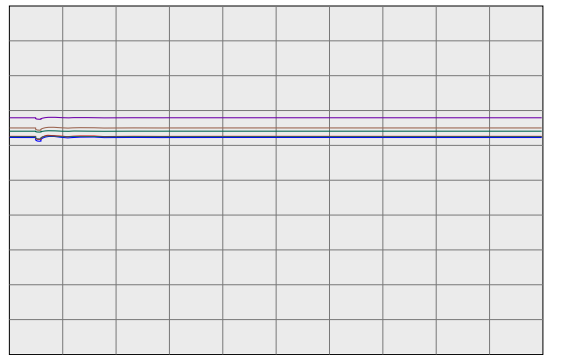


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

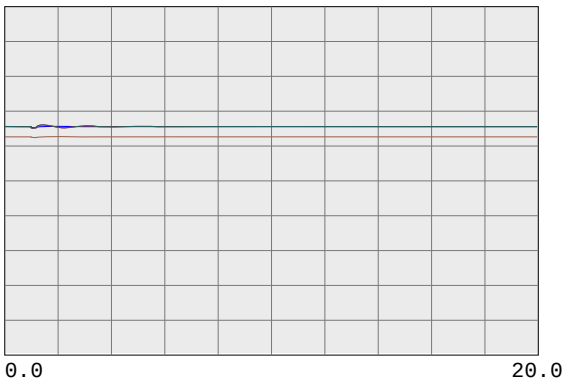
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



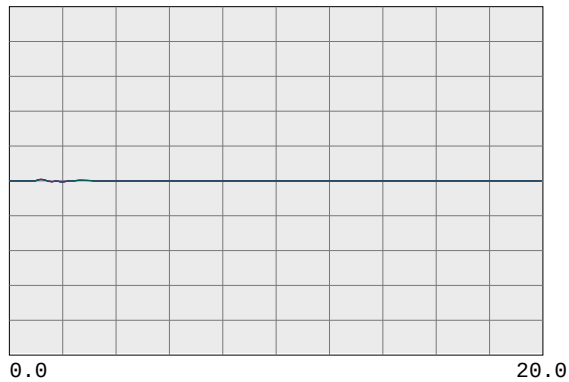
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



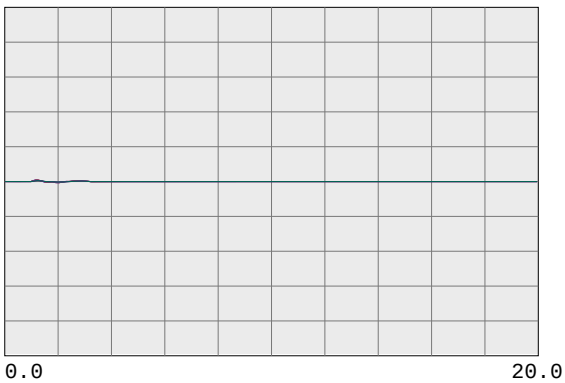
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



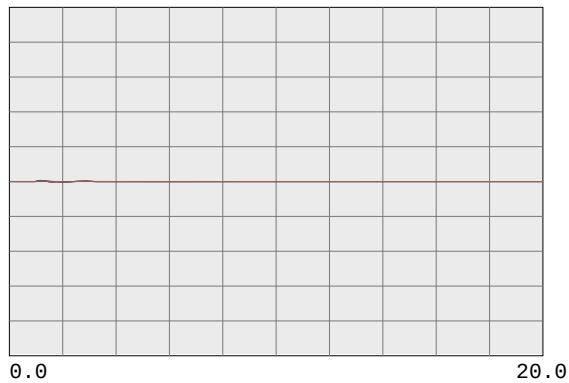
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



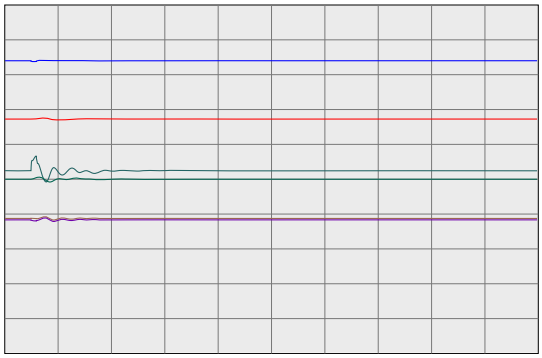
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



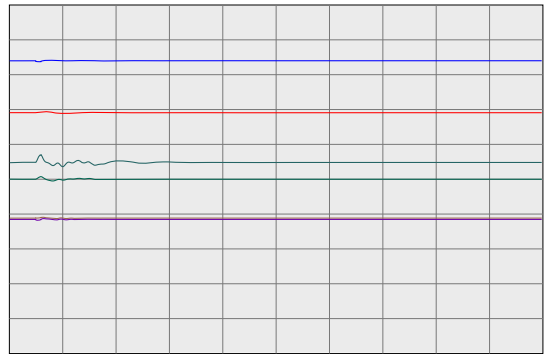
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

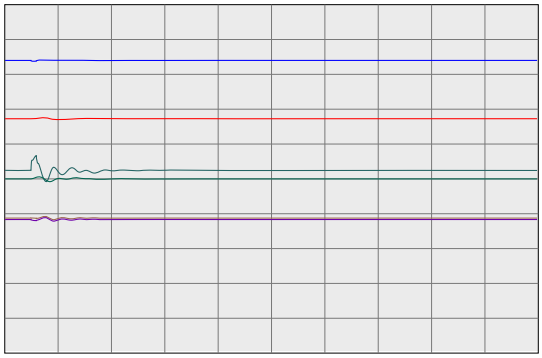
WILLOW PASS GENERATION PLANT



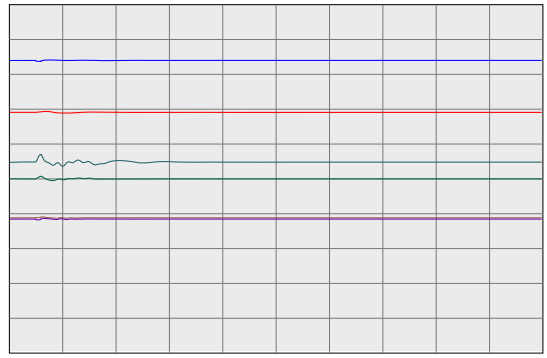
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



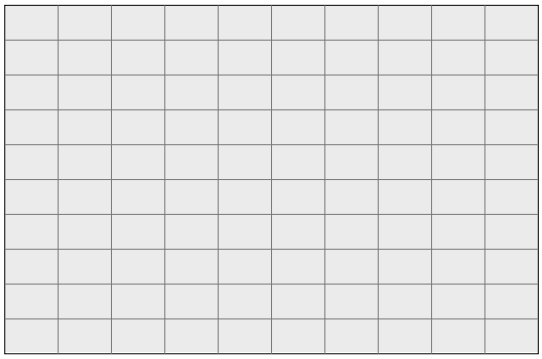
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

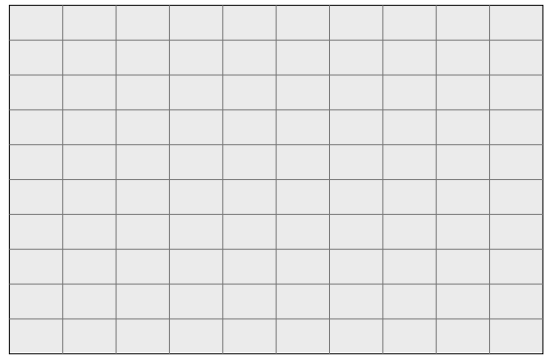


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



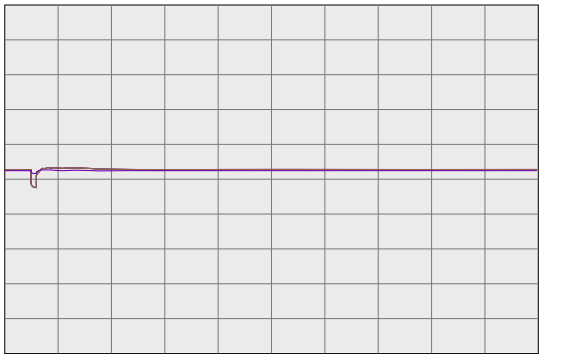
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



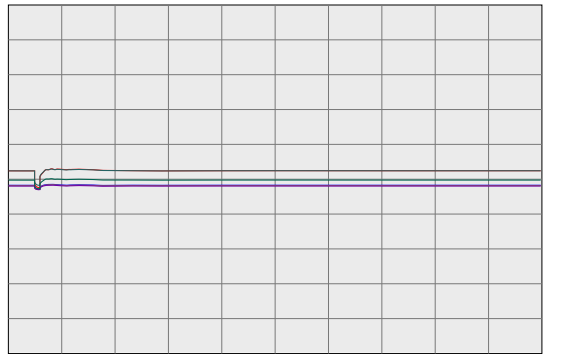


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

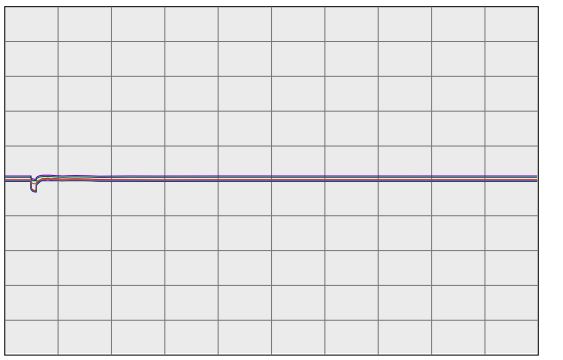
230-KV SYSTEM VOLTAGES



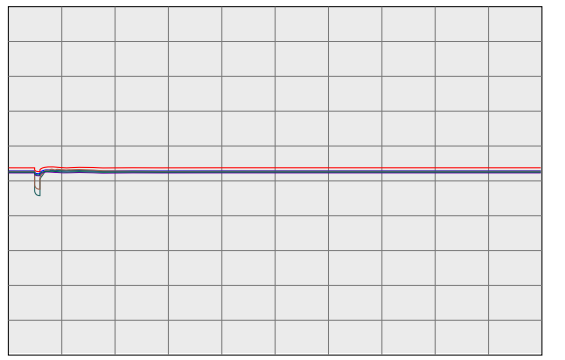
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



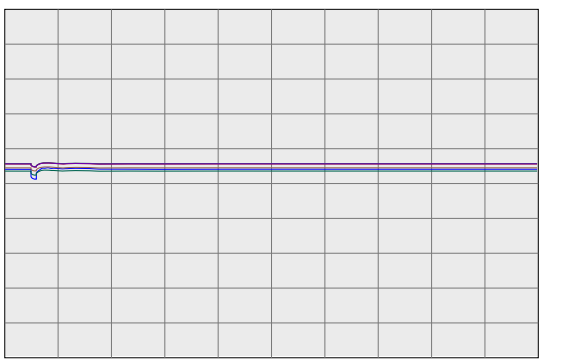
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



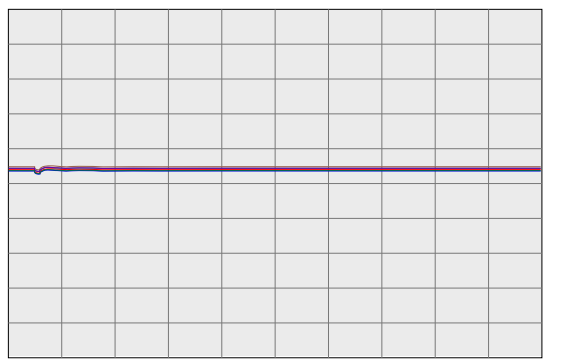
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



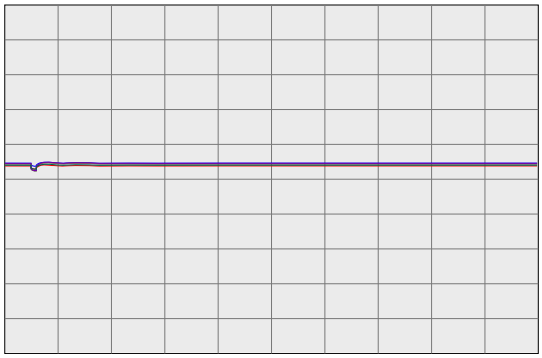
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

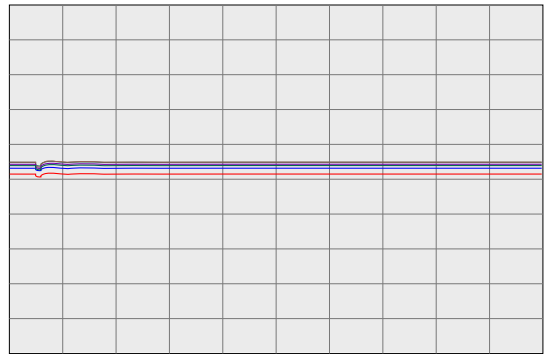
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

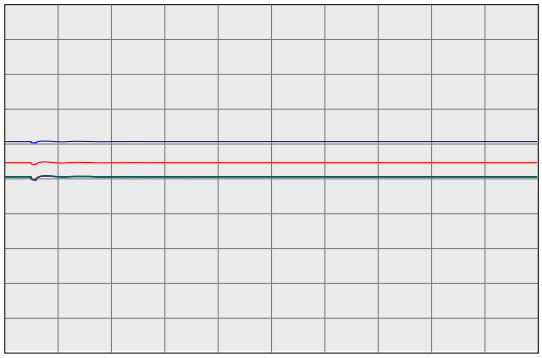
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

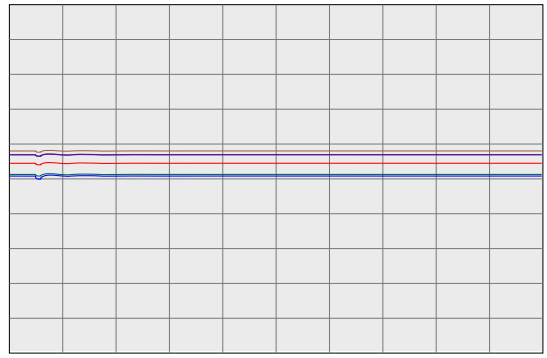
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

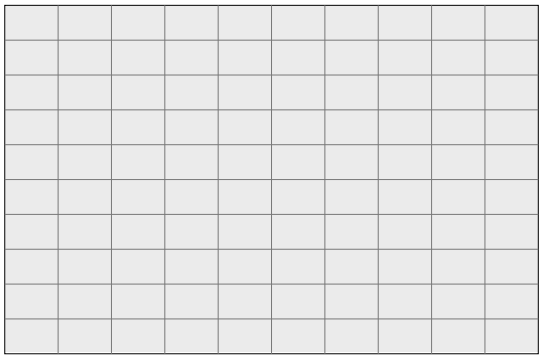
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

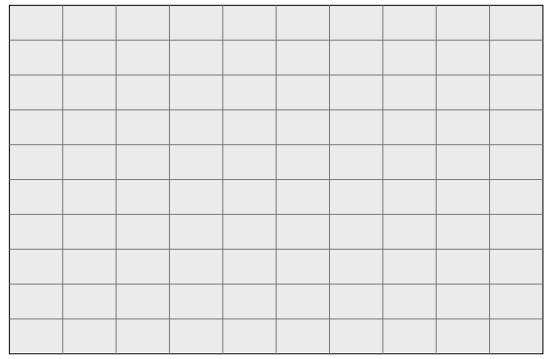


0.0 20.0

Time(sec)

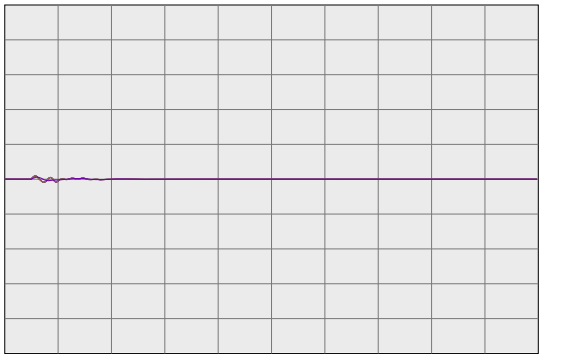
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





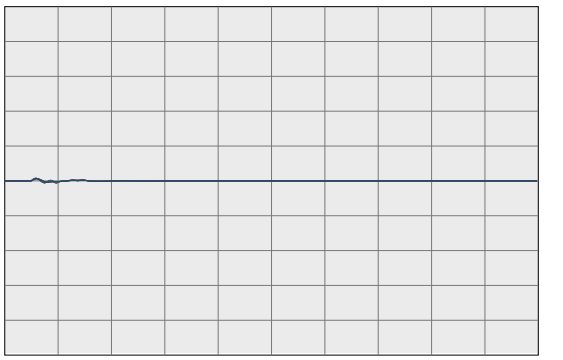
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

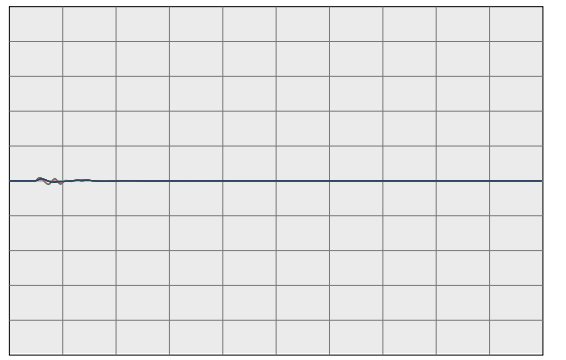


59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

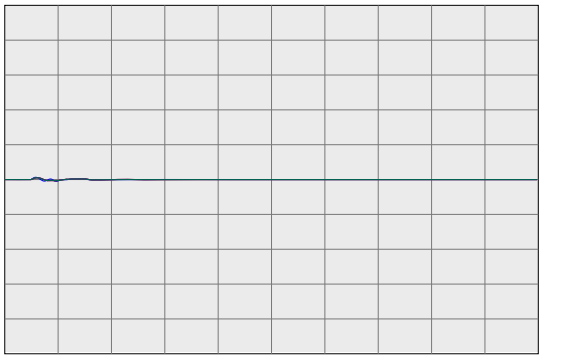
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



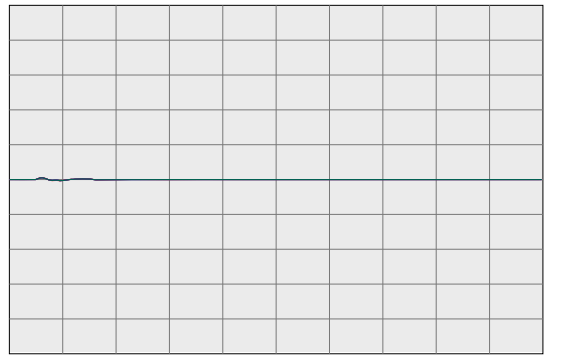
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



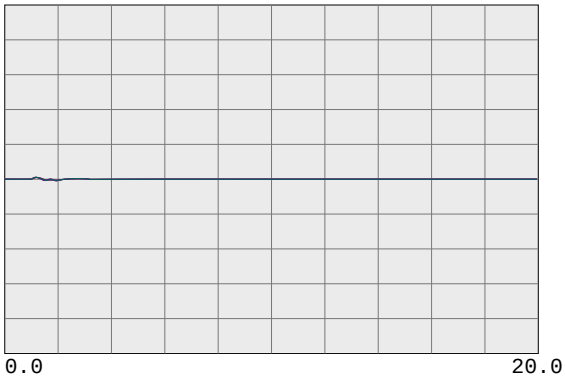
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



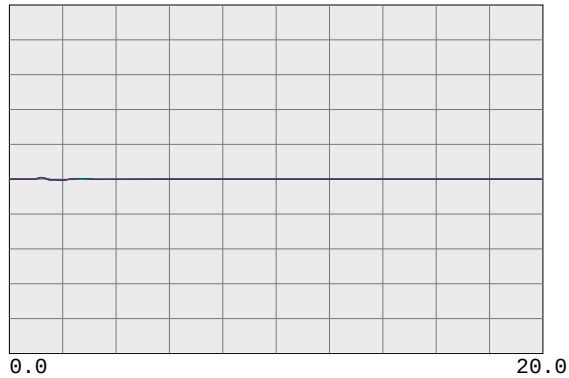
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

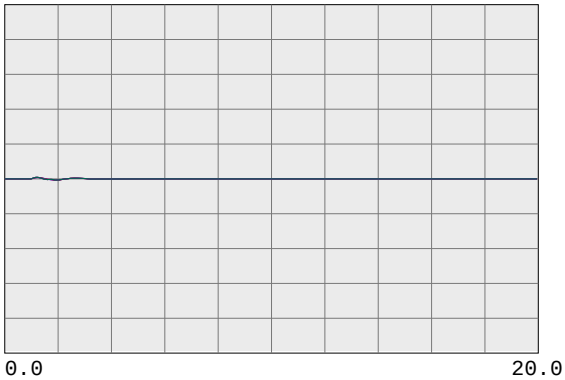
230-KV SYSTEM FREQUENCIES



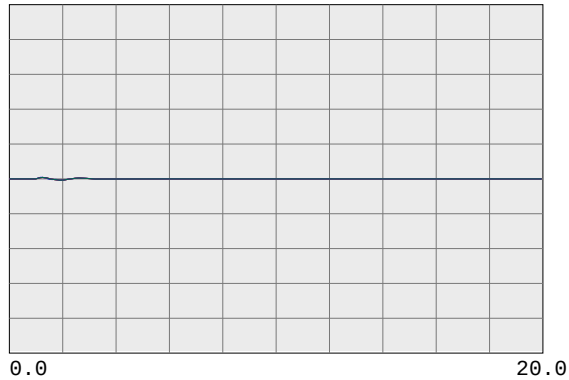
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



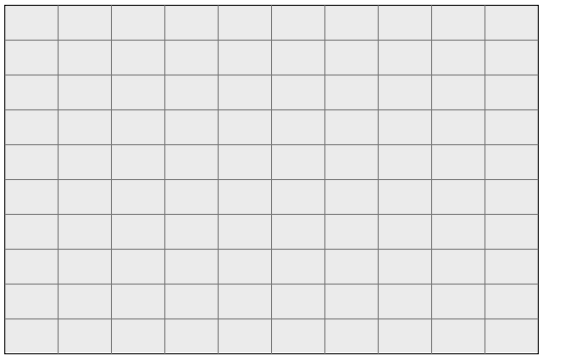
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

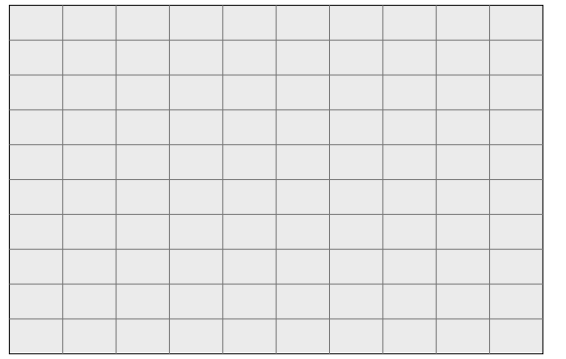


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



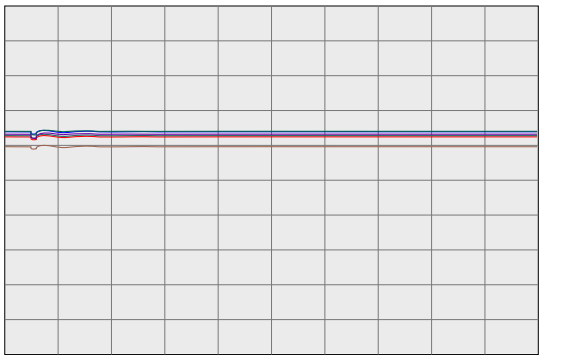
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



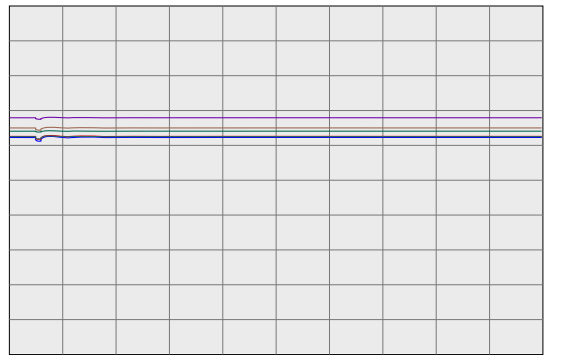


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

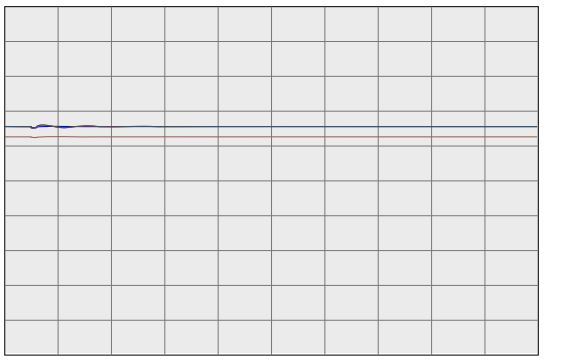
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



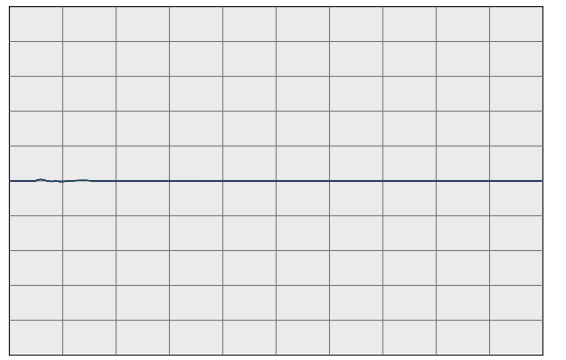
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



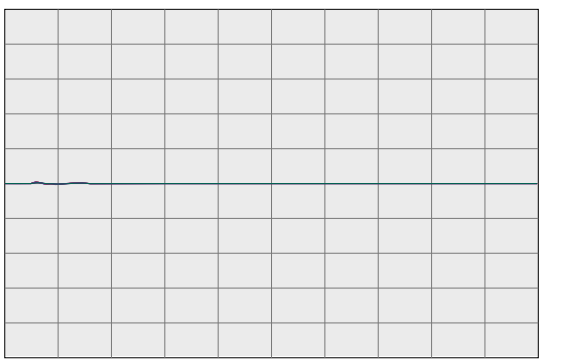
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

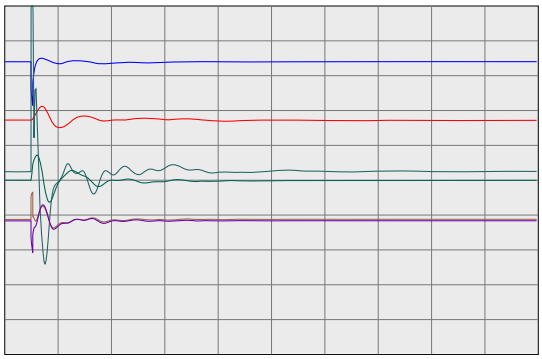


59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

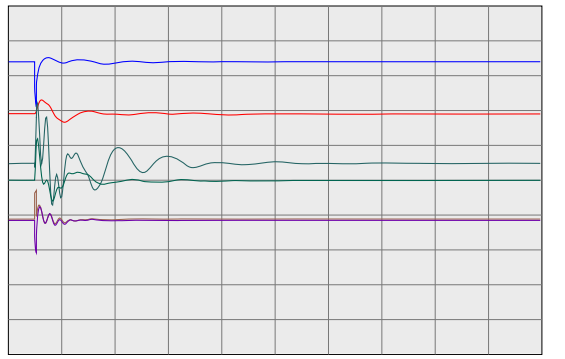
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

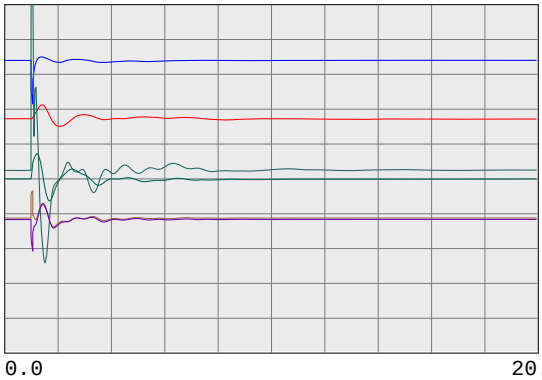
WILLOW PASS GENERATION PLANT



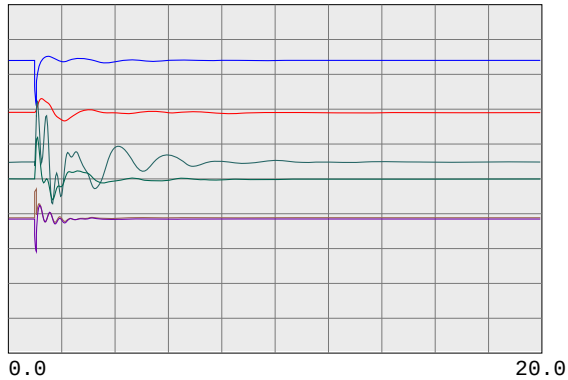
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



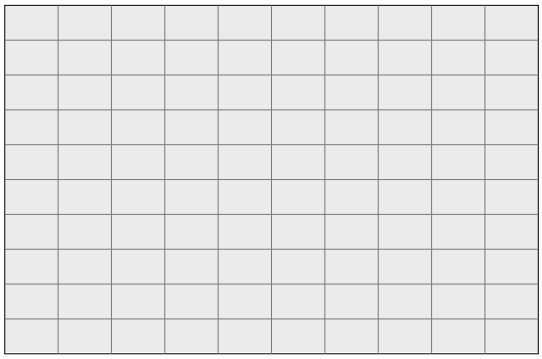
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

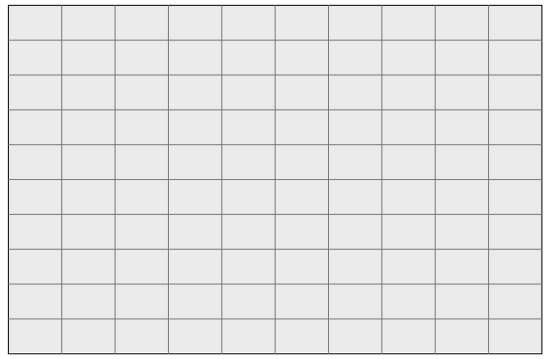


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



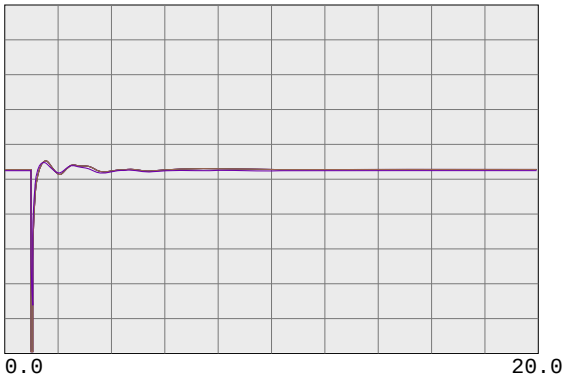
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



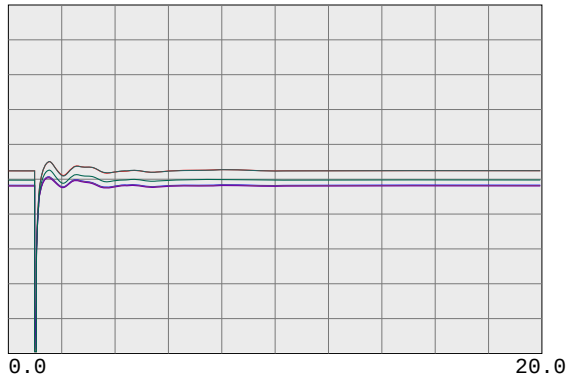


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

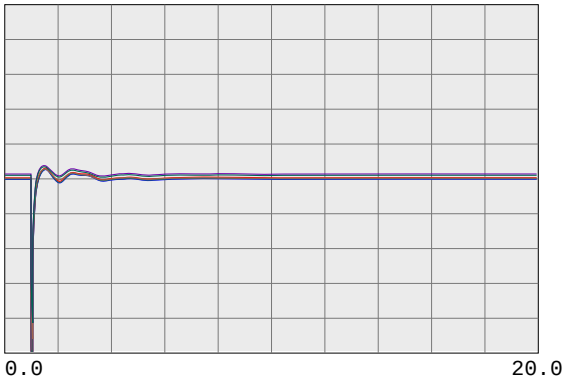
230-KV SYSTEM VOLTAGES



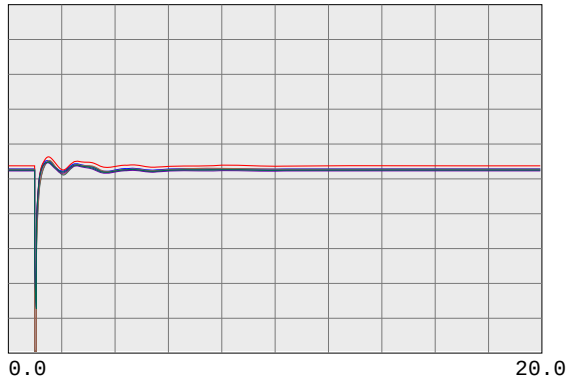
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



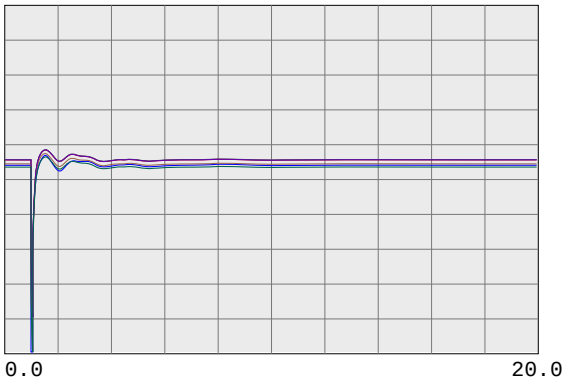
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



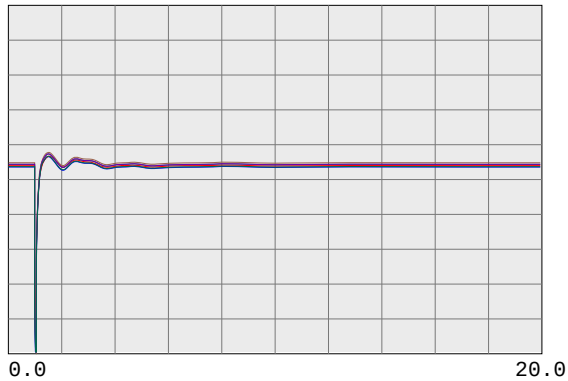
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



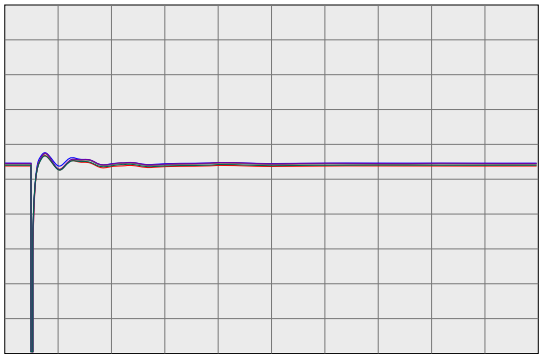
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

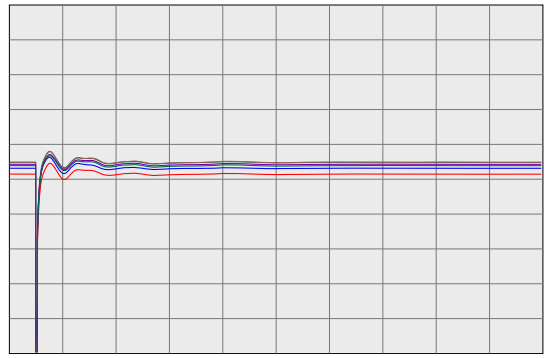
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

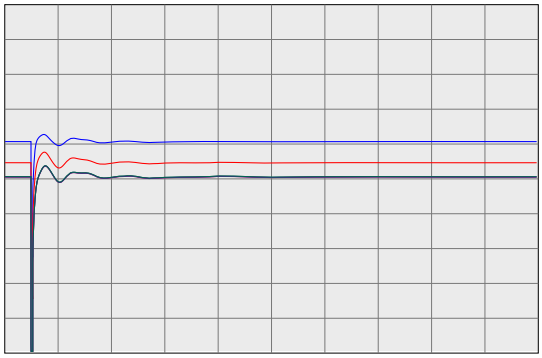
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

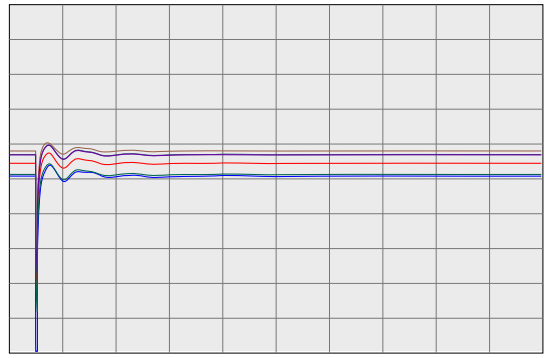
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

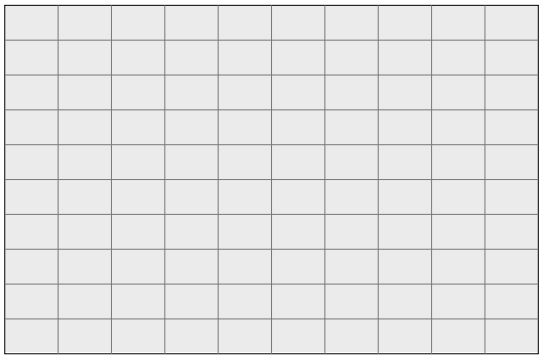
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

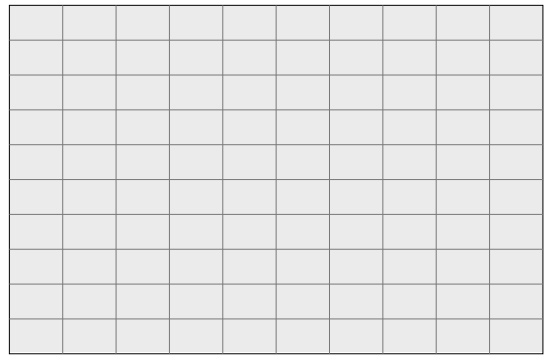


0.0 20.0

Time(sec)

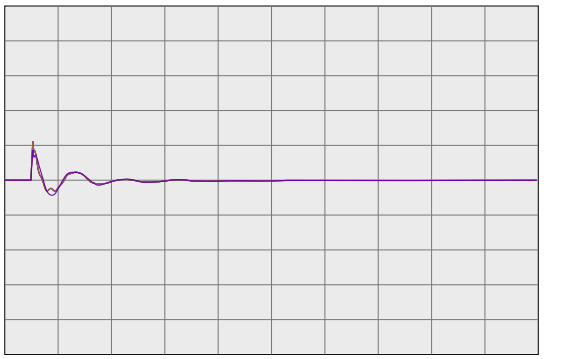
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



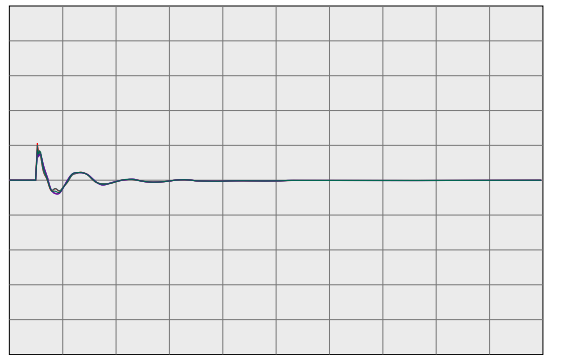


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

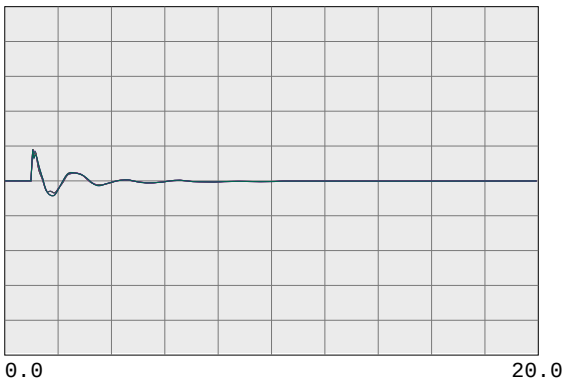
230-KV SYSTEM FREQUENCIES



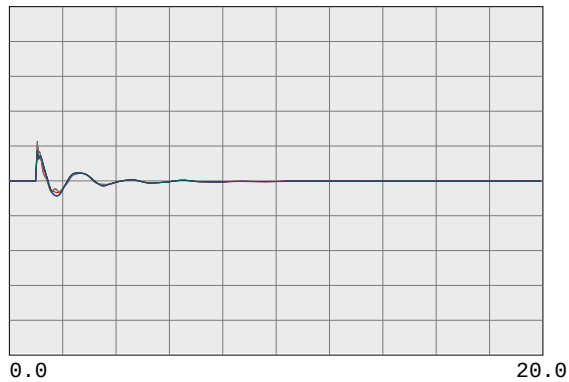
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



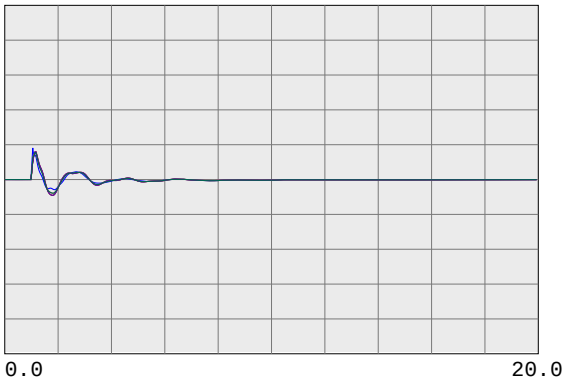
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



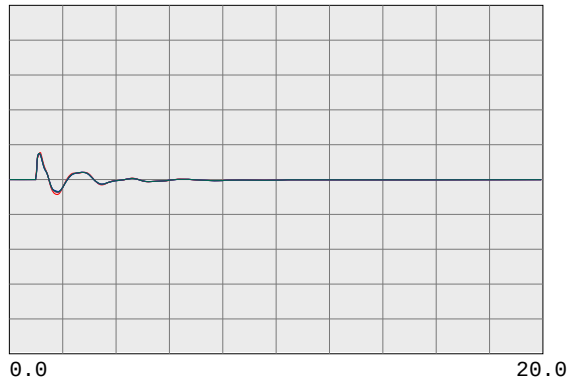
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



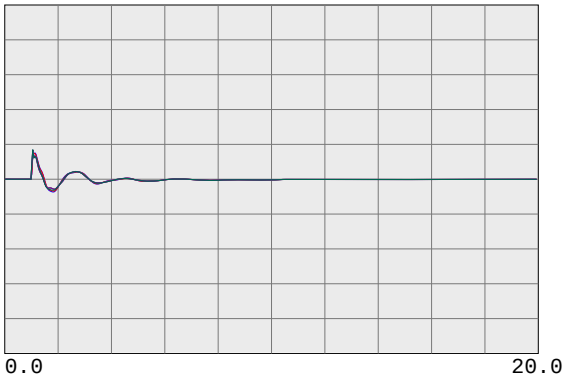
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



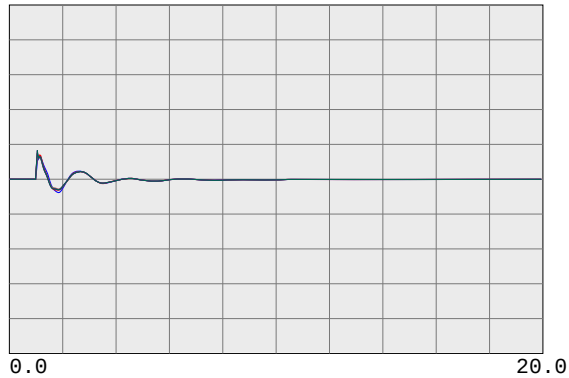
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

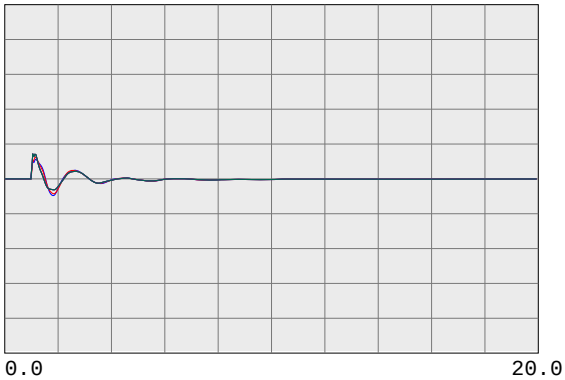
230-KV SYSTEM FREQUENCIES



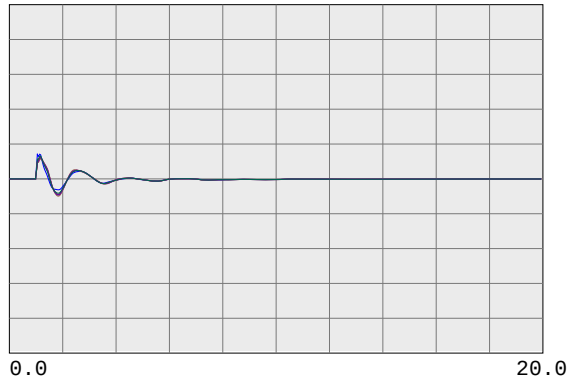
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



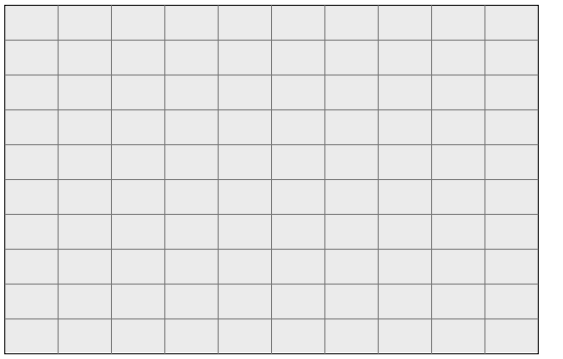
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

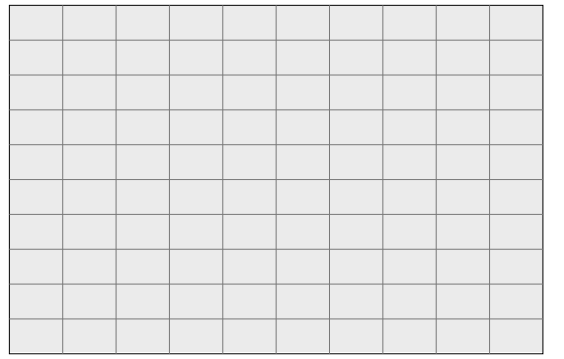


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



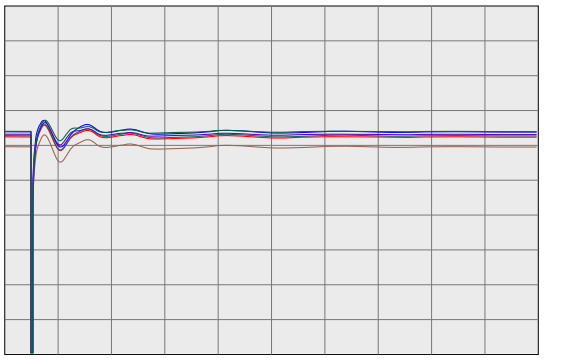
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



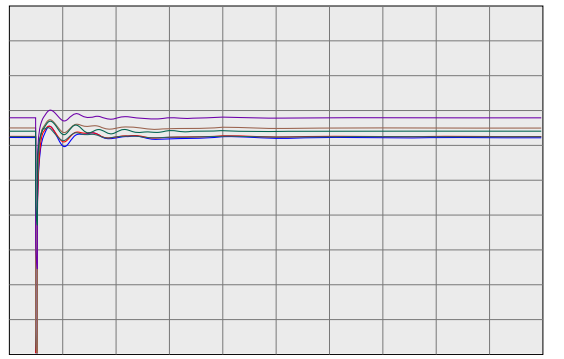


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

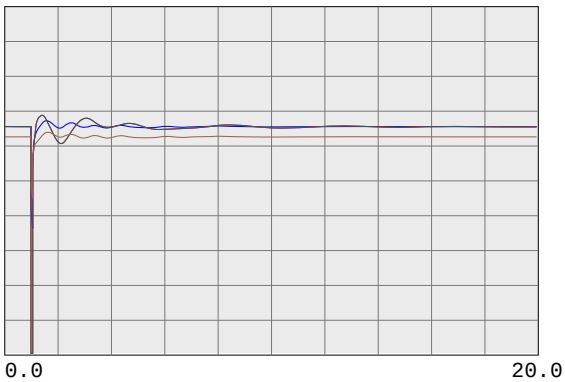
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



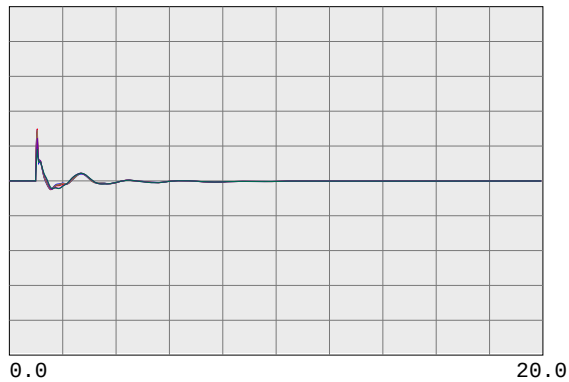
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



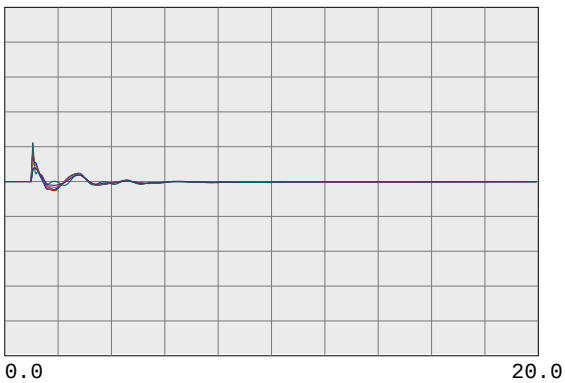
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



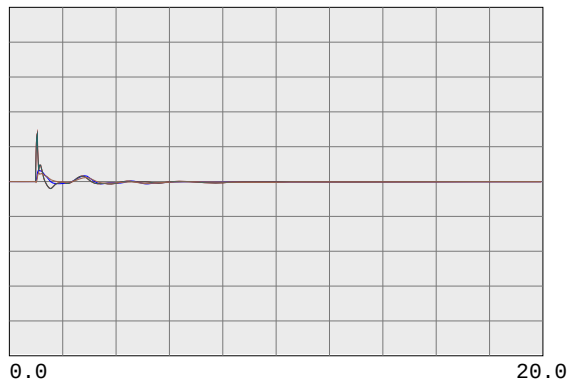
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



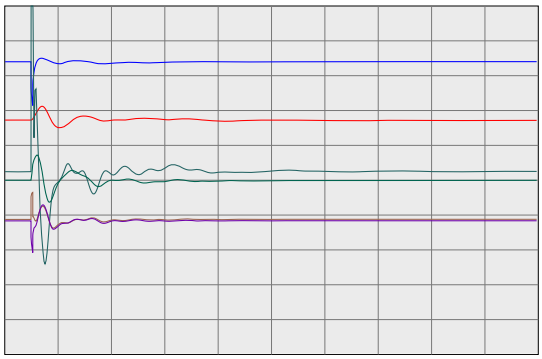
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



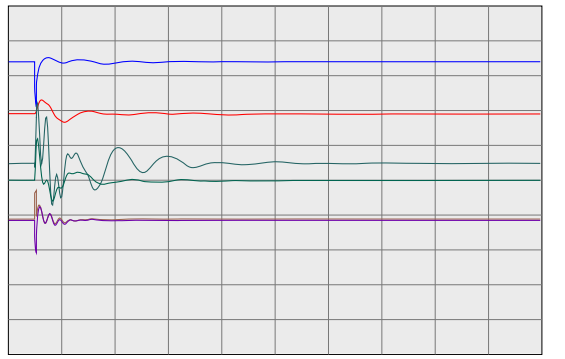
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

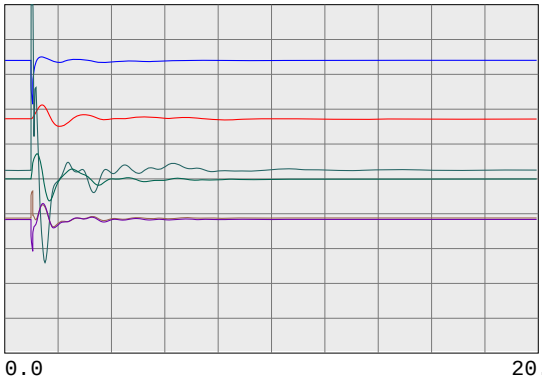
WILLOW PASS GENERATION PLANT



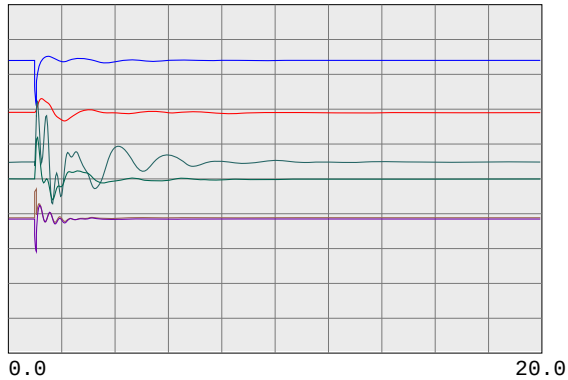
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



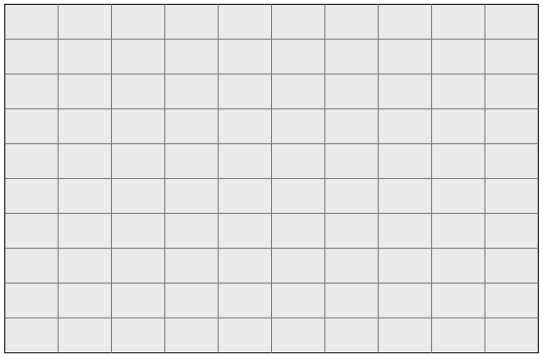
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

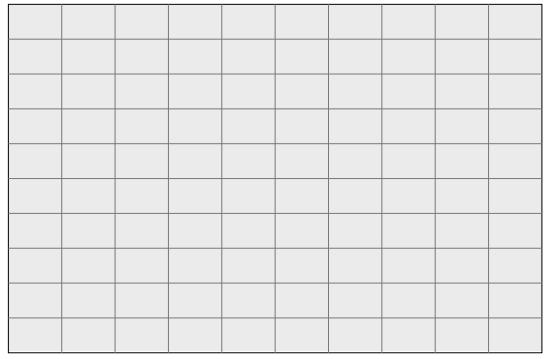


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



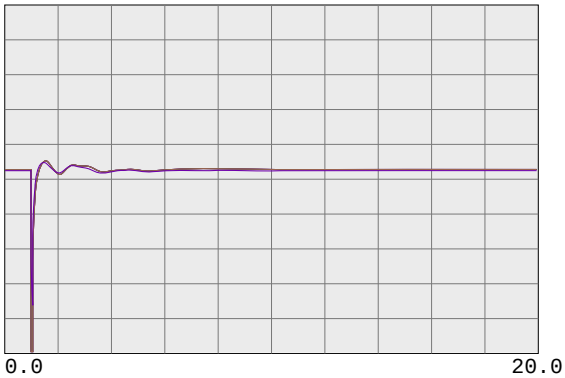
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



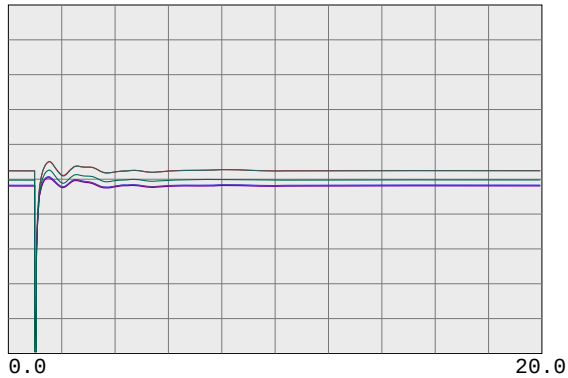


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

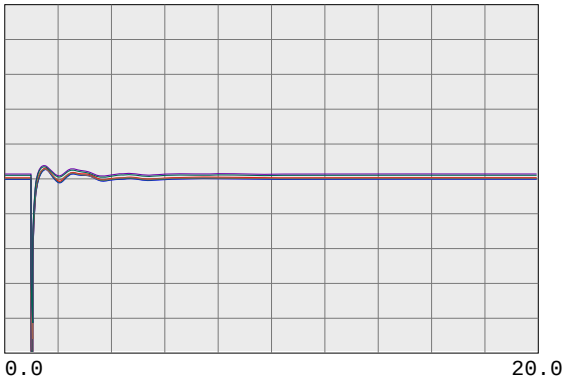
230-KV SYSTEM VOLTAGES



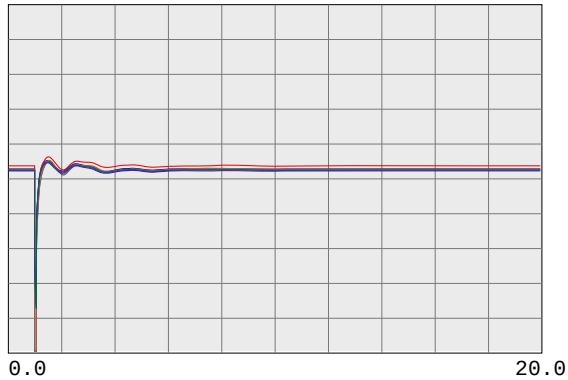
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



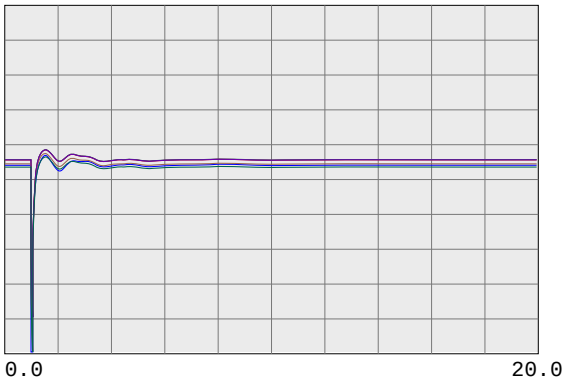
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



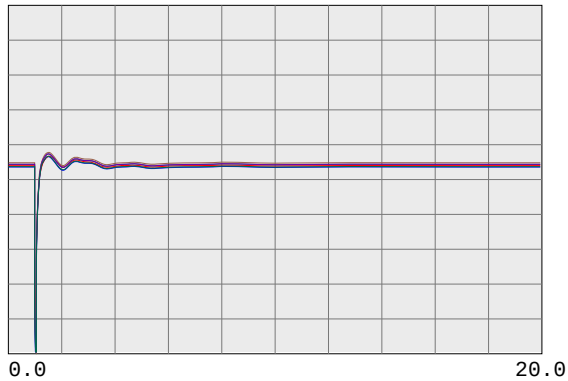
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



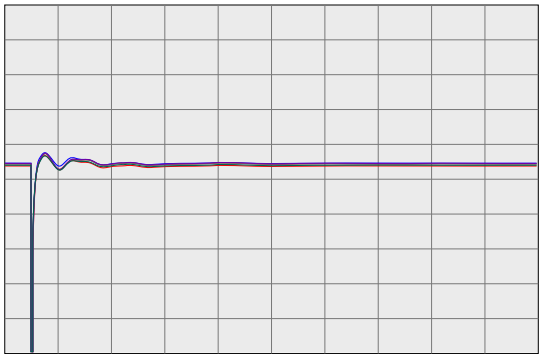
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

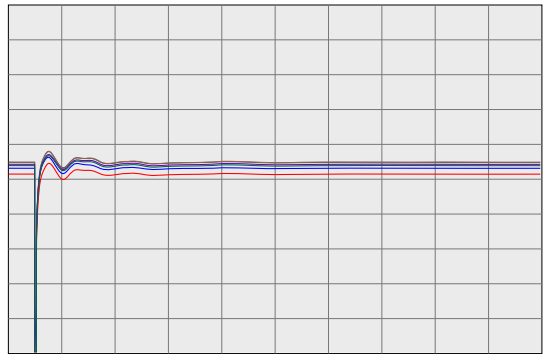
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

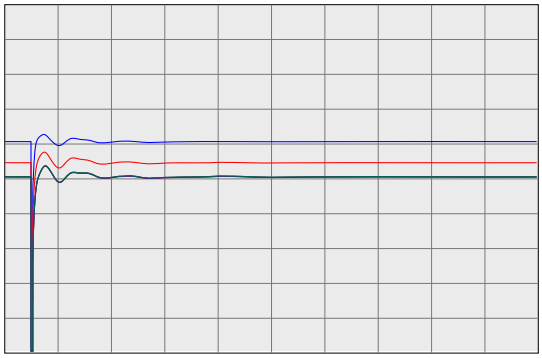
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

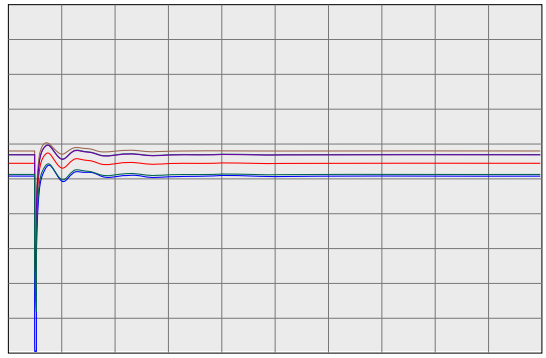
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

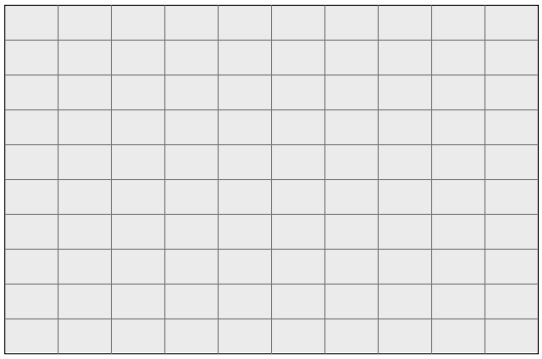
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

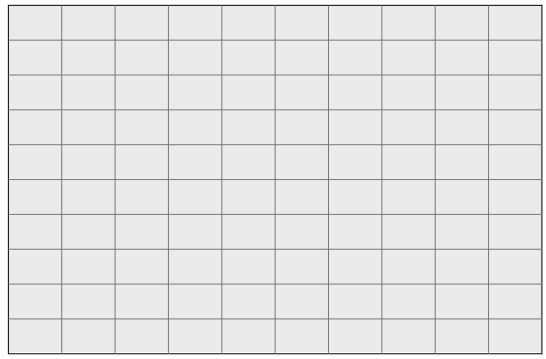


0.0 20.0

Time(sec)

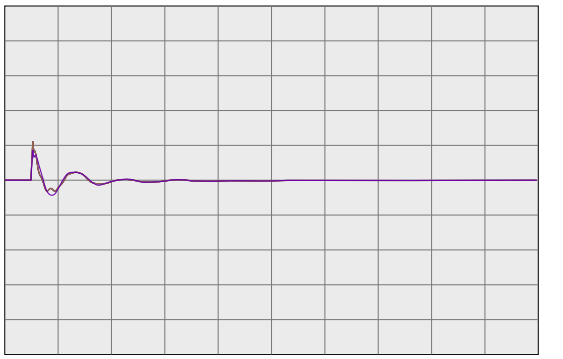
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



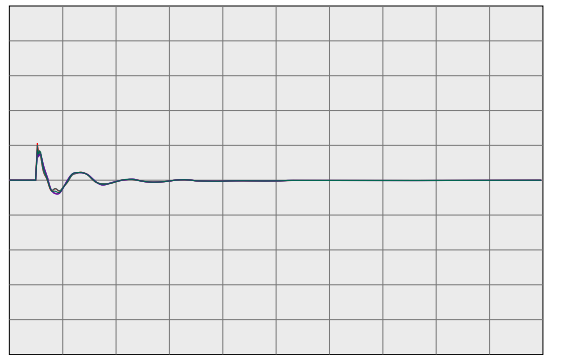


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

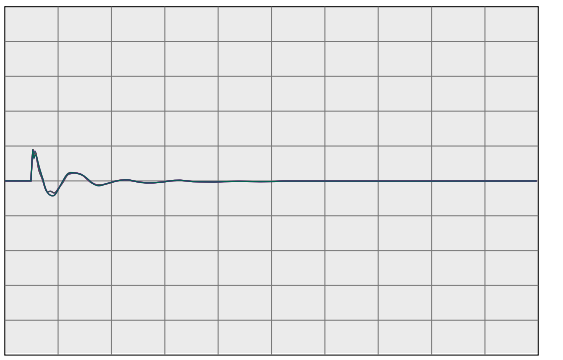
230-KV SYSTEM FREQUENCIES



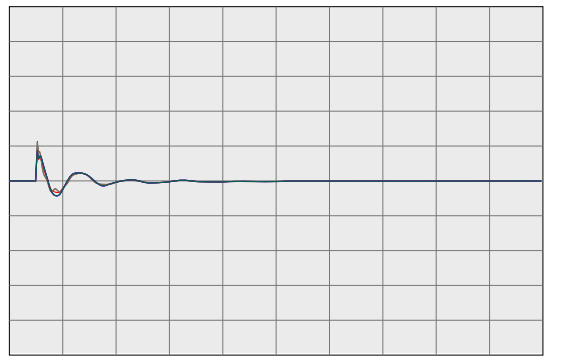
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



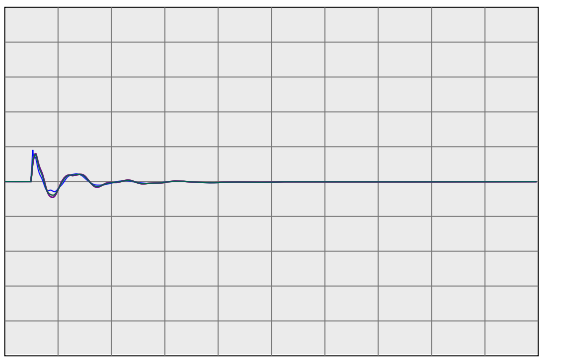
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



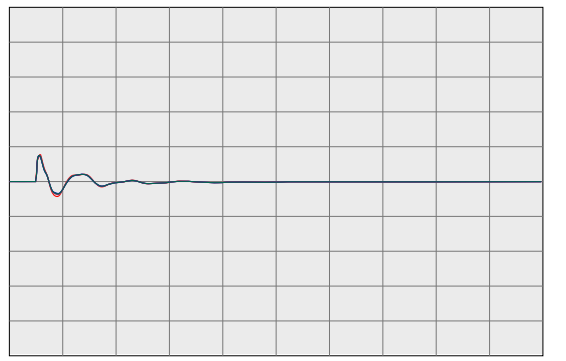
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



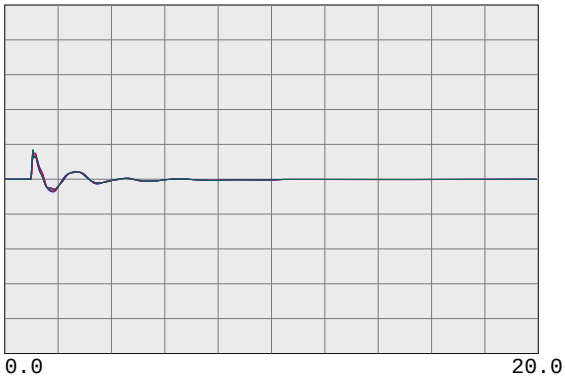
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



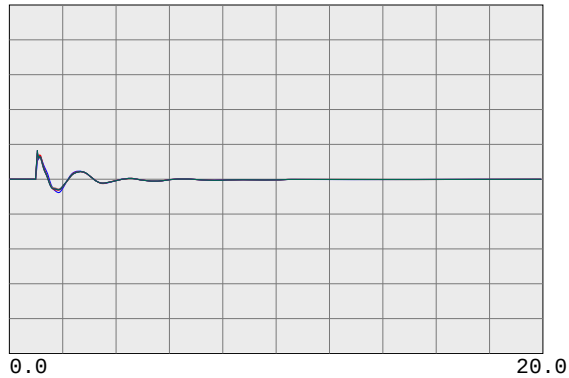
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

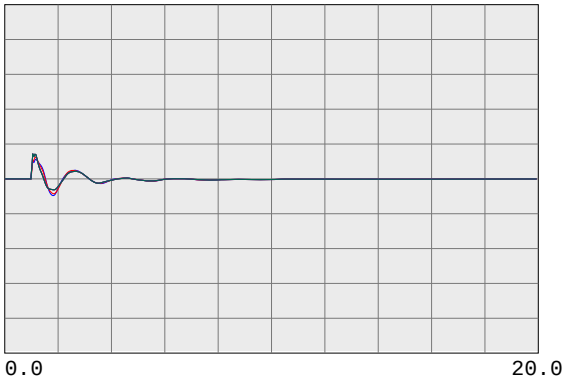
230-KV SYSTEM FREQUENCIES



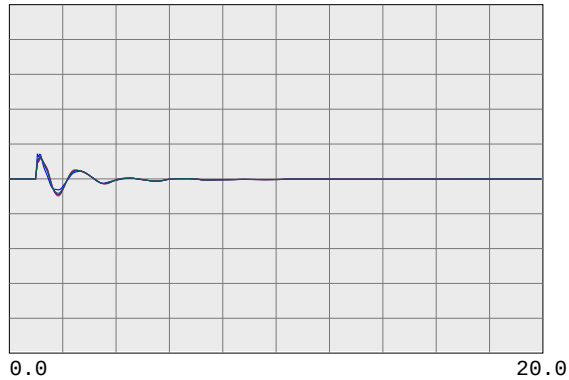
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



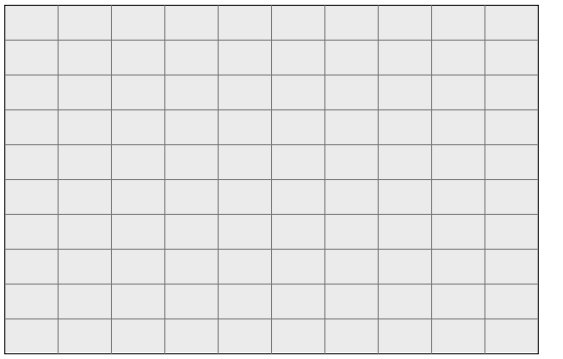
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

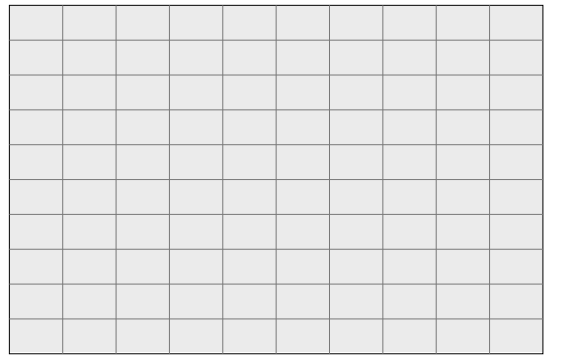


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



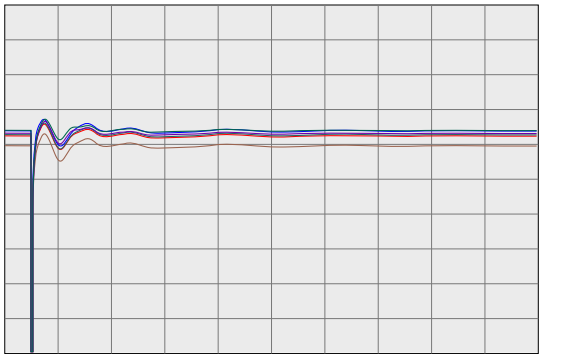
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



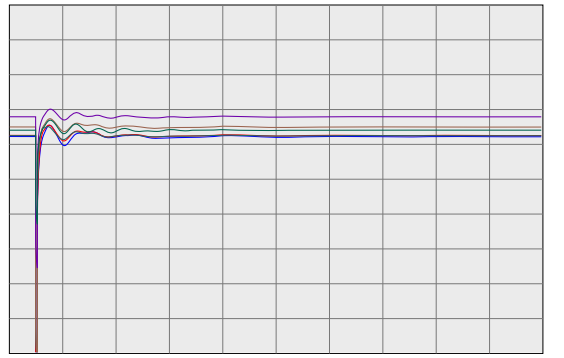


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

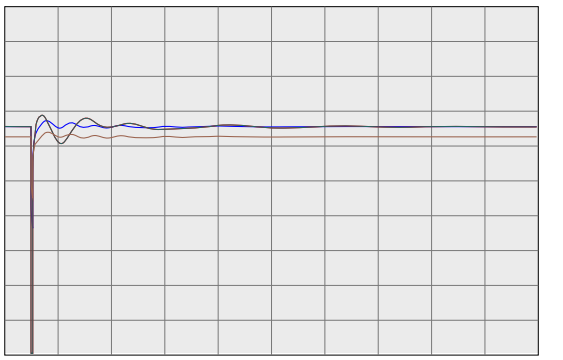
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



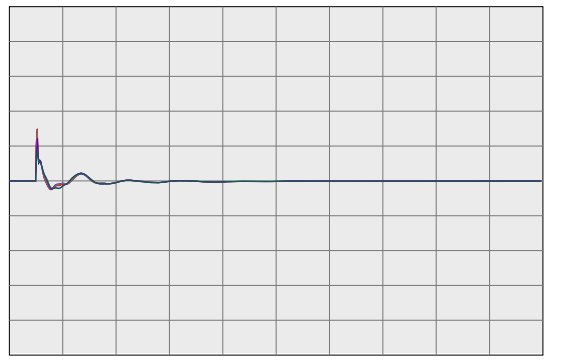
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



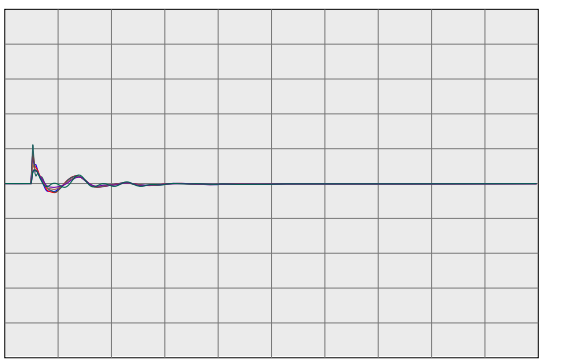
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



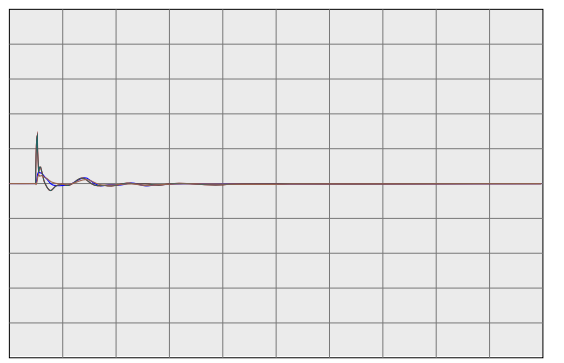
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



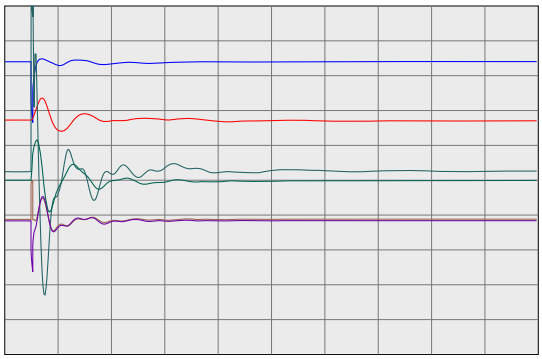
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



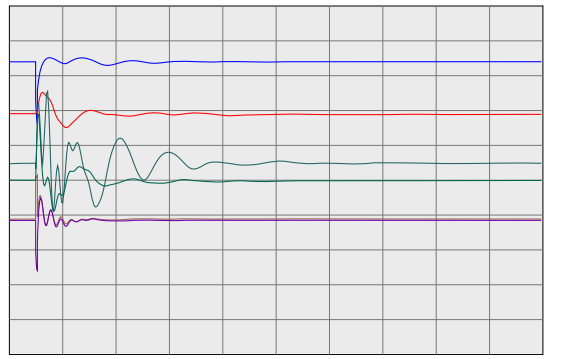
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

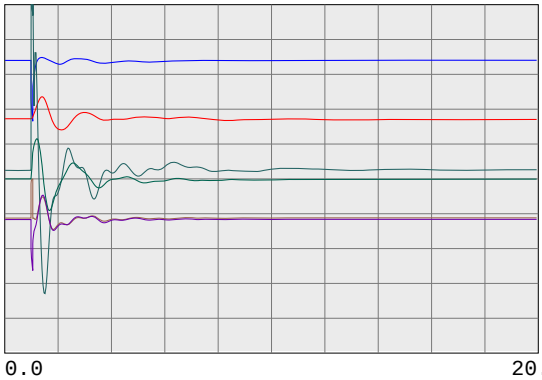
WILLOW PASS GENERATION PLANT



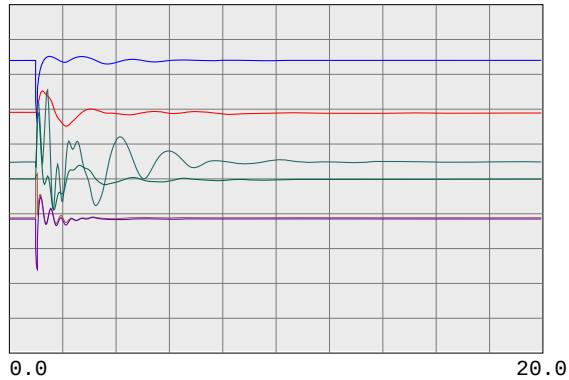
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



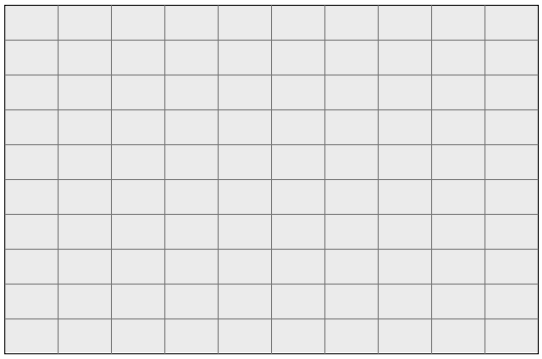
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

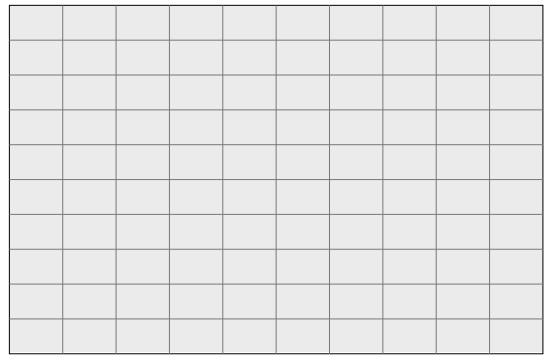


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



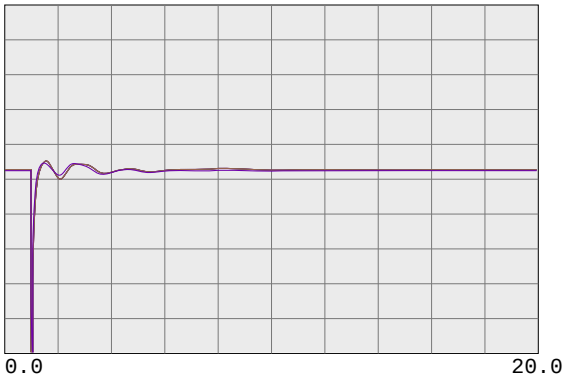
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



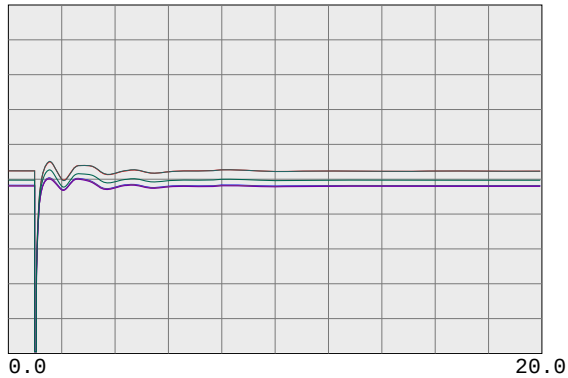


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

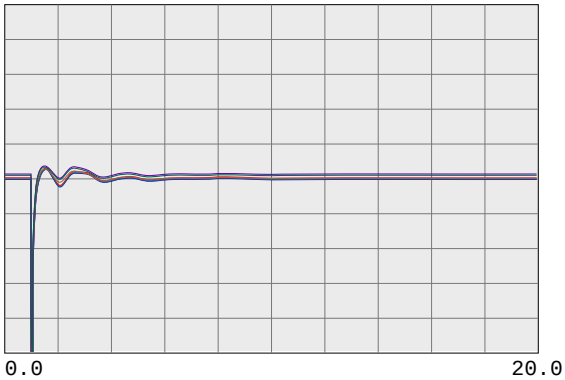
230-KV SYSTEM VOLTAGES



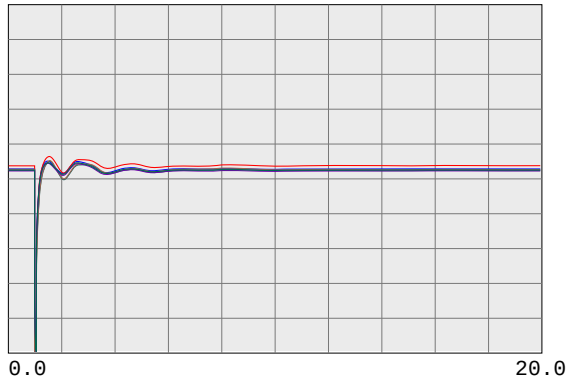
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



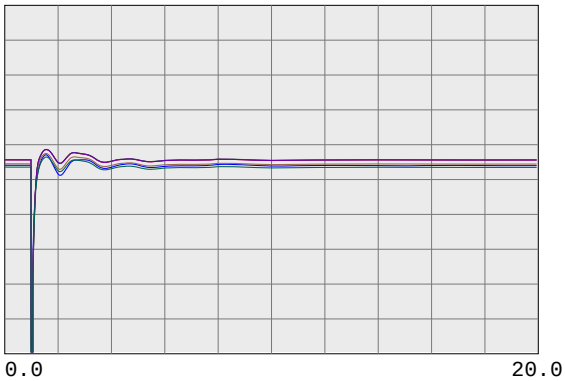
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



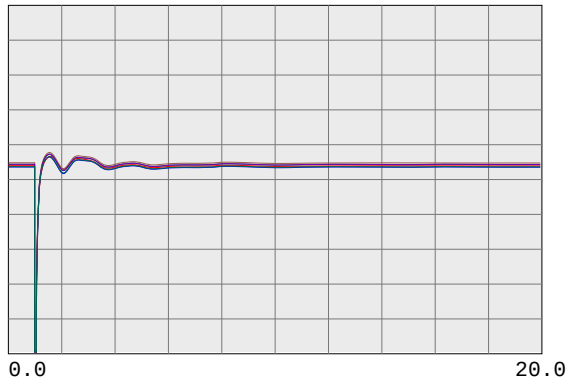
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



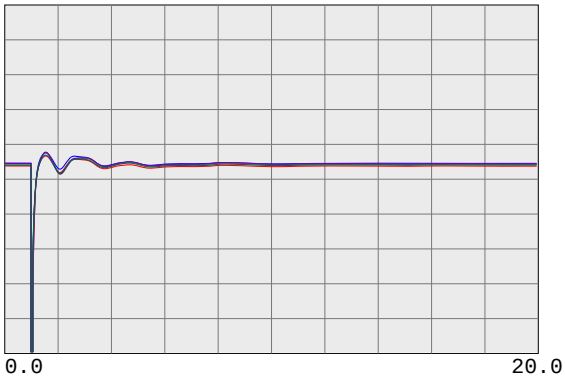
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



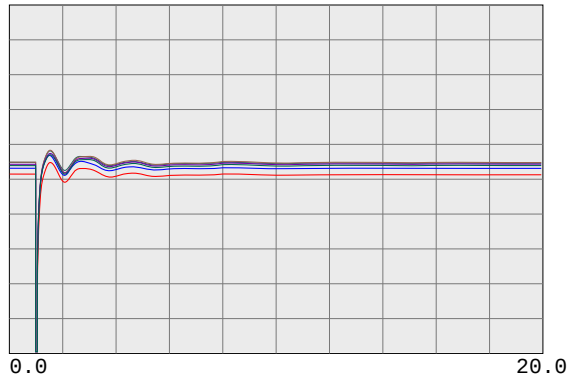
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

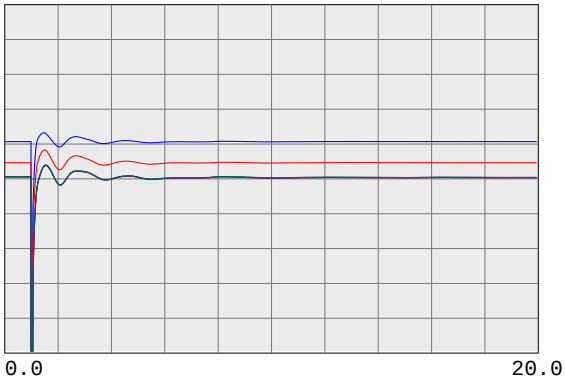
230-KV SYSTEM VOLTAGES



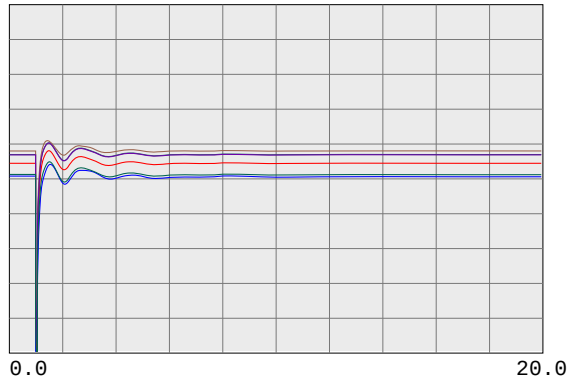
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



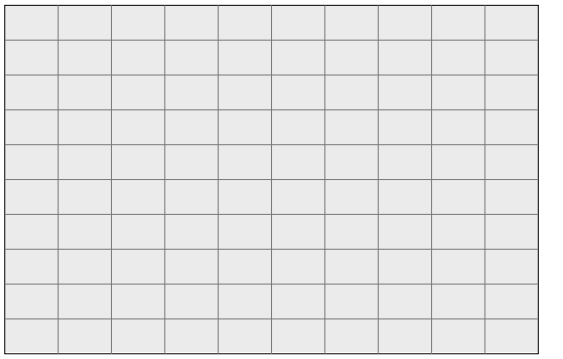
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

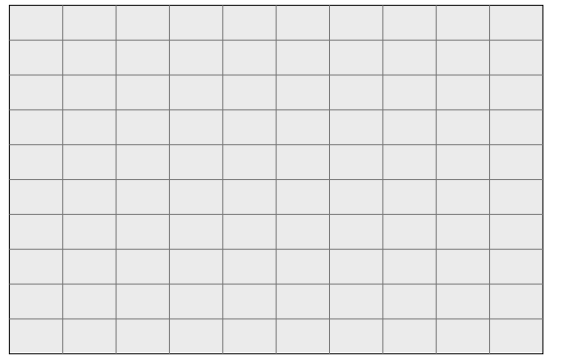


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



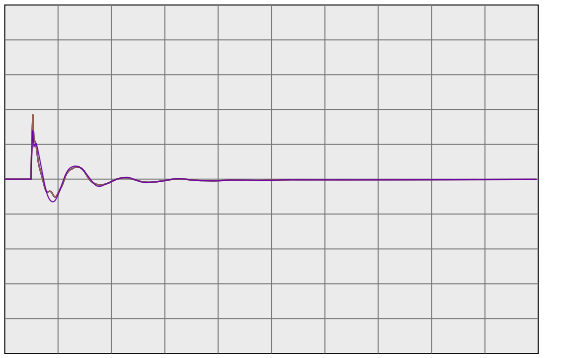
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



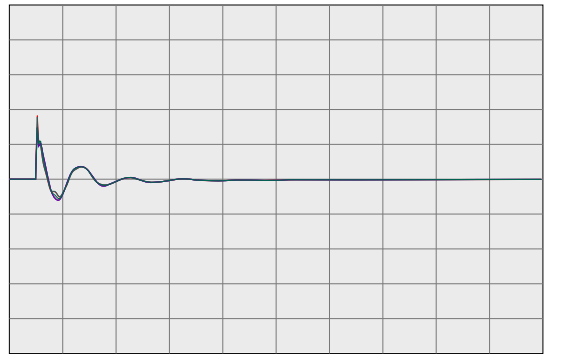


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

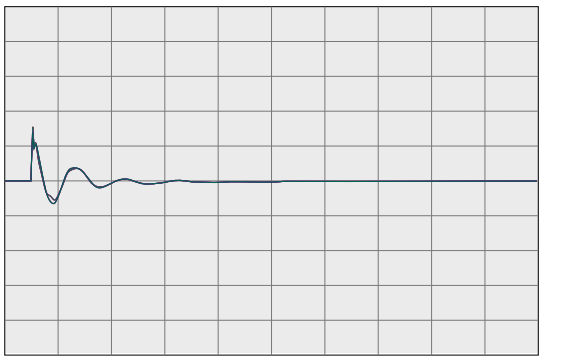
230-KV SYSTEM FREQUENCIES



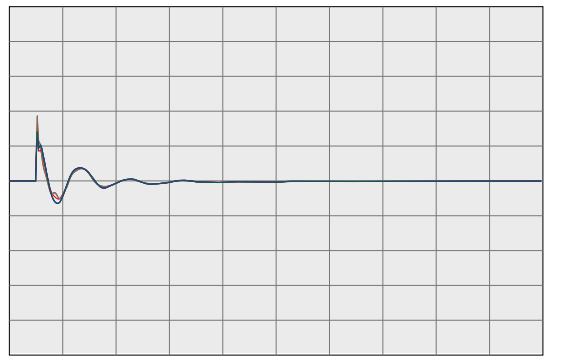
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



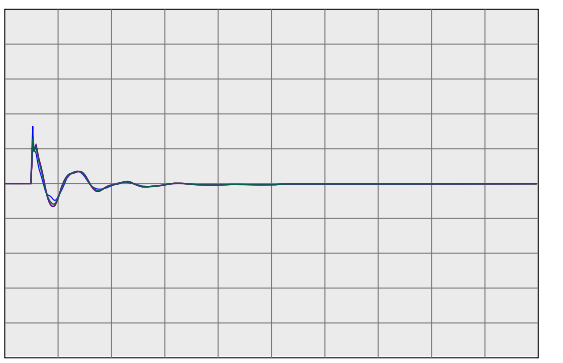
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



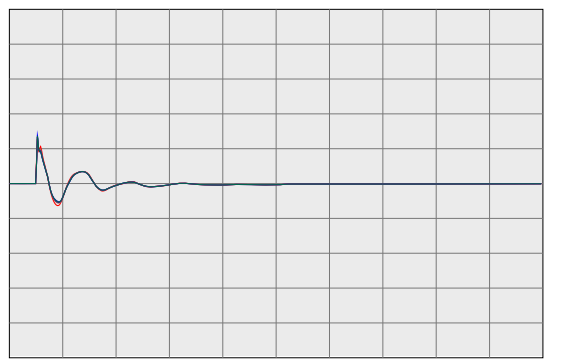
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



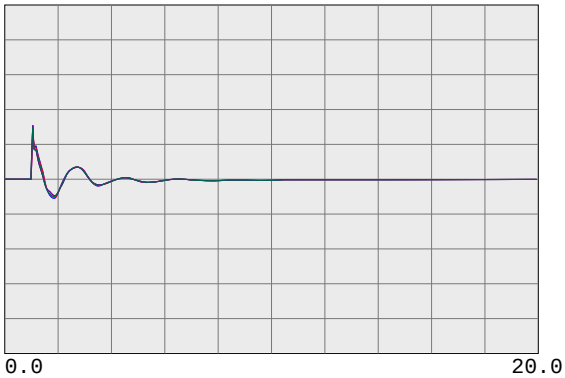
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



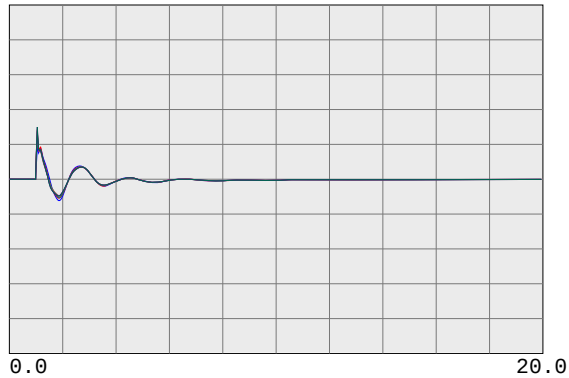
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

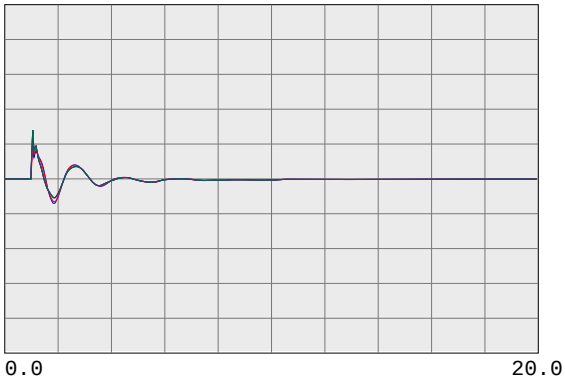
230-KV SYSTEM FREQUENCIES



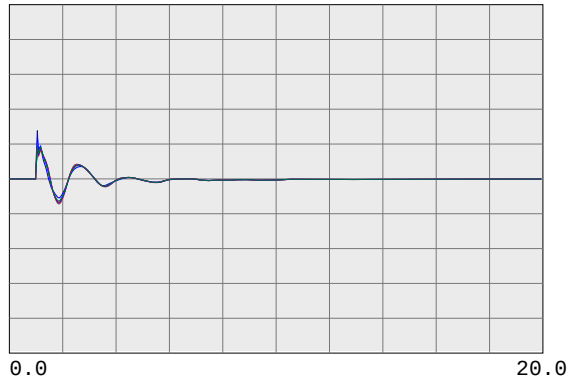
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



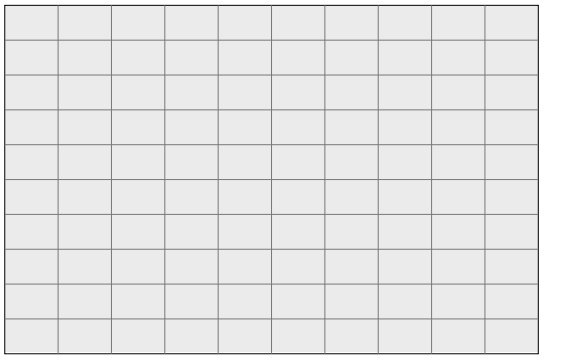
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

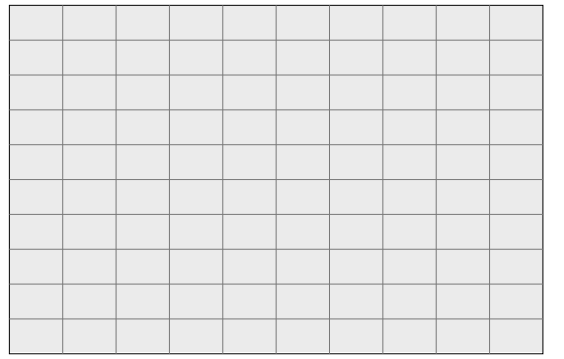


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



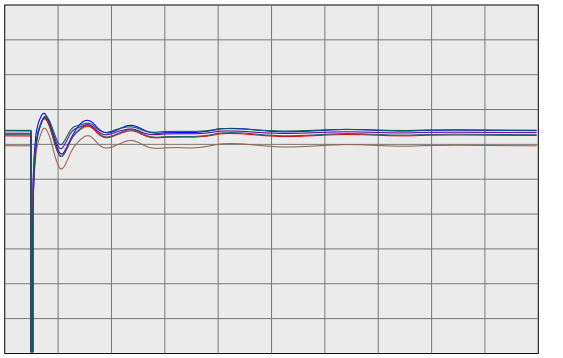
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



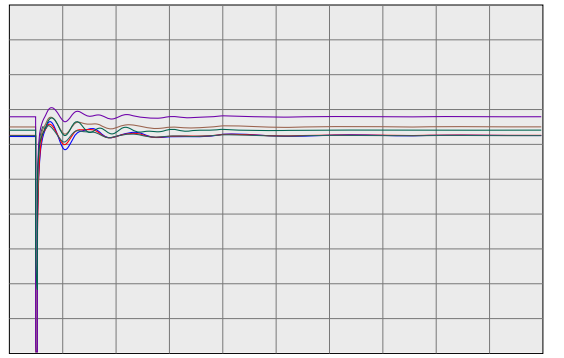


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

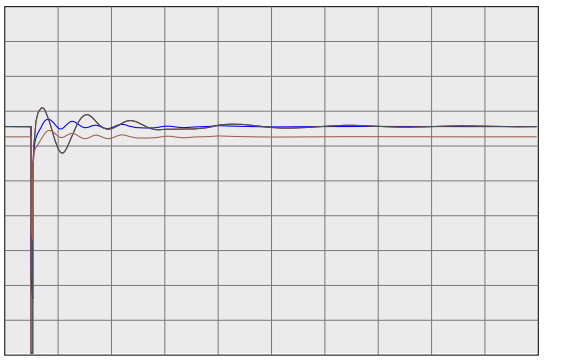
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



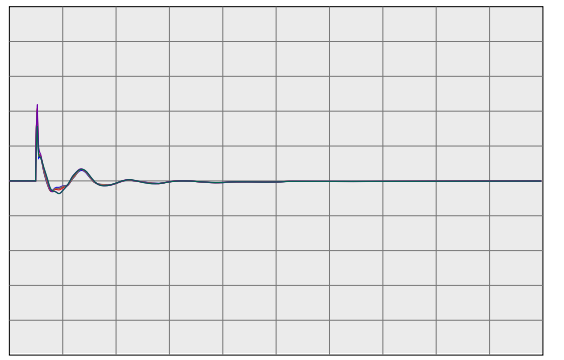
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



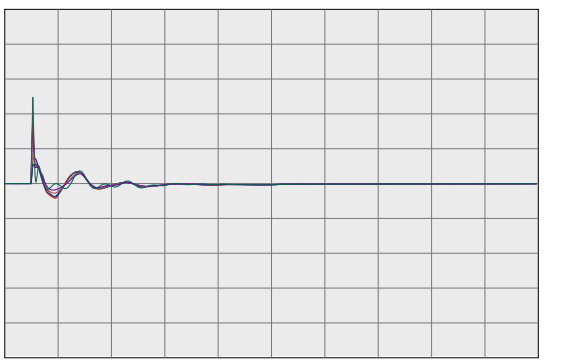
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



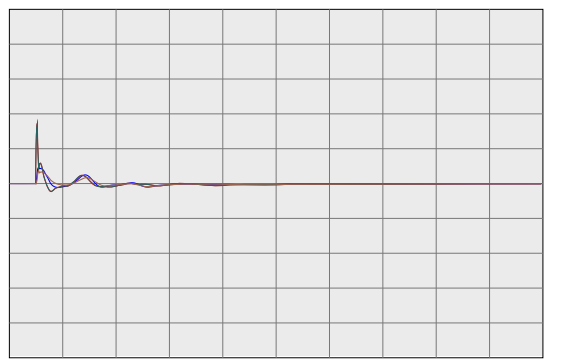
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



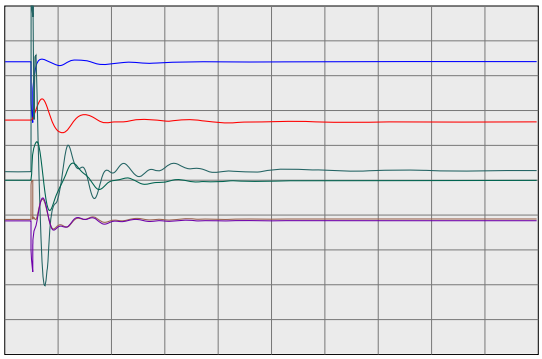
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



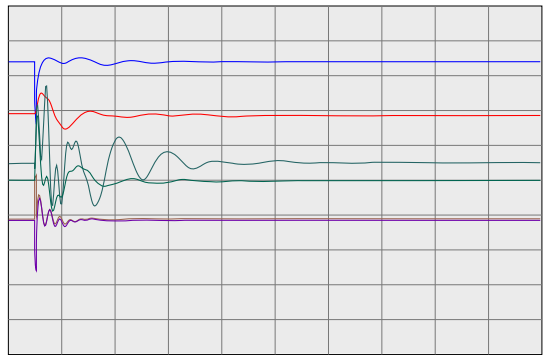
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

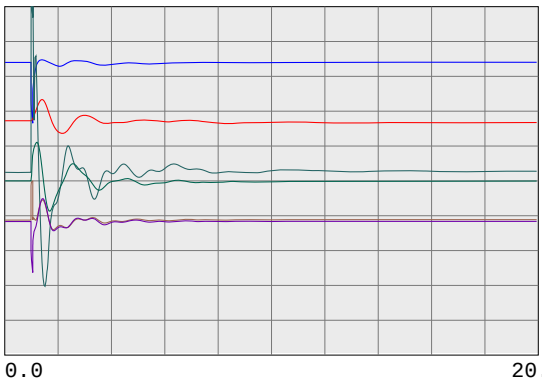
WILLOW PASS GENERATION PLANT



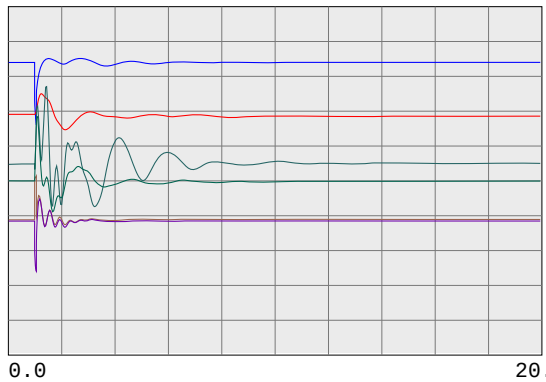
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



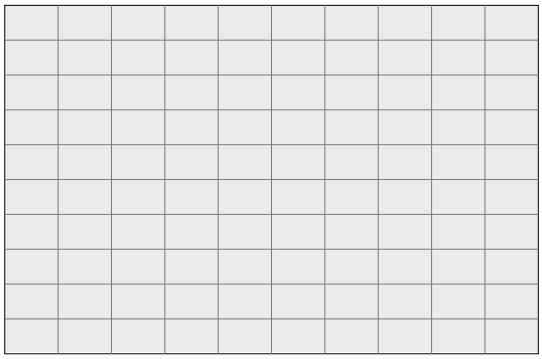
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

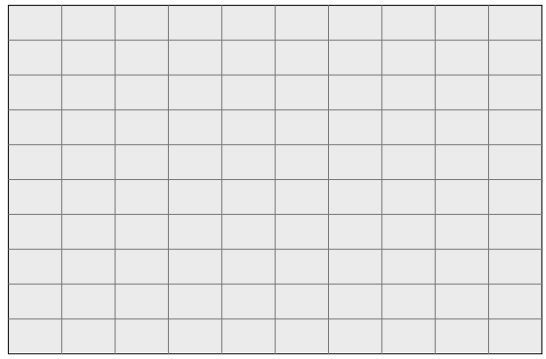


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



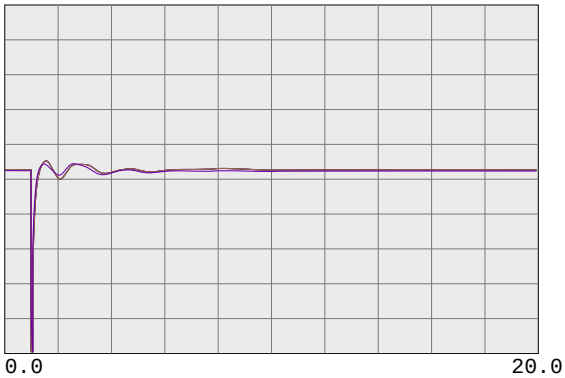
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



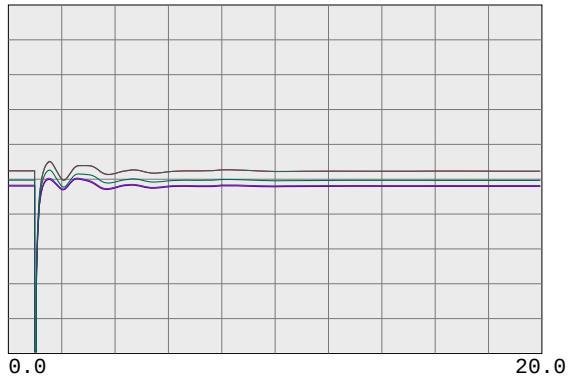


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

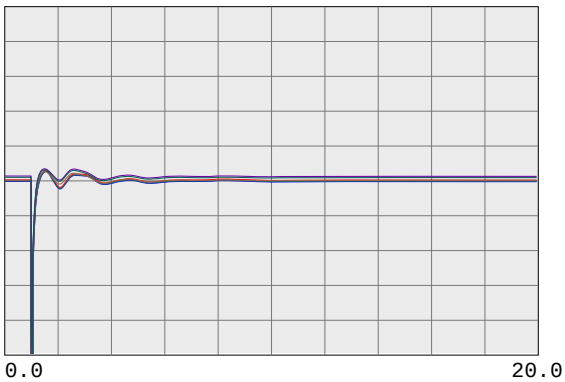
230-KV SYSTEM VOLTAGES



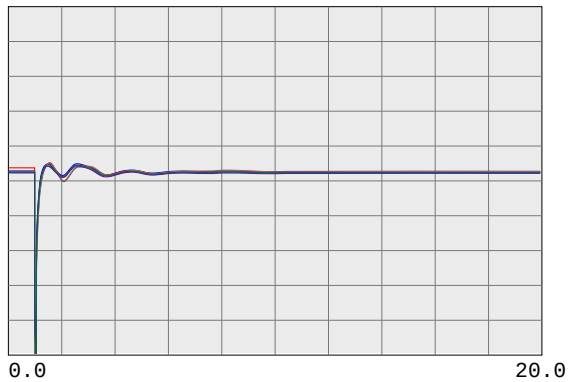
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



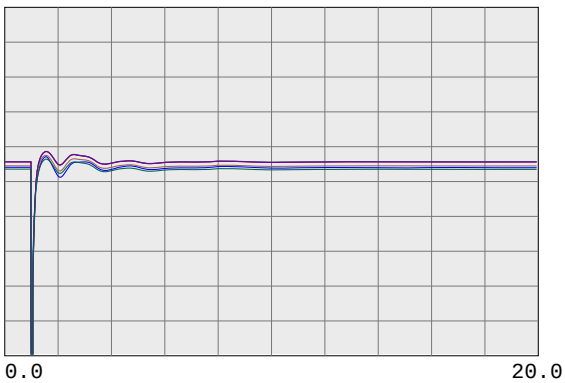
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



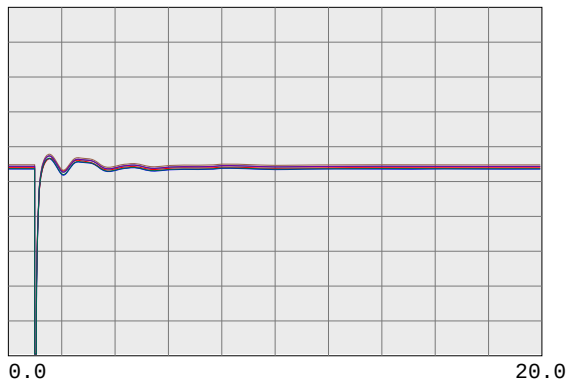
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



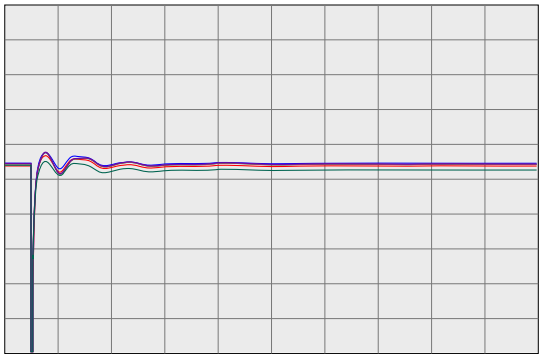
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

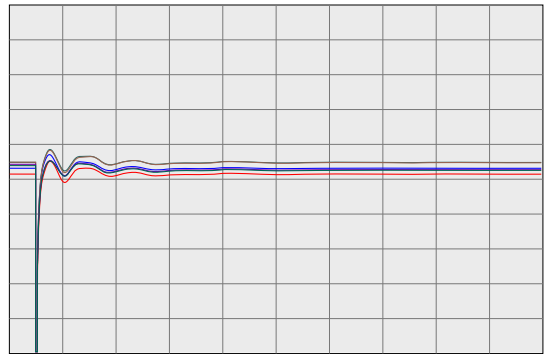
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

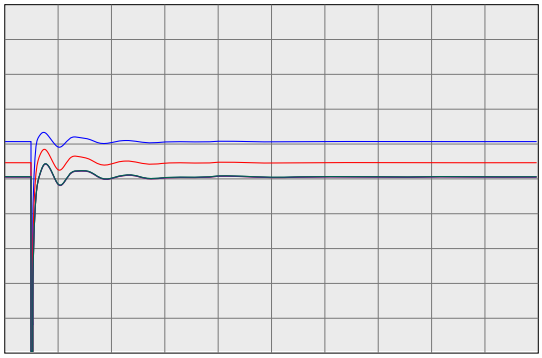
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

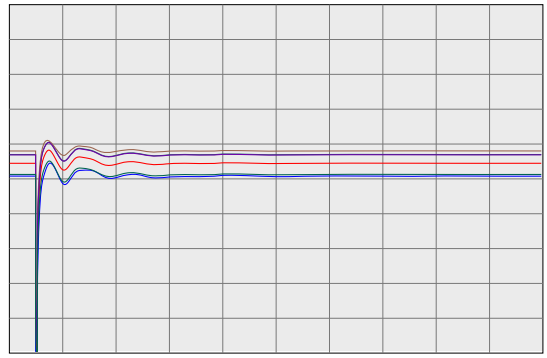
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

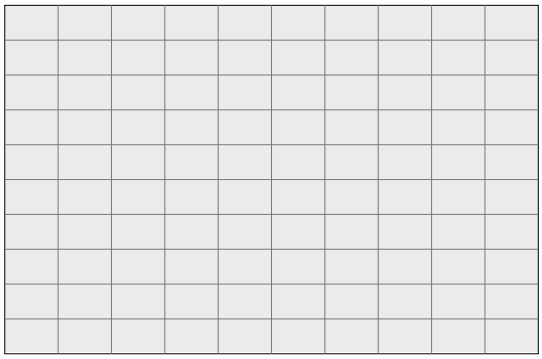
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

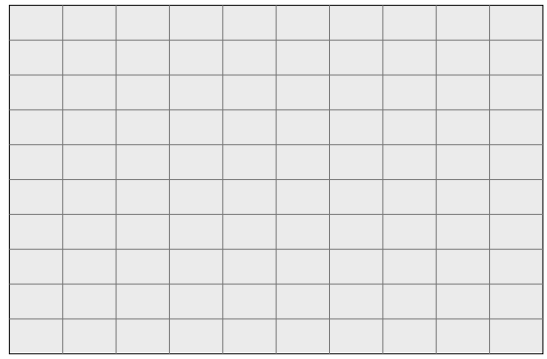


0.0 20.0

Time(sec)

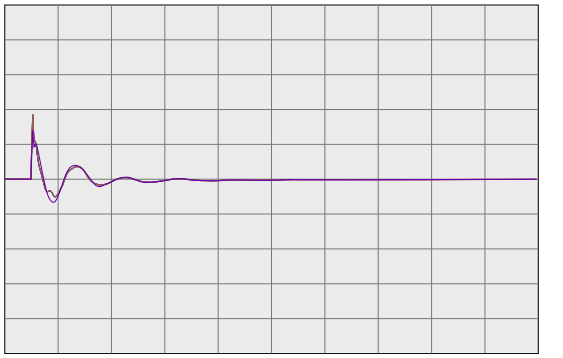
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



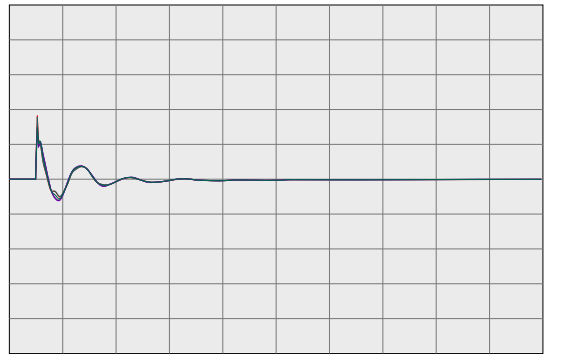


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

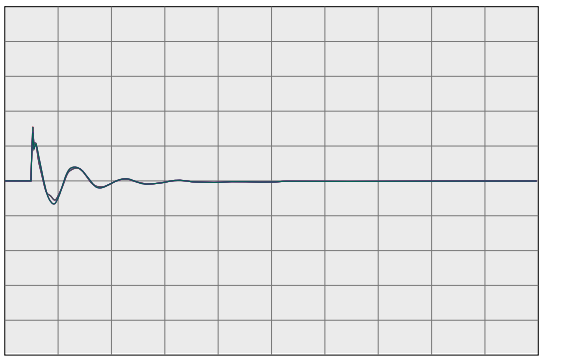
230-KV SYSTEM FREQUENCIES



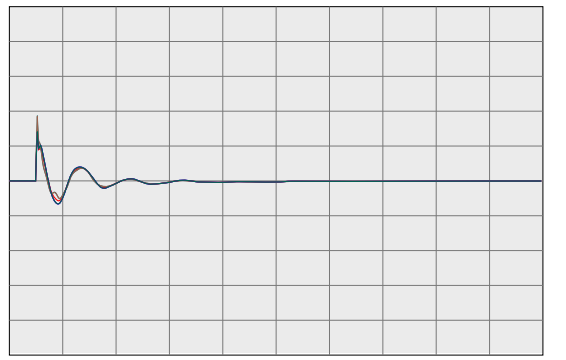
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



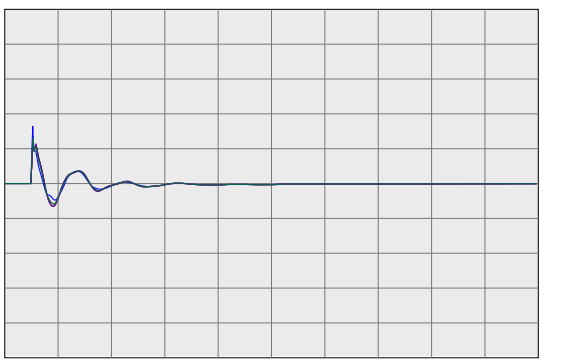
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



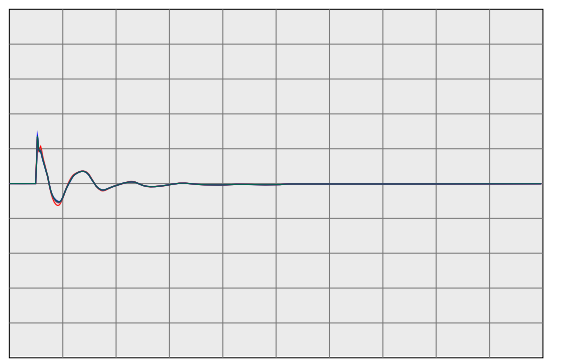
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



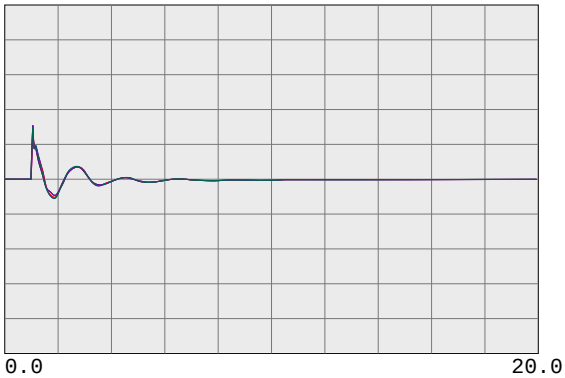
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



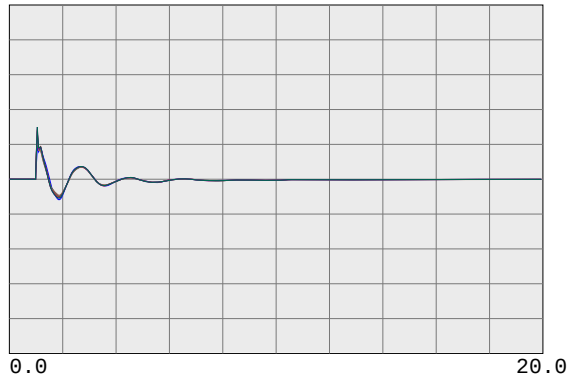
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

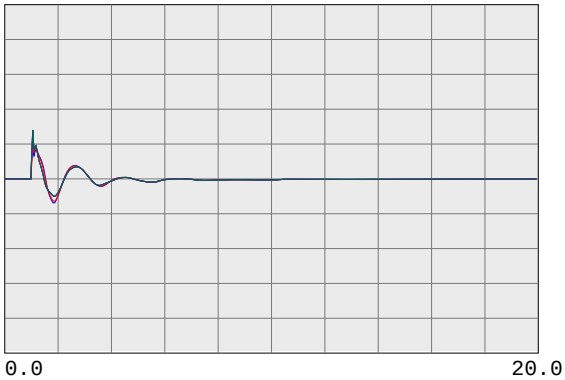
230-KV SYSTEM FREQUENCIES



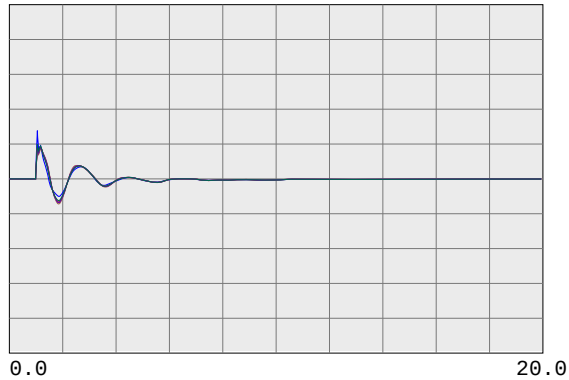
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



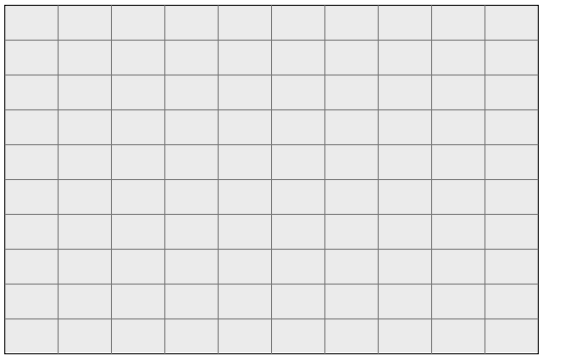
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

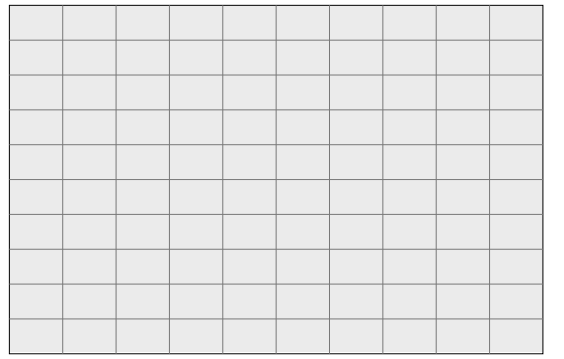


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



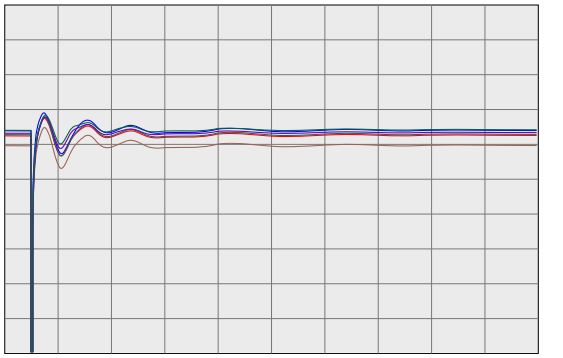
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



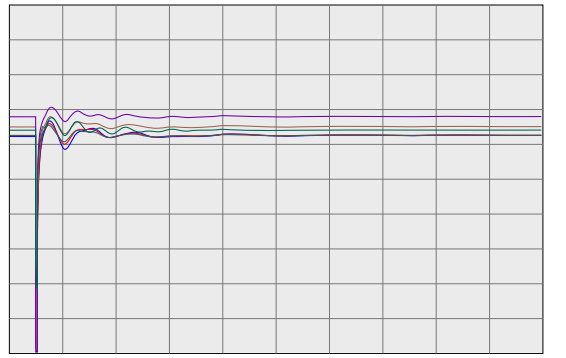


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

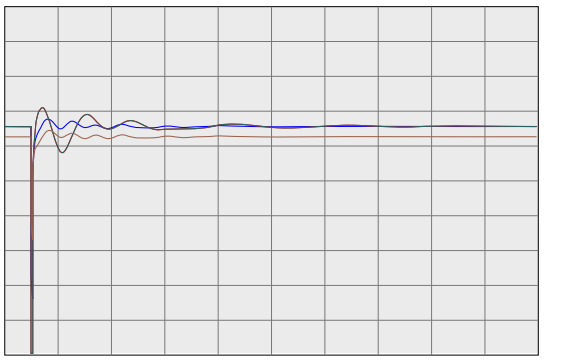
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



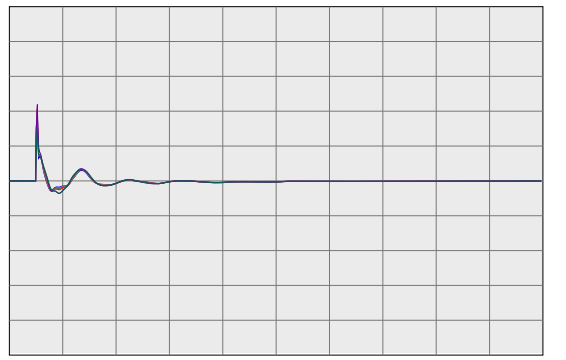
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



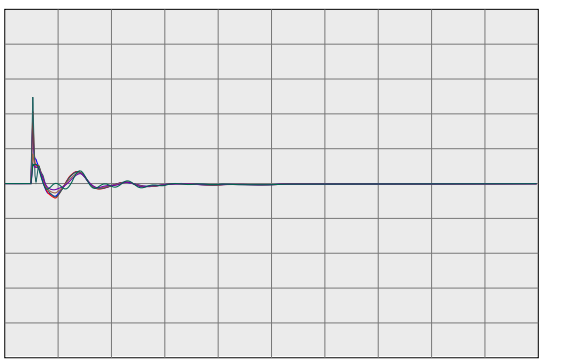
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



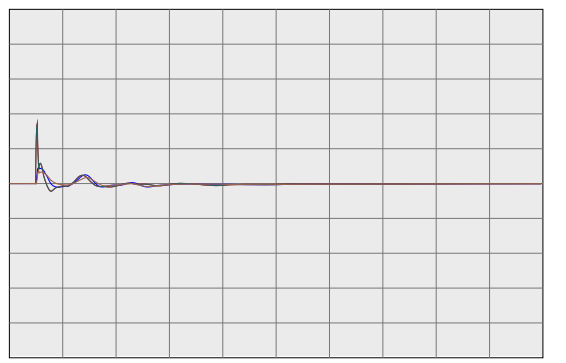
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



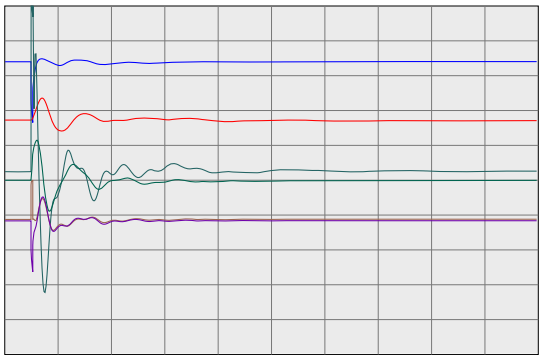
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



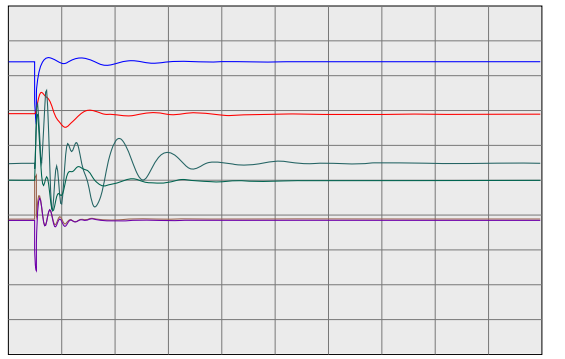
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

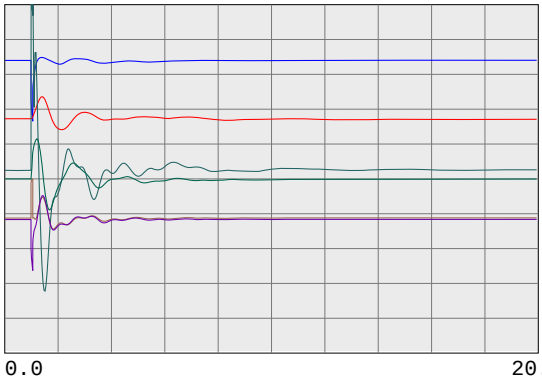
WILLOW PASS GENERATION PLANT



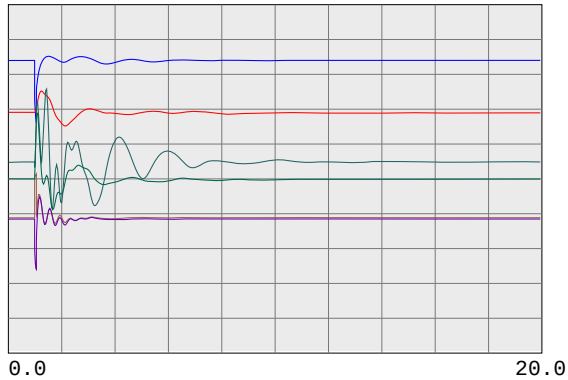
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



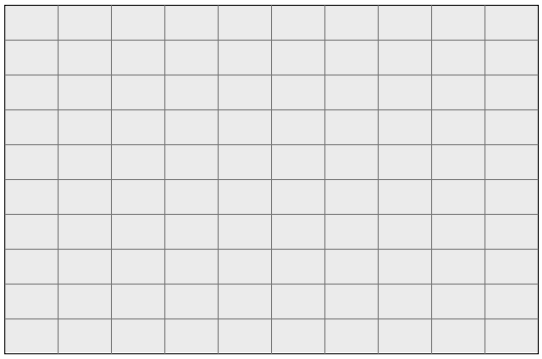
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

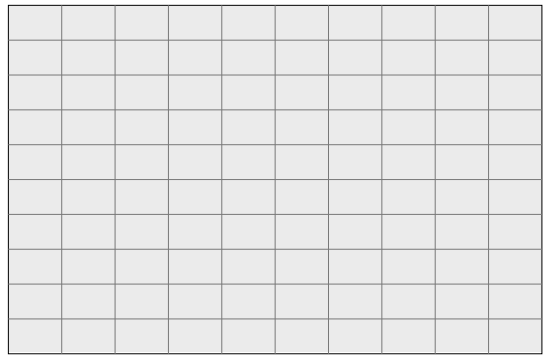


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



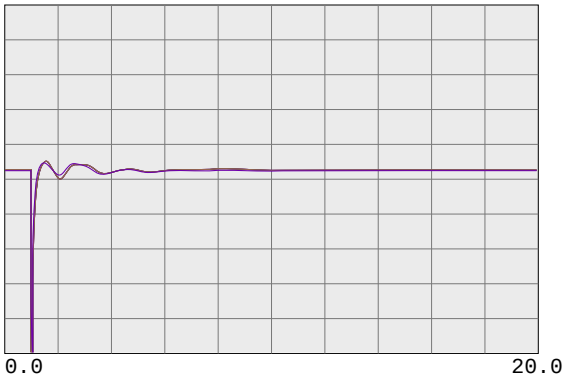
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



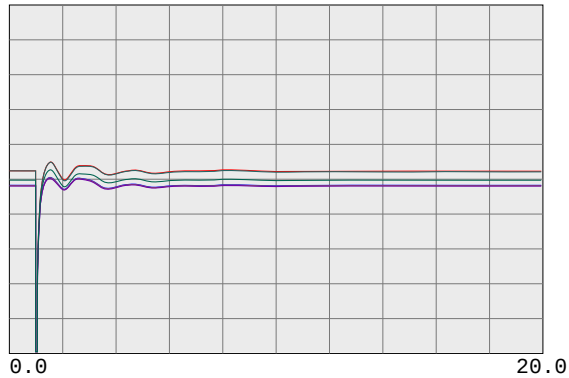


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

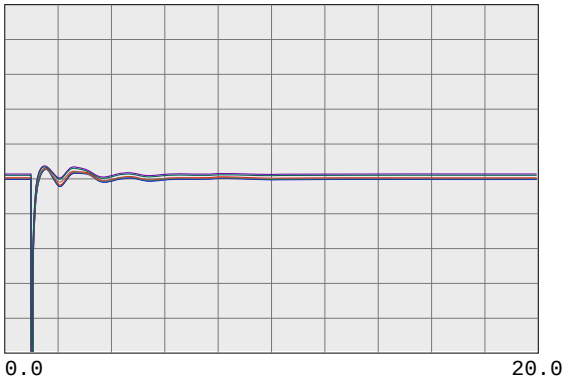
230-KV SYSTEM VOLTAGES



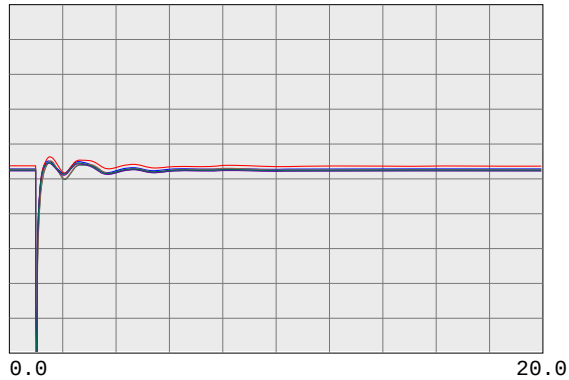
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



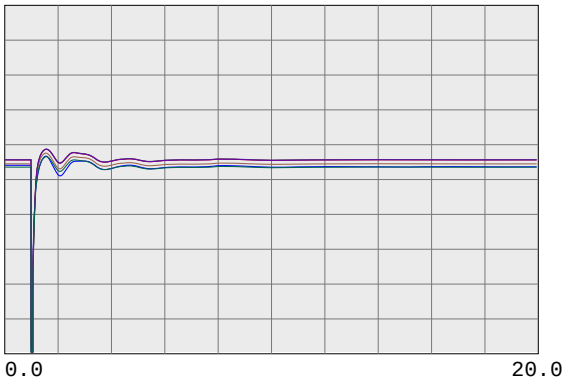
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



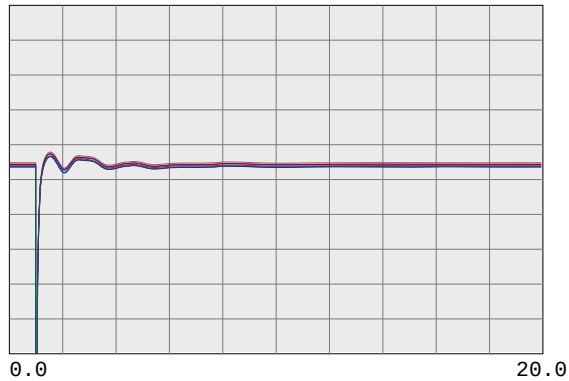
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



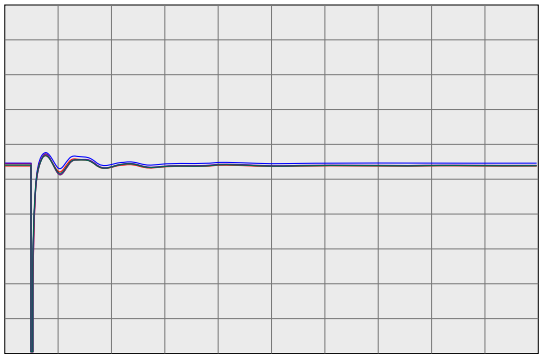
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

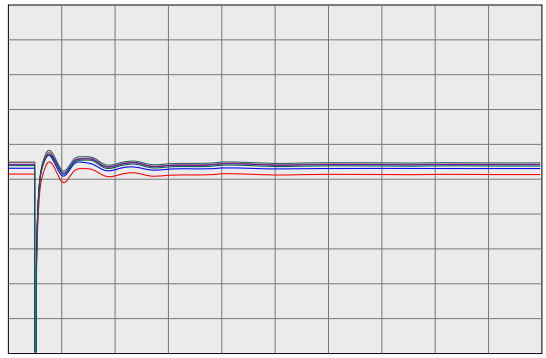
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

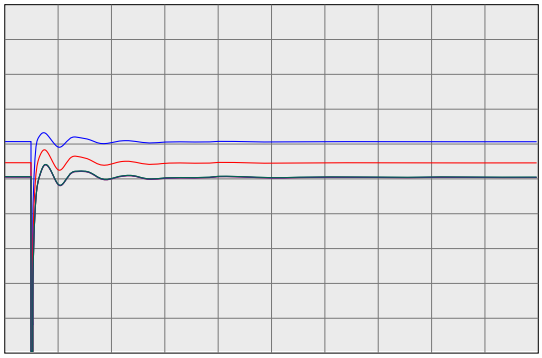
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

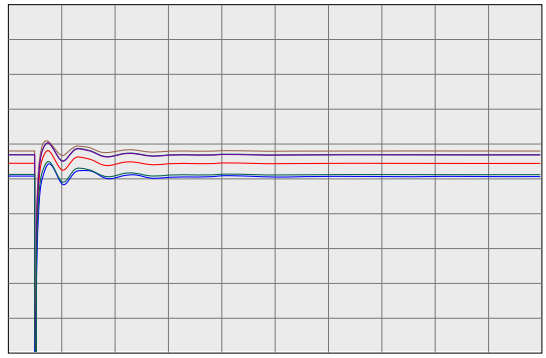
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

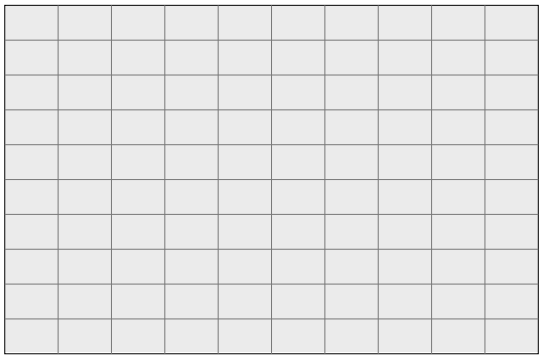
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

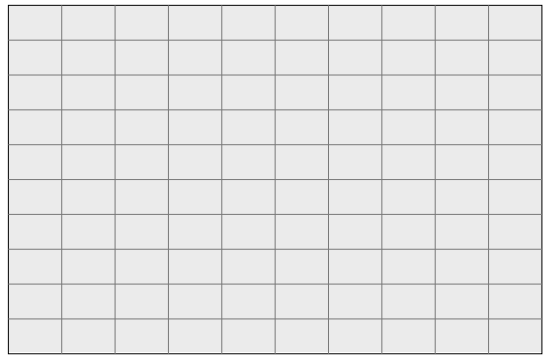


0.0 20.0

Time(sec)

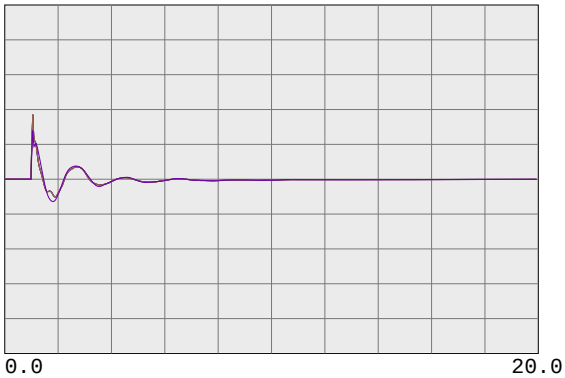
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



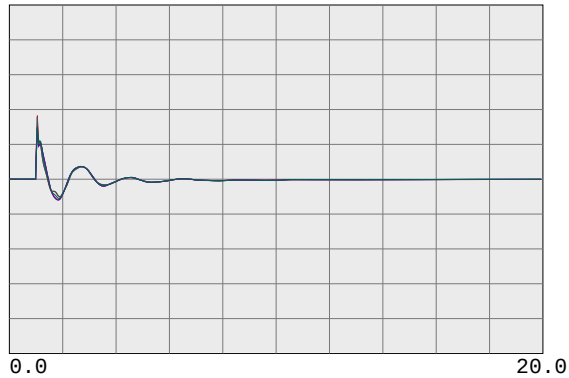


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

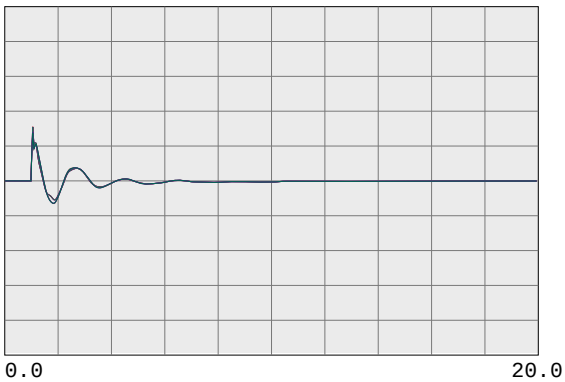
230-KV SYSTEM FREQUENCIES



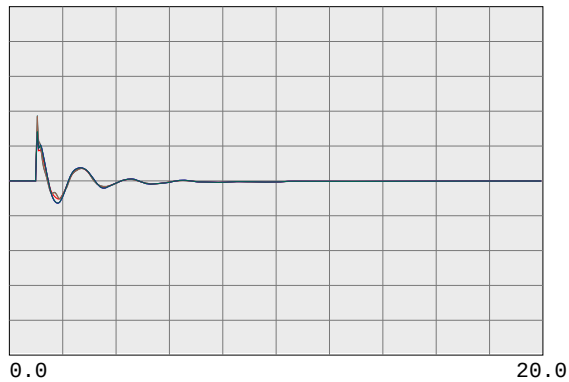
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



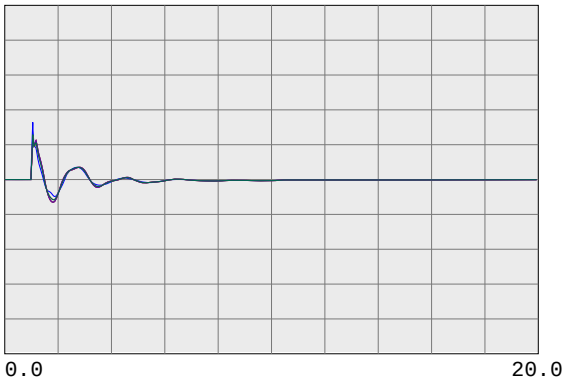
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



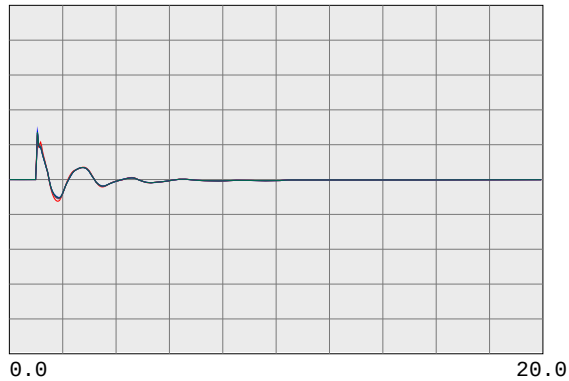
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



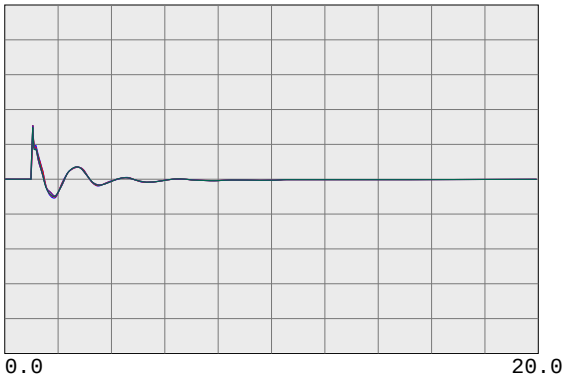
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



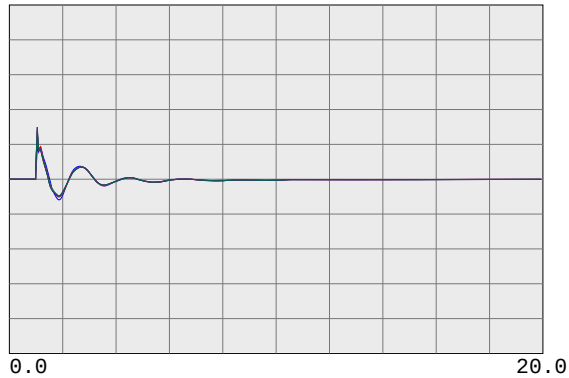
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

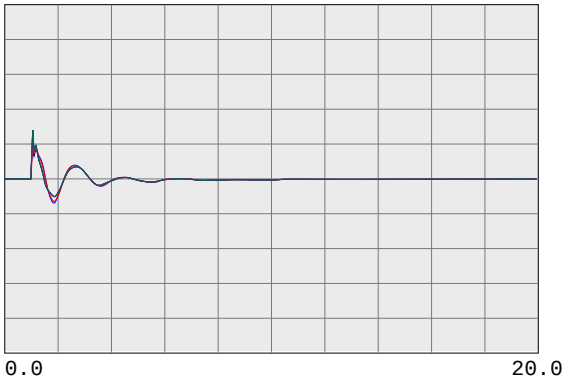
230-KV SYSTEM FREQUENCIES



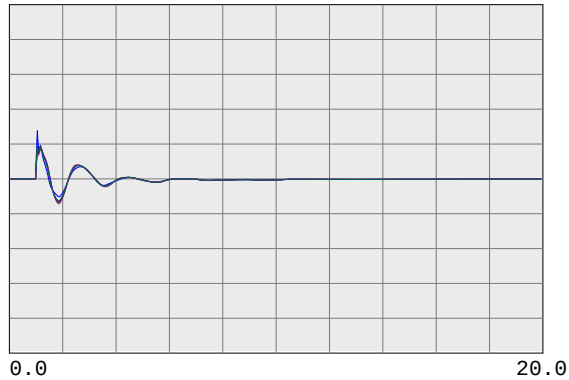
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



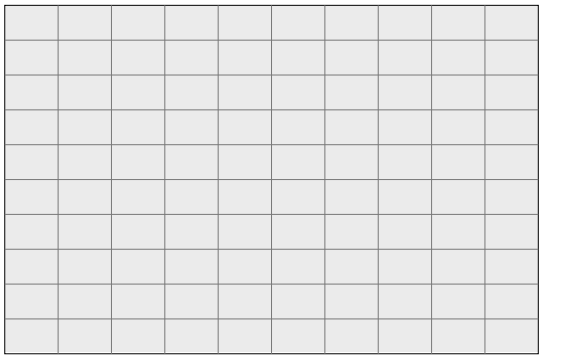
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

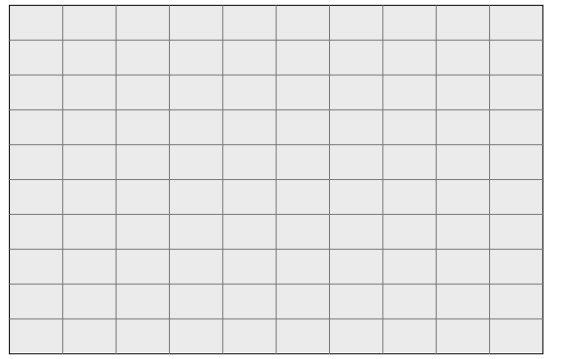


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



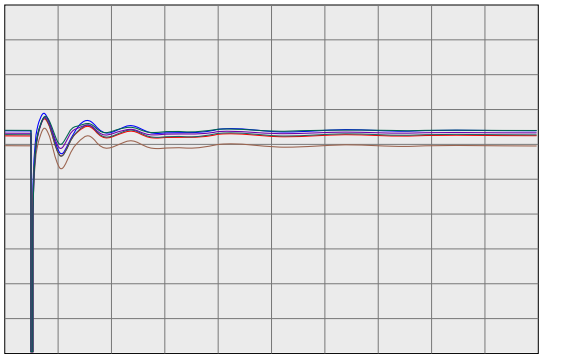
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



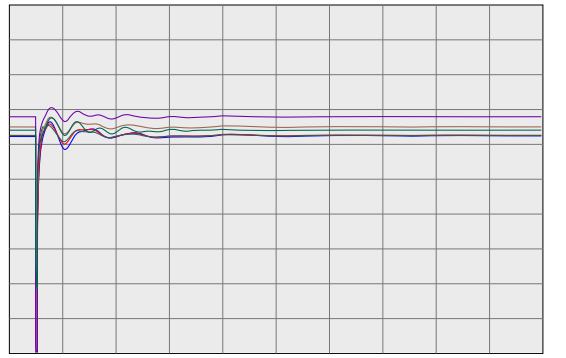


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

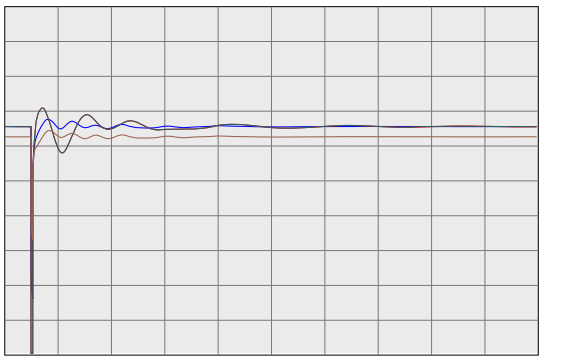
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



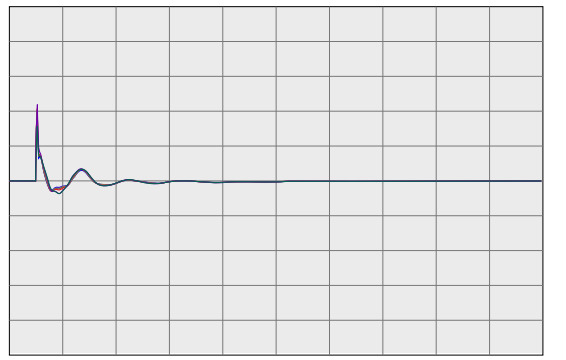
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



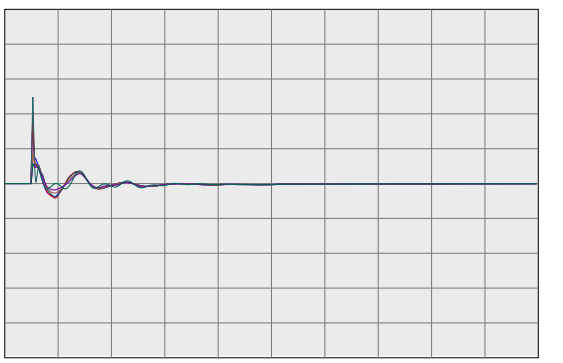
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



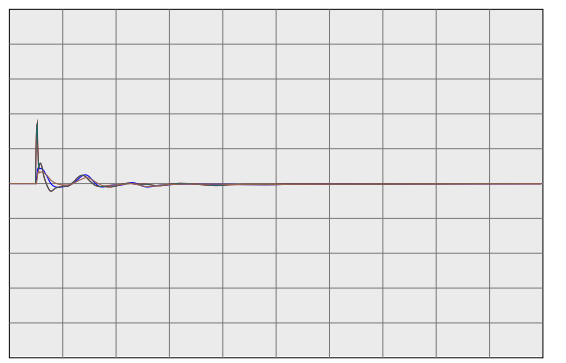
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



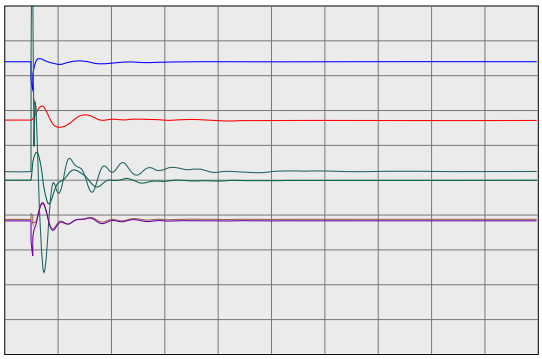
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



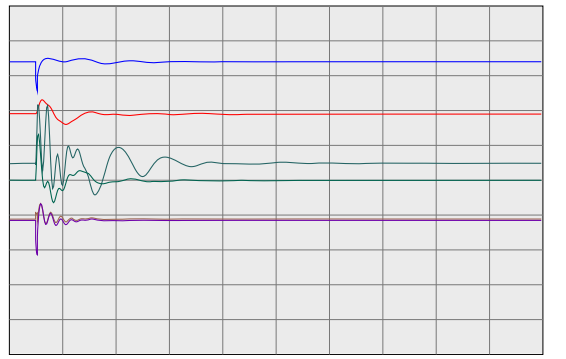
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

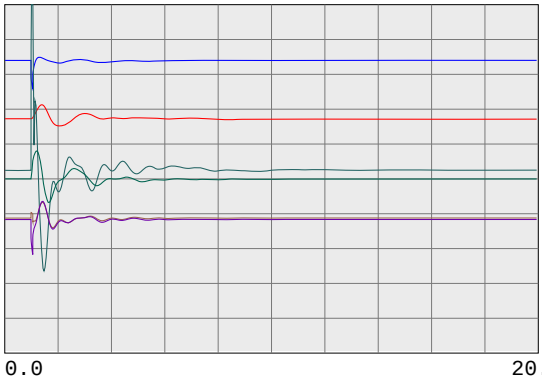
WILLOW PASS GENERATION PLANT



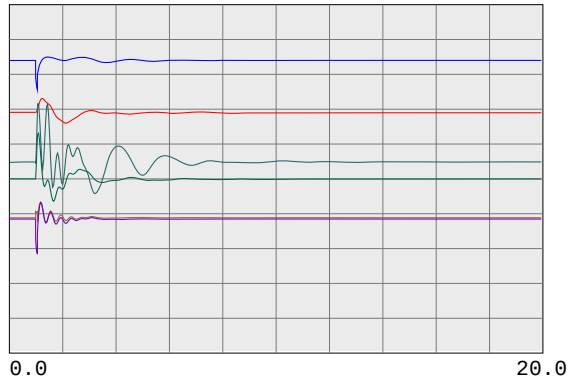
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



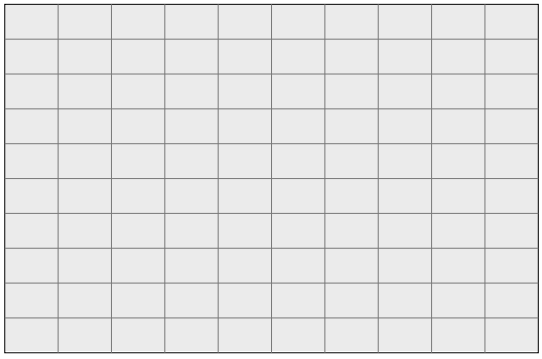
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

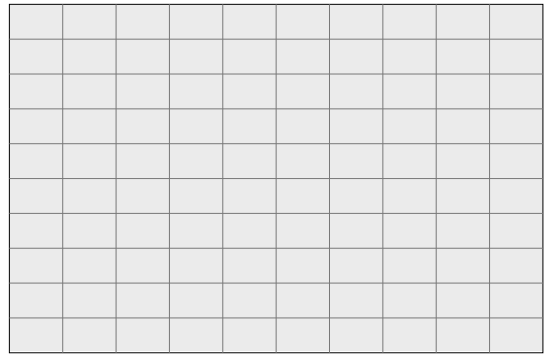


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



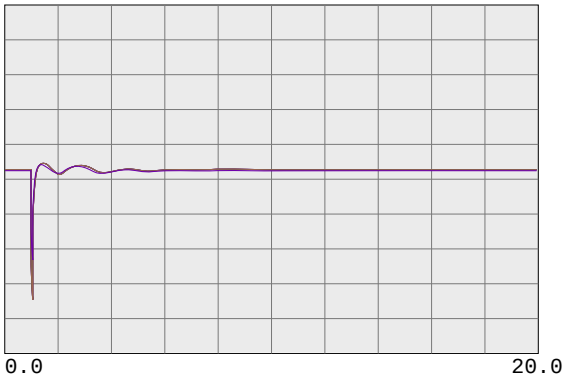
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



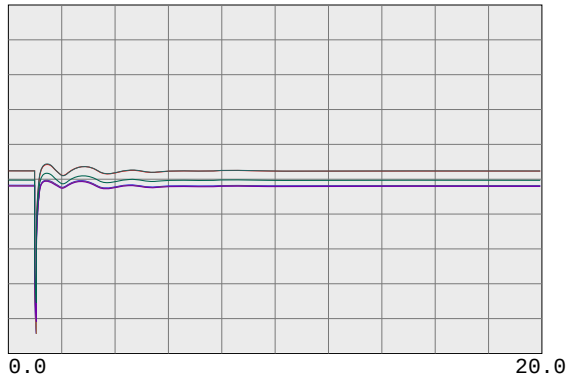


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

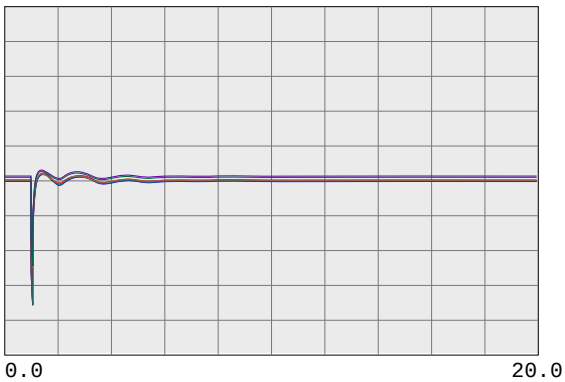
230-KV SYSTEM VOLTAGES



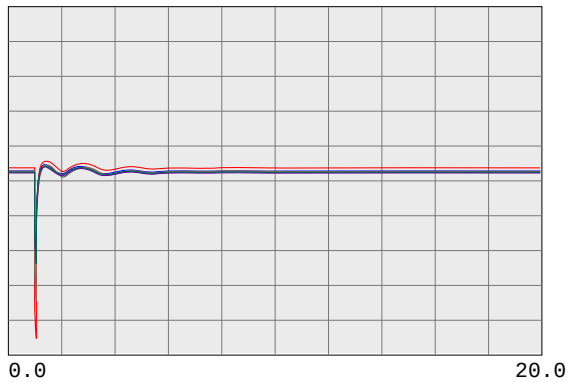
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



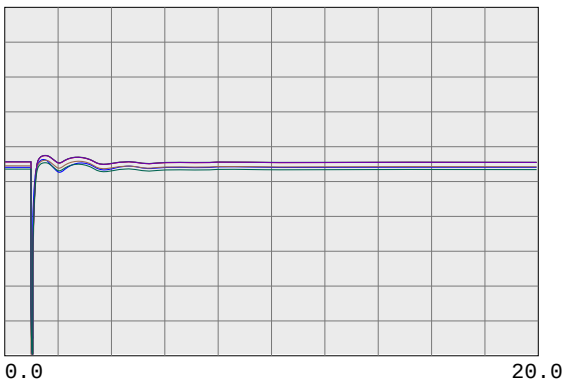
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



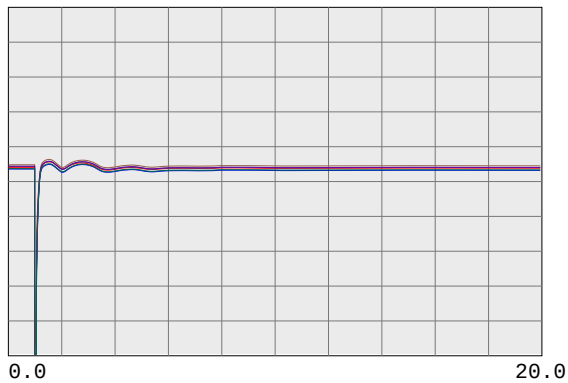
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



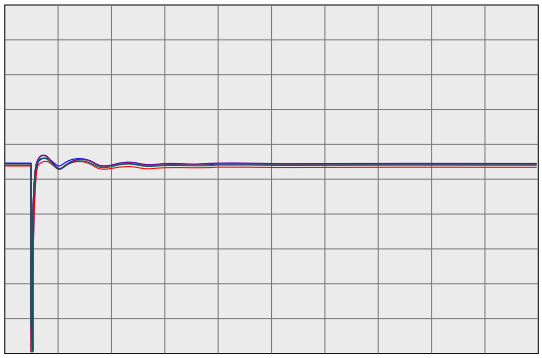
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



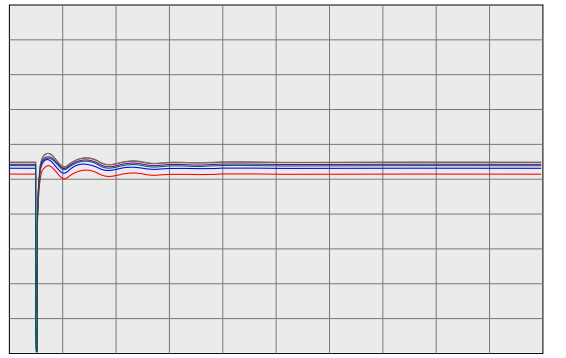
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

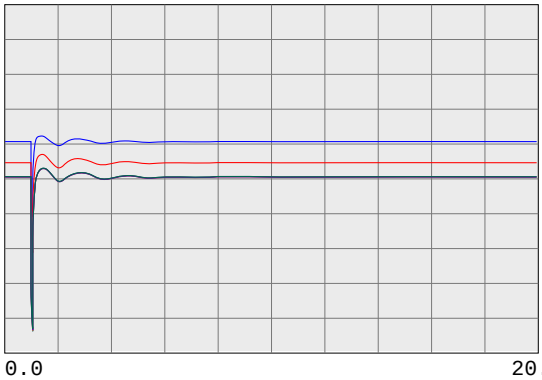
230-KV SYSTEM VOLTAGES



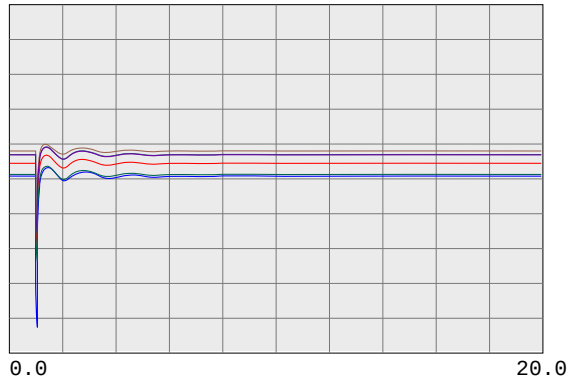
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



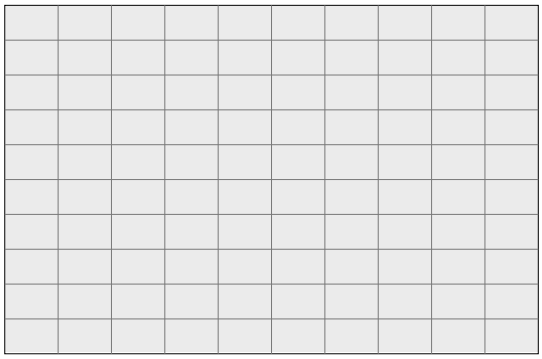
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

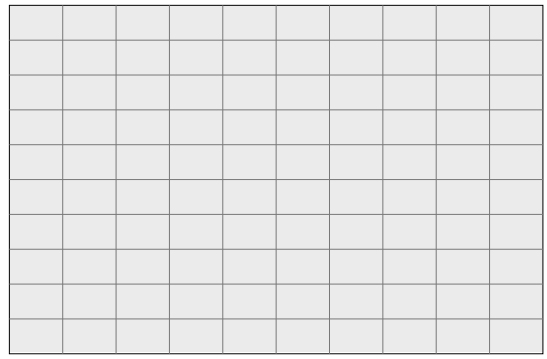


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



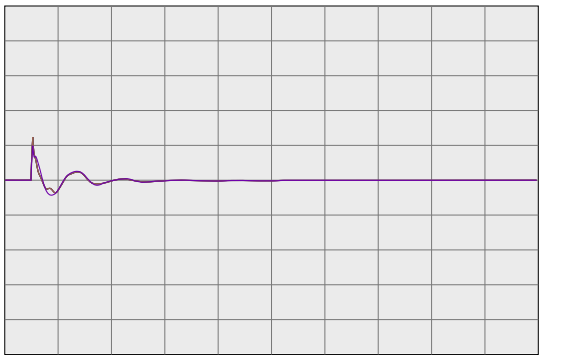
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



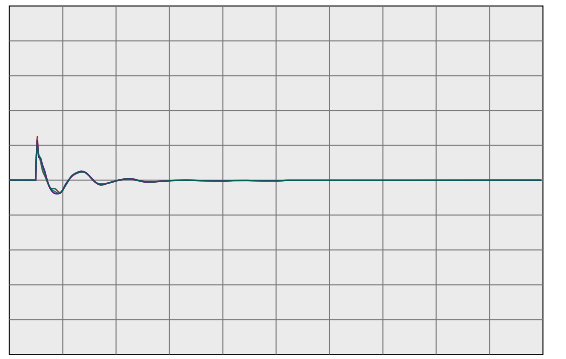


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

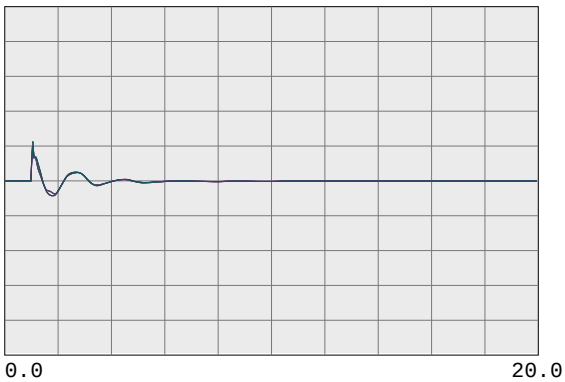
230-KV SYSTEM FREQUENCIES



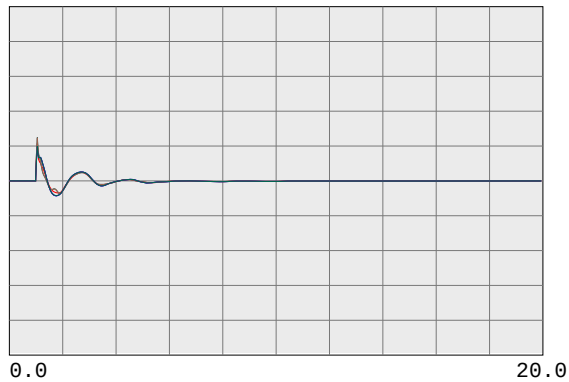
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



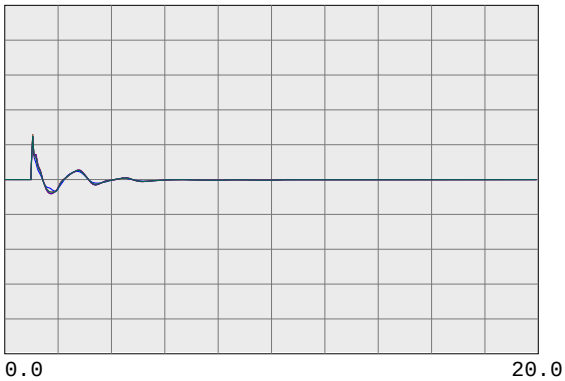
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



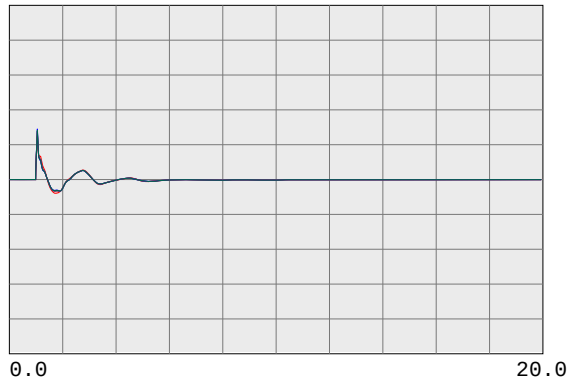
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



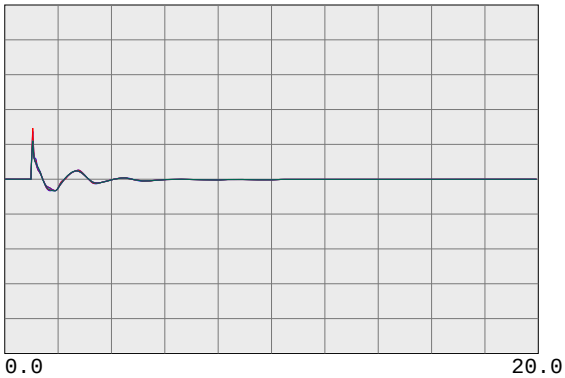
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



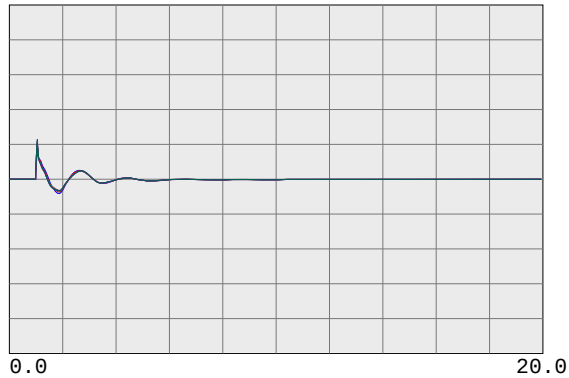
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

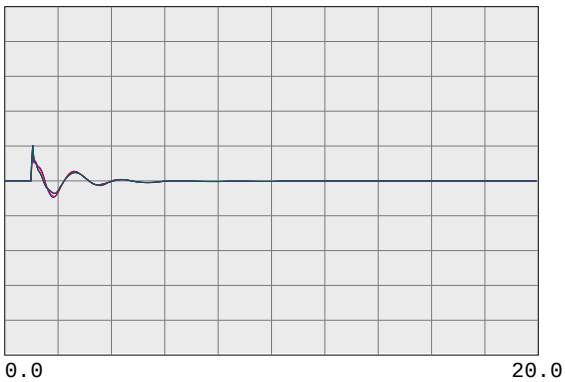
230-KV SYSTEM FREQUENCIES



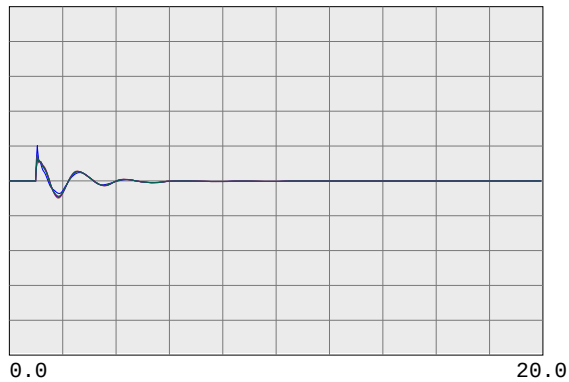
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



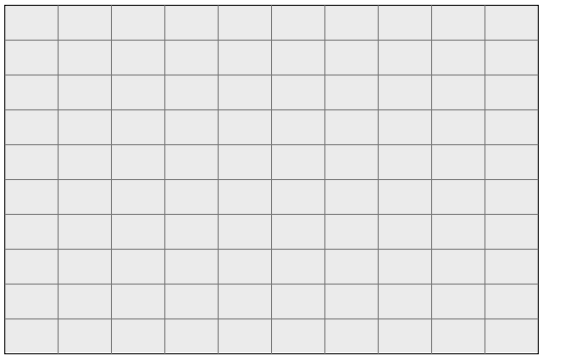
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

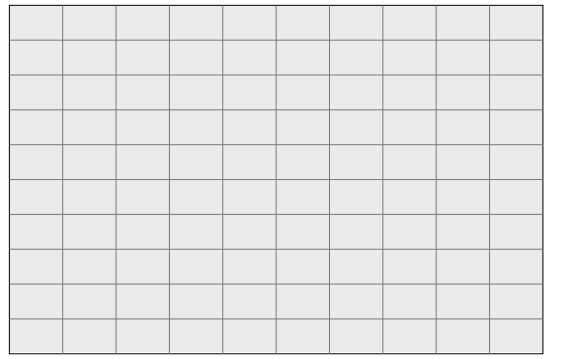


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



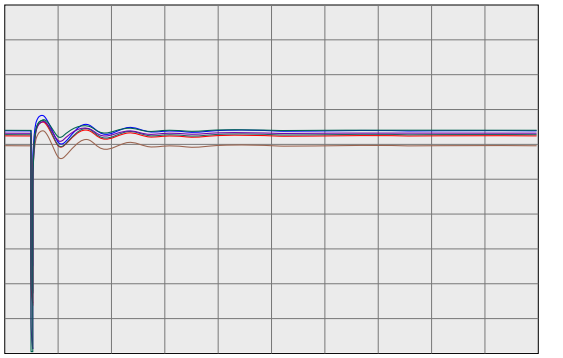
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



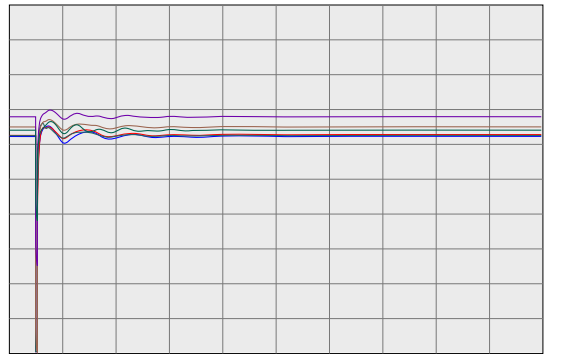


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

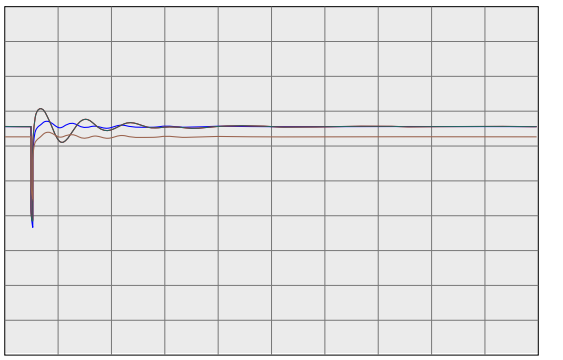
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



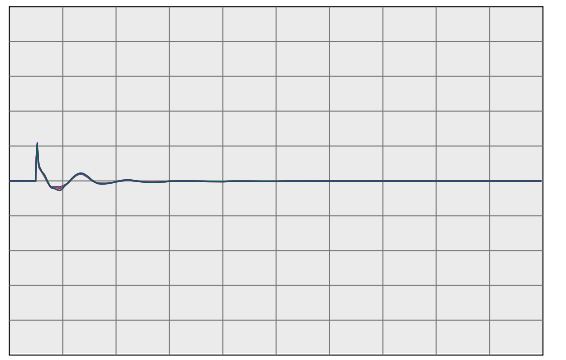
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



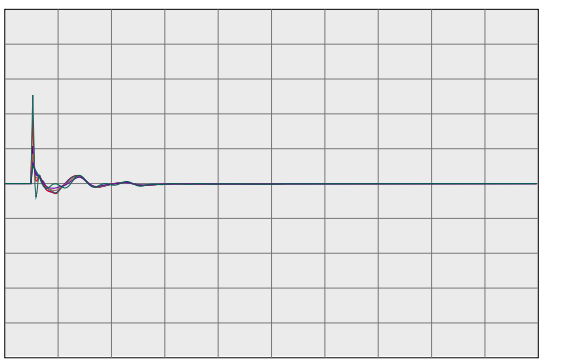
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



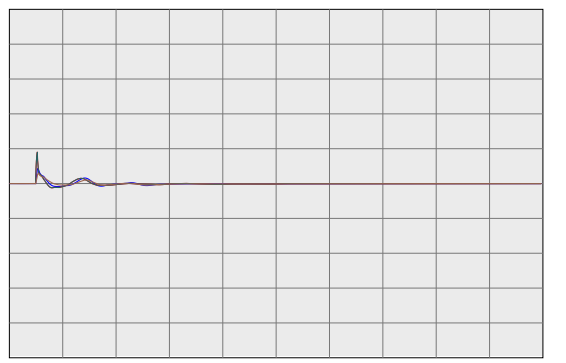
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



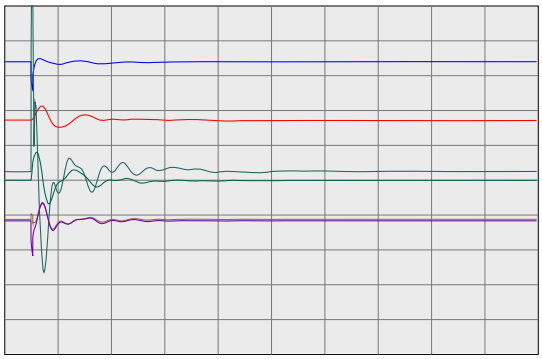
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



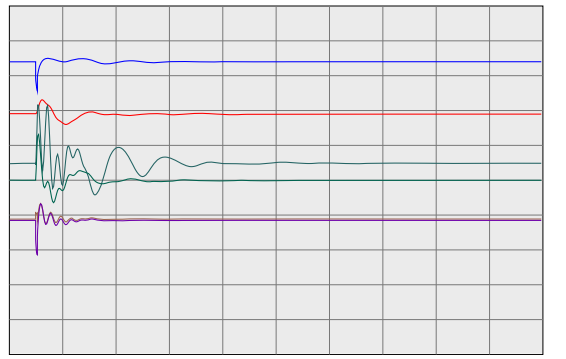
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

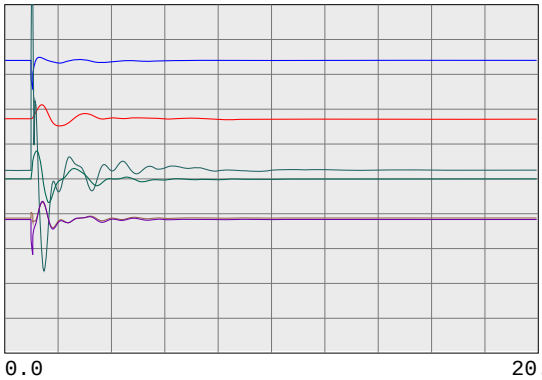
WILLOW PASS GENERATION PLANT



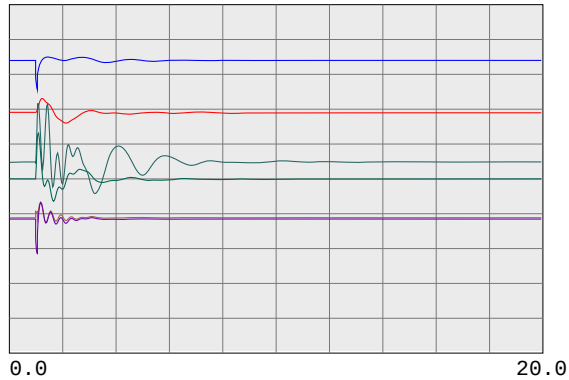
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



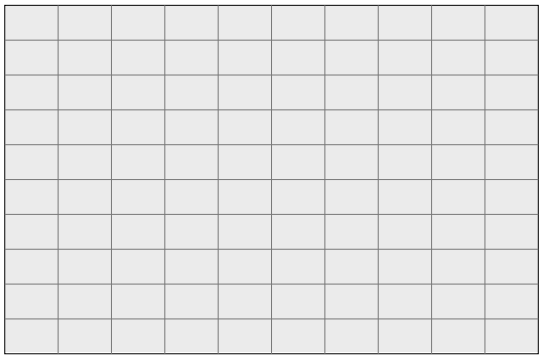
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

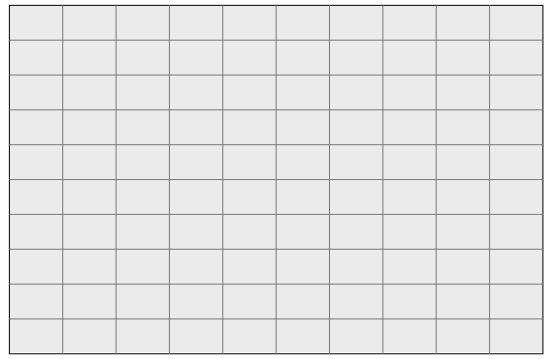


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



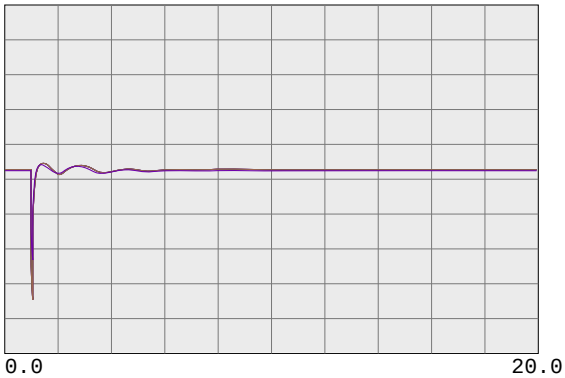
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



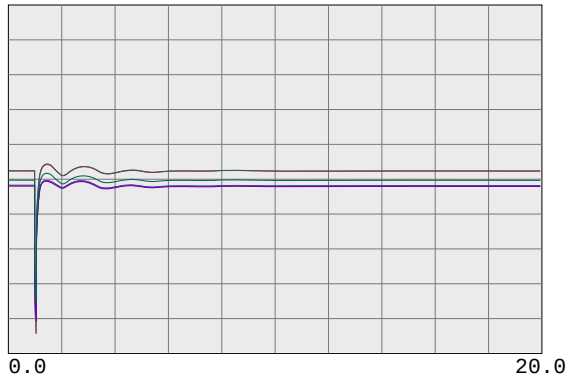


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

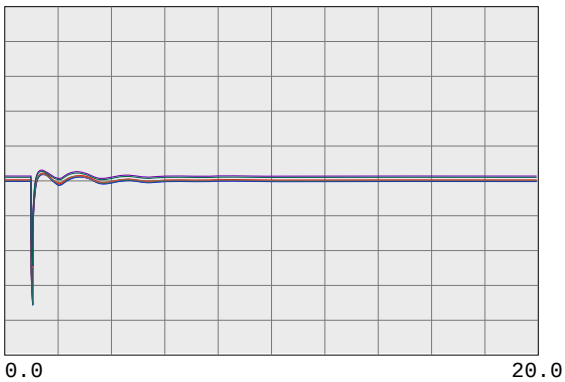
230-KV SYSTEM VOLTAGES



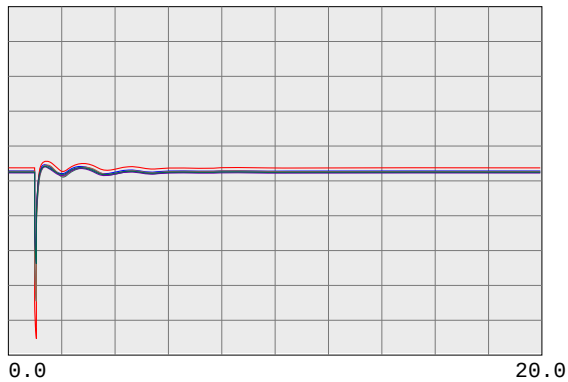
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



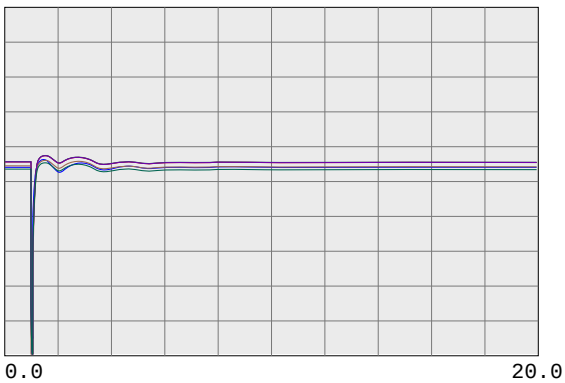
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



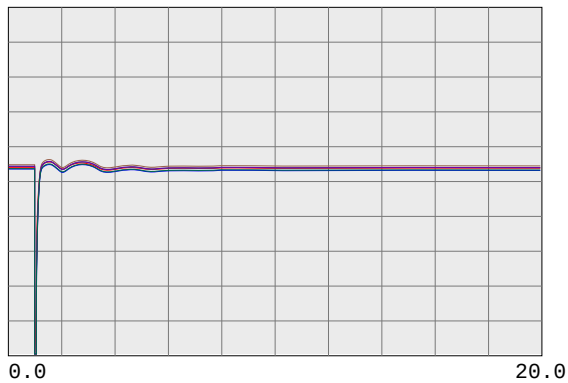
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



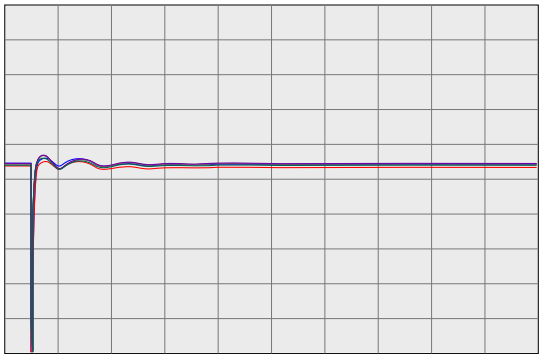
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

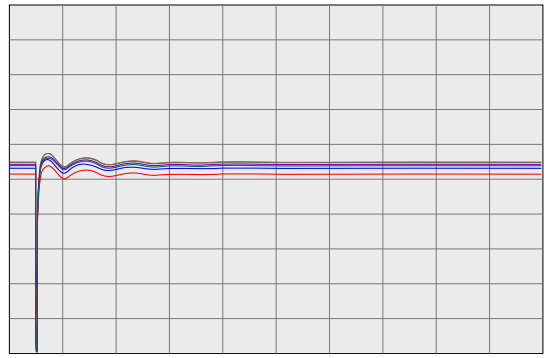
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

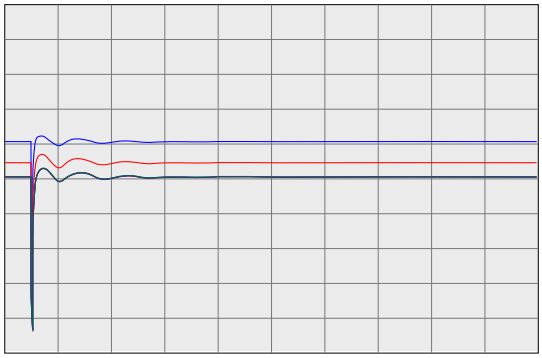
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

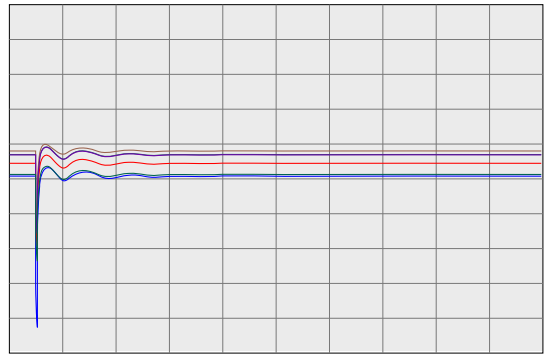
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

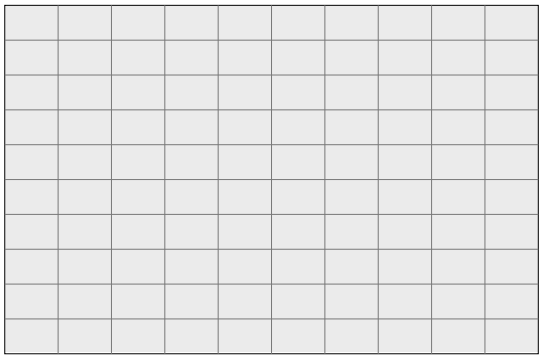
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

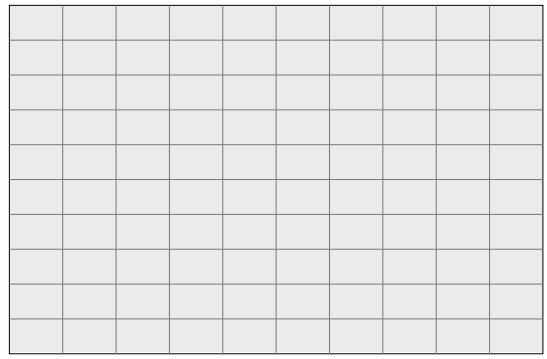


0.0 20.0

Time(sec)

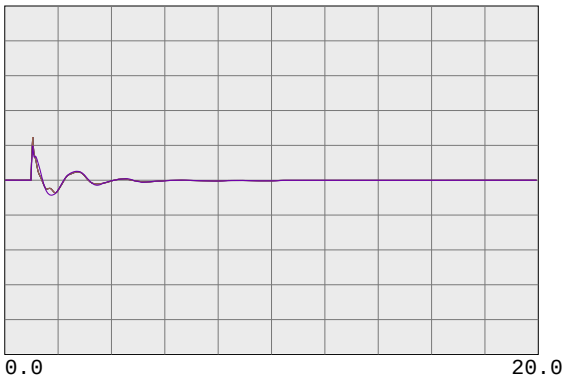
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



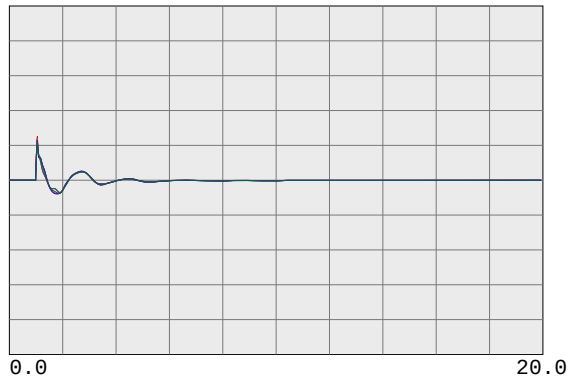


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

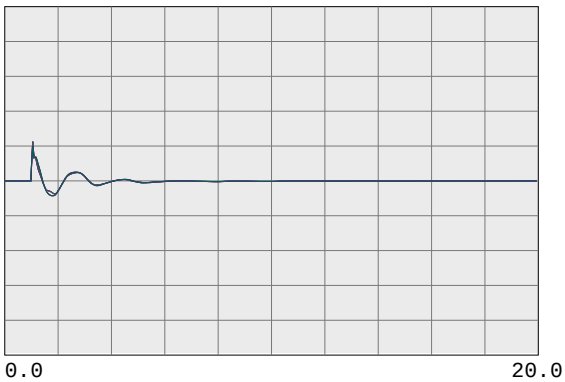
230-KV SYSTEM FREQUENCIES



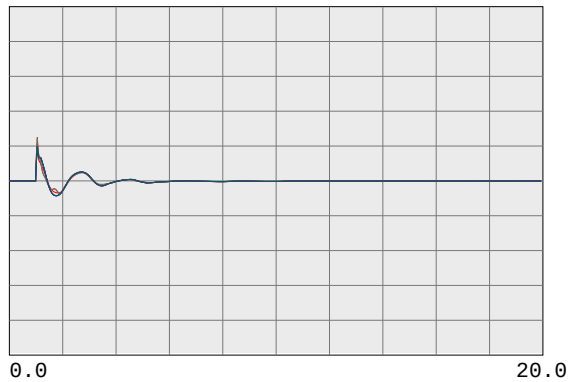
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



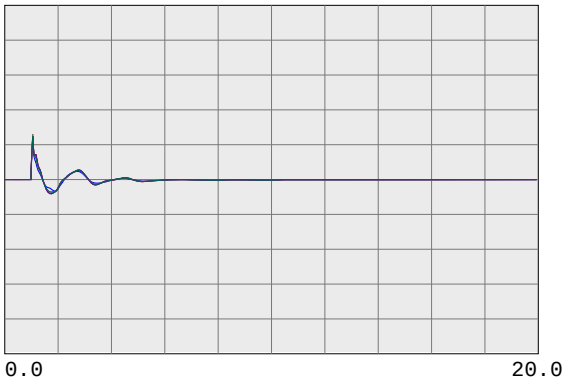
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



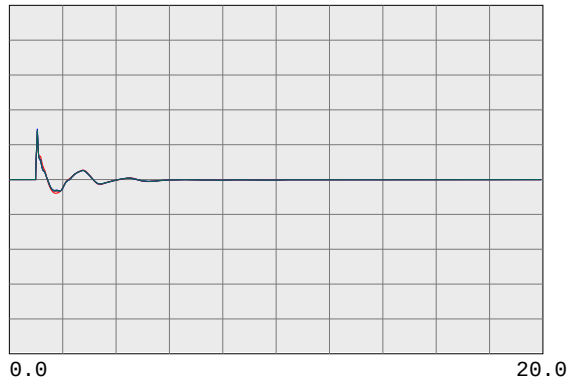
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



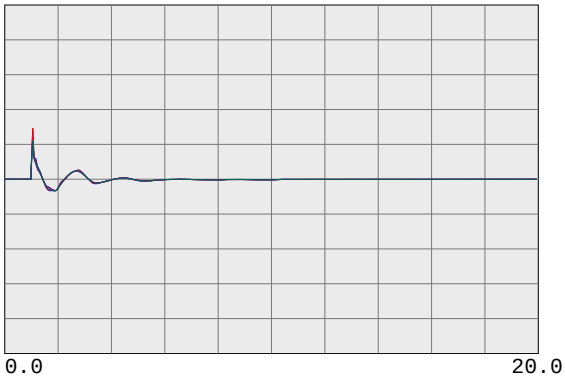
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



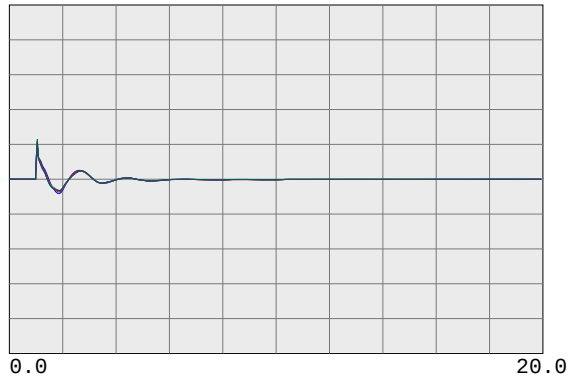
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

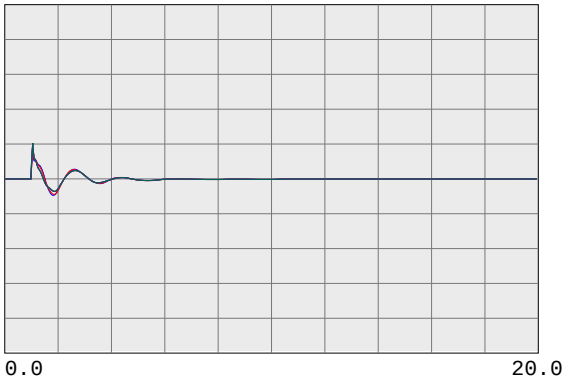
230-KV SYSTEM FREQUENCIES



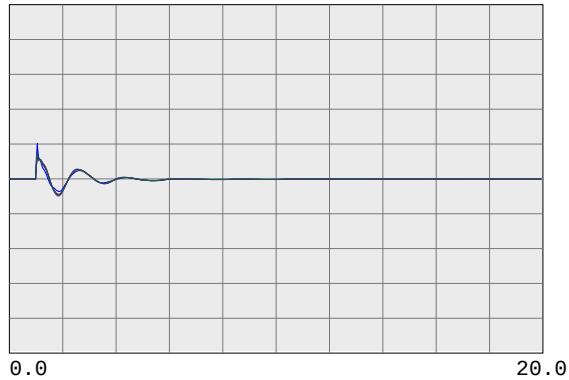
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



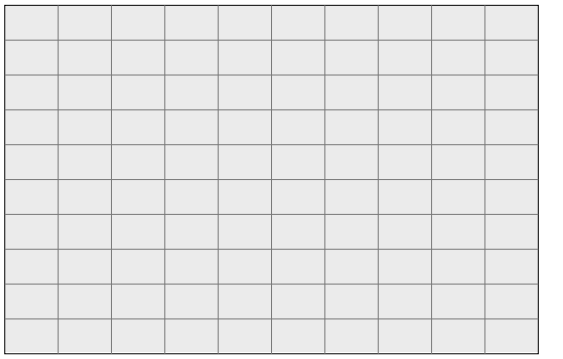
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

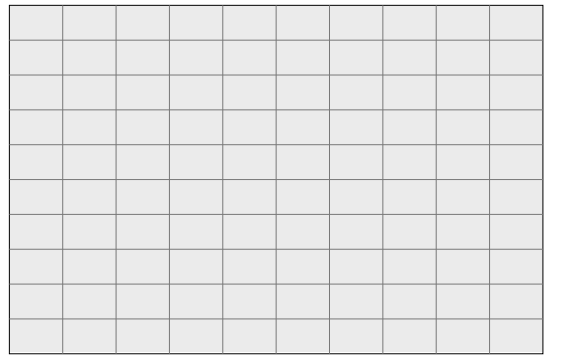


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



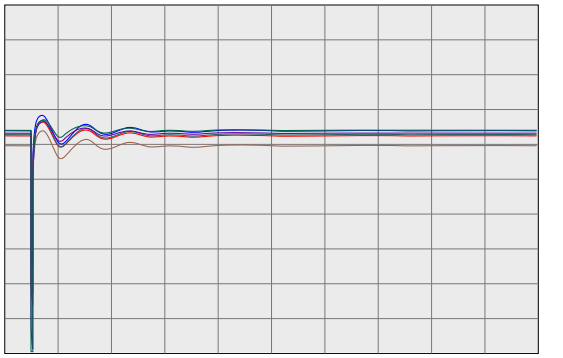
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



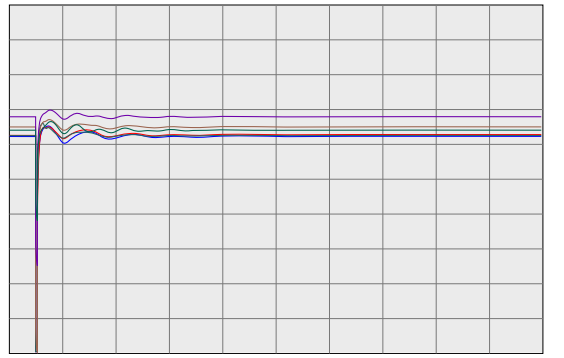


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

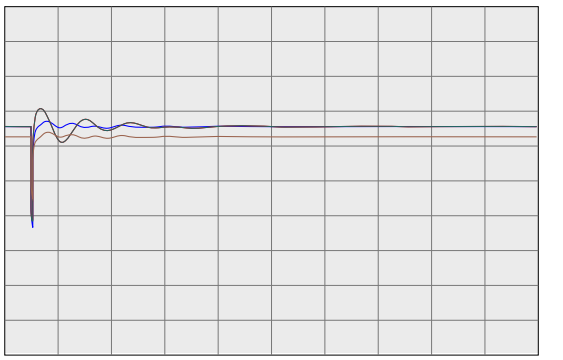
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



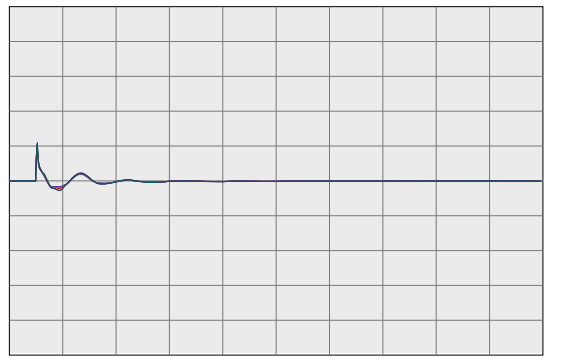
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



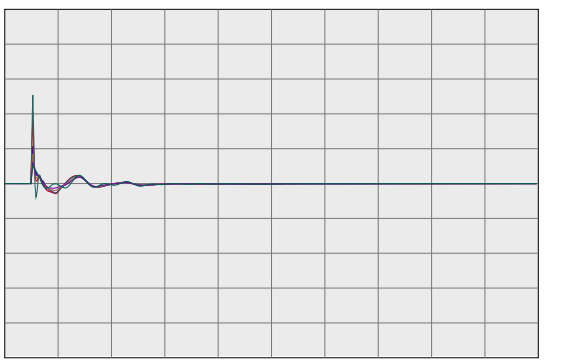
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



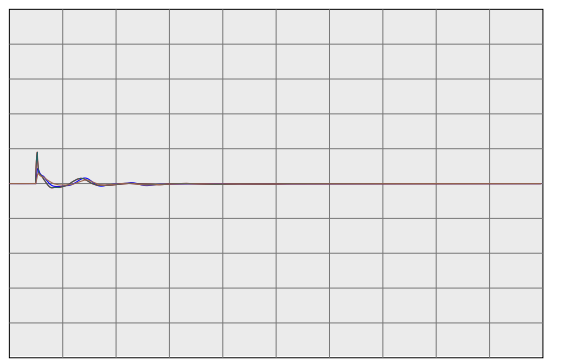
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



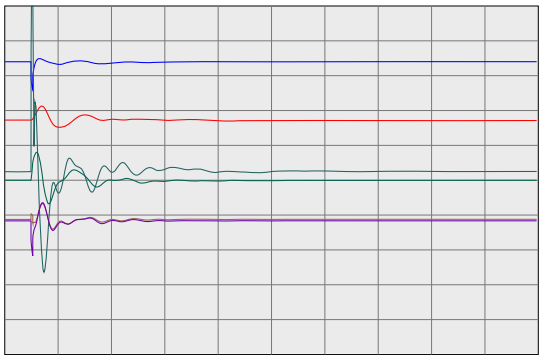
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



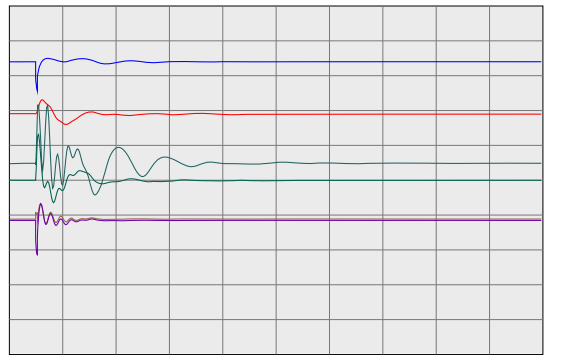
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

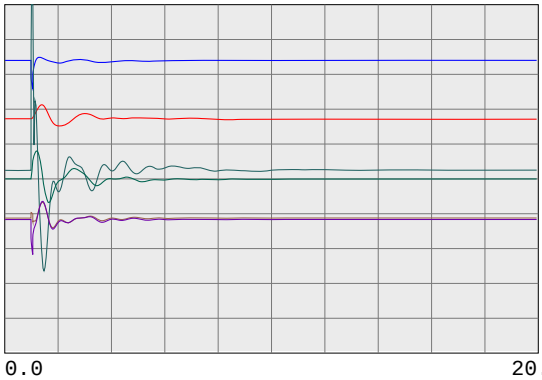
WILLOW PASS GENERATION PLANT



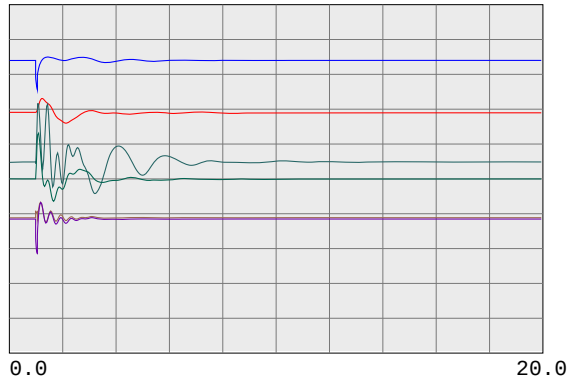
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



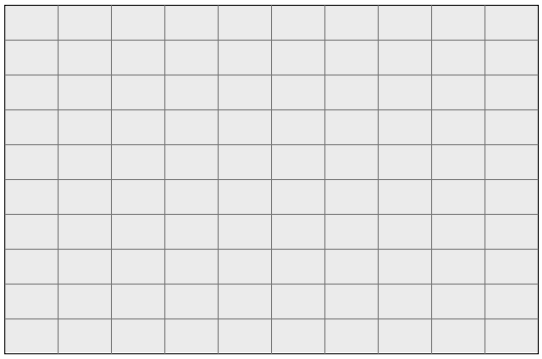
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

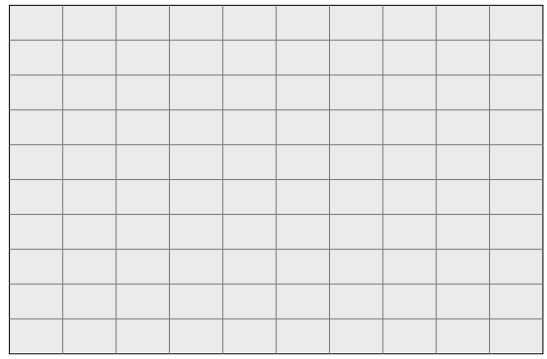


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



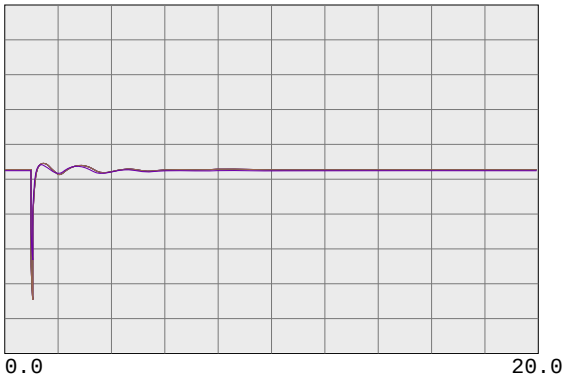
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



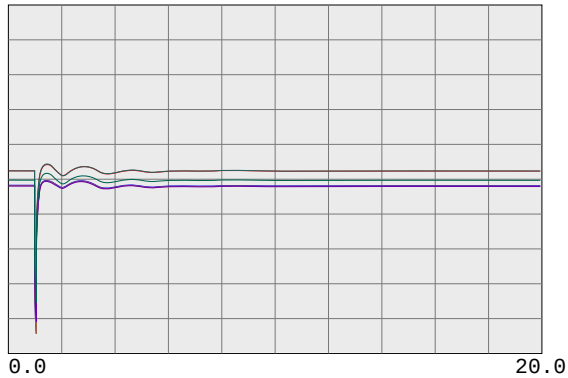


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

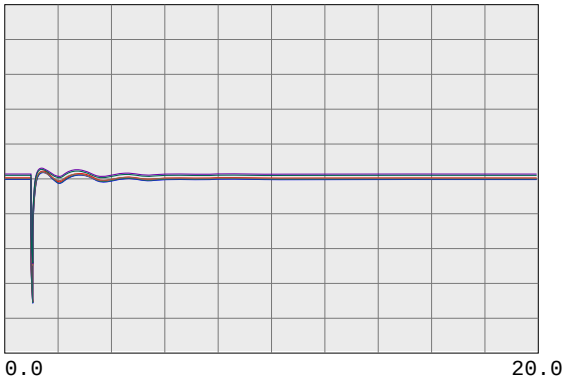
230-KV SYSTEM VOLTAGES



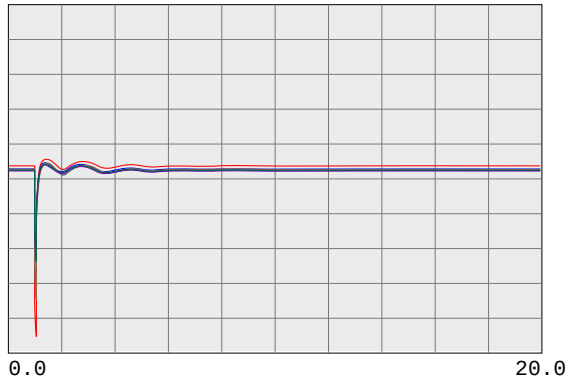
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



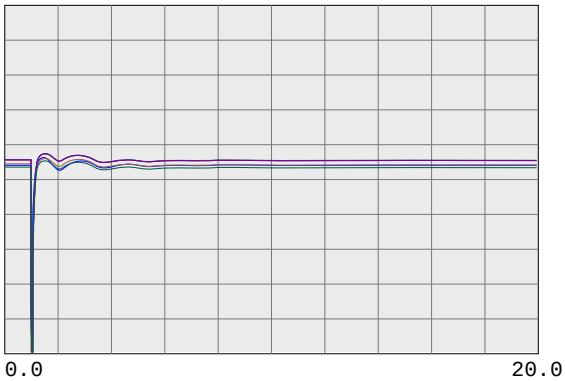
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



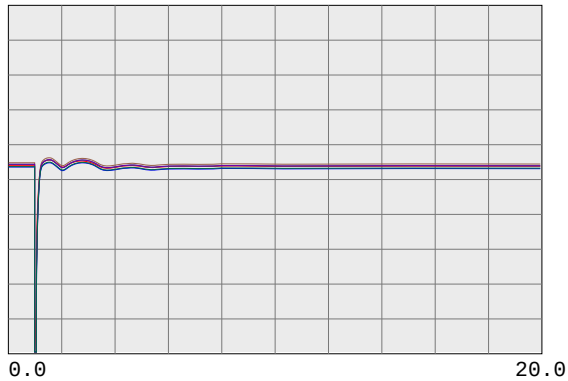
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



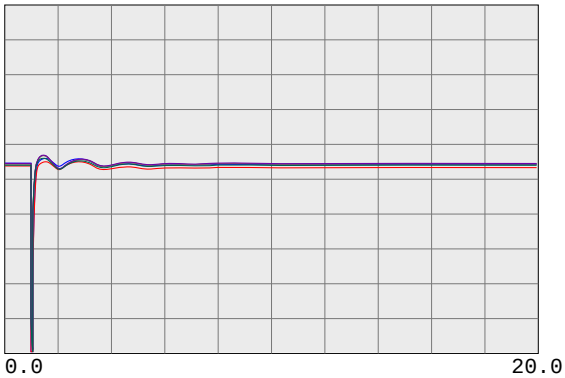
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



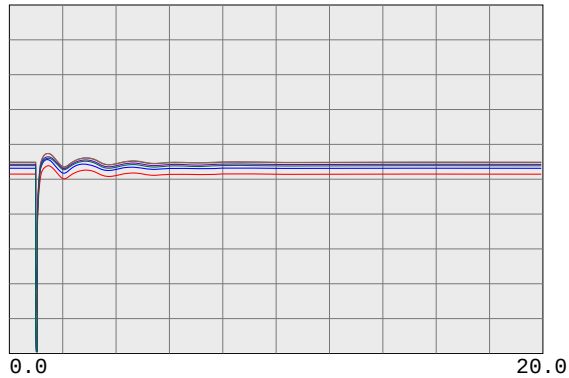
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

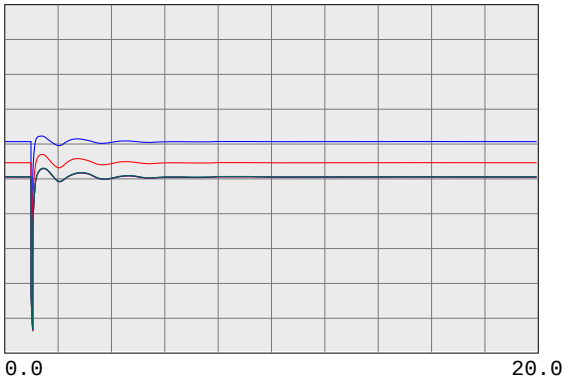
230-KV SYSTEM VOLTAGES



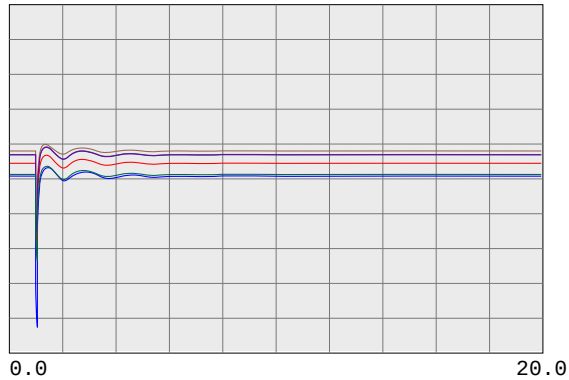
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



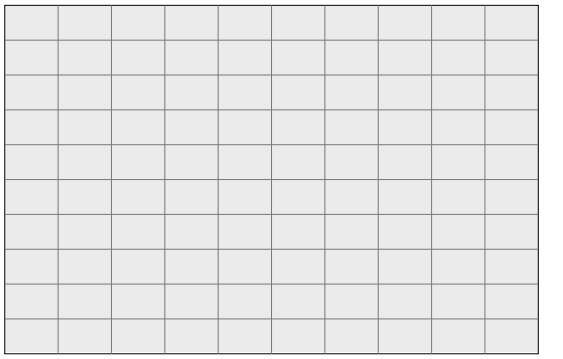
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

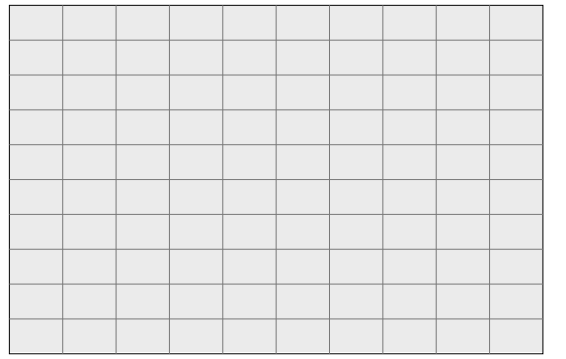


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



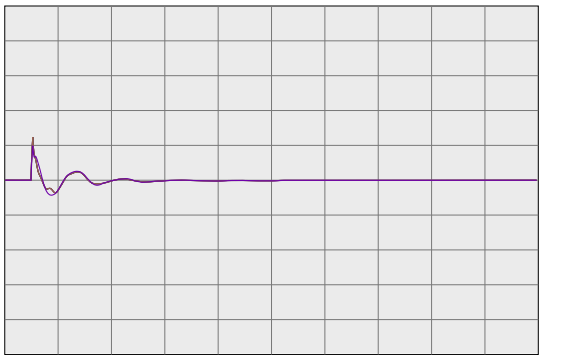
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



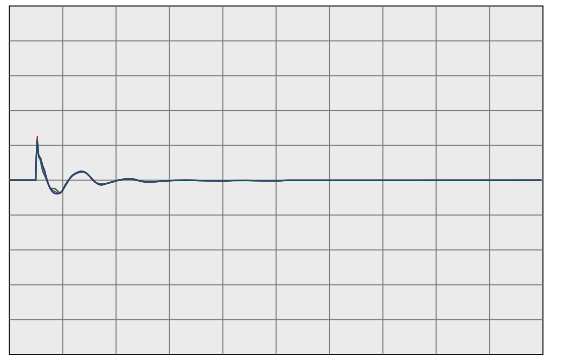


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

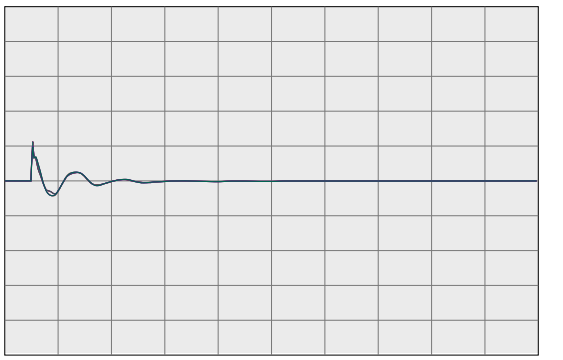
230-KV SYSTEM FREQUENCIES



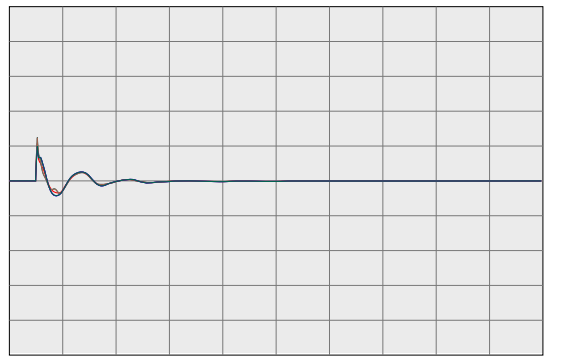
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



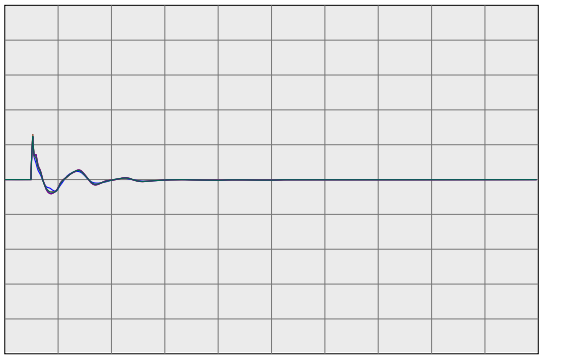
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



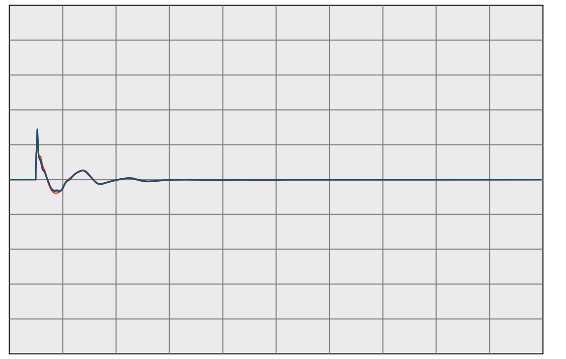
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



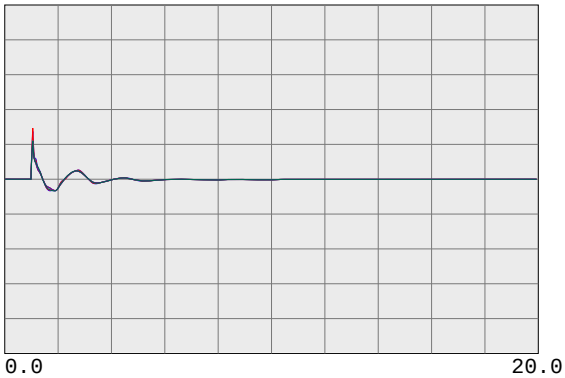
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



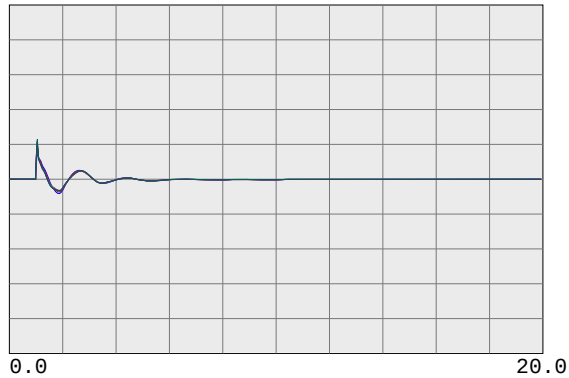
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

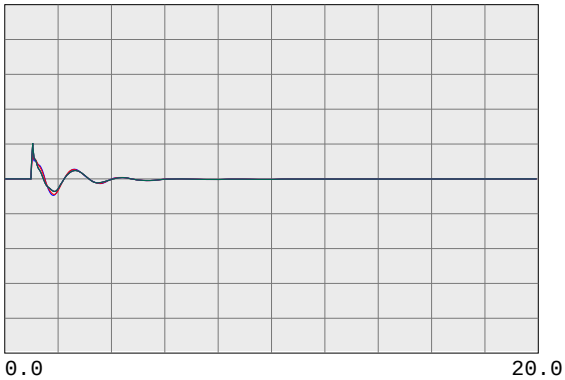
230-KV SYSTEM FREQUENCIES



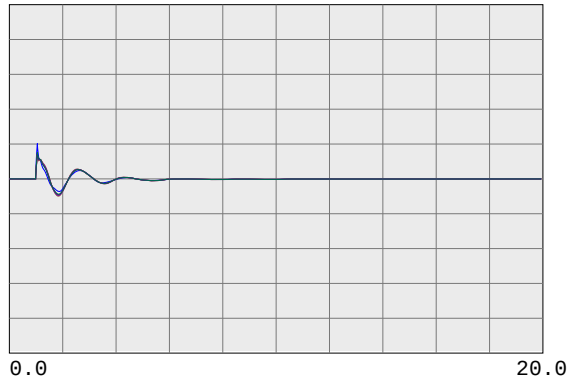
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



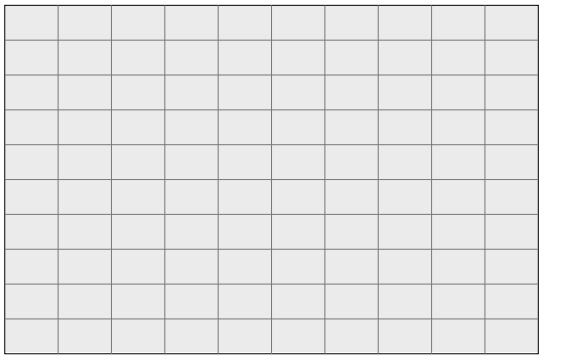
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

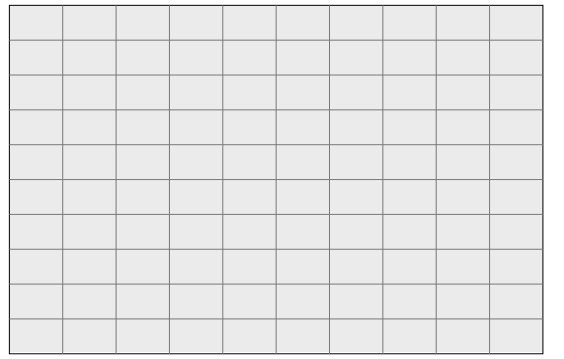


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



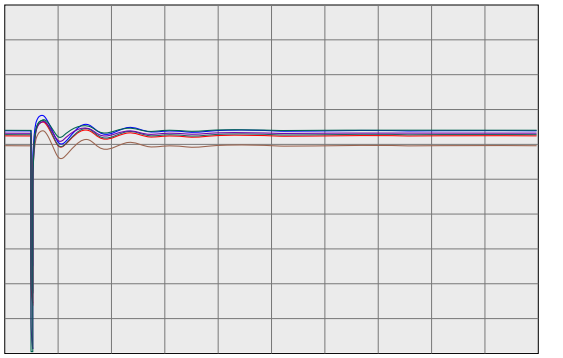
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



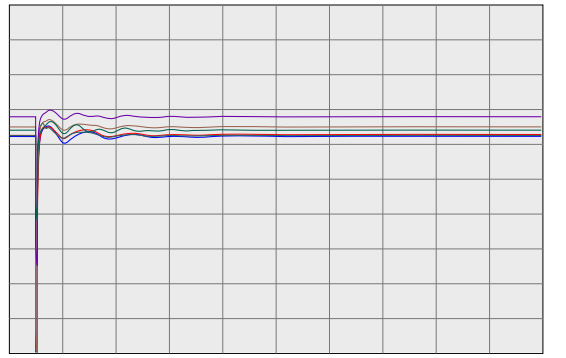


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

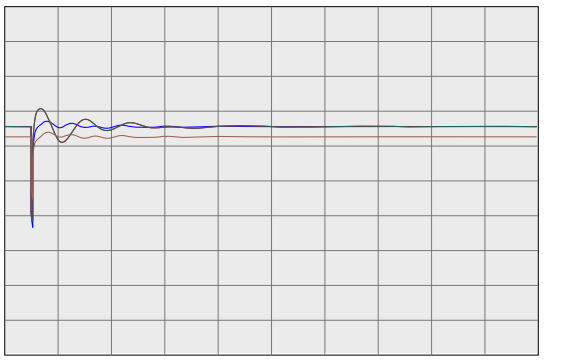
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



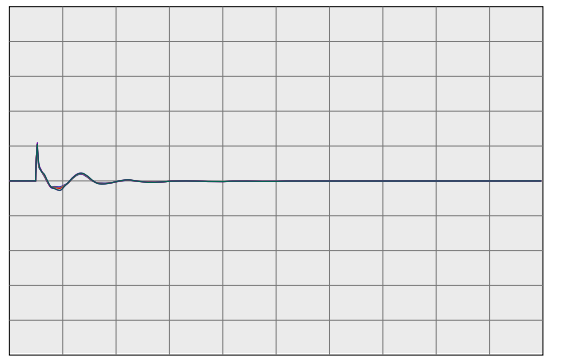
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



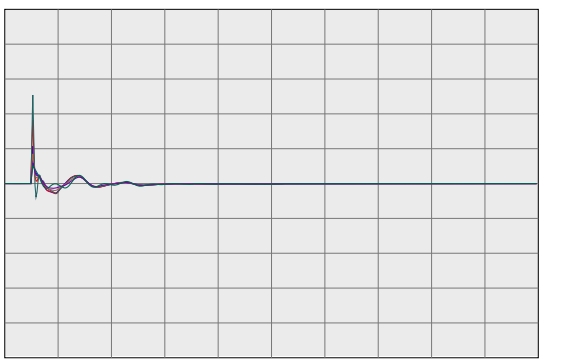
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



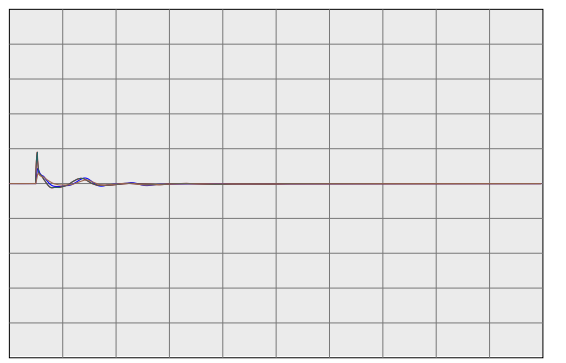
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



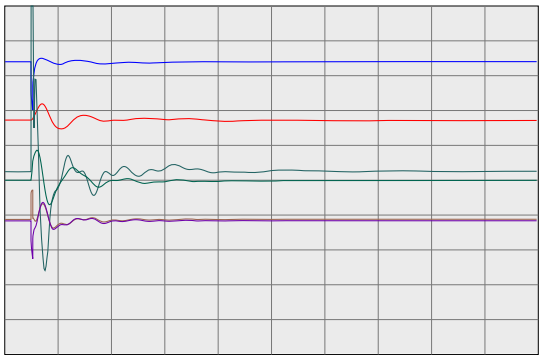
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



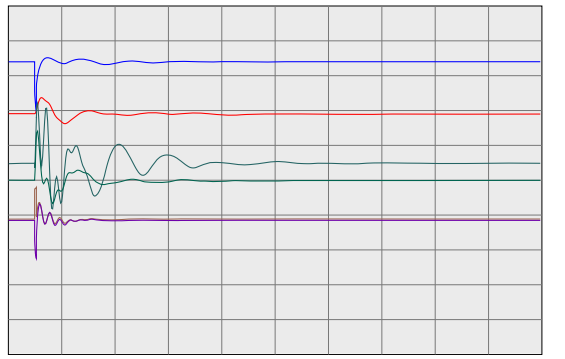
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

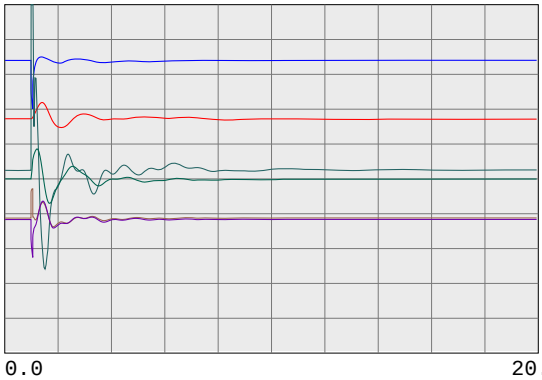
WILLOW PASS GENERATION PLANT



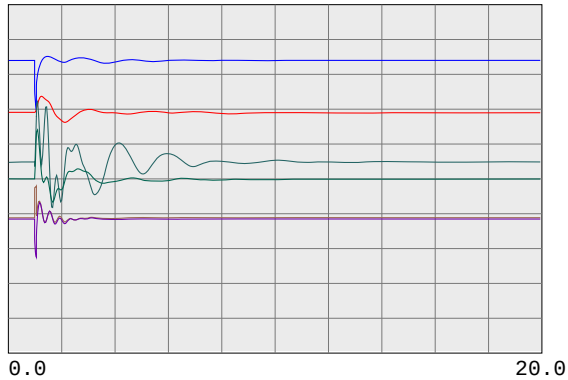
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



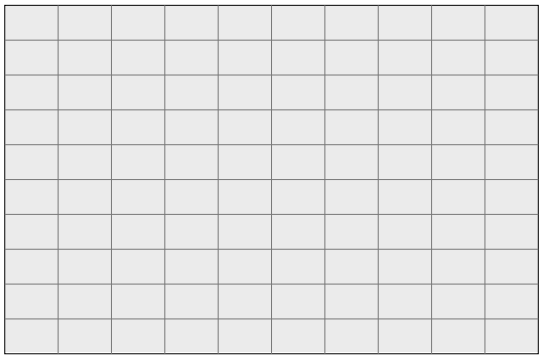
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

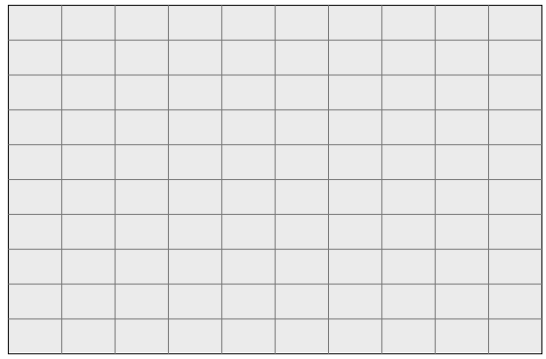


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



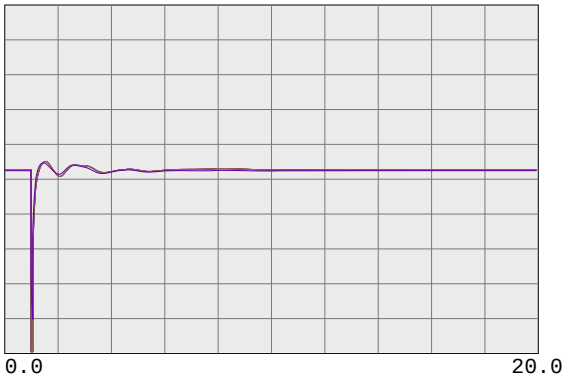
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



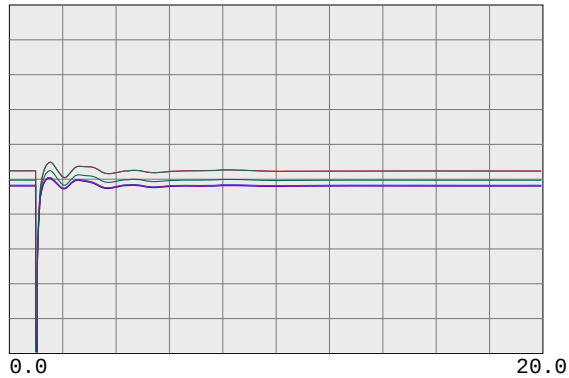


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

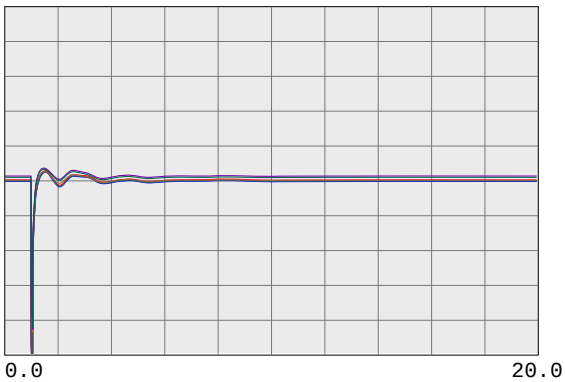
230-KV SYSTEM VOLTAGES



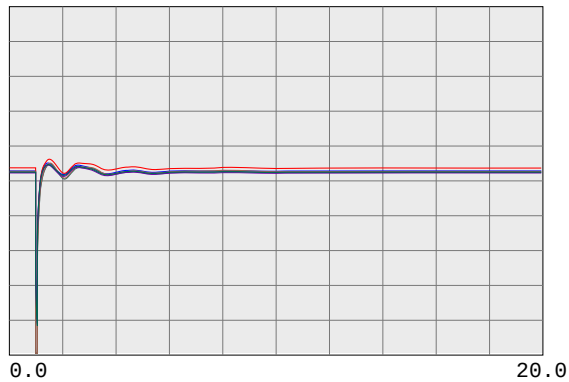
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



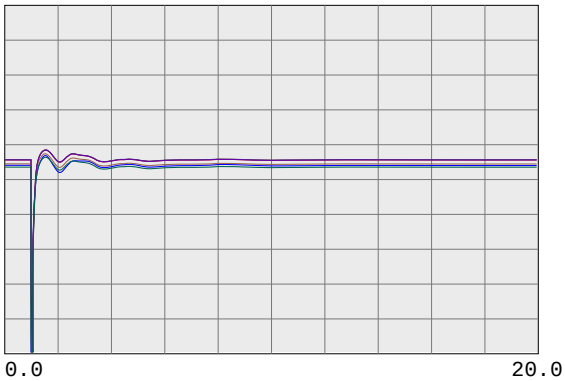
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



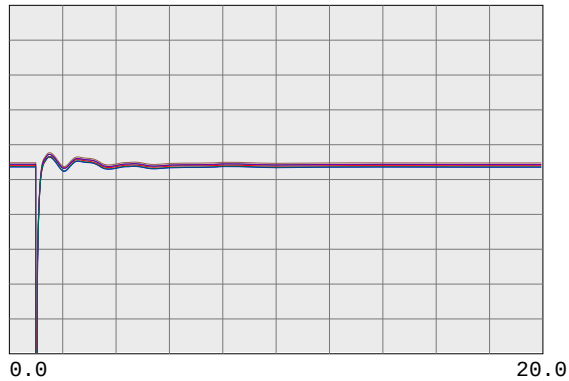
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



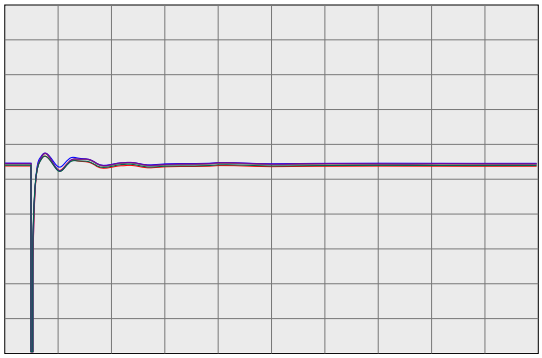
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

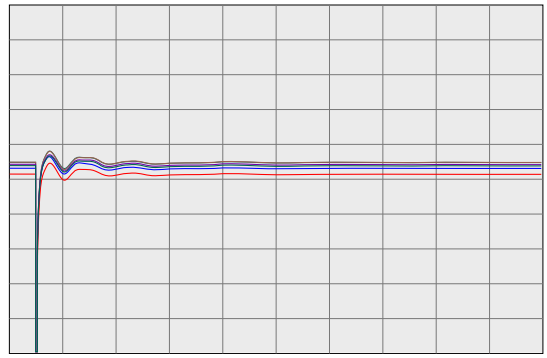
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

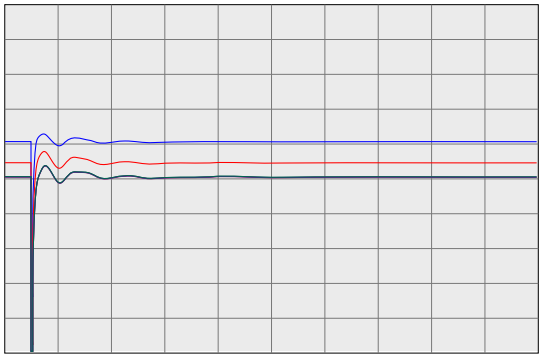
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

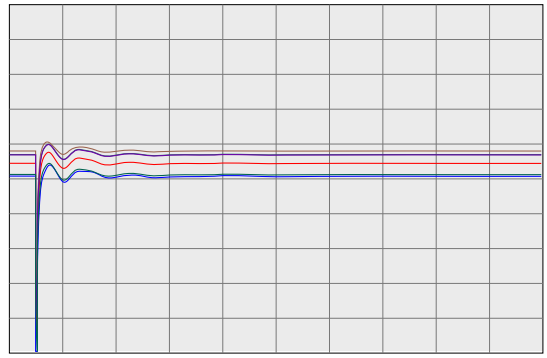
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

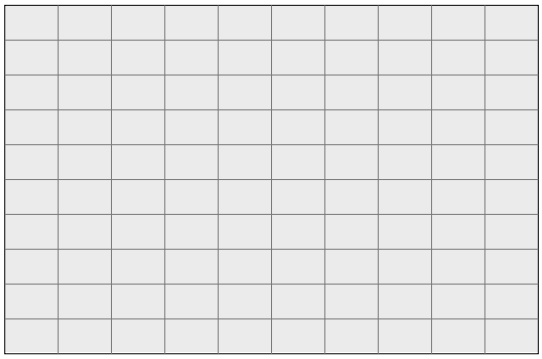
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

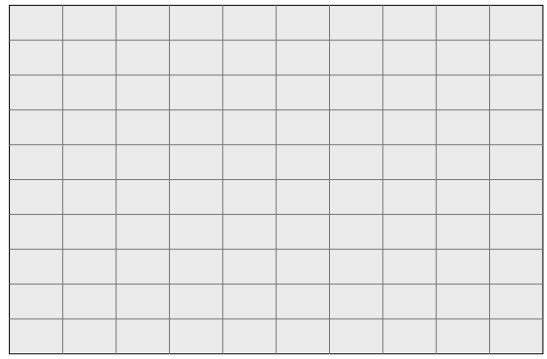


0.0 20.0

Time(sec)

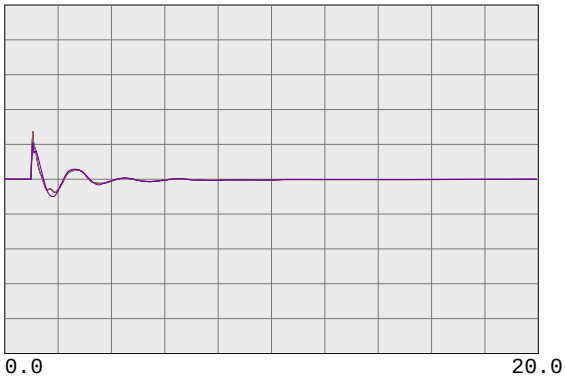
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



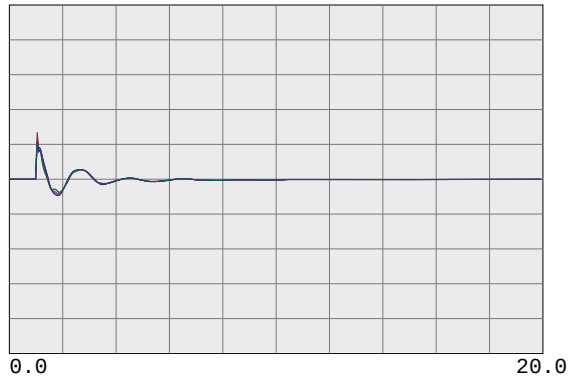


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

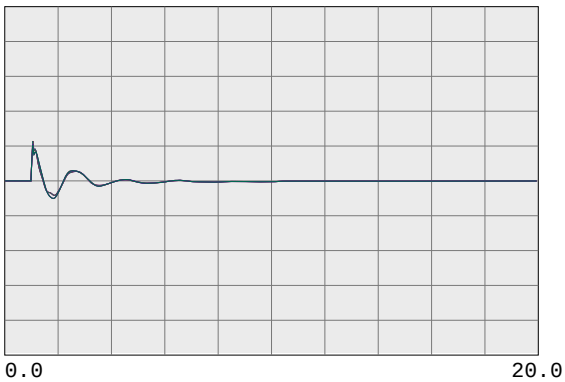
230-KV SYSTEM FREQUENCIES



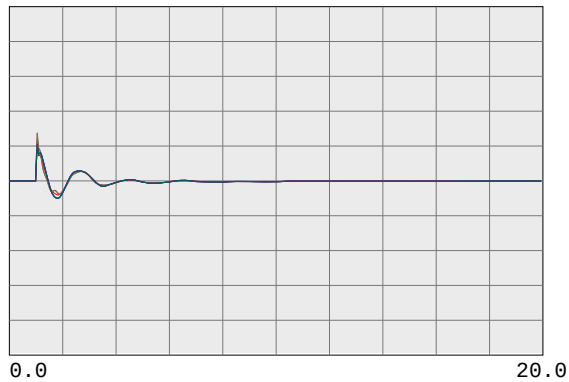
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



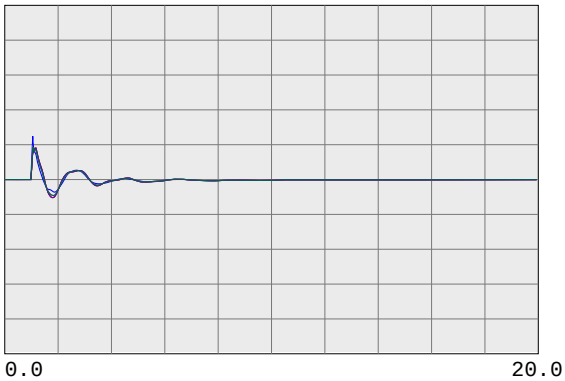
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



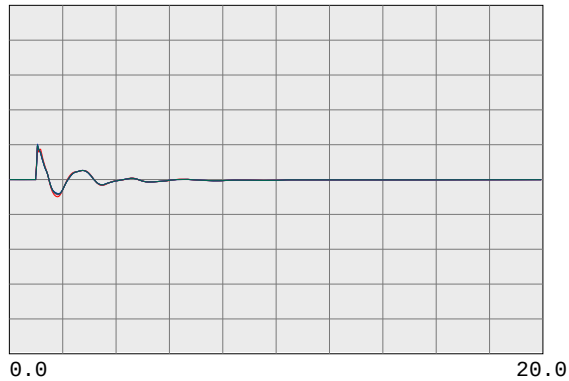
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



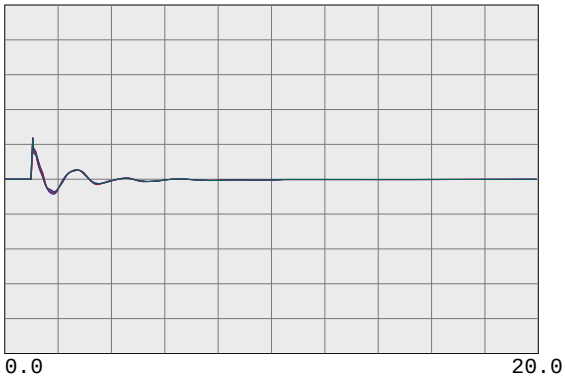
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



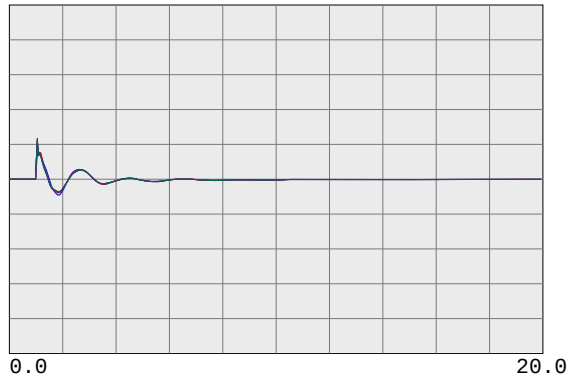
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

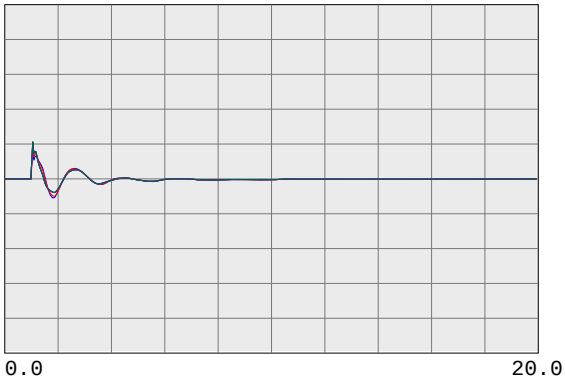
230-KV SYSTEM FREQUENCIES



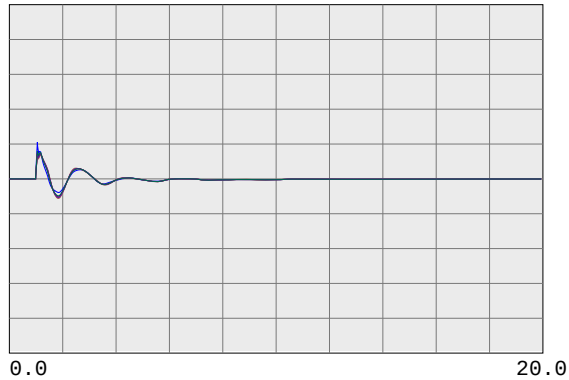
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



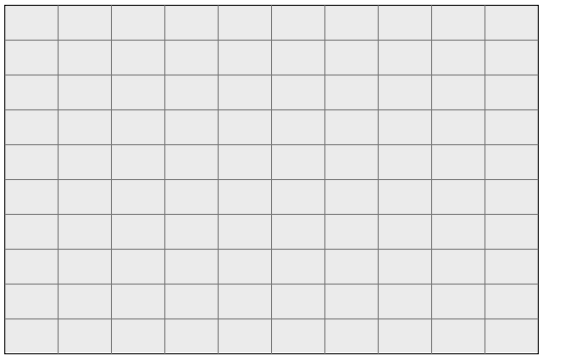
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

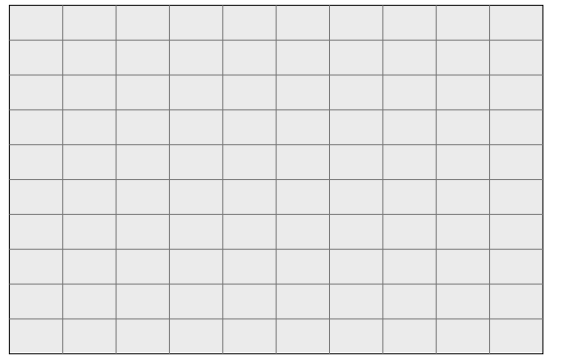


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



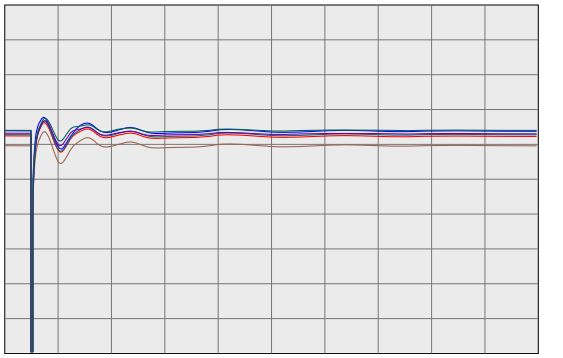
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



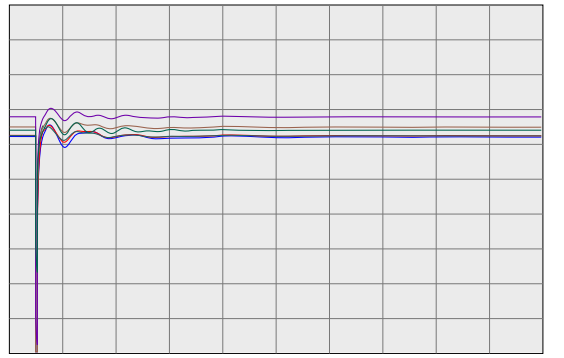


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

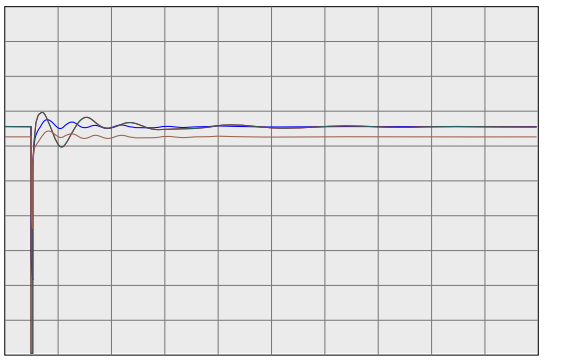
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



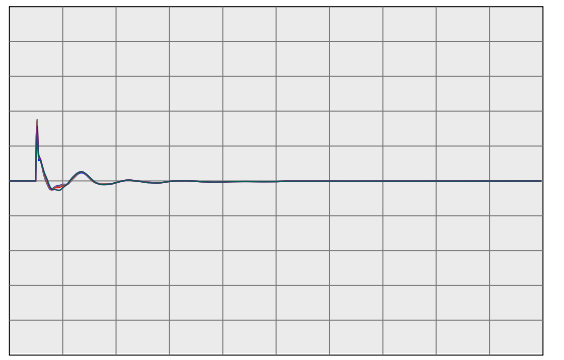
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



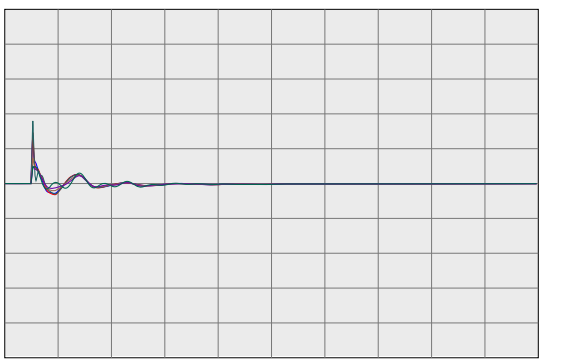
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



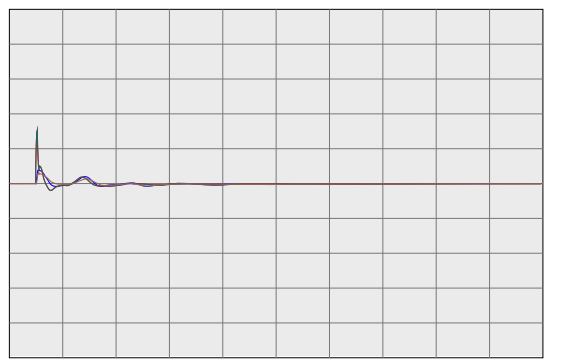
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



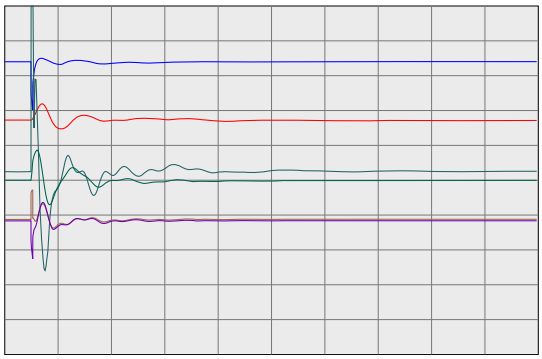
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



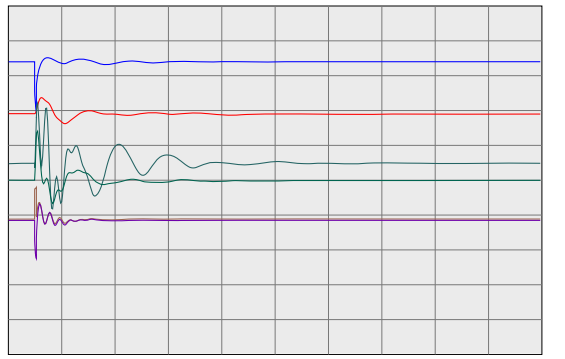
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

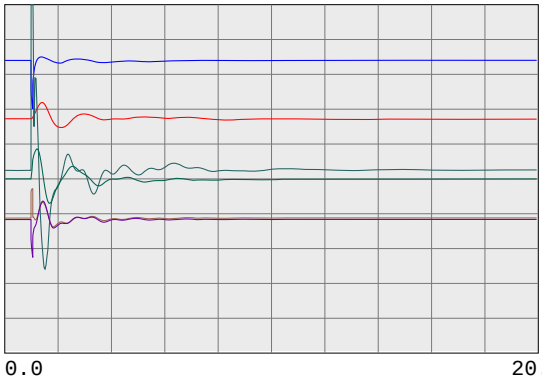
WILLOW PASS GENERATION PLANT



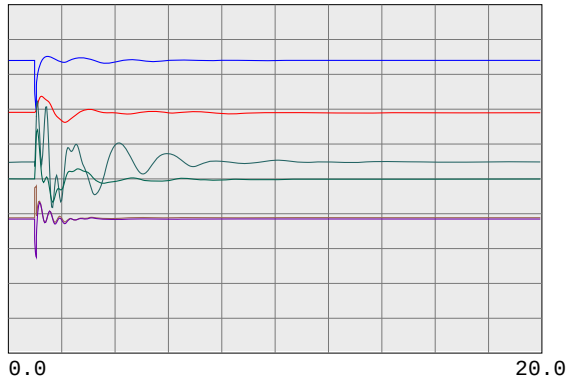
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



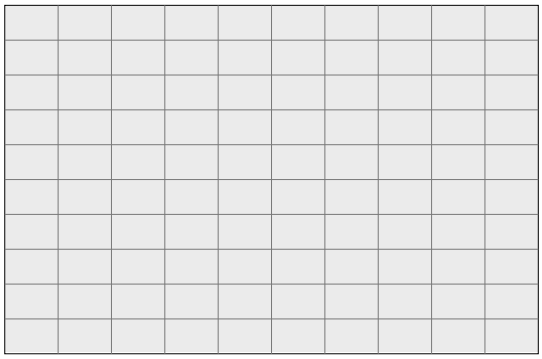
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

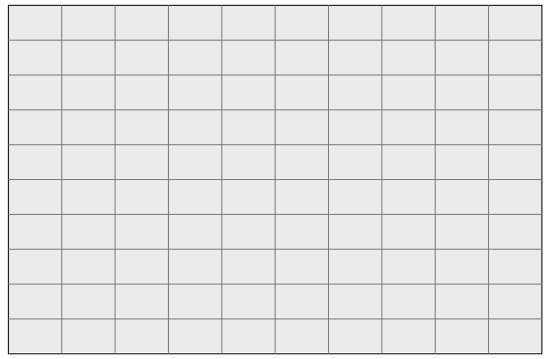


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



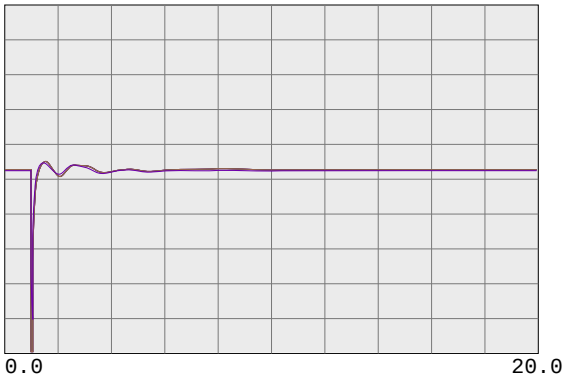
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



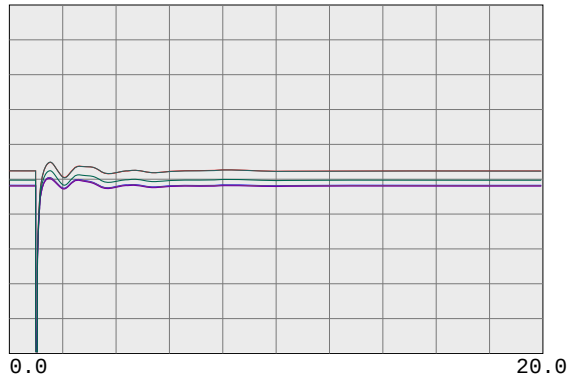


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

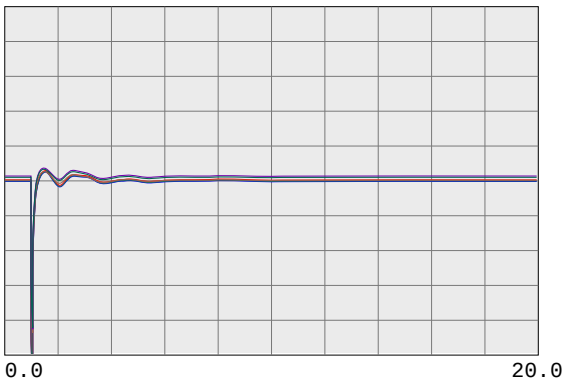
230-KV SYSTEM VOLTAGES



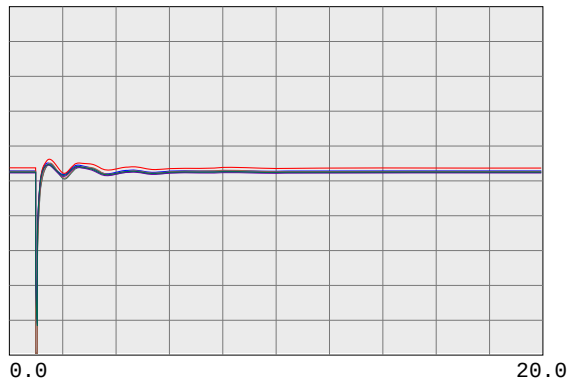
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



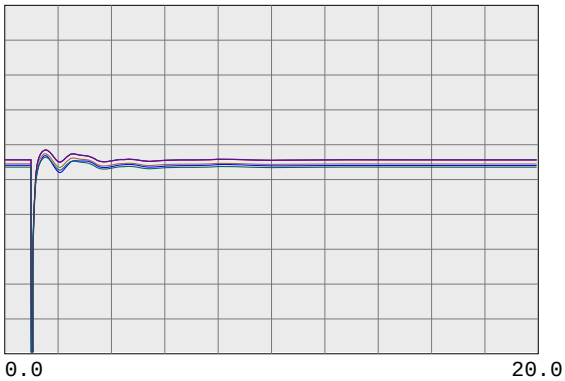
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



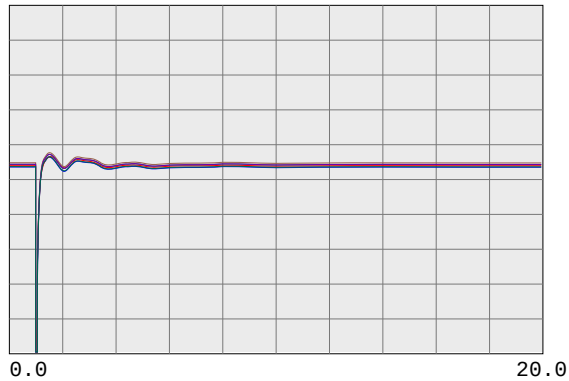
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



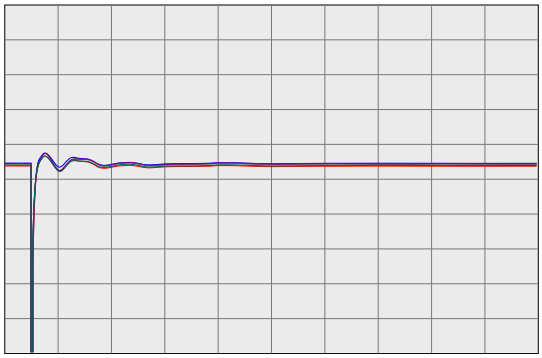
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

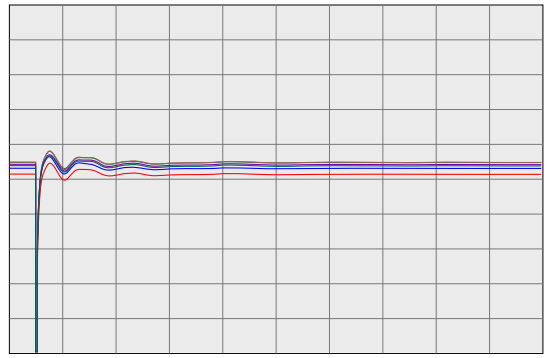
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

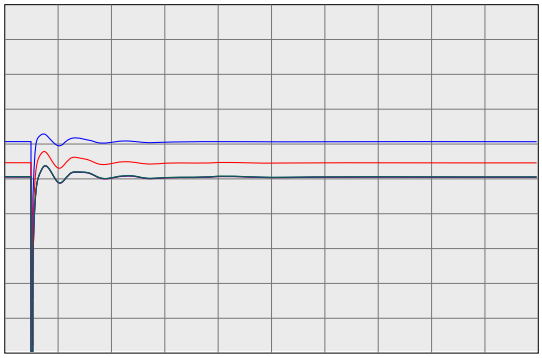
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

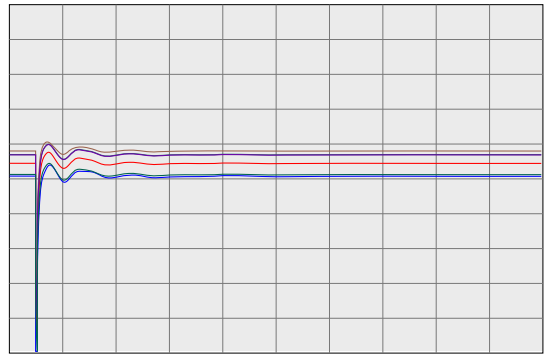
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

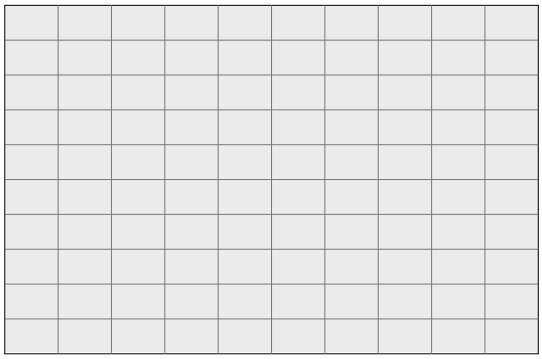
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

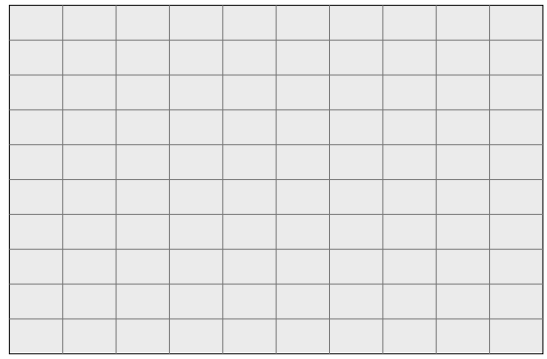


0.0 20.0

Time(sec)

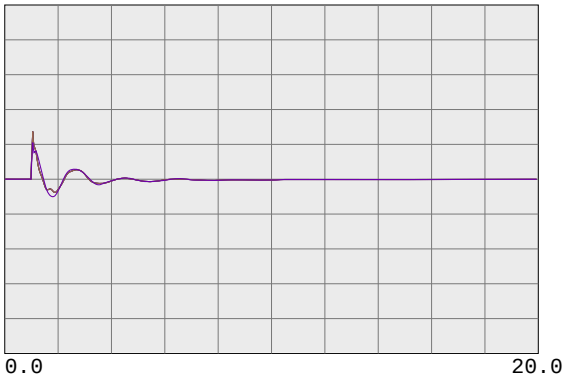
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



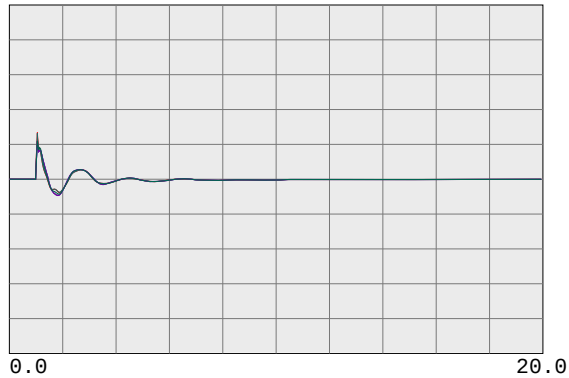


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

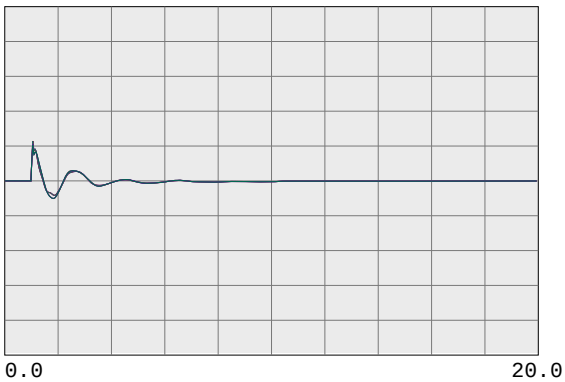
230-KV SYSTEM FREQUENCIES



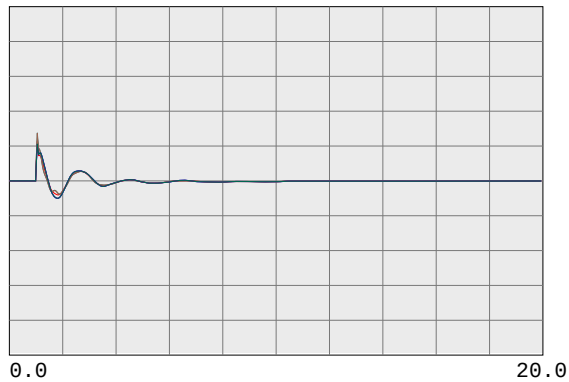
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



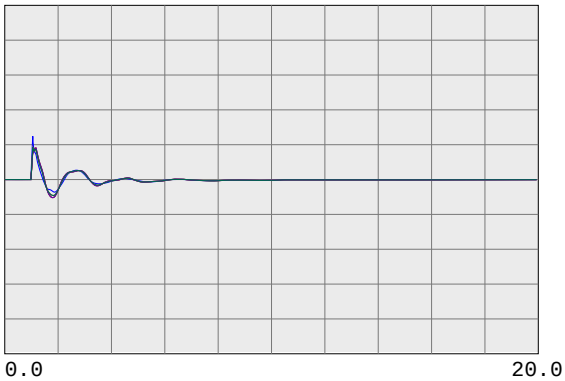
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



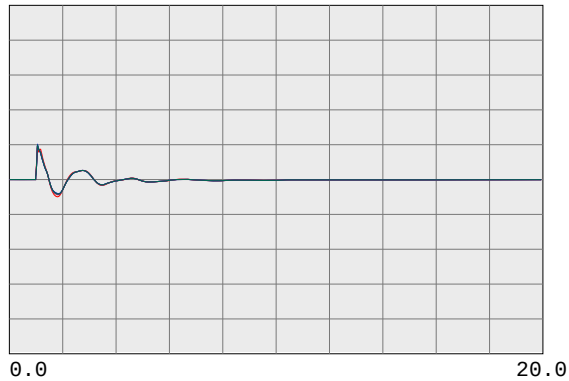
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



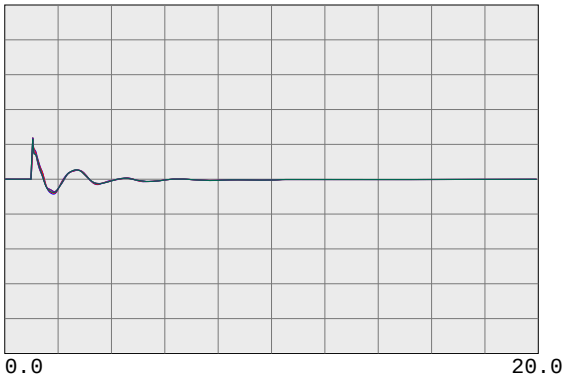
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



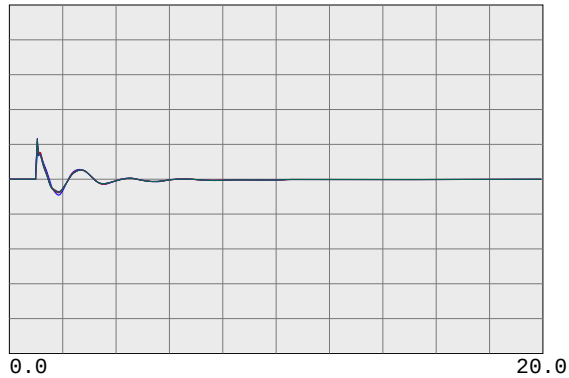
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

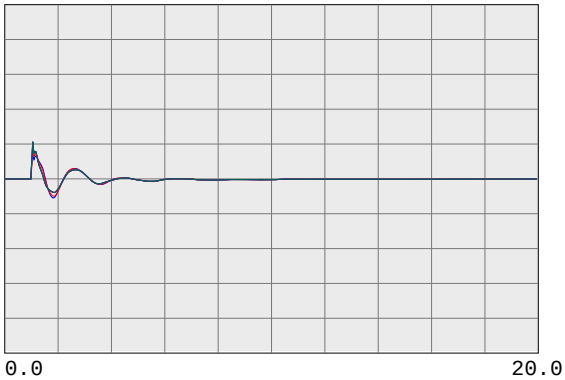
230-KV SYSTEM FREQUENCIES



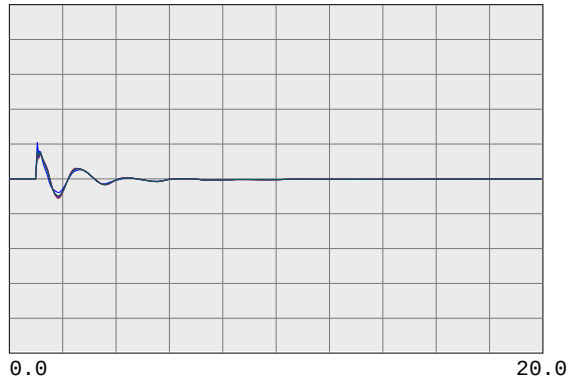
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



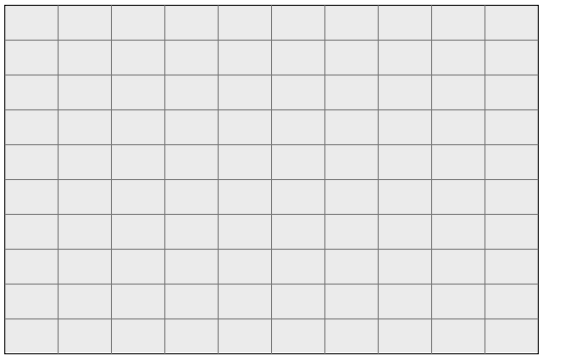
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

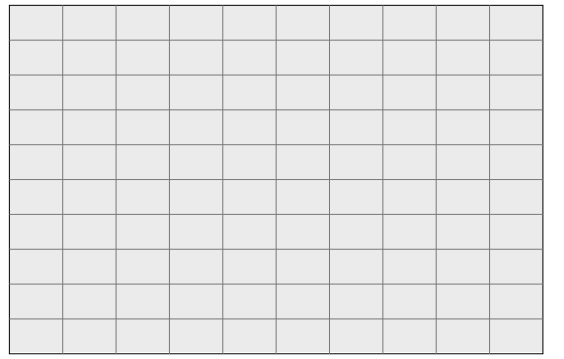


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



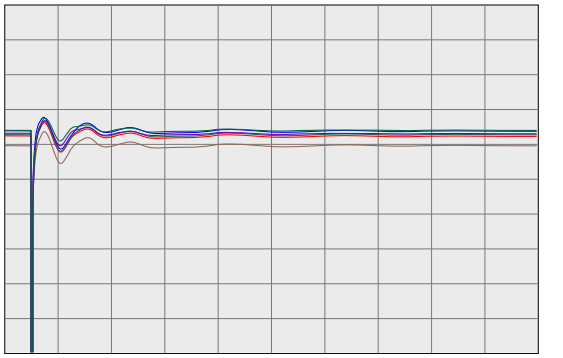
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



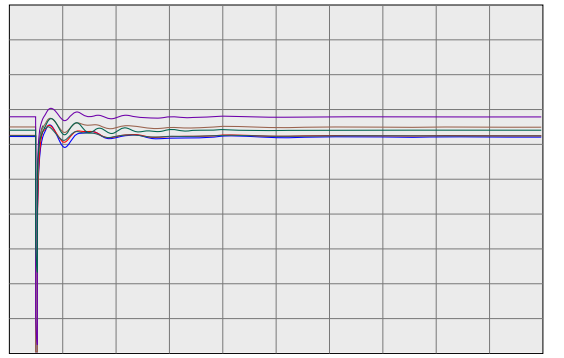


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

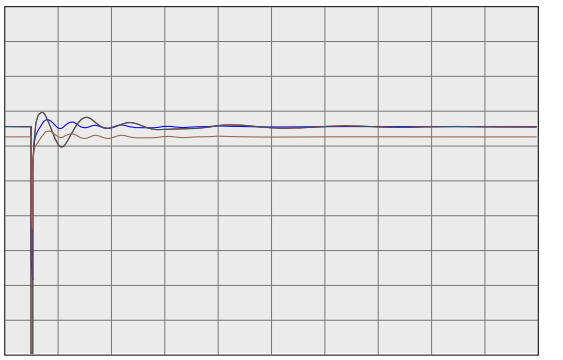
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



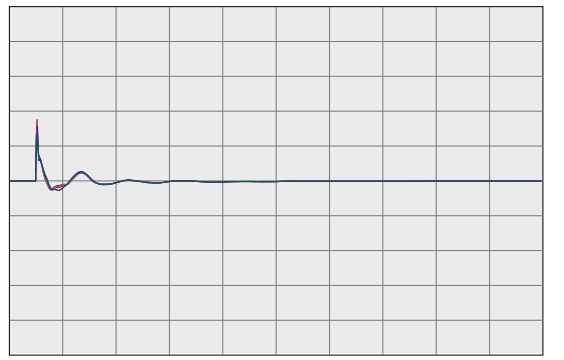
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



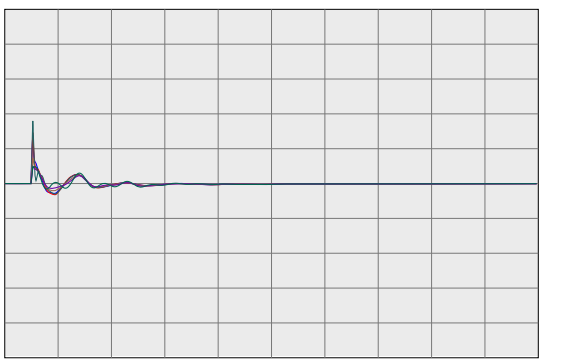
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



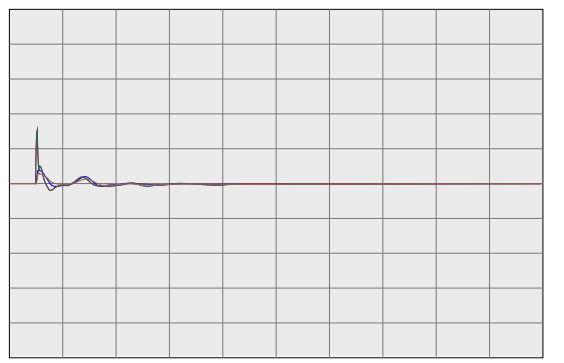
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



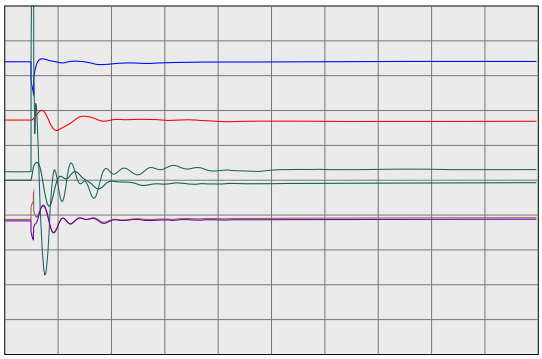
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



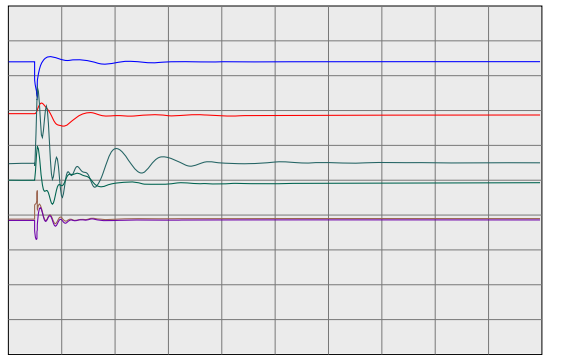
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

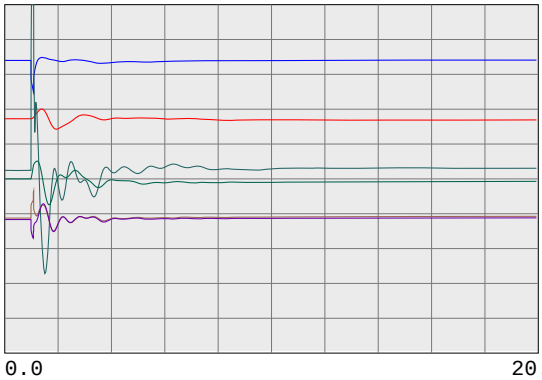
WILLOW PASS GENERATION PLANT



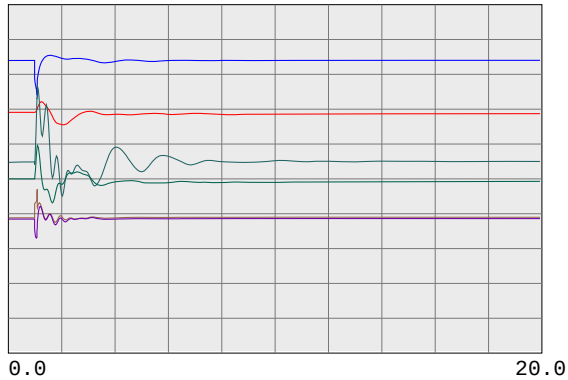
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



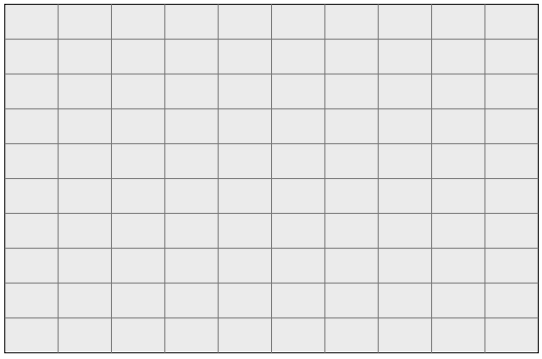
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

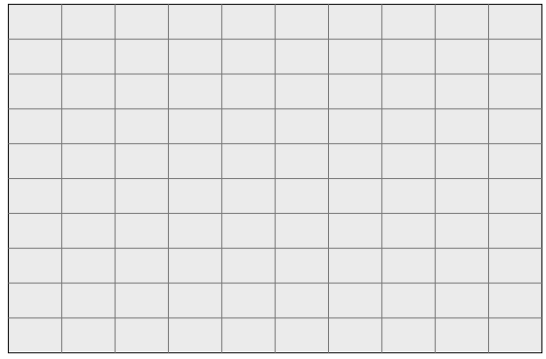


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



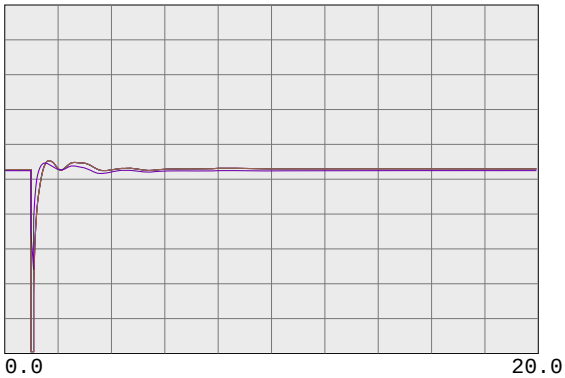
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



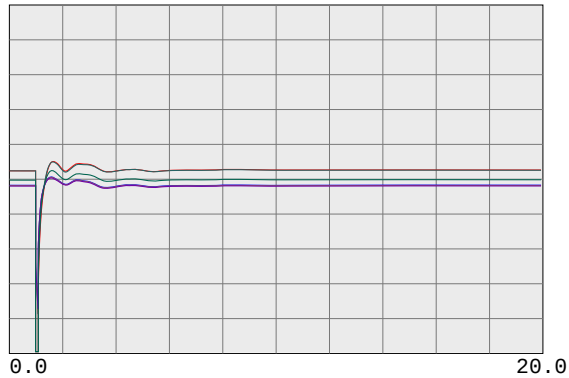


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

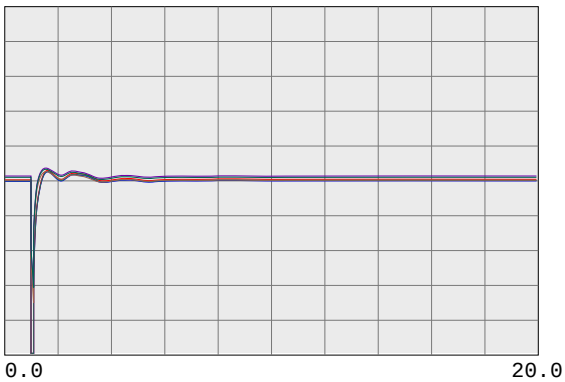
230-KV SYSTEM VOLTAGES



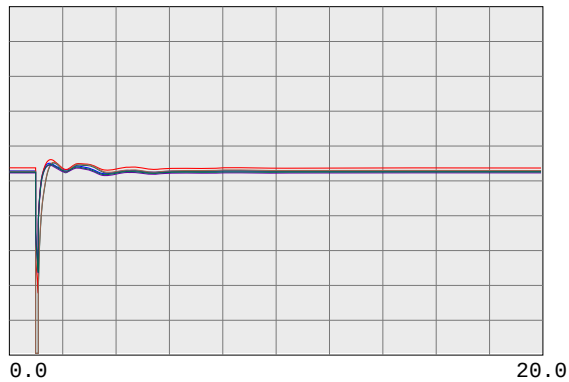
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



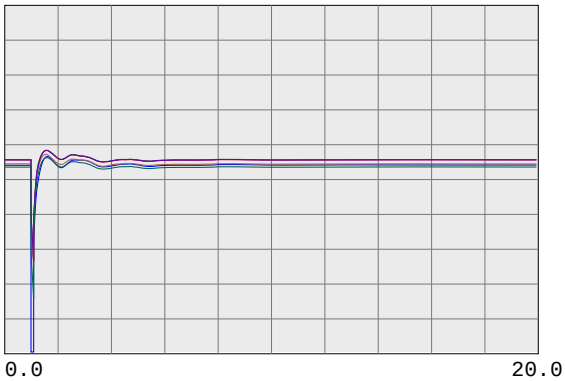
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



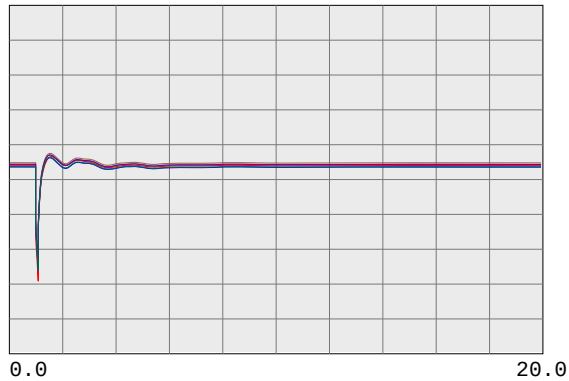
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



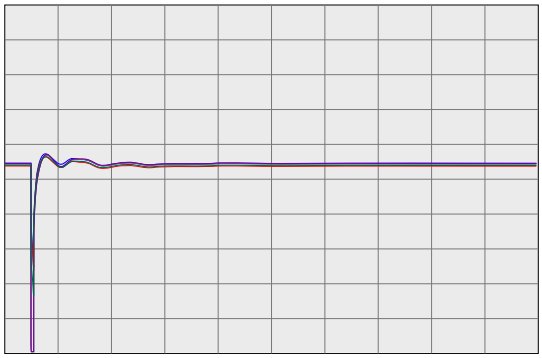
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

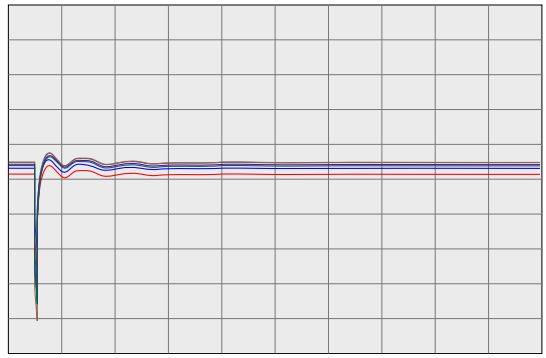
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

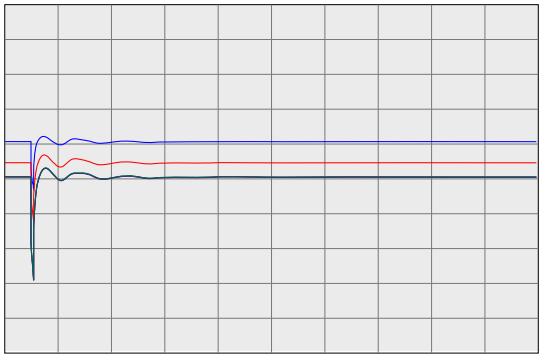
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

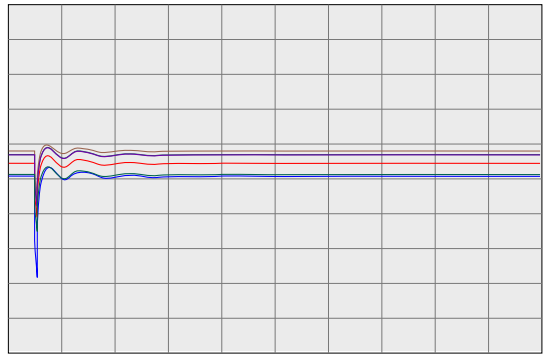
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

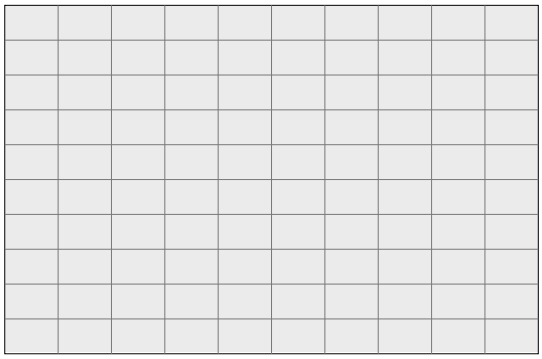
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

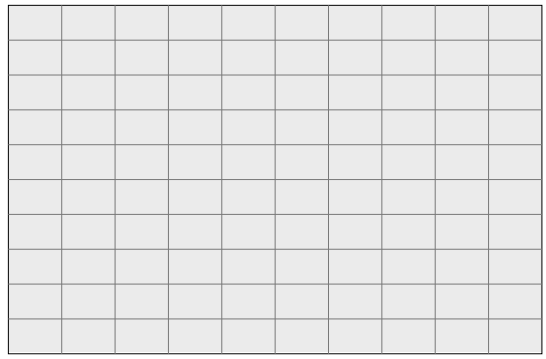


0.0 20.0

Time(sec)

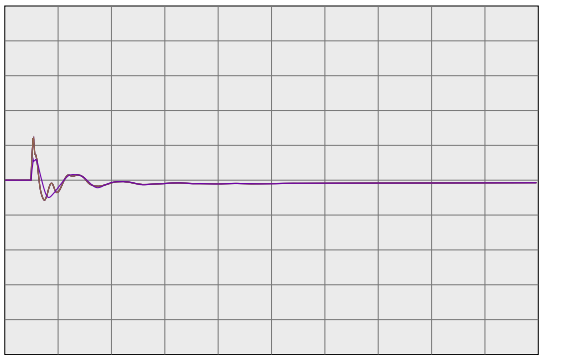
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



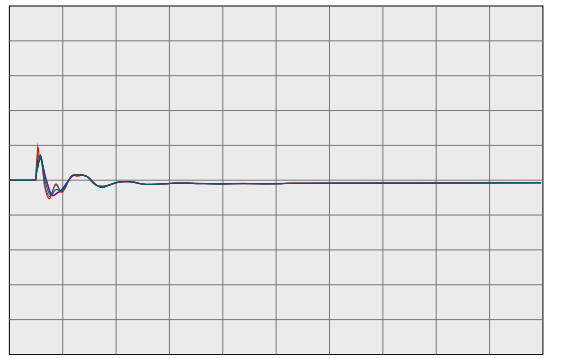


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

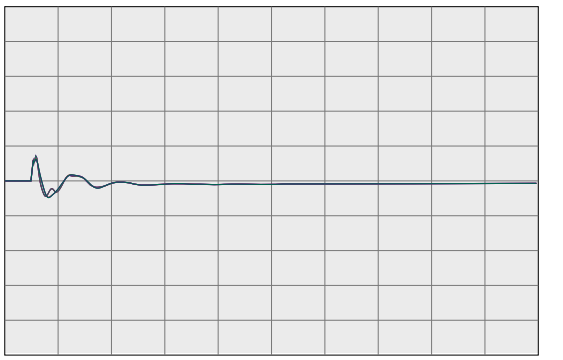
230-KV SYSTEM FREQUENCIES



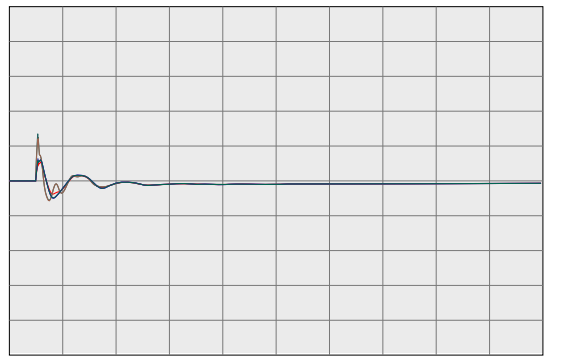
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



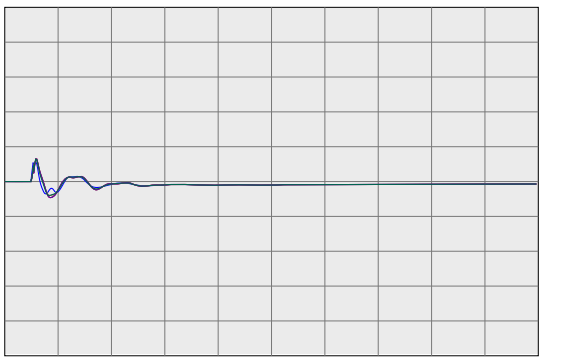
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



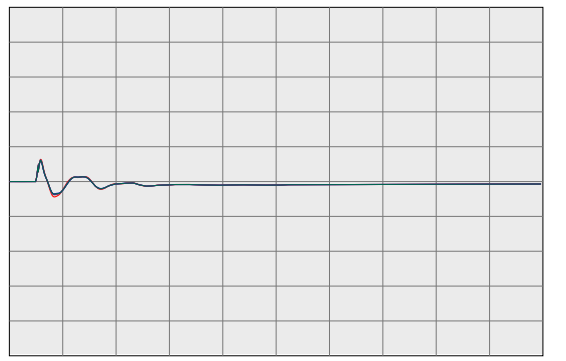
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



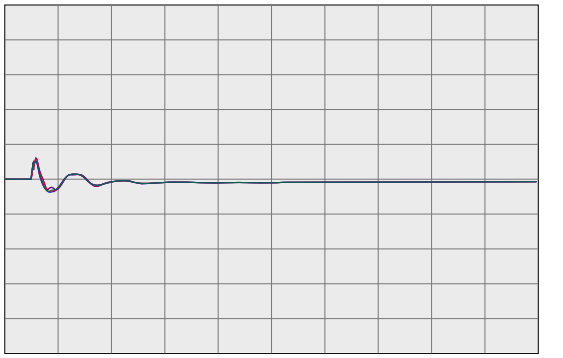
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



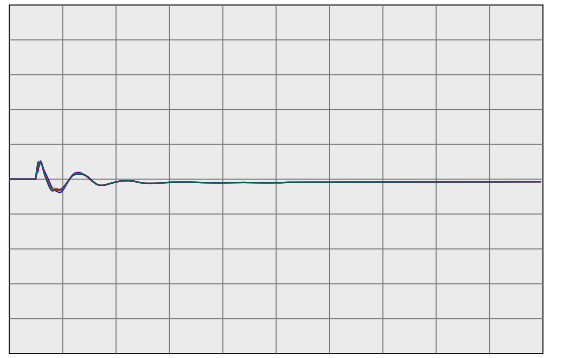
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

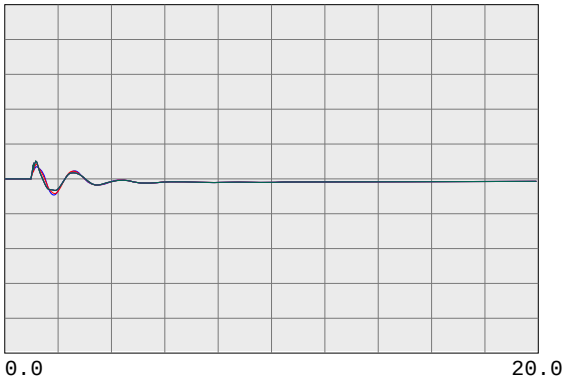
230-KV SYSTEM FREQUENCIES



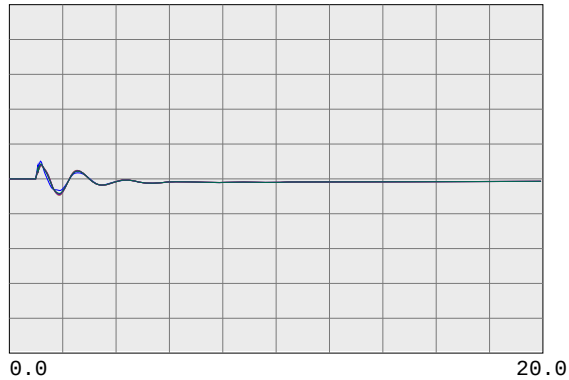
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



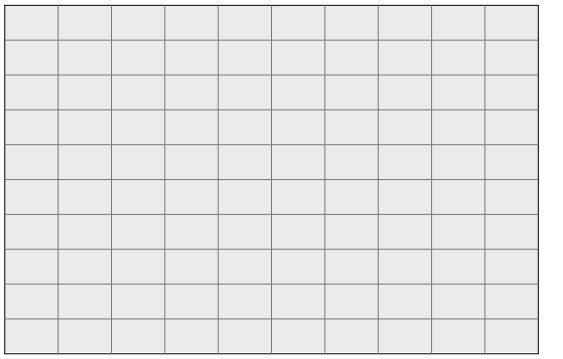
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

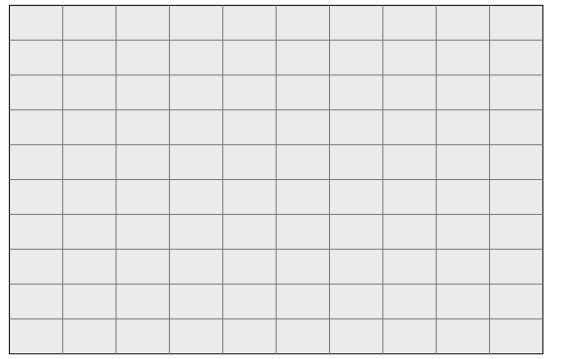


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



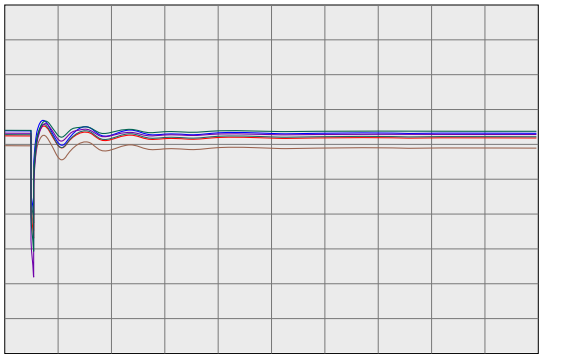
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



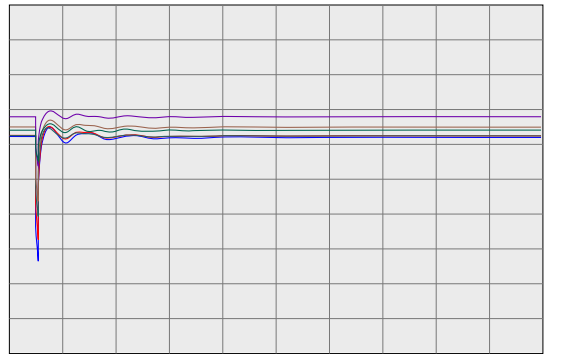


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

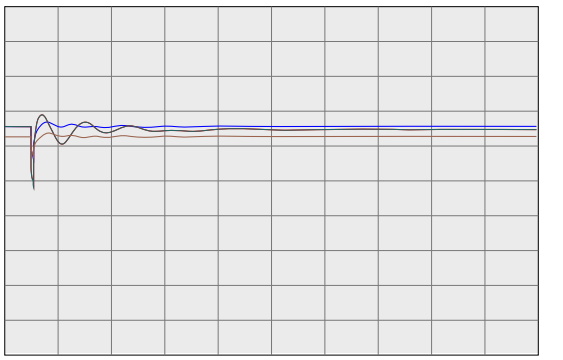
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



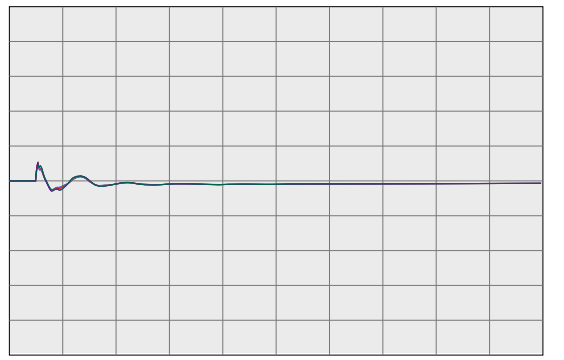
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



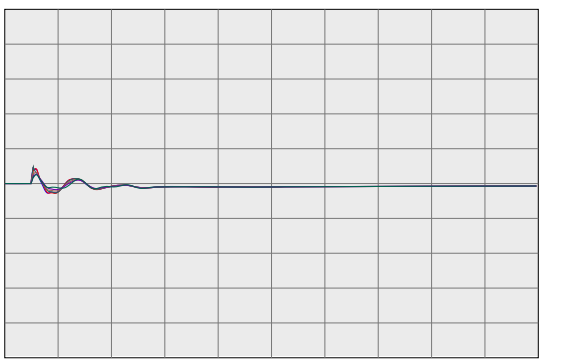
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



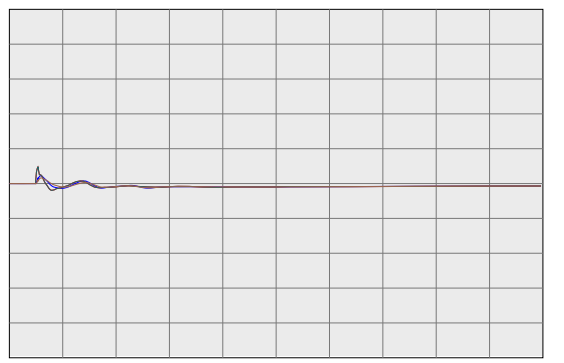
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



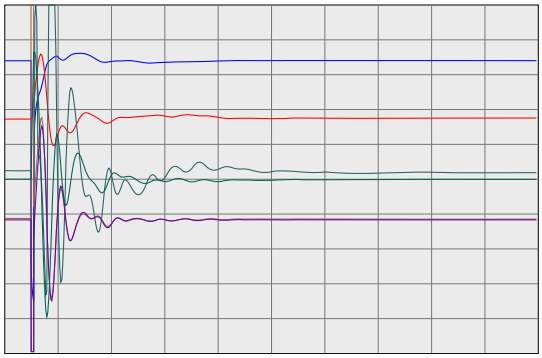
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



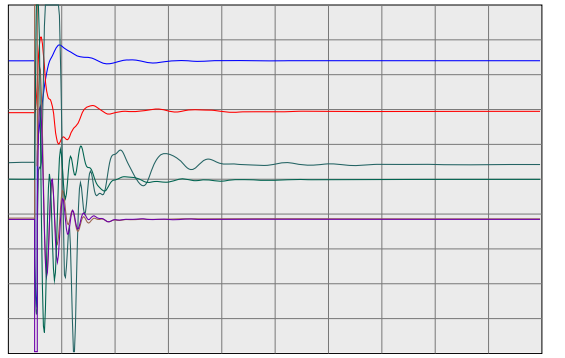
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

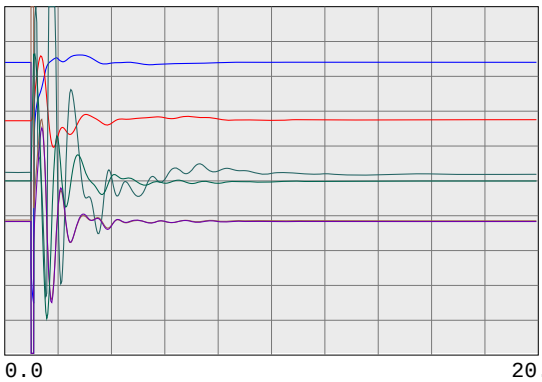
WILLOW PASS GENERATION PLANT



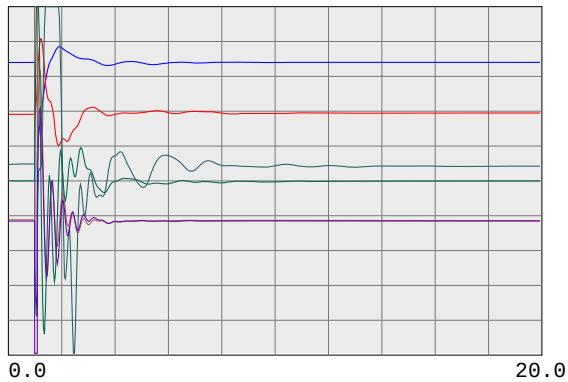
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



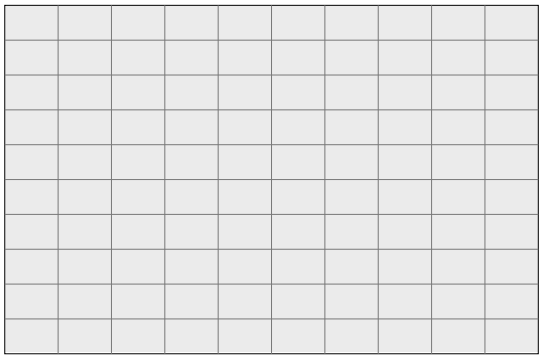
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

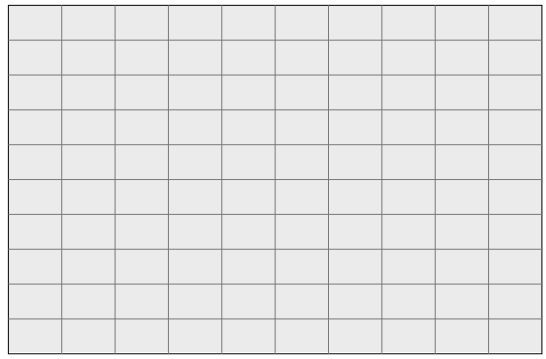


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



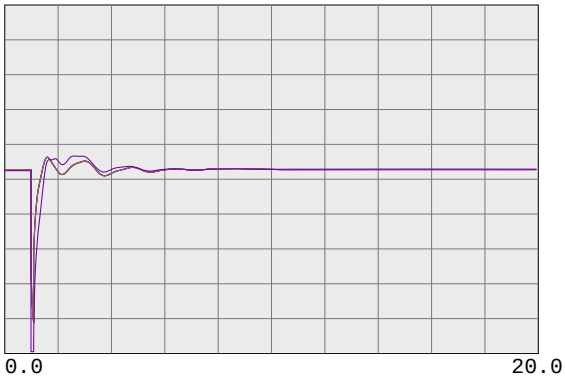
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



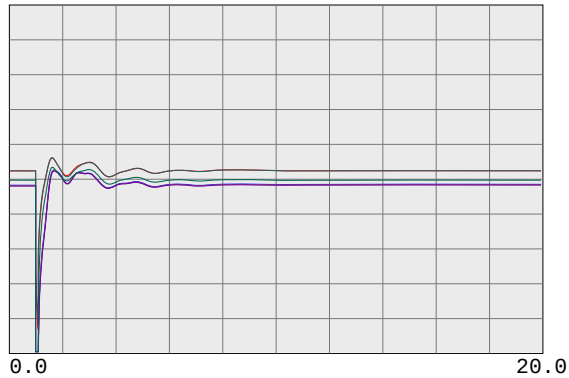


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

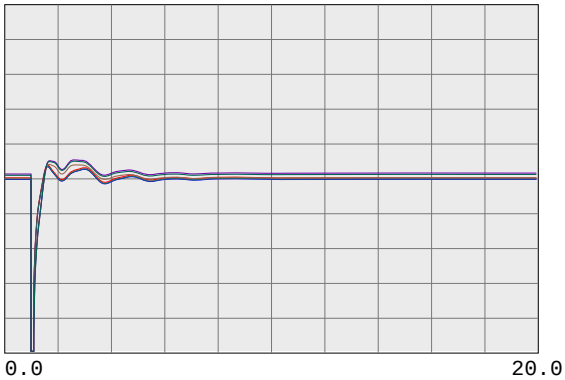
230-KV SYSTEM VOLTAGES



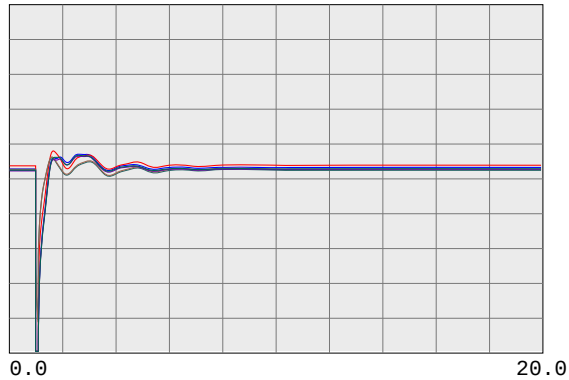
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



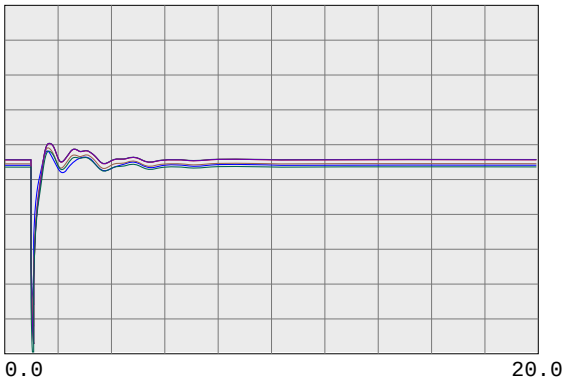
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



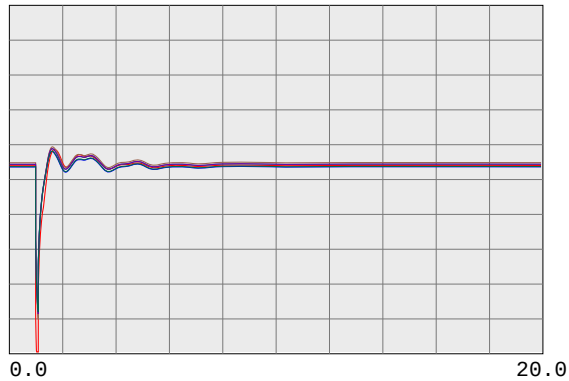
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



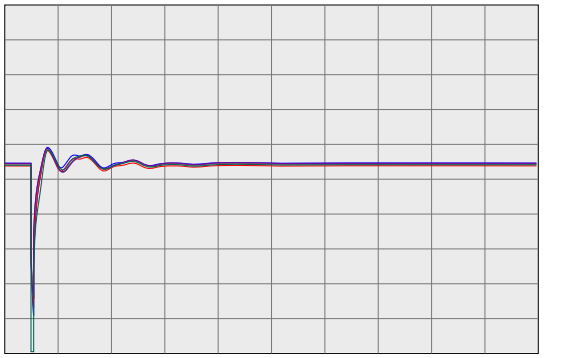
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



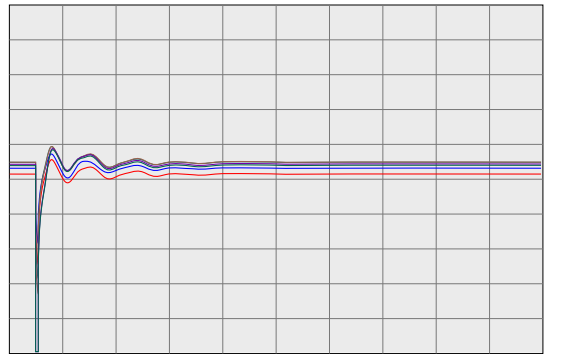
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

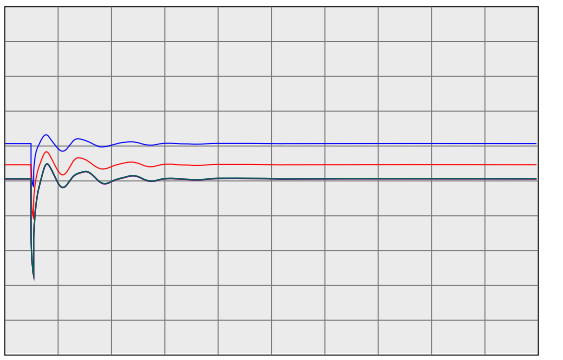
230-KV SYSTEM VOLTAGES



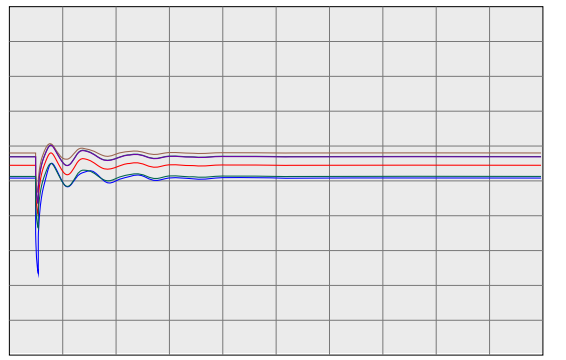
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



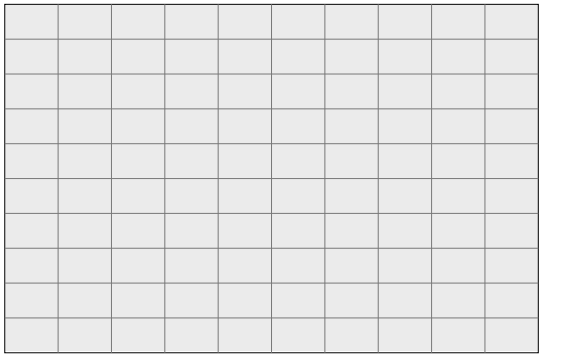
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

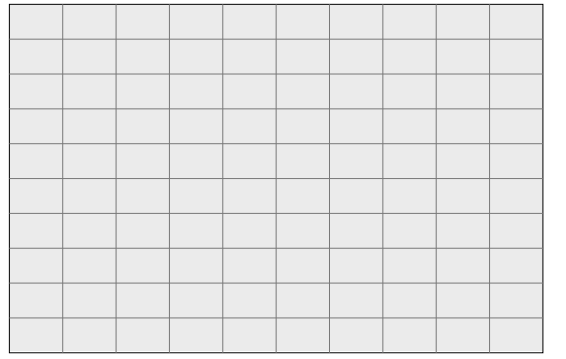


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



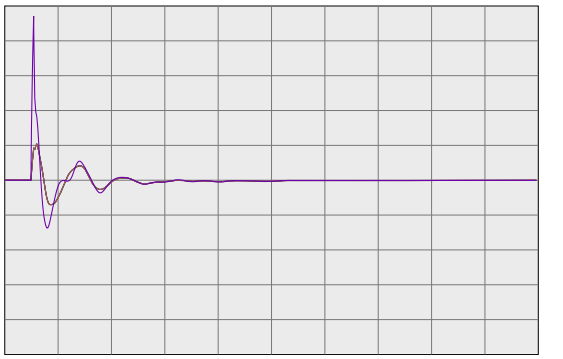
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



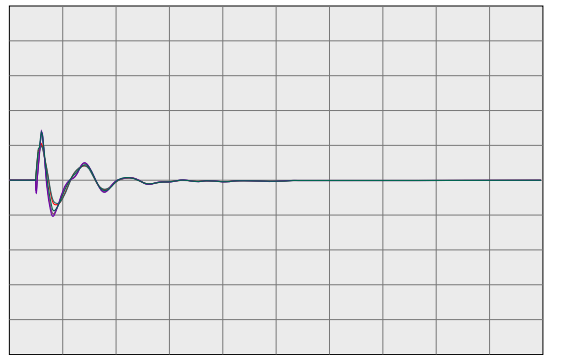


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

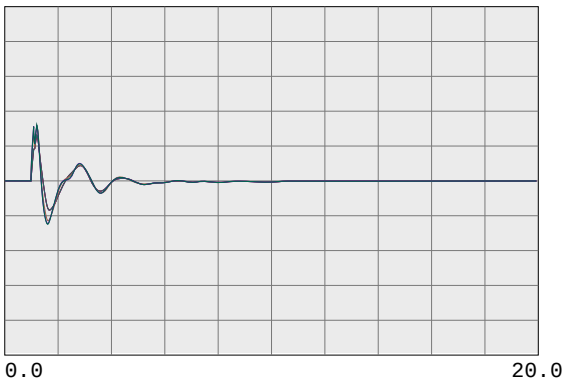
230-KV SYSTEM FREQUENCIES



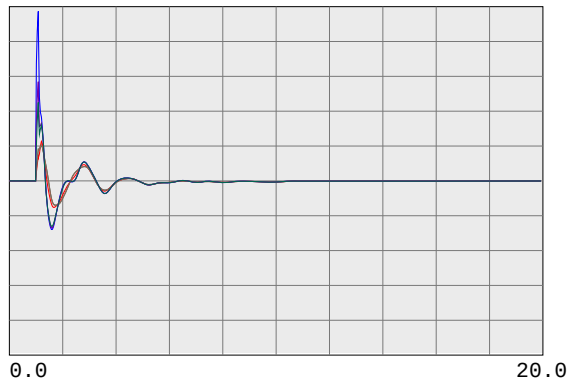
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



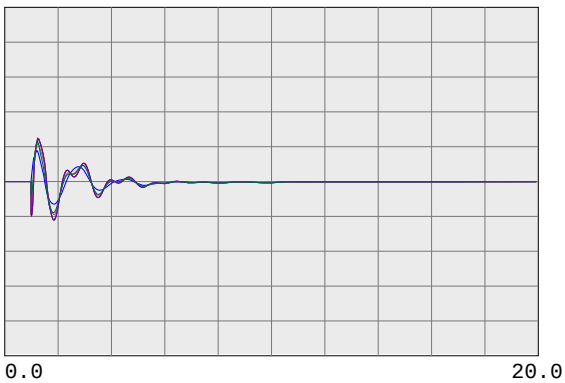
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



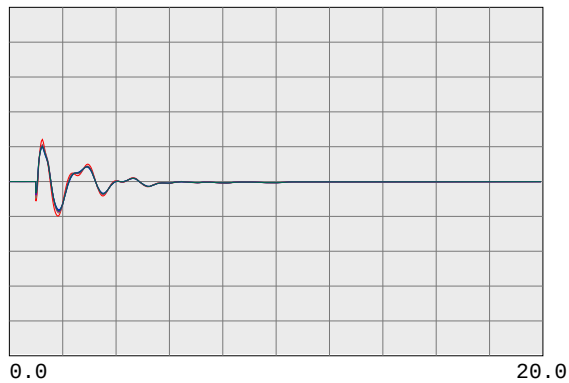
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



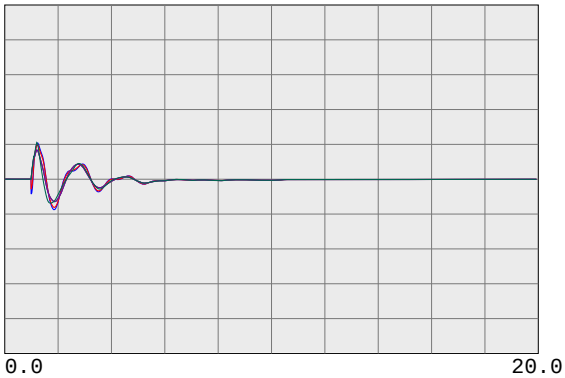
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



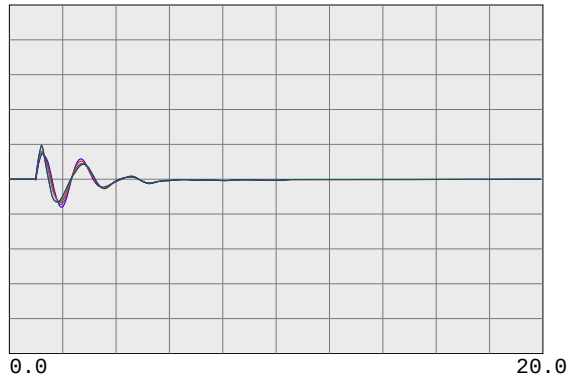
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

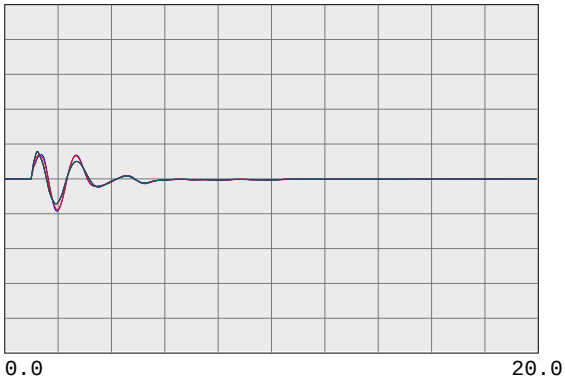
230-KV SYSTEM FREQUENCIES



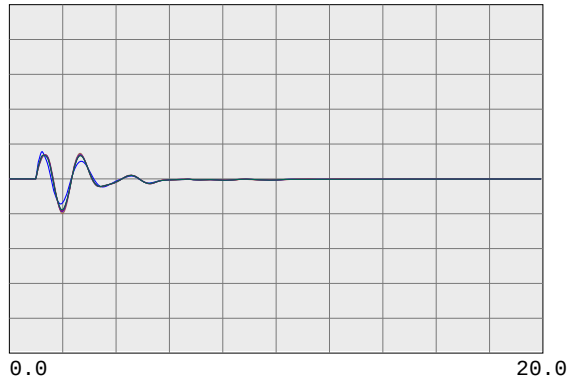
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



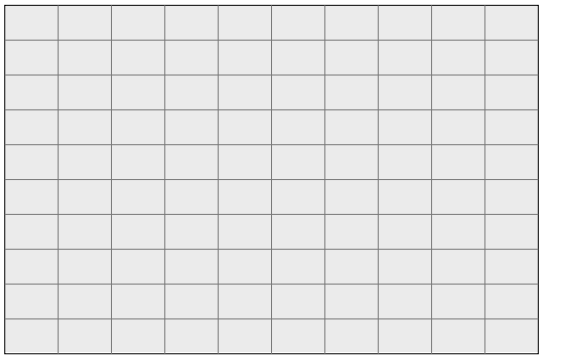
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

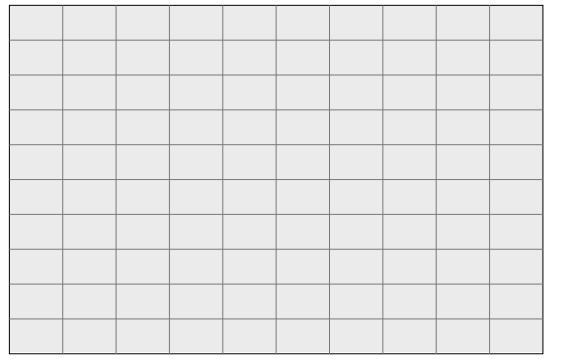


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



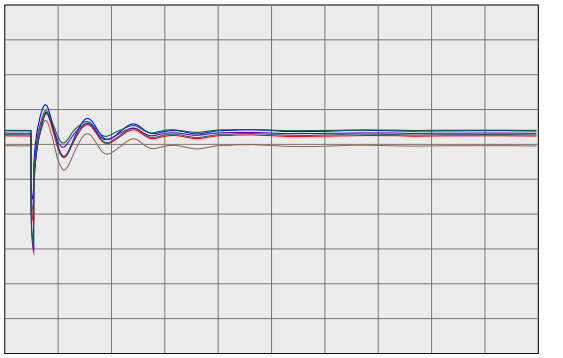
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



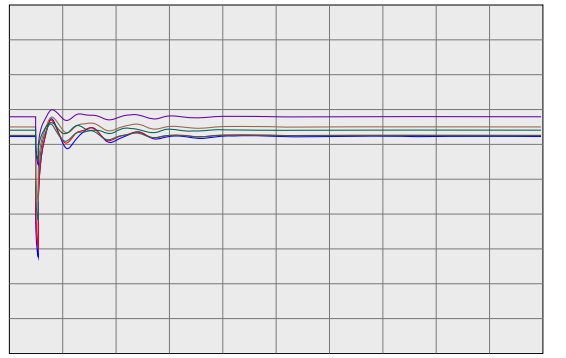


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

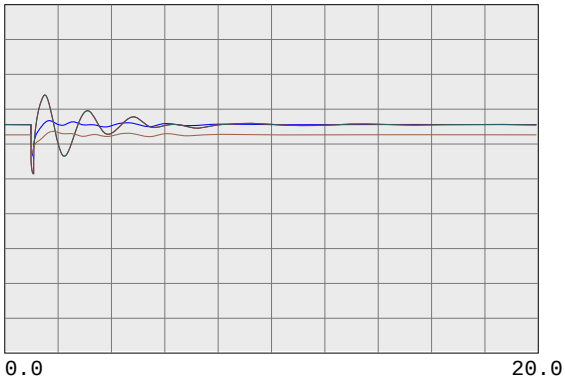
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



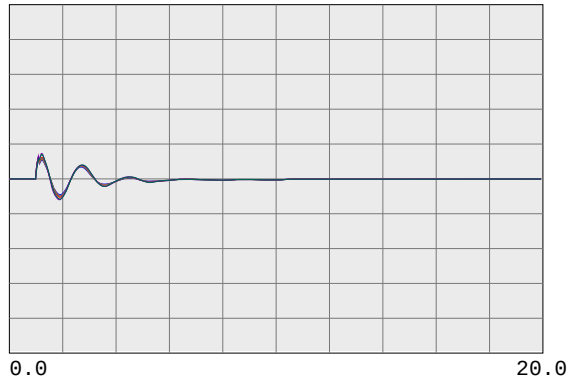
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



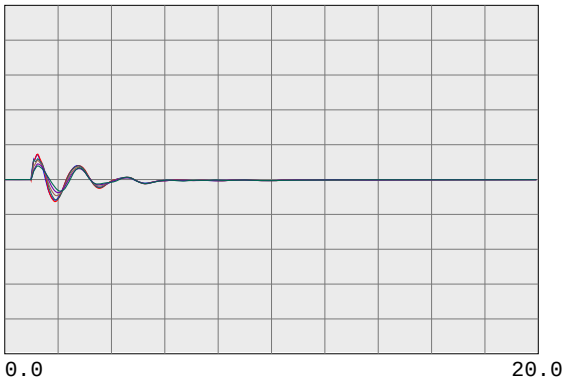
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



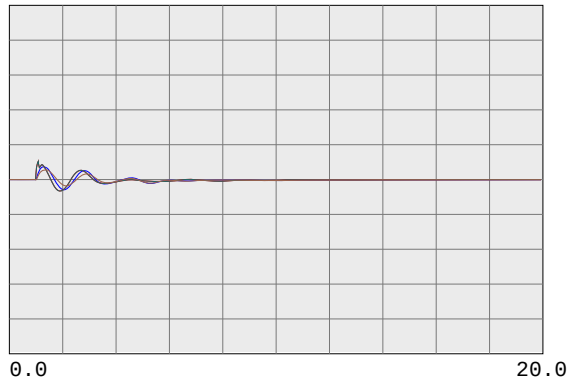
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



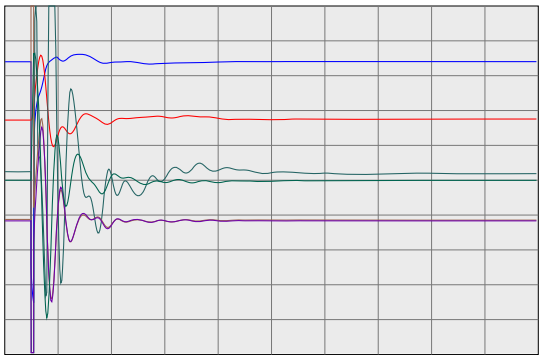
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



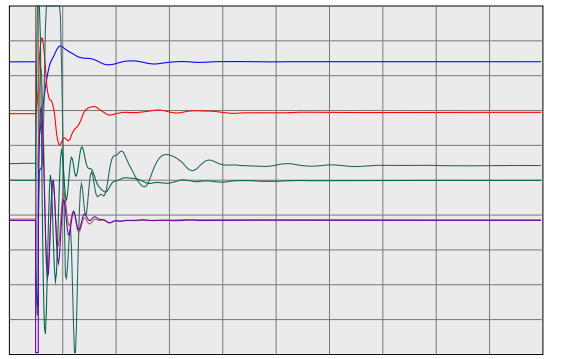
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

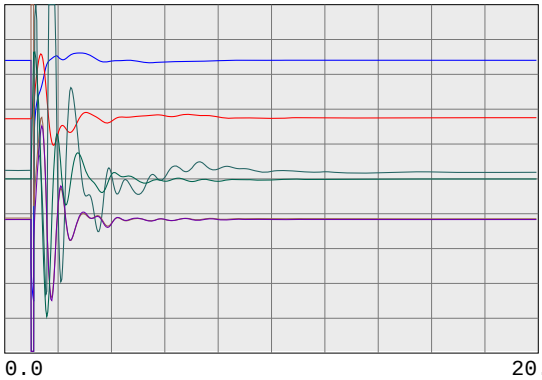
WILLOW PASS GENERATION PLANT



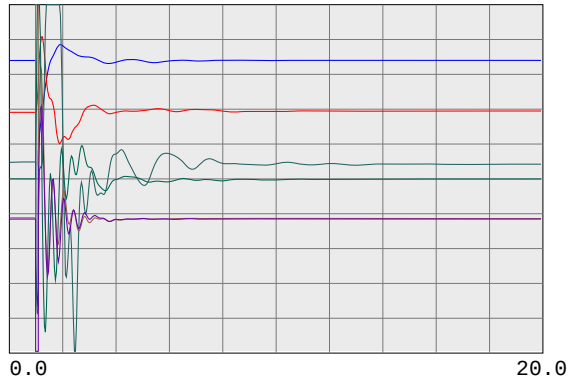
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



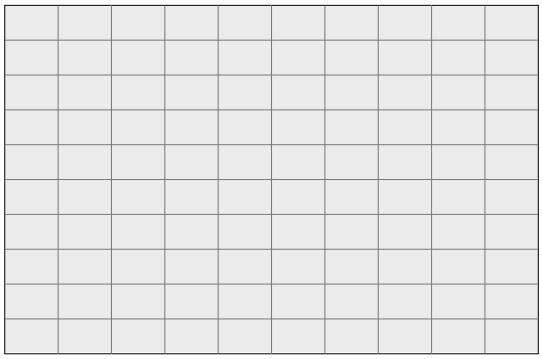
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

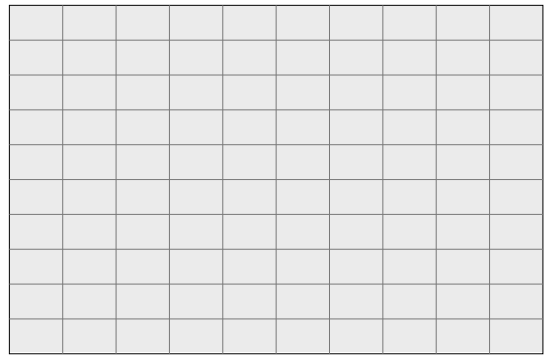


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



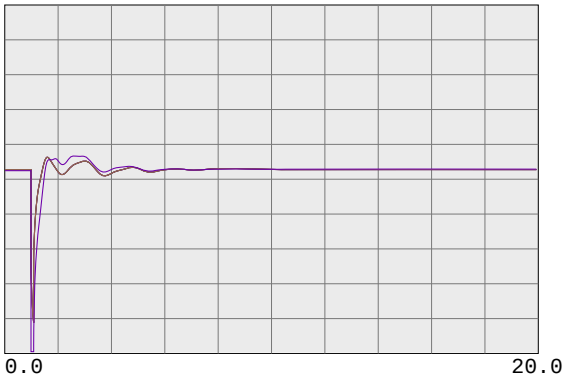
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



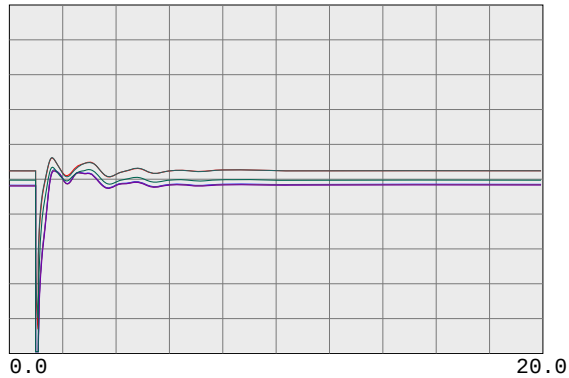


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

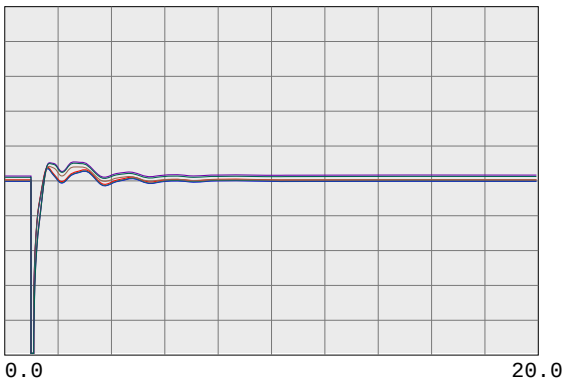
230-KV SYSTEM VOLTAGES



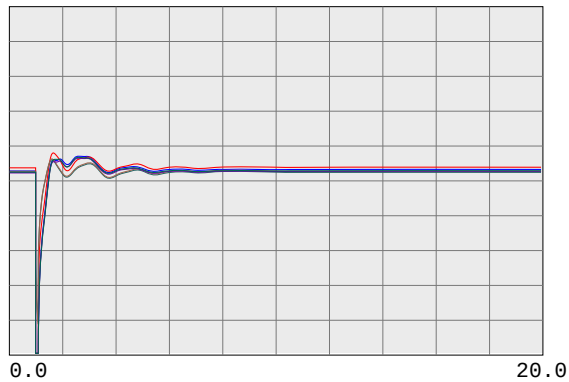
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



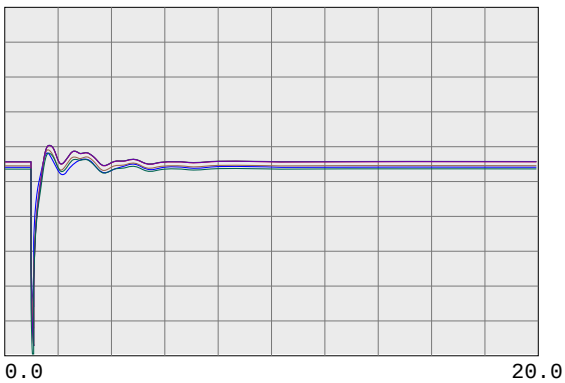
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



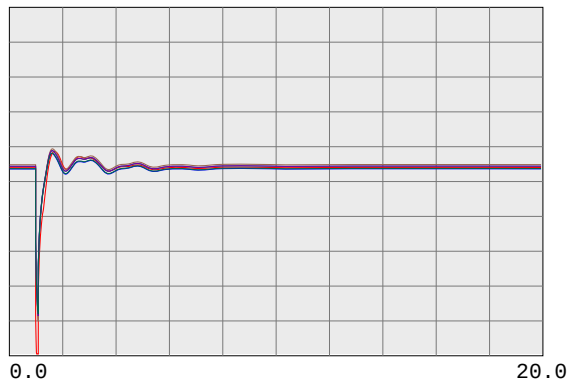
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



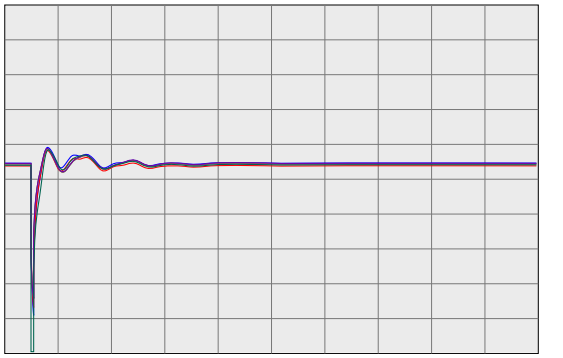
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



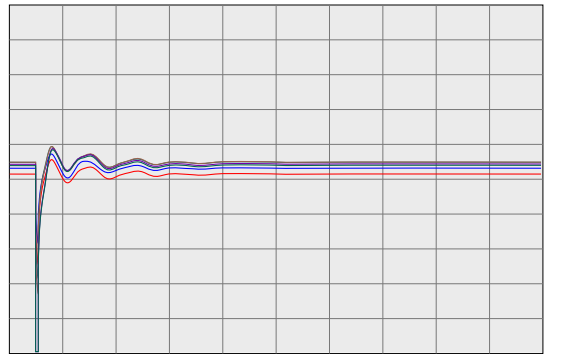
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

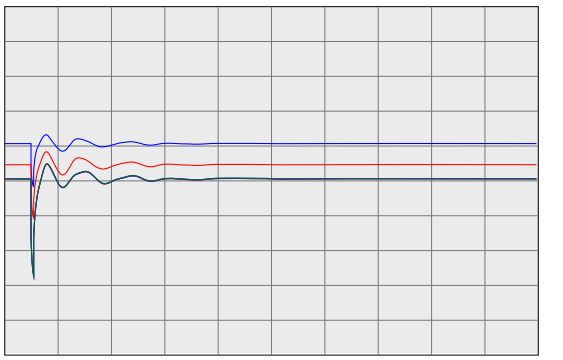
230-KV SYSTEM VOLTAGES



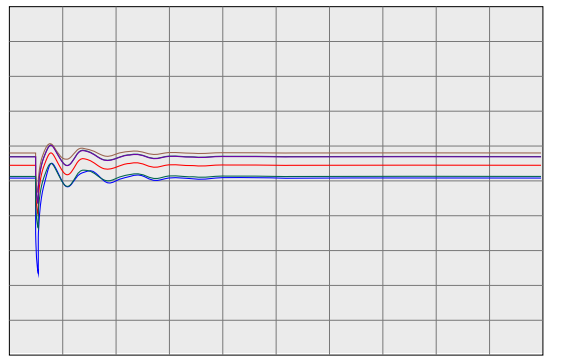
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



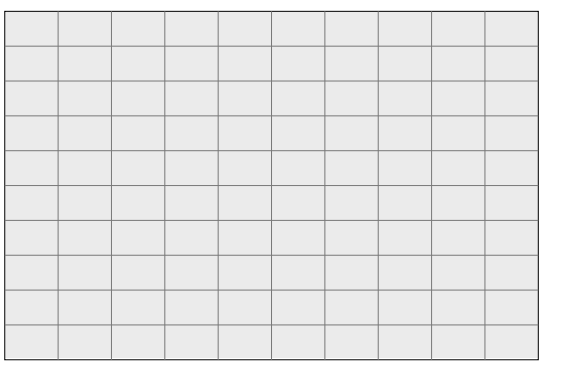
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

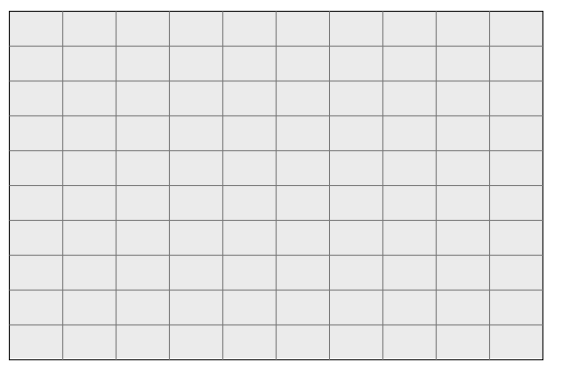


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



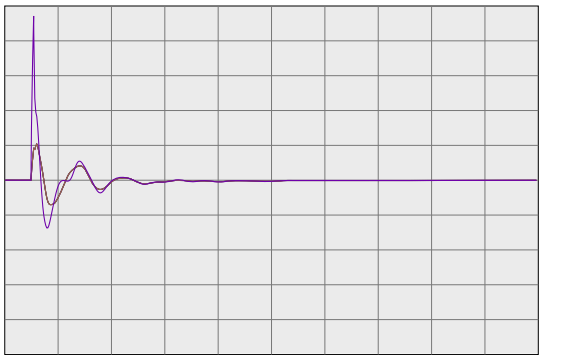
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



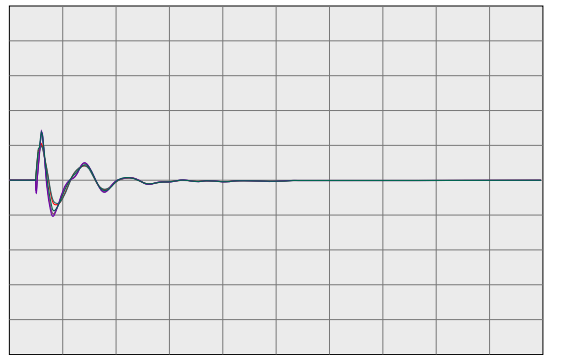


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

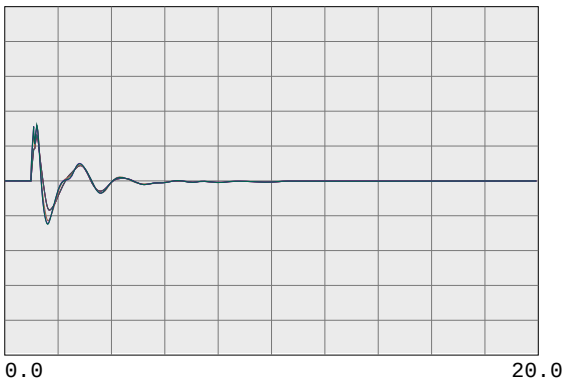
230-KV SYSTEM FREQUENCIES



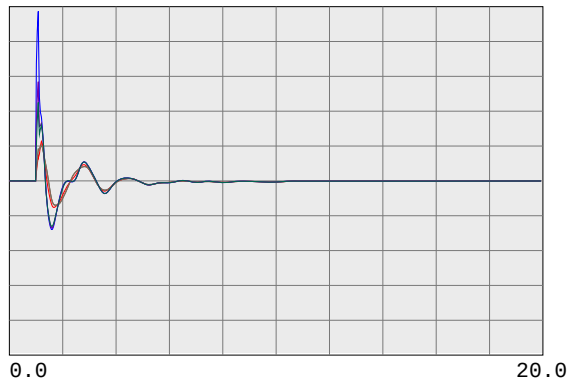
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



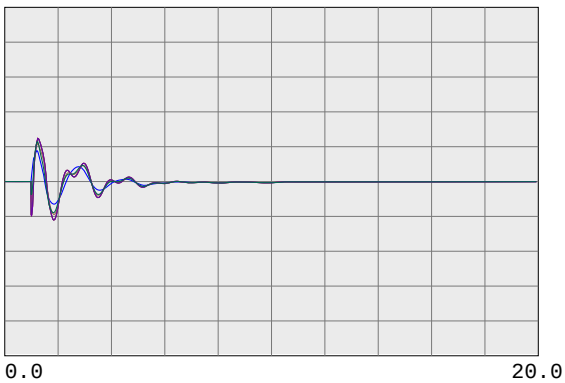
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



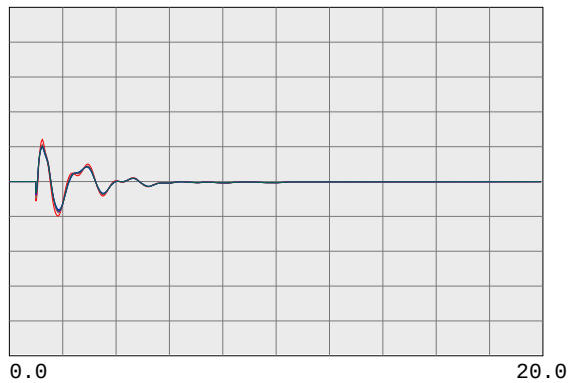
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



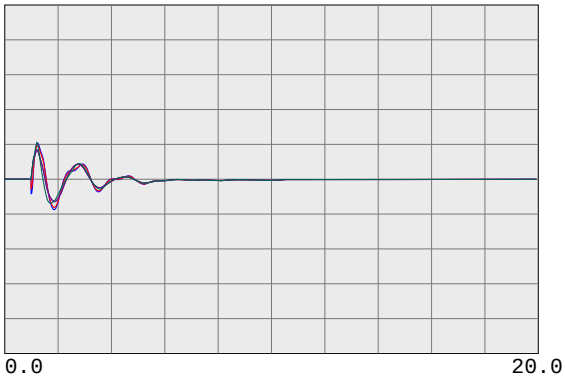
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



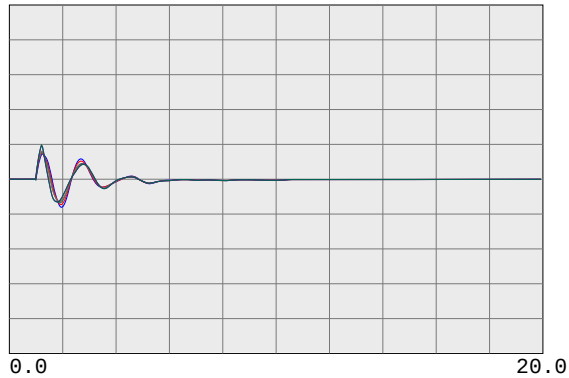
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

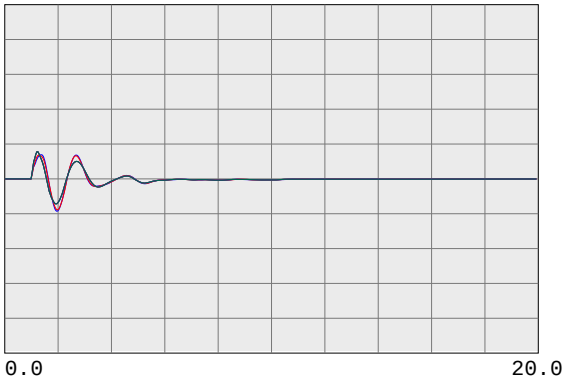
230-KV SYSTEM FREQUENCIES



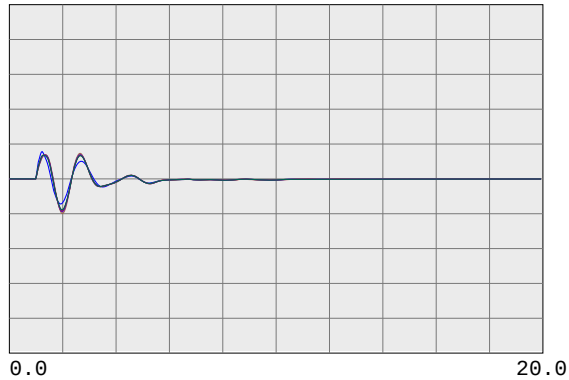
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



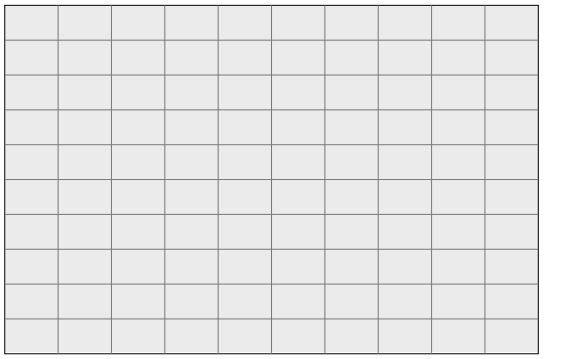
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

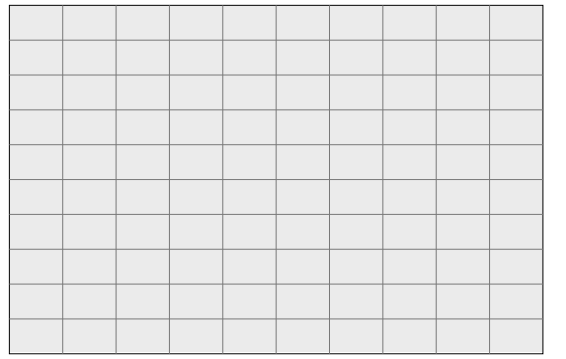


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



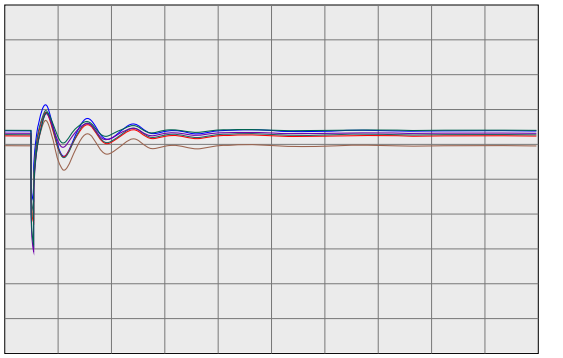
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



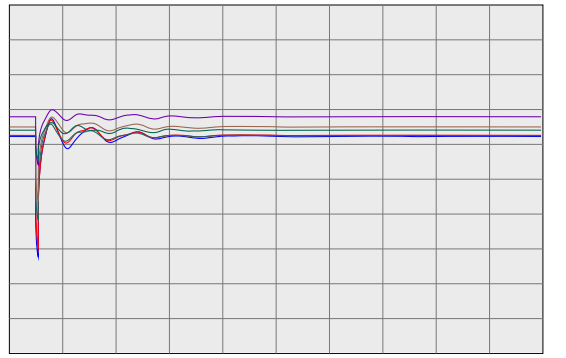


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

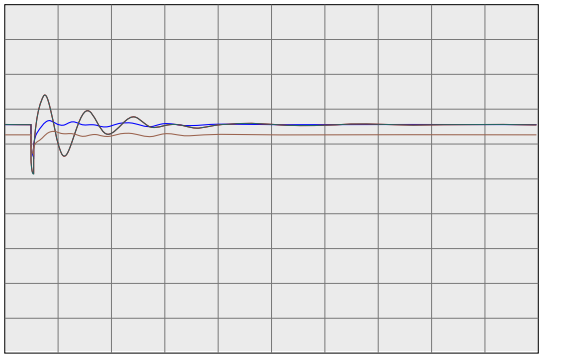
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



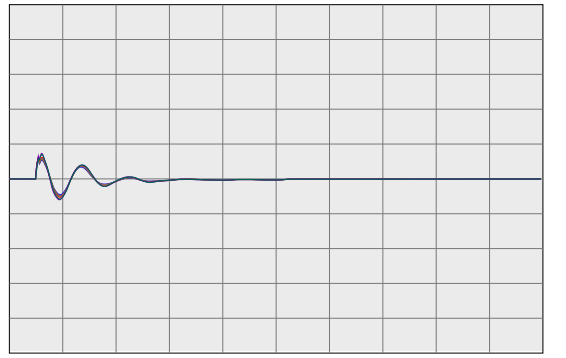
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



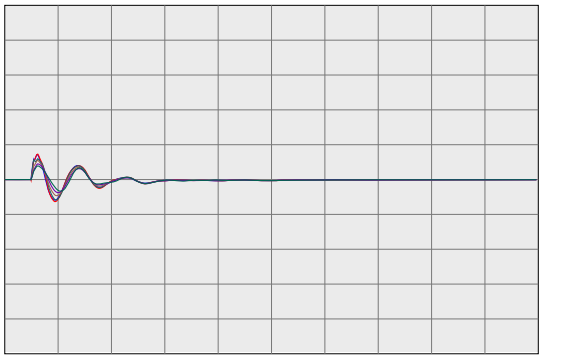
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



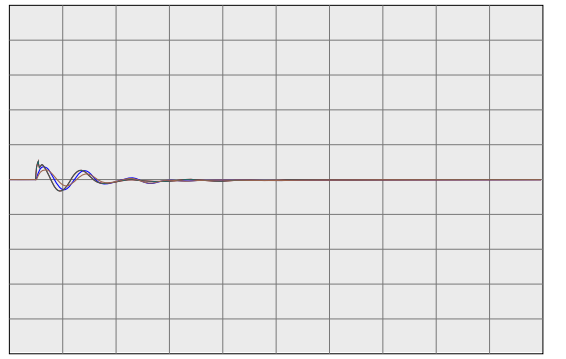
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



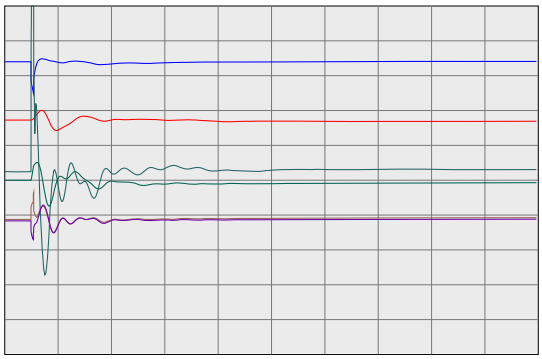
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

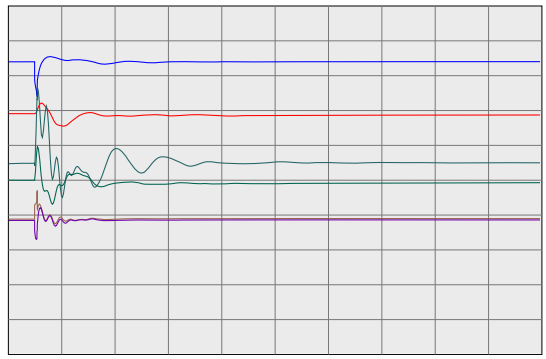
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

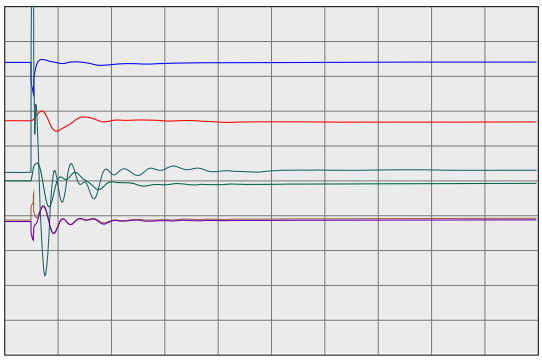
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

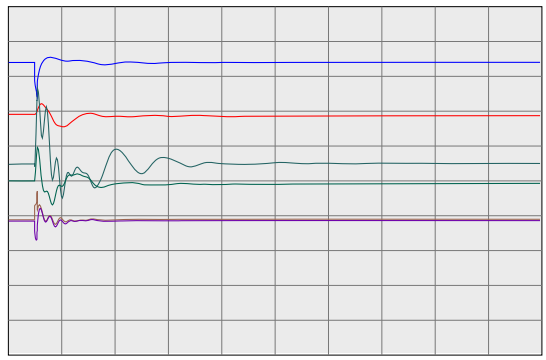
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

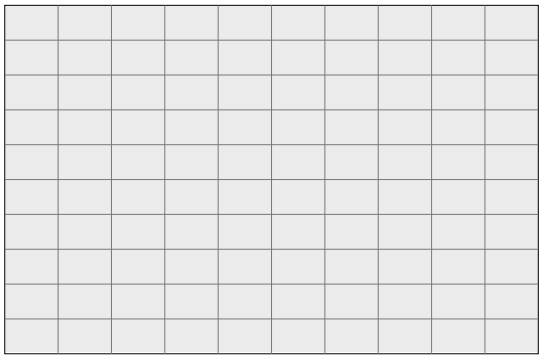
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

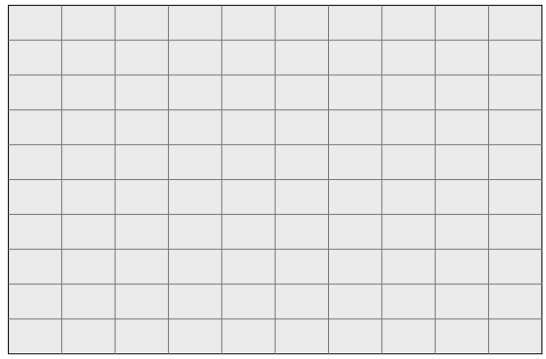


0.0 20.0

Time(sec)

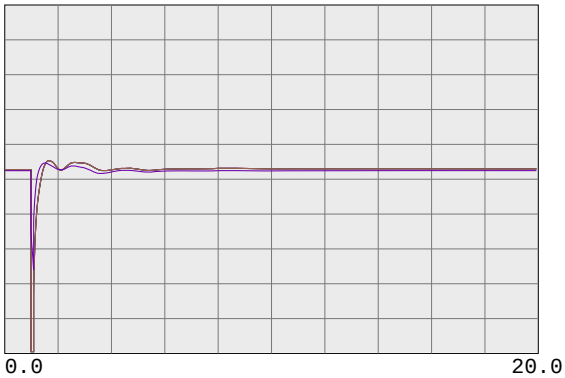
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



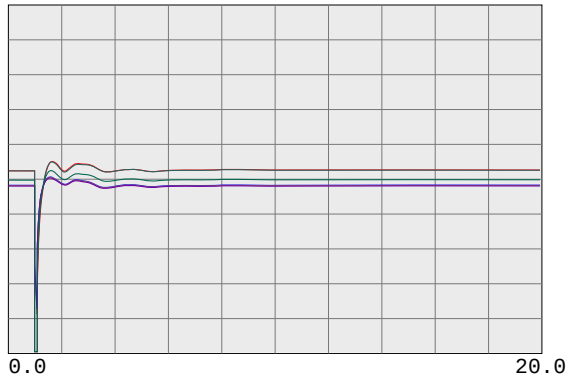


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

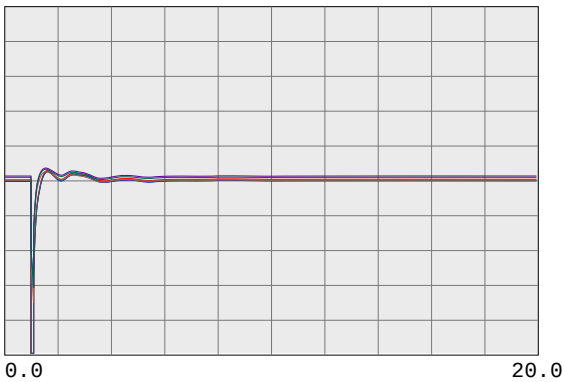
230-KV SYSTEM VOLTAGES



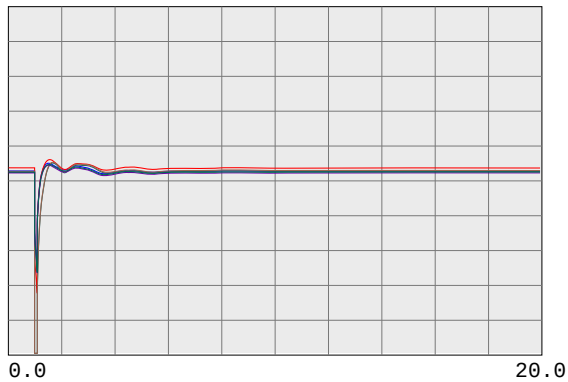
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



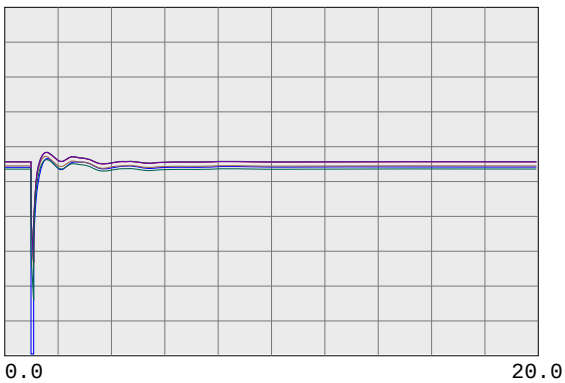
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



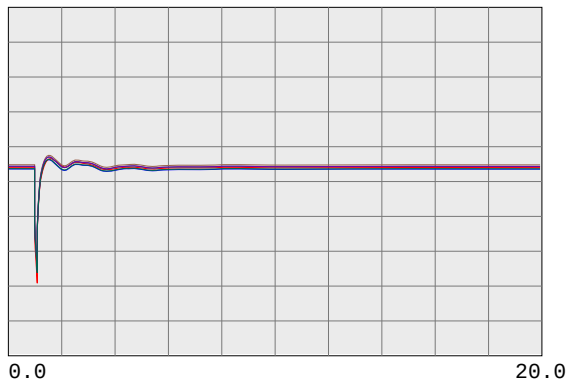
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



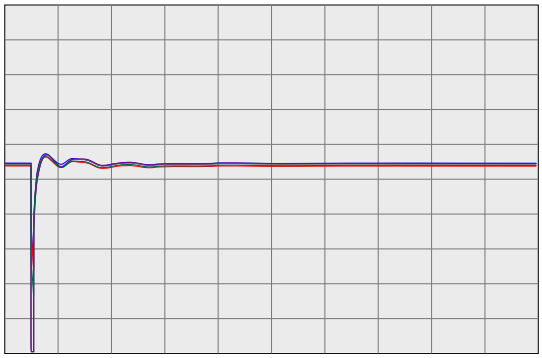
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

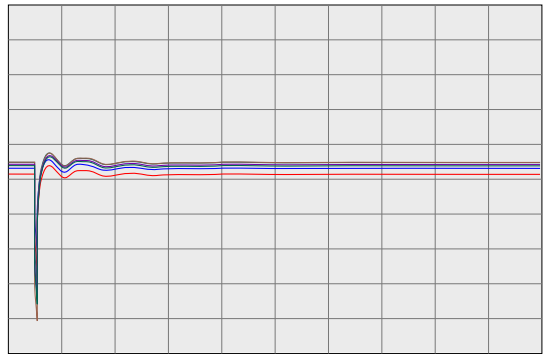
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

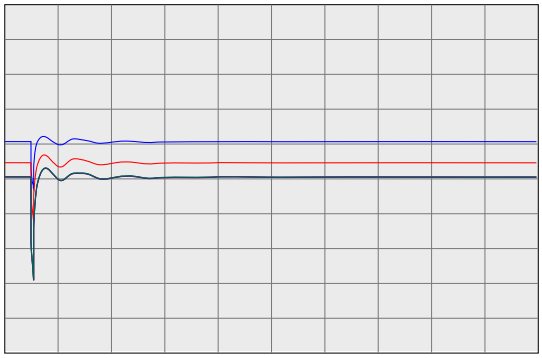
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

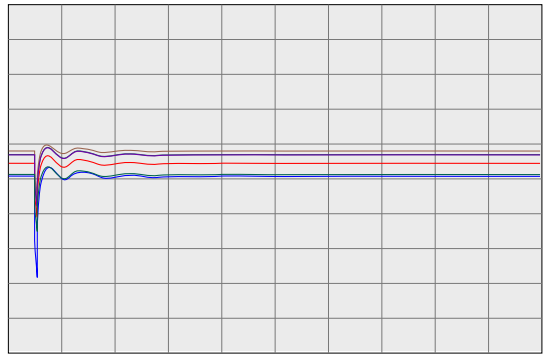
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

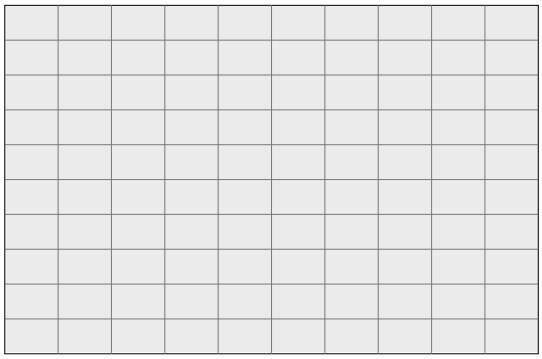
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

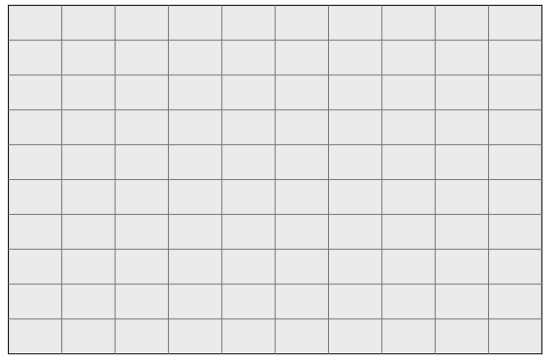


0.0 20.0

Time(sec)

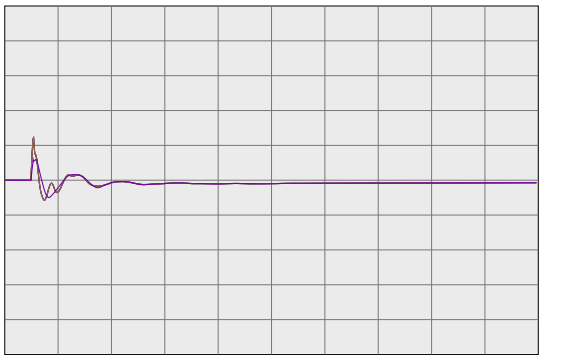
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



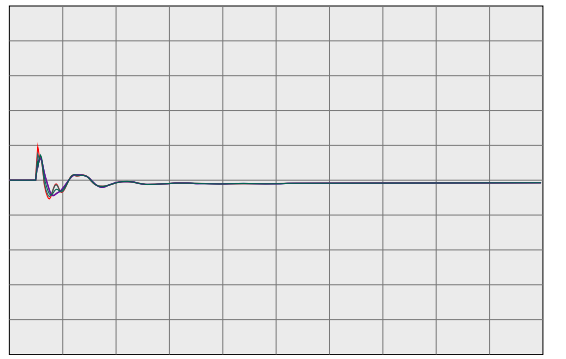


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

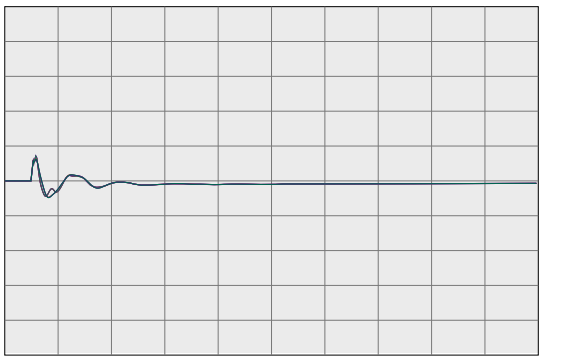
230-KV SYSTEM FREQUENCIES



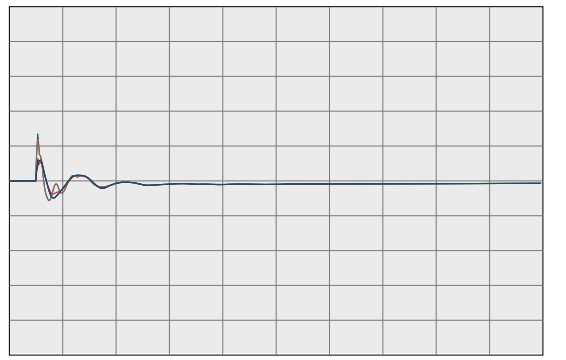
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



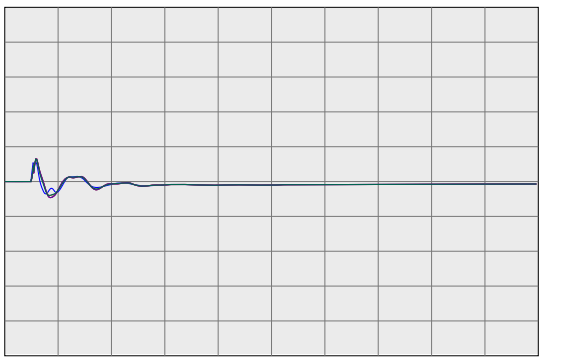
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



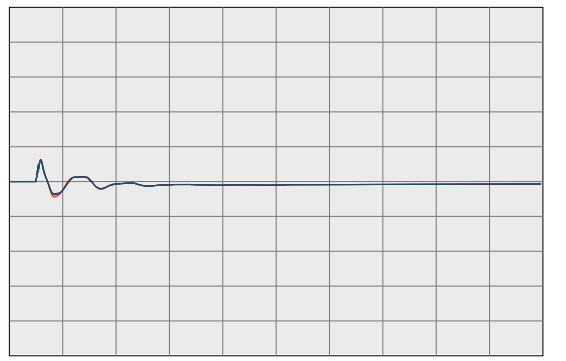
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



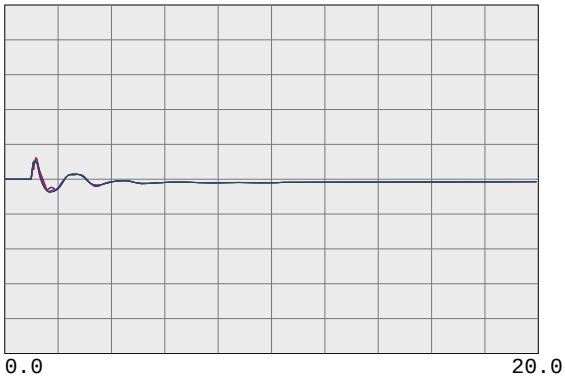
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



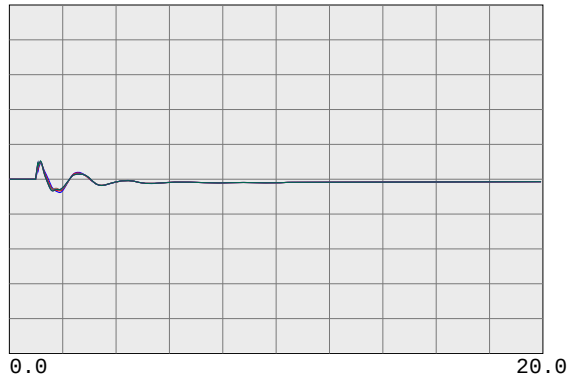
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

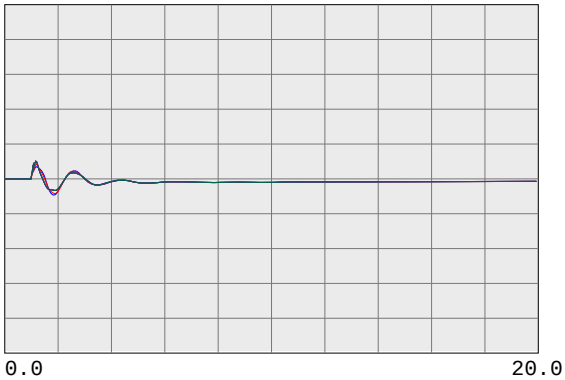
230-KV SYSTEM FREQUENCIES



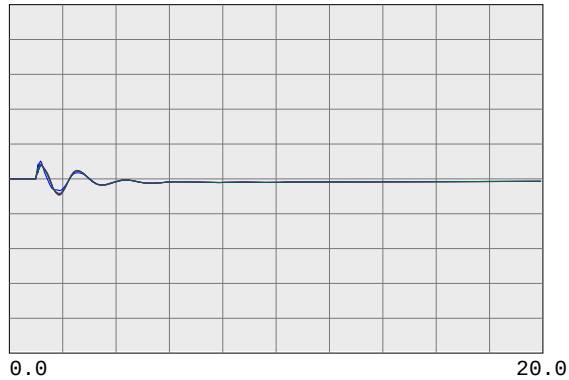
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



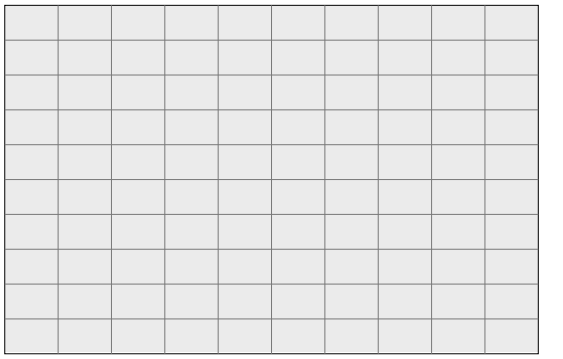
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

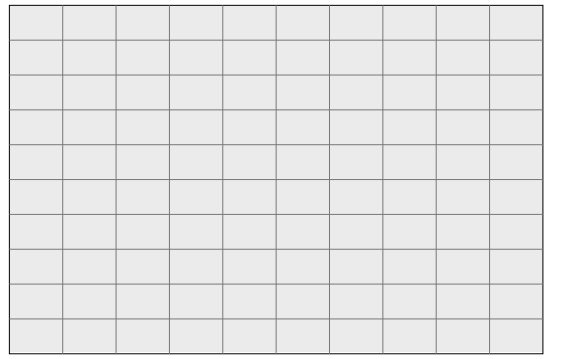


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



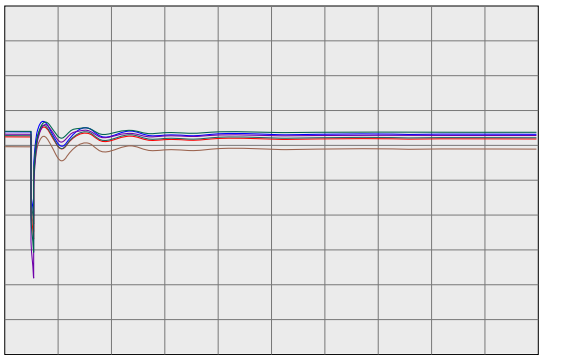
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



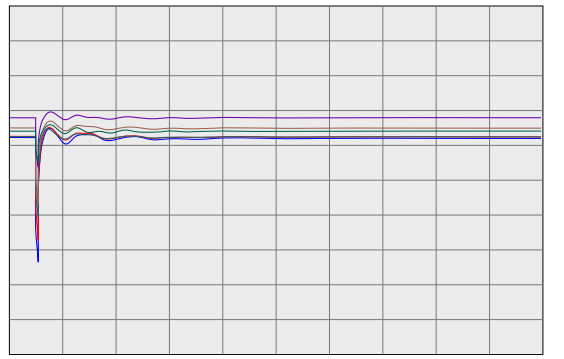


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

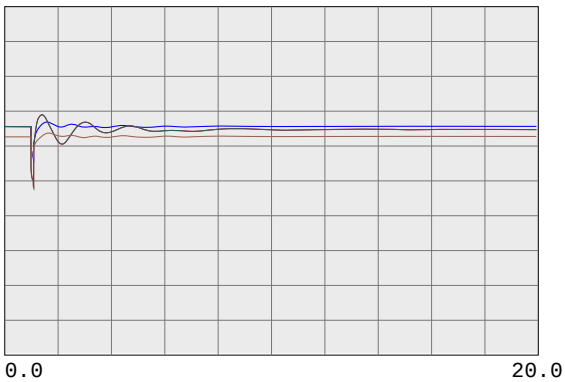
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



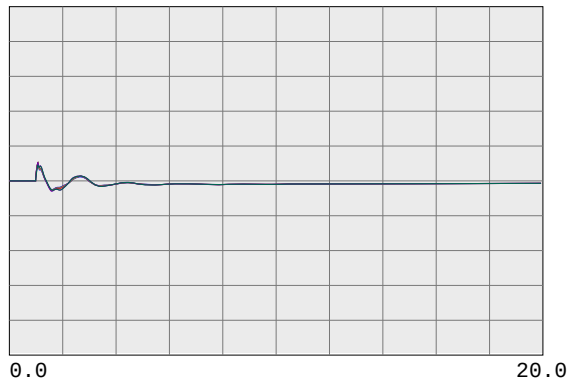
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



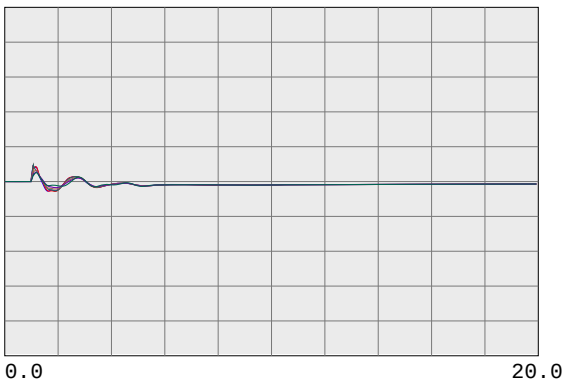
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



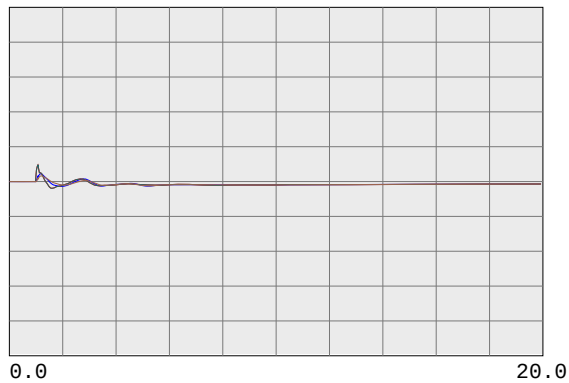
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



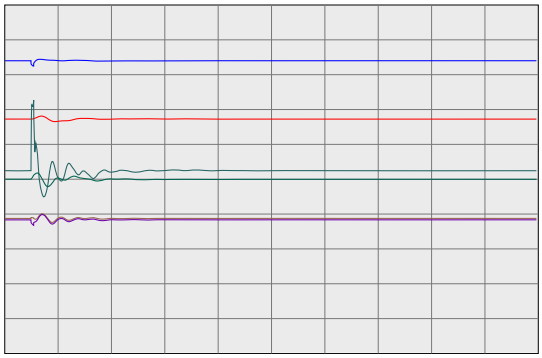
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

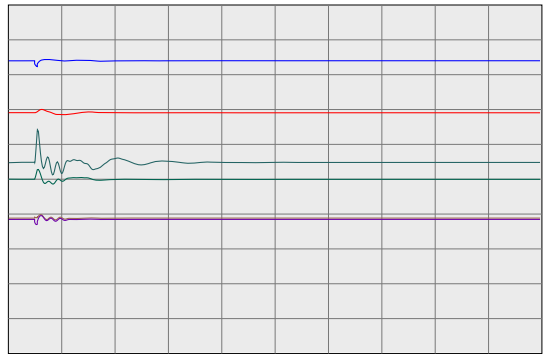
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

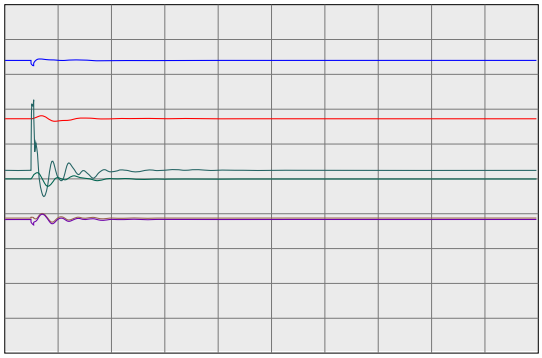
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

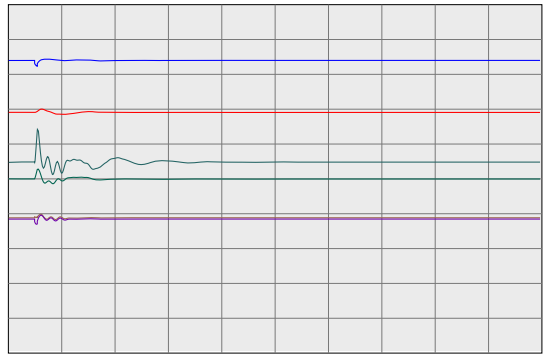
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

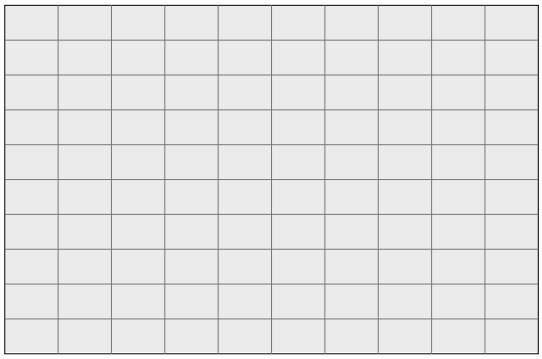
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

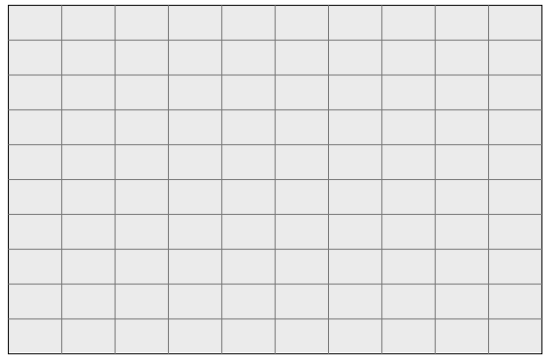


0.0 20.0

Time(sec)

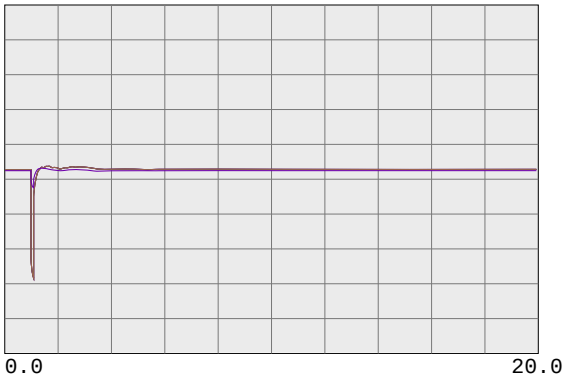
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



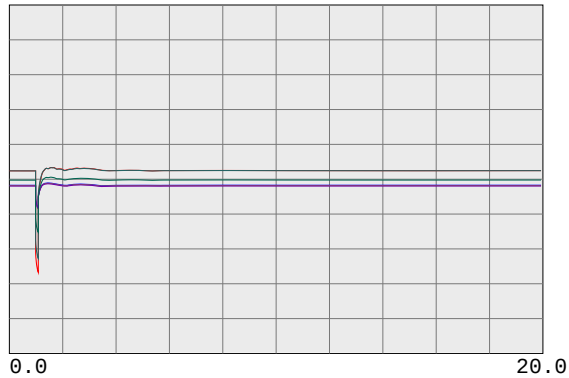


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

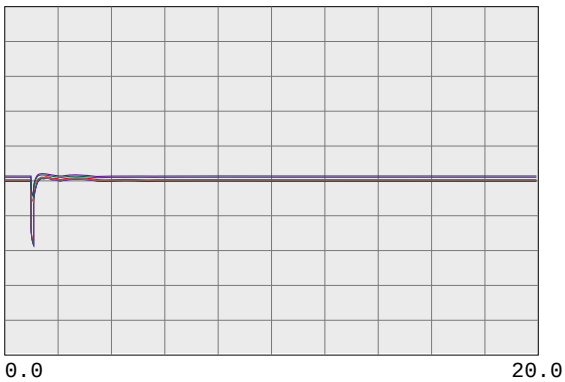
230-KV SYSTEM VOLTAGES



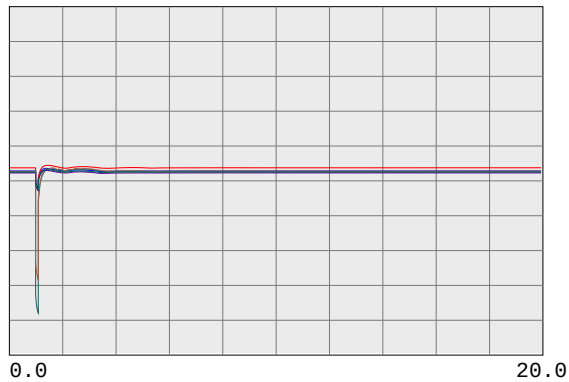
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



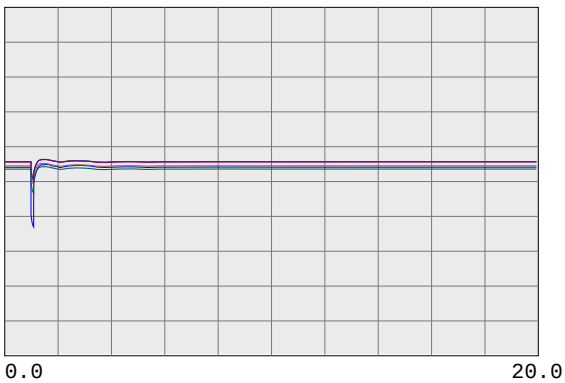
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



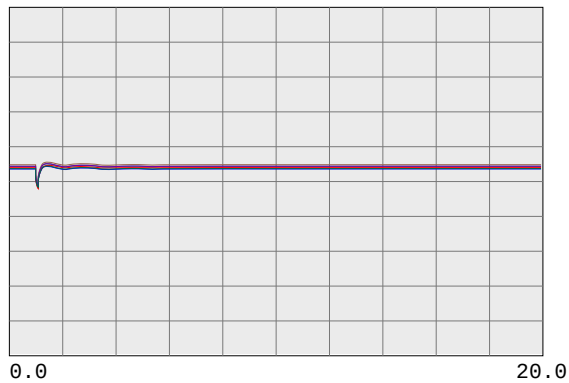
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



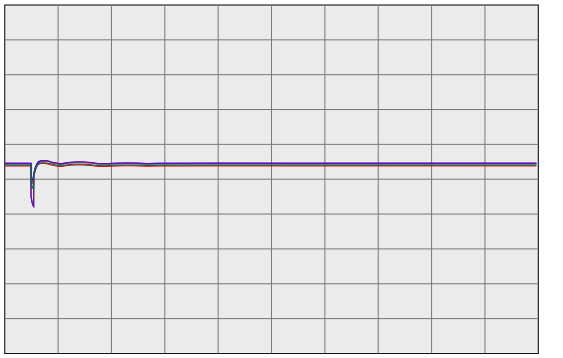
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



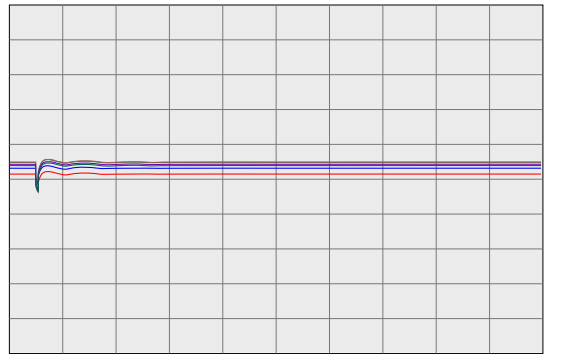
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

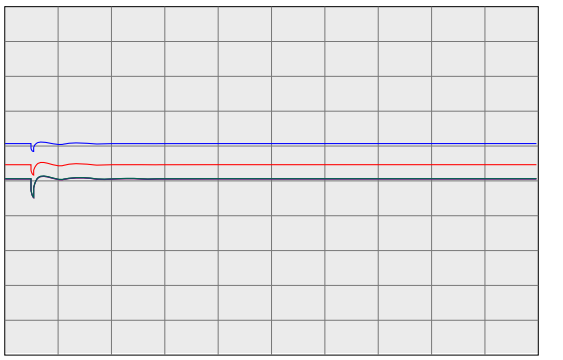
230-KV SYSTEM VOLTAGES



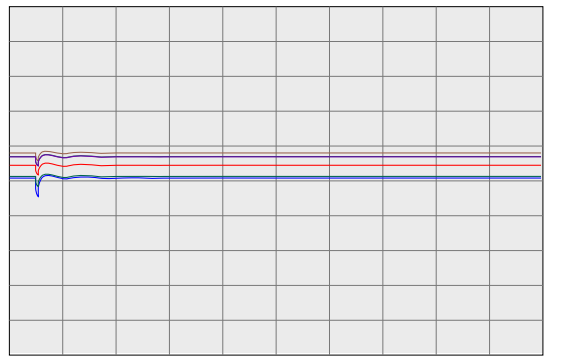
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



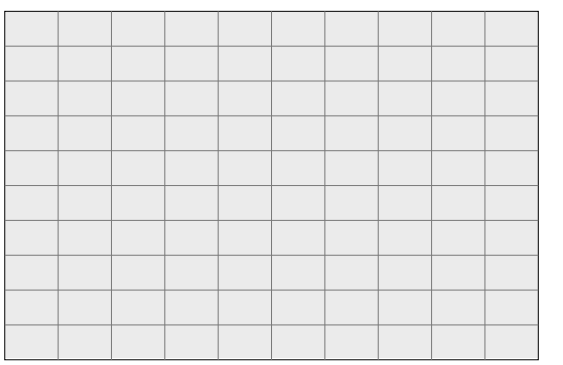
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

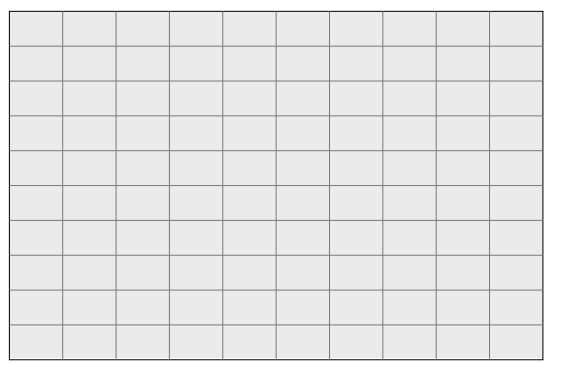


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



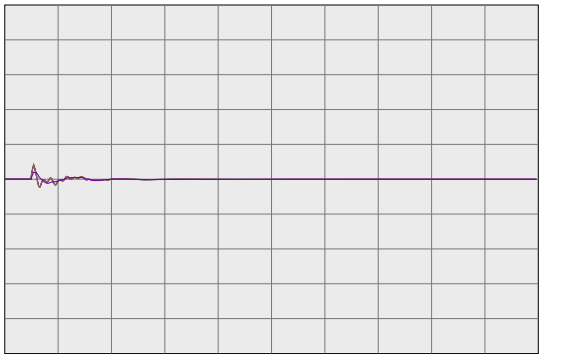
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





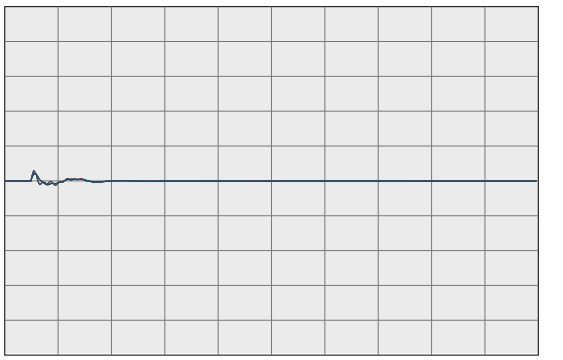
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

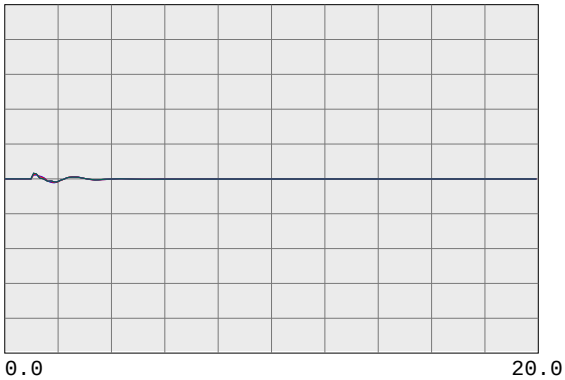
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

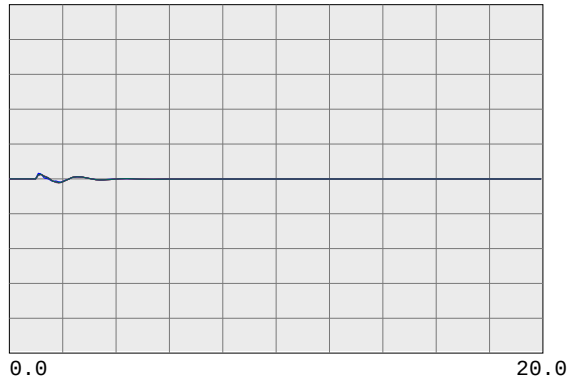
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

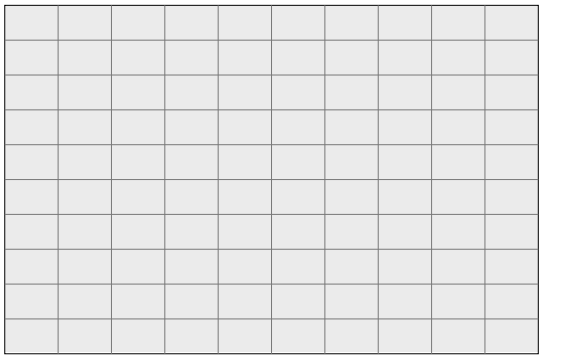
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

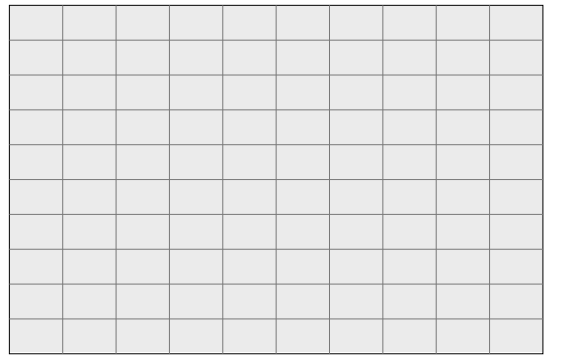


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



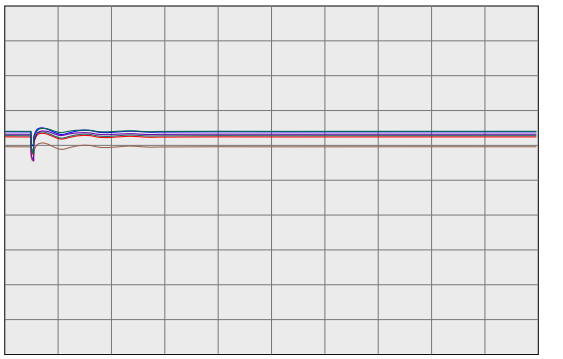
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



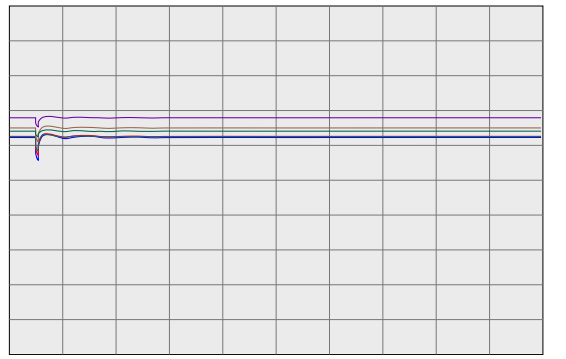


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

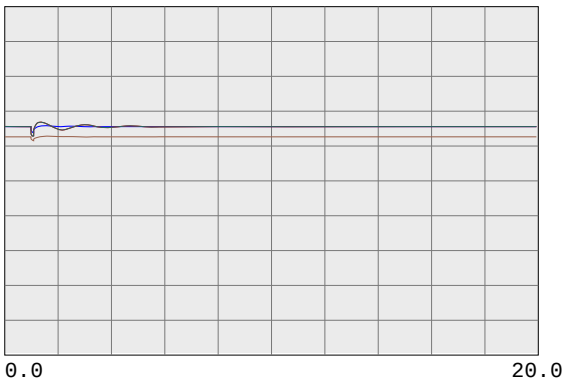
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



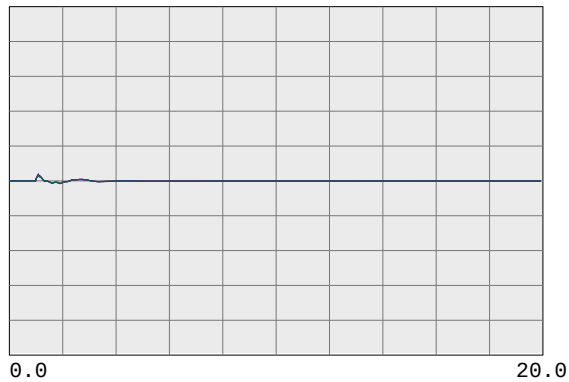
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



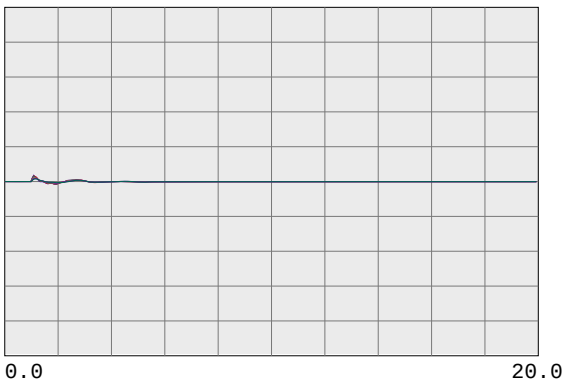
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

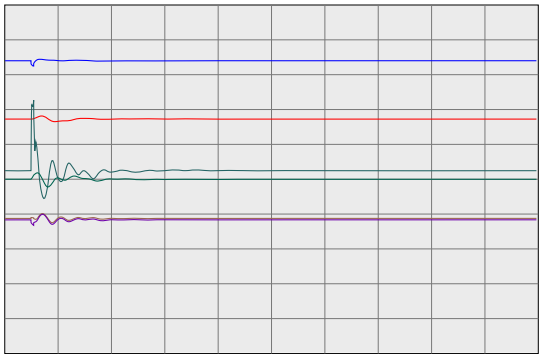


59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

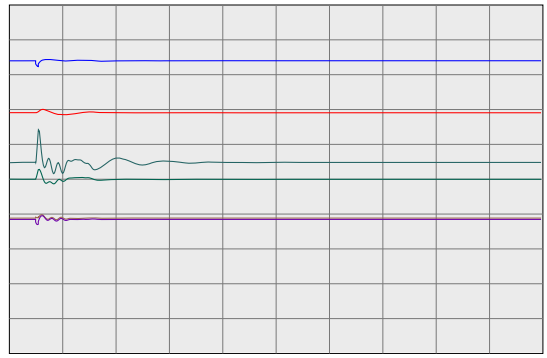
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

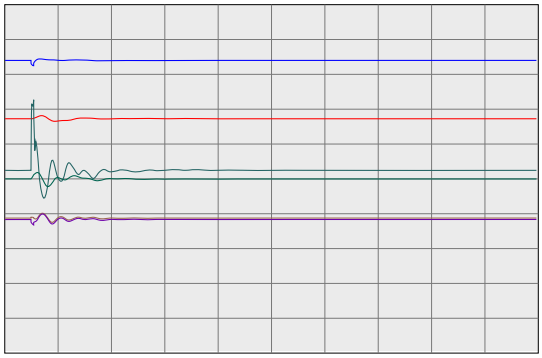
WILLOW PASS GENERATION PLANT



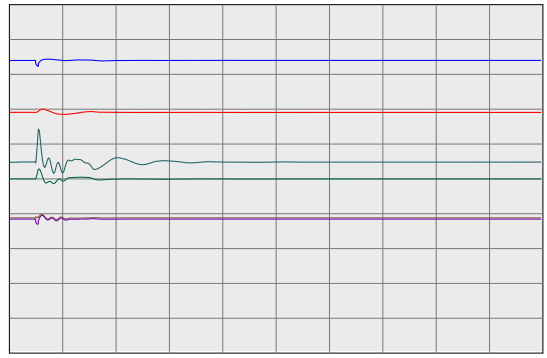
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



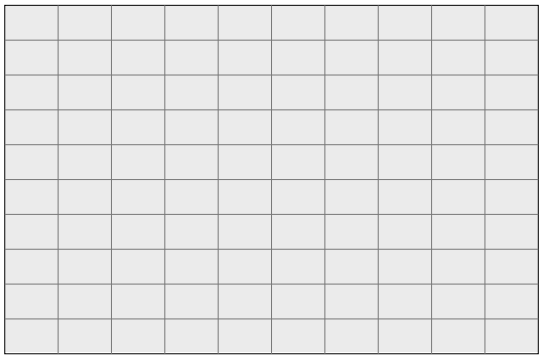
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

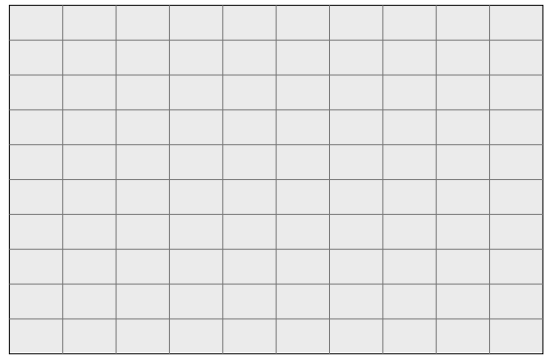


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



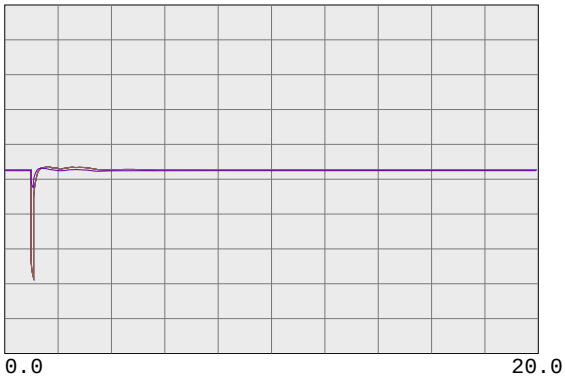
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



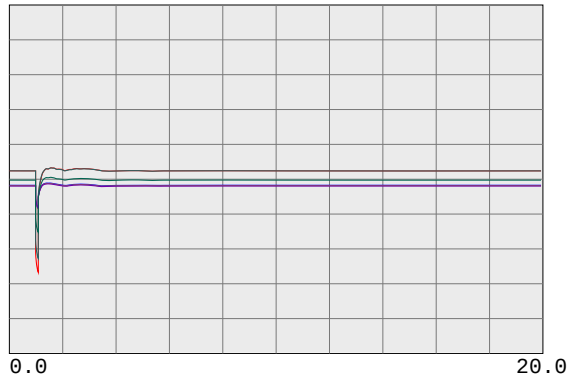


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

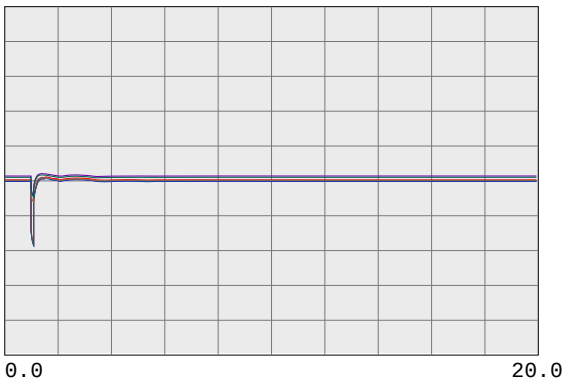
230-KV SYSTEM VOLTAGES



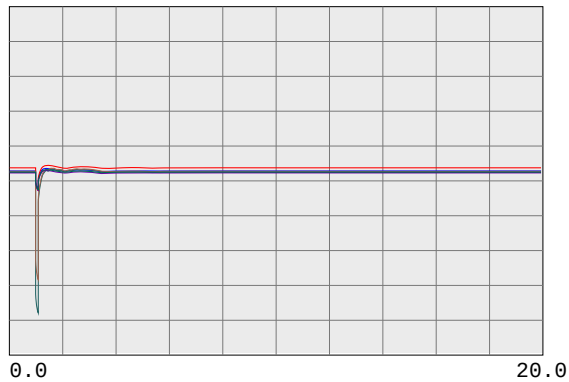
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



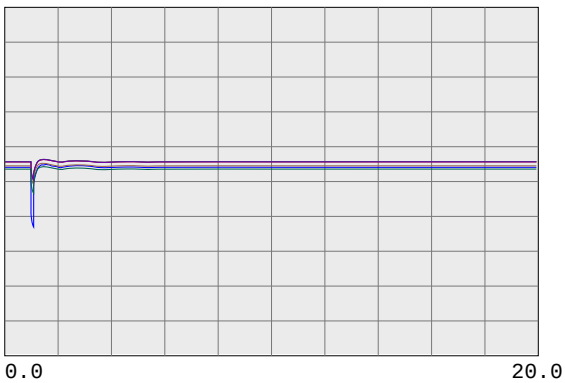
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



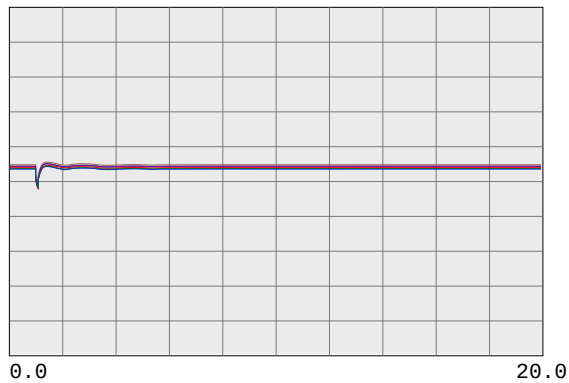
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



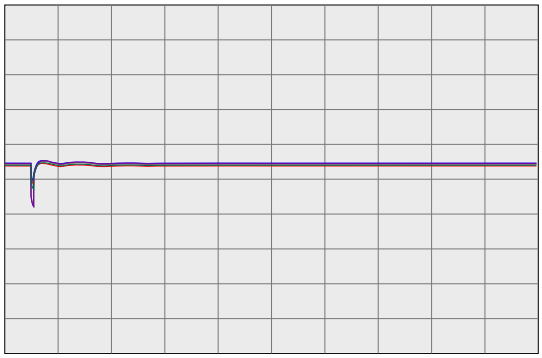
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

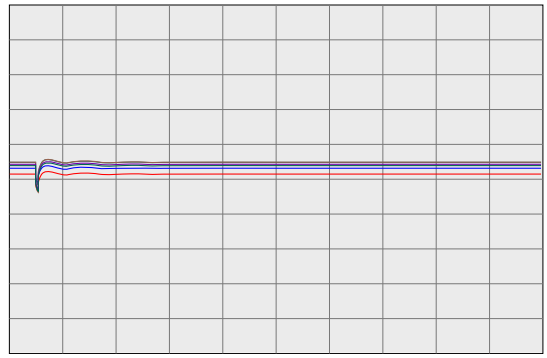
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

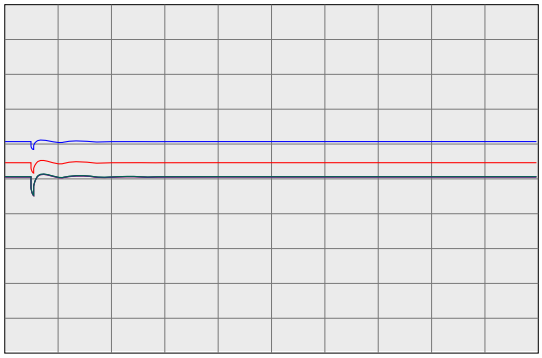
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

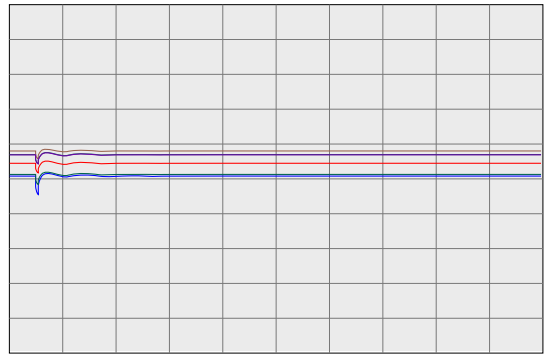
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

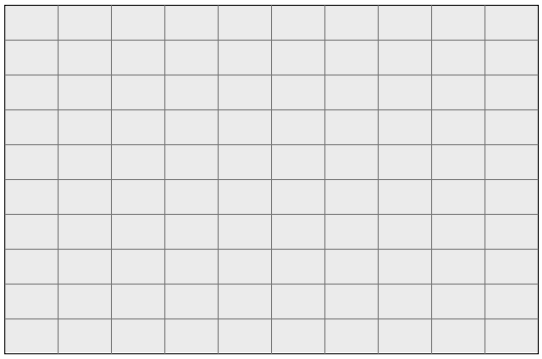
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

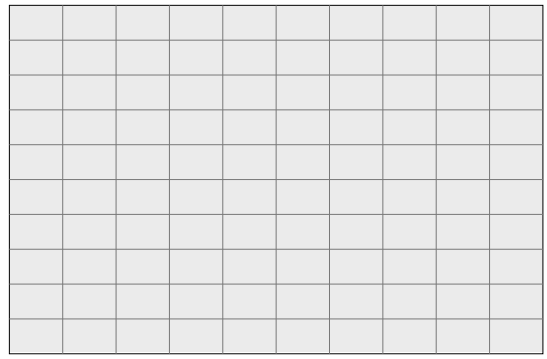


0.0 20.0

Time(sec)

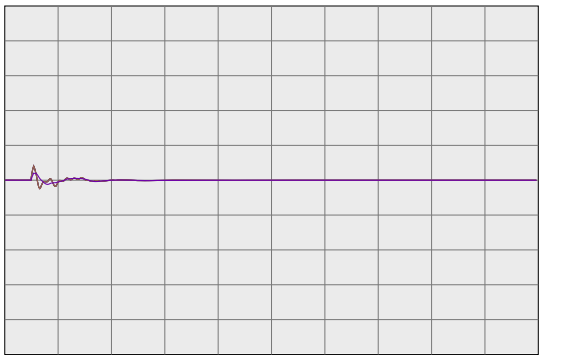
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





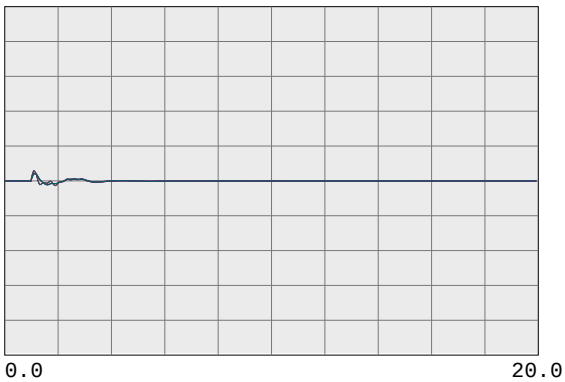
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000

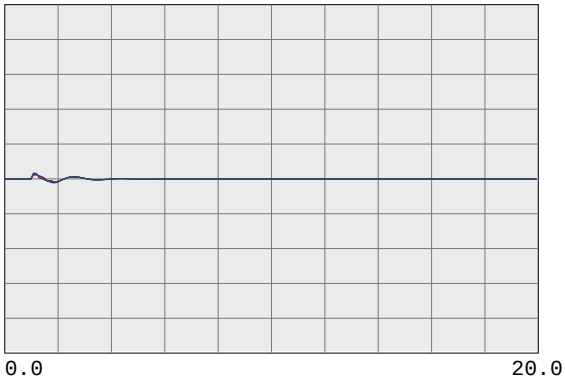
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

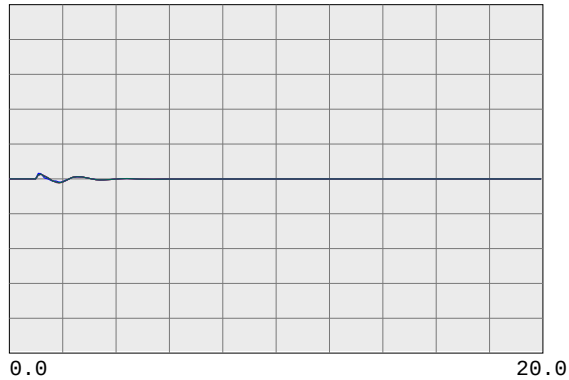
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

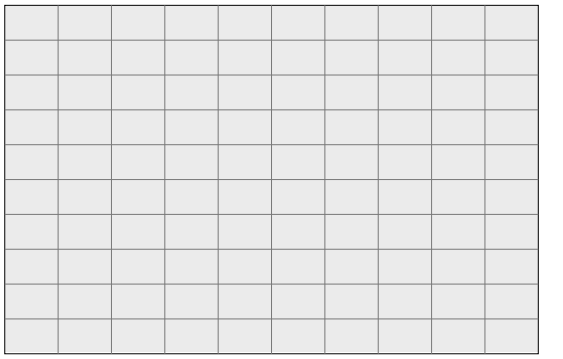
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

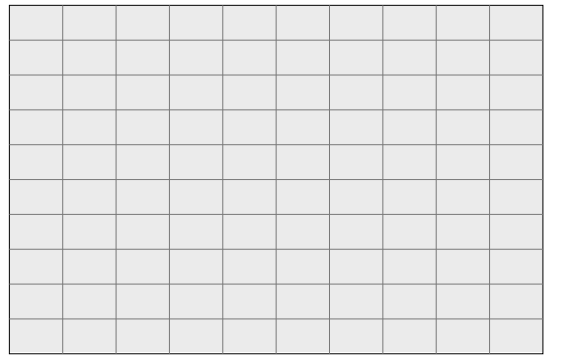


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



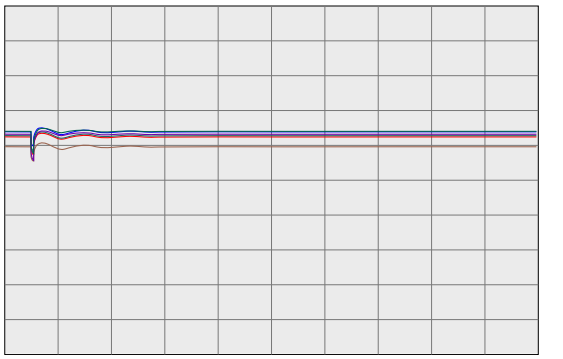
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



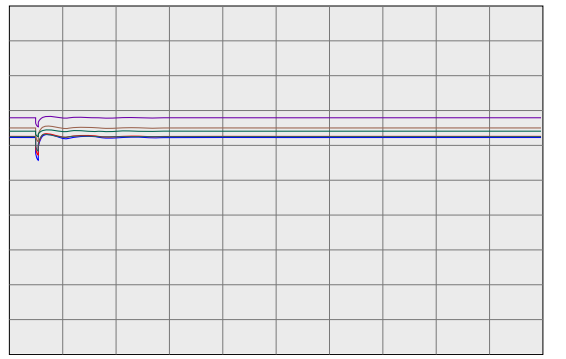


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

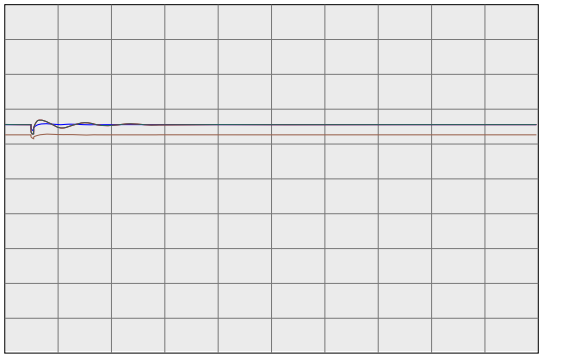
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



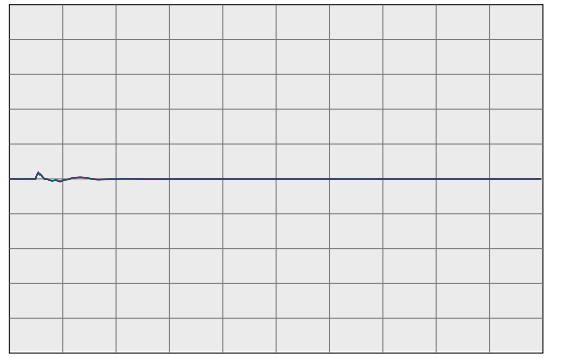
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



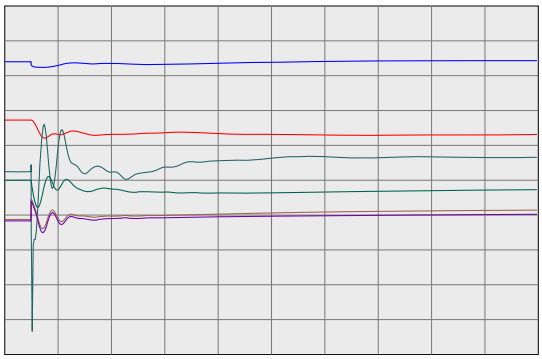
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

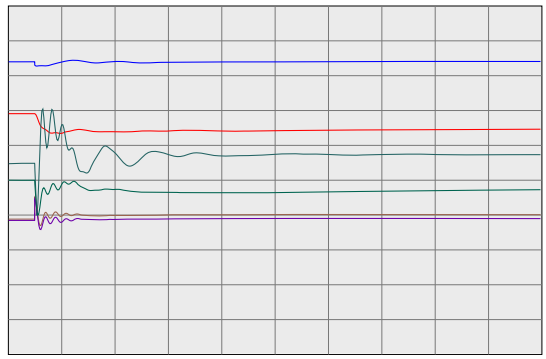
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

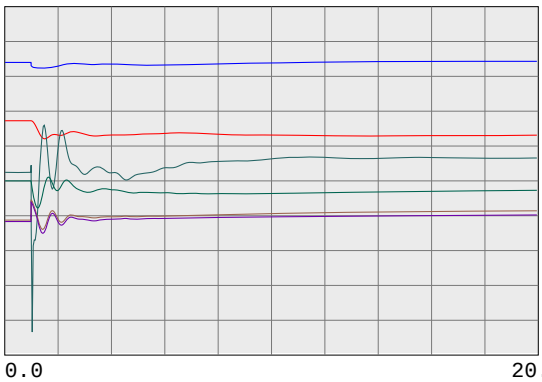
WILLOW PASS GENERATION PLANT



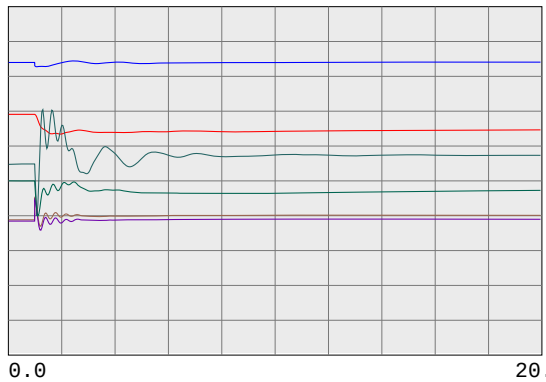
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



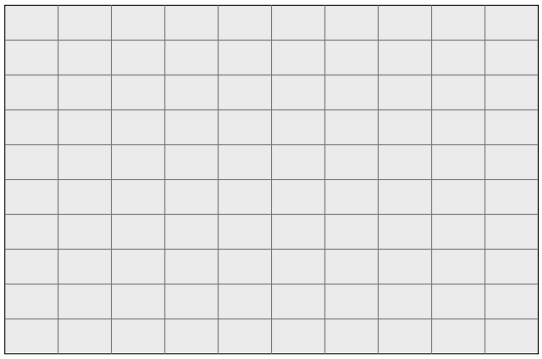
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

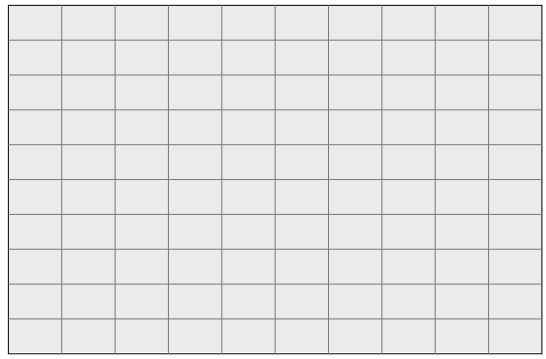


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



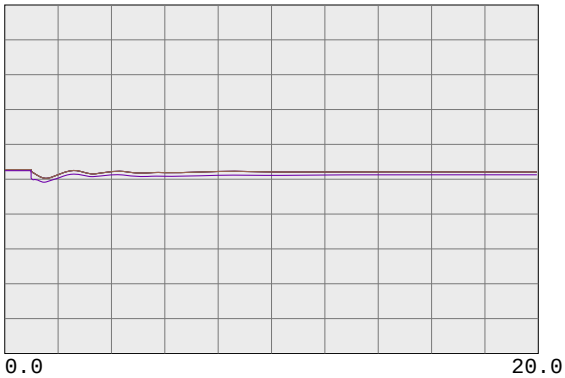
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



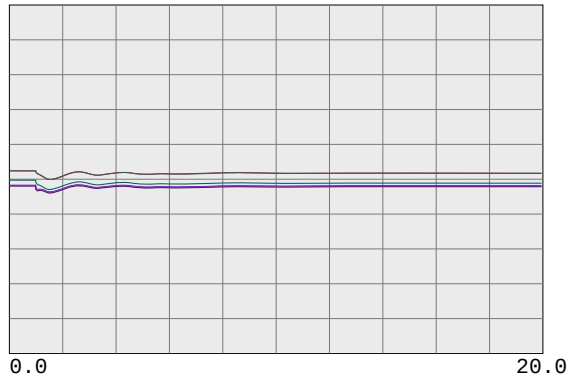


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

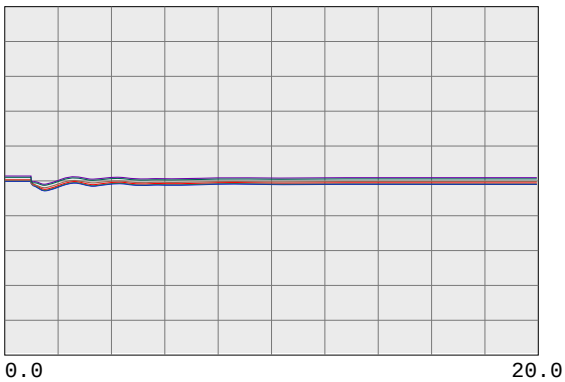
230-KV SYSTEM VOLTAGES



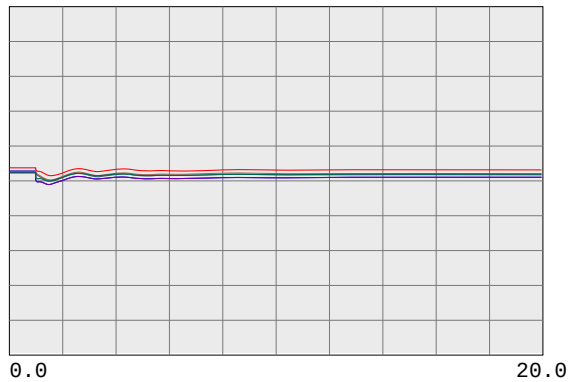
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



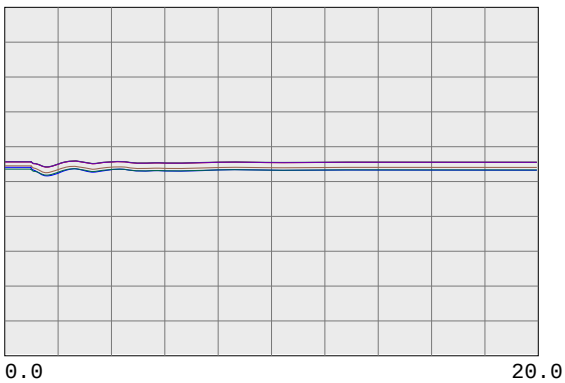
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



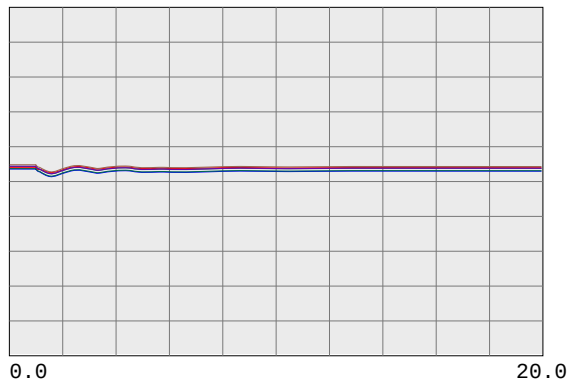
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



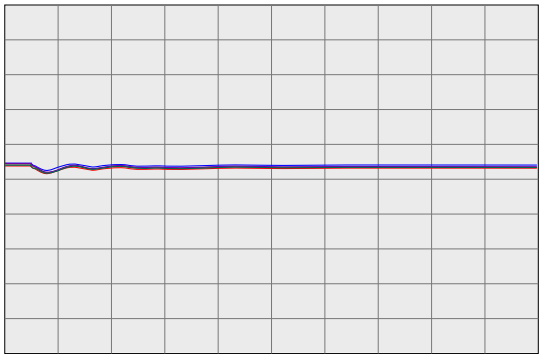
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

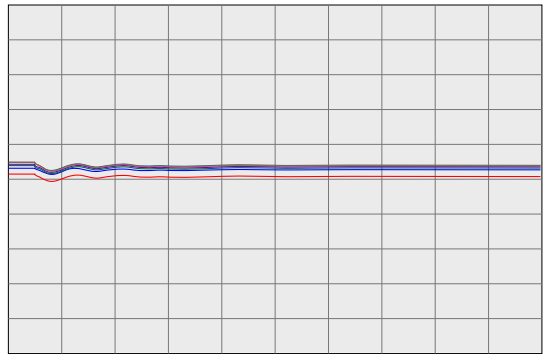
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

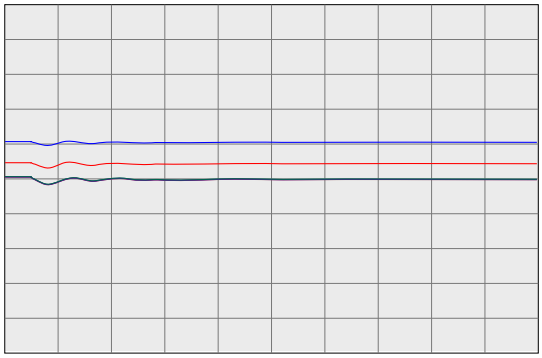
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

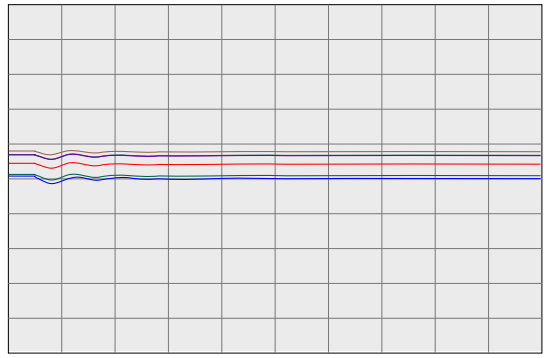
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

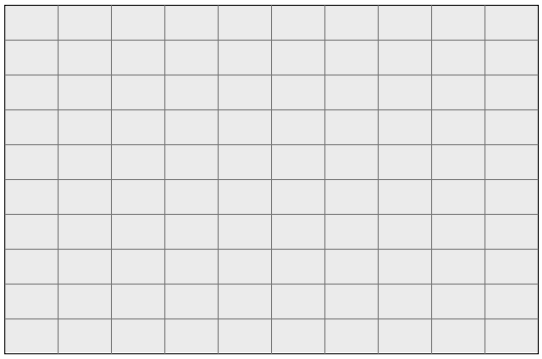
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

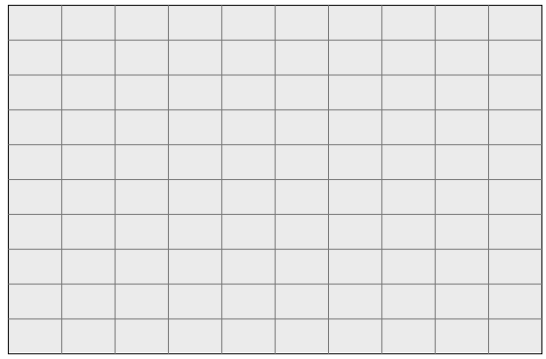


0.0 20.0

Time(sec)

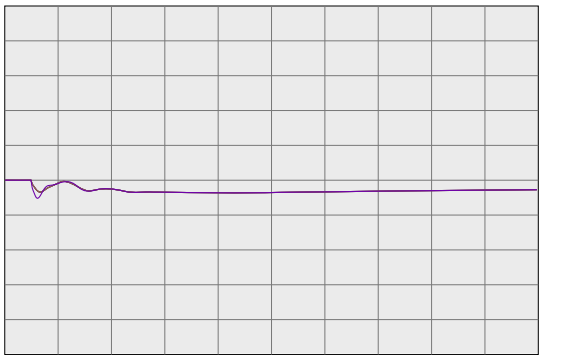
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



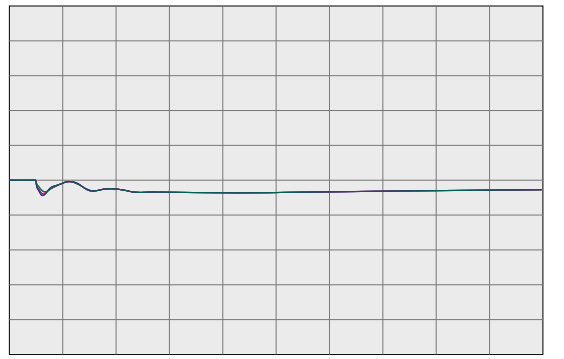


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

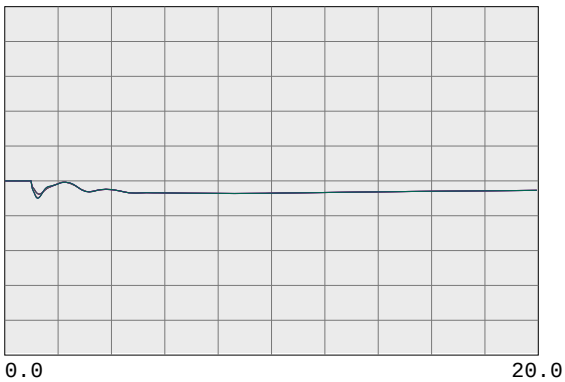
230-KV SYSTEM FREQUENCIES



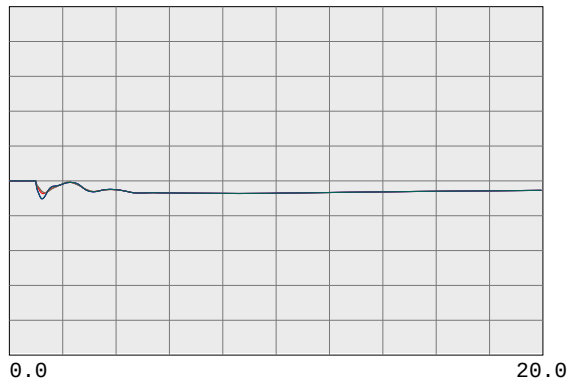
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



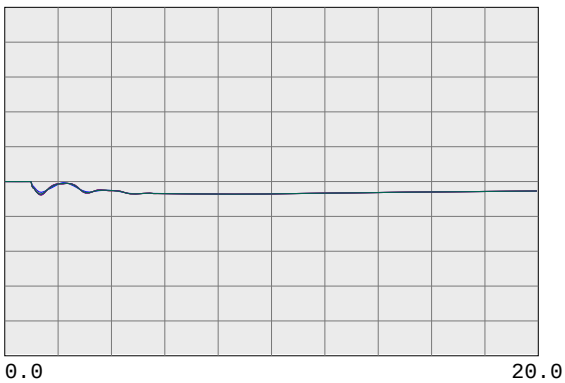
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



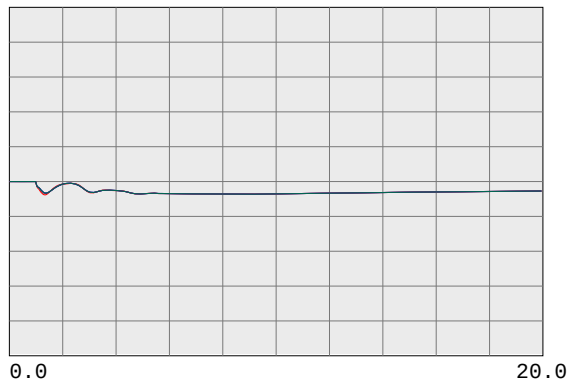
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



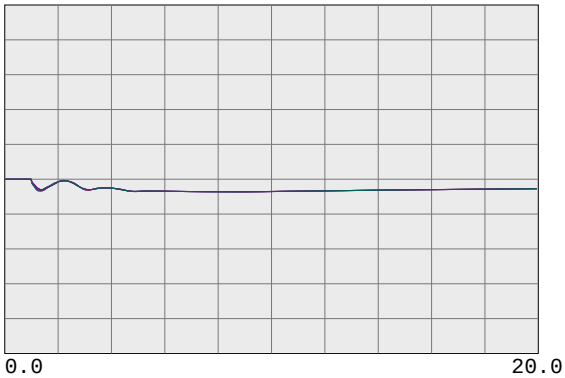
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



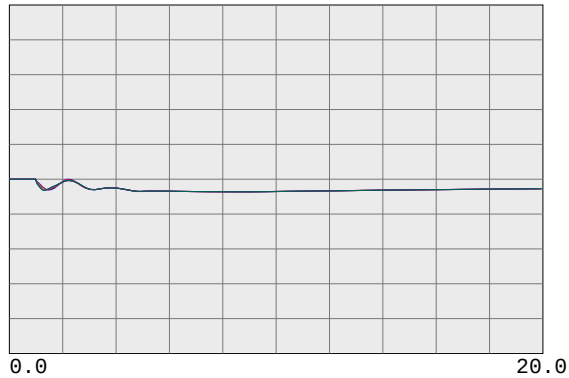
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

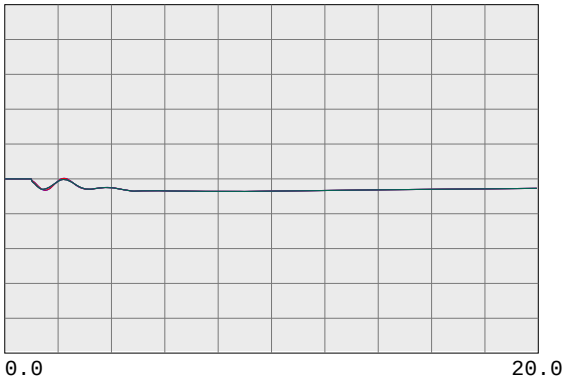
230-KV SYSTEM FREQUENCIES



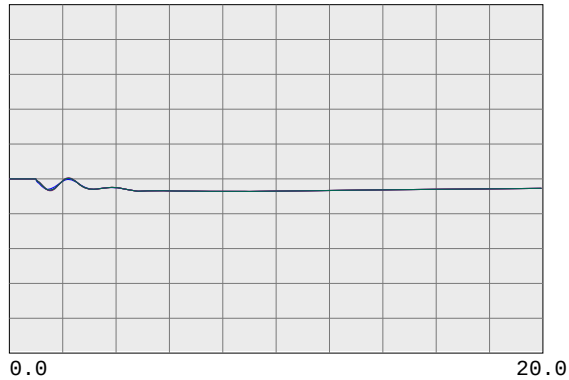
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



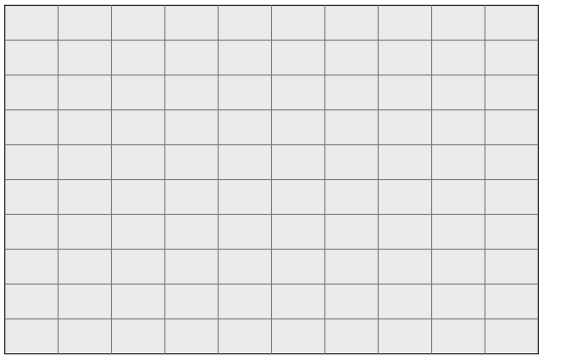
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

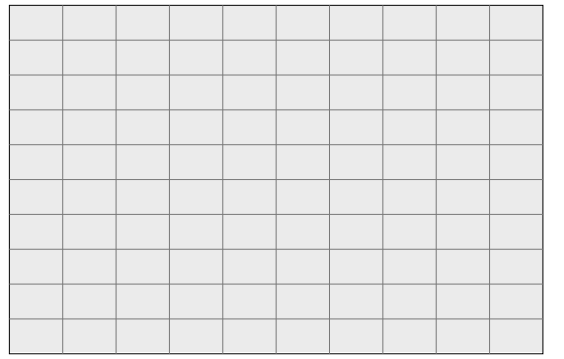


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



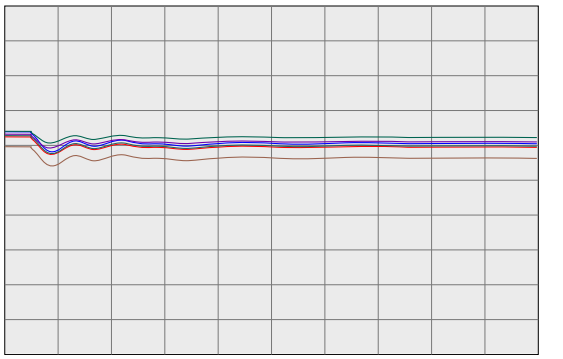
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



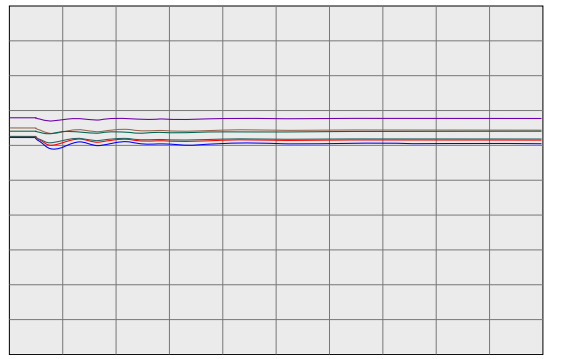


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

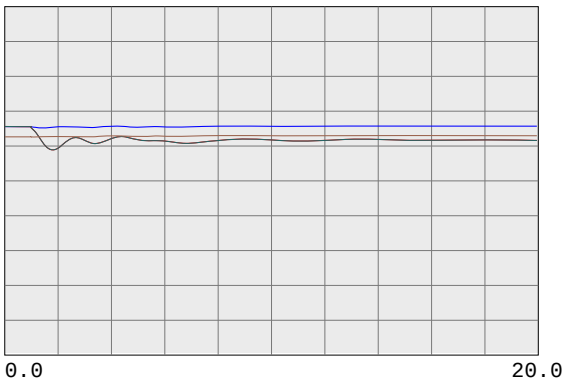
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



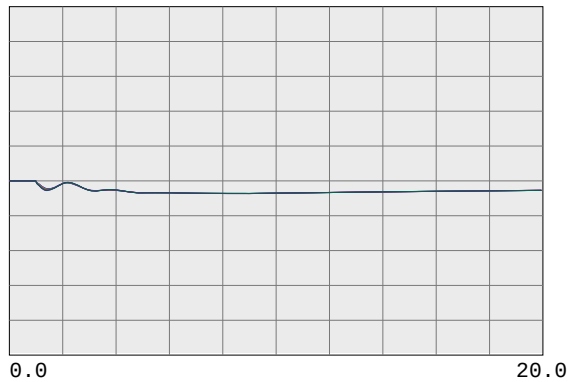
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



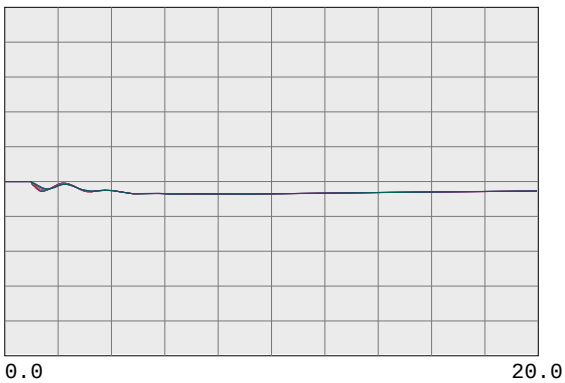
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



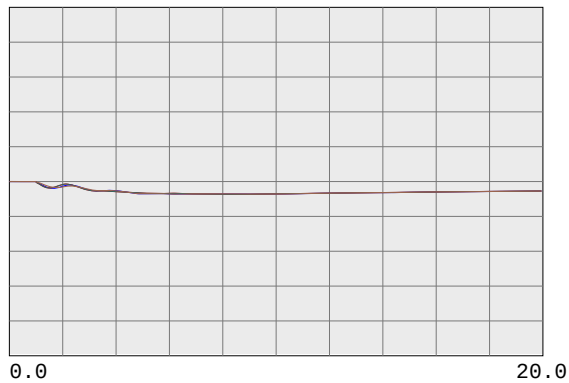
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



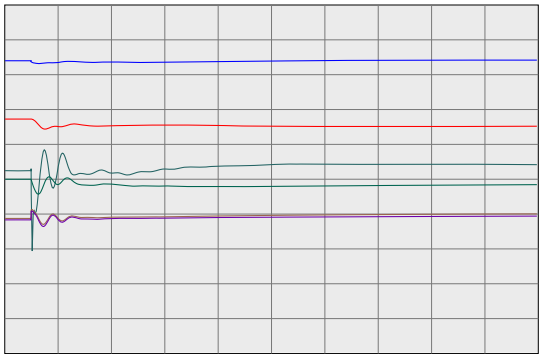
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

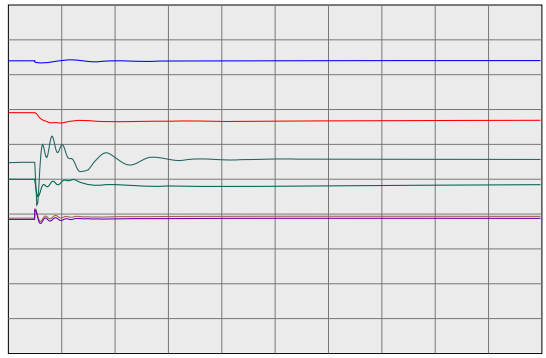
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

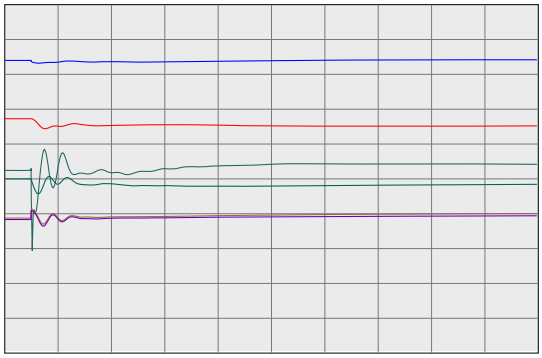
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

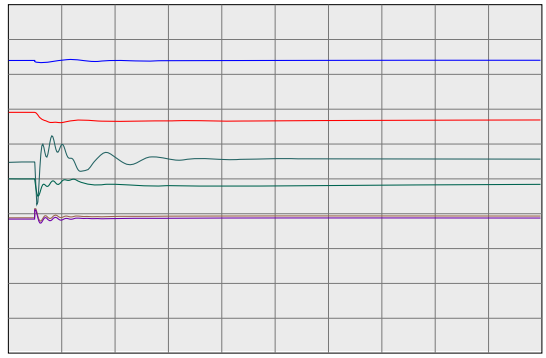
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

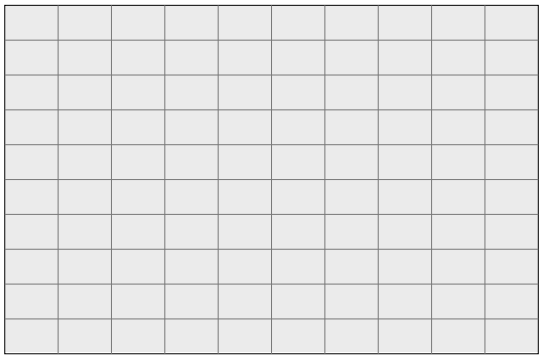
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

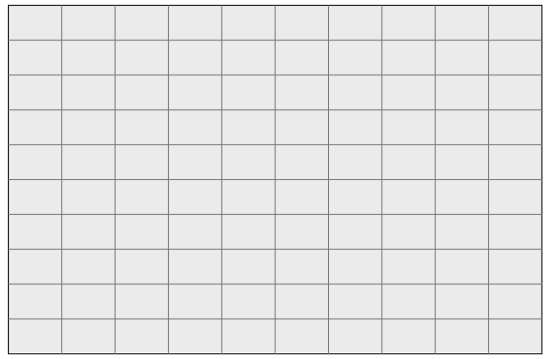


0.0 20.0

Time(sec)

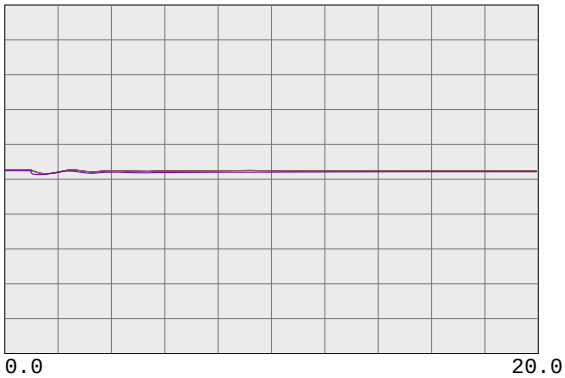
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



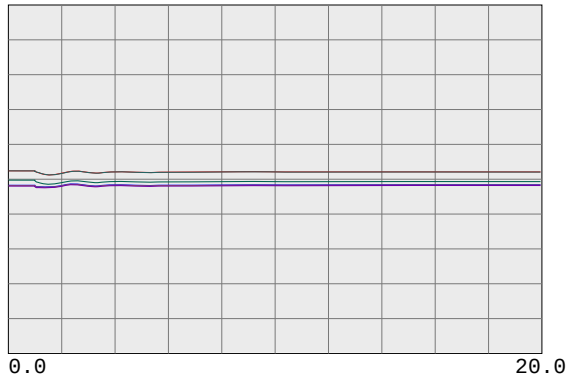


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

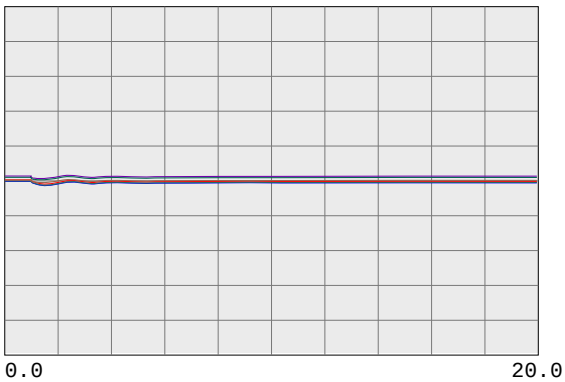
230-KV SYSTEM VOLTAGES



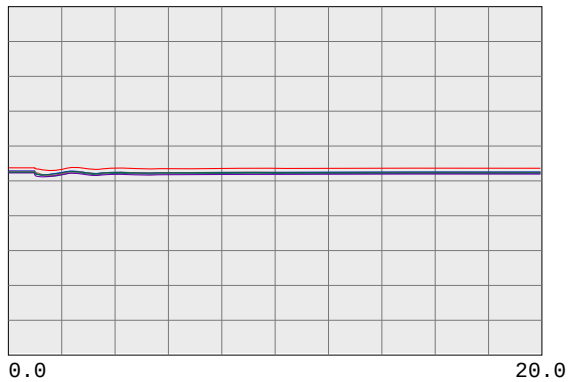
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



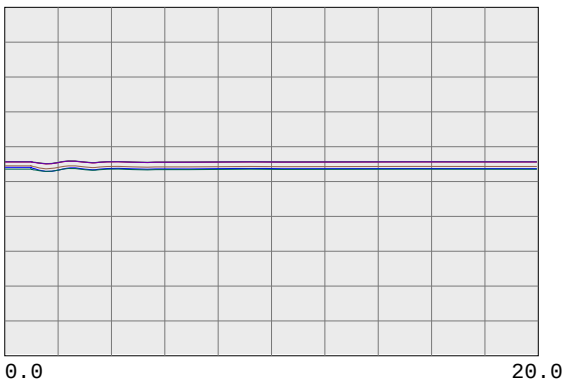
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



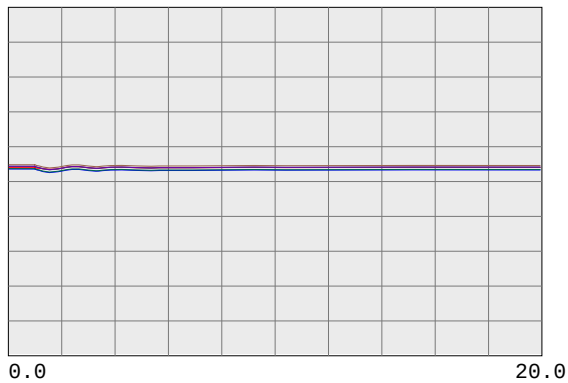
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



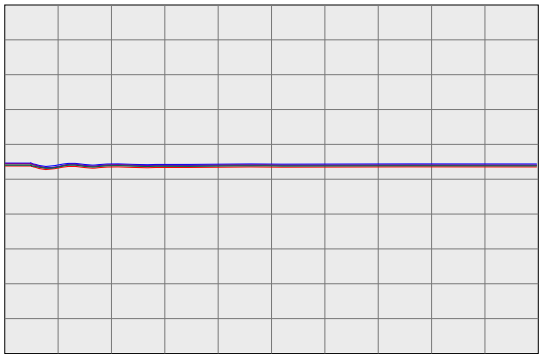
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

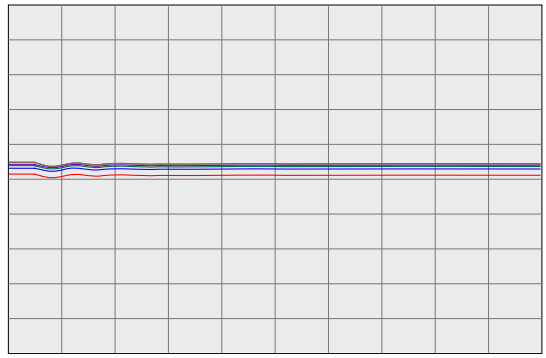
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

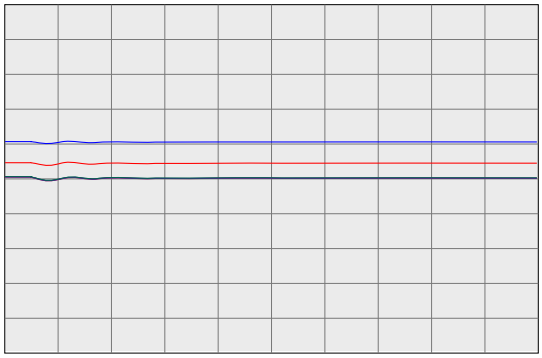
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

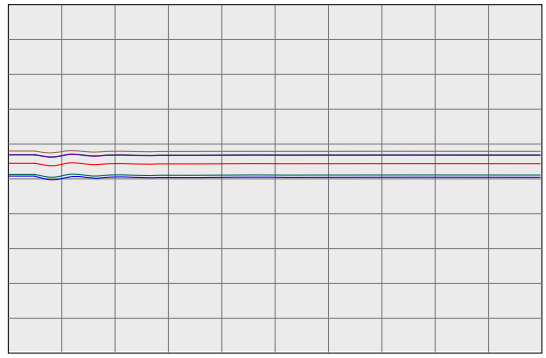
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

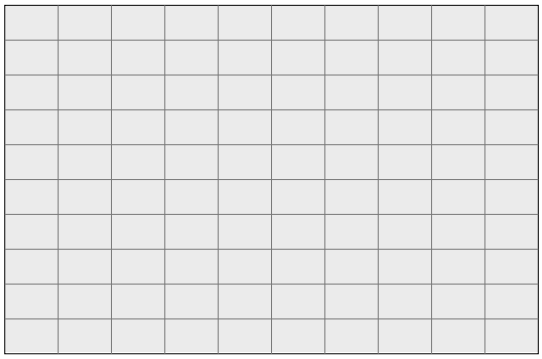
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

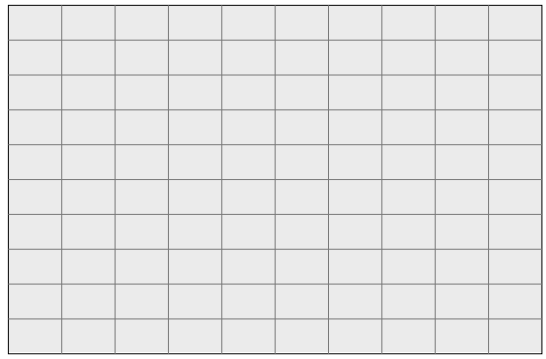


0.0 20.0

Time(sec)

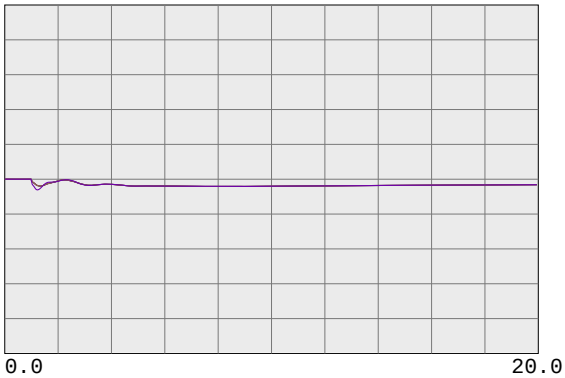
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



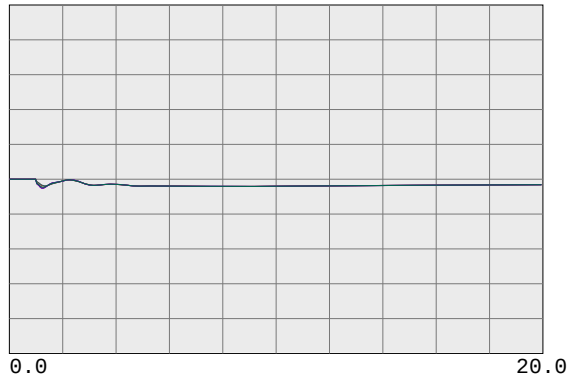


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

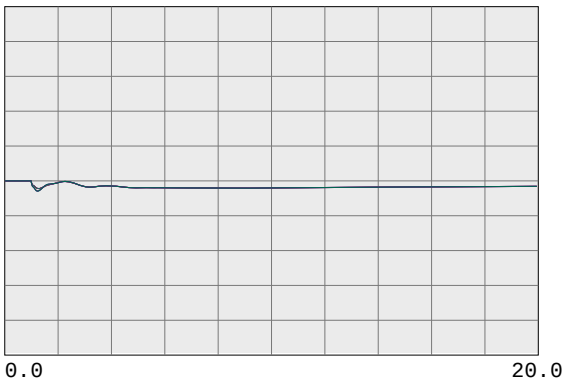
230-KV SYSTEM FREQUENCIES



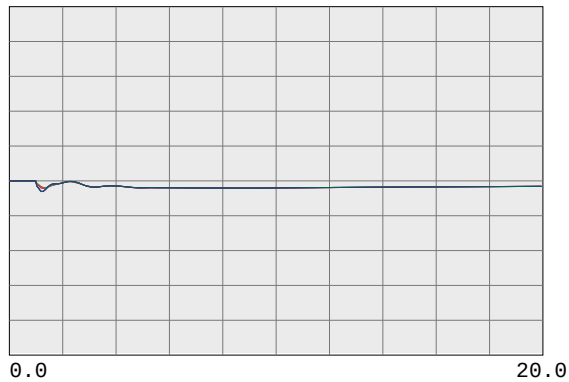
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



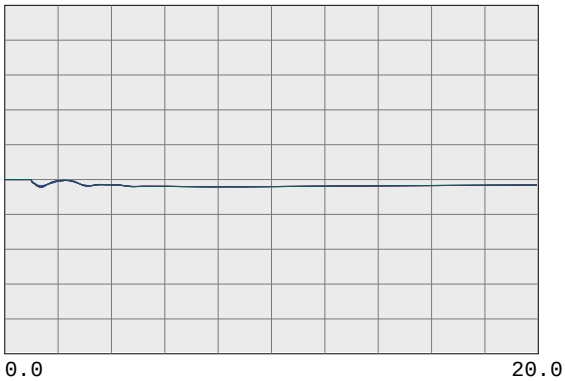
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



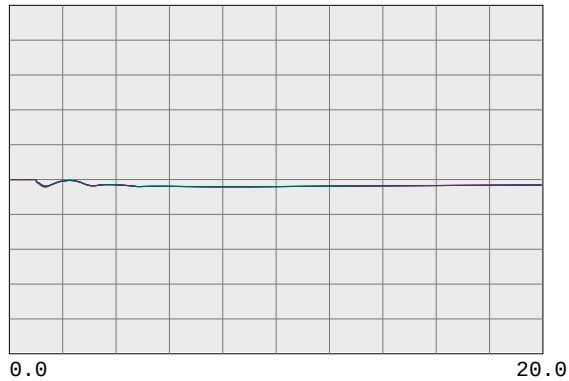
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



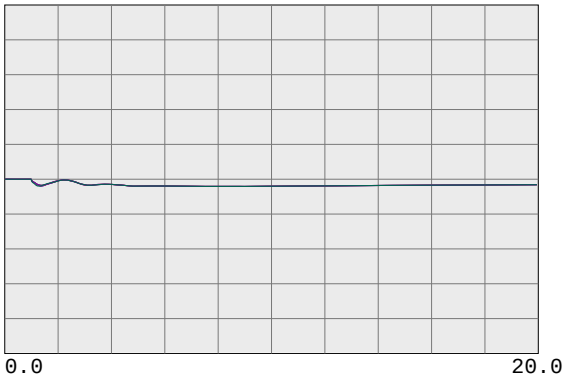
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



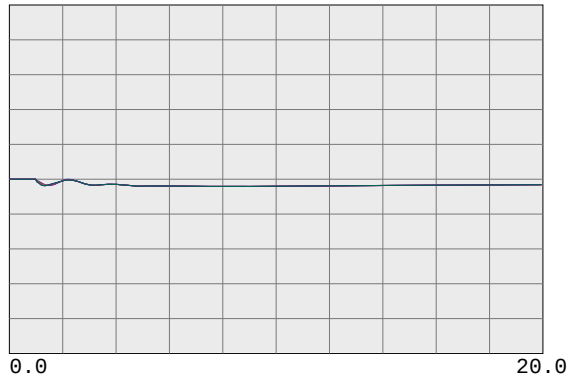
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

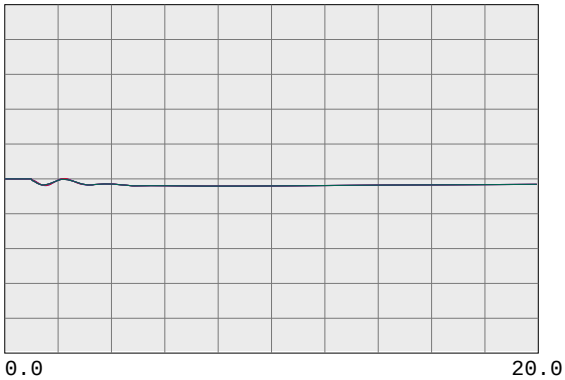
230-KV SYSTEM FREQUENCIES



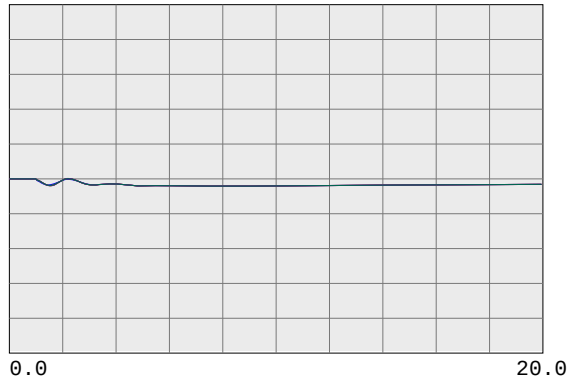
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



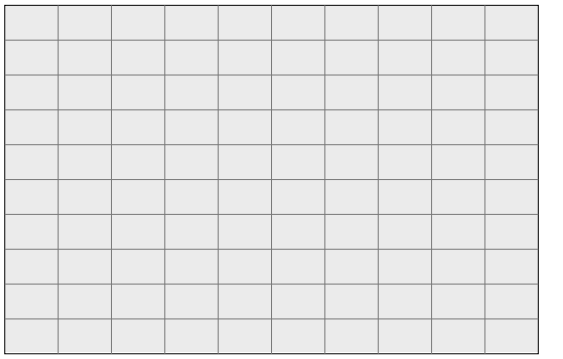
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

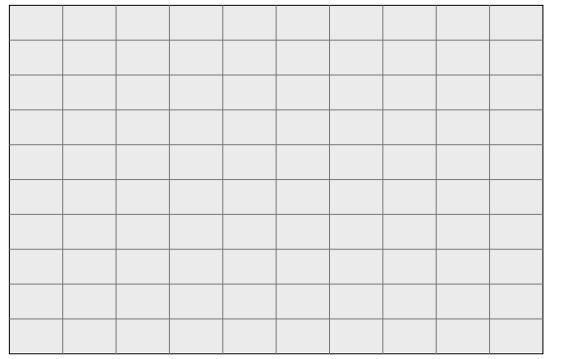


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



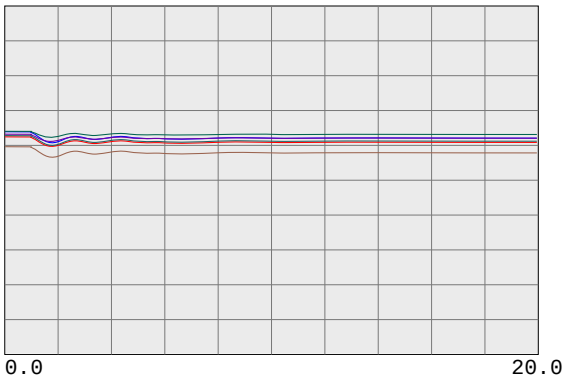
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



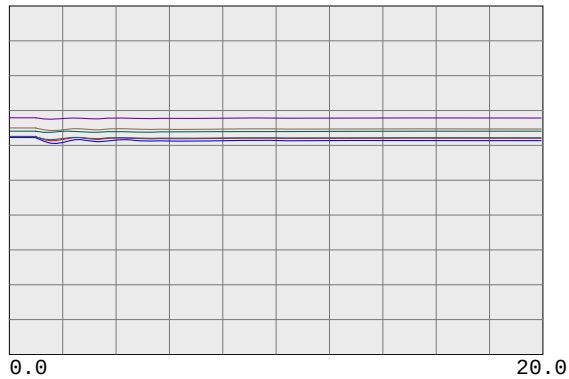


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

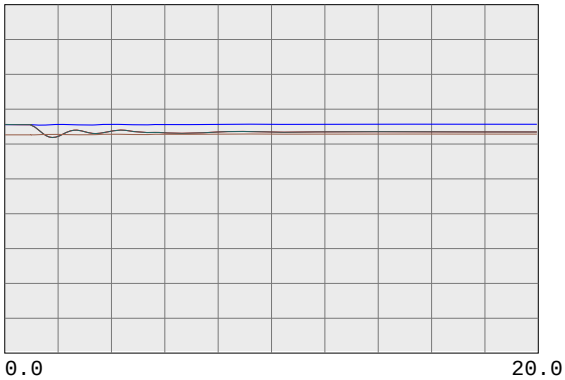
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



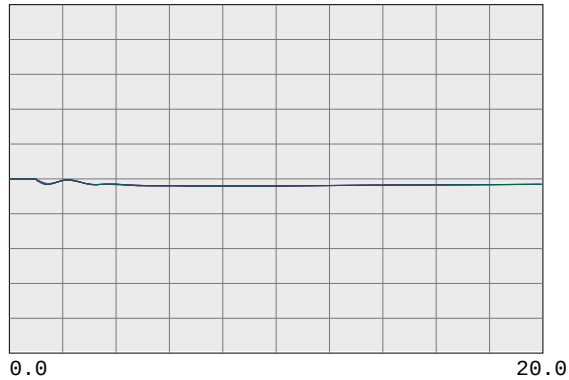
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



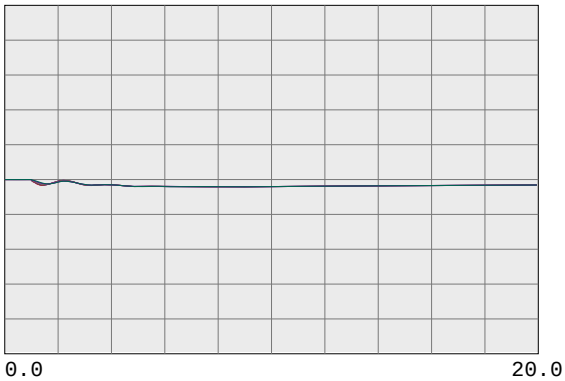
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



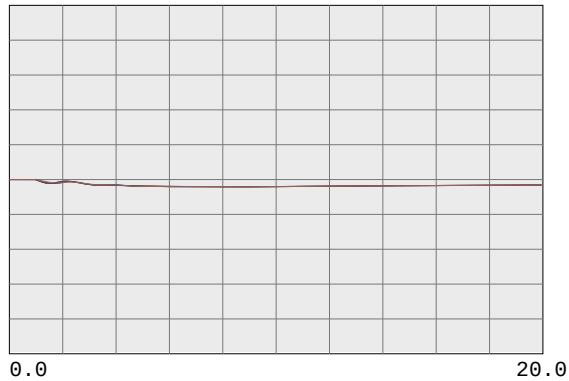
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



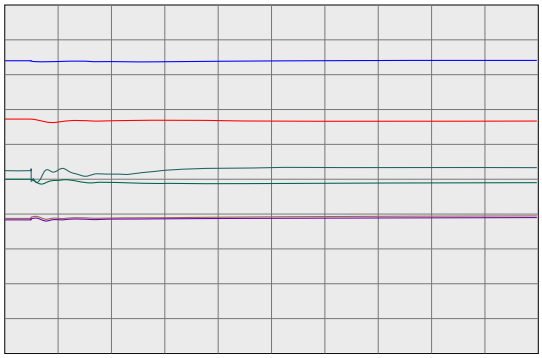
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

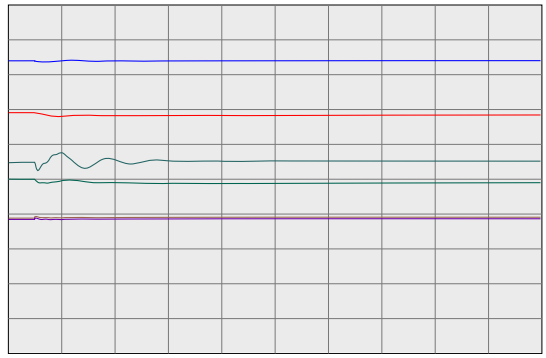
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

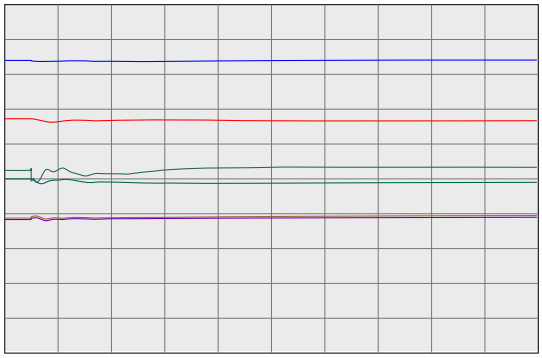
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

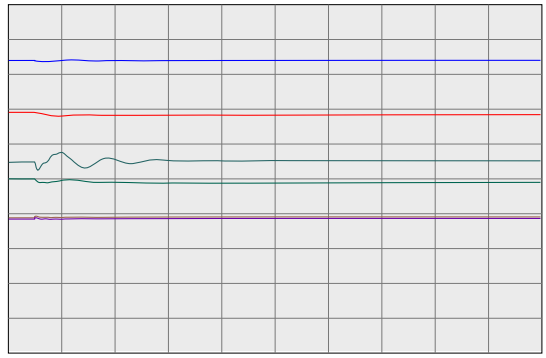
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

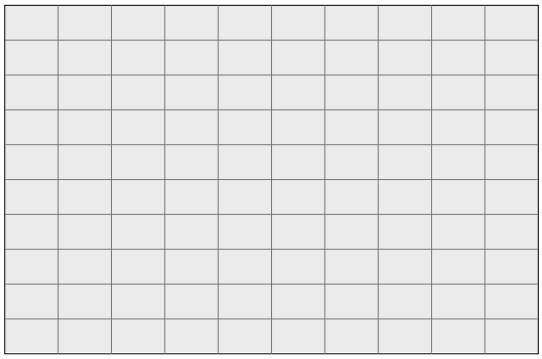
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

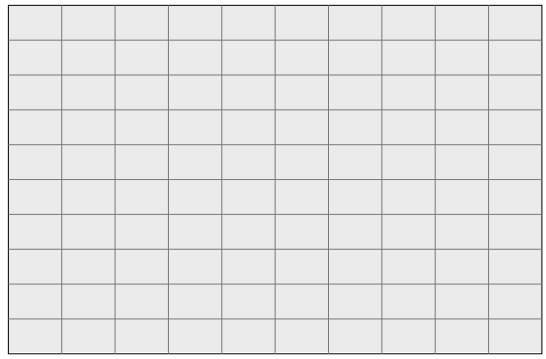


0.0 20.0

Time(sec)

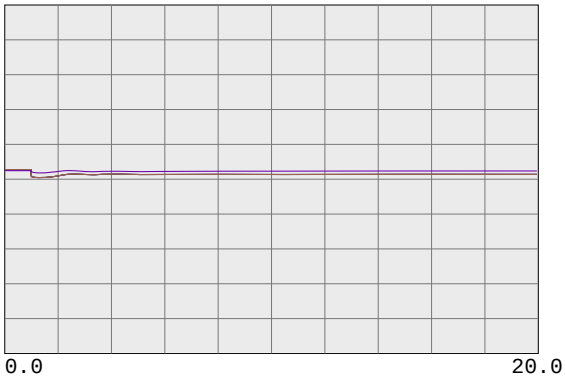
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



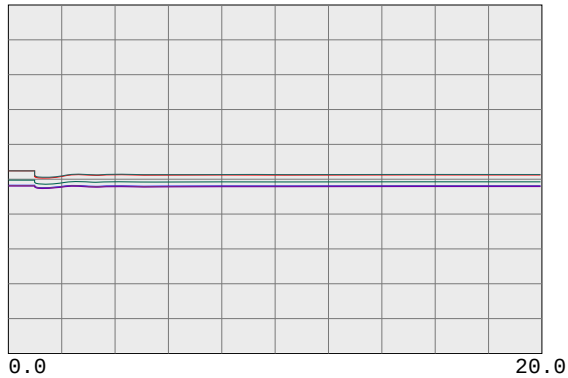


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

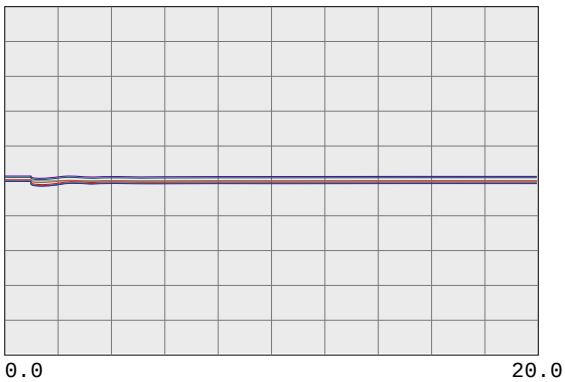
230-KV SYSTEM VOLTAGES



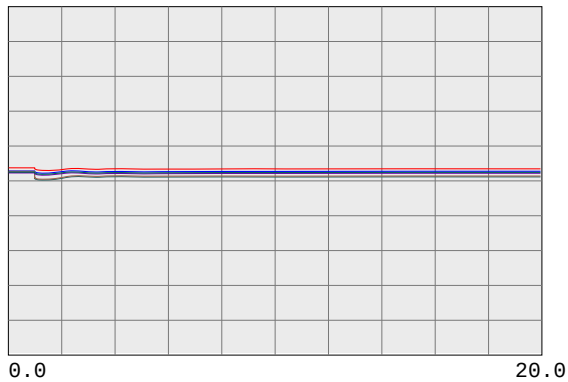
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



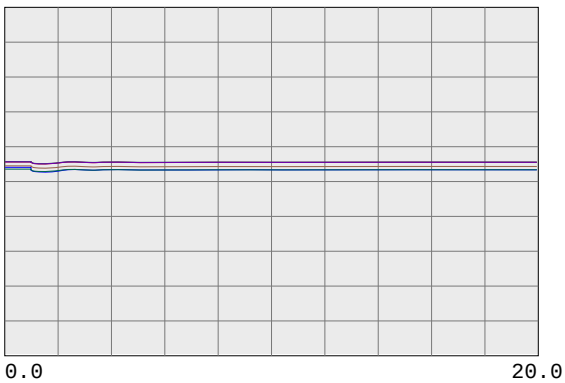
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



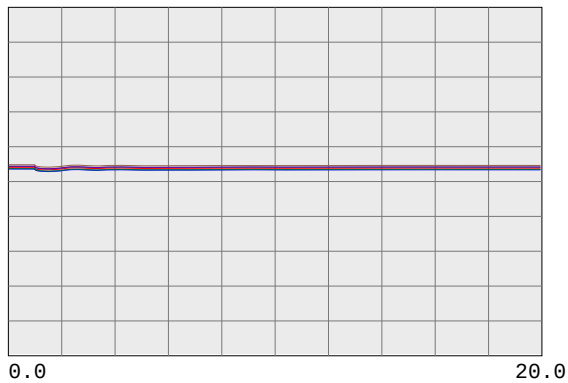
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



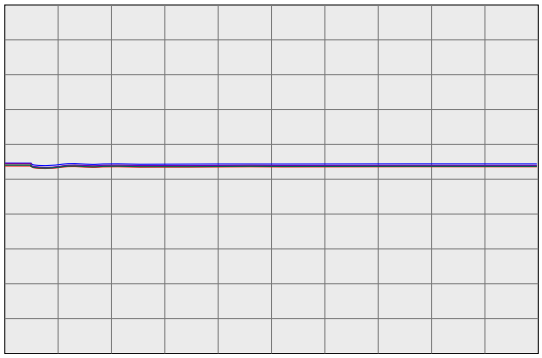
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

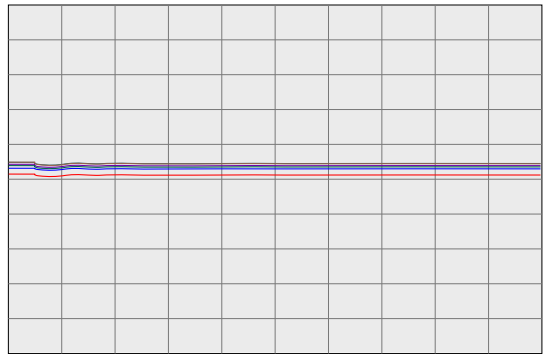
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

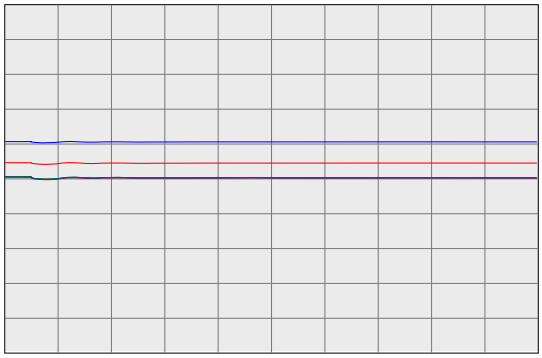
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

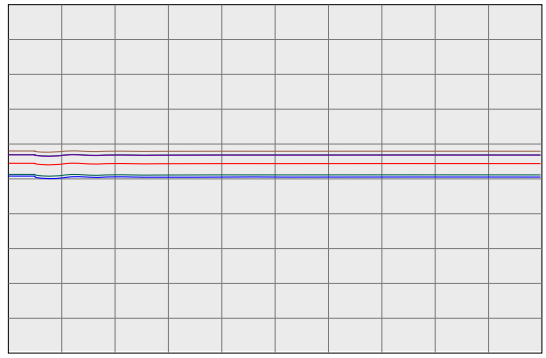
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

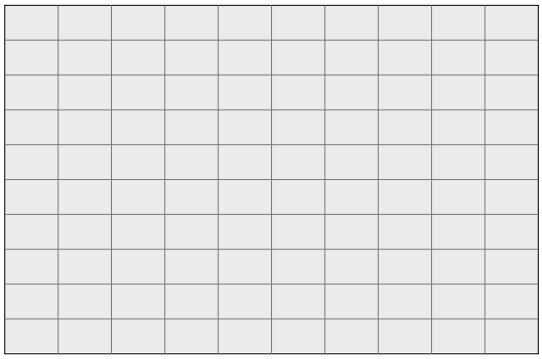
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

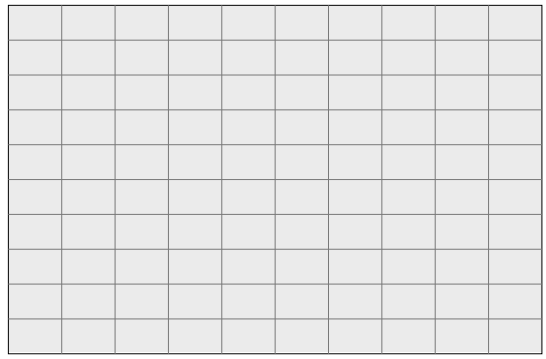


0.0 20.0

Time(sec)

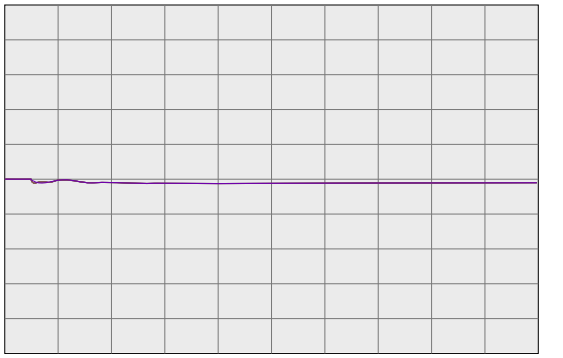
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



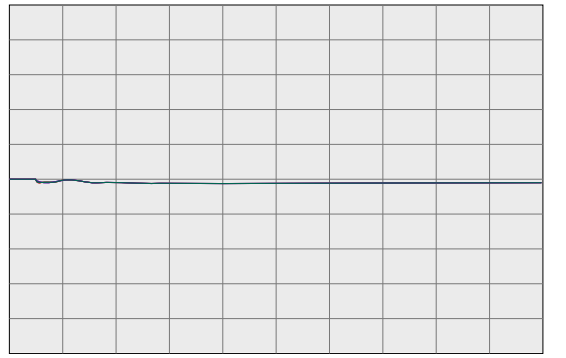


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

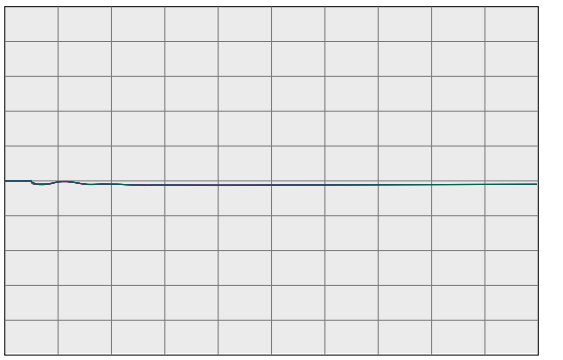
230-KV SYSTEM FREQUENCIES



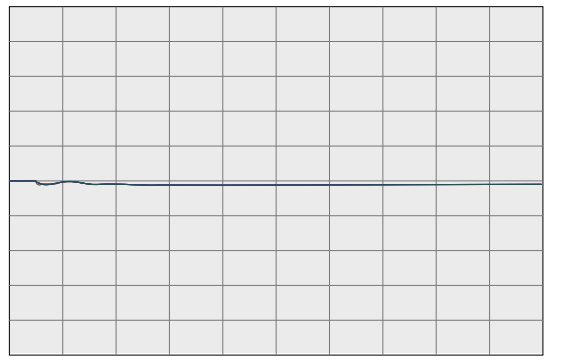
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



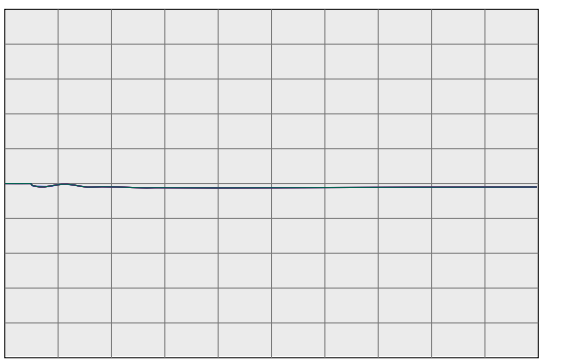
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



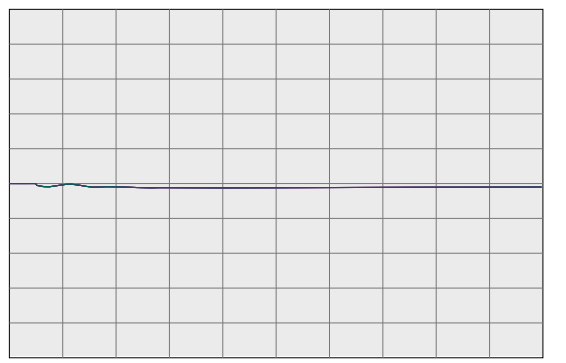
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



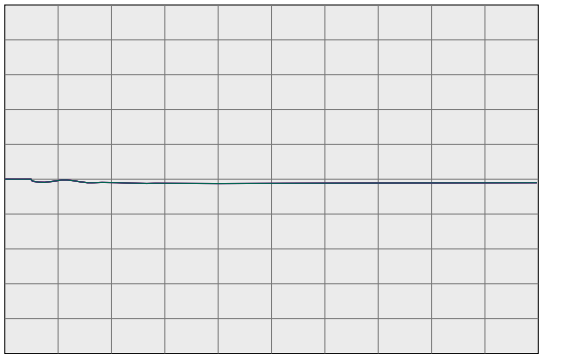
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



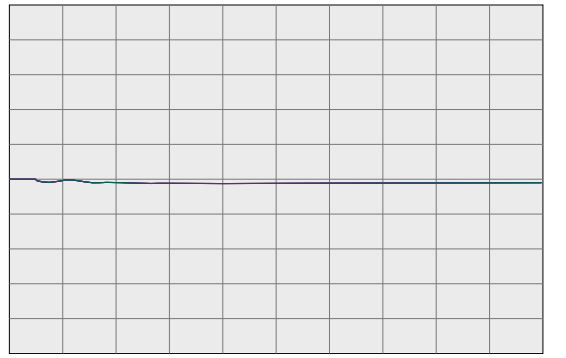
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

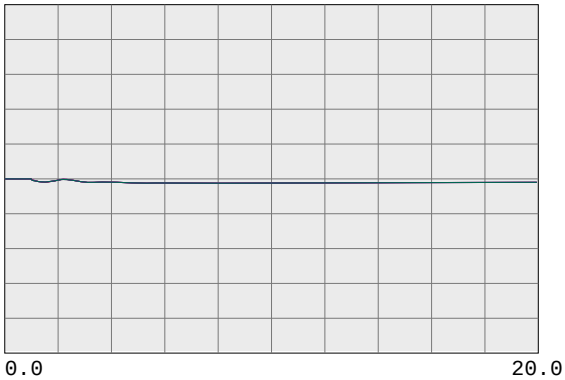
230-KV SYSTEM FREQUENCIES



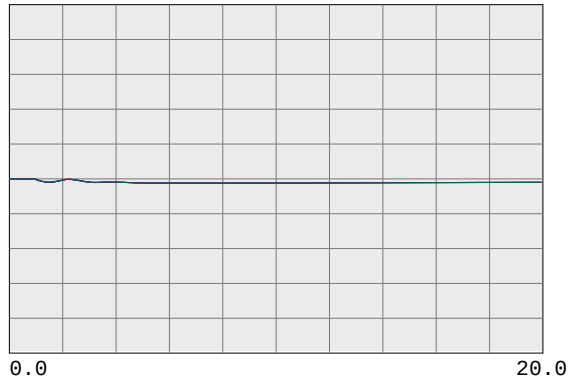
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



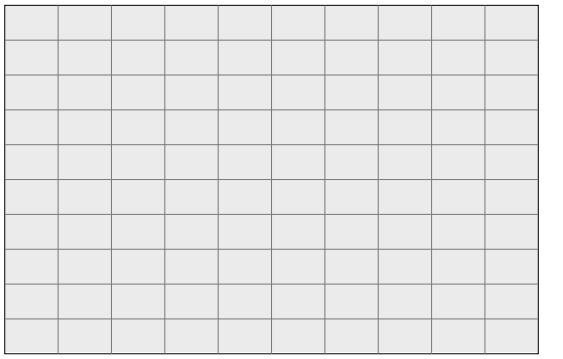
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

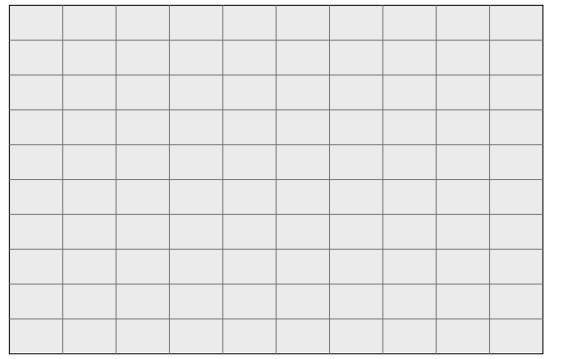


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



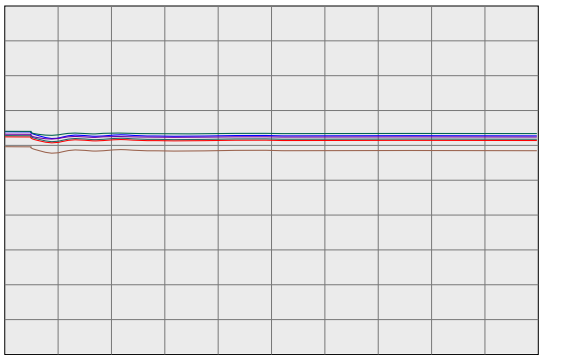
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



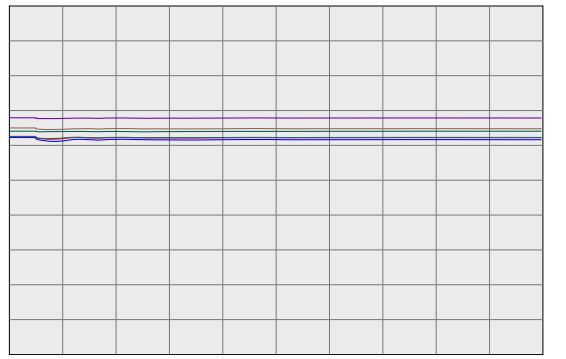


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

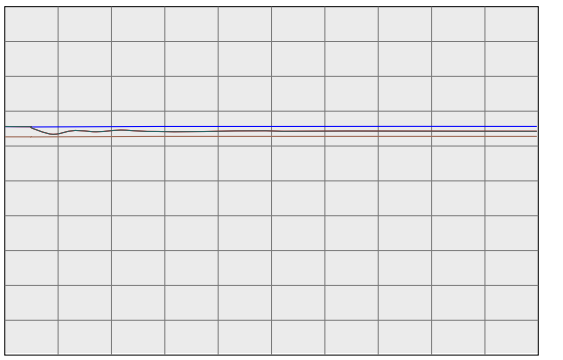
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



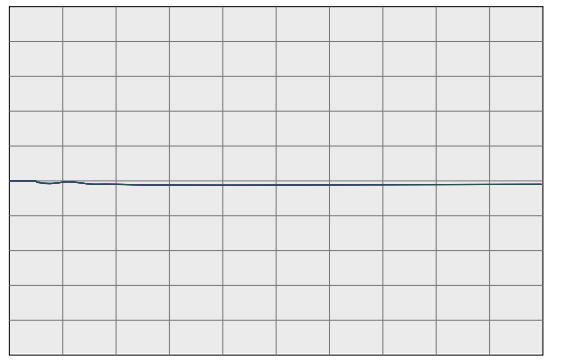
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



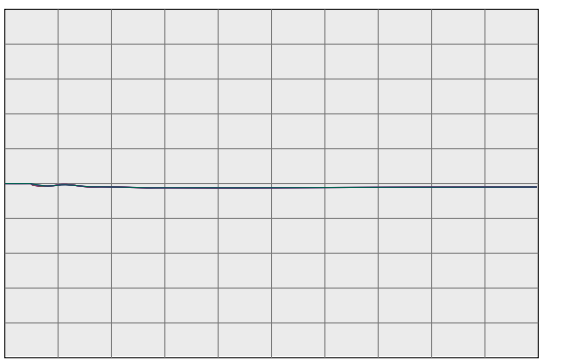
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



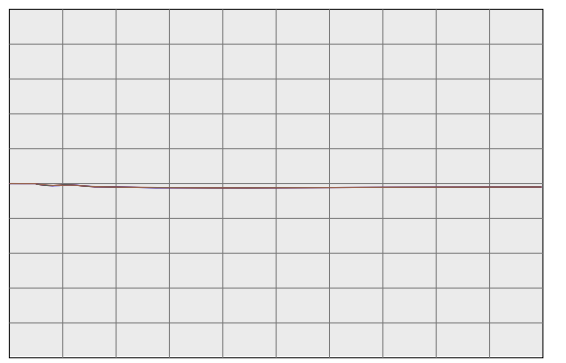
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



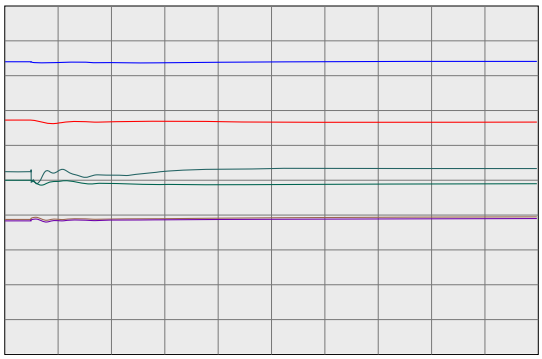
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

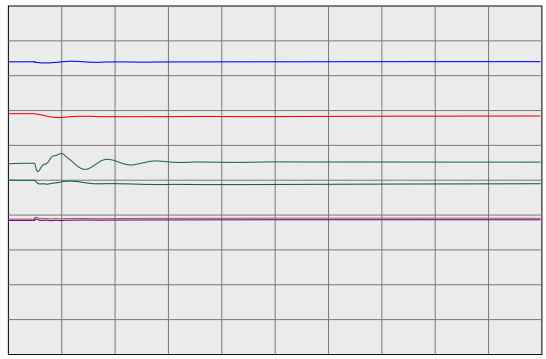
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

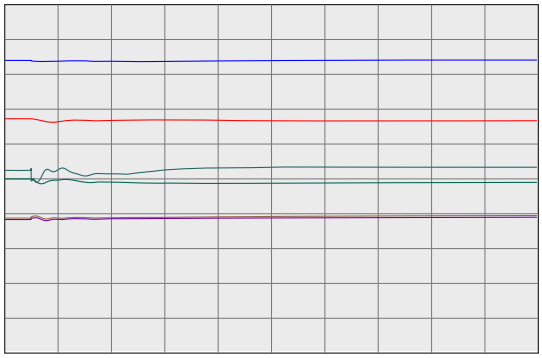
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

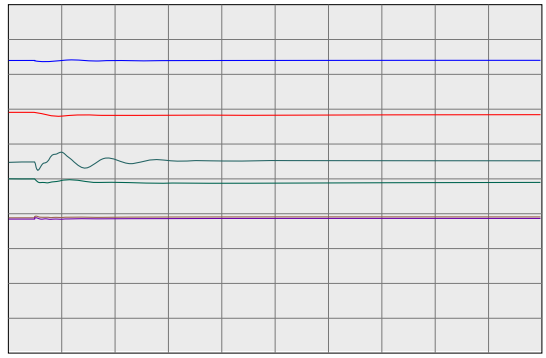
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

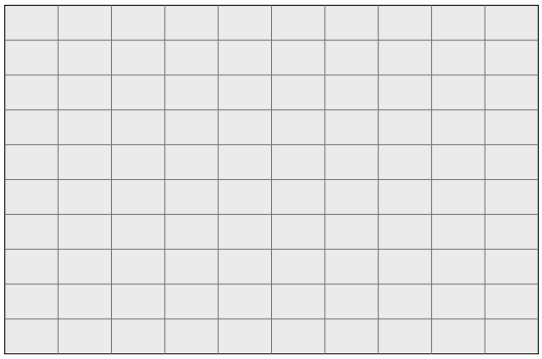
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

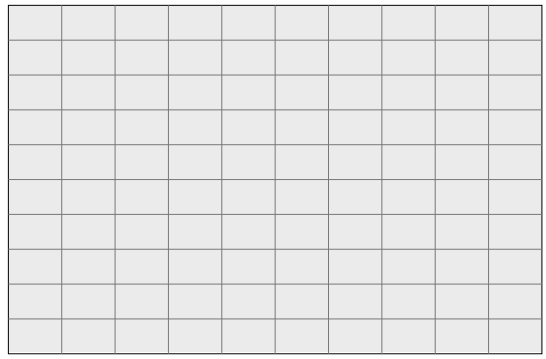


0.0 20.0

Time(sec)

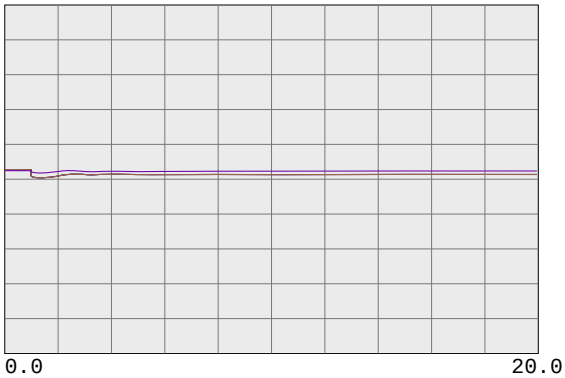
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



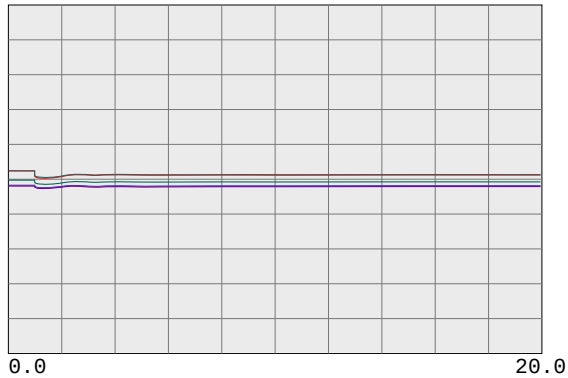


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

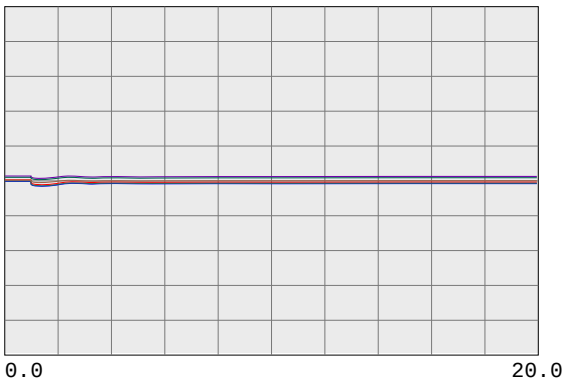
230-KV SYSTEM VOLTAGES



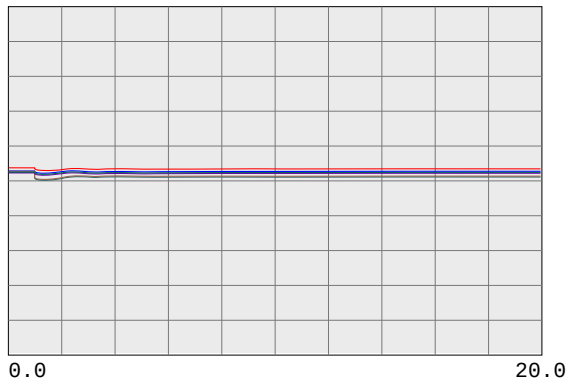
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



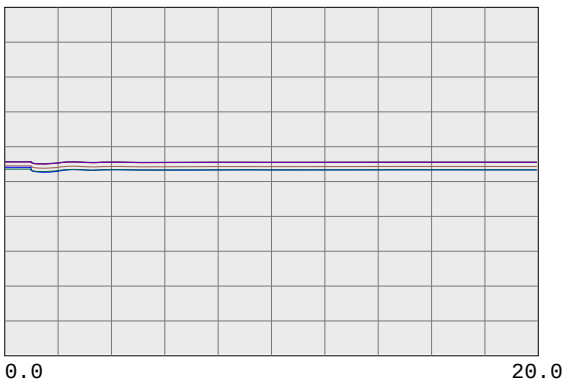
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



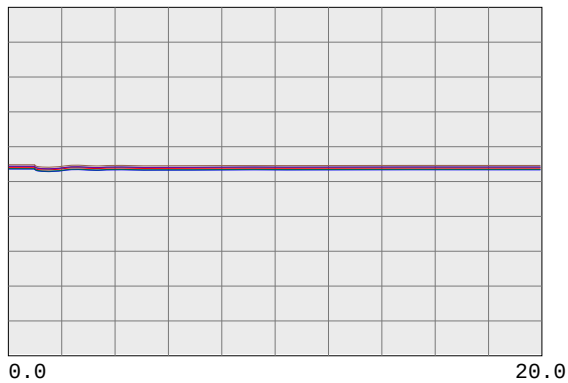
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



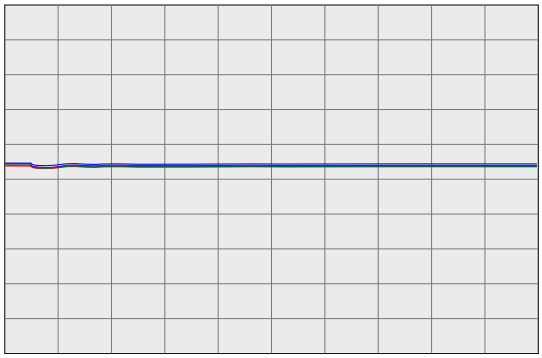
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

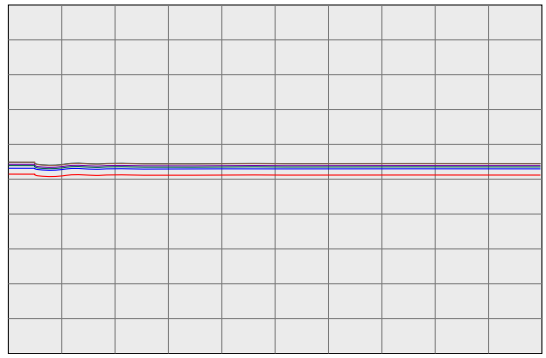
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

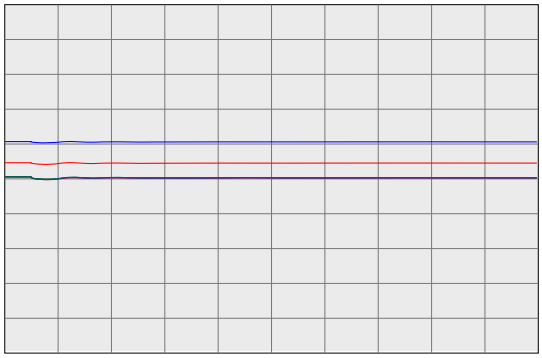
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

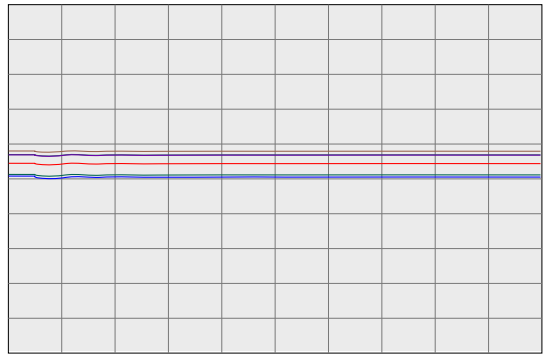
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

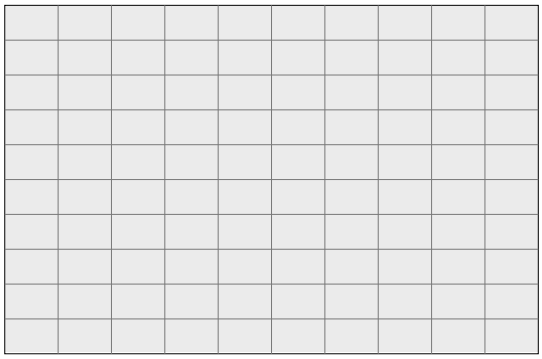
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

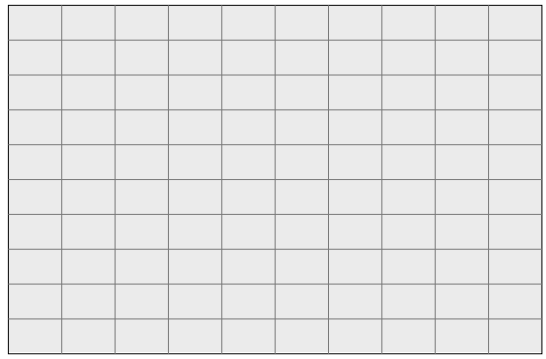


0.0 20.0

Time(sec)

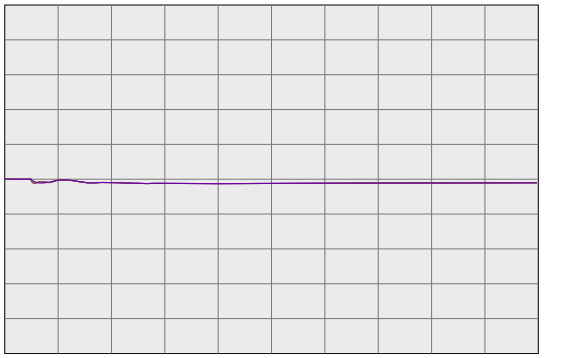
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



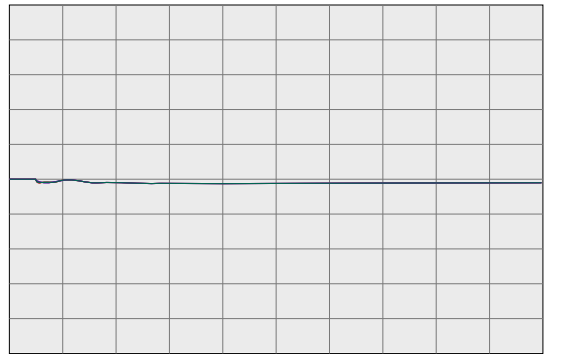


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

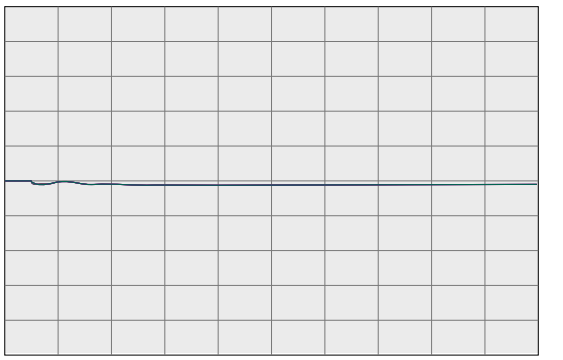
230-KV SYSTEM FREQUENCIES



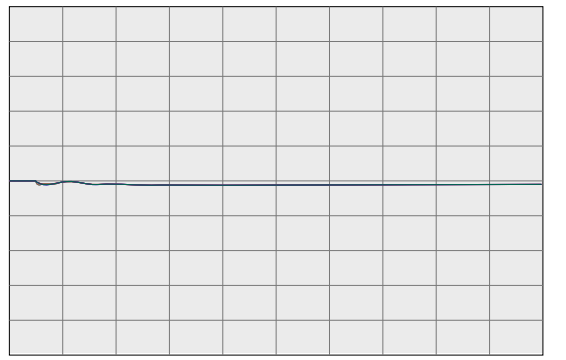
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



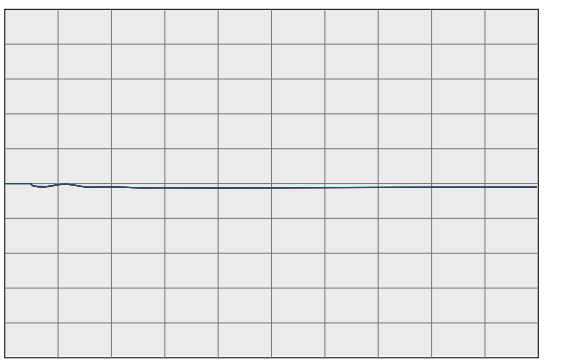
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



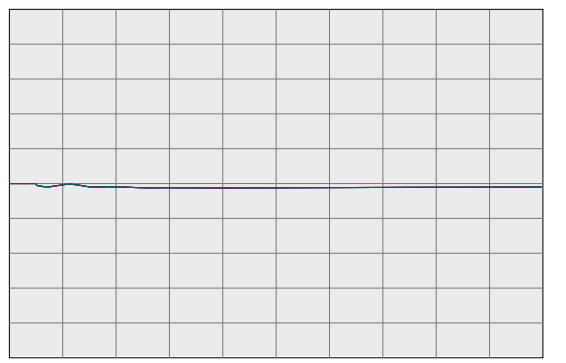
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



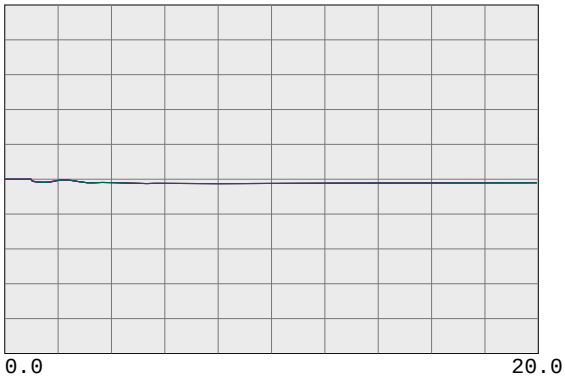
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



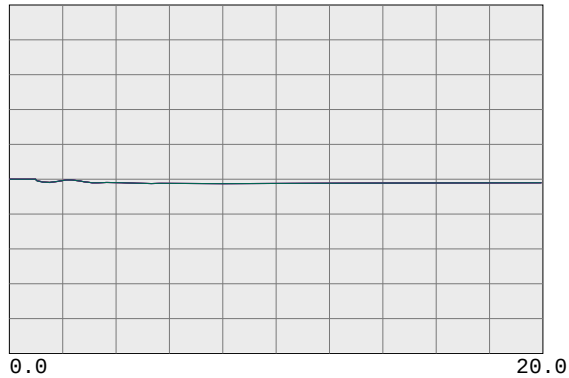
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

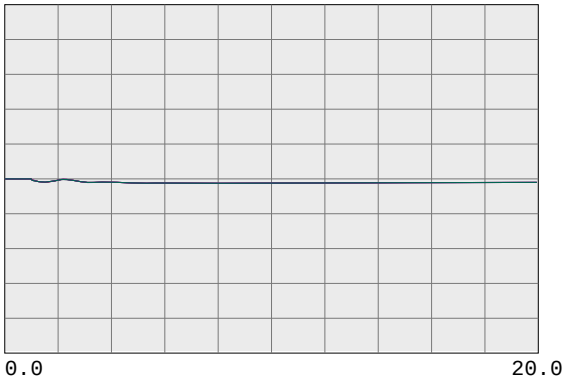
230-KV SYSTEM FREQUENCIES



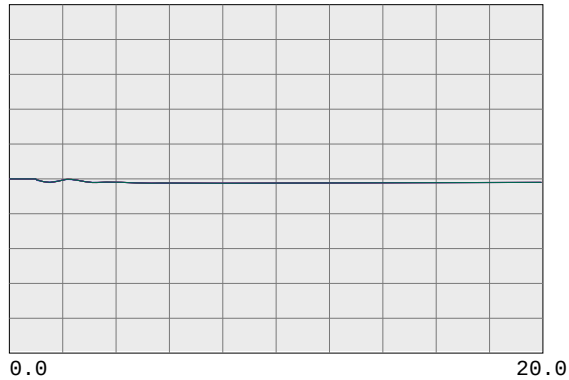
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



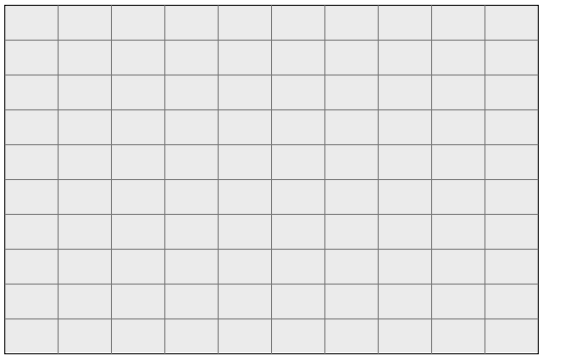
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

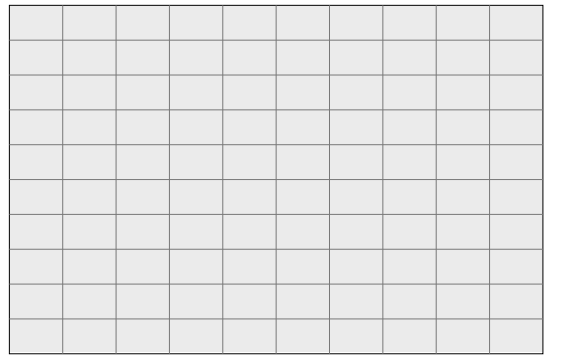


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



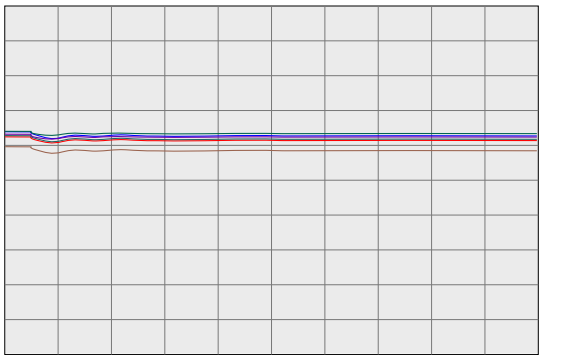
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



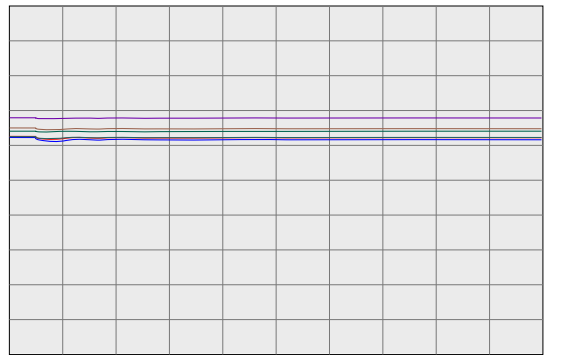


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

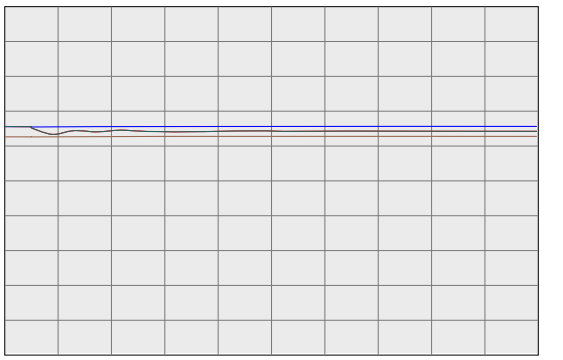
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



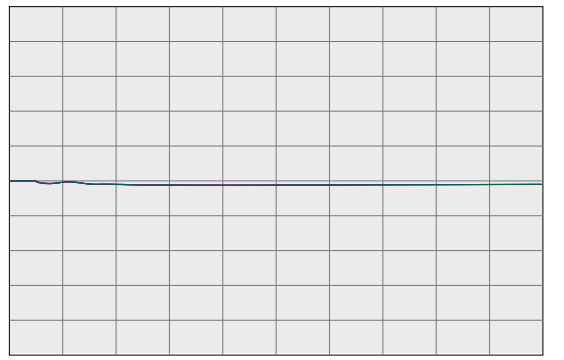
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



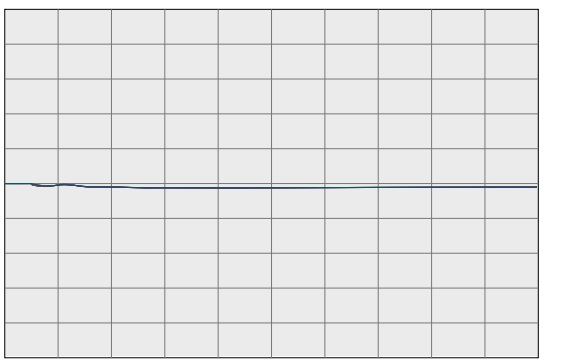
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



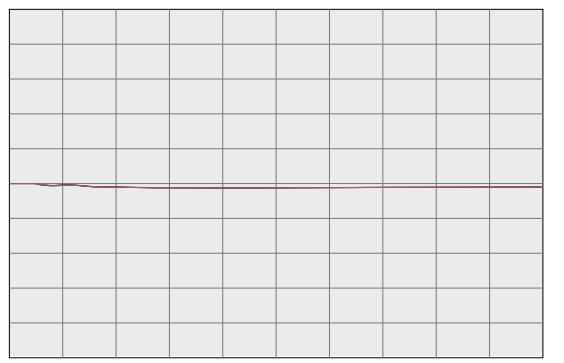
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



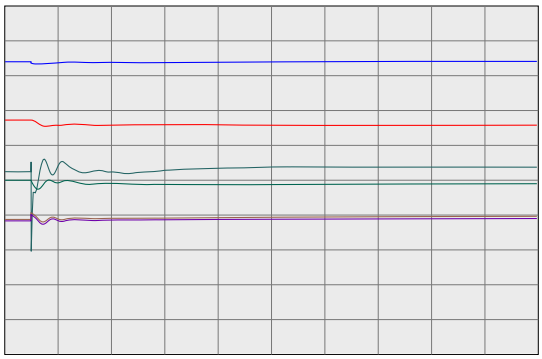
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

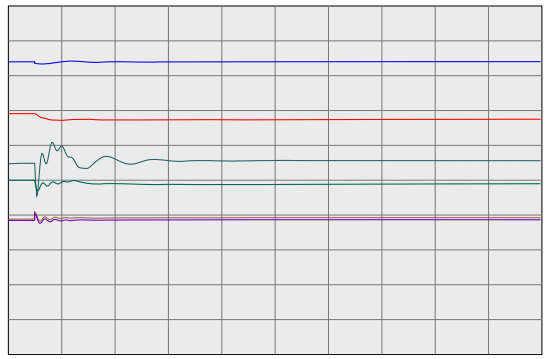
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

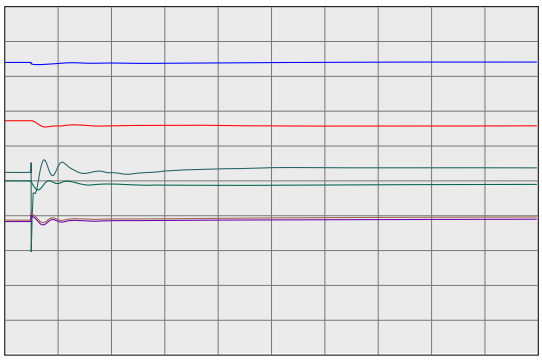
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

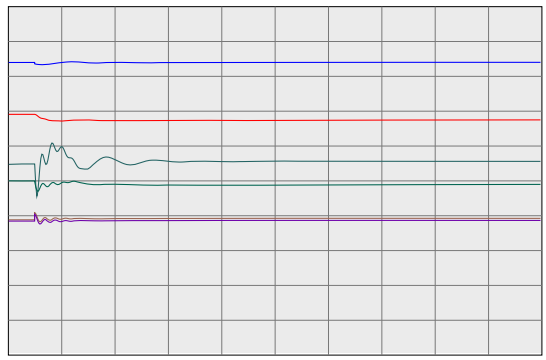
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

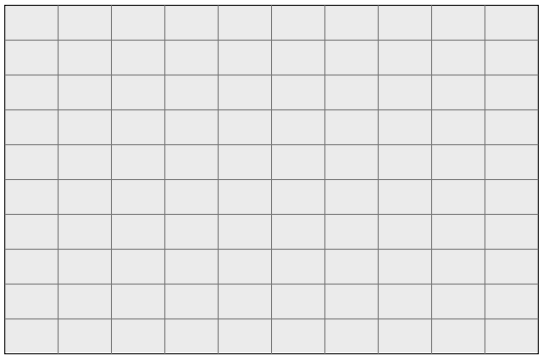
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

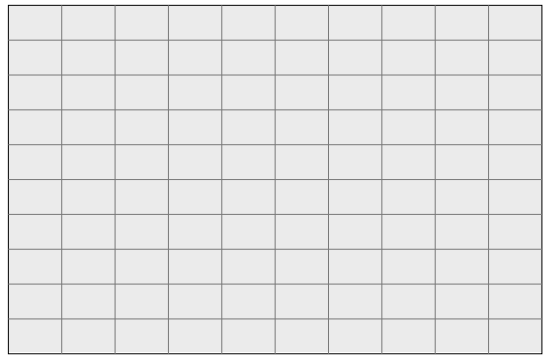


0.0 20.0

Time(sec)

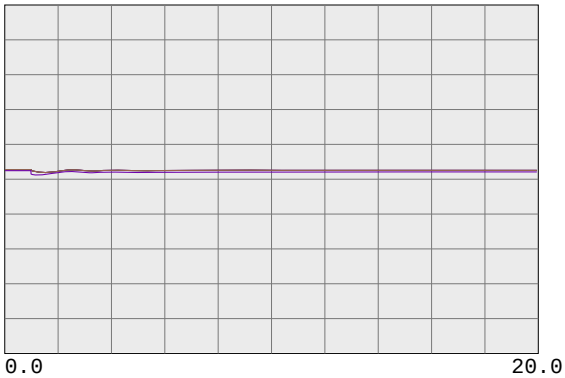
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



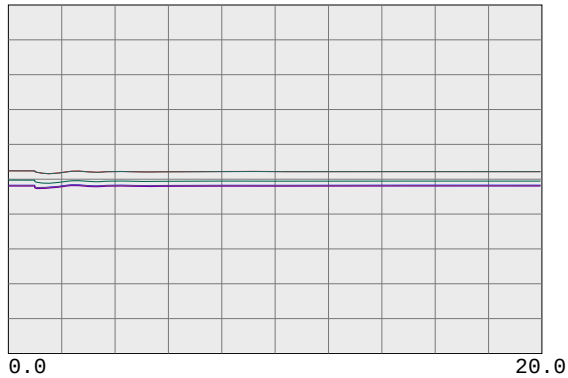


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

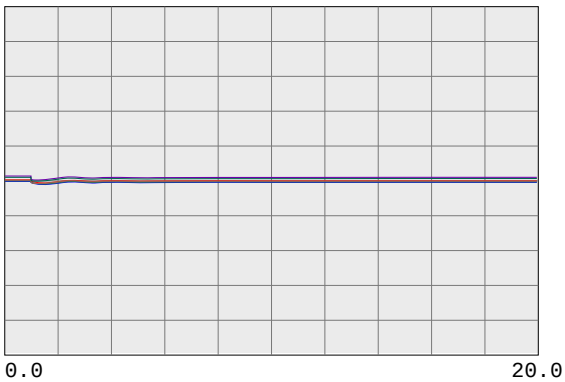
230-KV SYSTEM VOLTAGES



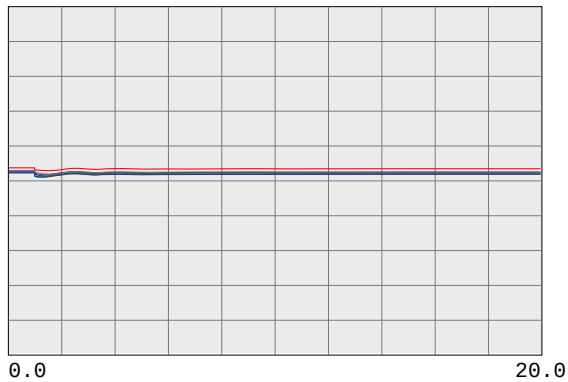
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



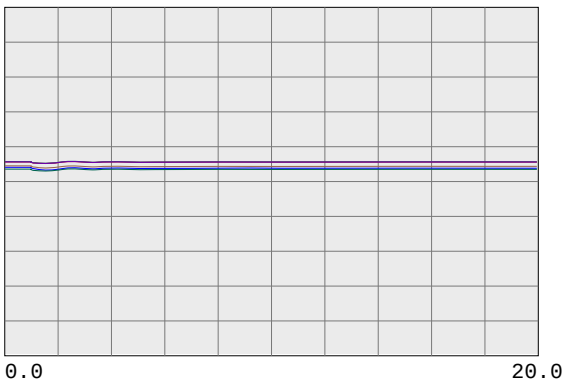
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



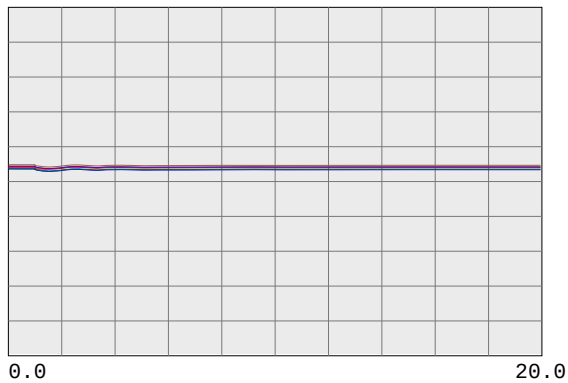
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



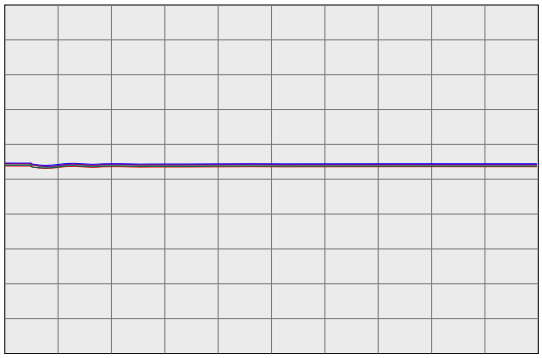
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

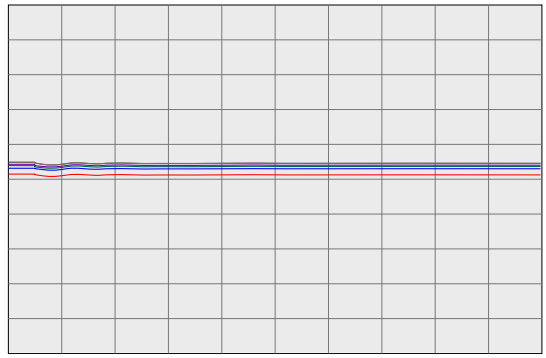
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

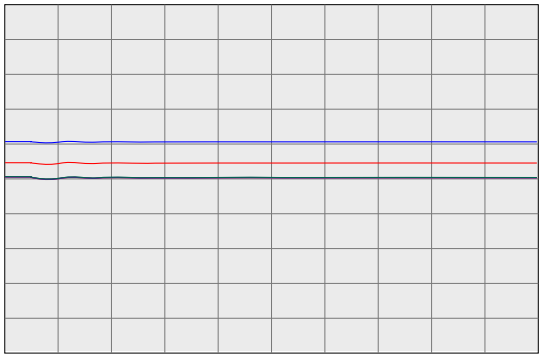
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

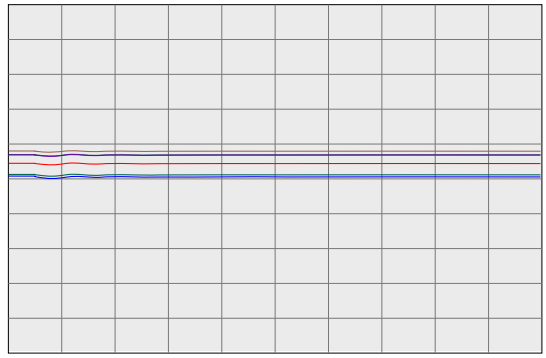
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

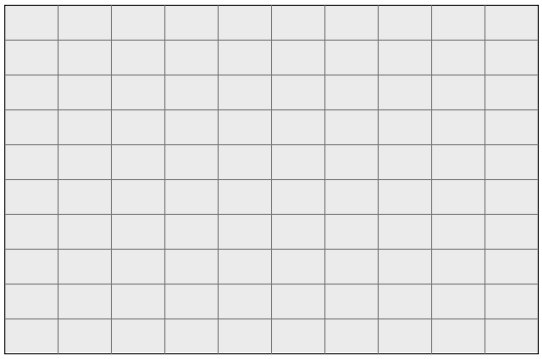
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

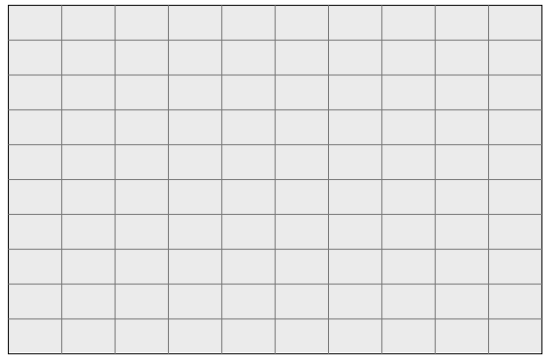


0.0 20.0

Time(sec)

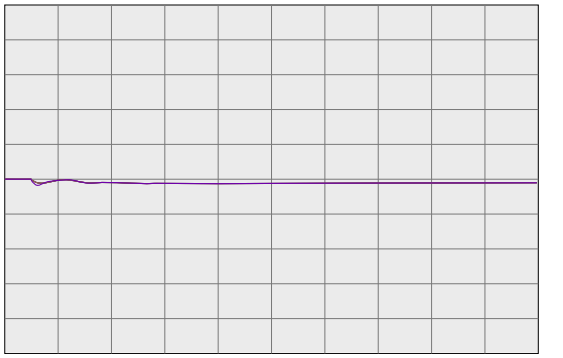
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



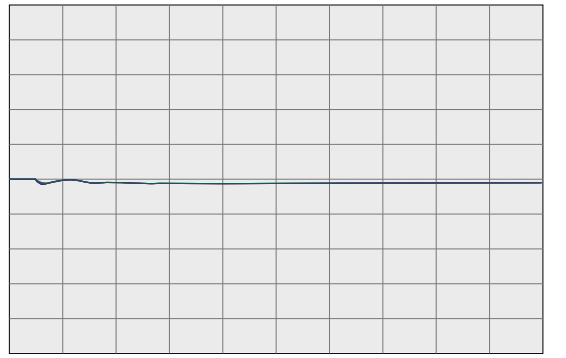


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

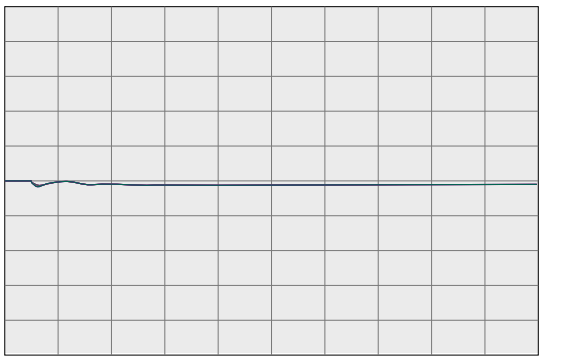
230-KV SYSTEM FREQUENCIES



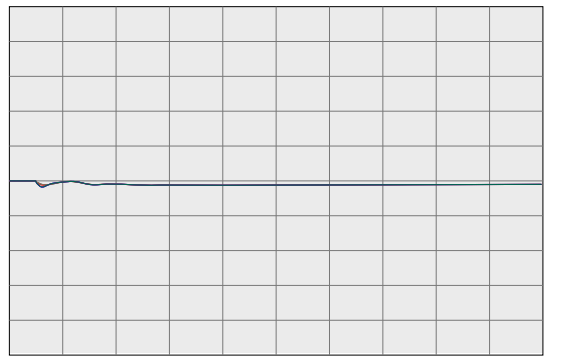
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



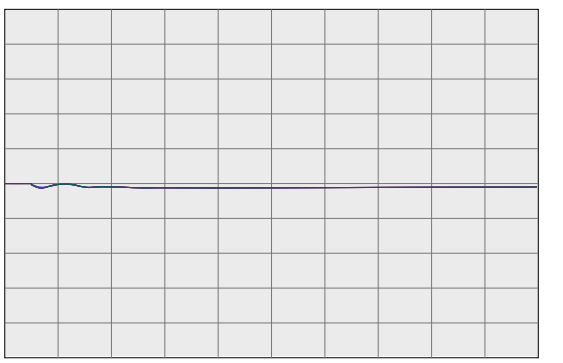
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



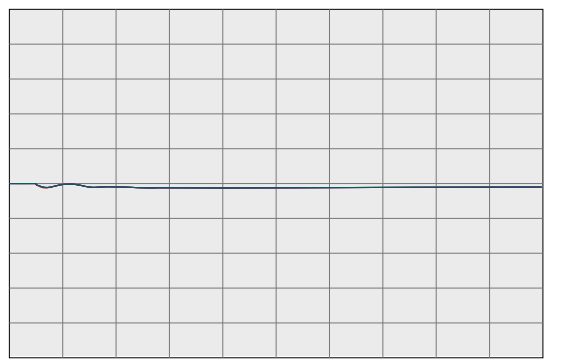
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



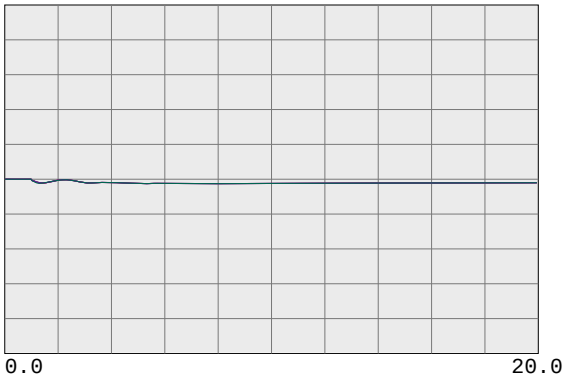
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



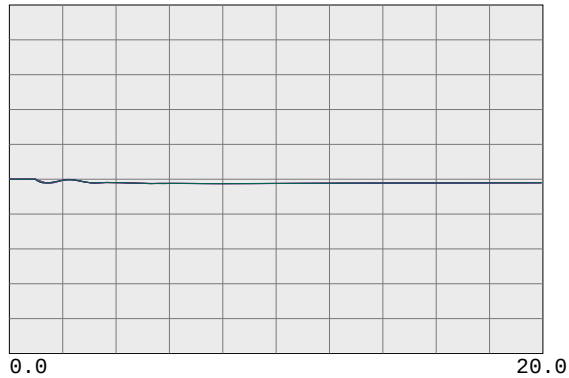
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

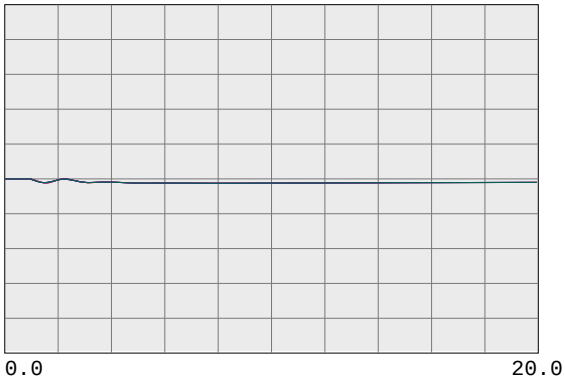
230-KV SYSTEM FREQUENCIES



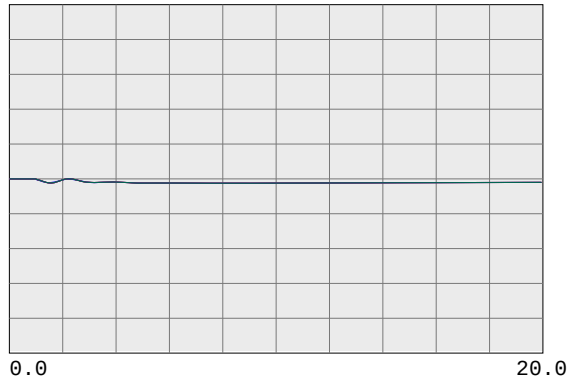
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



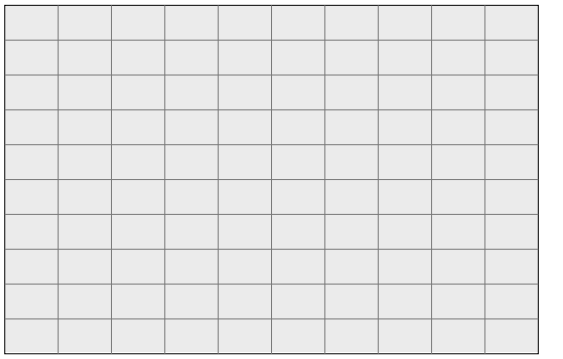
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

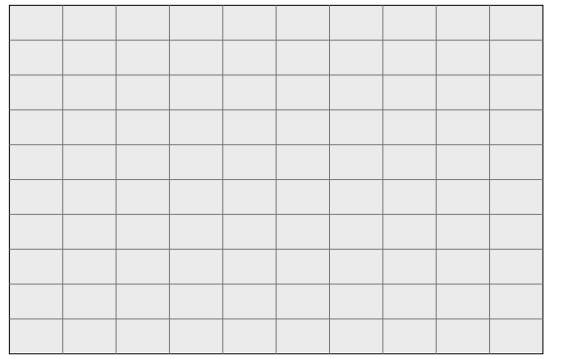


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



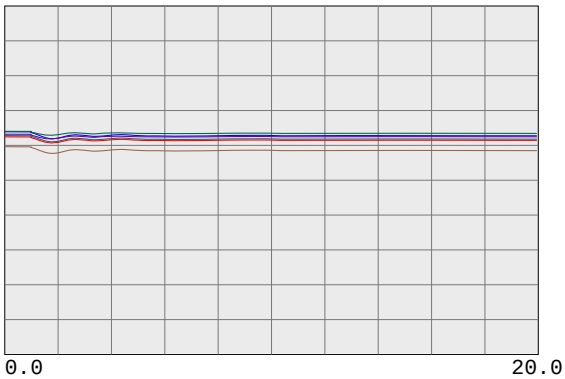
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



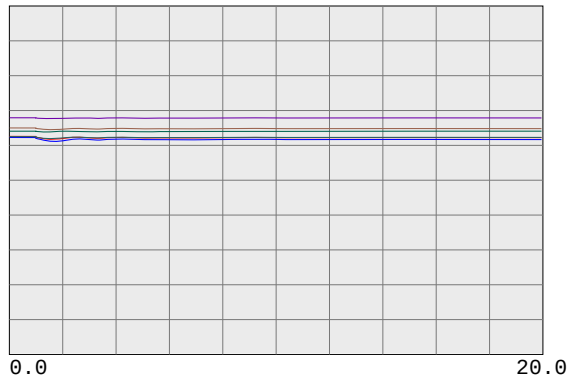


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

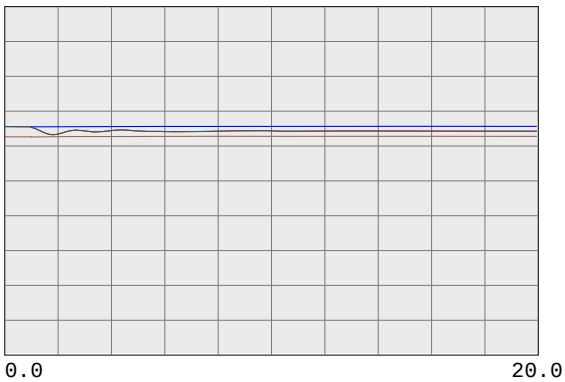
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



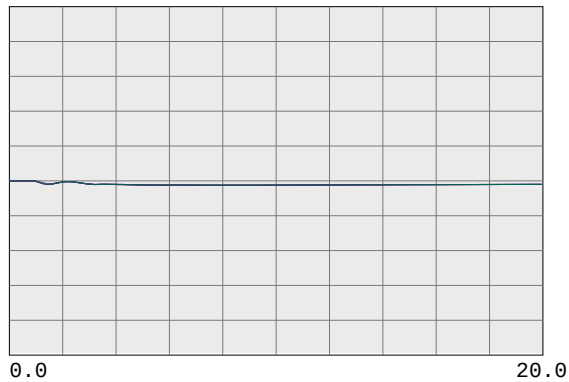
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



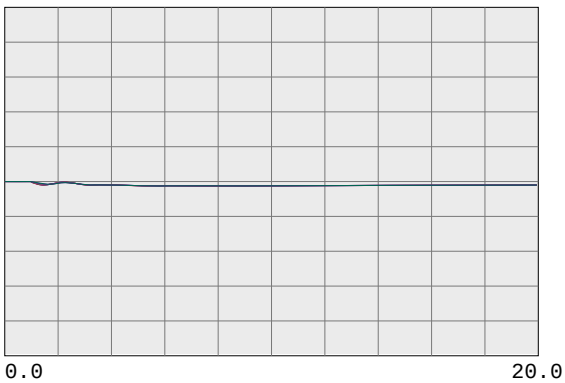
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



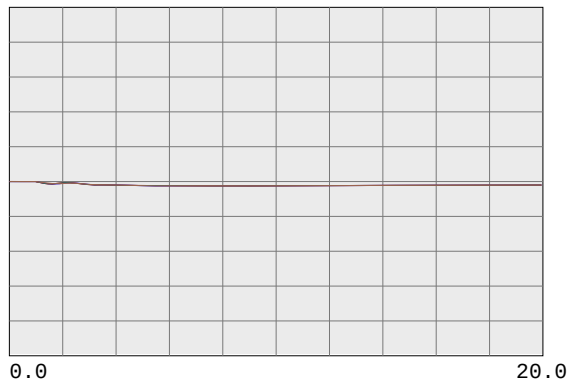
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



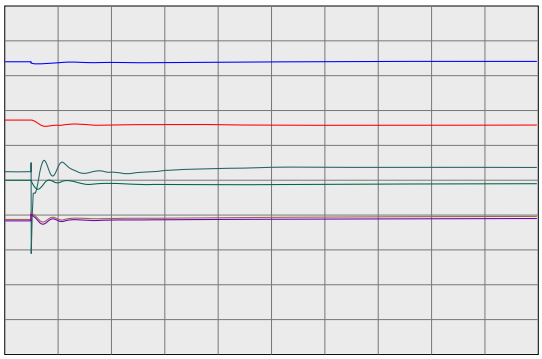
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



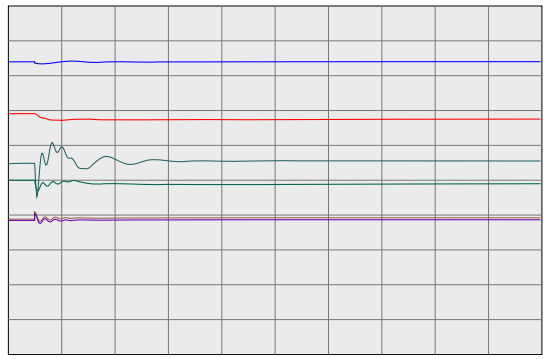
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

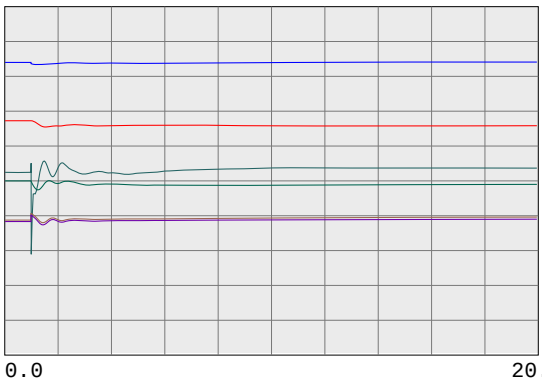
WILLOW PASS GENERATION PLANT



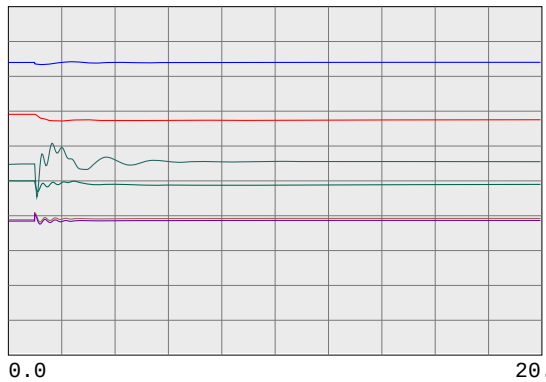
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



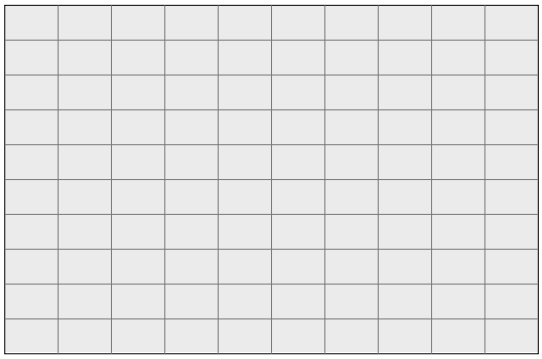
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

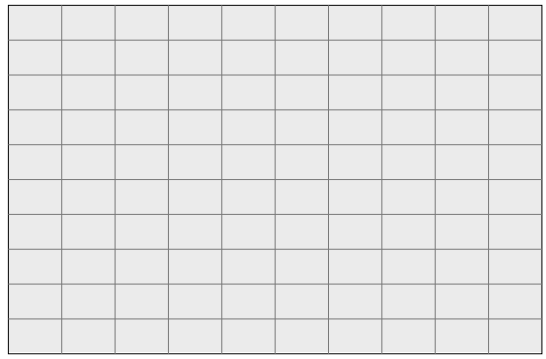


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



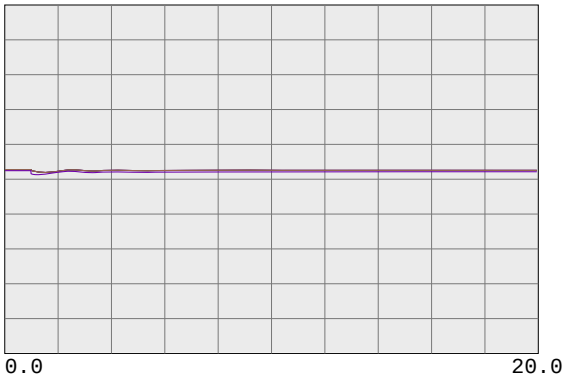
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



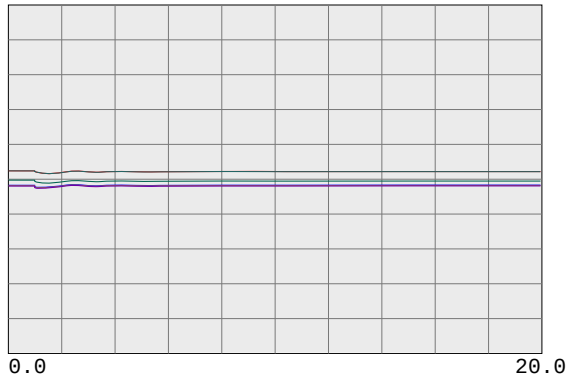


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

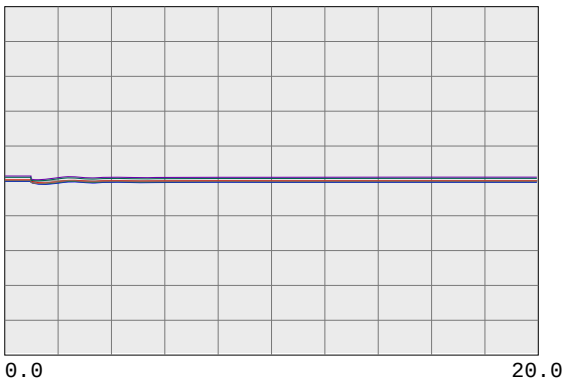
230-KV SYSTEM VOLTAGES



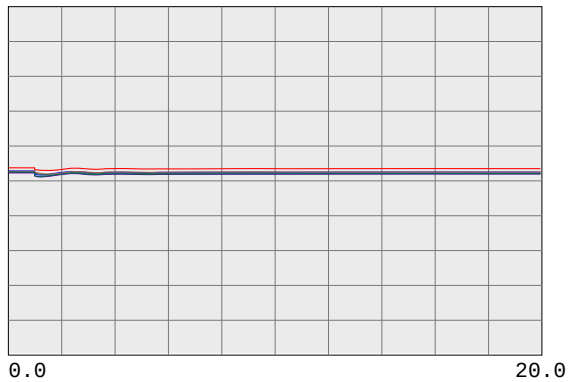
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



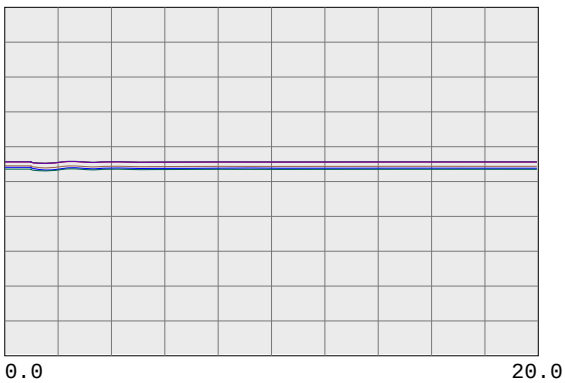
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



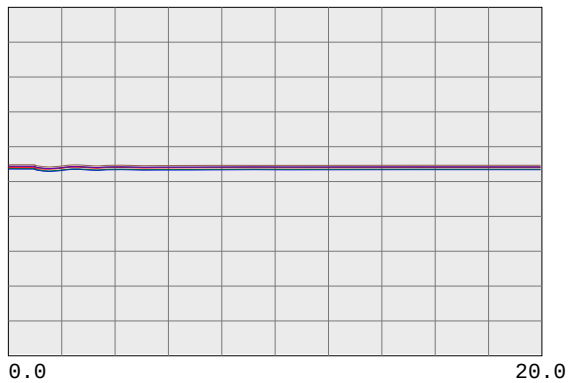
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



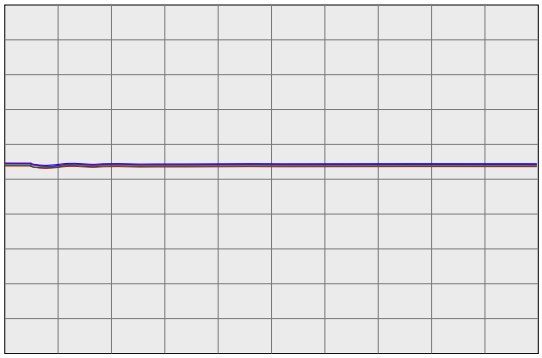
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

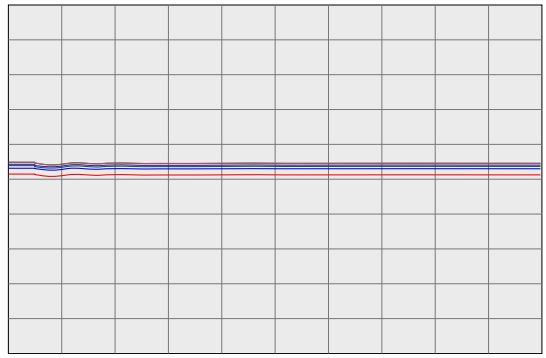
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

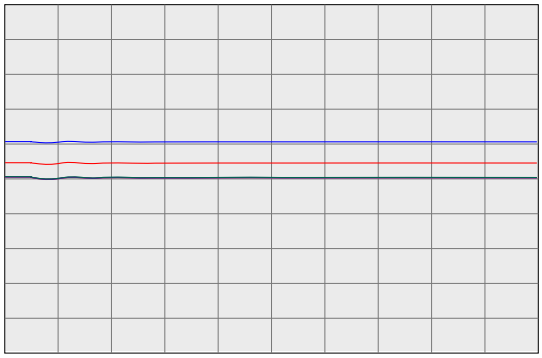
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

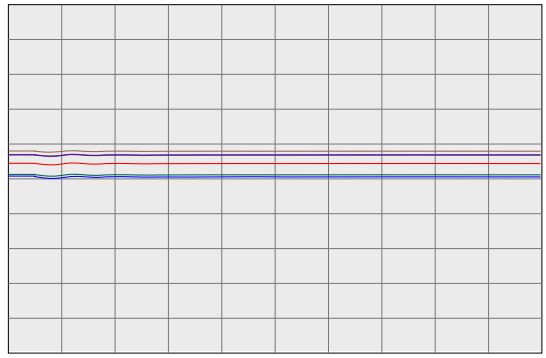
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

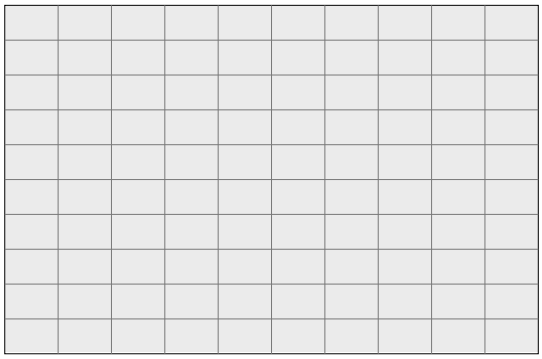
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

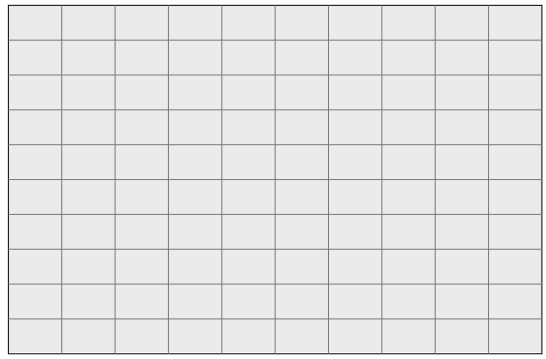


0.0 20.0

Time(sec)

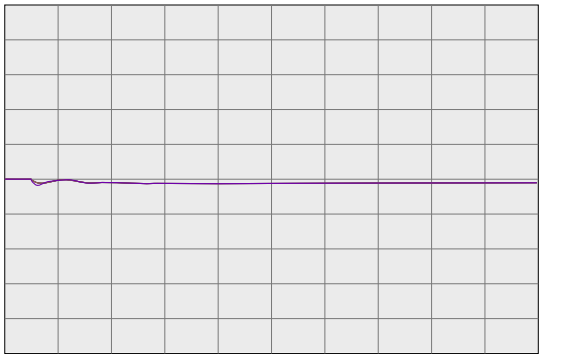
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



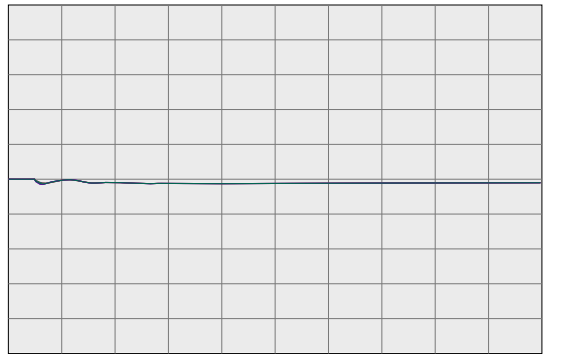


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

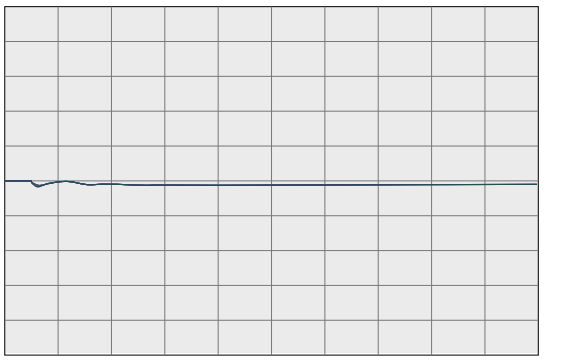
230-KV SYSTEM FREQUENCIES



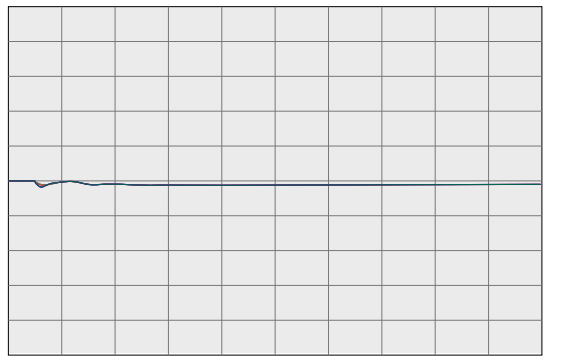
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



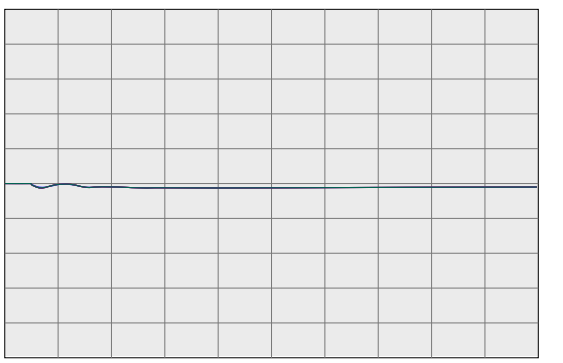
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



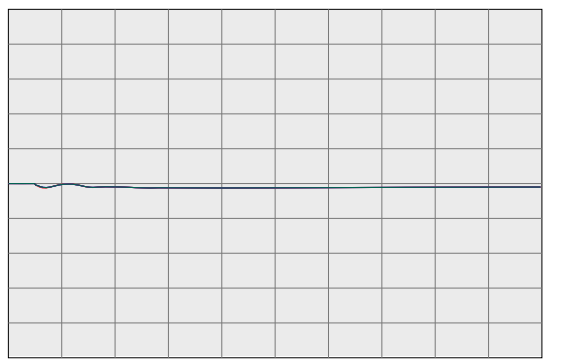
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



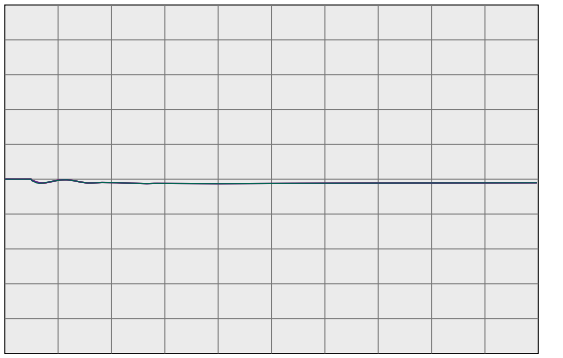
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



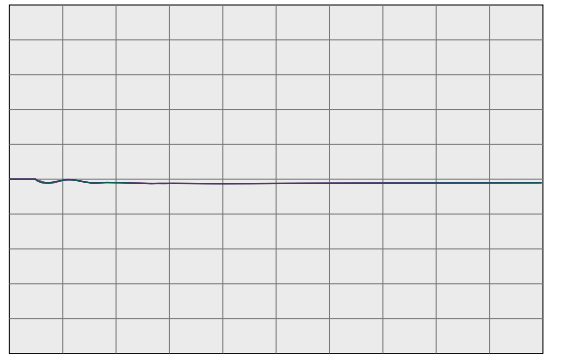
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

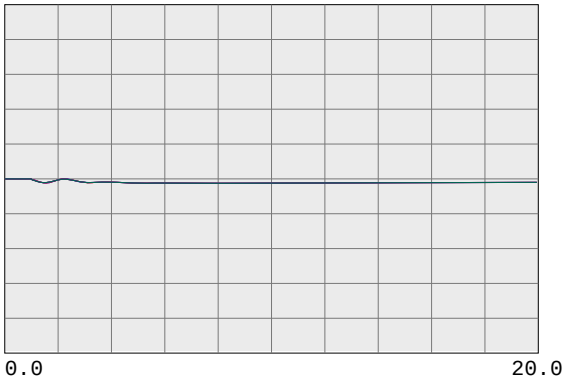
230-KV SYSTEM FREQUENCIES



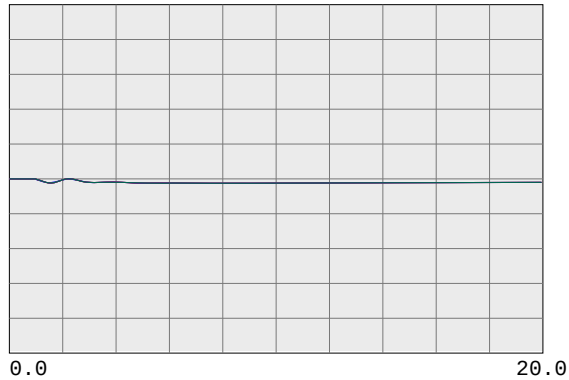
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



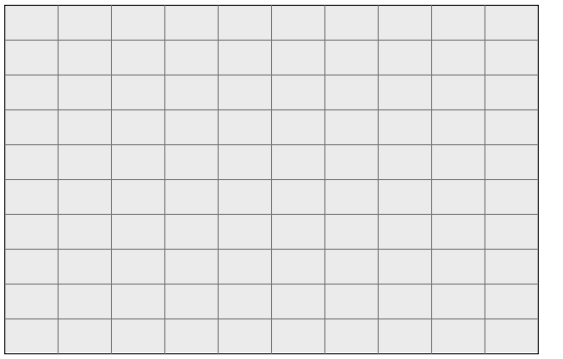
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

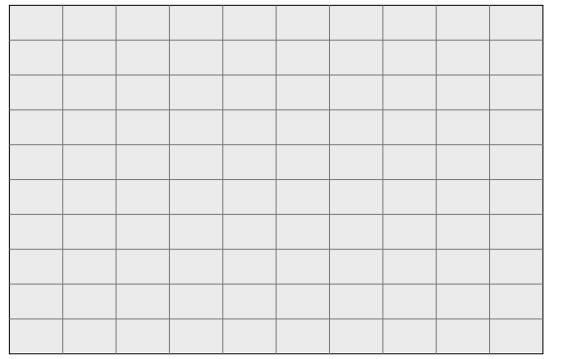


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



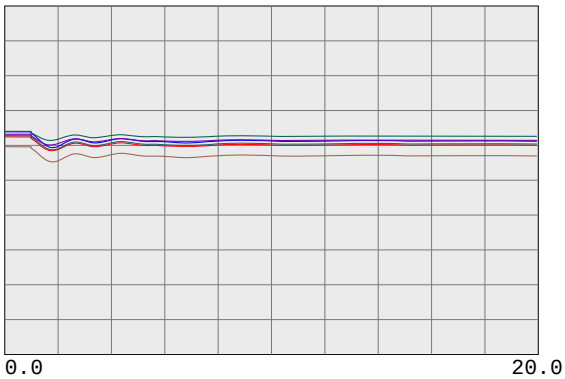
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



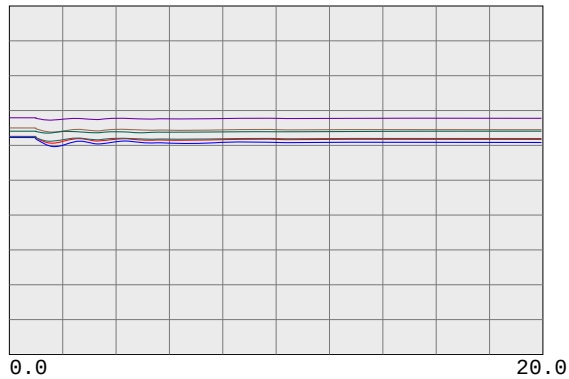


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

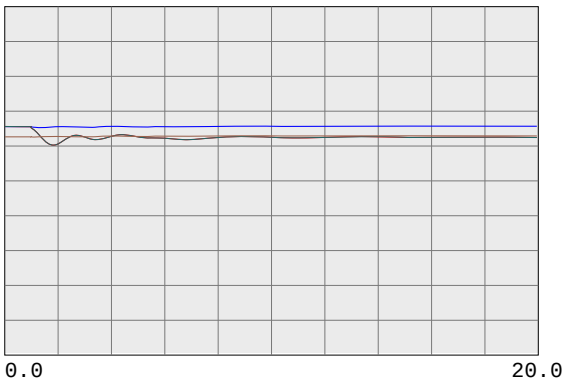
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



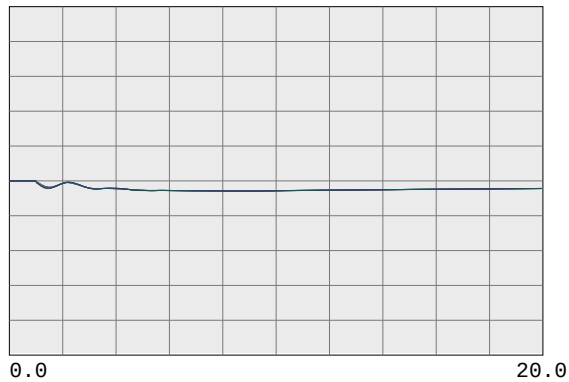
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



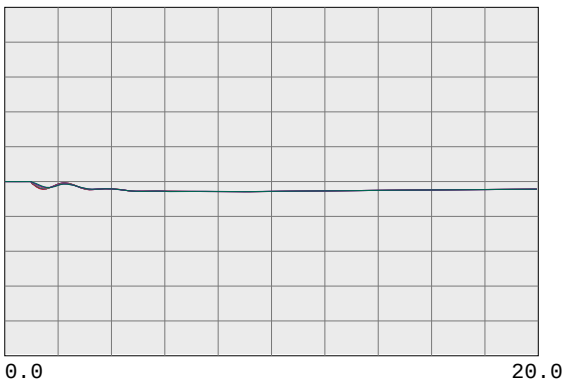
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



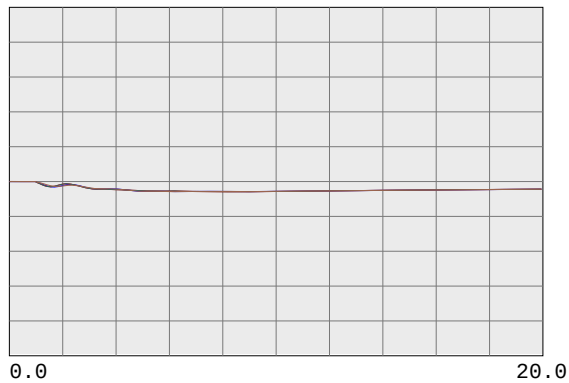
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



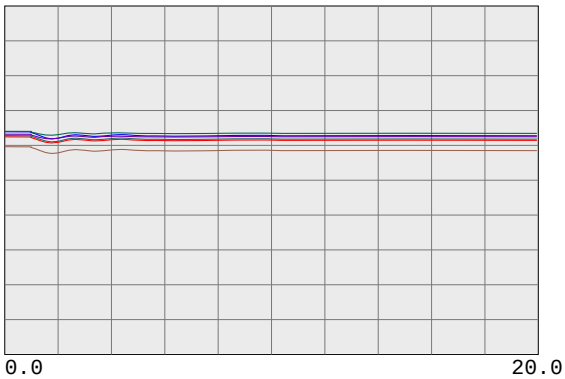
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



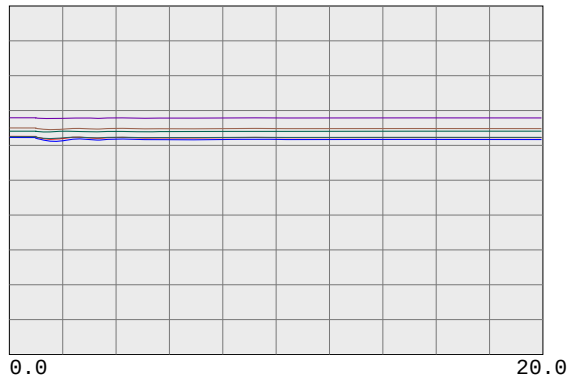
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

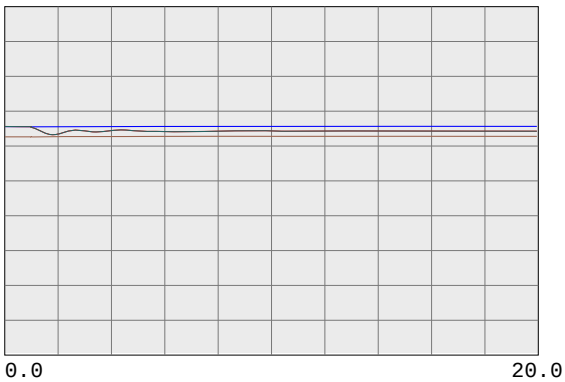
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



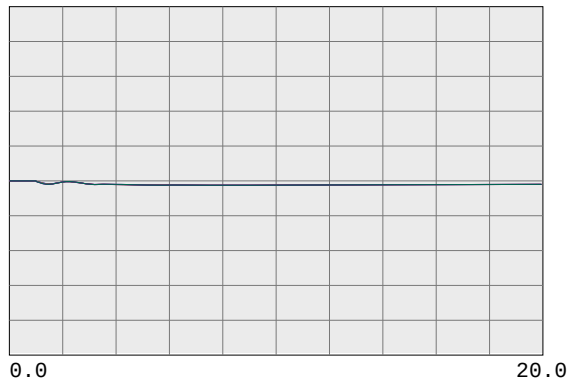
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



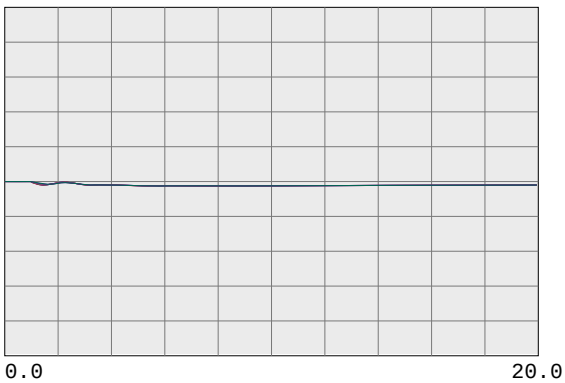
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



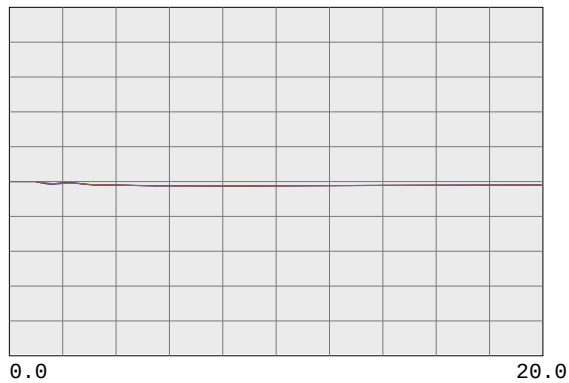
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



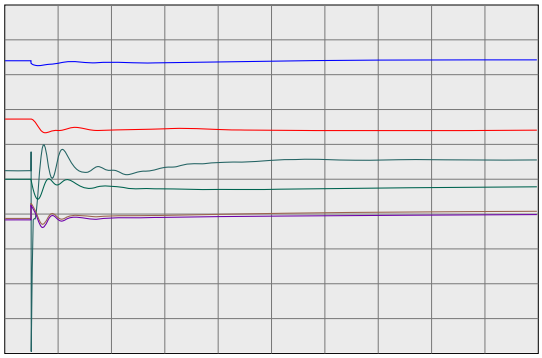
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

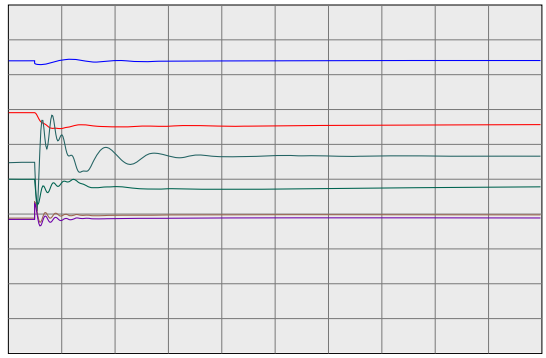
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

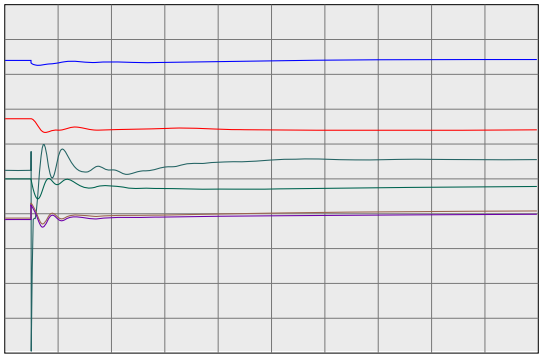
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

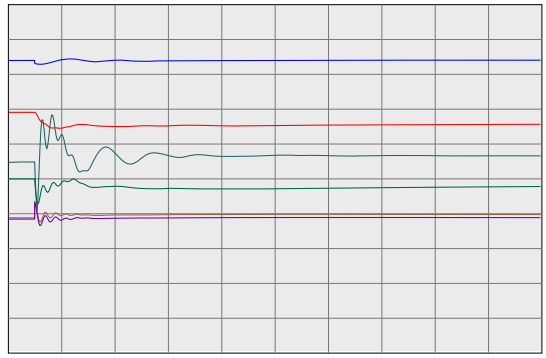
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

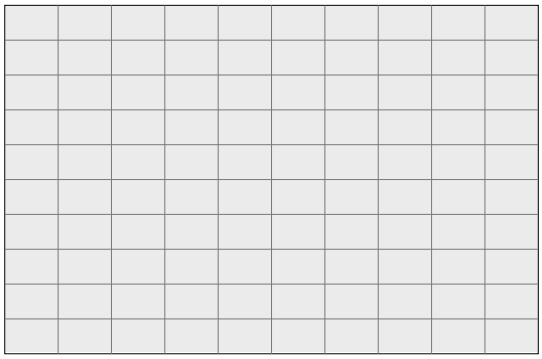
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

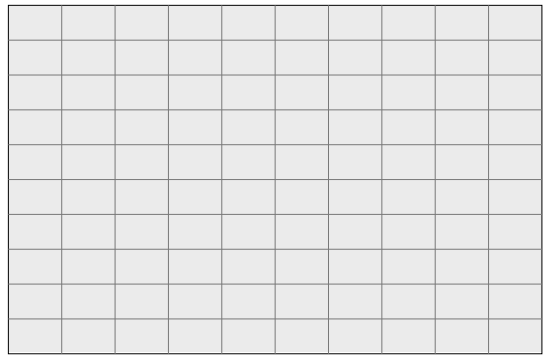


0.0 20.0

Time(sec)

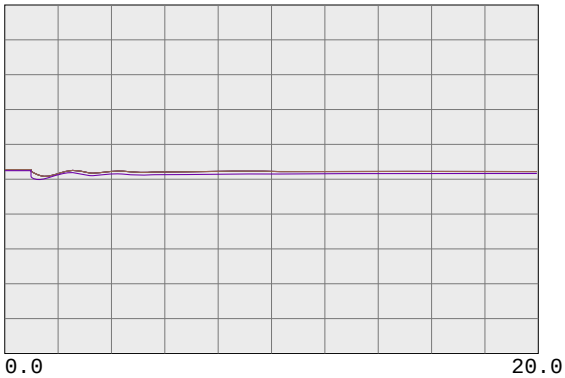
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



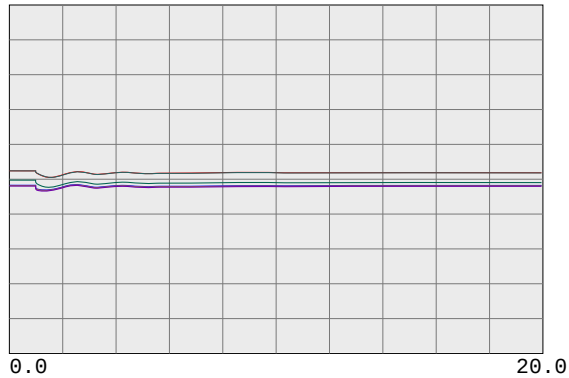


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

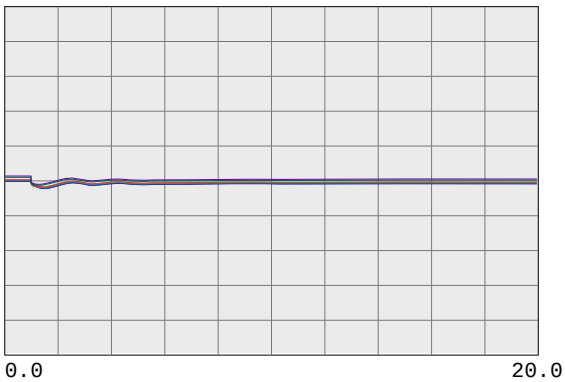
230-KV SYSTEM VOLTAGES



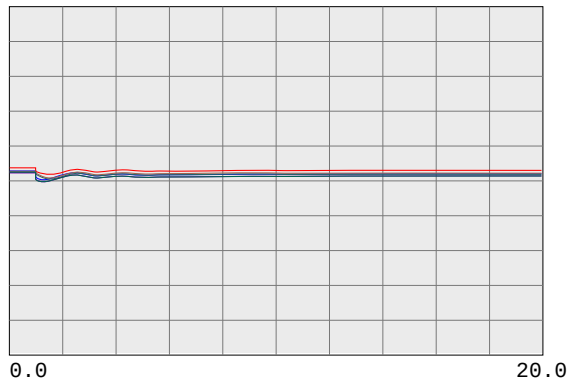
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



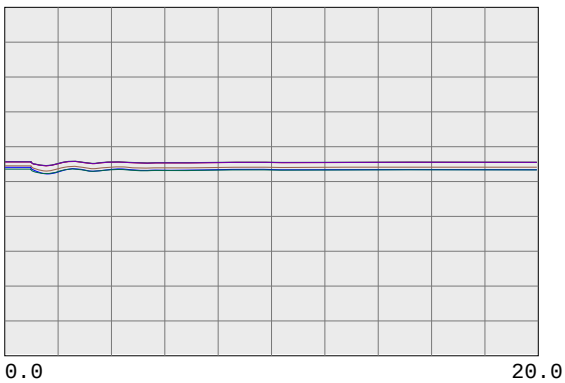
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



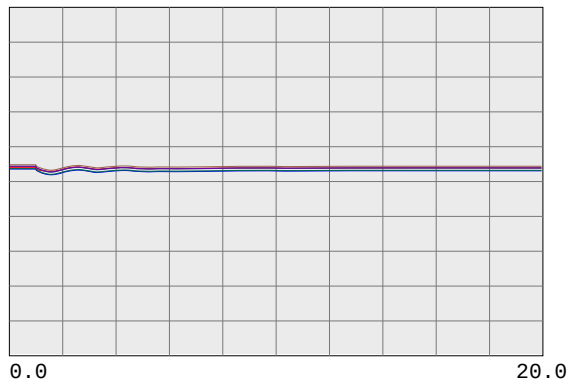
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



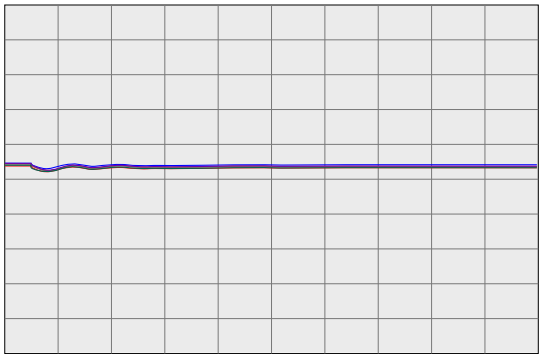
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

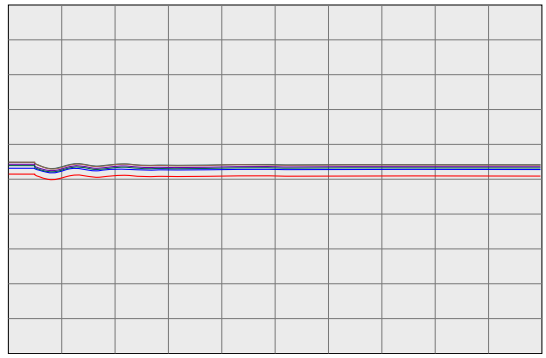
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

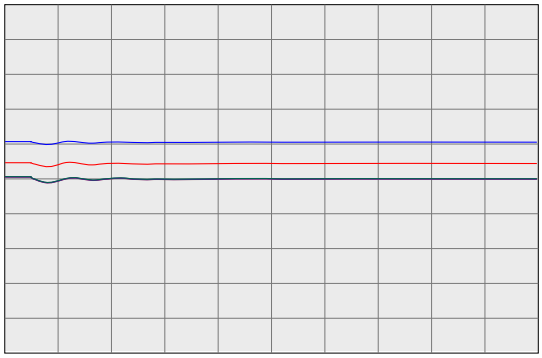
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

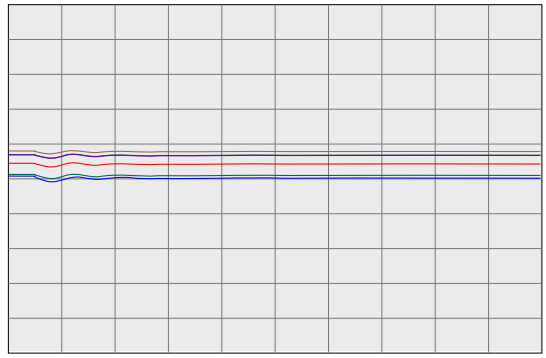
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

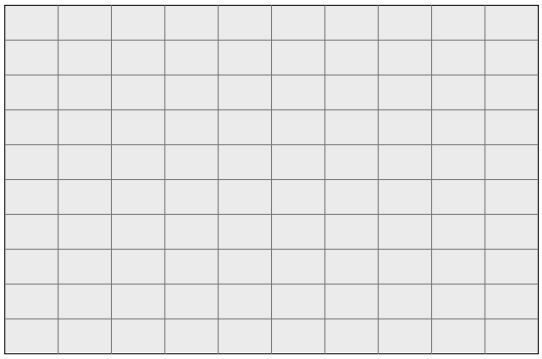
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

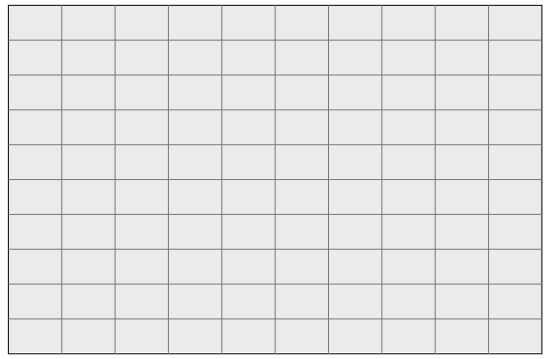


0.0 20.0

Time(sec)

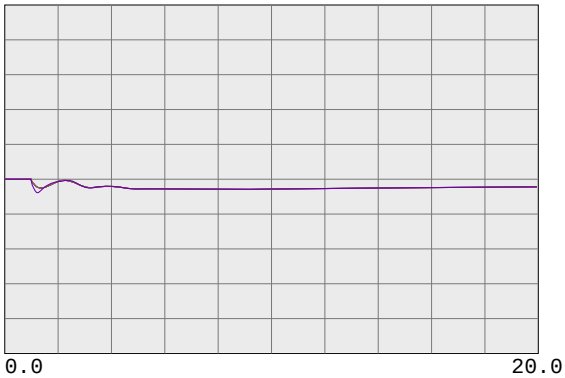
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



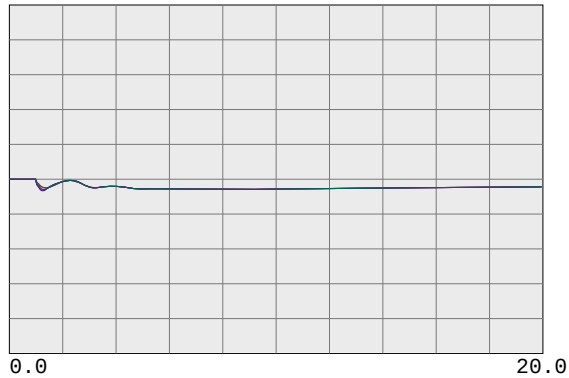


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

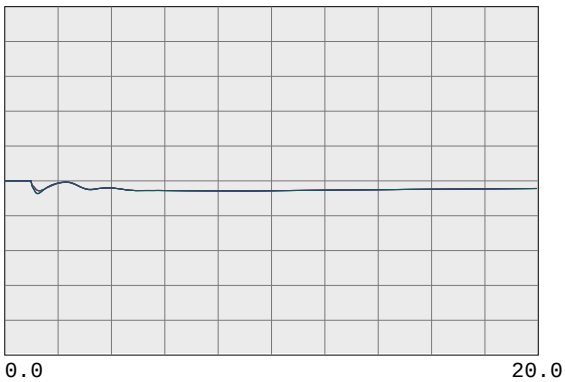
230-KV SYSTEM FREQUENCIES



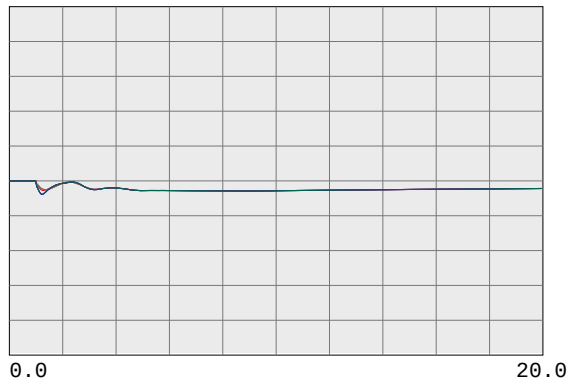
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



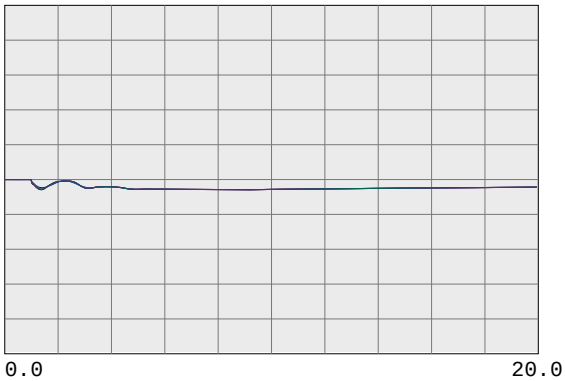
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



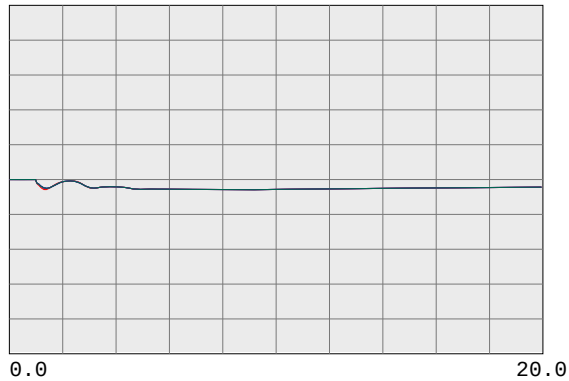
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



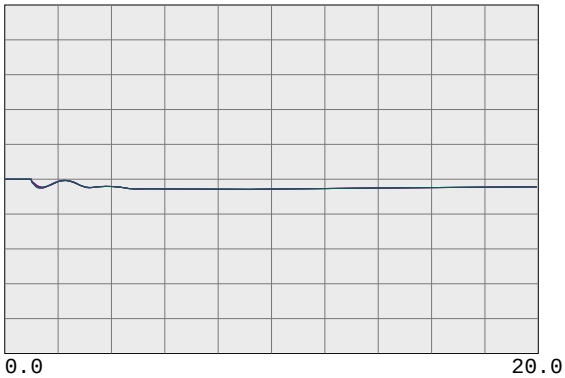
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



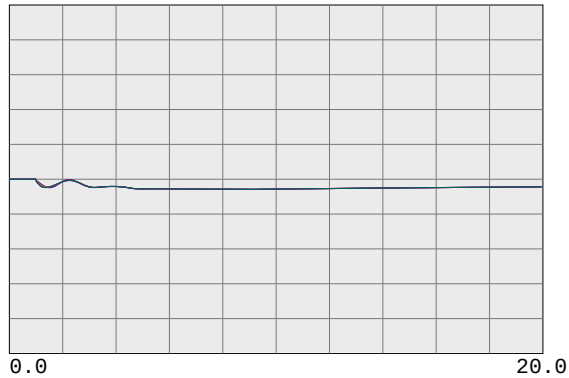
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

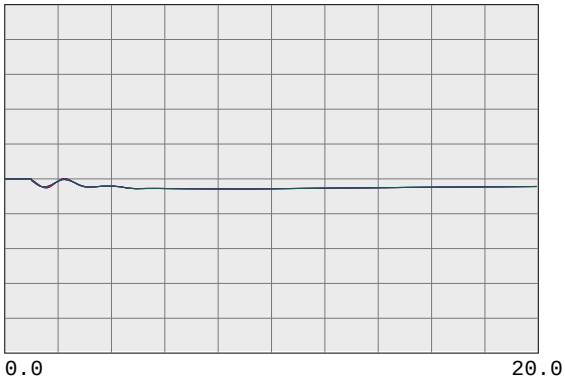
230-KV SYSTEM FREQUENCIES



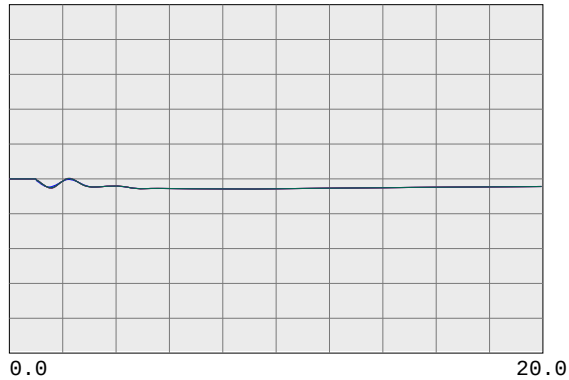
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



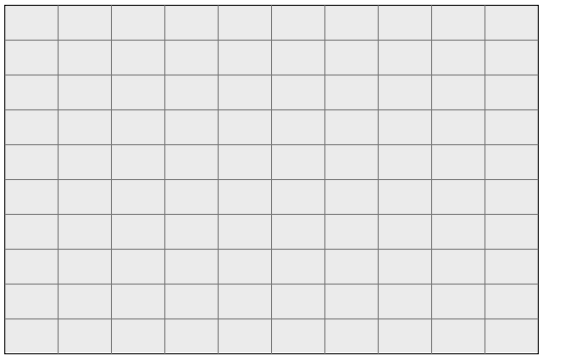
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

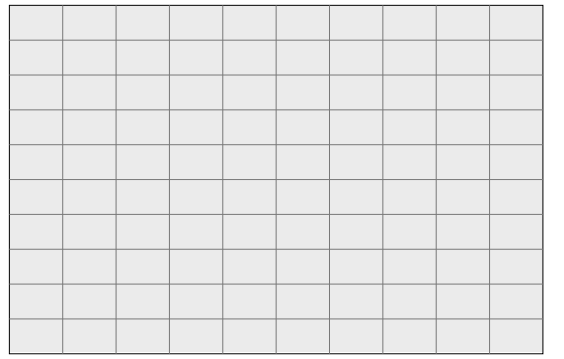


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



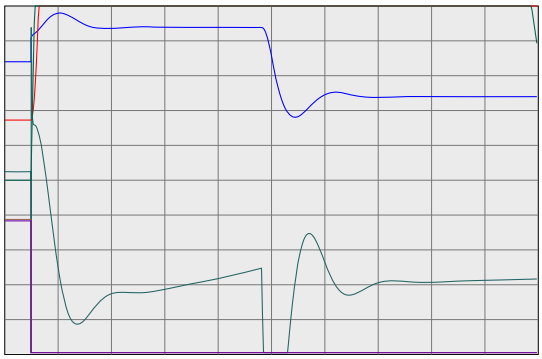
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



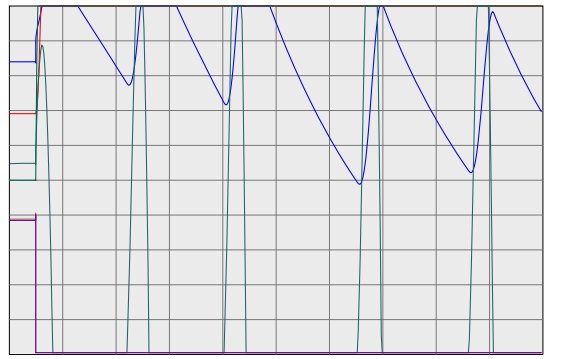


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

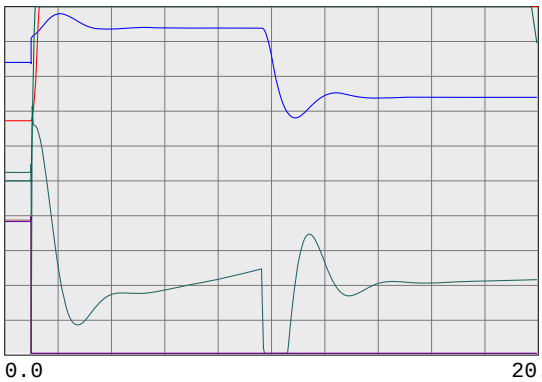
WILLOW PASS GENERATION PLANT



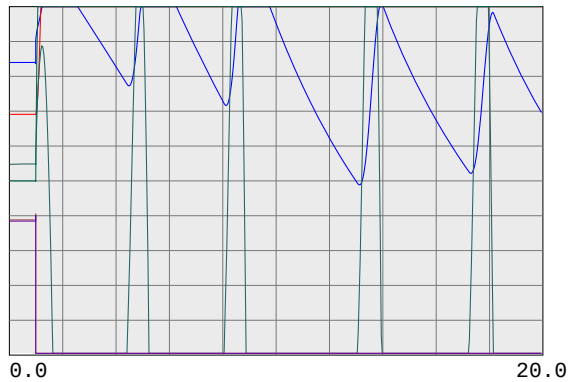
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



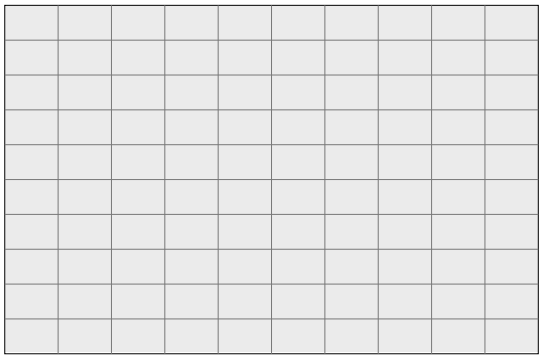
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

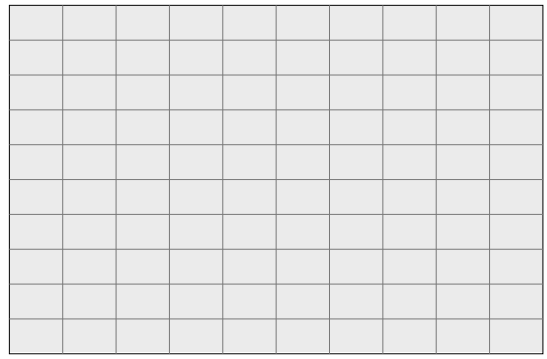


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



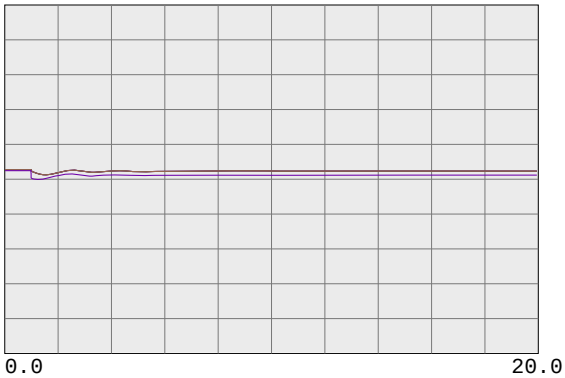
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



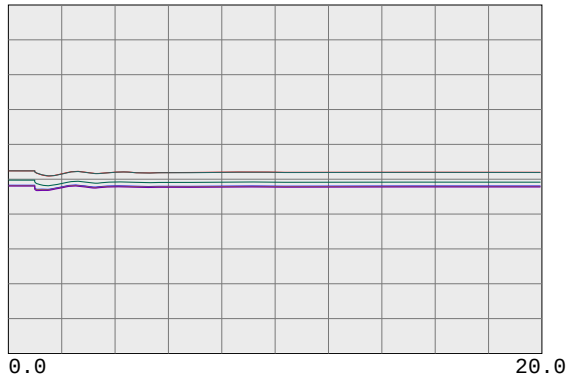


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

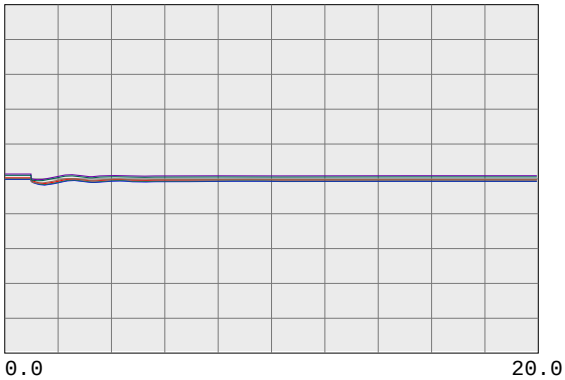
230-KV SYSTEM VOLTAGES



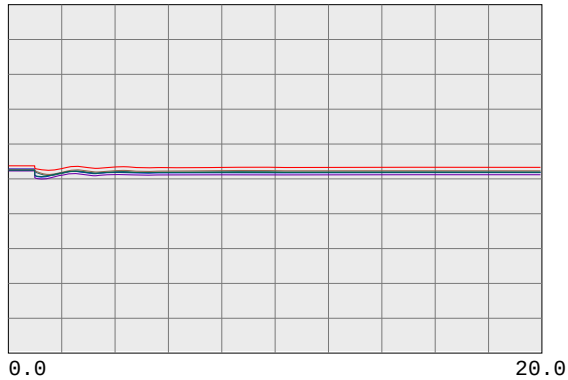
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



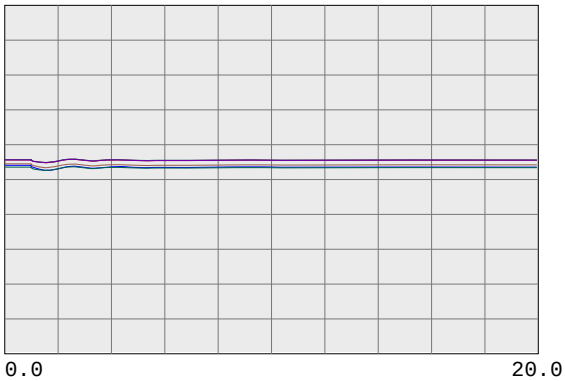
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



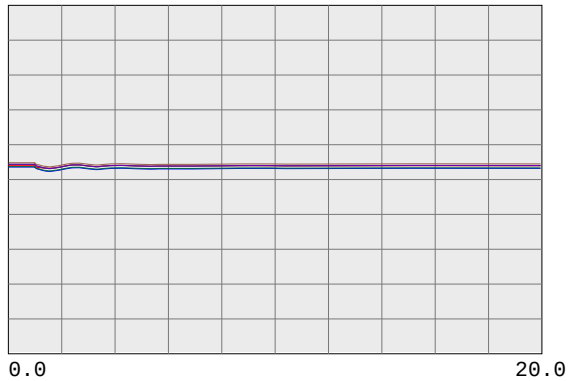
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



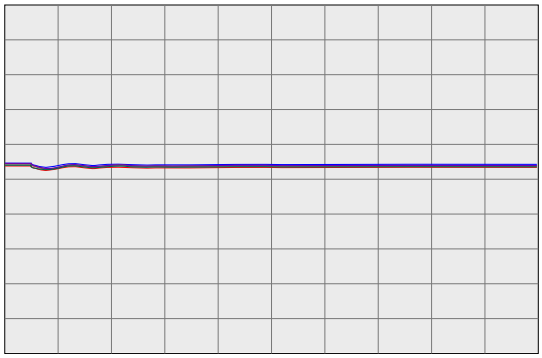
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

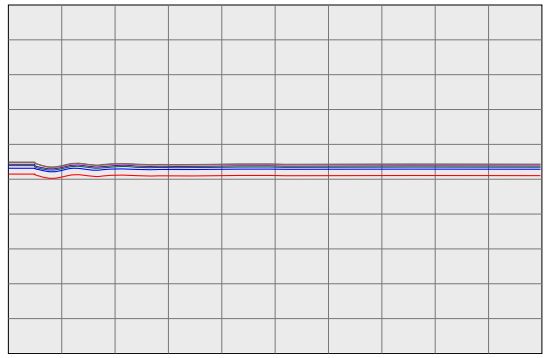
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

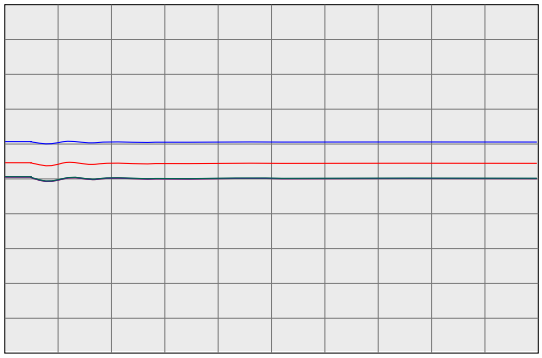
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

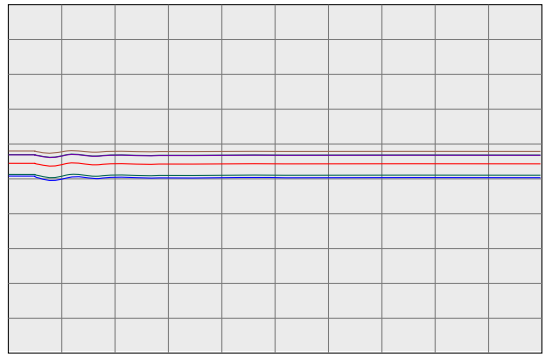
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

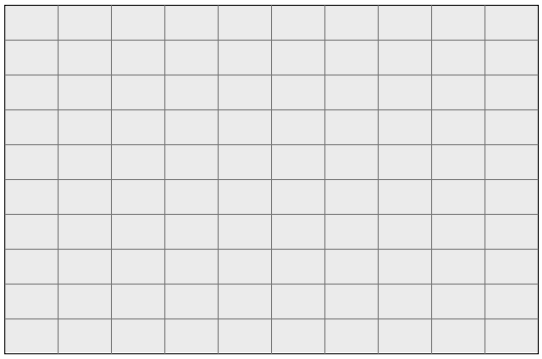
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

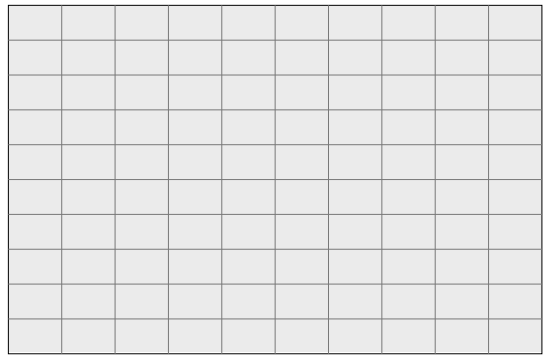


0.0 20.0

Time(sec)

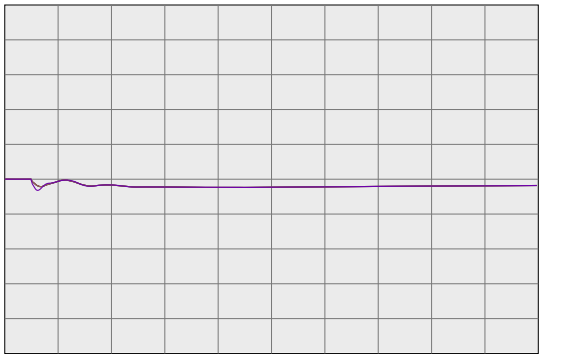
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



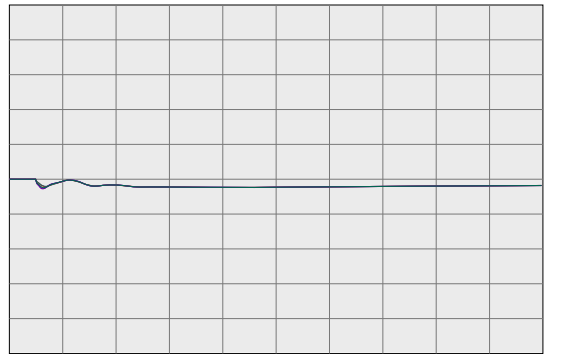


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

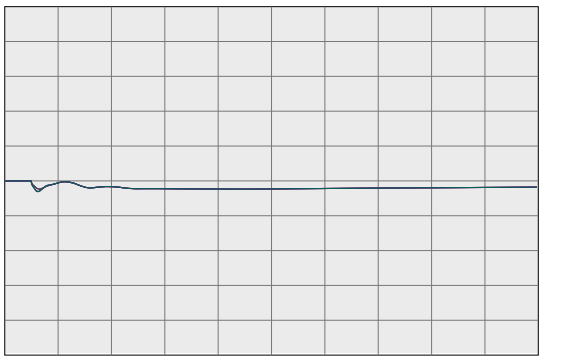
230-KV SYSTEM FREQUENCIES



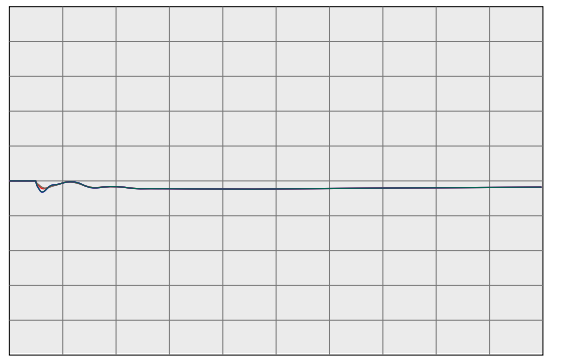
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



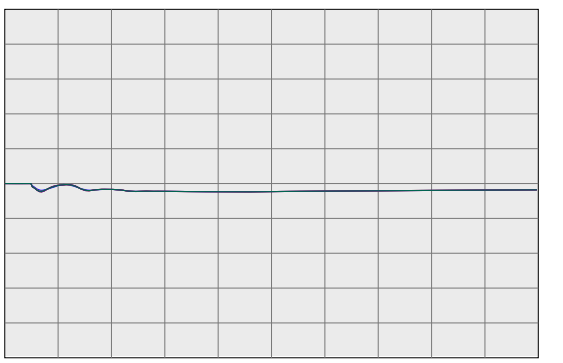
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



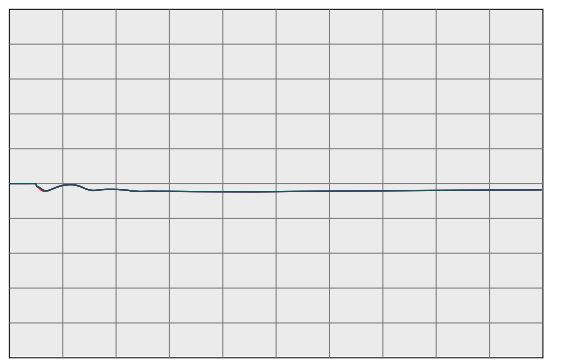
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



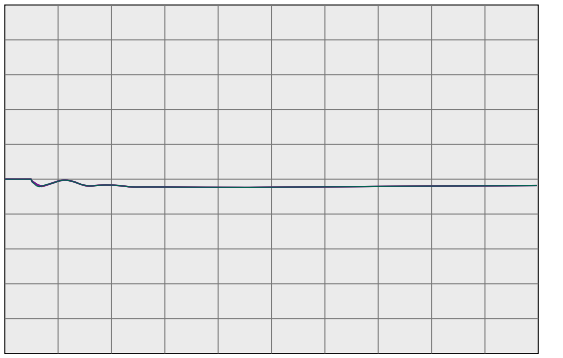
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



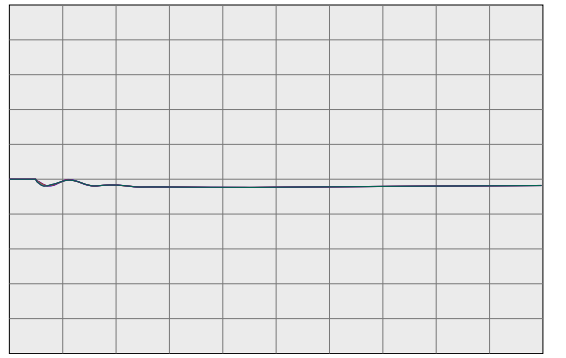
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

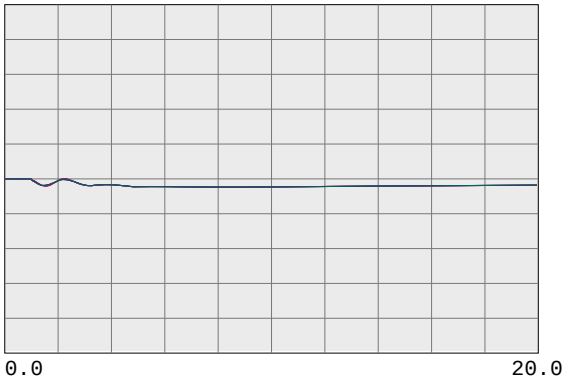
230-KV SYSTEM FREQUENCIES



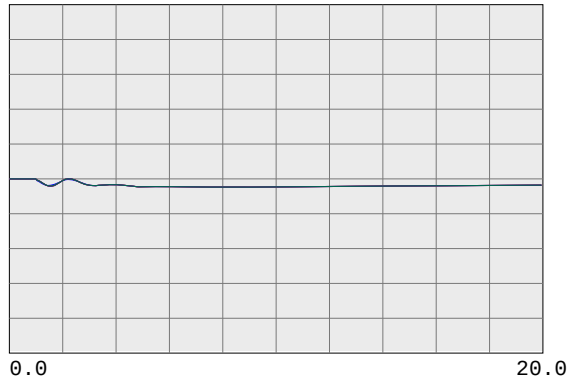
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



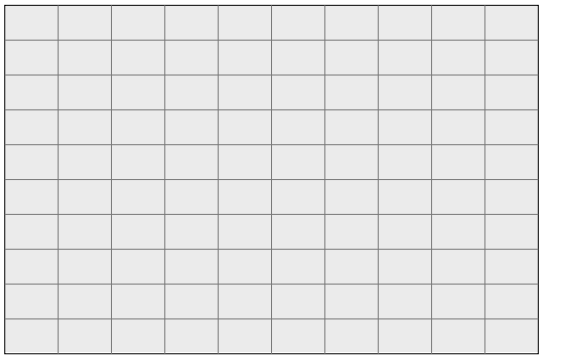
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

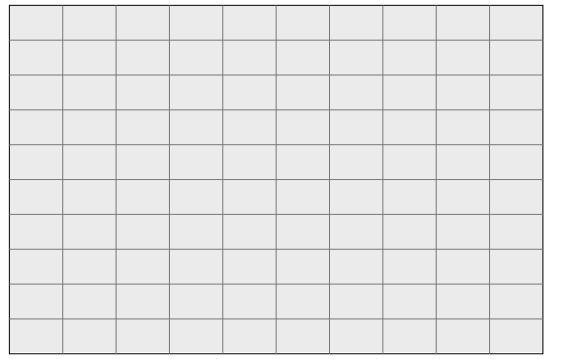


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



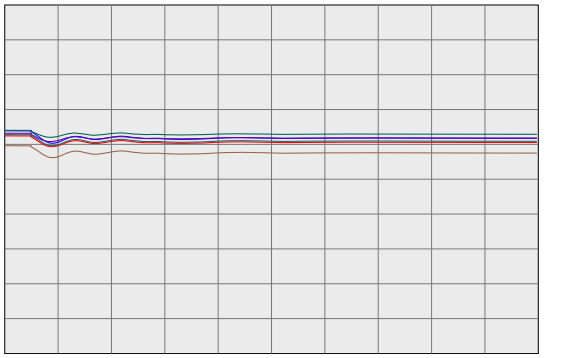
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



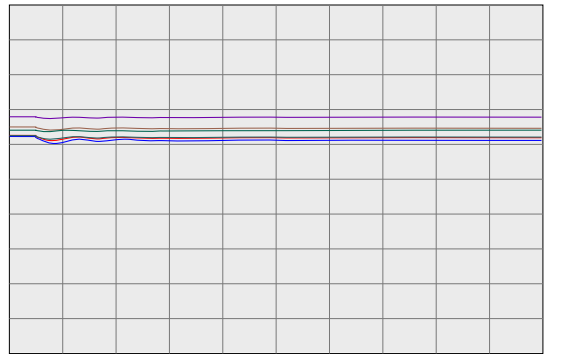


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

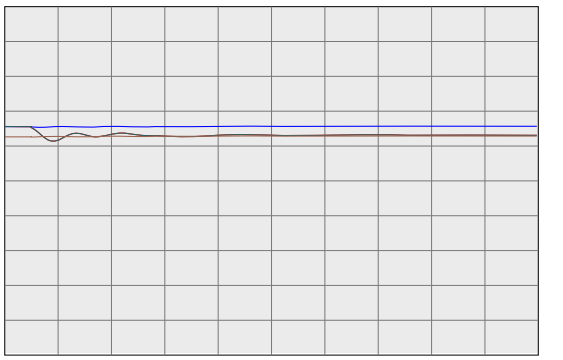
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



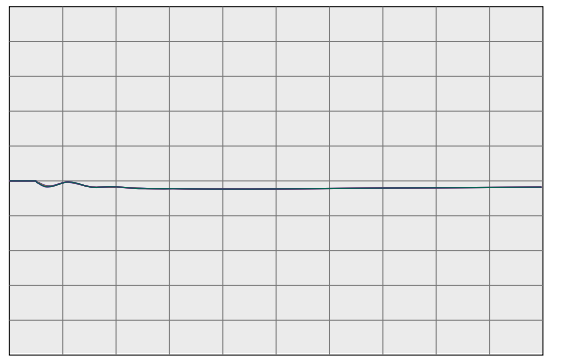
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



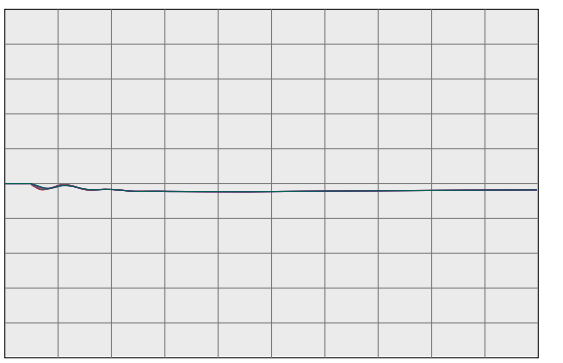
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



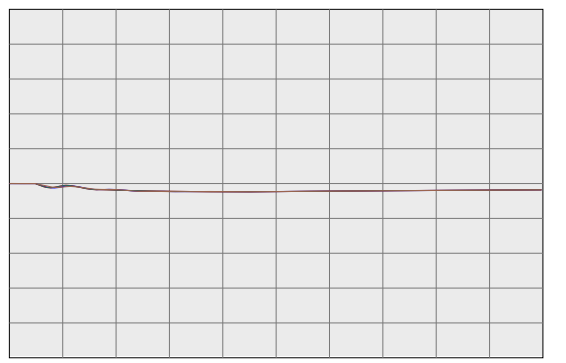
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

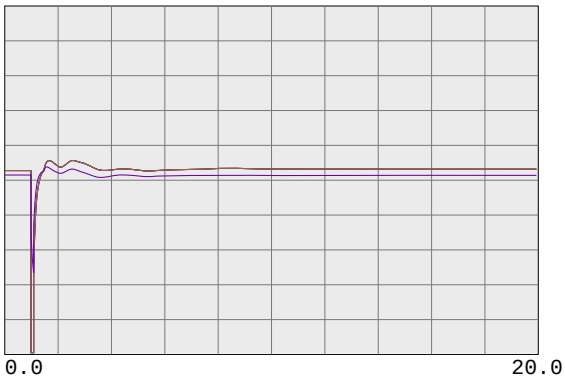
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

ATTACHMENT D3 – Category C Transient Stability Plots

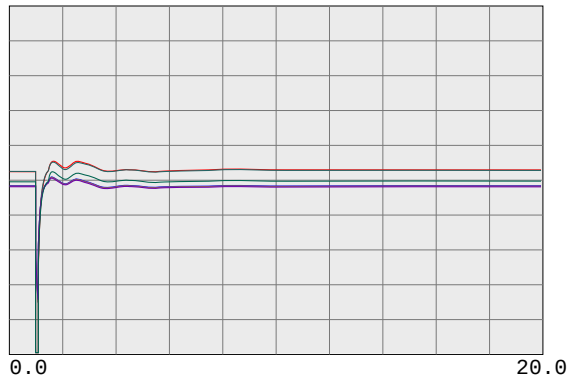
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

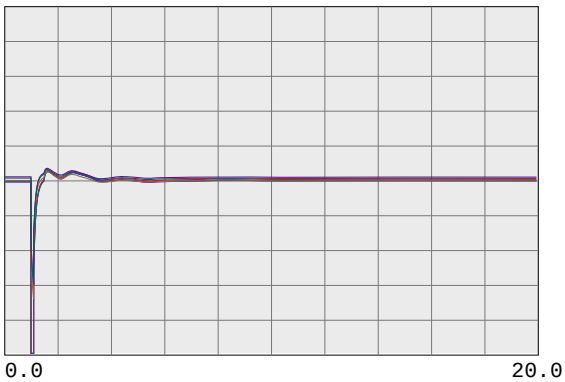
230-KV SYSTEM VOLTAGES



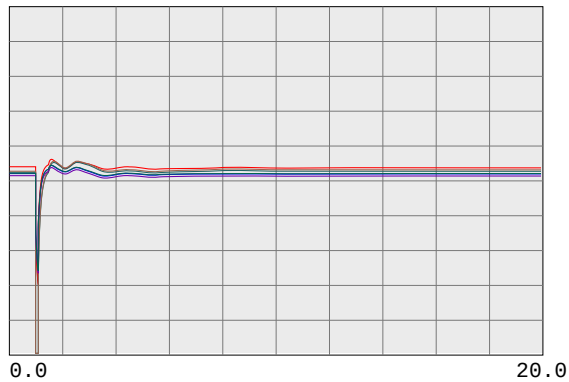
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



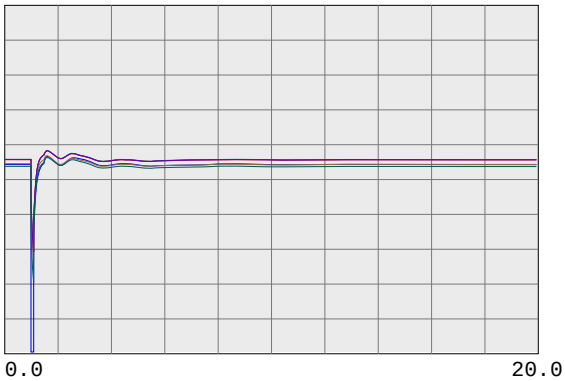
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



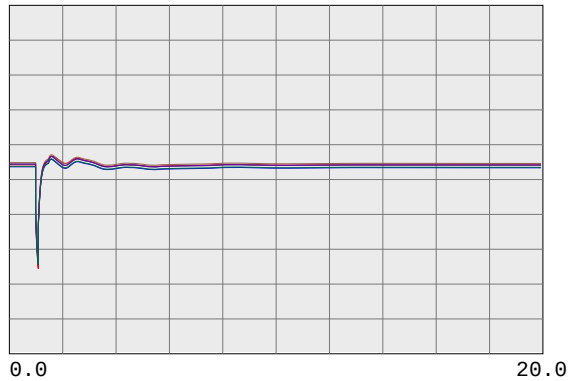
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



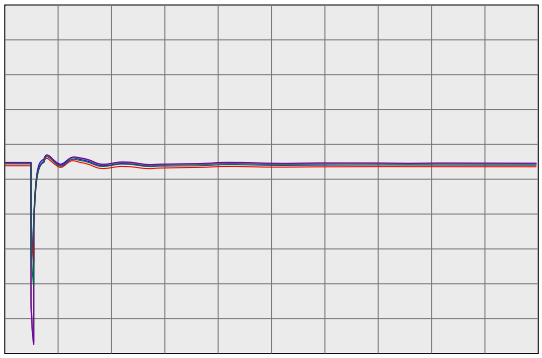
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

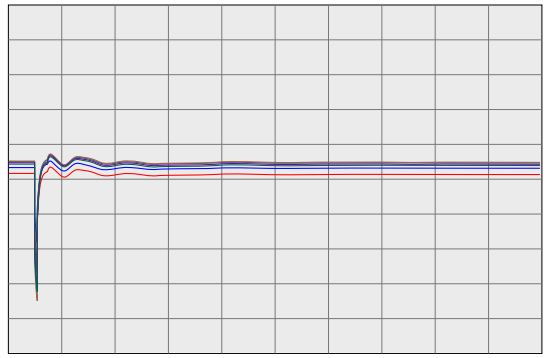
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

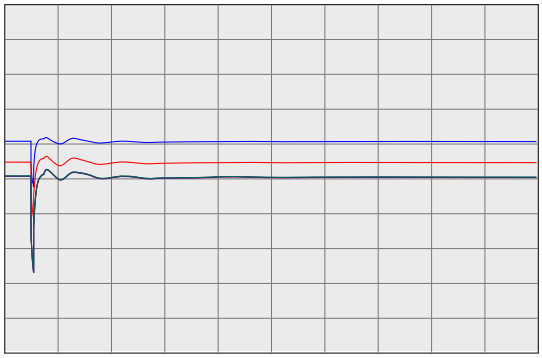
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

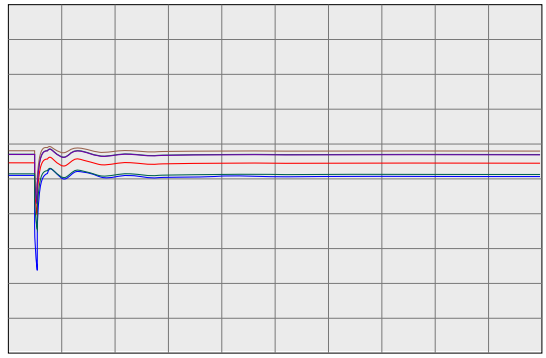
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

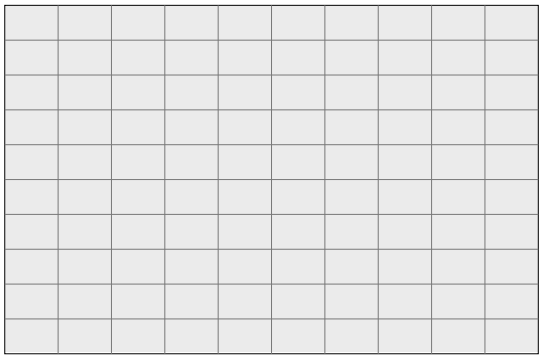
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

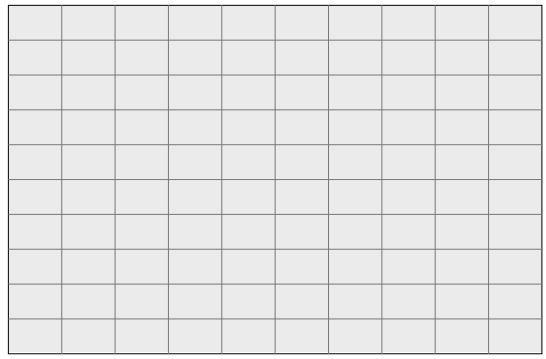


0.0 20.0

Time(sec)

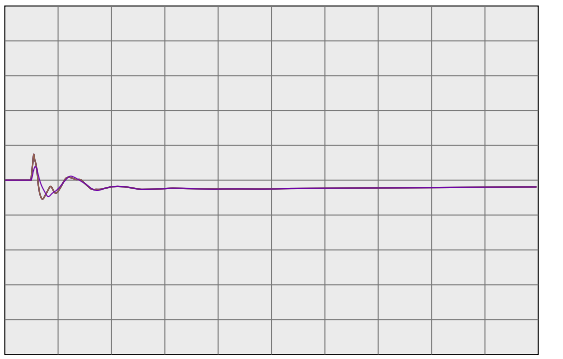
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



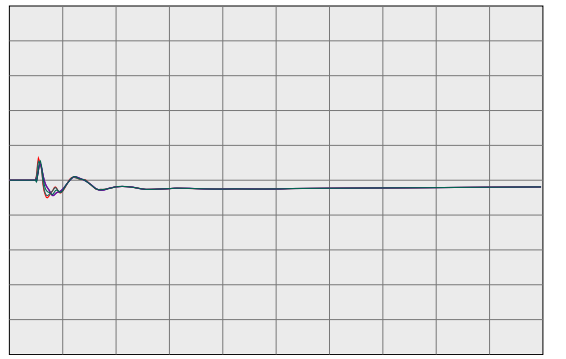


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

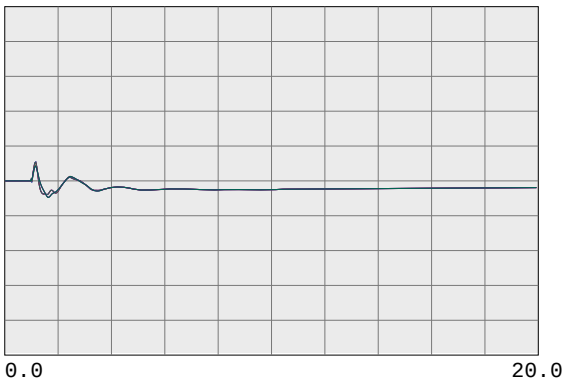
230-KV SYSTEM FREQUENCIES



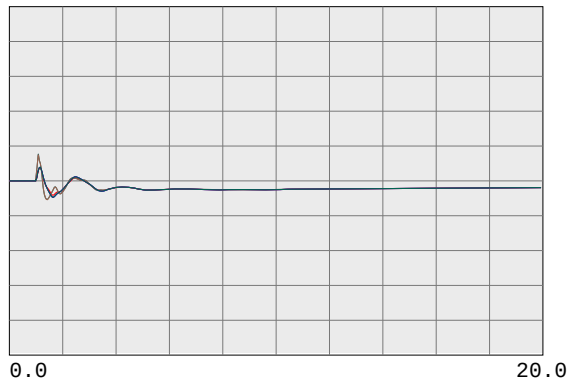
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



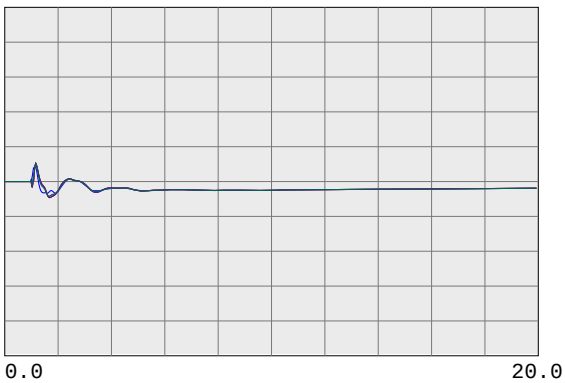
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



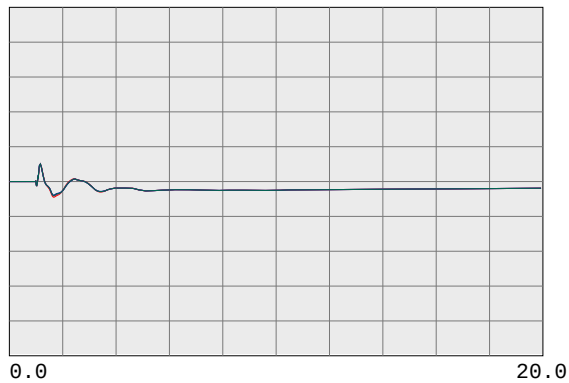
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



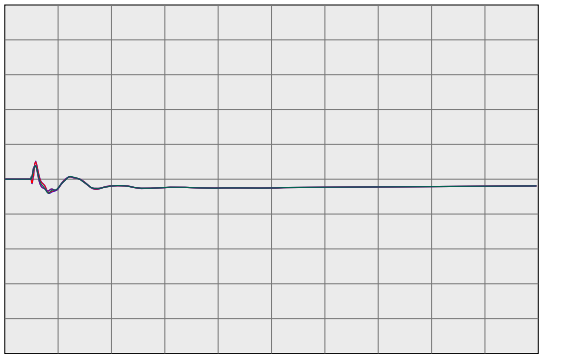
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



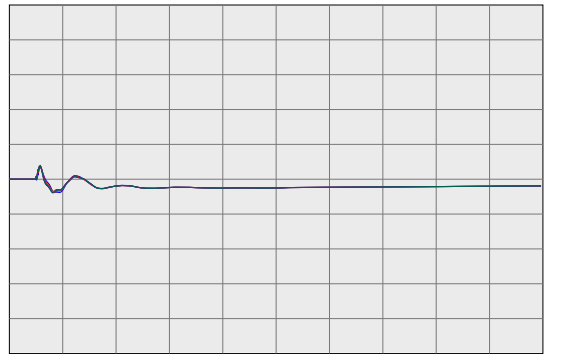
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

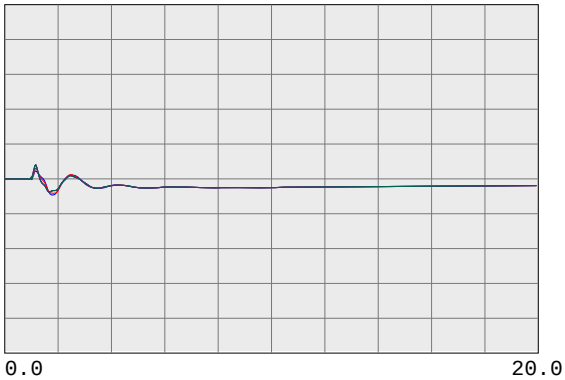
230-KV SYSTEM FREQUENCIES



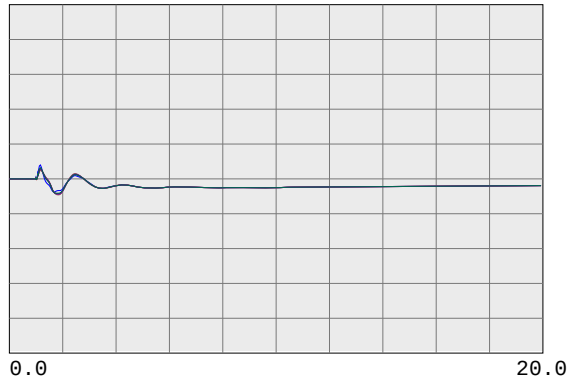
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



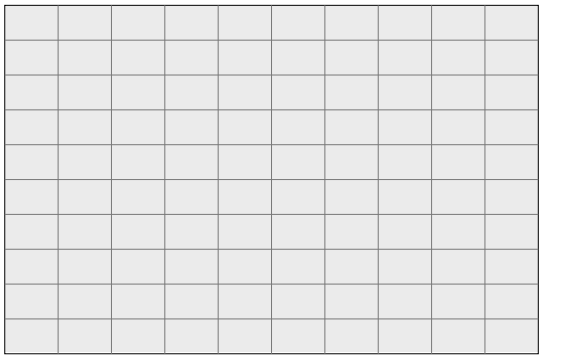
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

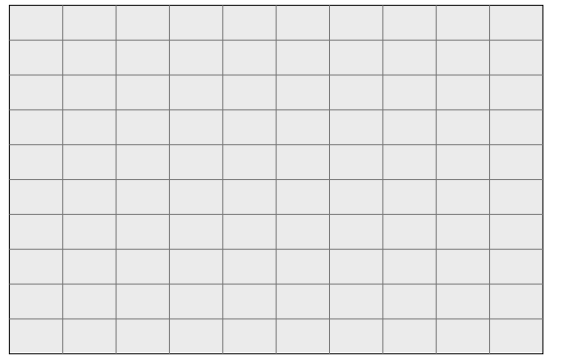


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



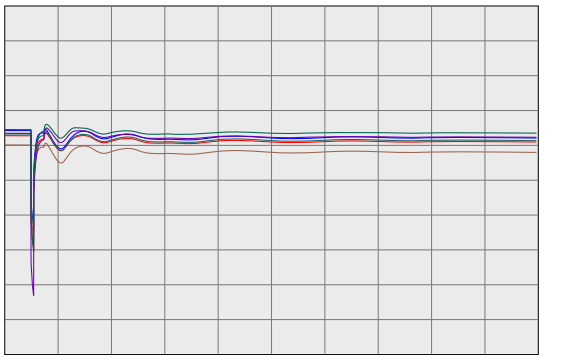
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



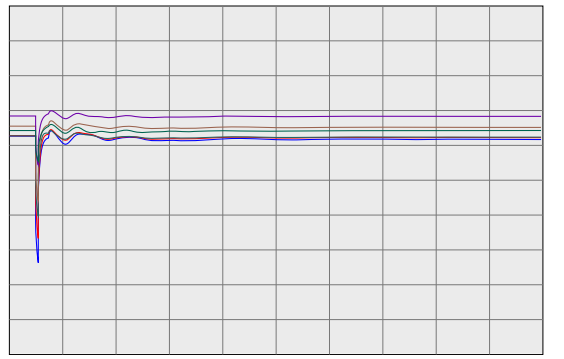


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

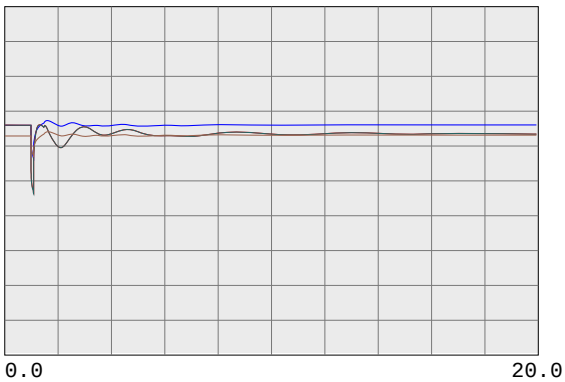
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



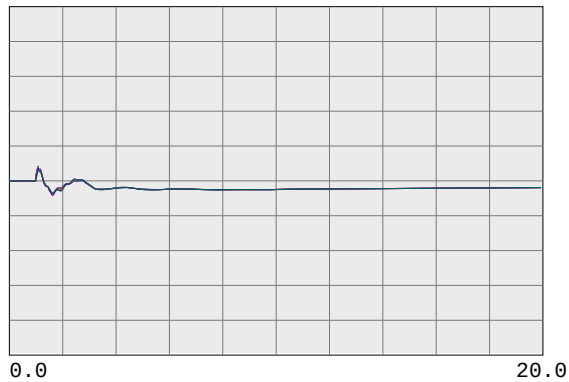
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



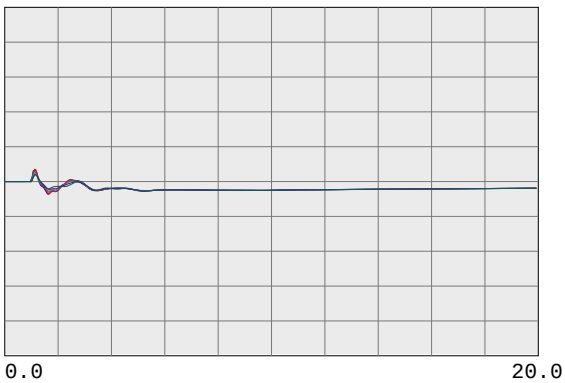
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



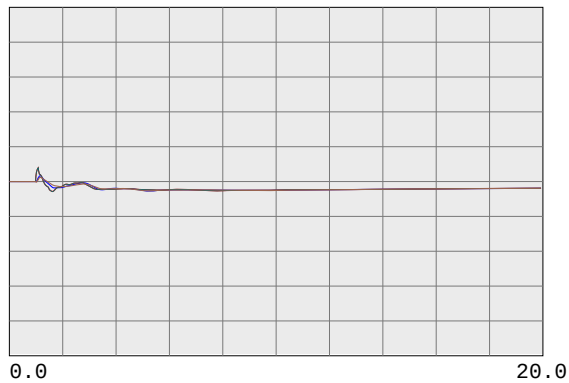
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



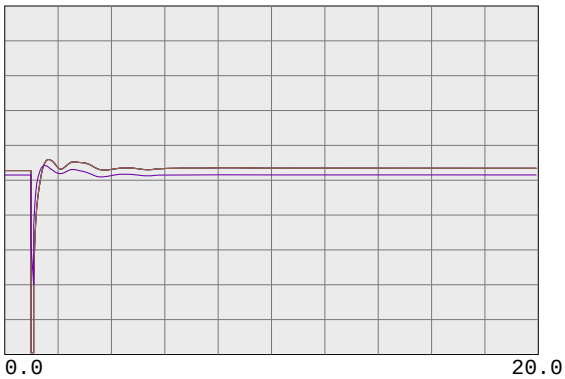
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

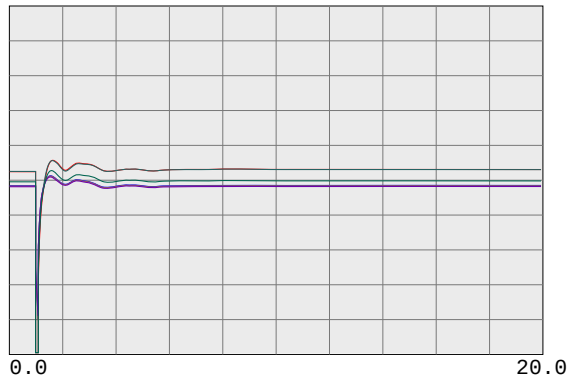
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

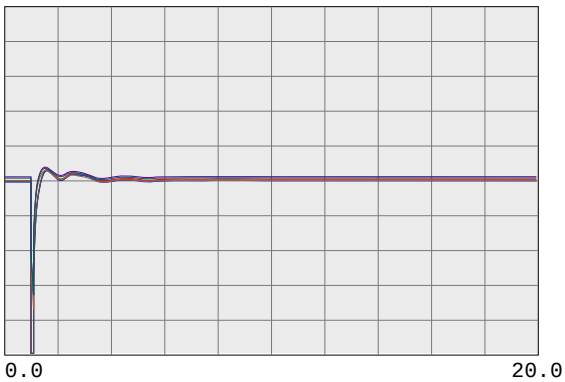
230-KV SYSTEM VOLTAGES



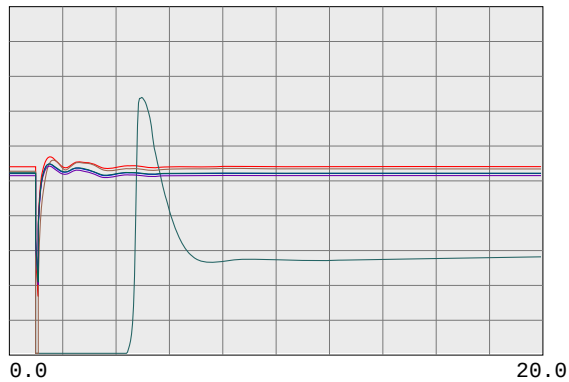
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



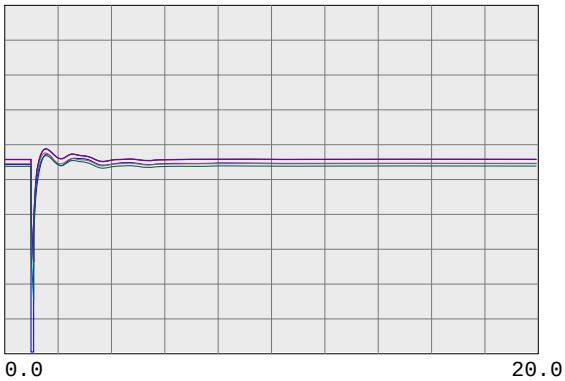
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



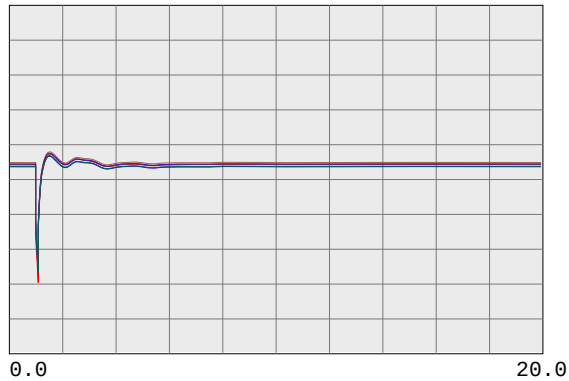
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



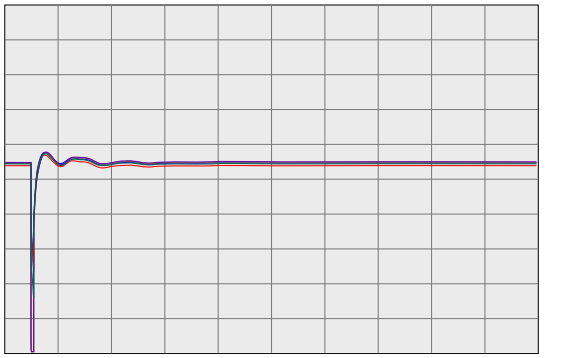
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



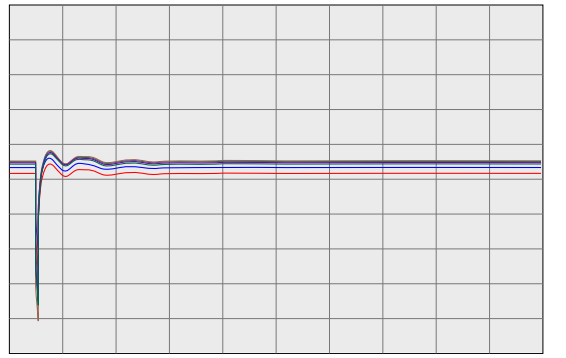
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

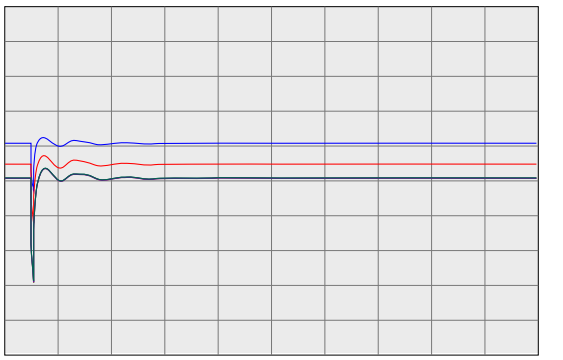
230-KV SYSTEM VOLTAGES



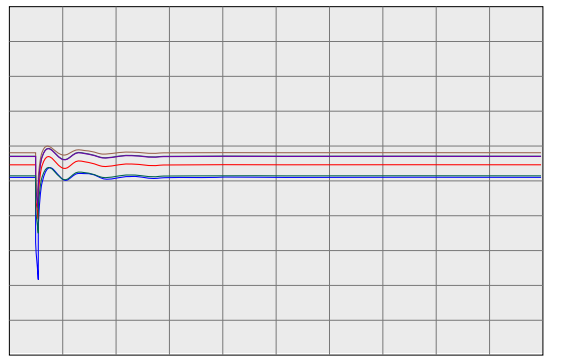
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



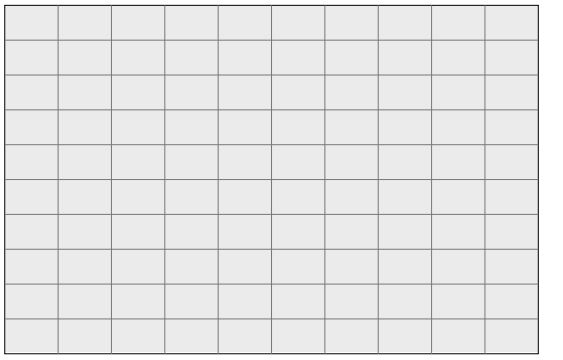
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

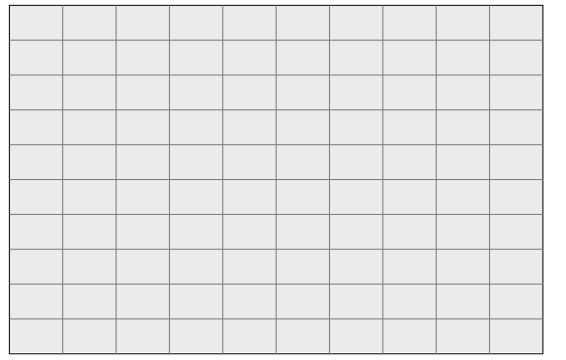


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



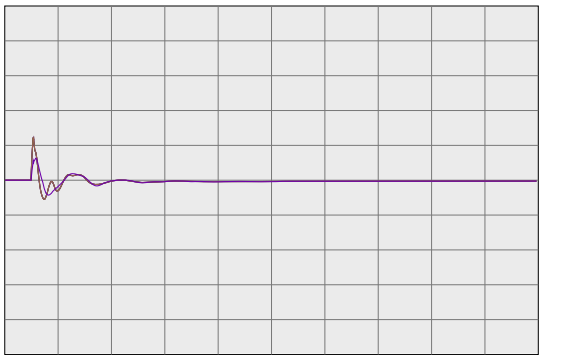
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



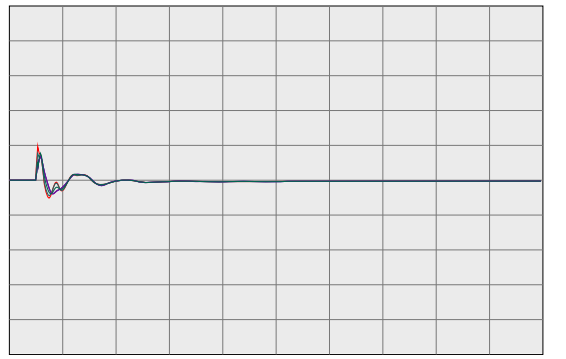


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

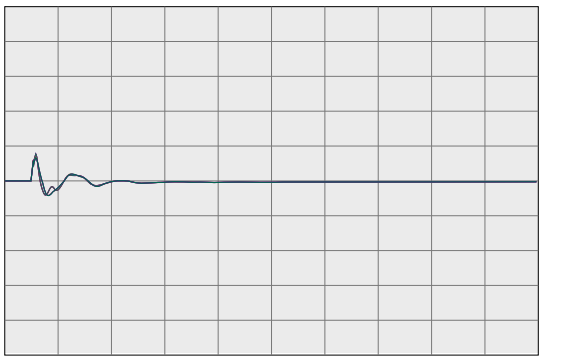
230-KV SYSTEM FREQUENCIES



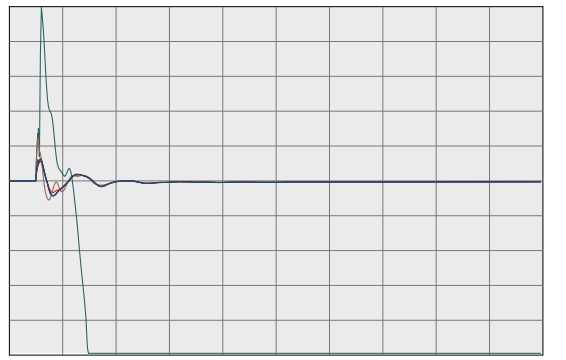
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



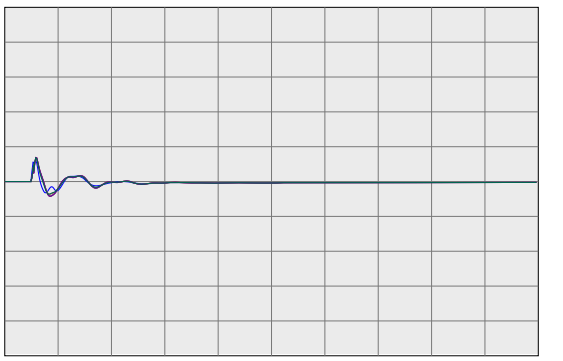
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



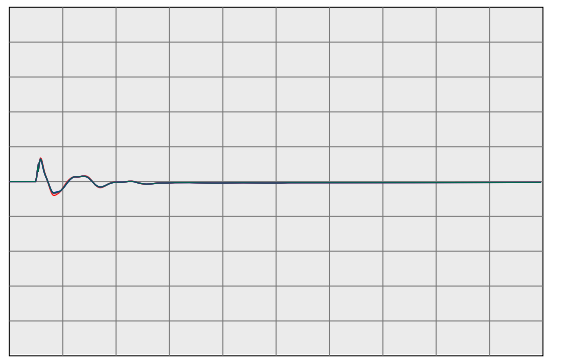
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



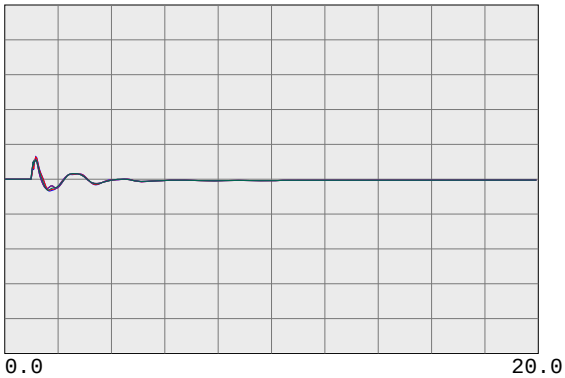
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



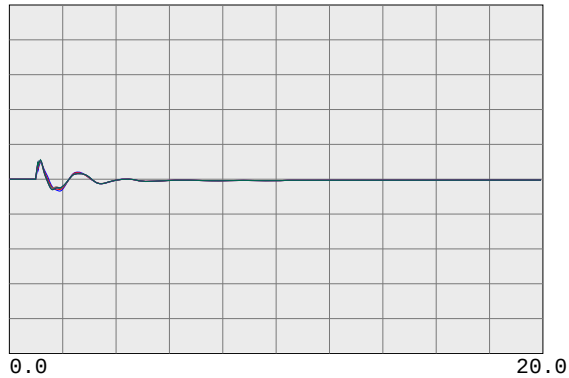
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

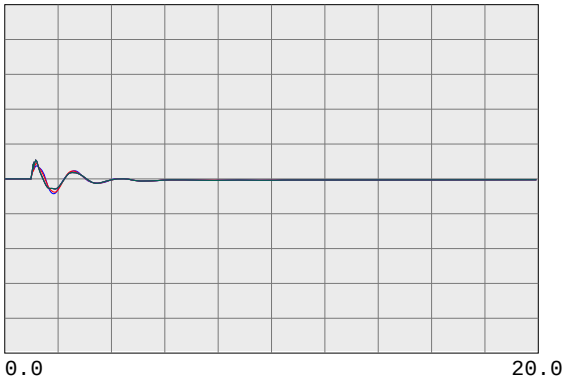
230-KV SYSTEM FREQUENCIES



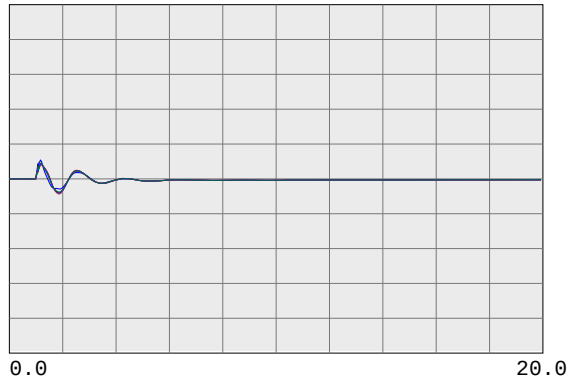
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



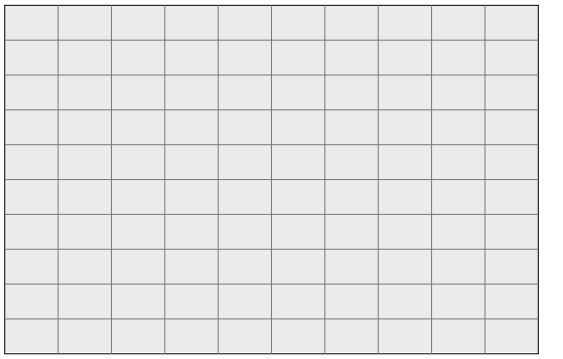
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

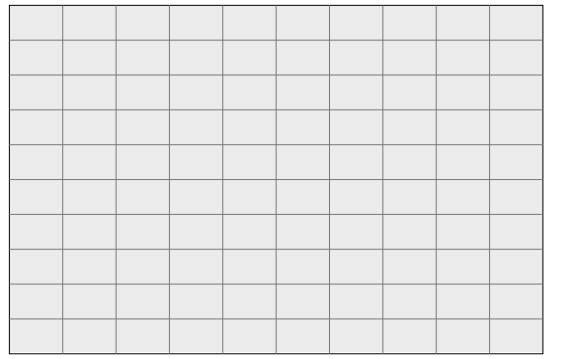


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



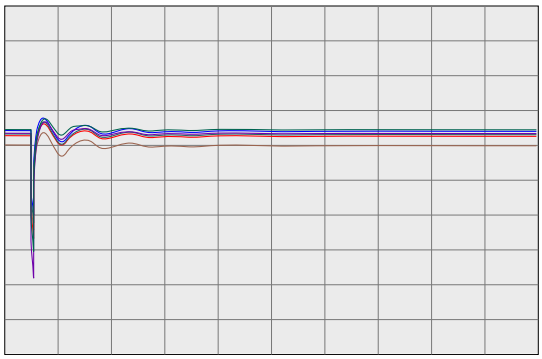
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



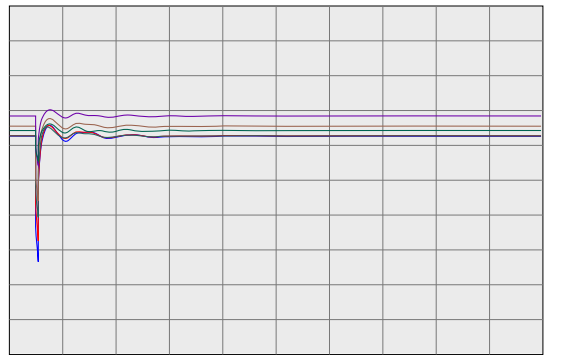


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

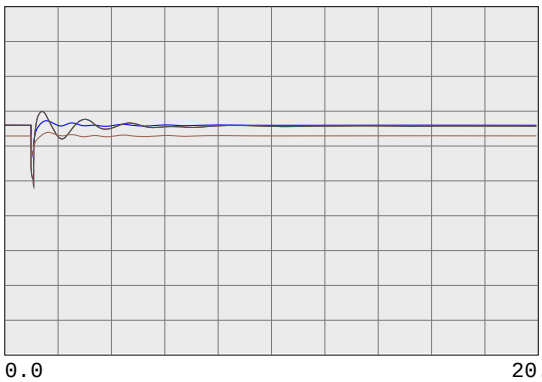
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



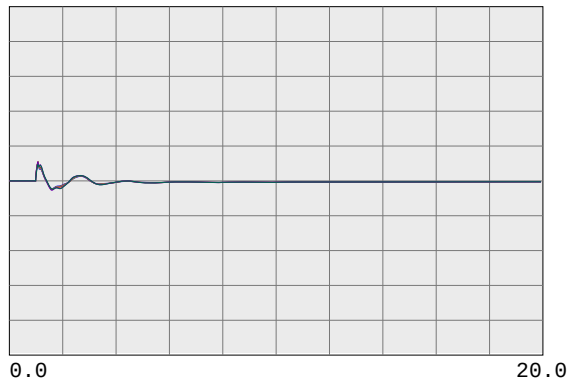
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



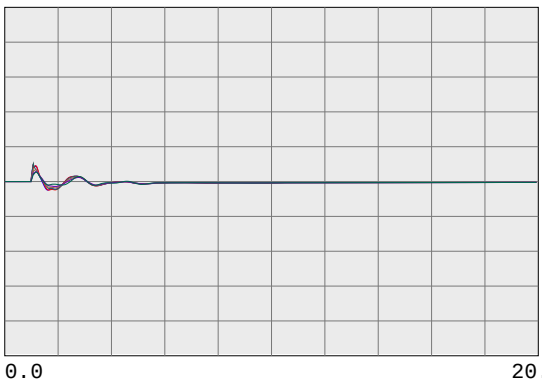
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



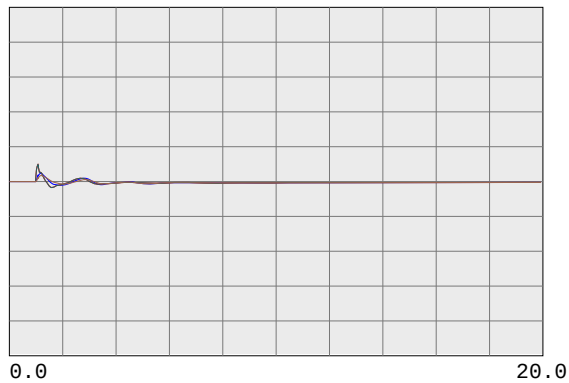
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



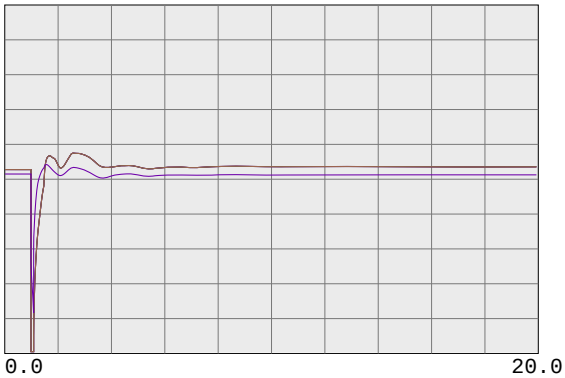
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

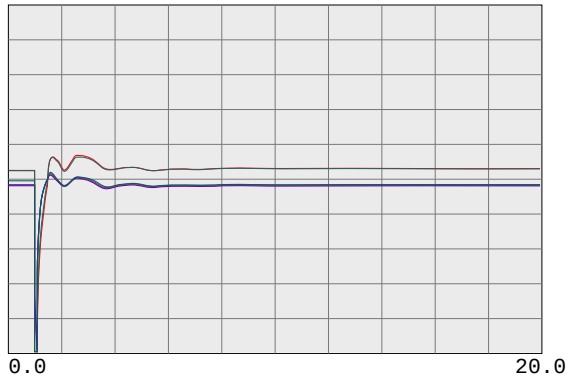
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

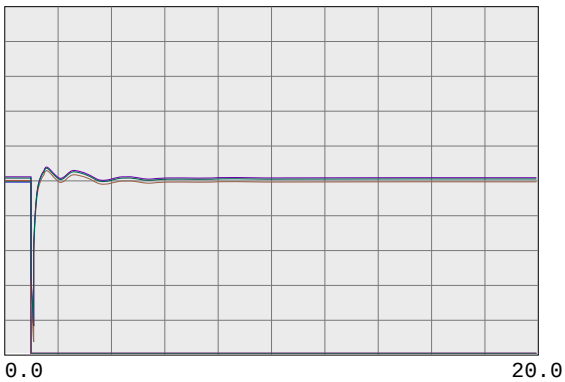
230-KV SYSTEM VOLTAGES



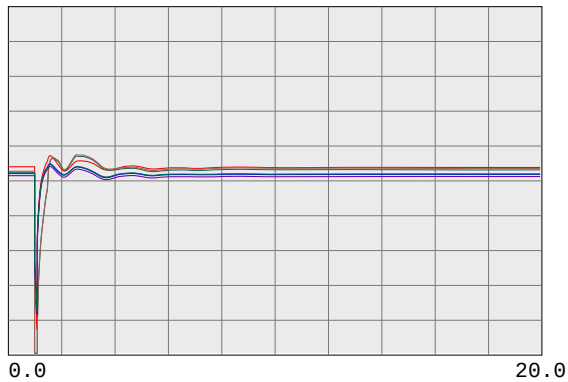
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



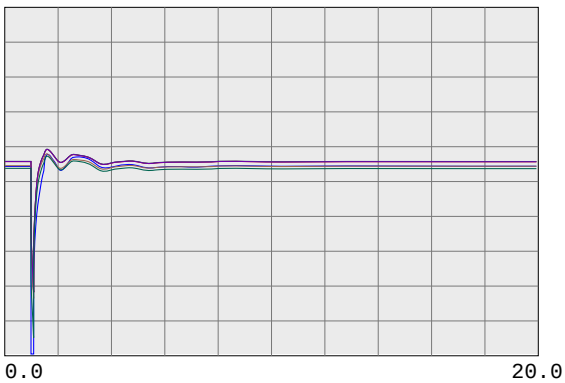
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



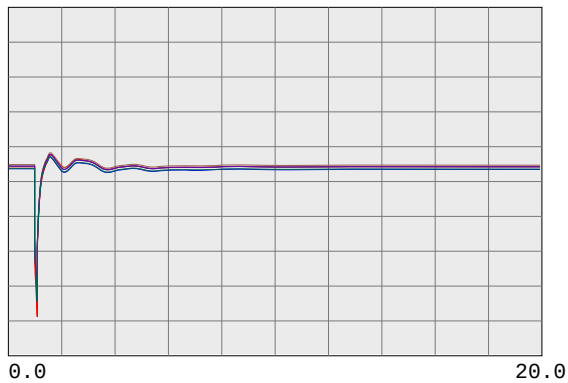
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



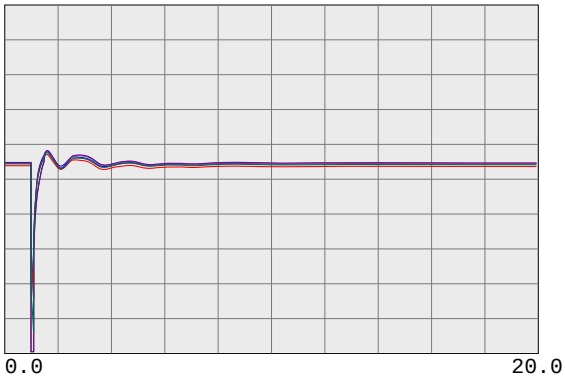
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



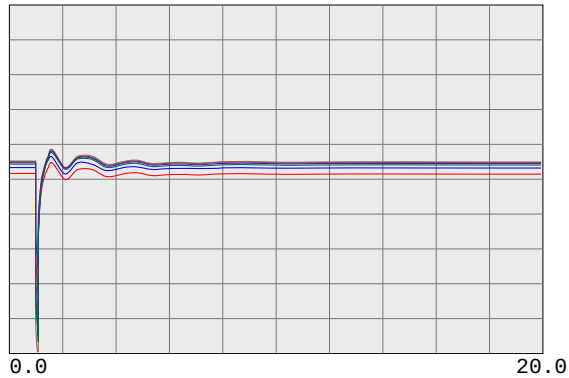
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

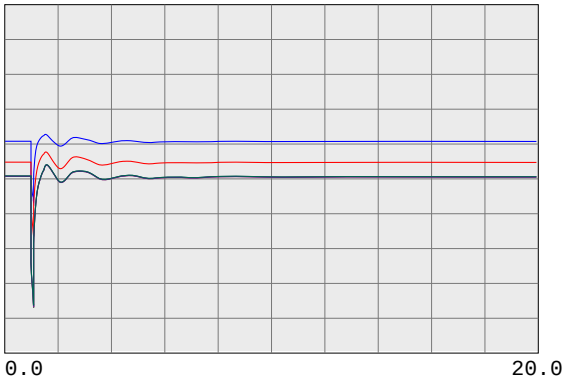
230-KV SYSTEM VOLTAGES



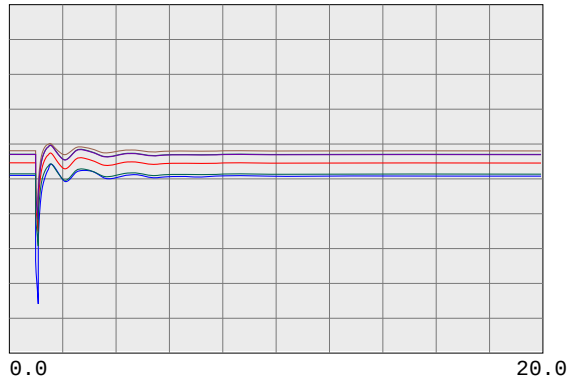
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



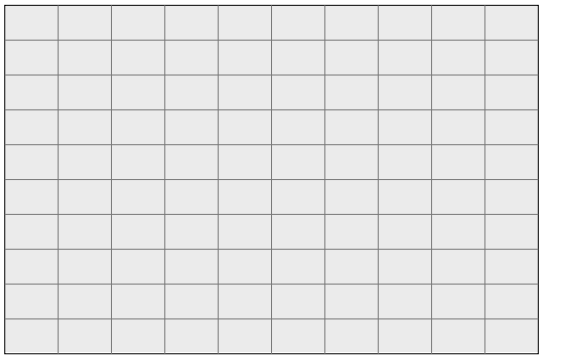
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

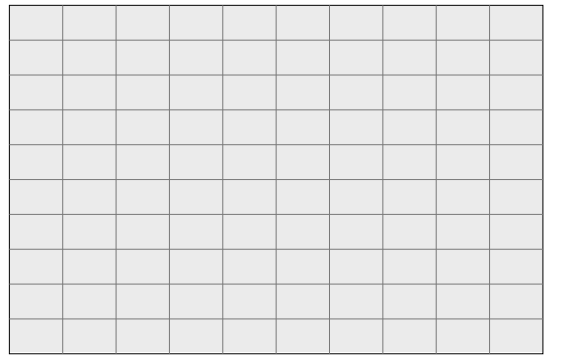


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



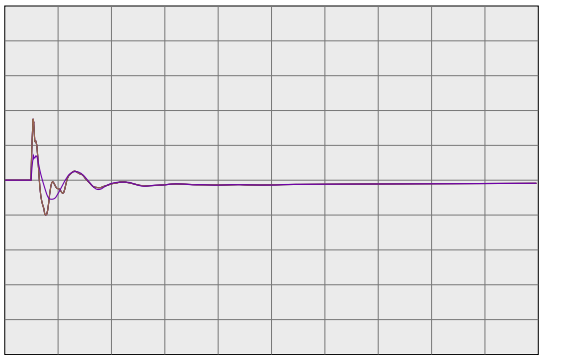
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



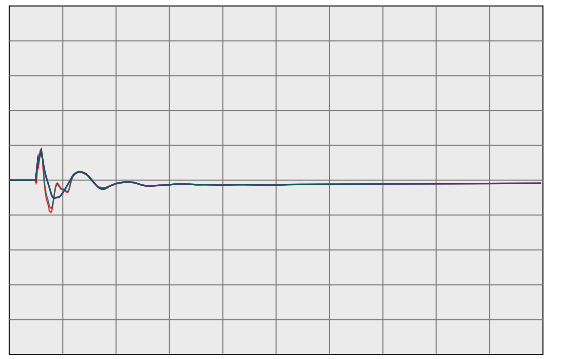


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

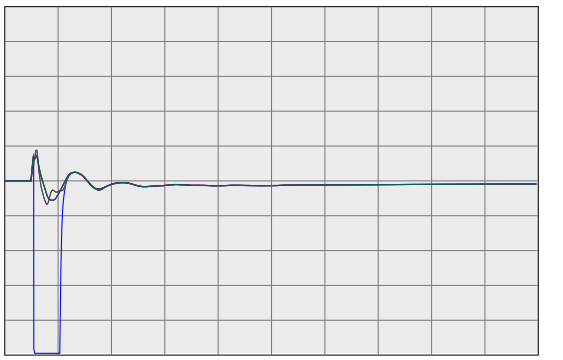
230-KV SYSTEM FREQUENCIES



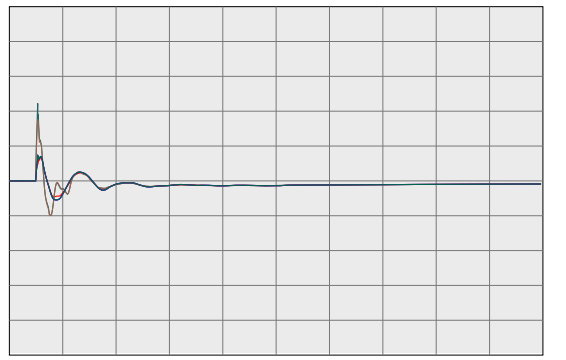
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



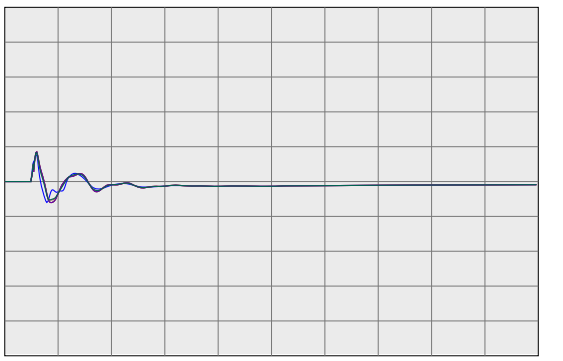
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



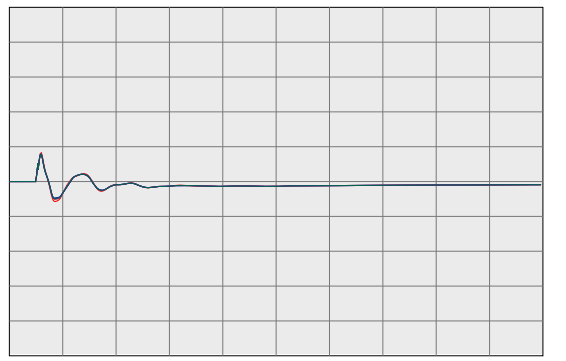
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



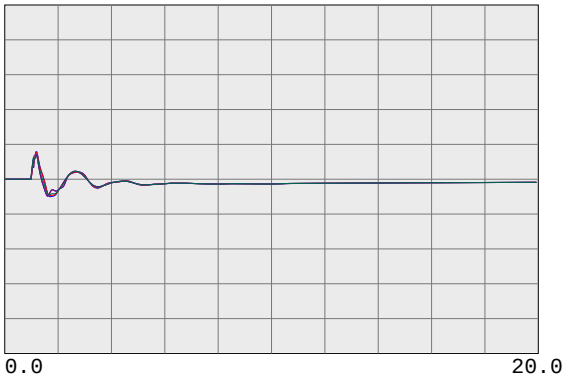
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



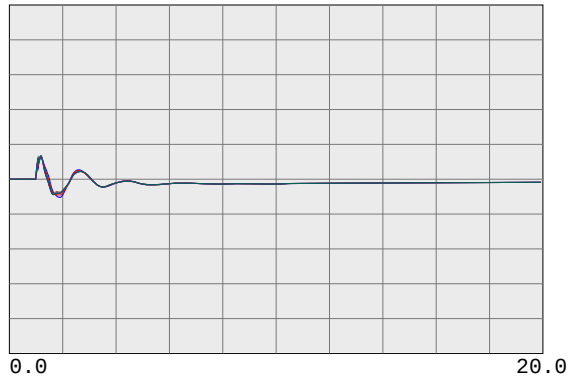
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

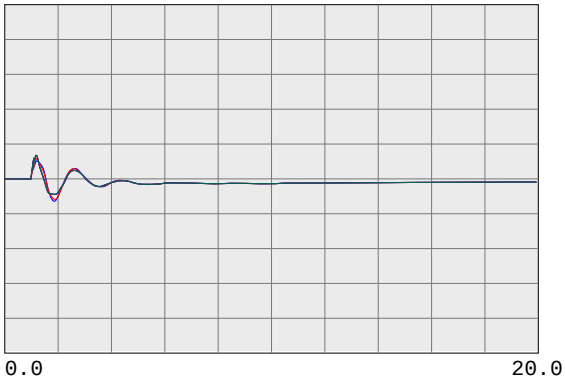
230-KV SYSTEM FREQUENCIES



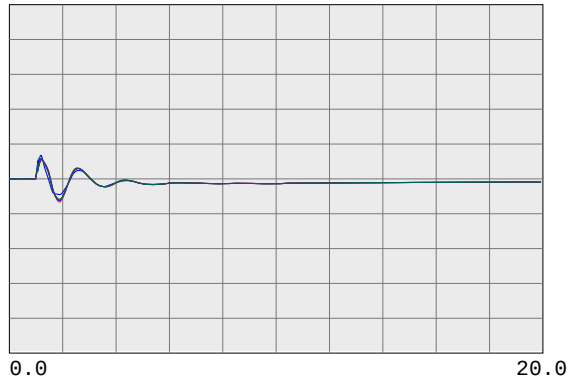
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



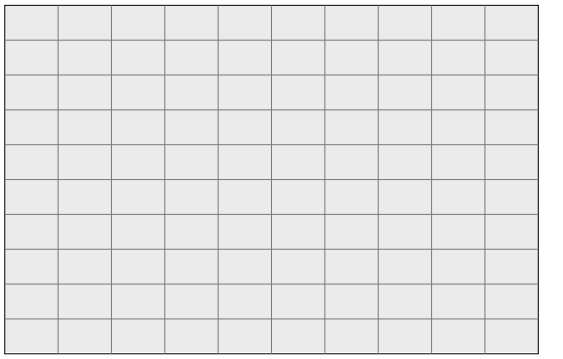
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

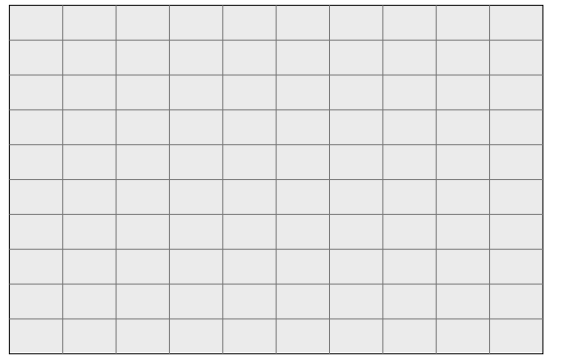


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



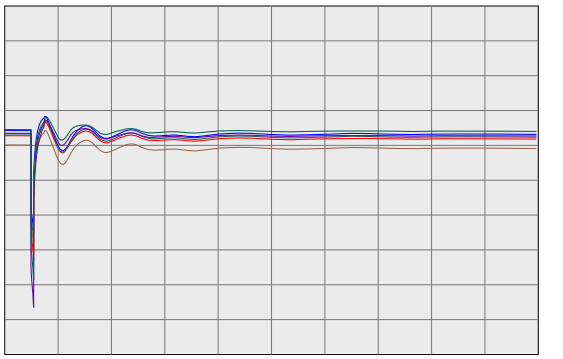
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



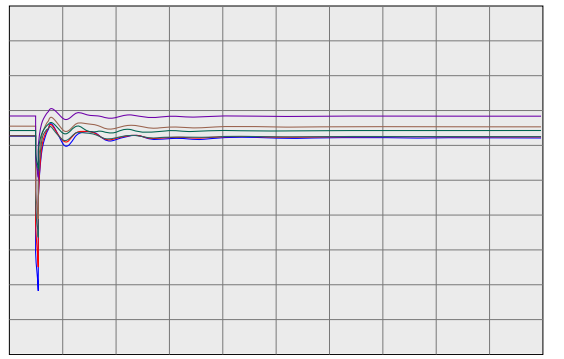


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

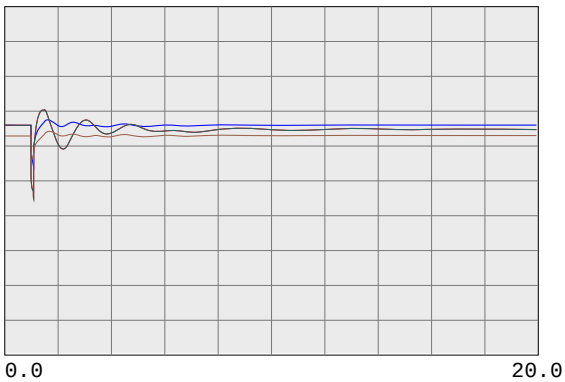
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



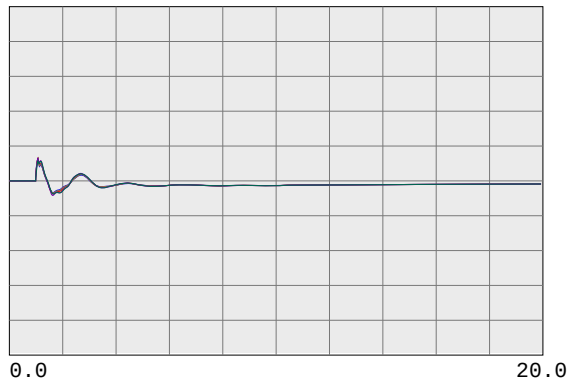
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



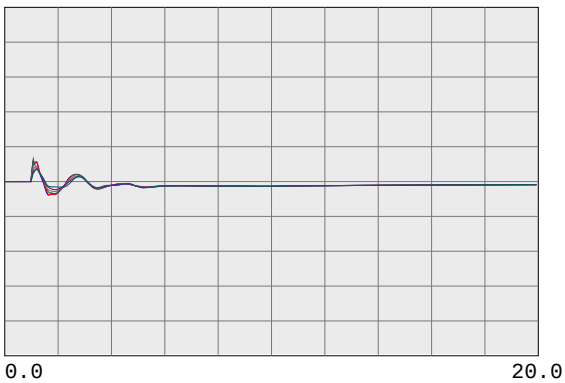
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



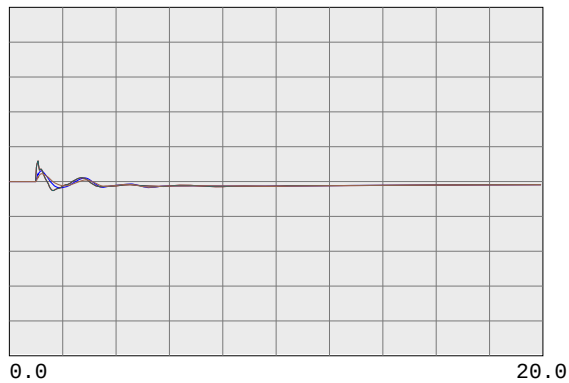
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



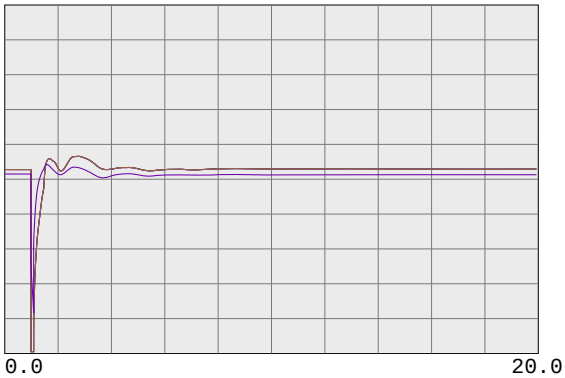
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

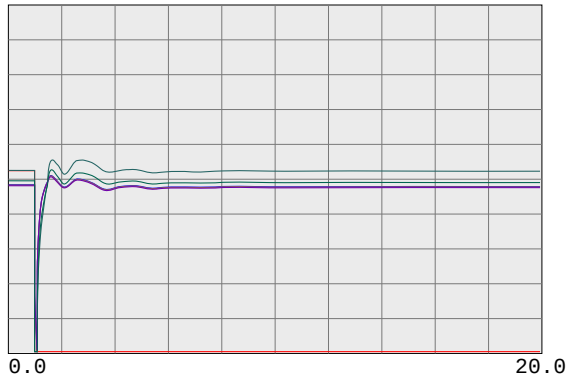
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

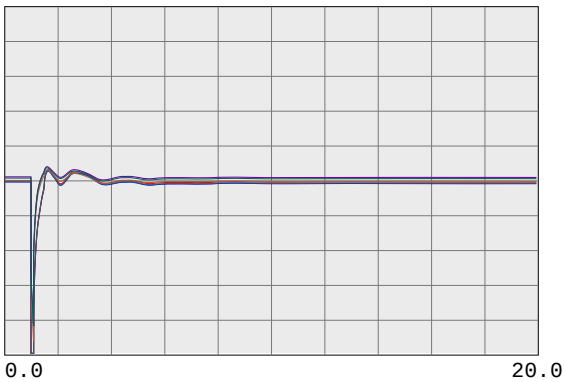
230-KV SYSTEM VOLTAGES



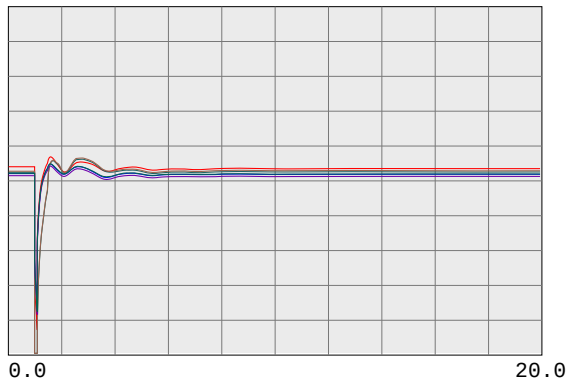
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



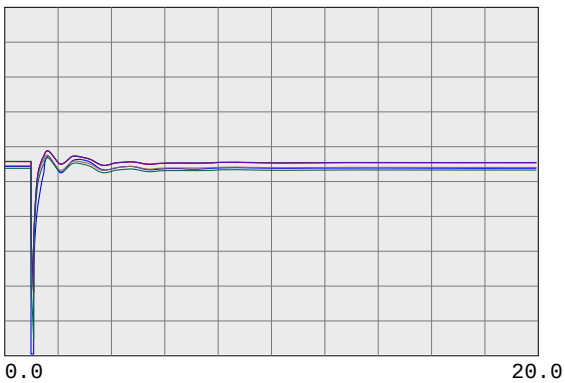
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



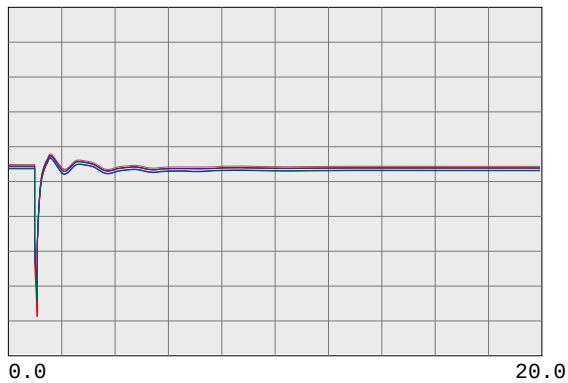
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



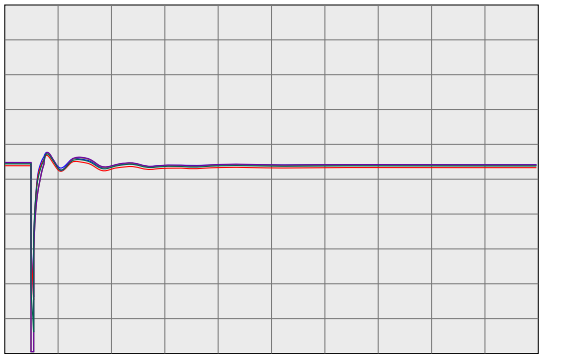
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



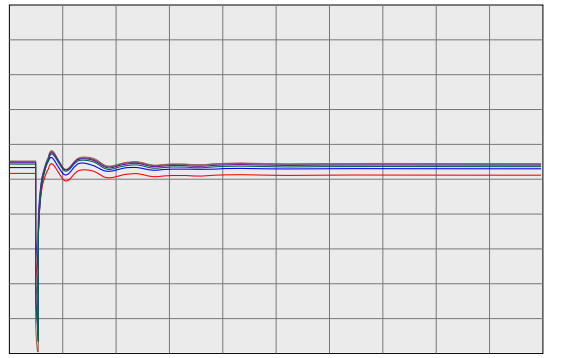
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

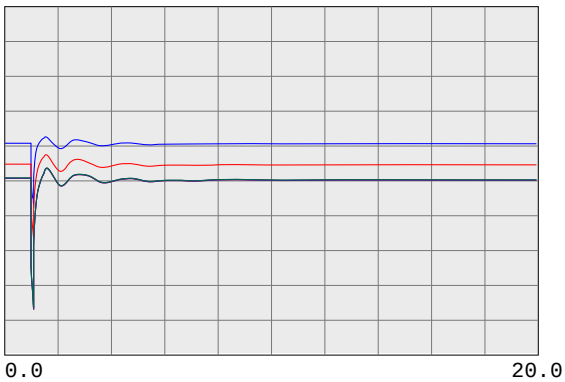
230-KV SYSTEM VOLTAGES



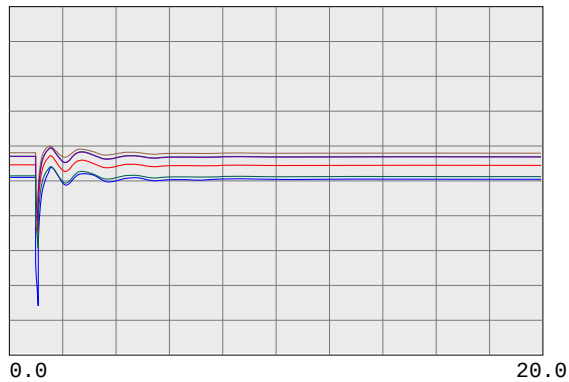
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



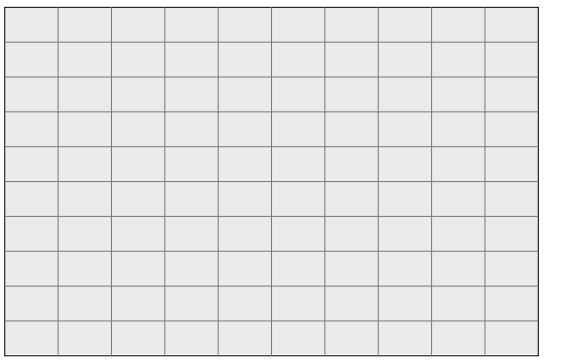
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

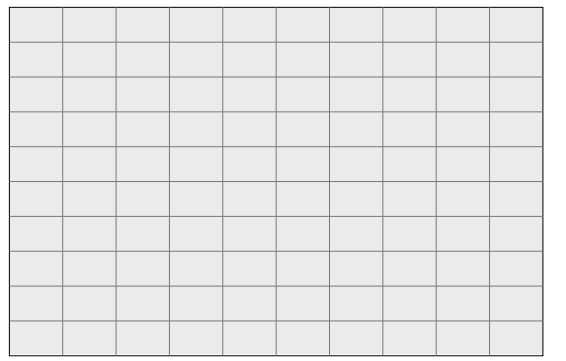


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



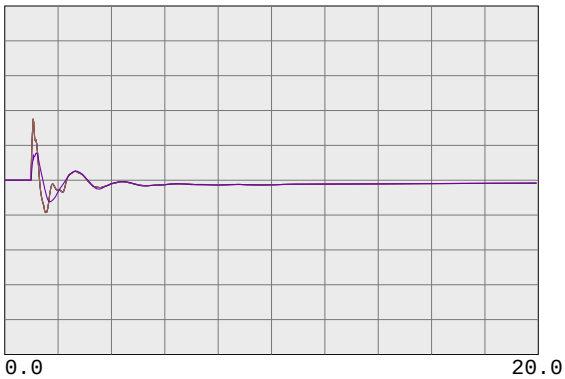
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



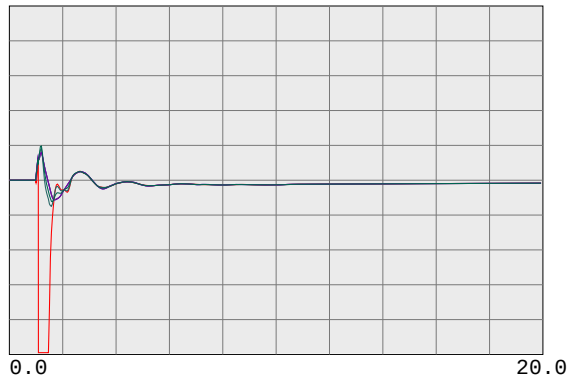


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

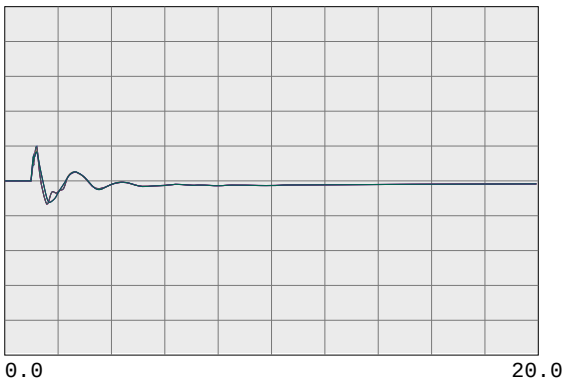
230-KV SYSTEM FREQUENCIES



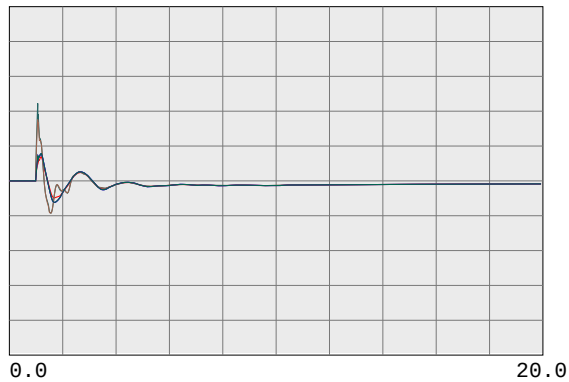
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



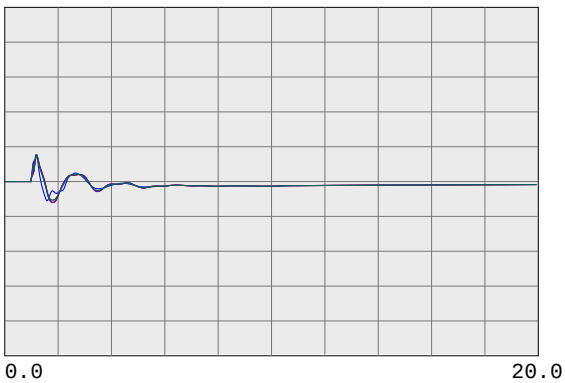
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



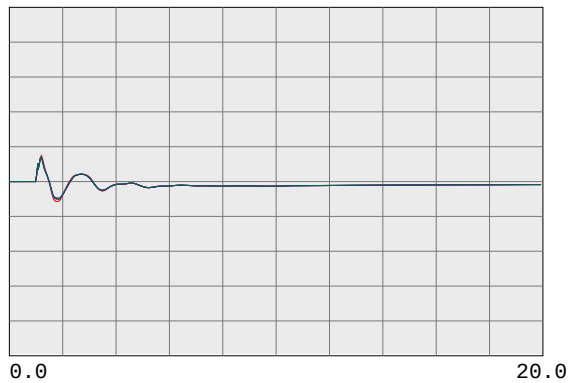
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



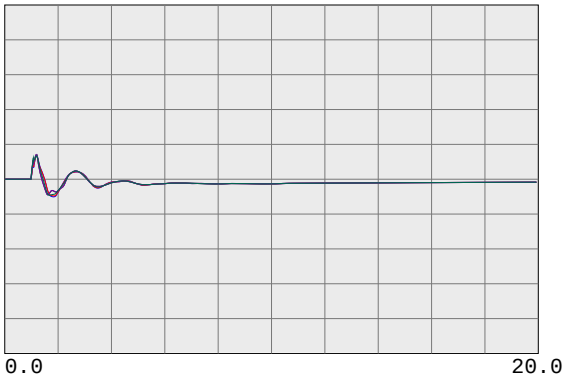
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



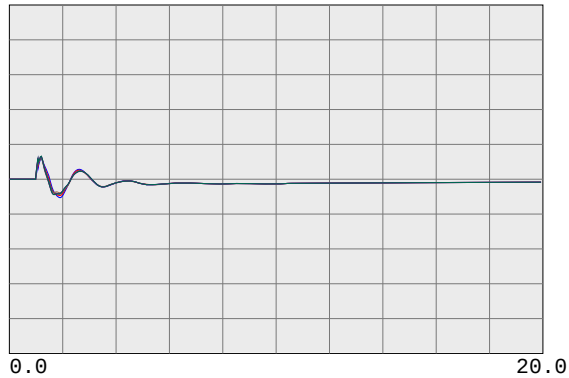
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

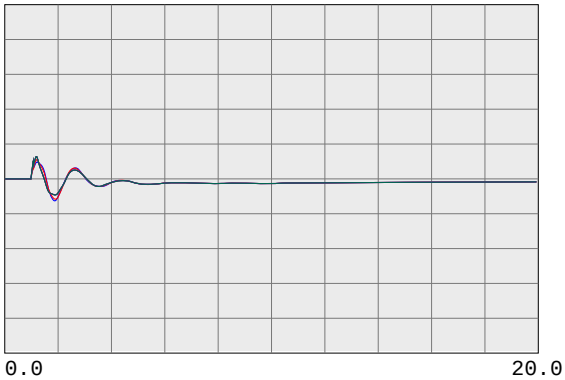
230-KV SYSTEM FREQUENCIES



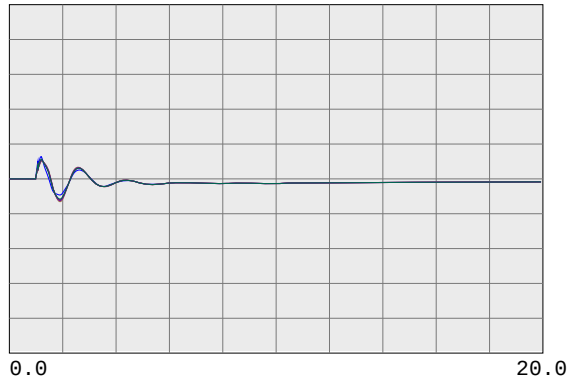
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



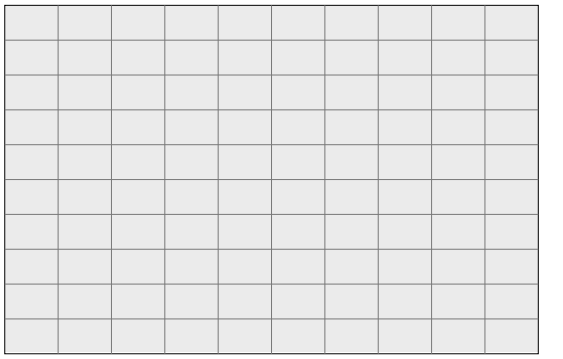
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

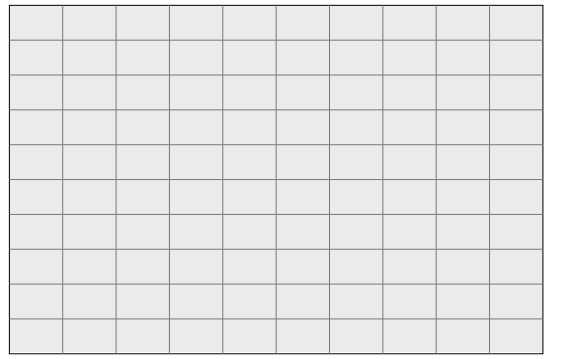


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



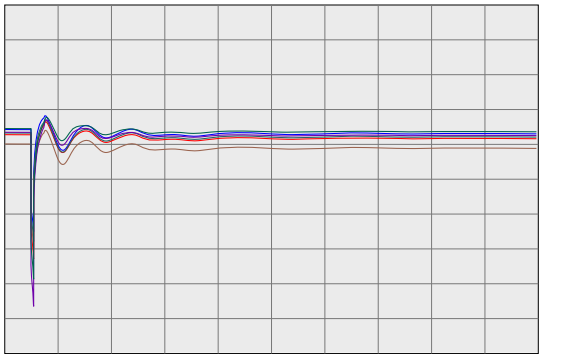
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



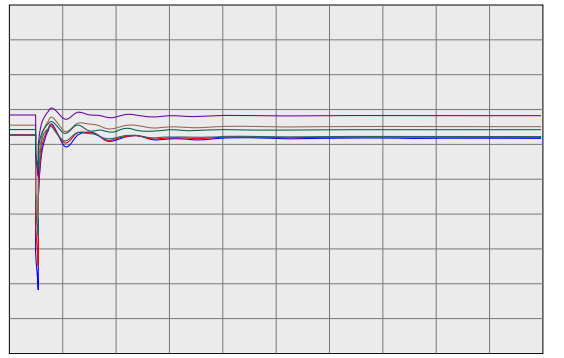


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

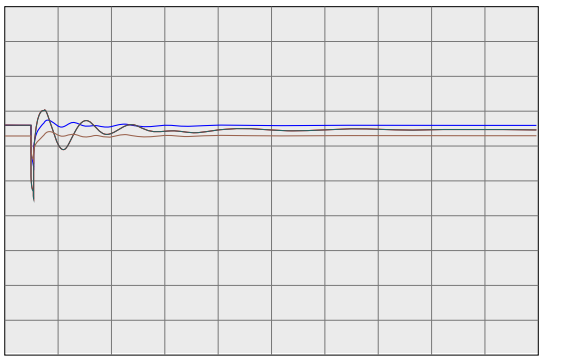
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



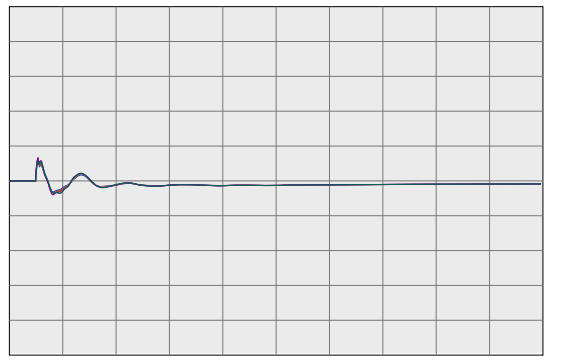
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



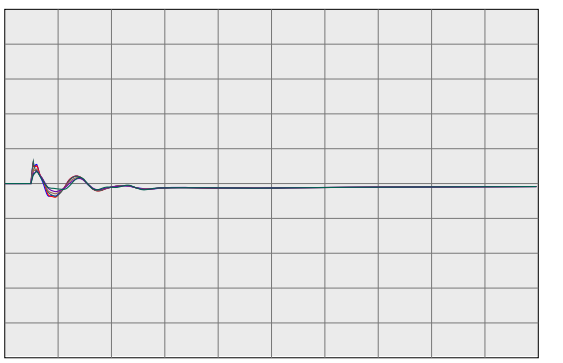
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



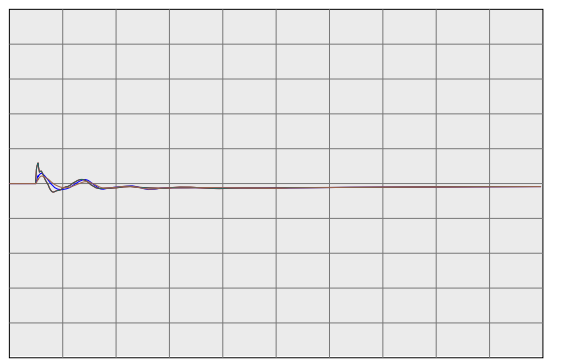
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



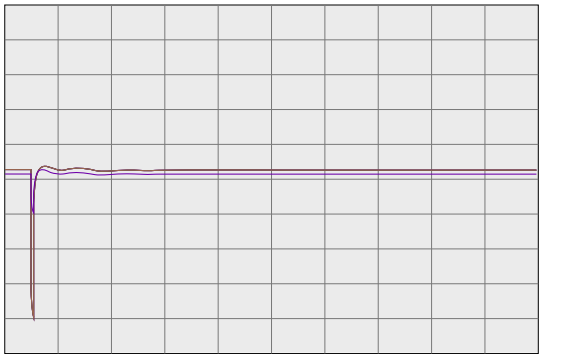
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

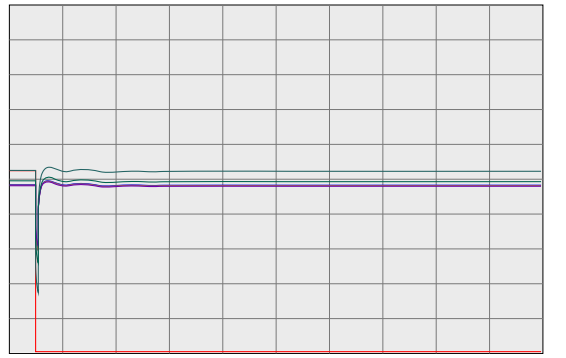
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

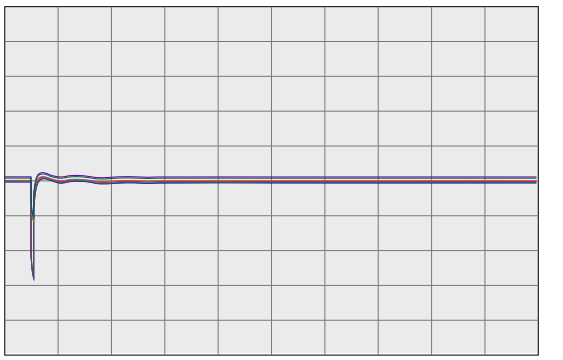
230-KV SYSTEM VOLTAGES



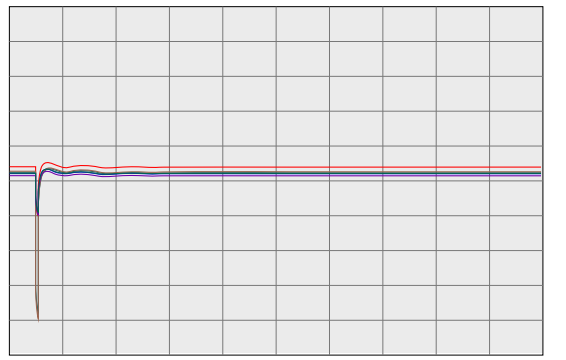
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



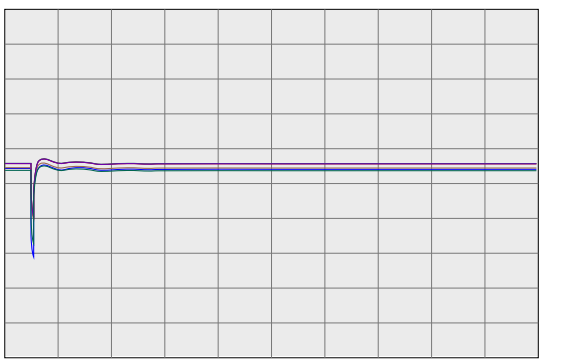
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



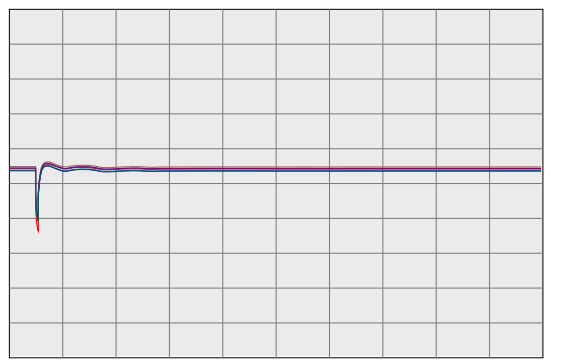
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



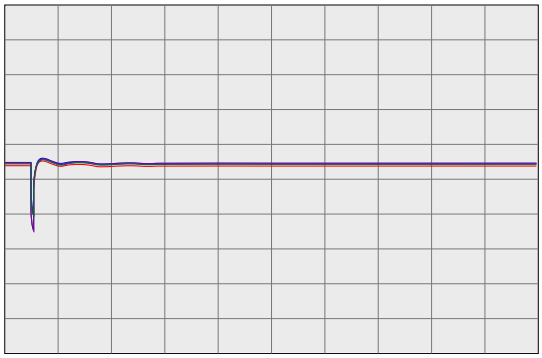
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

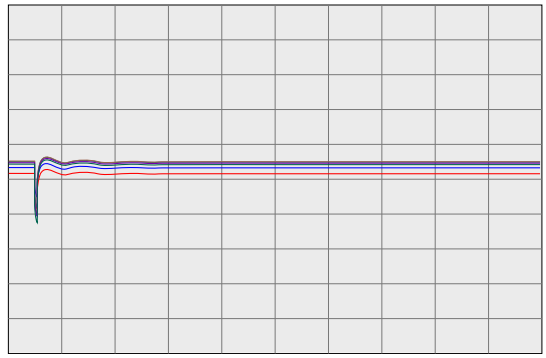
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

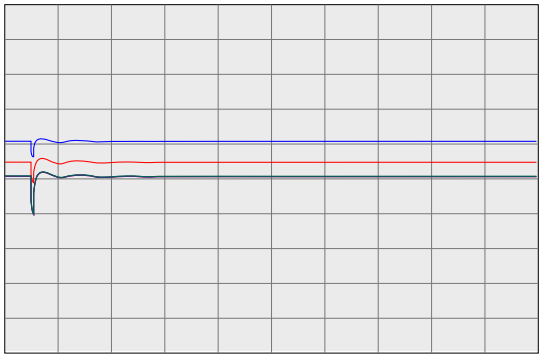
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

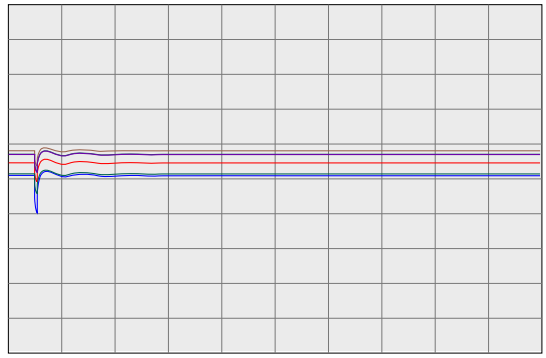
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

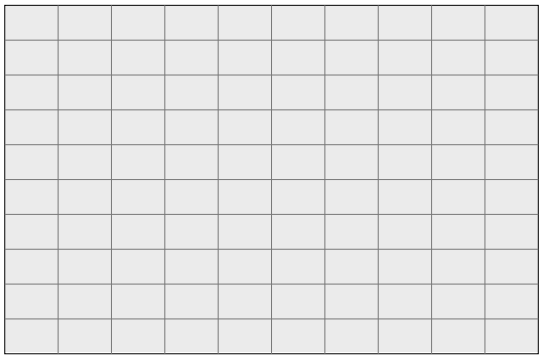
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

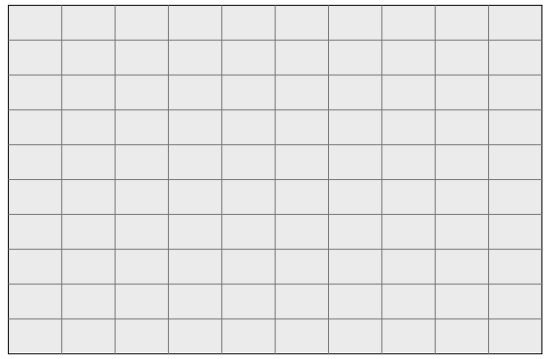


0.0 20.0

Time(sec)

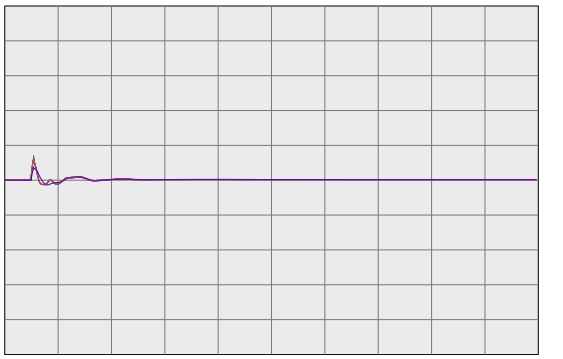
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



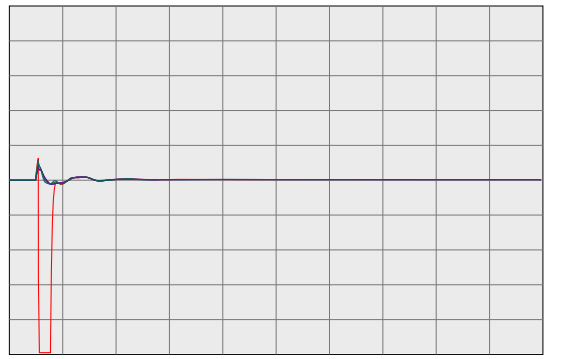


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

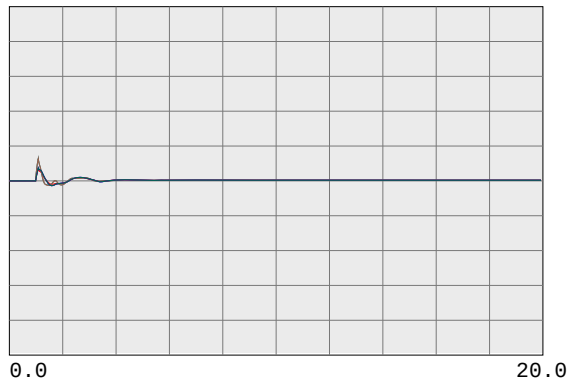


59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



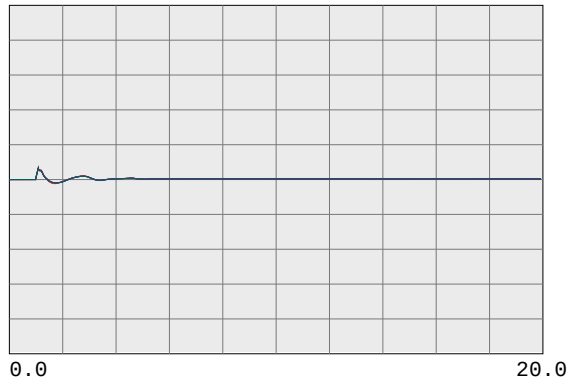
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

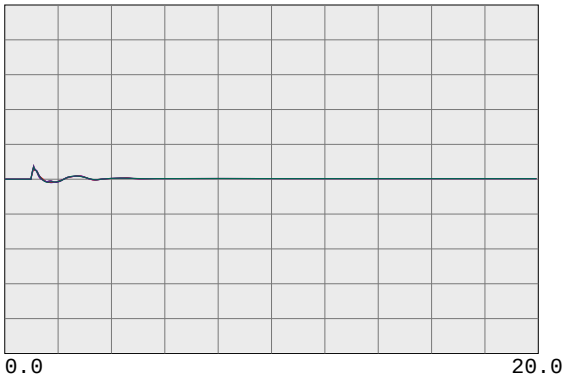
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES

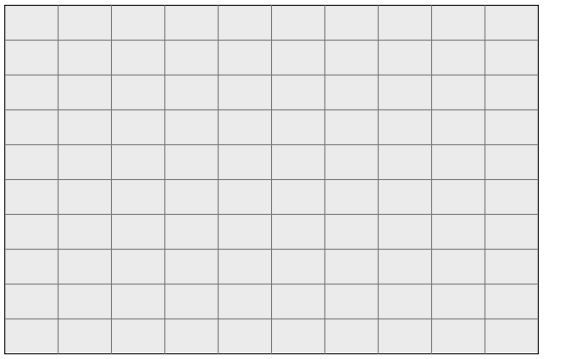


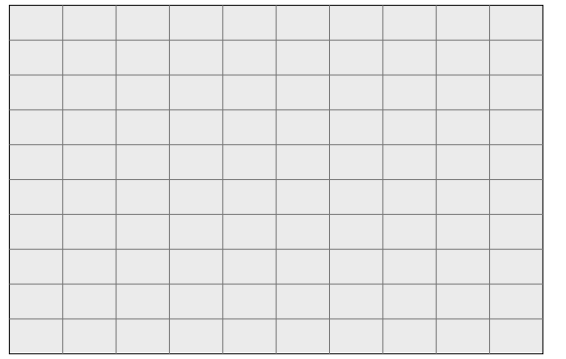
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

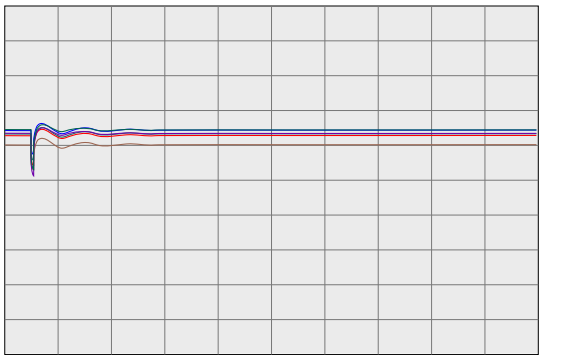
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



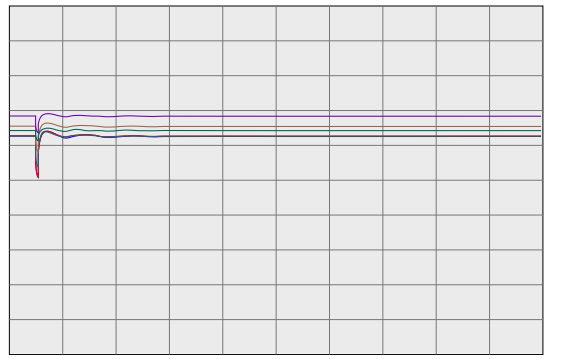


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

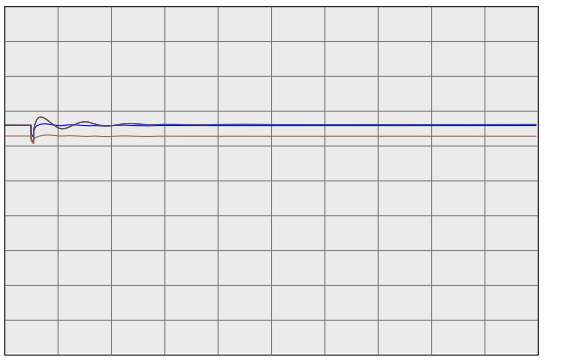
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500

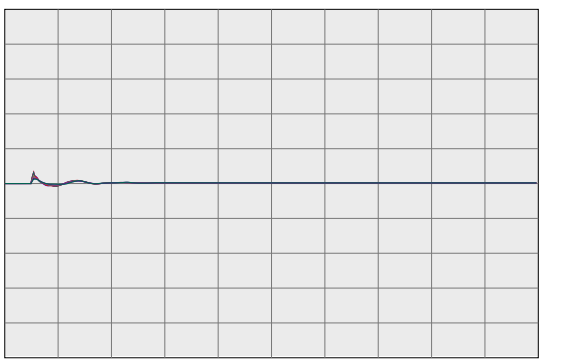


0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500

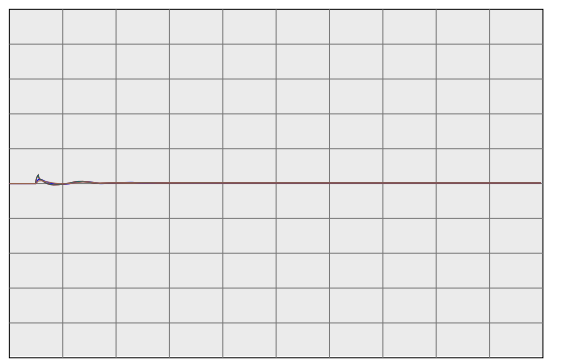


0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



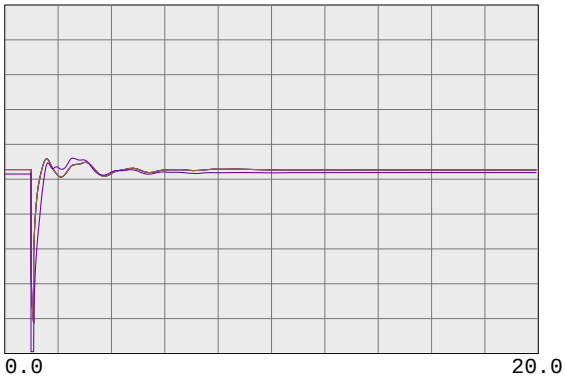
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

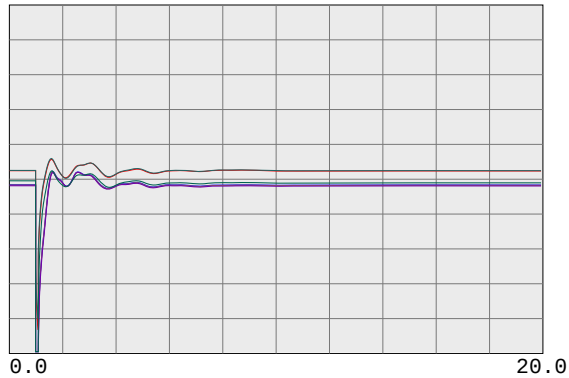
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

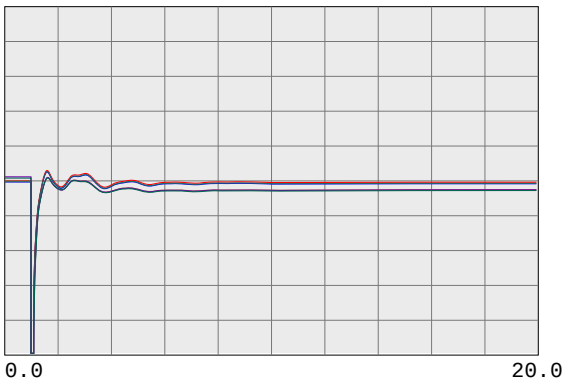
230-KV SYSTEM VOLTAGES



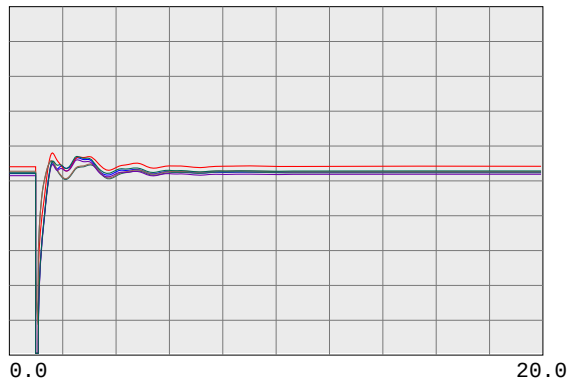
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



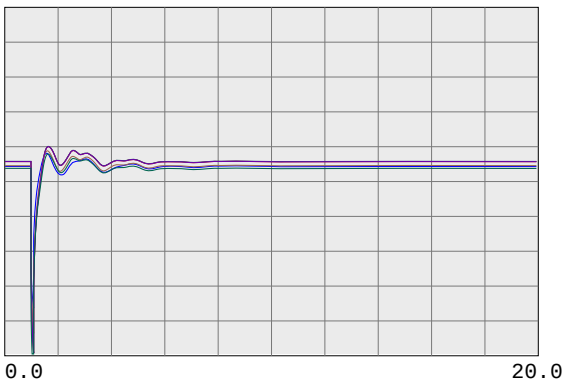
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



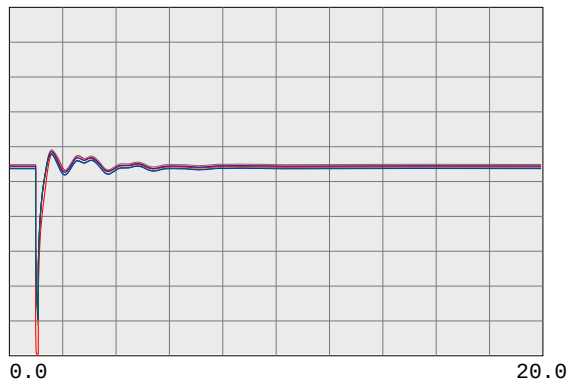
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



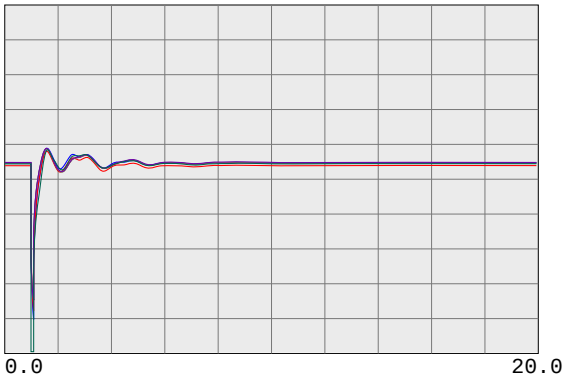
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



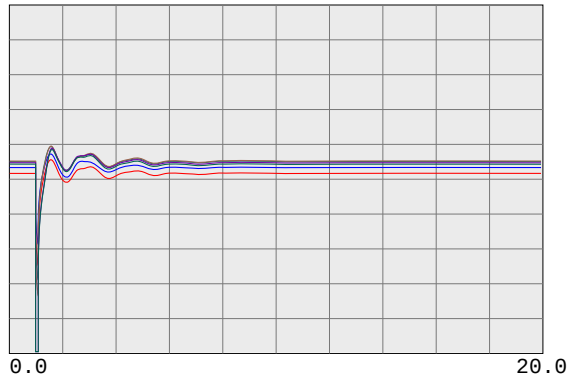
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

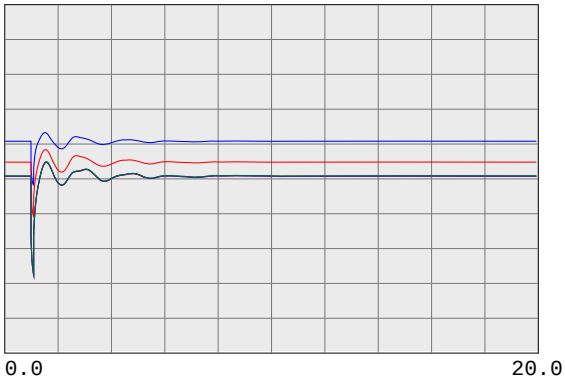
230-KV SYSTEM VOLTAGES



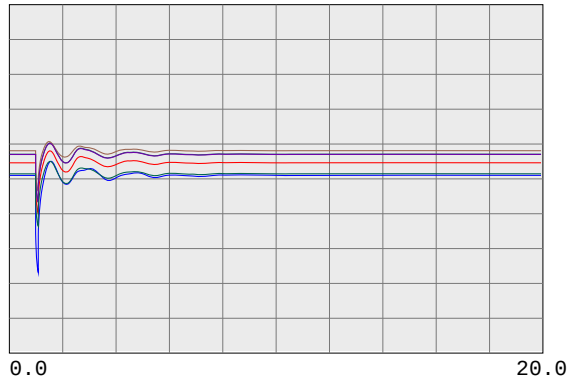
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



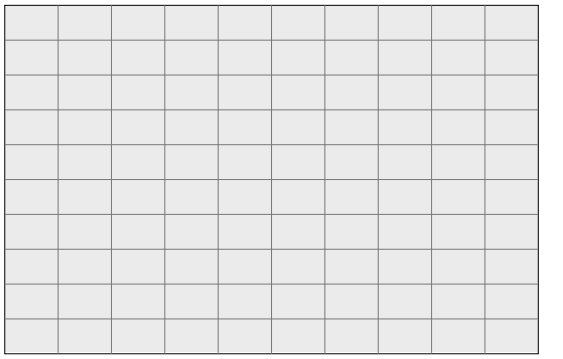
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

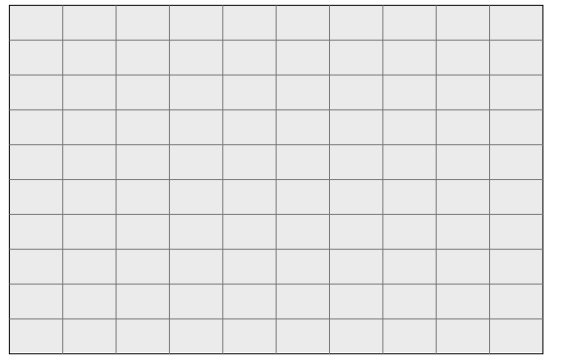


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



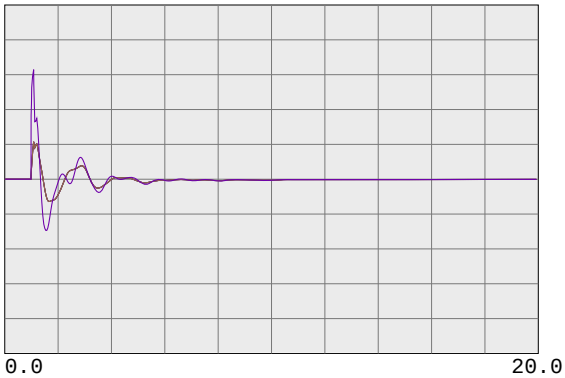
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



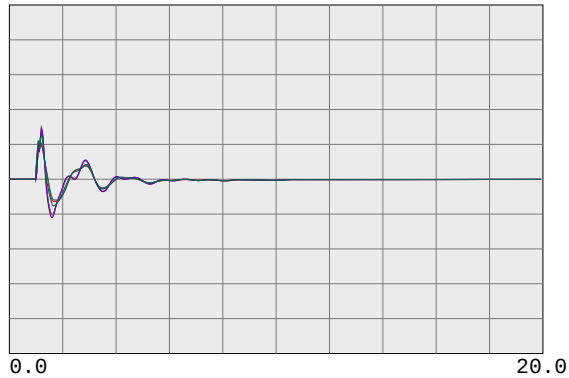


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

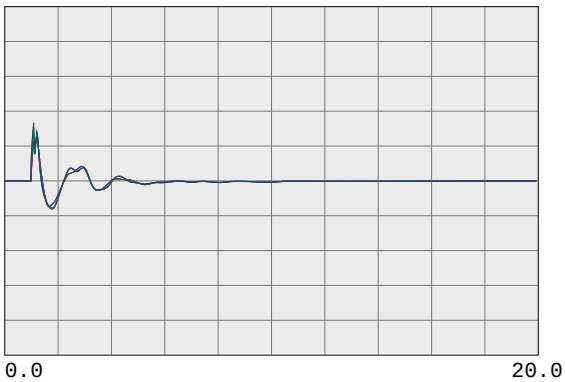
230-KV SYSTEM FREQUENCIES



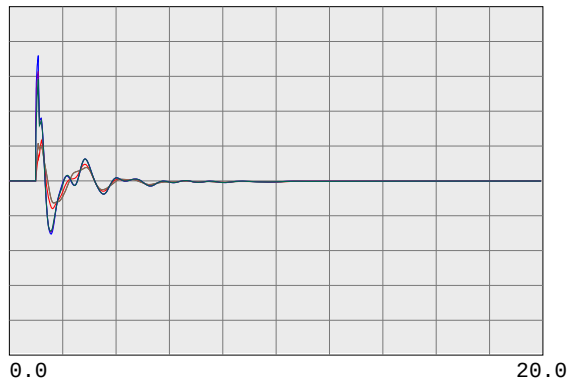
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



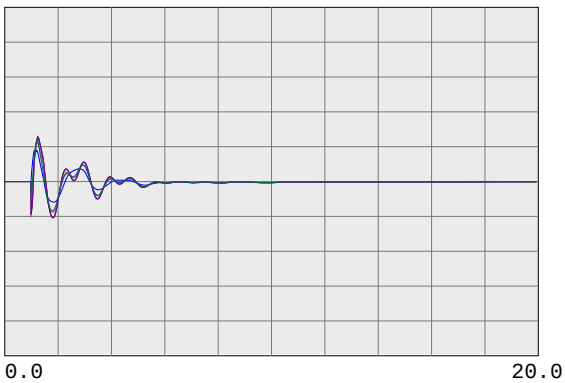
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



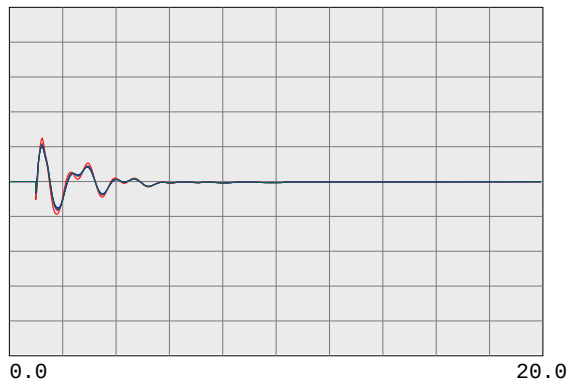
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



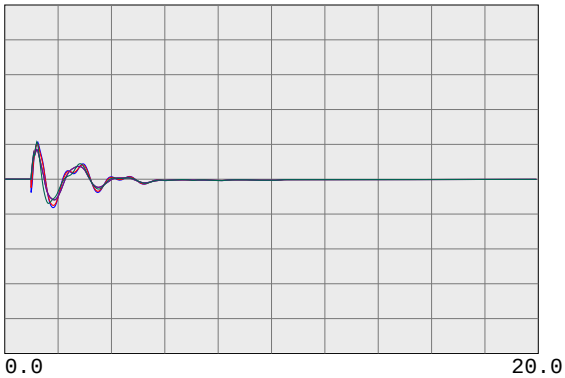
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



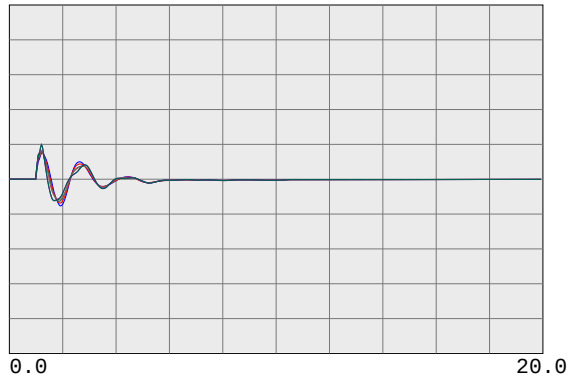
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

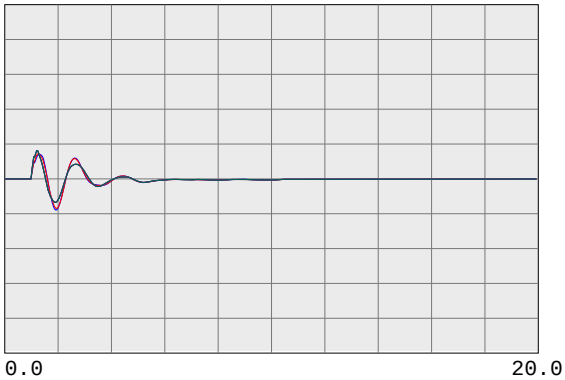
230-KV SYSTEM FREQUENCIES



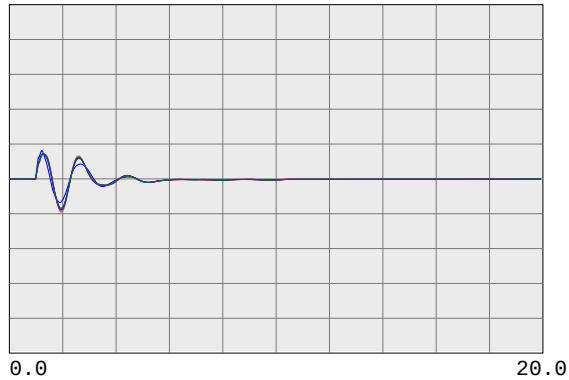
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



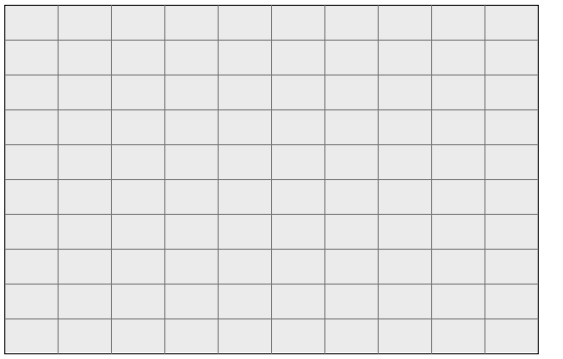
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

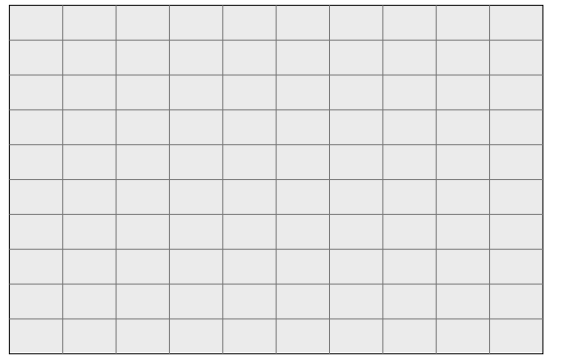


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



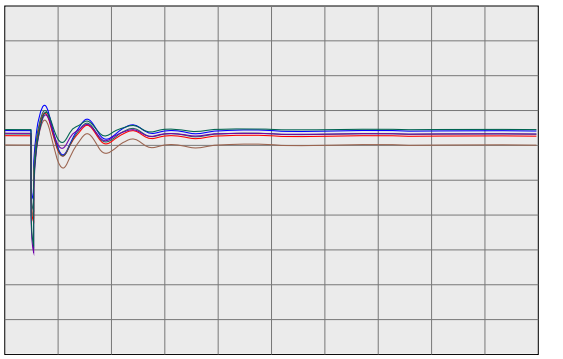
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



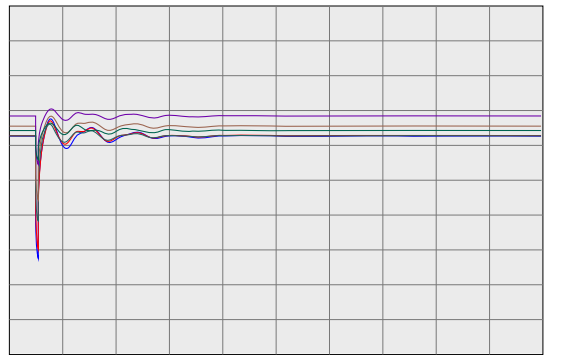


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

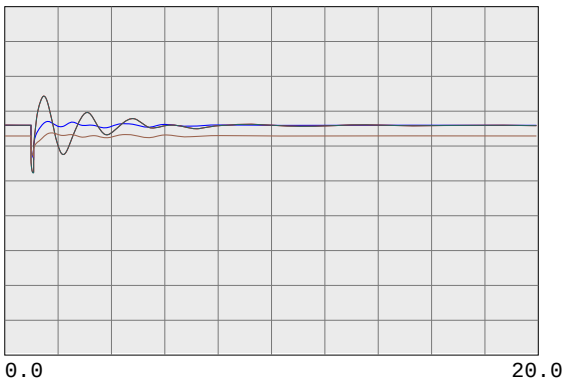
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



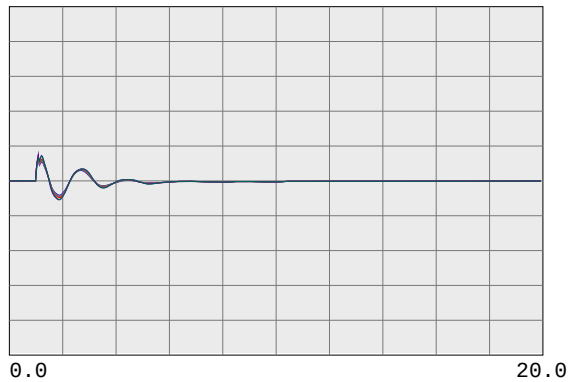
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



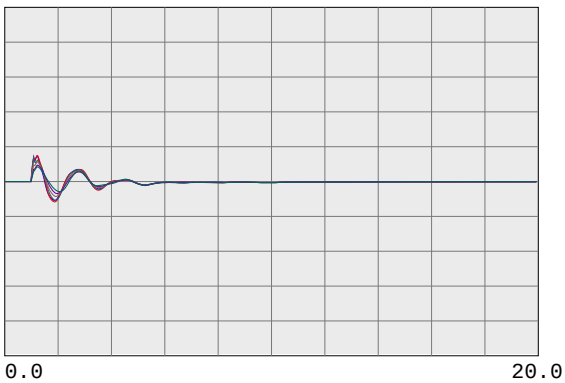
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



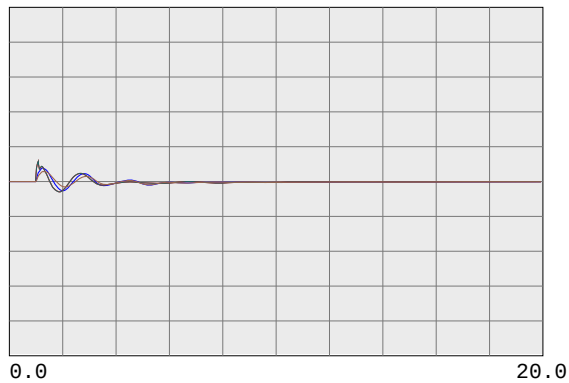
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



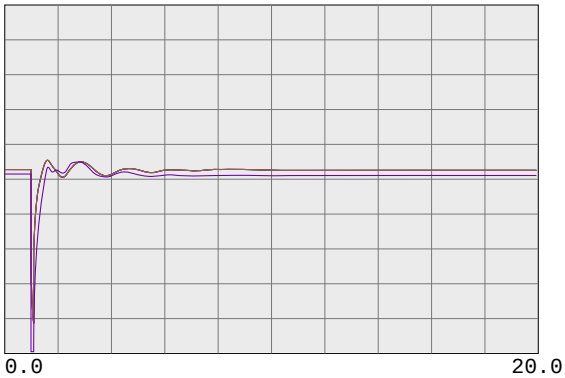
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

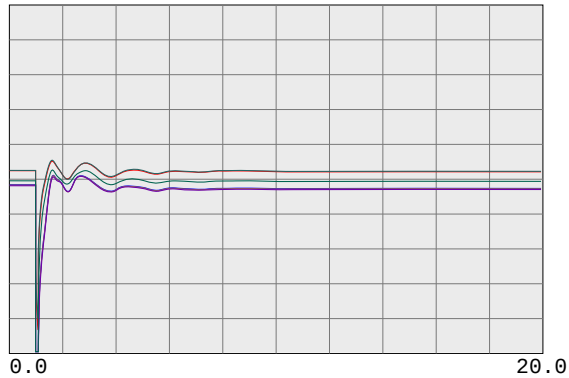
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

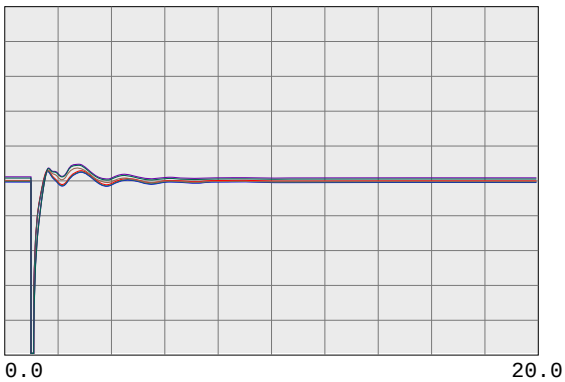
230-KV SYSTEM VOLTAGES



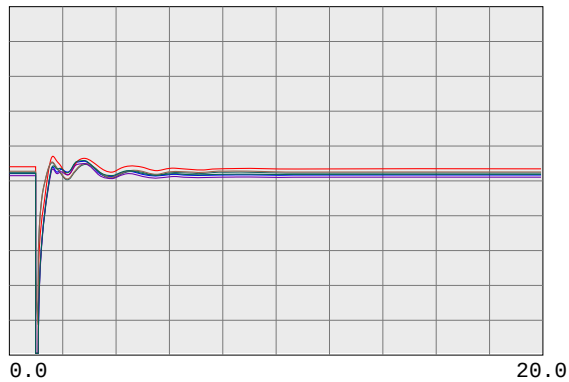
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



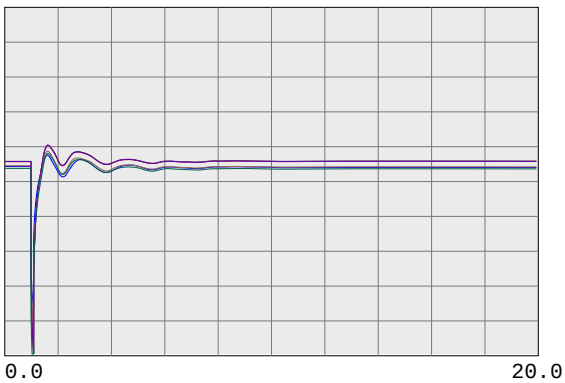
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



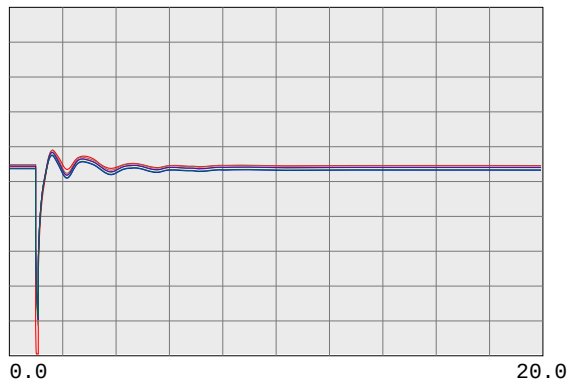
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



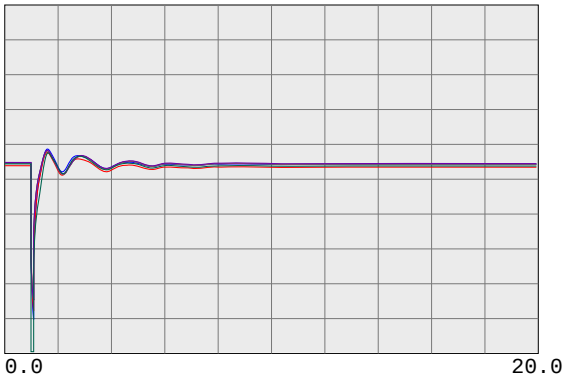
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



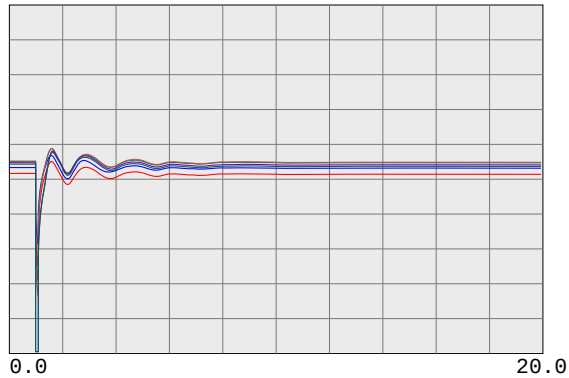
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

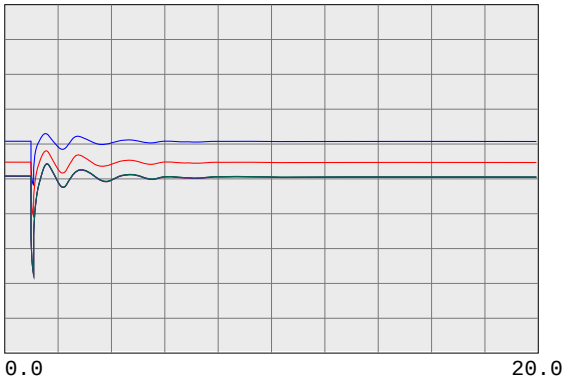
230-KV SYSTEM VOLTAGES



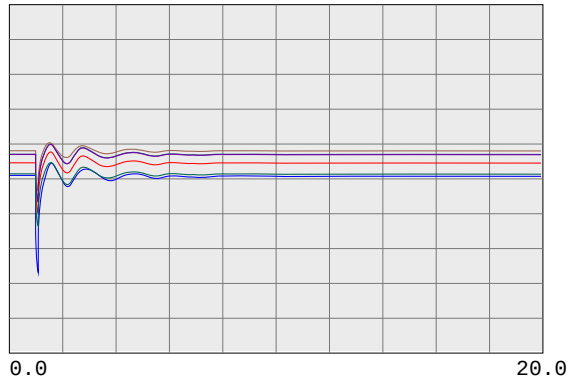
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



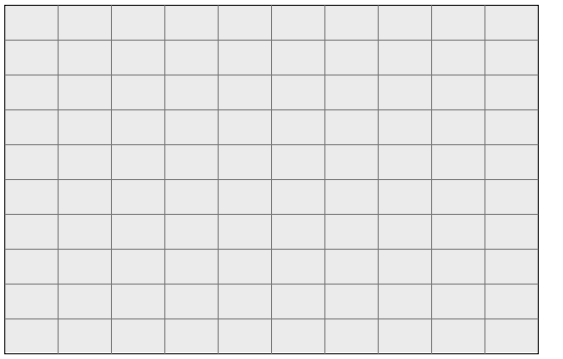
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

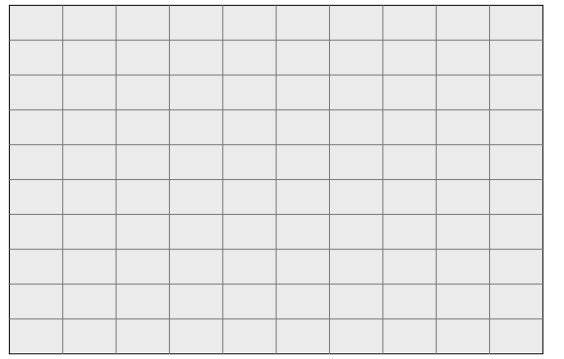


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



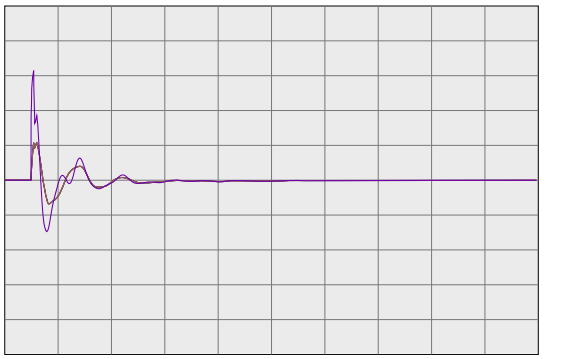
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



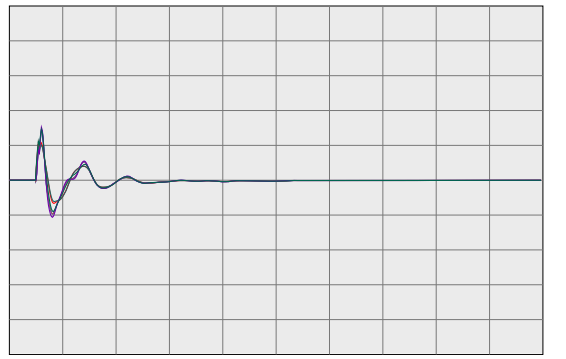


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

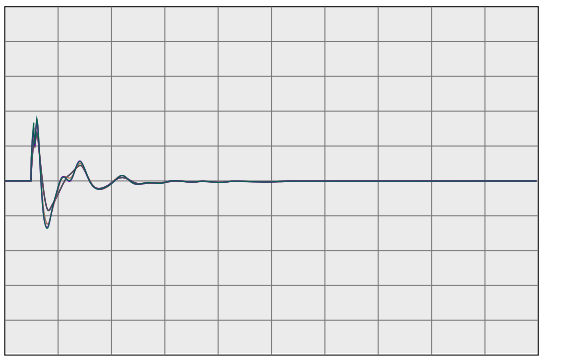
230-KV SYSTEM FREQUENCIES



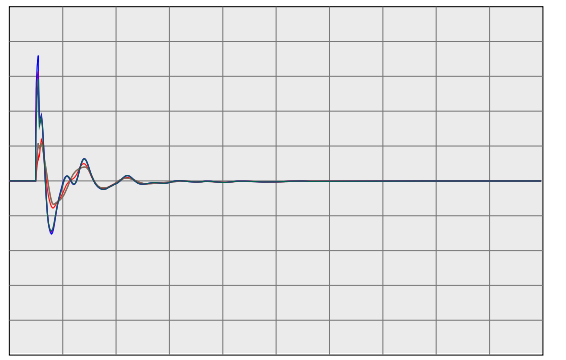
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



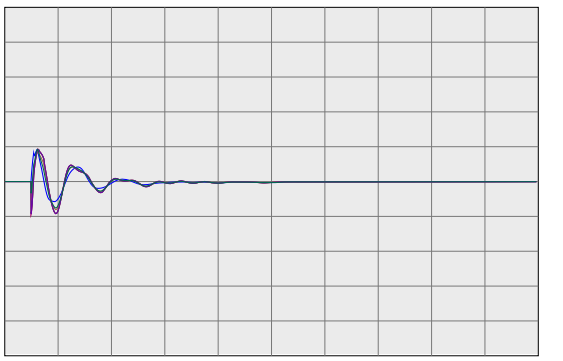
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



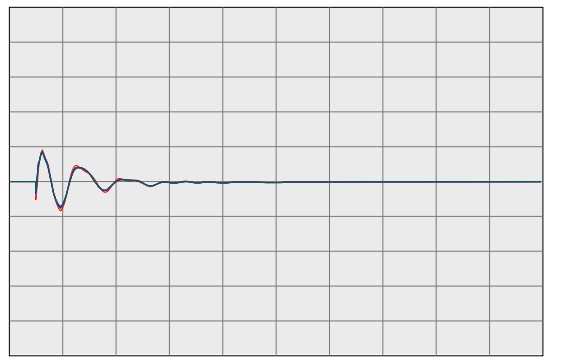
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



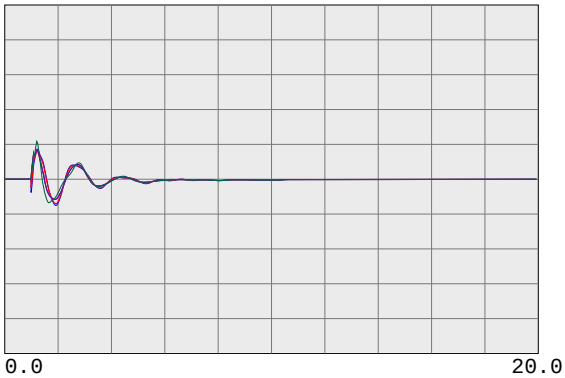
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



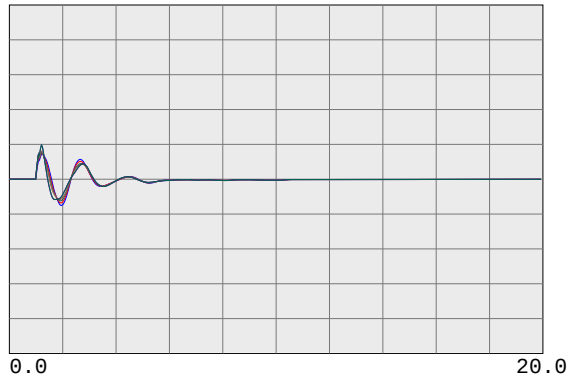
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

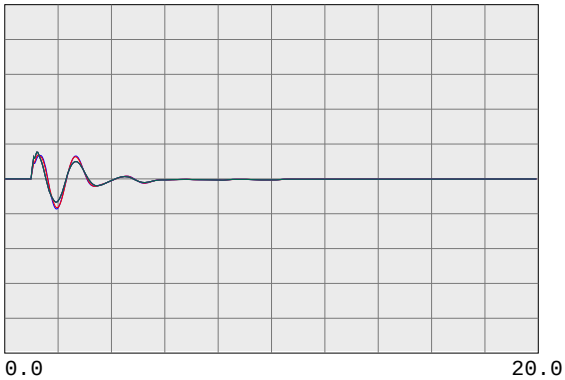
230-KV SYSTEM FREQUENCIES



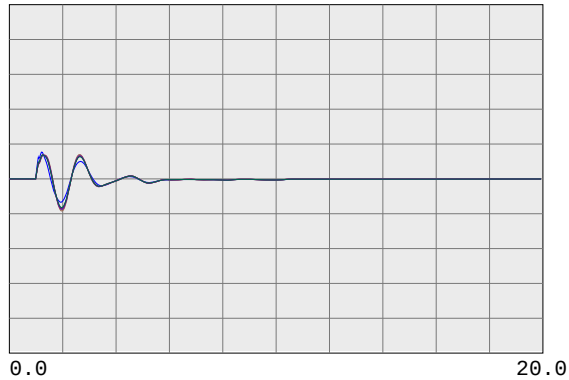
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



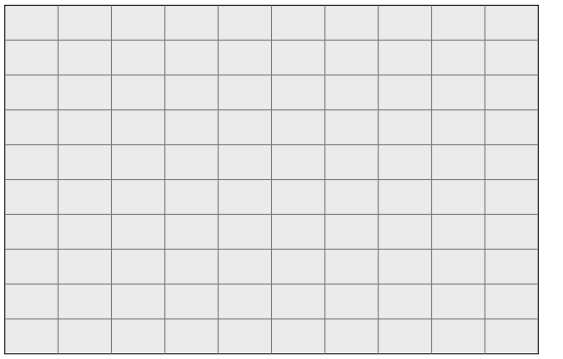
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

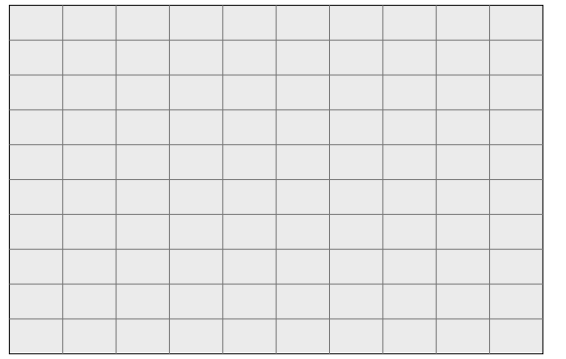


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



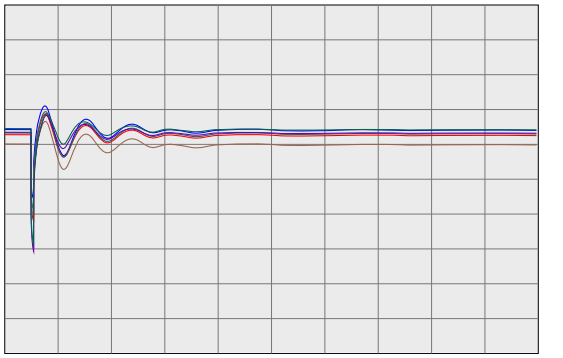
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



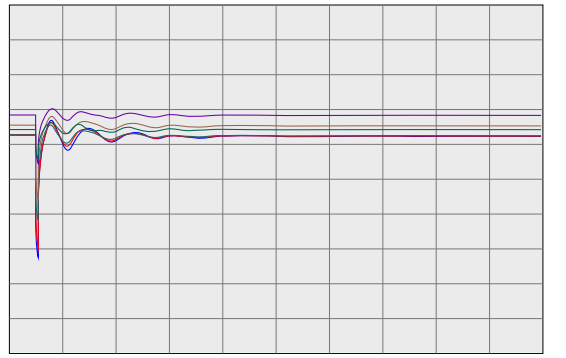


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

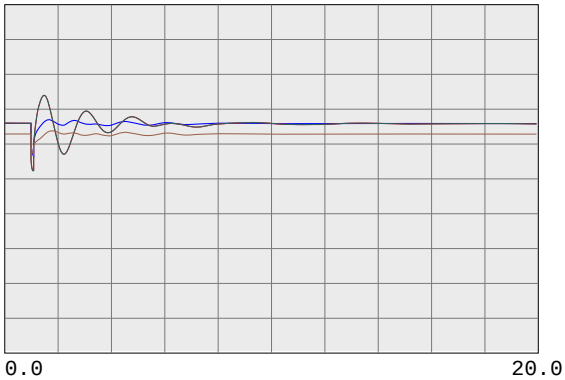
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



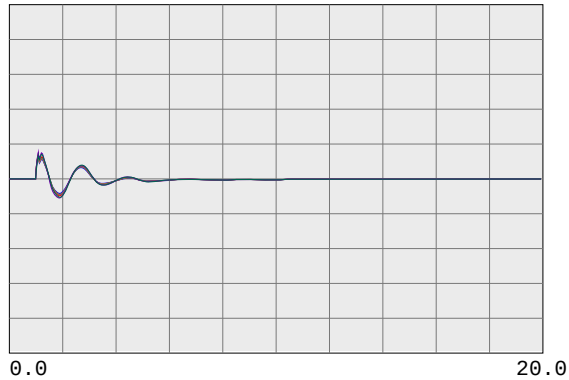
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



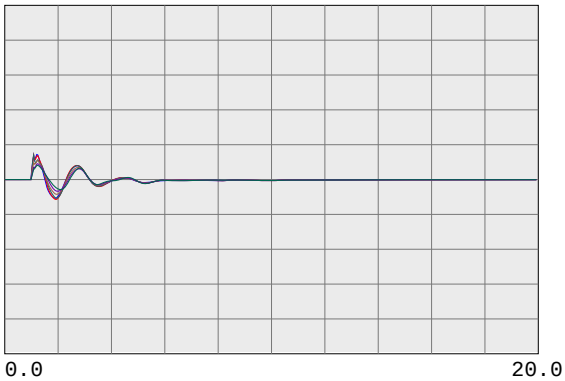
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



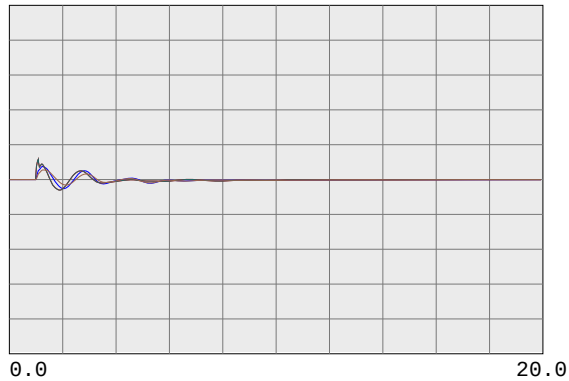
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



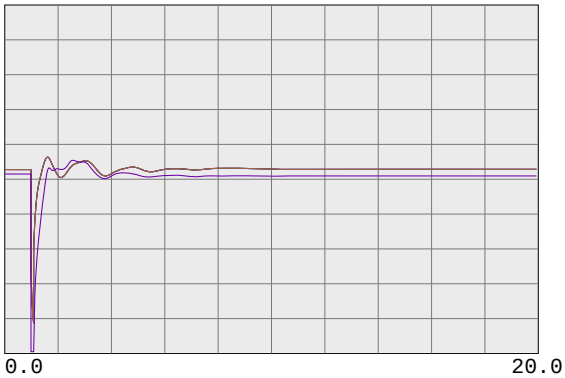
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

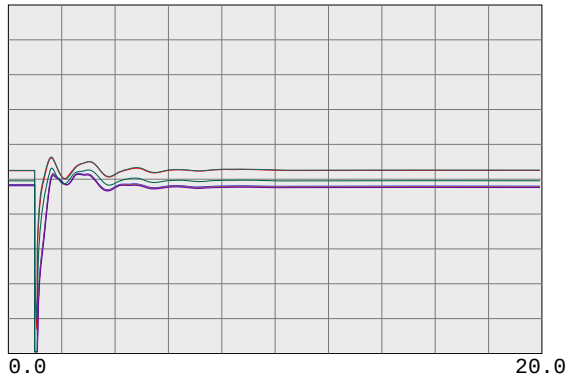
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

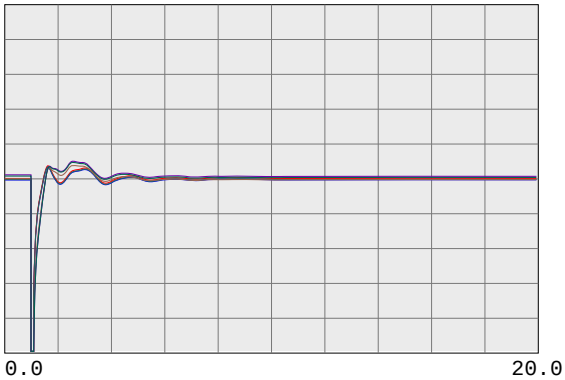
230-KV SYSTEM VOLTAGES



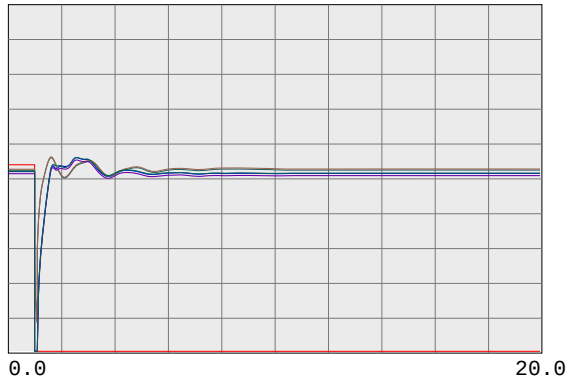
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



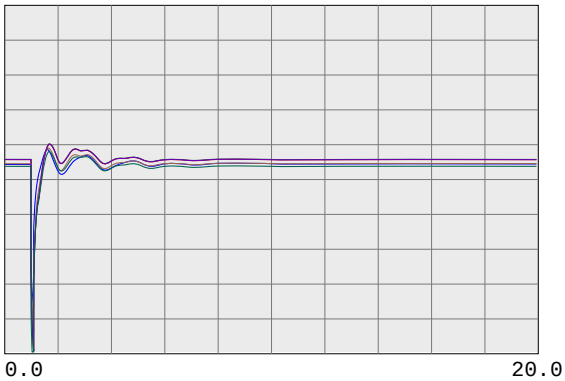
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



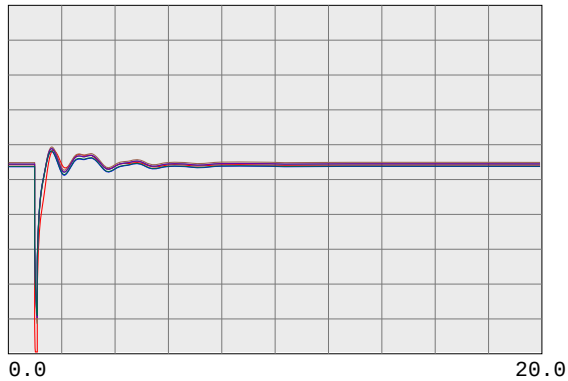
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



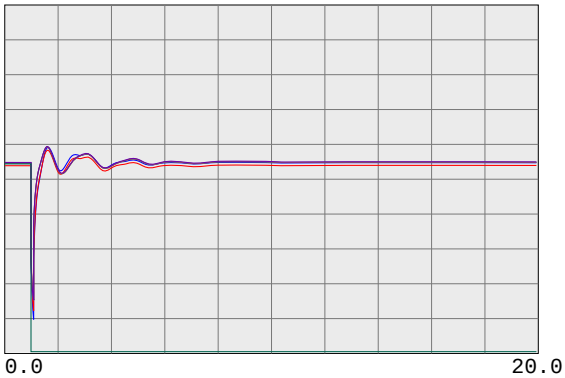
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



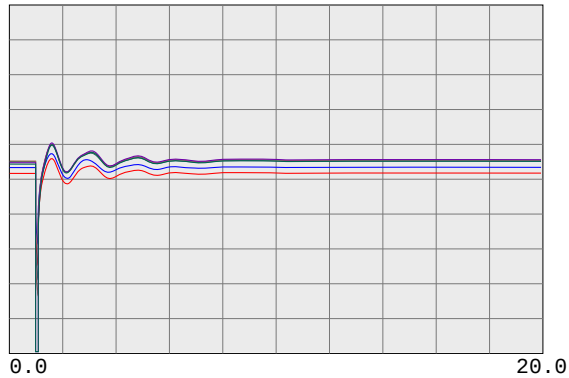
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

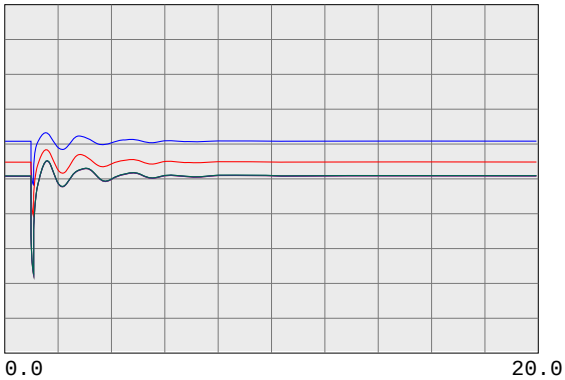
230-KV SYSTEM VOLTAGES



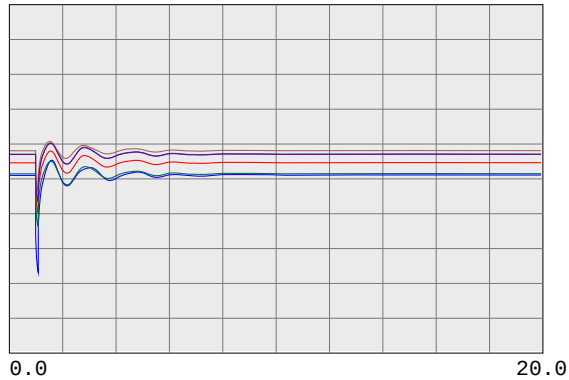
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



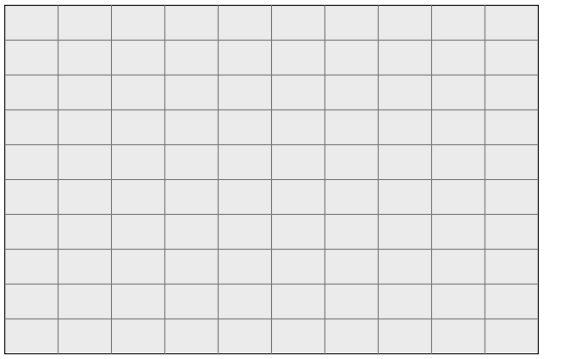
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

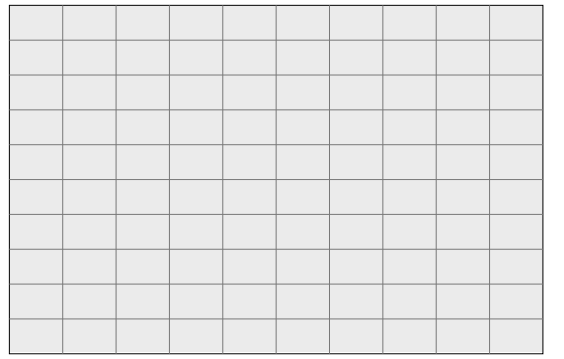


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



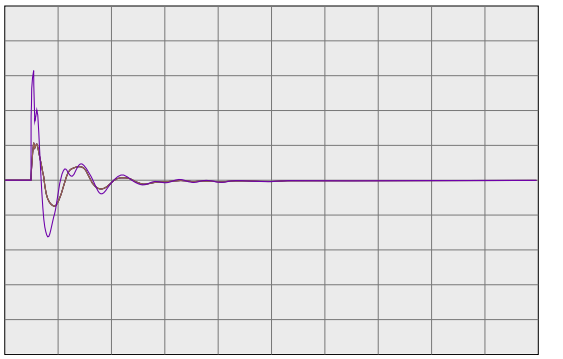
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



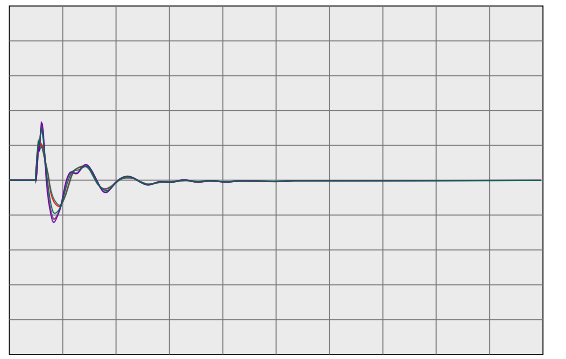


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

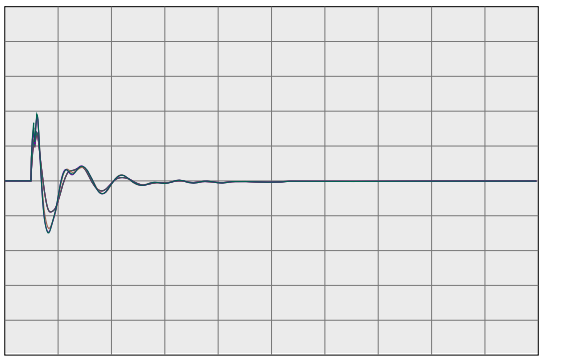
230-KV SYSTEM FREQUENCIES



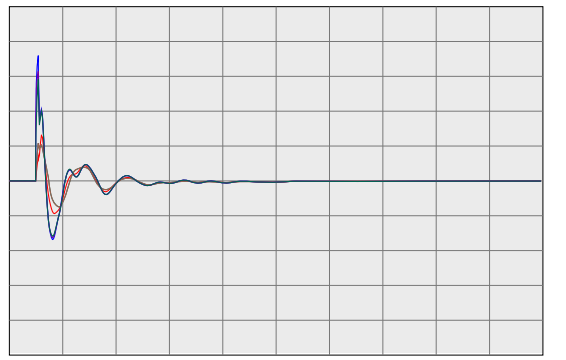
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



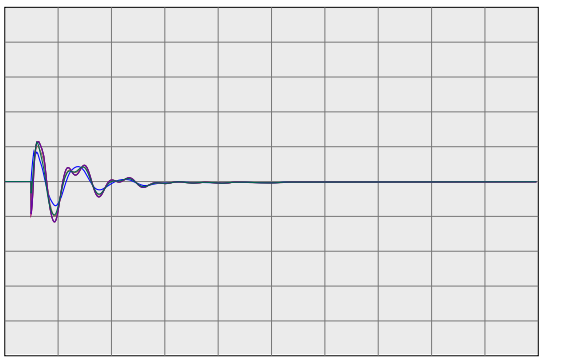
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



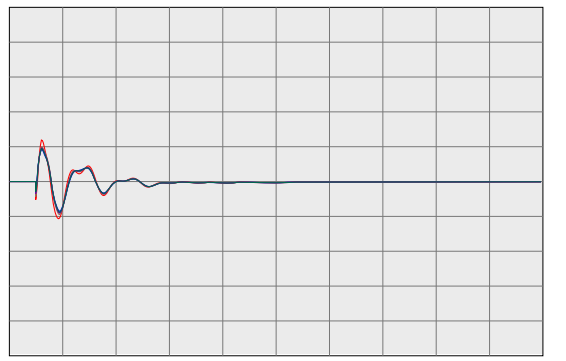
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



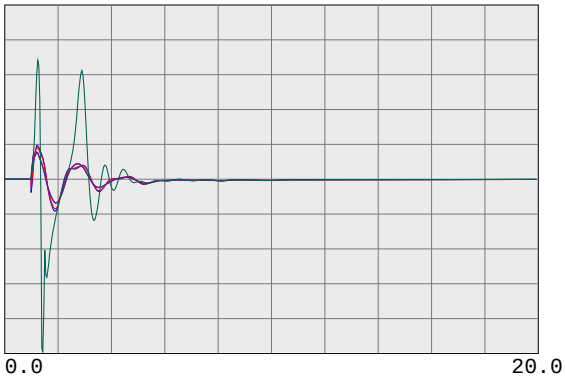
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



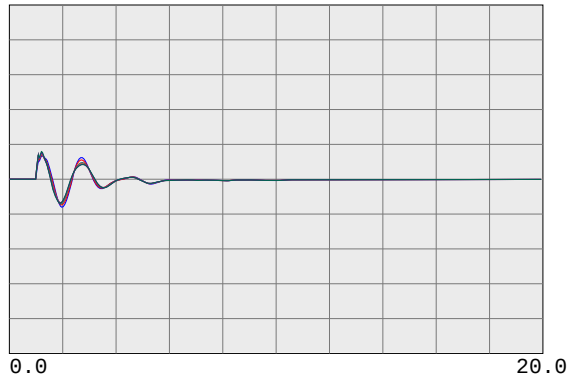
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

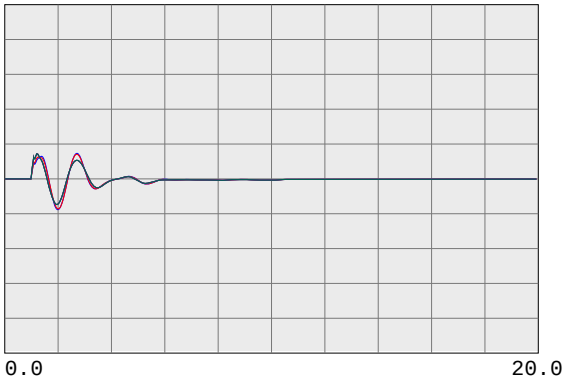
230-KV SYSTEM FREQUENCIES



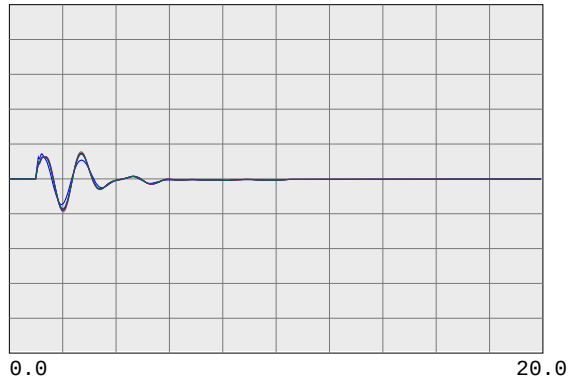
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



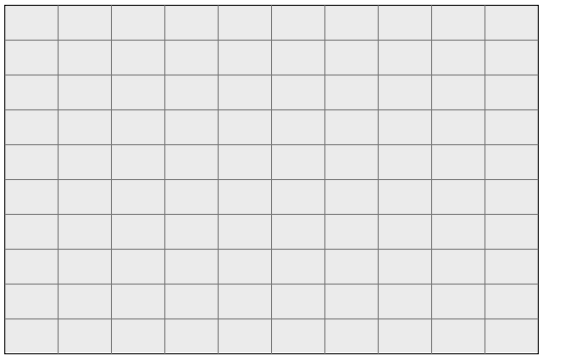
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

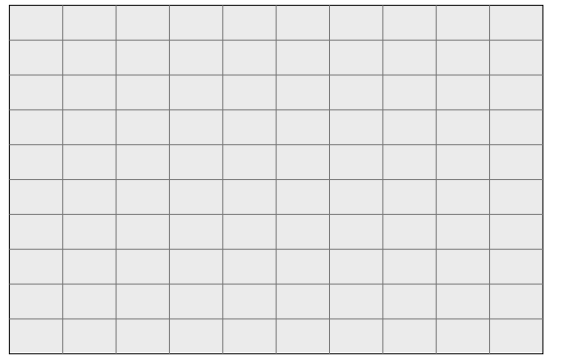


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



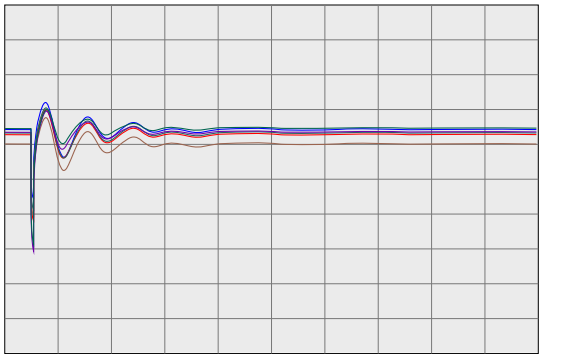
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



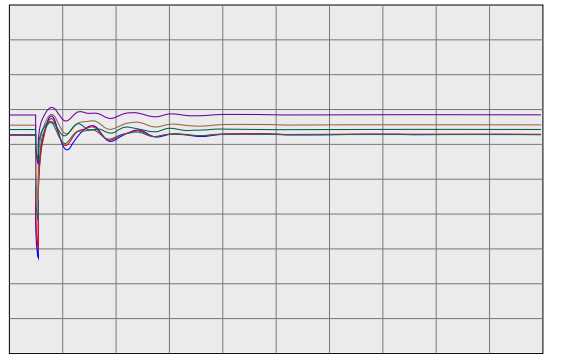


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

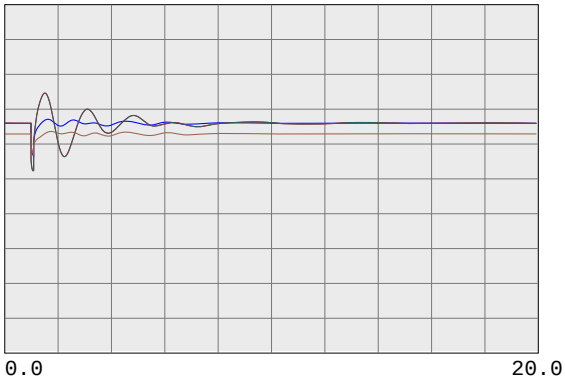
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



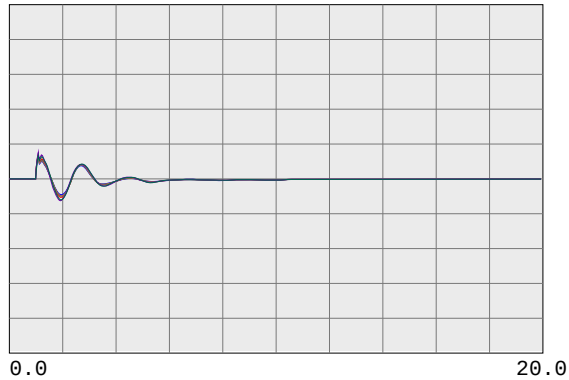
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



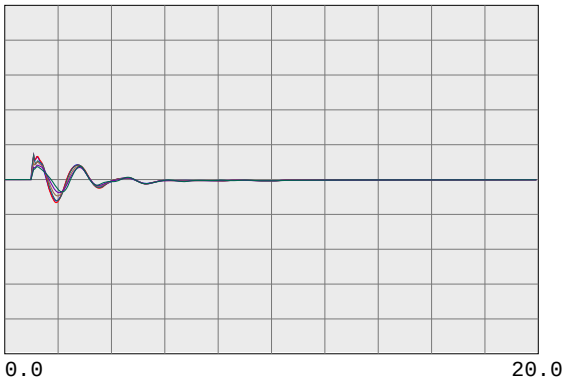
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



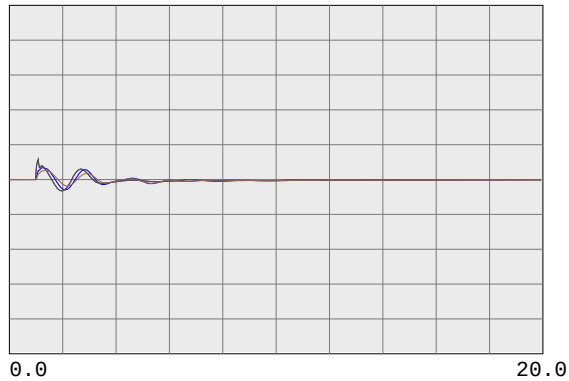
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



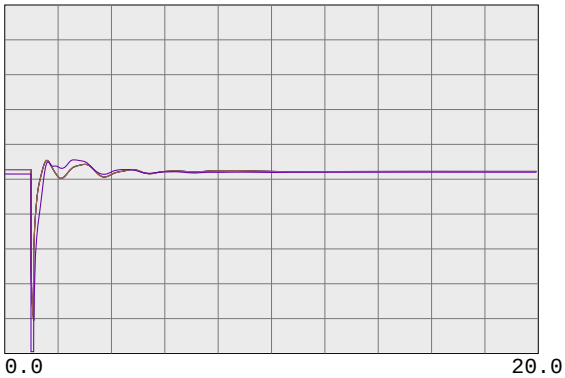
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

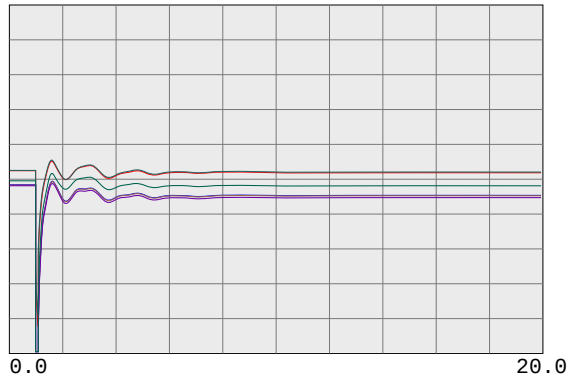
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

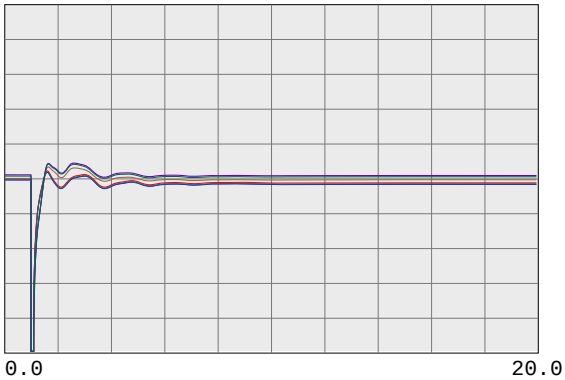
230-KV SYSTEM VOLTAGES



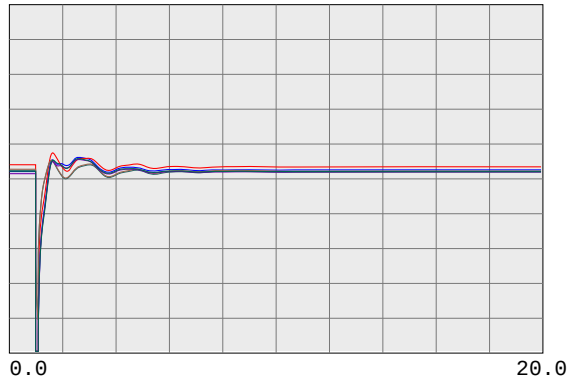
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



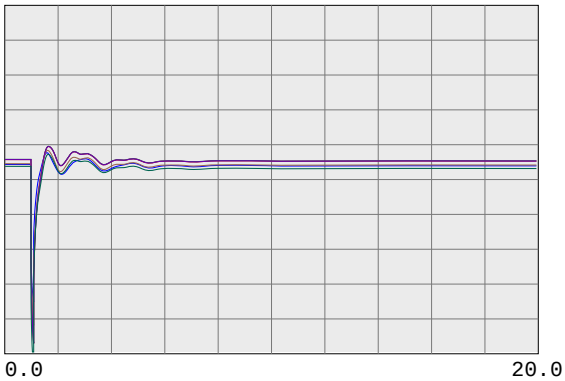
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



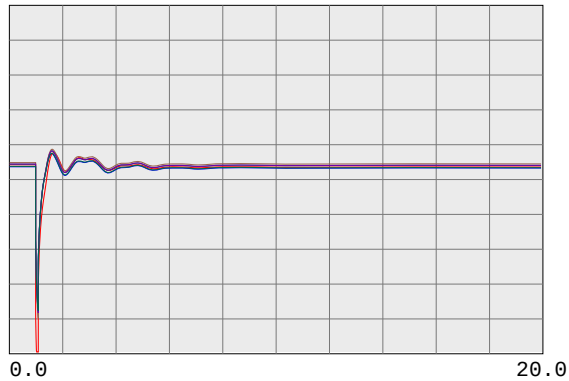
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



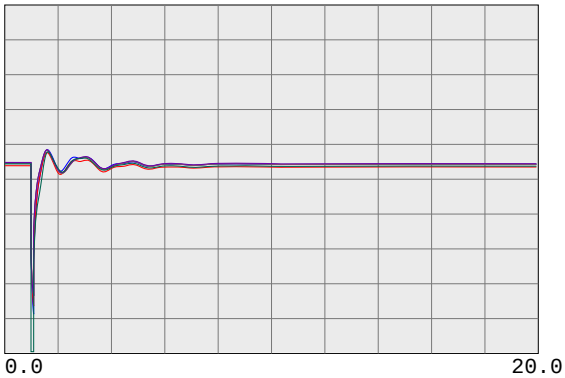
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



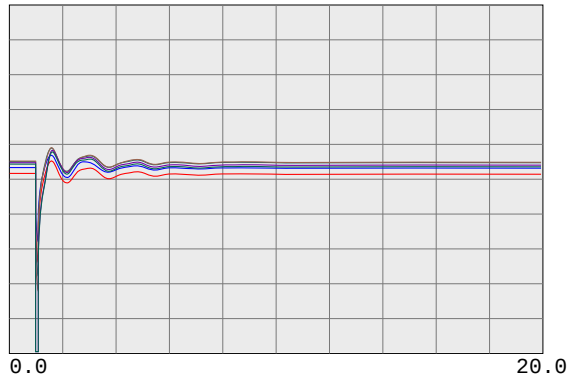
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

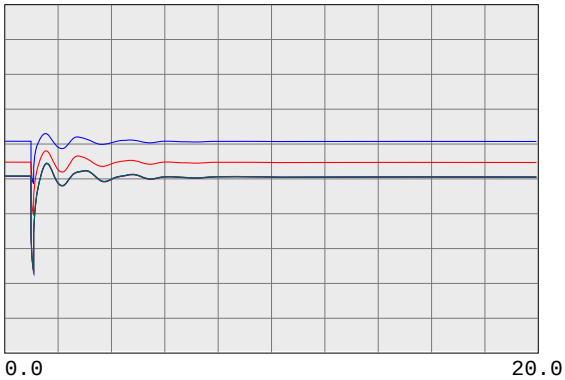
230-KV SYSTEM VOLTAGES



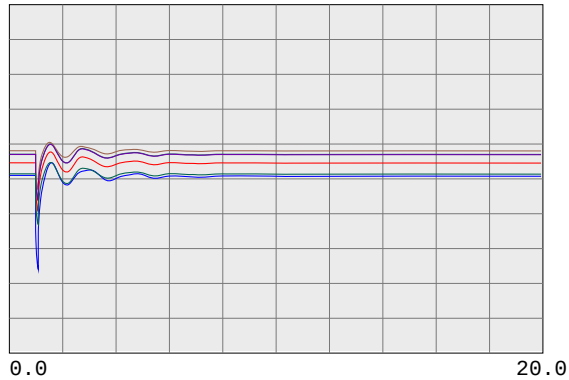
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



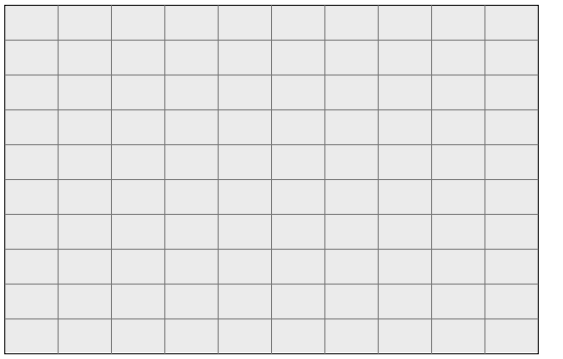
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

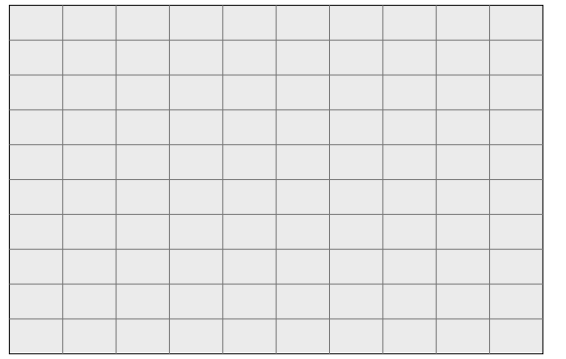


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



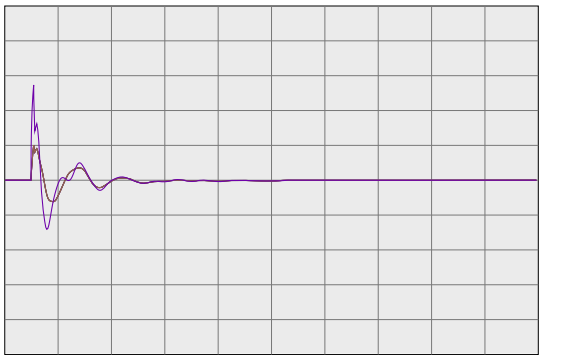
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



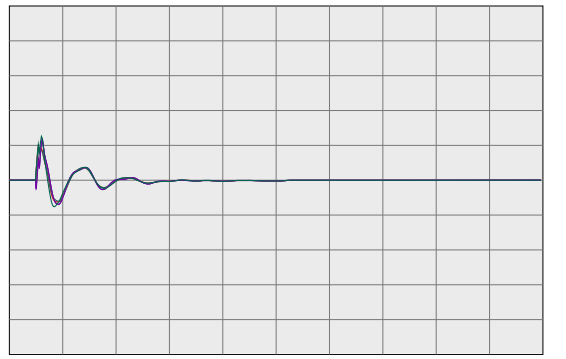


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

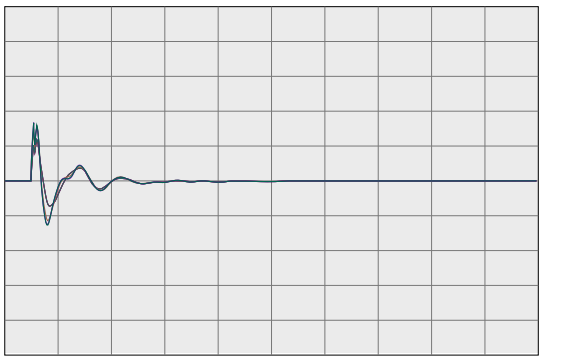
230-KV SYSTEM FREQUENCIES



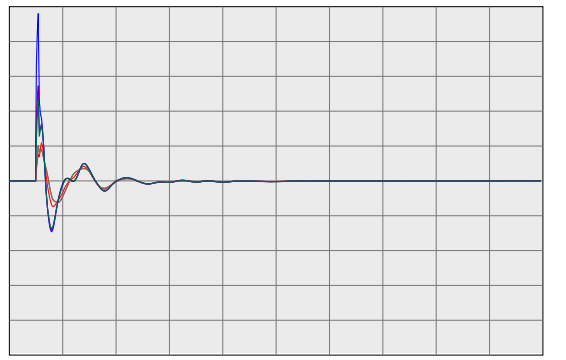
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



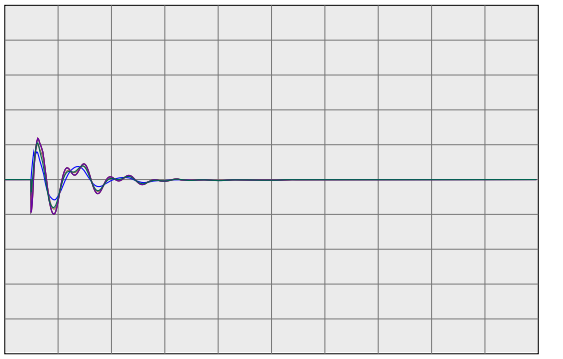
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



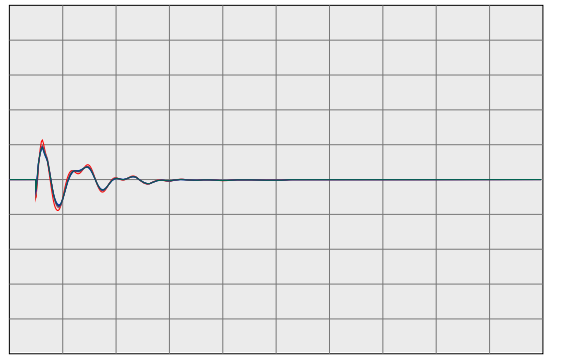
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



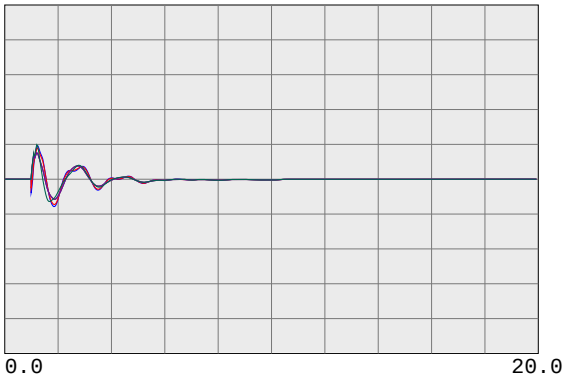
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



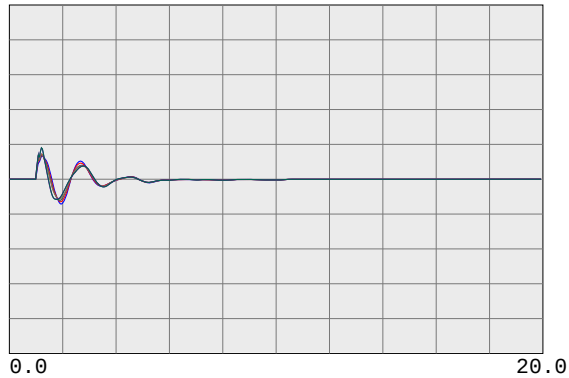
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

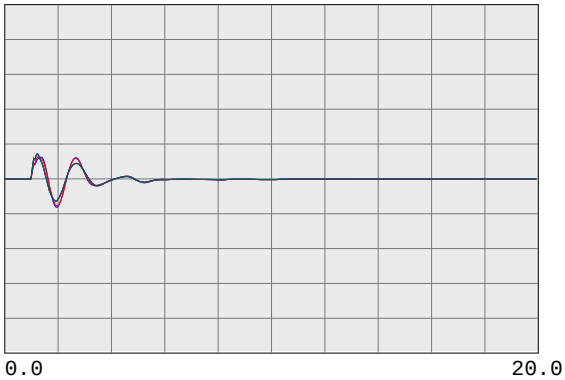
230-KV SYSTEM FREQUENCIES



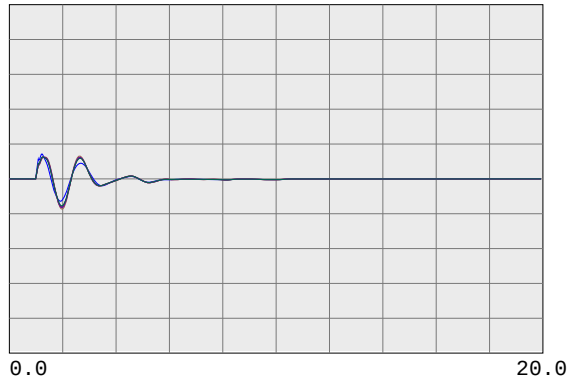
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



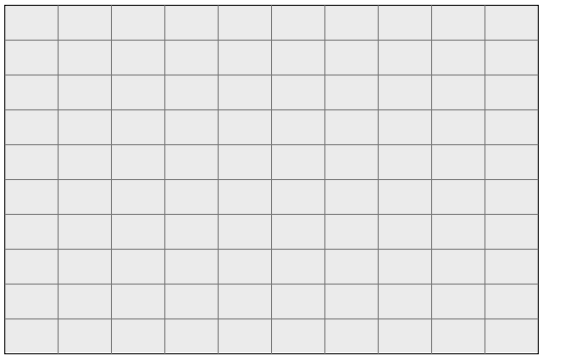
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

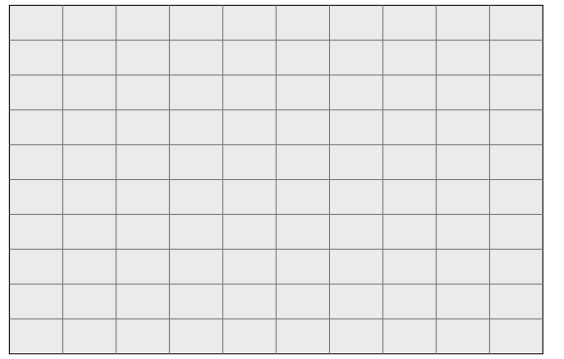


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



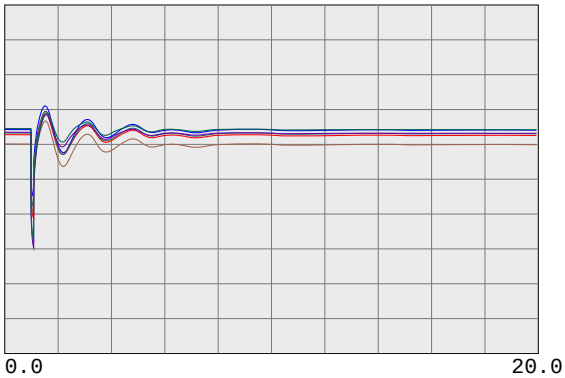
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



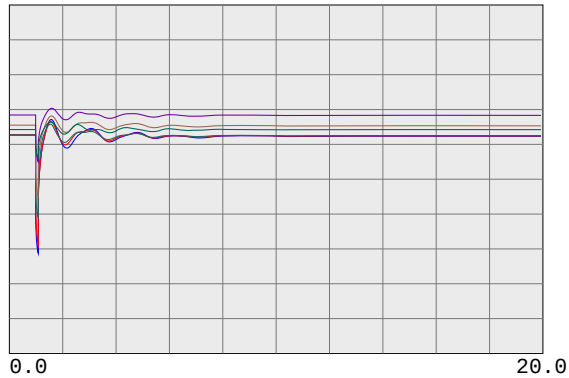


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

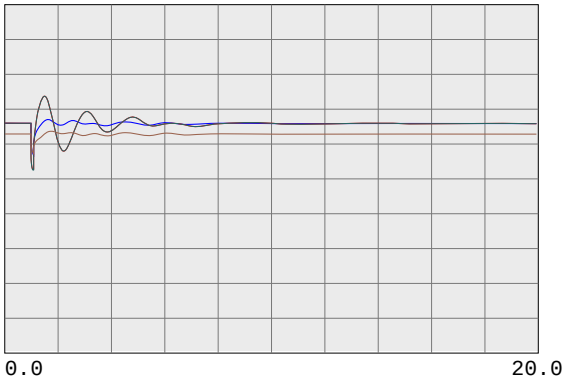
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



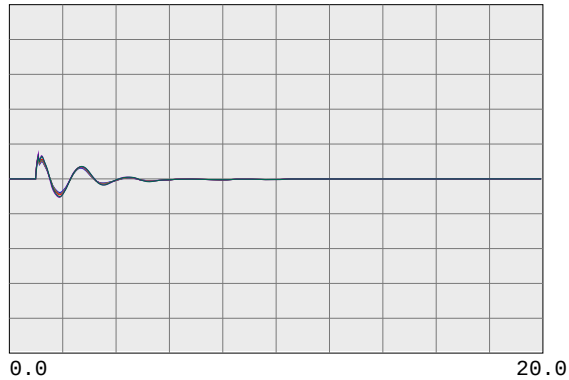
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



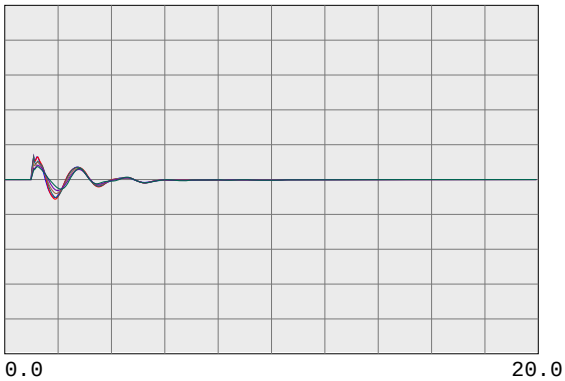
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



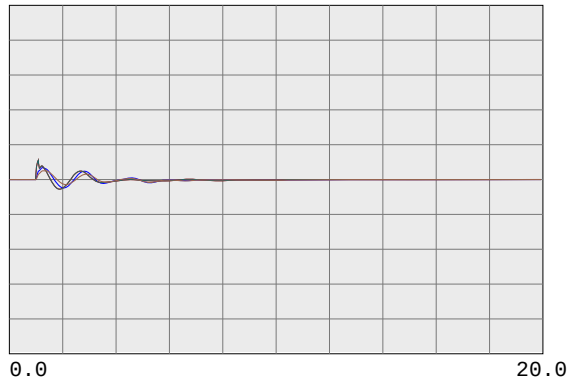
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



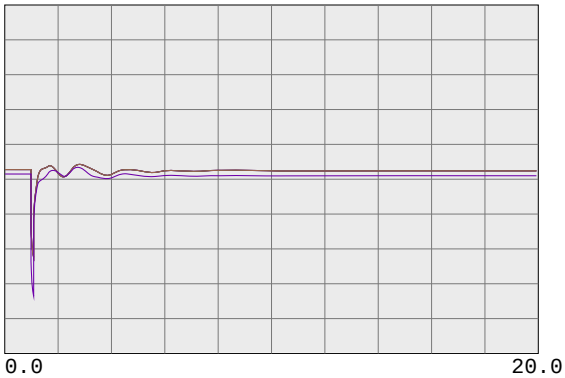
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

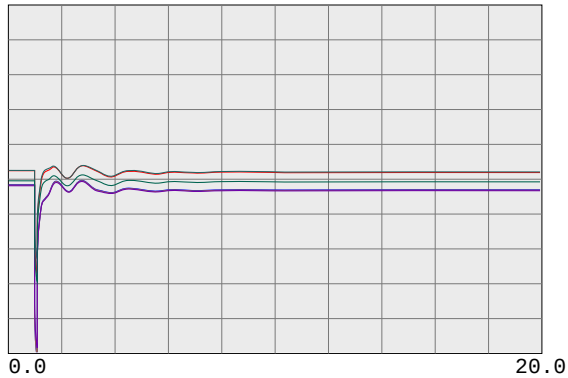
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

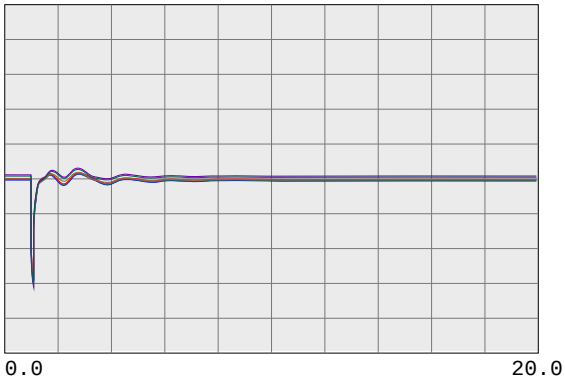
230-KV SYSTEM VOLTAGES



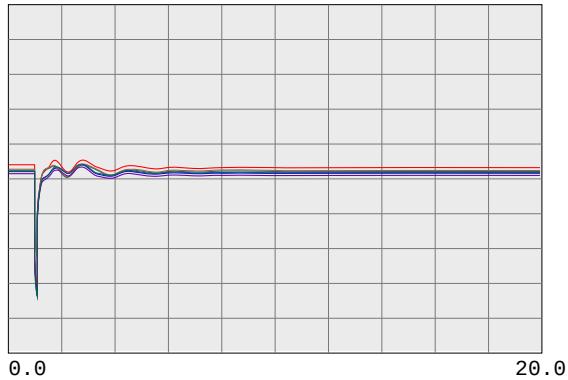
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



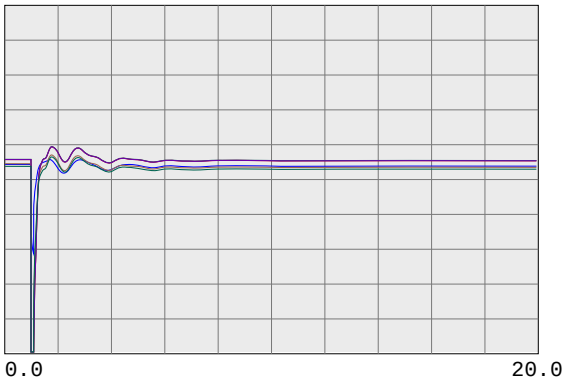
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



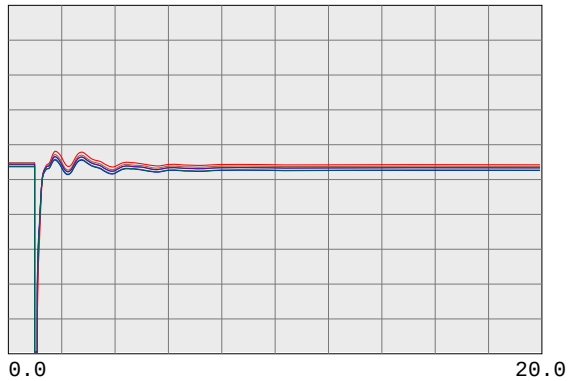
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



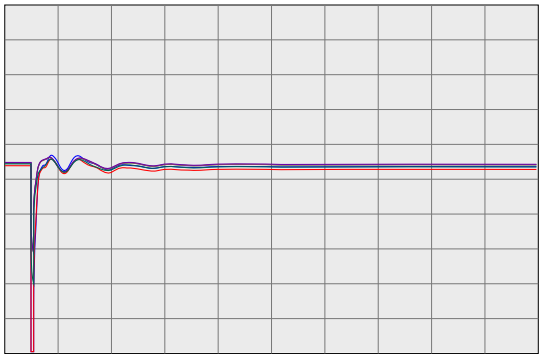
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



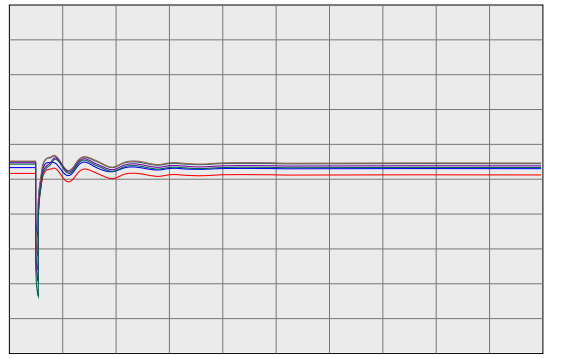
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

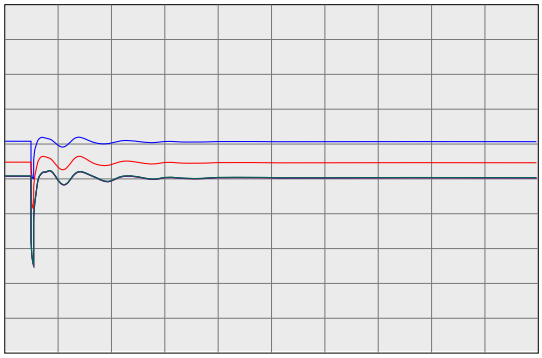
230-KV SYSTEM VOLTAGES



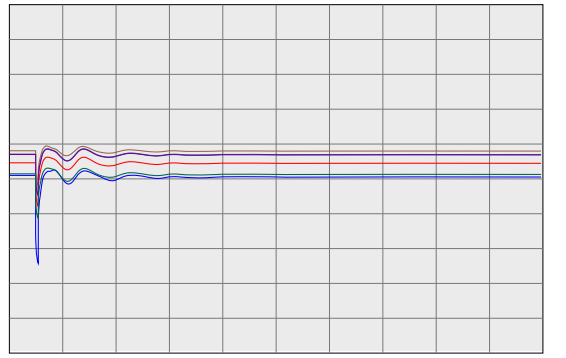
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



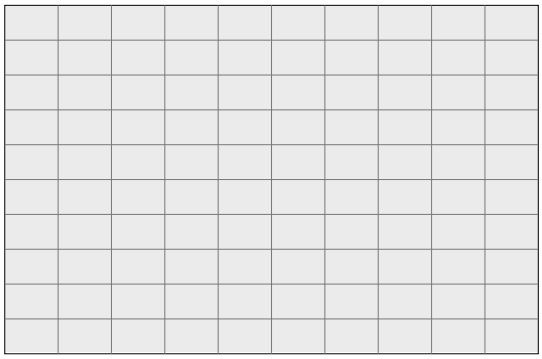
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

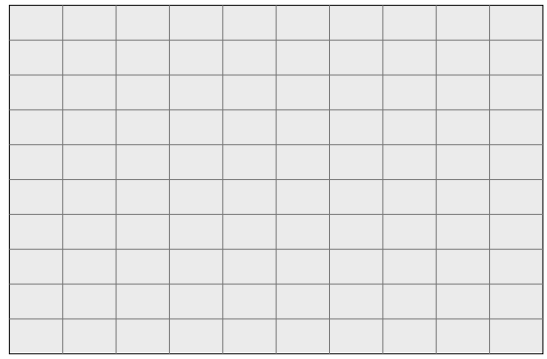


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



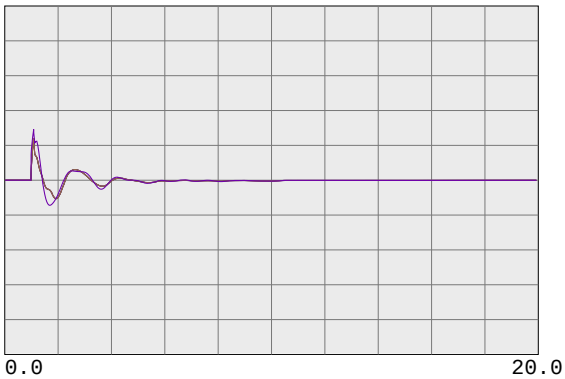
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



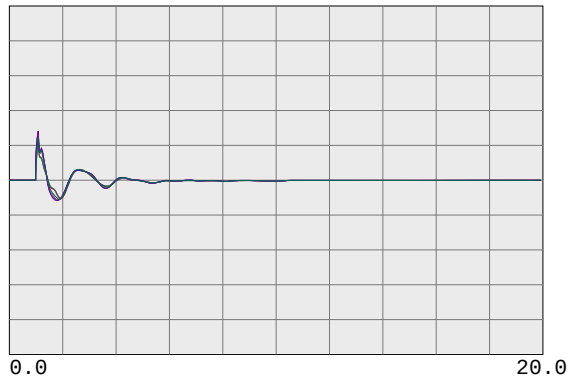


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

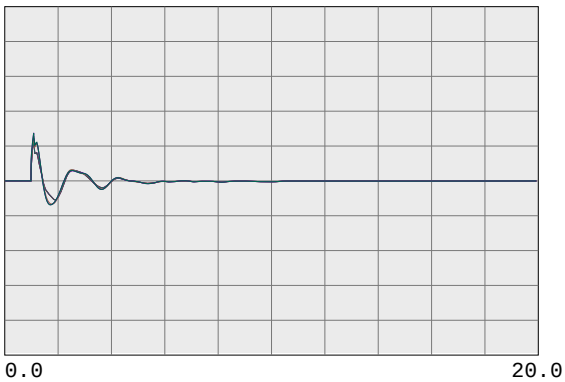
230-KV SYSTEM FREQUENCIES



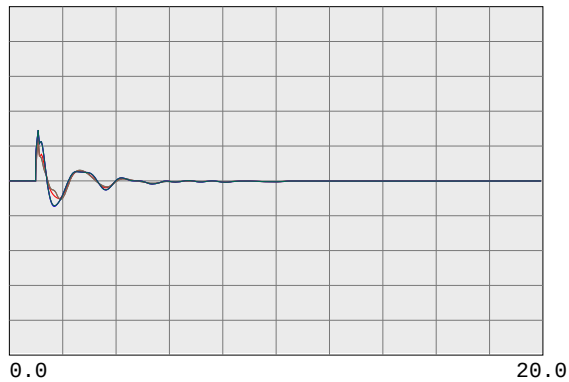
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



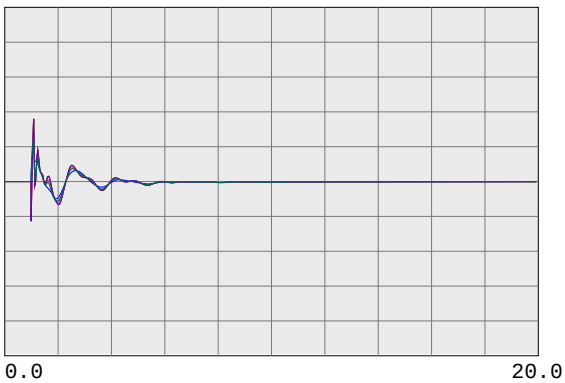
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



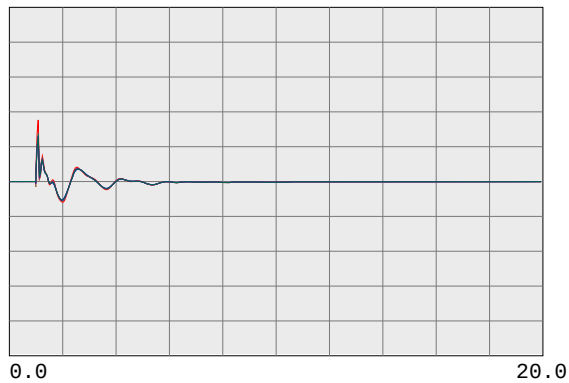
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



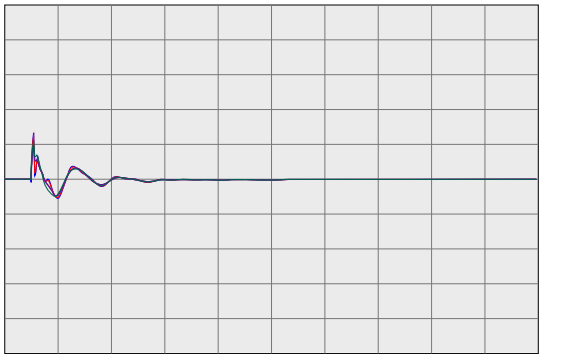
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



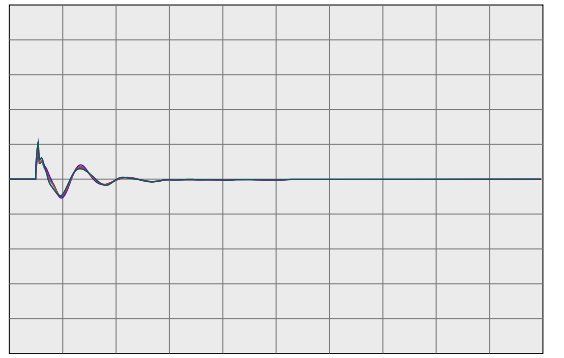
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

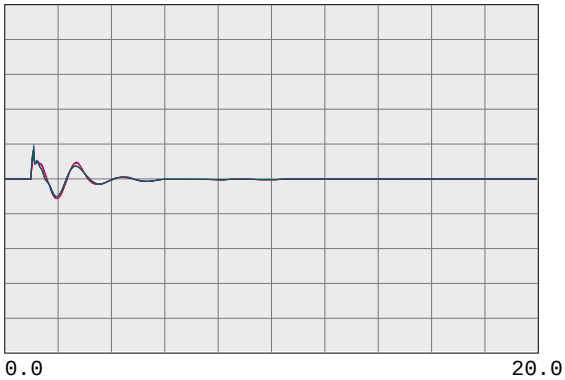
230-KV SYSTEM FREQUENCIES



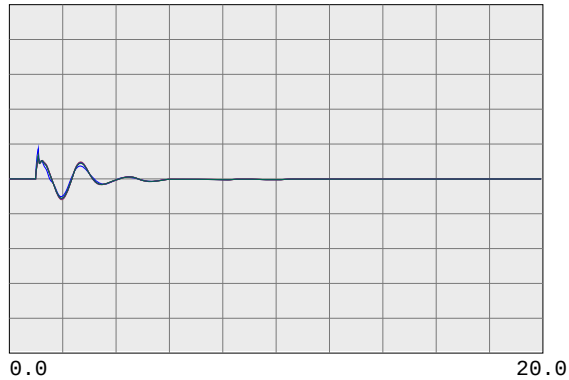
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



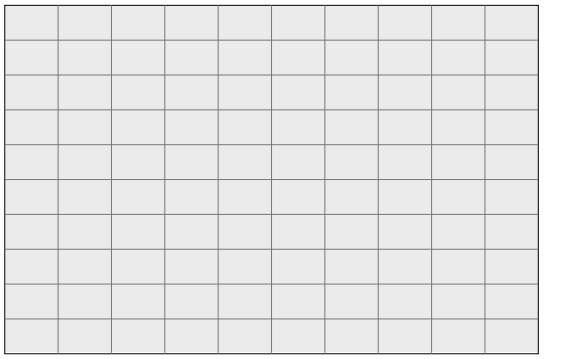
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

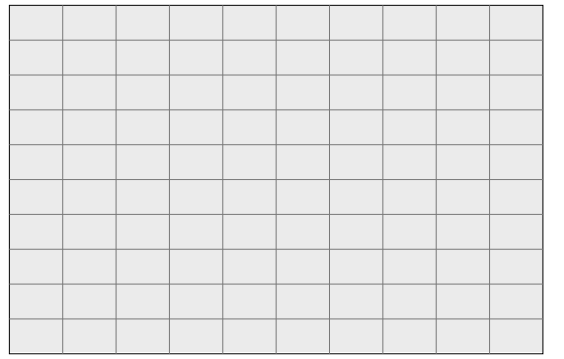


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



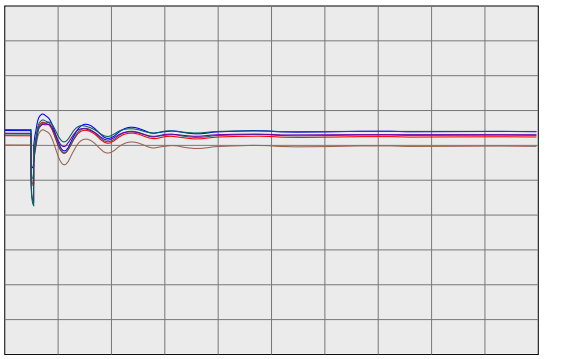
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



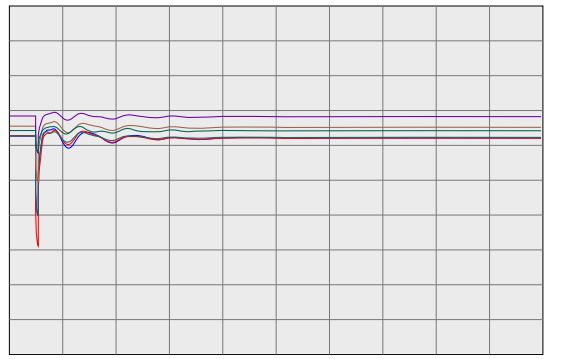


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

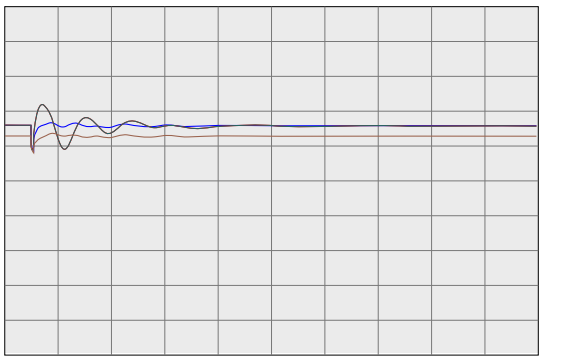
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



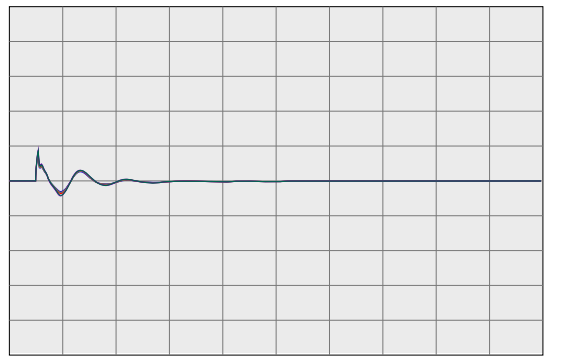
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



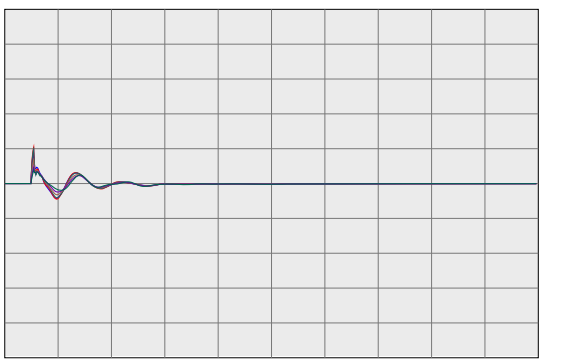
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



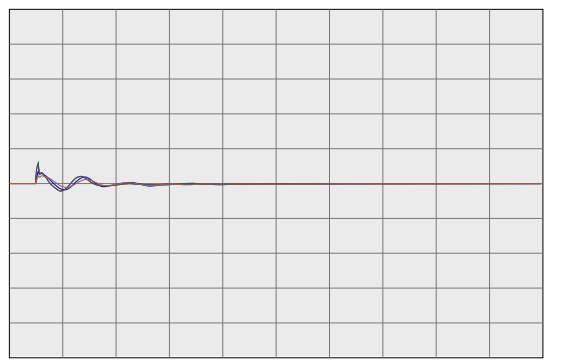
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



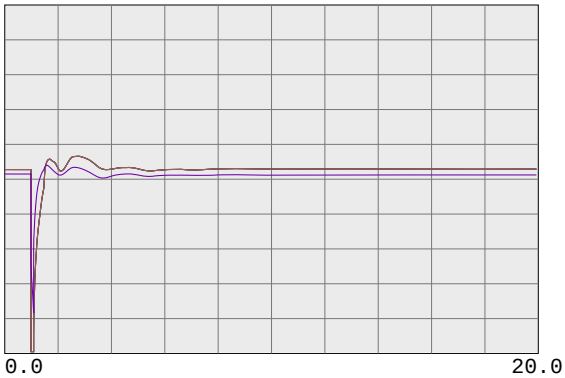
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

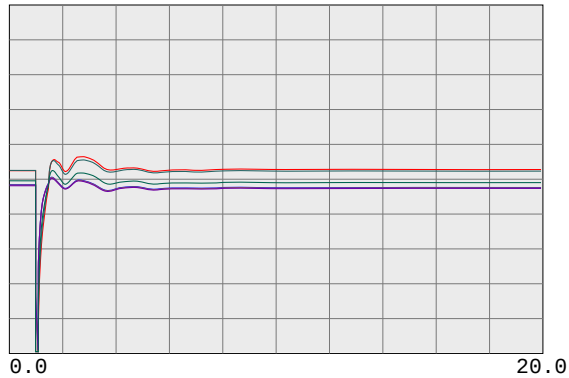
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

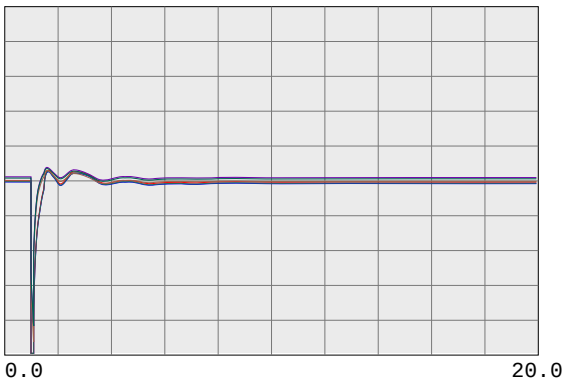
230-KV SYSTEM VOLTAGES



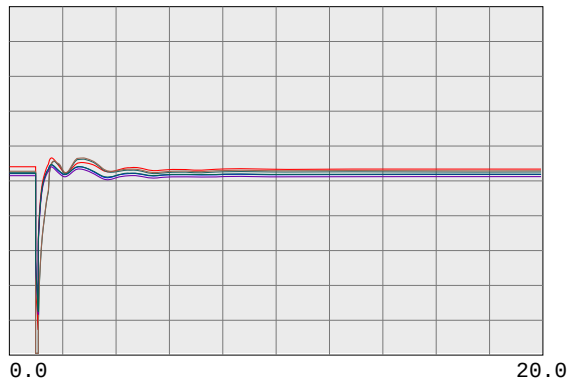
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



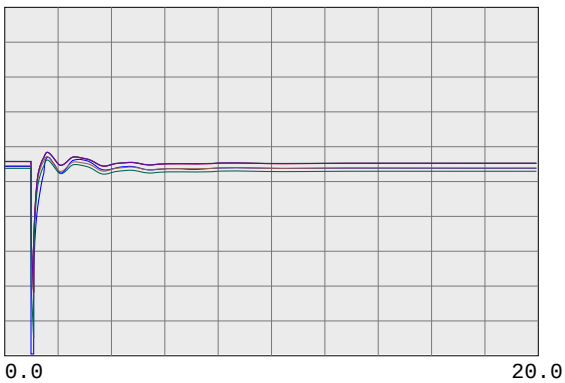
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



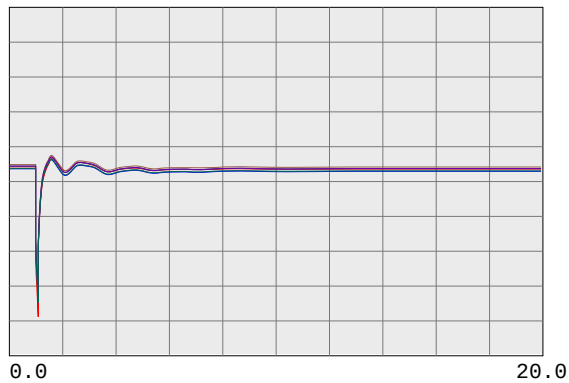
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



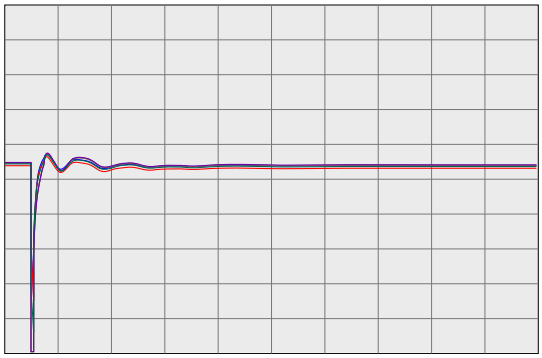
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

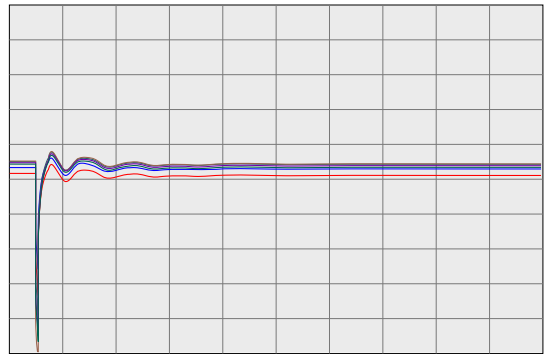
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

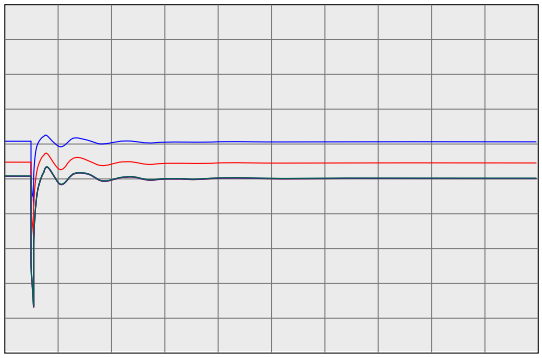
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

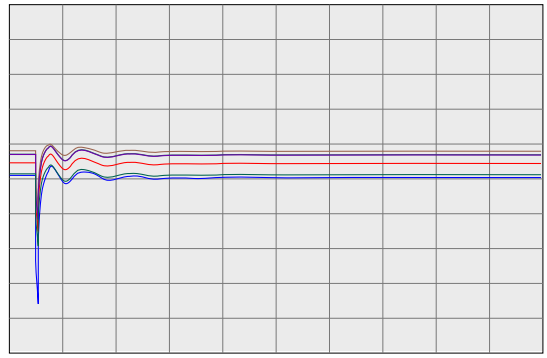
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

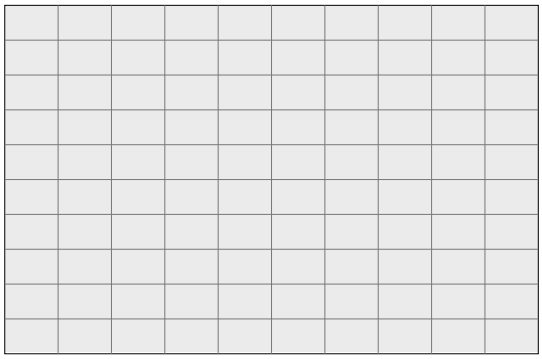
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

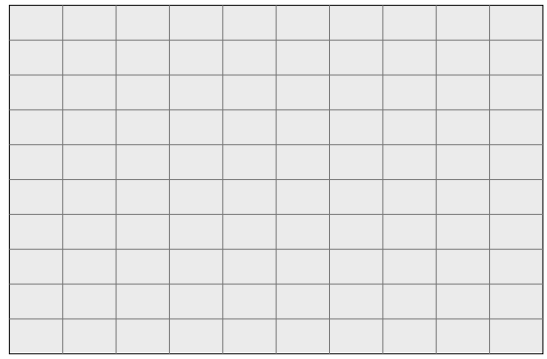


0.0 20.0

Time(sec)

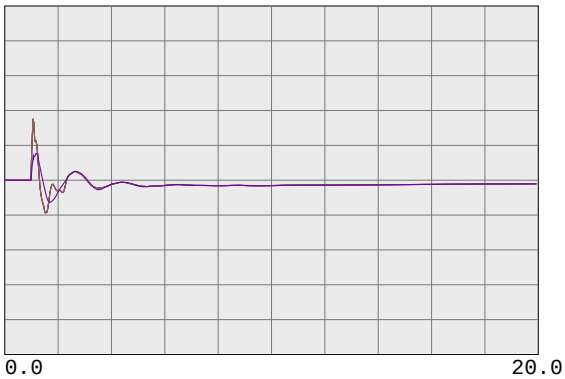
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



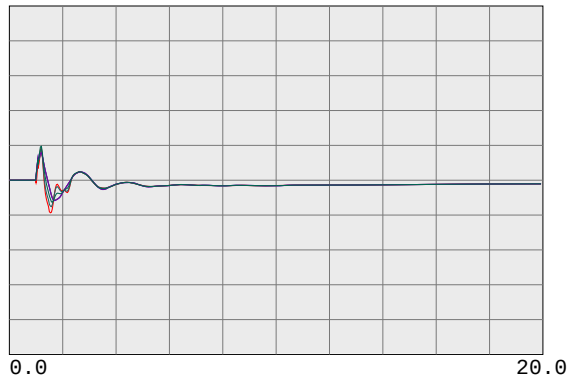


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

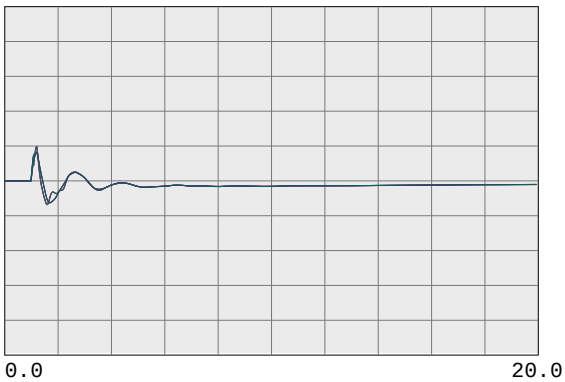
230-KV SYSTEM FREQUENCIES



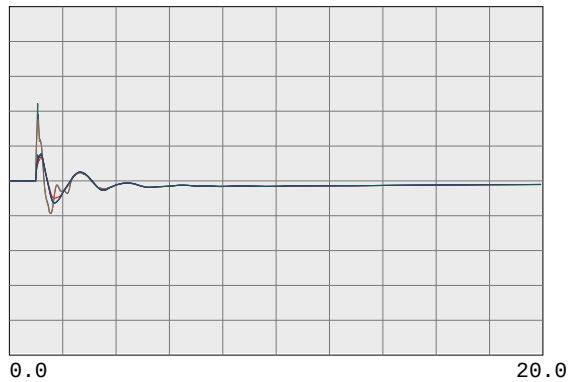
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



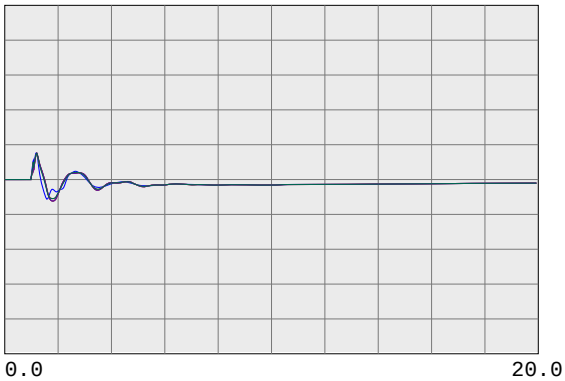
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



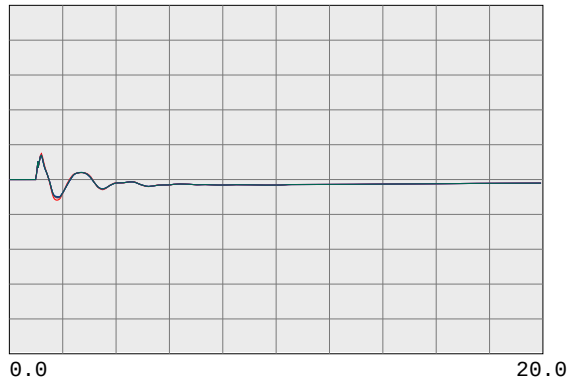
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



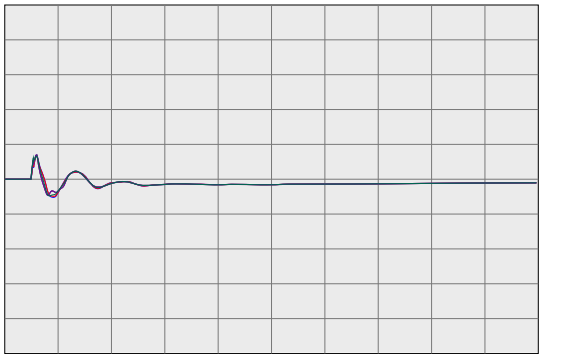
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



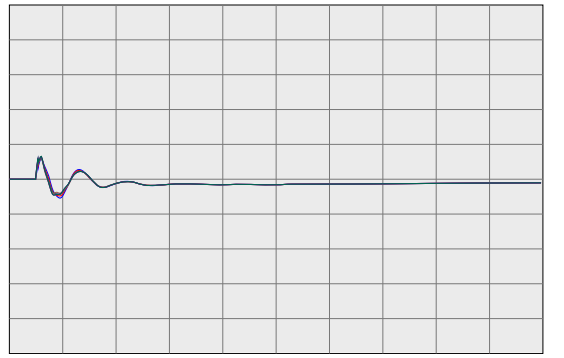
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

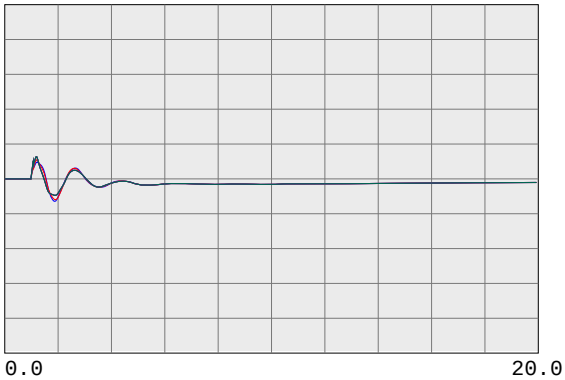
230-KV SYSTEM FREQUENCIES



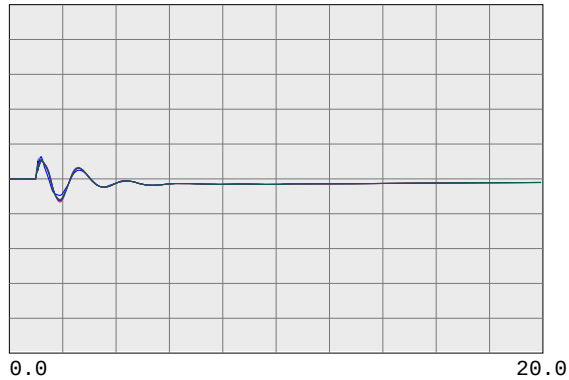
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



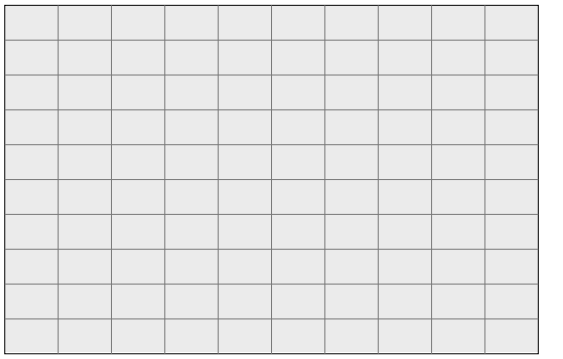
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

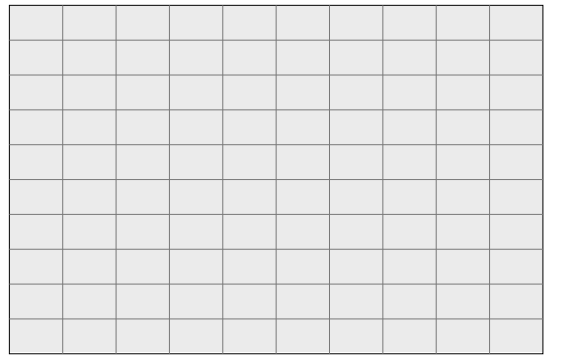


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



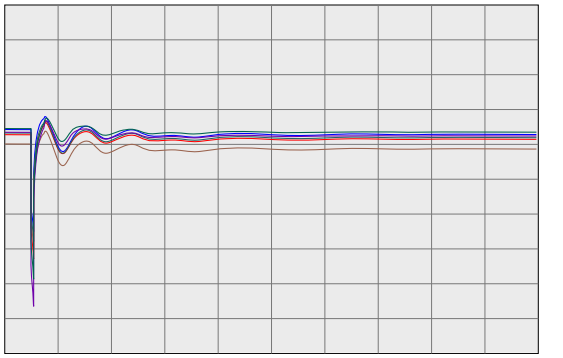
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



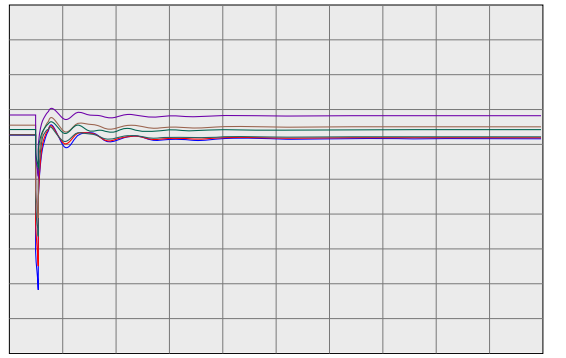


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

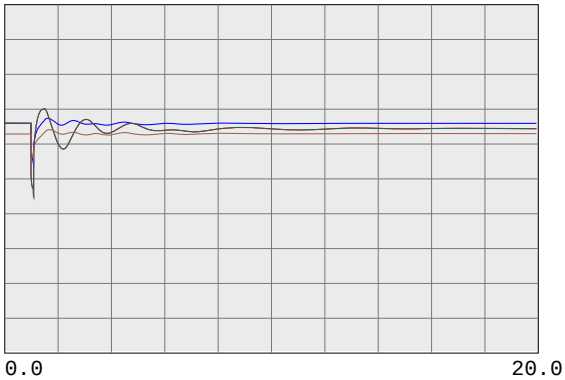
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



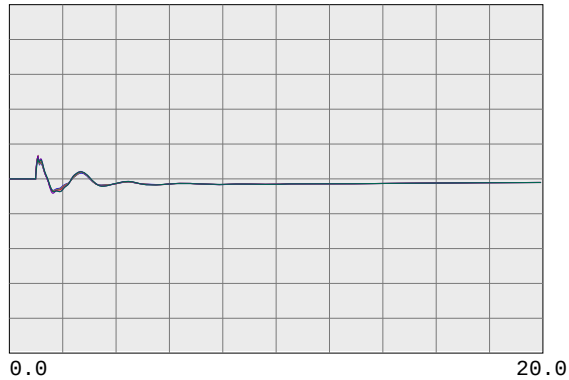
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



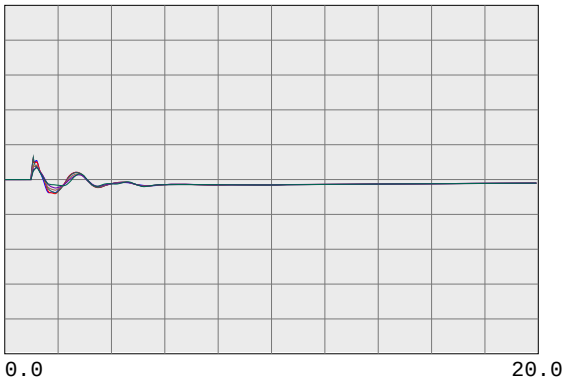
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



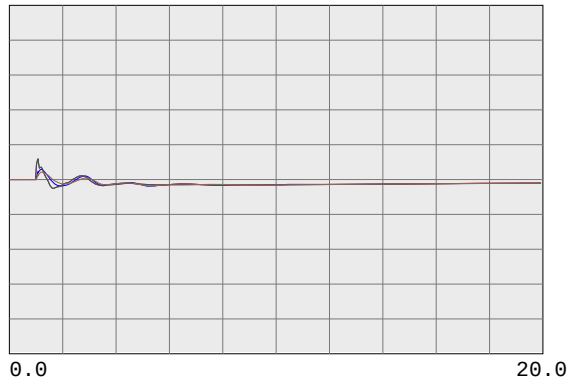
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



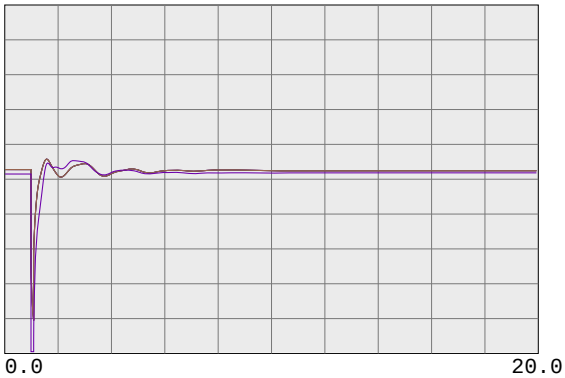
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

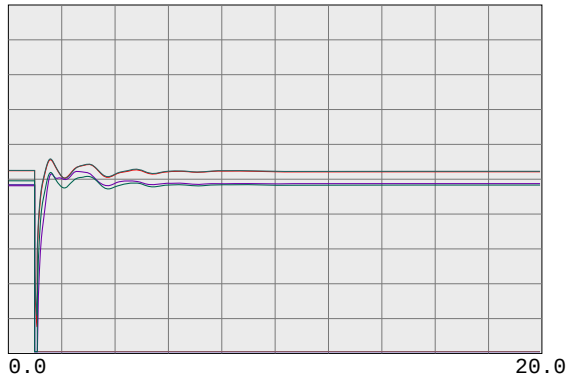
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

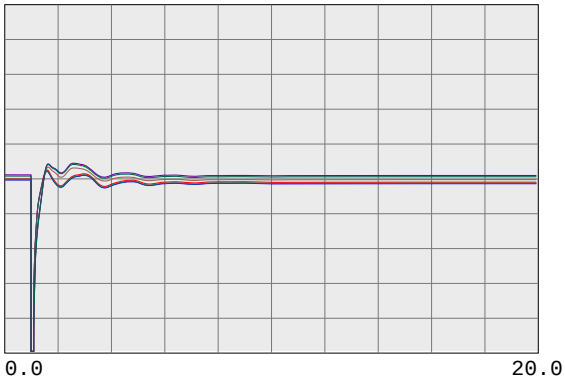
230-KV SYSTEM VOLTAGES



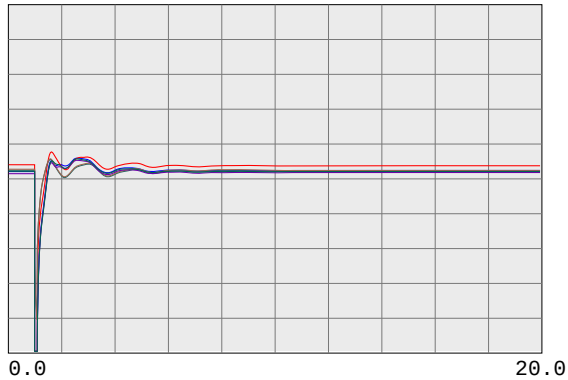
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



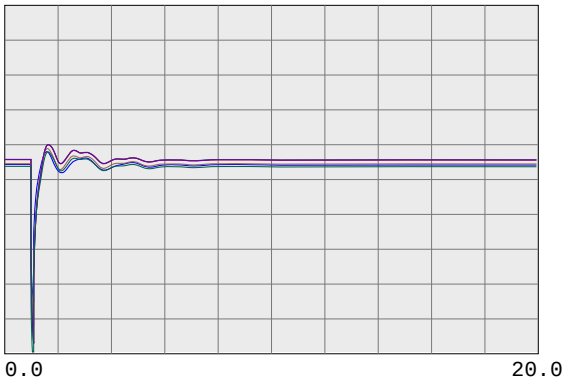
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



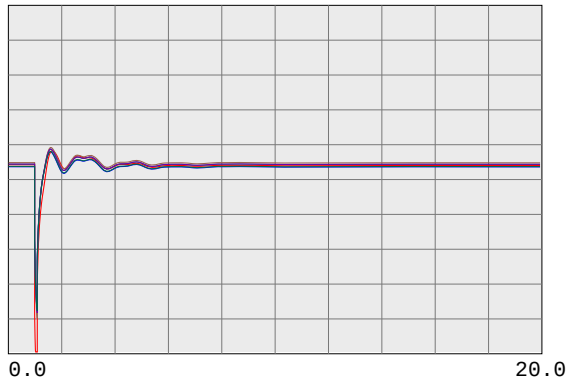
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



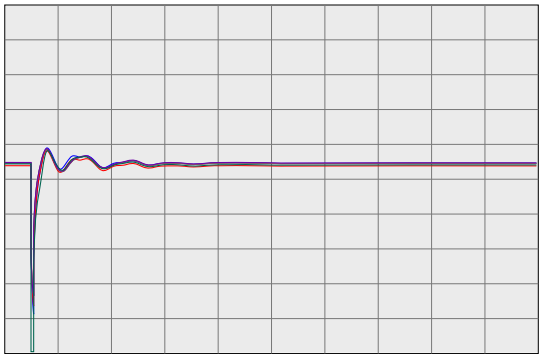
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



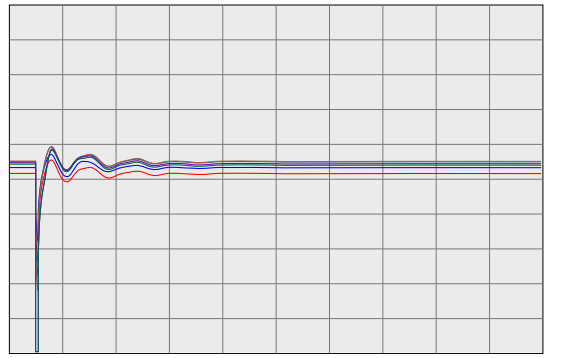
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

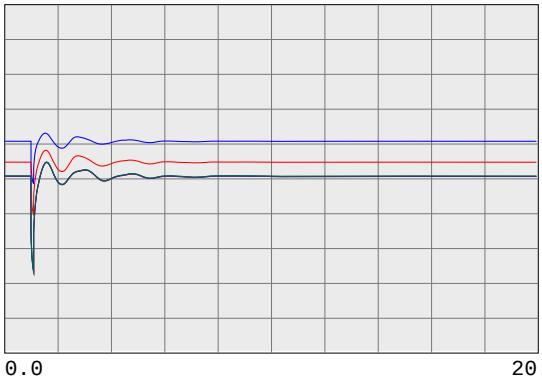
230-KV SYSTEM VOLTAGES



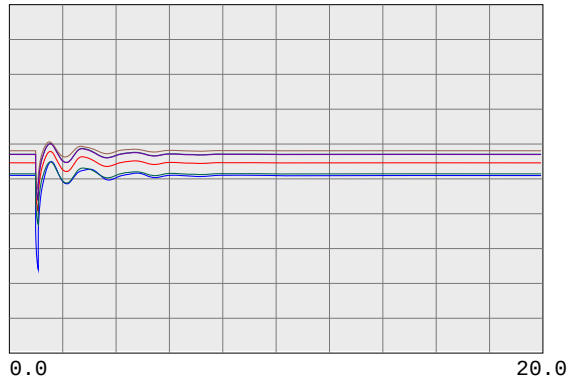
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



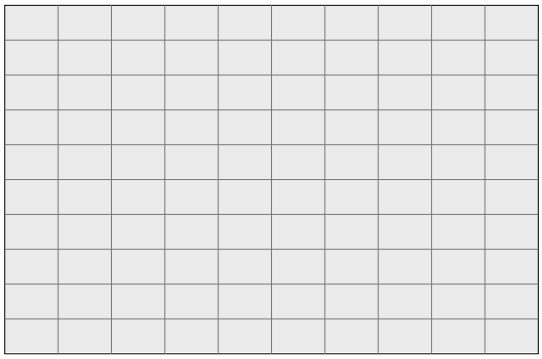
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

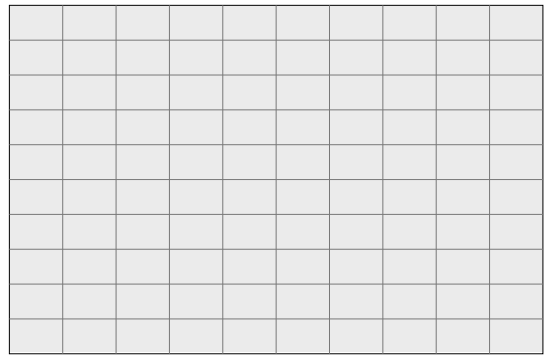


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



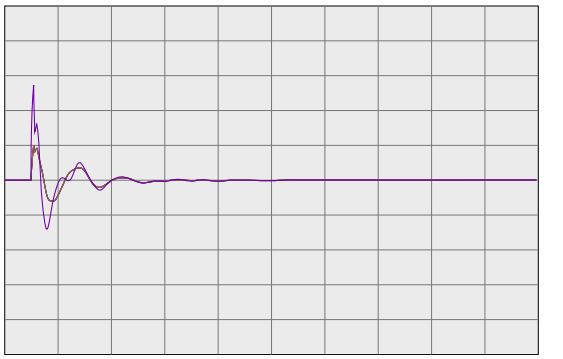
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



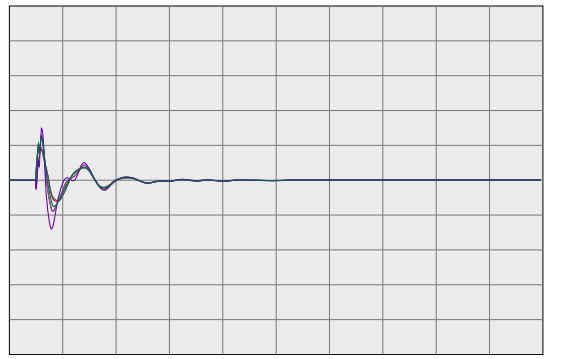


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

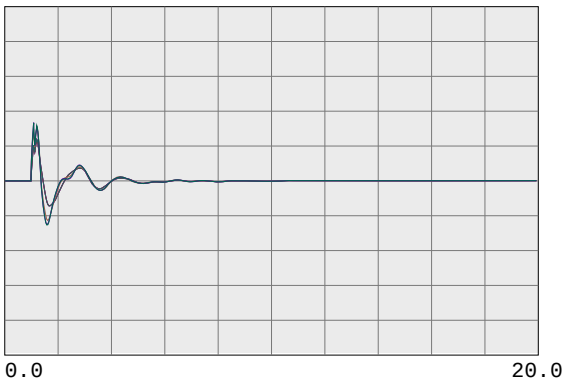
230-KV SYSTEM FREQUENCIES



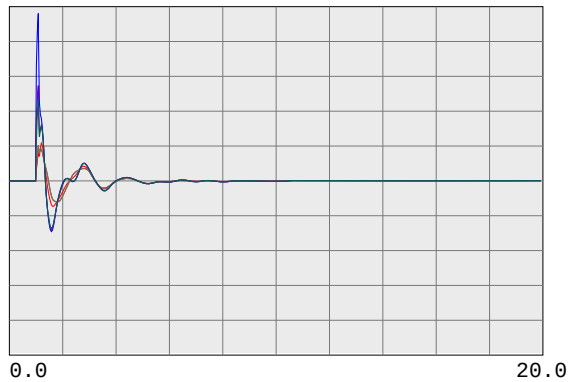
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



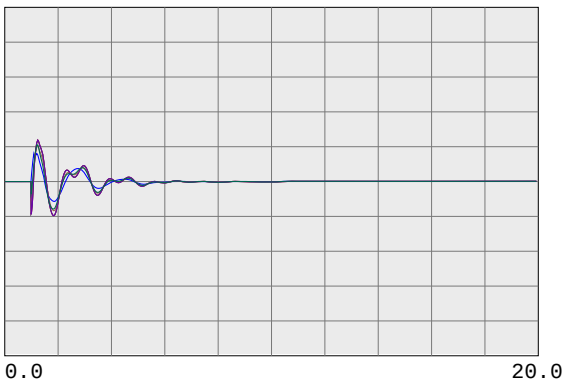
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



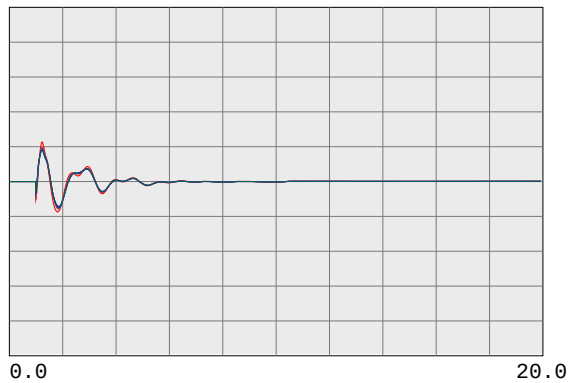
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



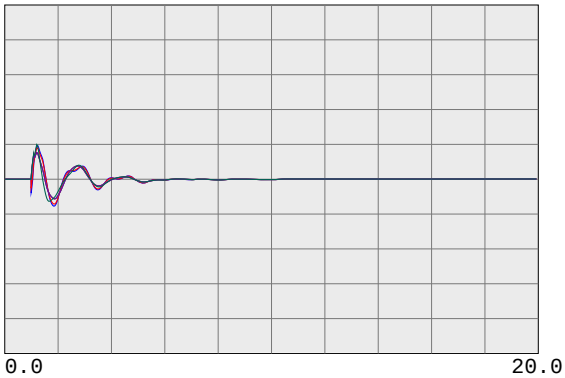
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



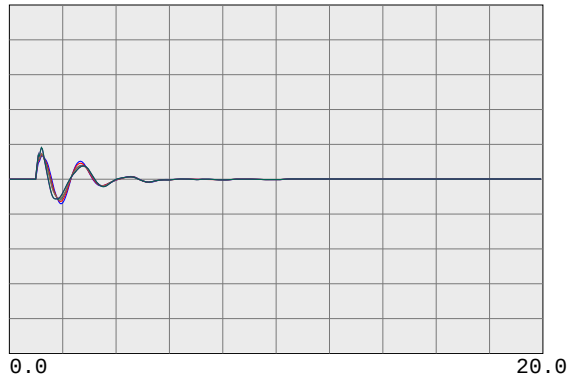
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

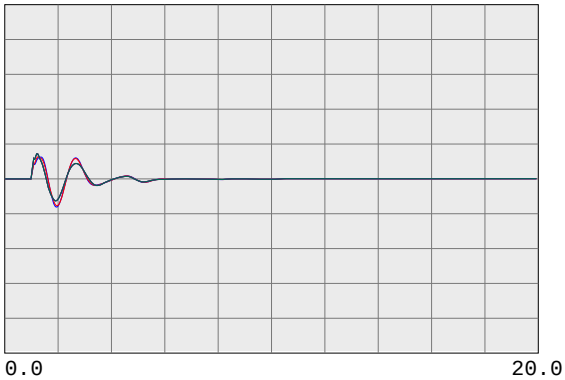
230-KV SYSTEM FREQUENCIES



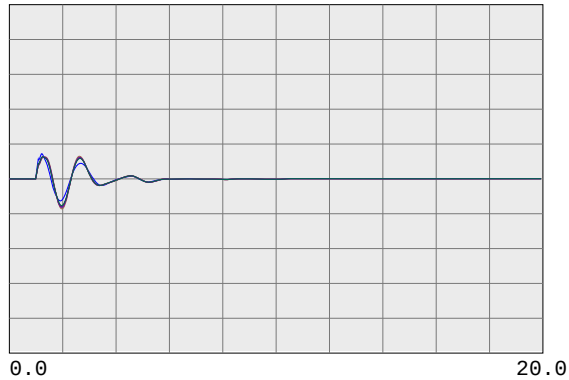
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



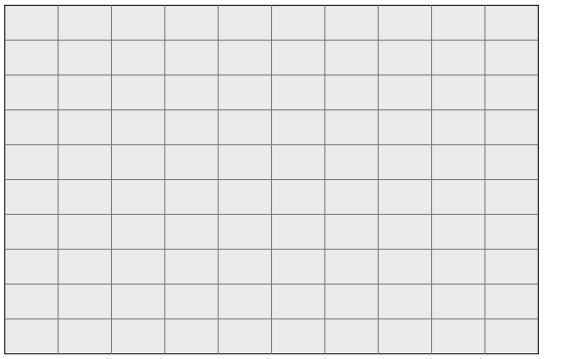
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

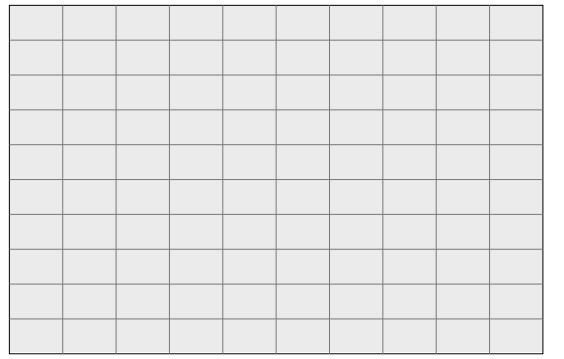


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



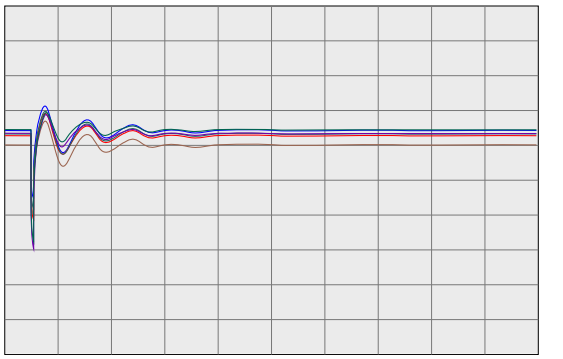
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



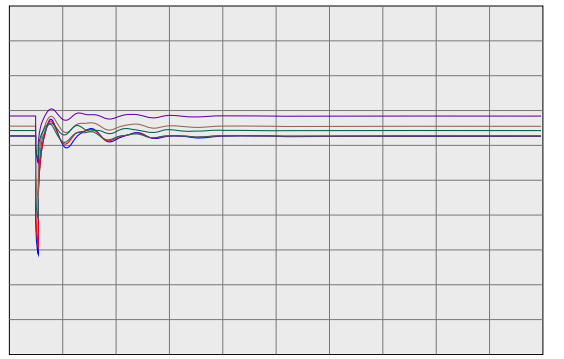


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

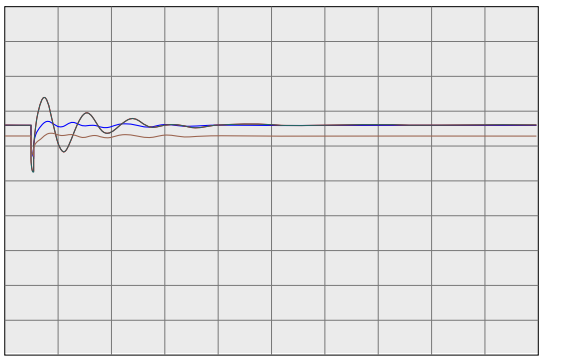
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



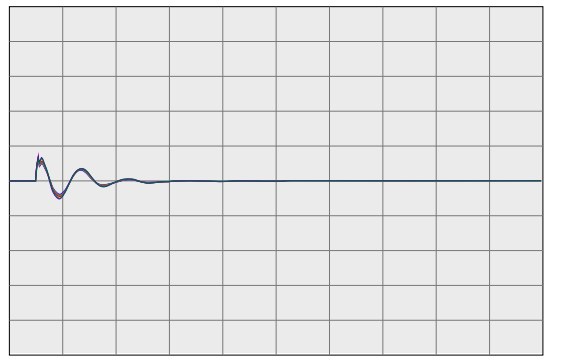
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



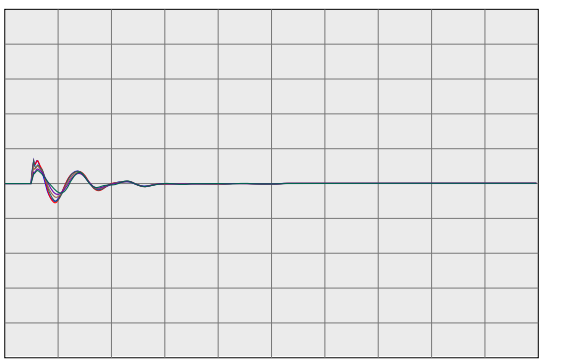
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



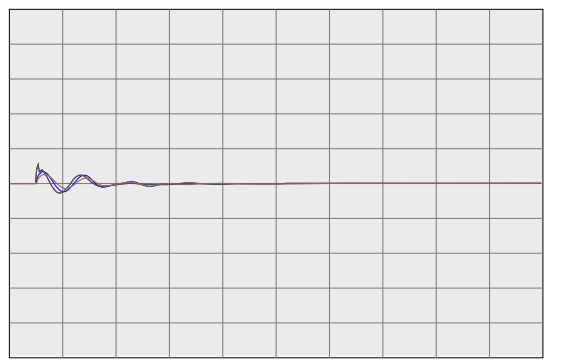
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



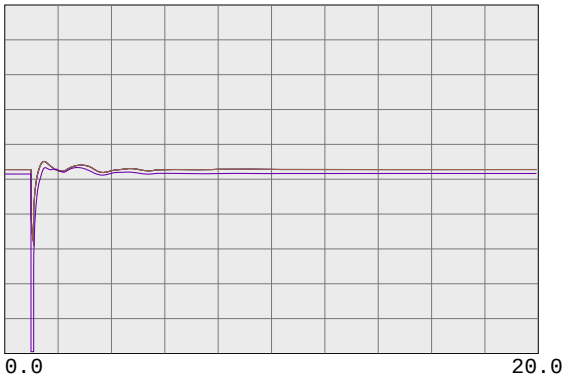
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

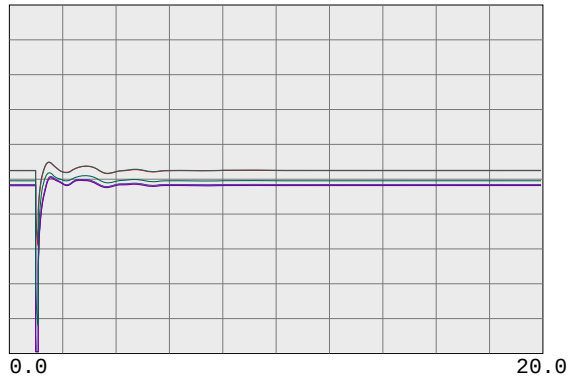
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

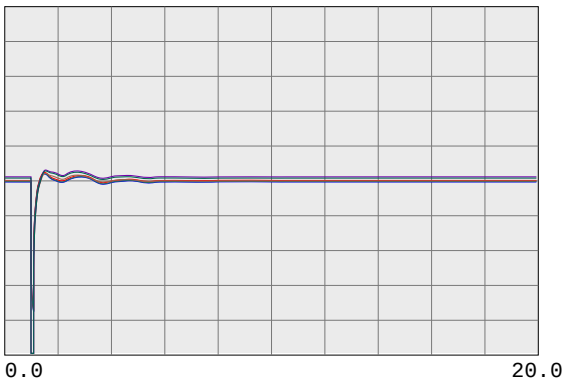
230-KV SYSTEM VOLTAGES



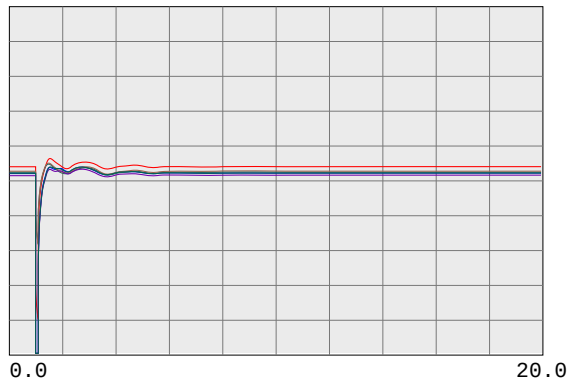
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



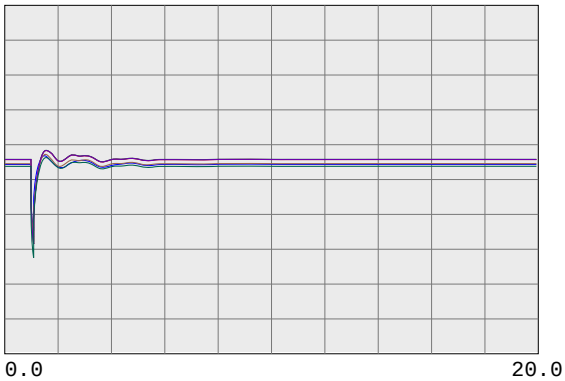
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



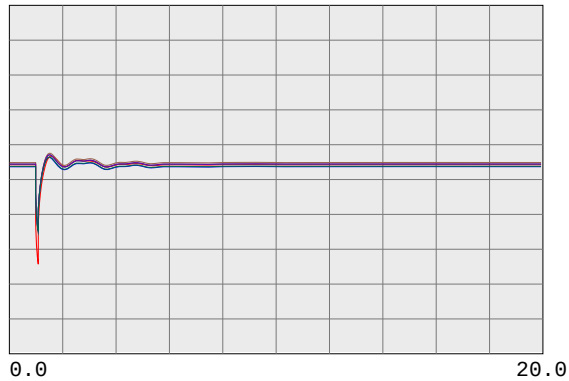
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



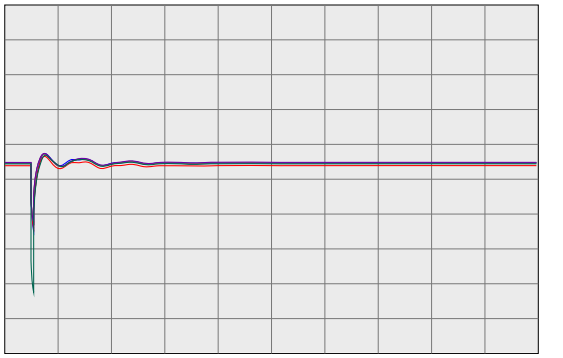
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



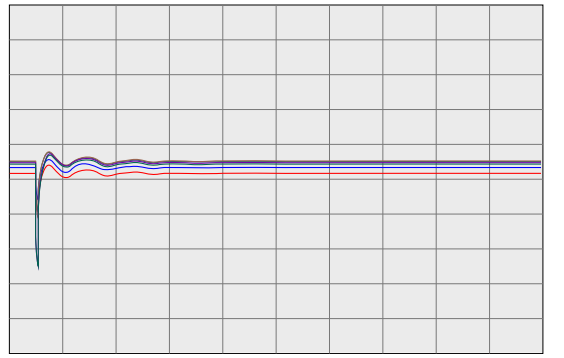
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

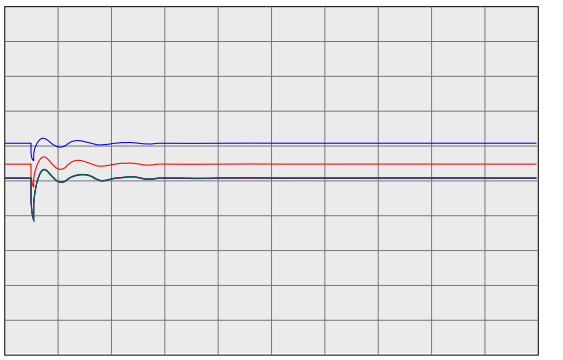
230-KV SYSTEM VOLTAGES



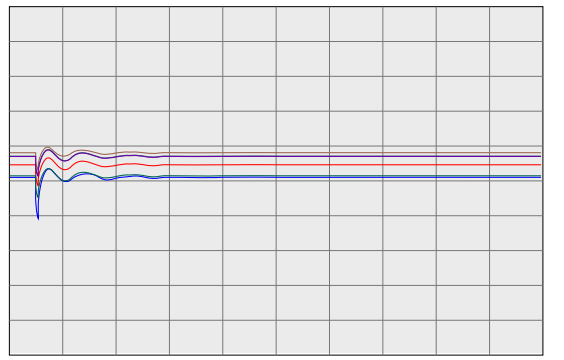
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



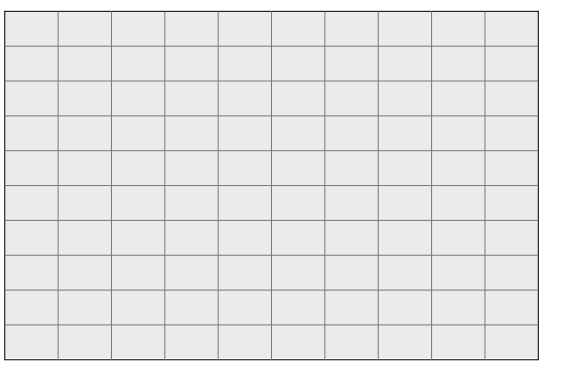
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

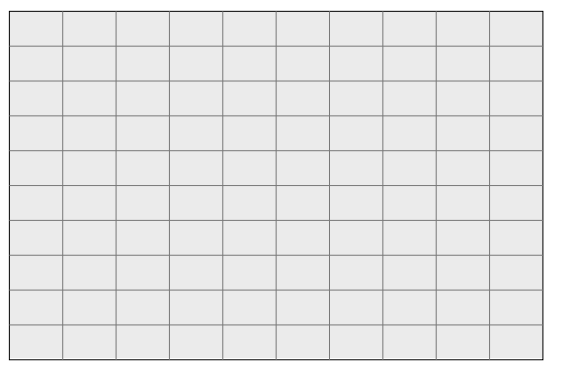


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



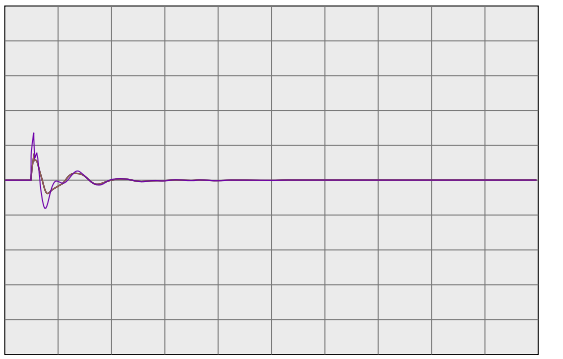
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



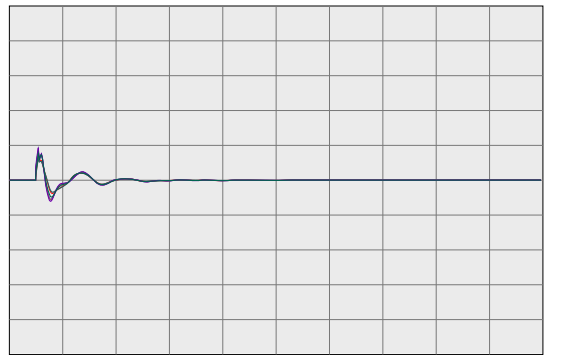


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

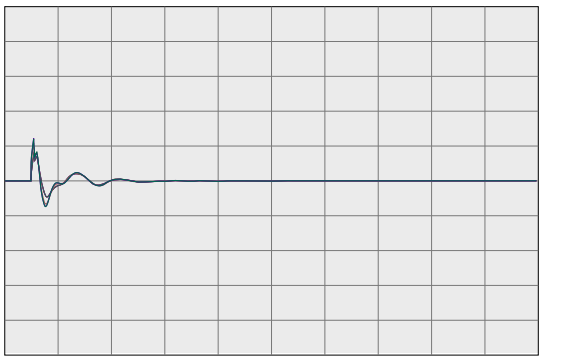
230-KV SYSTEM FREQUENCIES



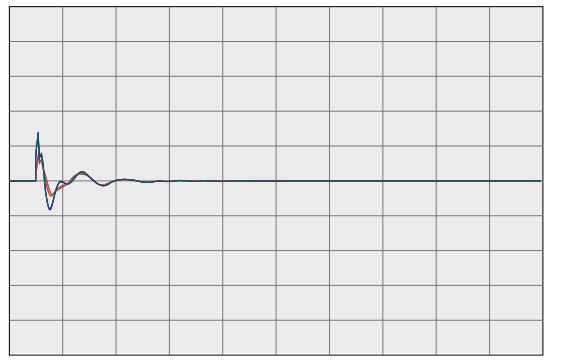
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



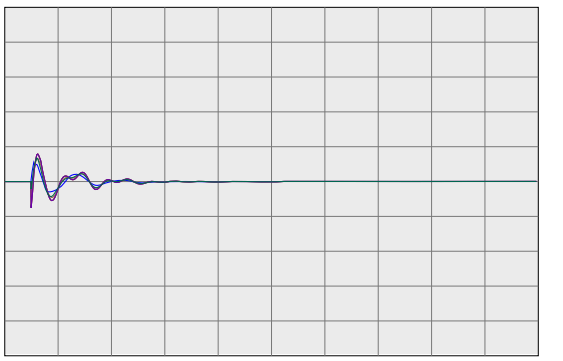
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



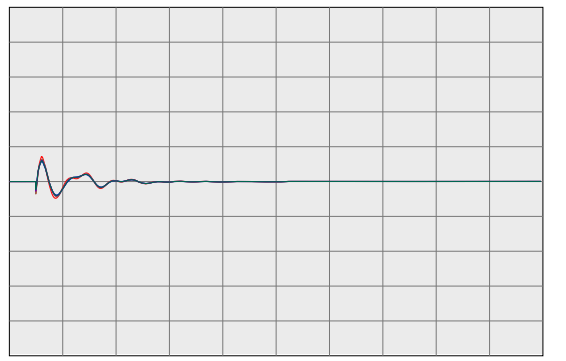
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



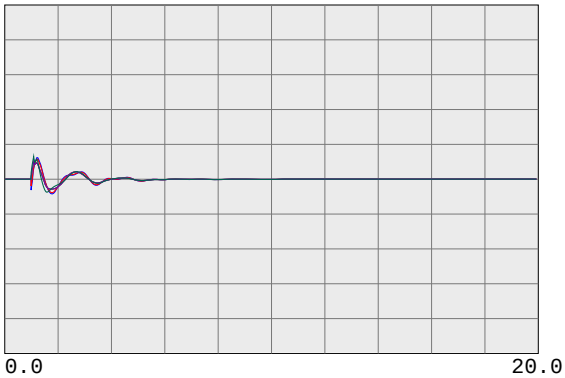
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



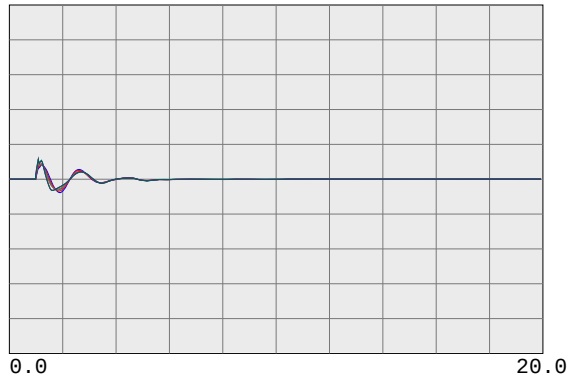
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

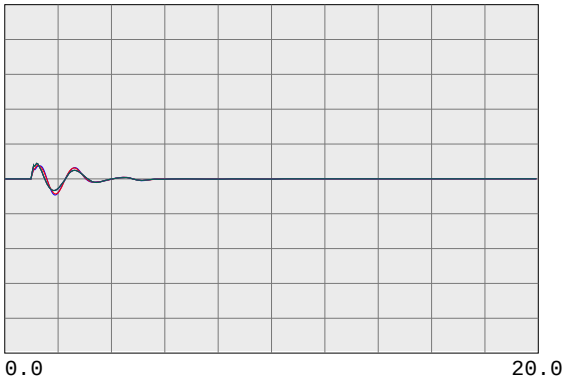
230-KV SYSTEM FREQUENCIES



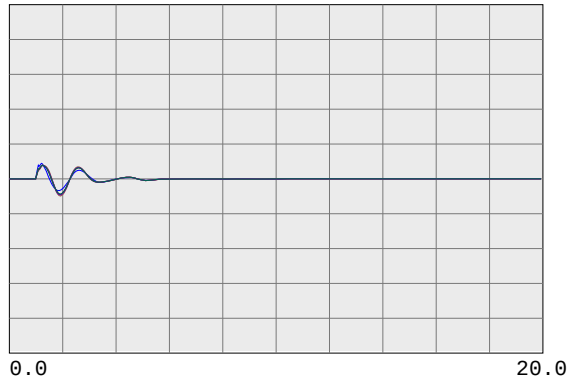
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



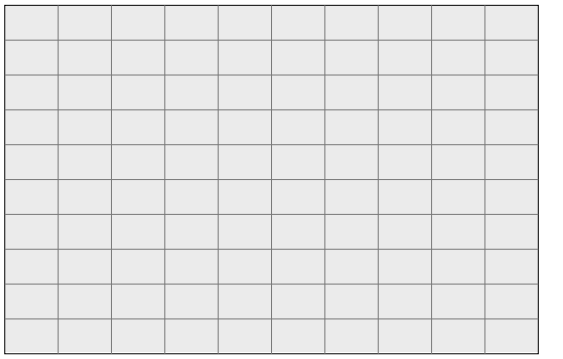
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

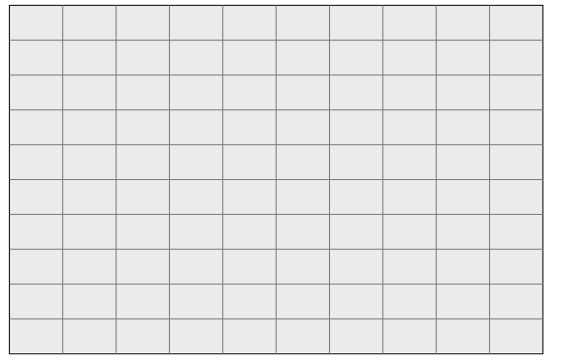


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



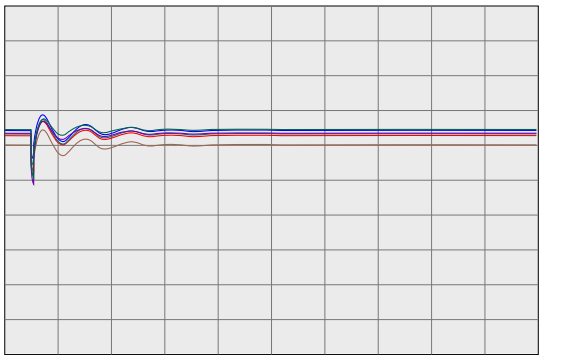
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



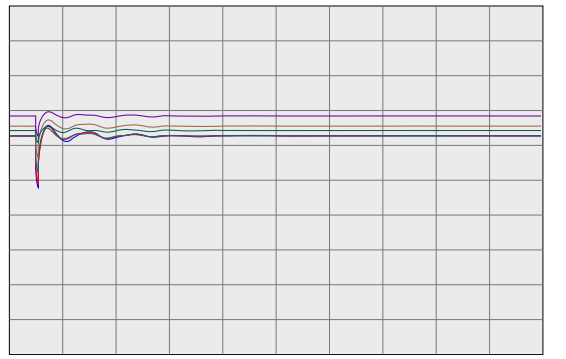


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

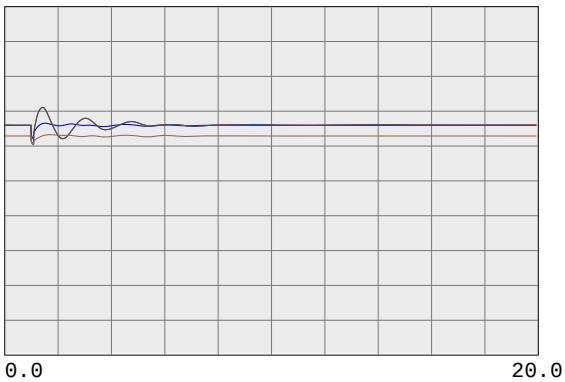
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



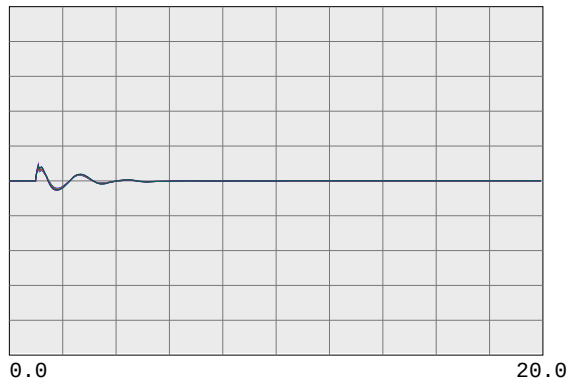
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



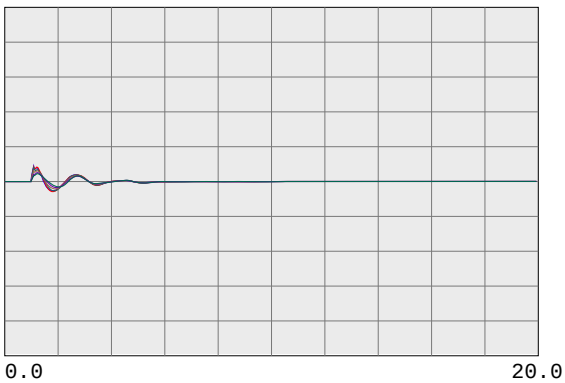
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



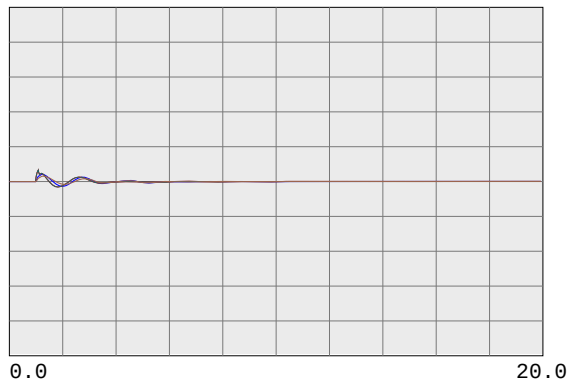
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



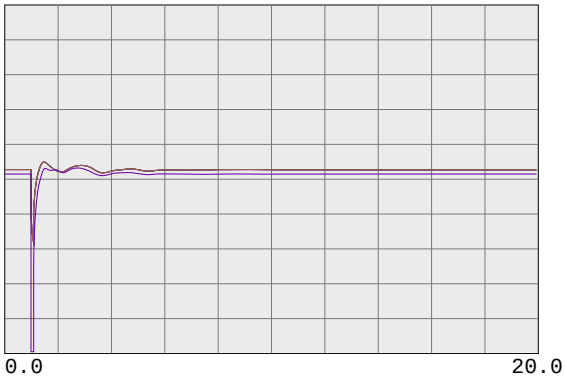
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

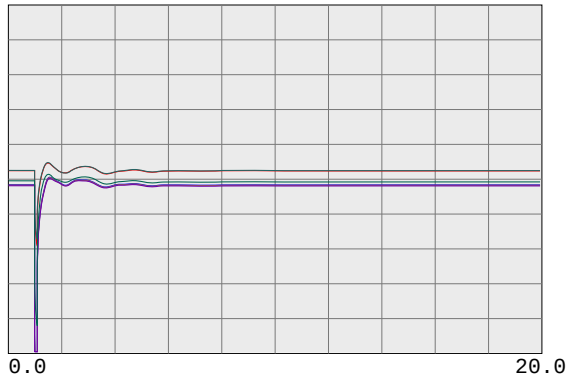
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

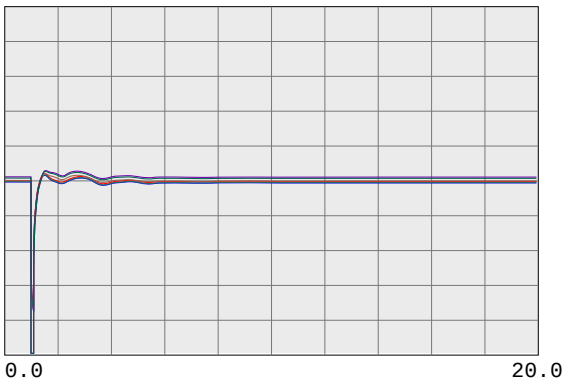
230-KV SYSTEM VOLTAGES



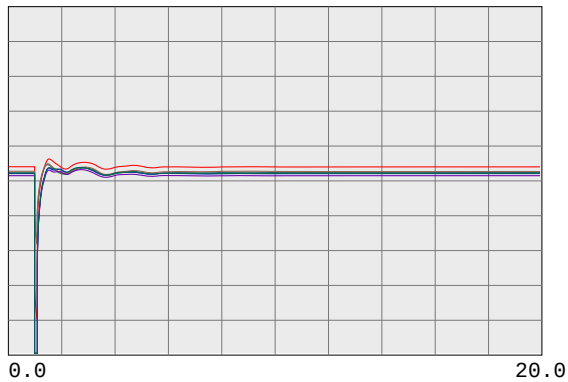
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



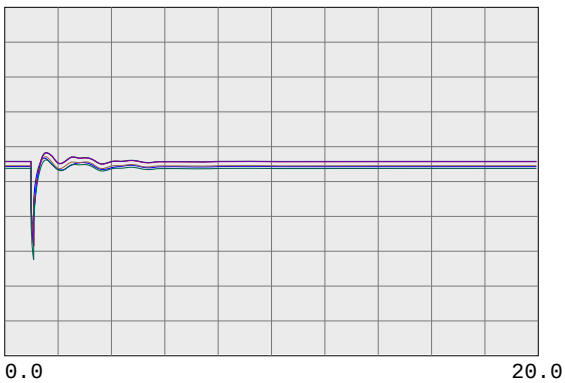
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



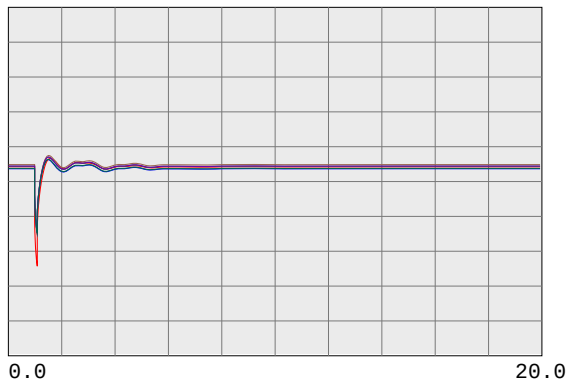
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



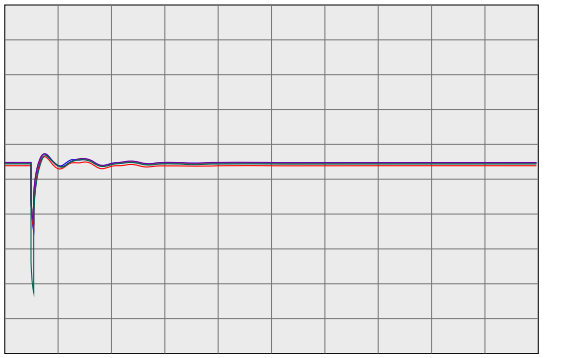
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



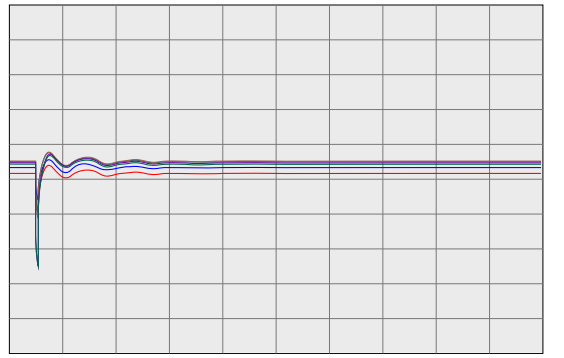
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

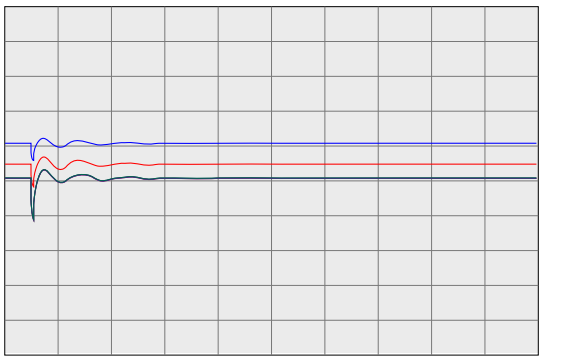
230-KV SYSTEM VOLTAGES



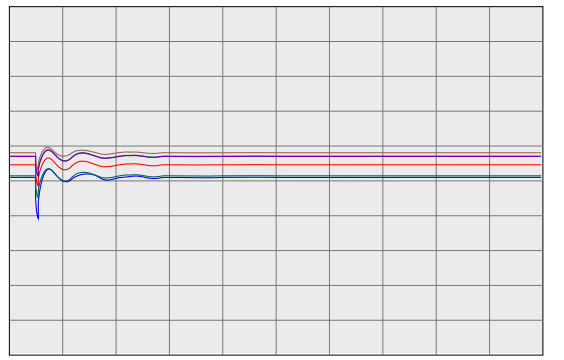
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



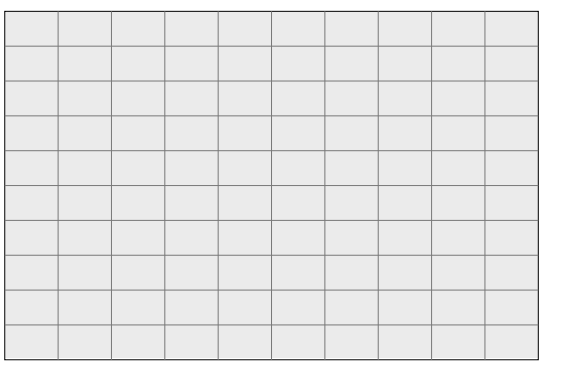
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

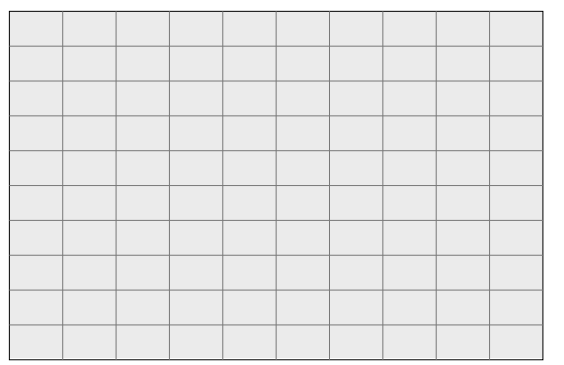


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



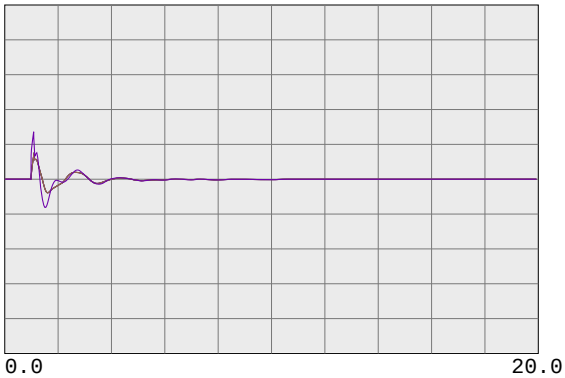
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



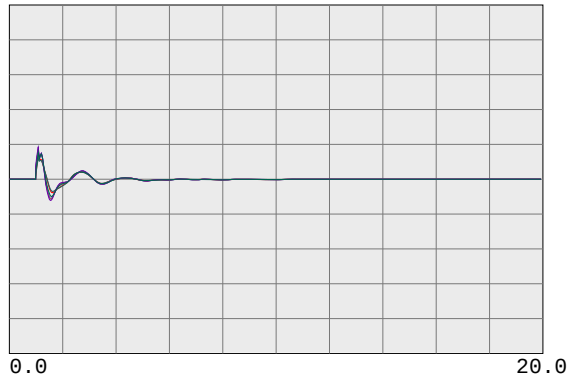


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

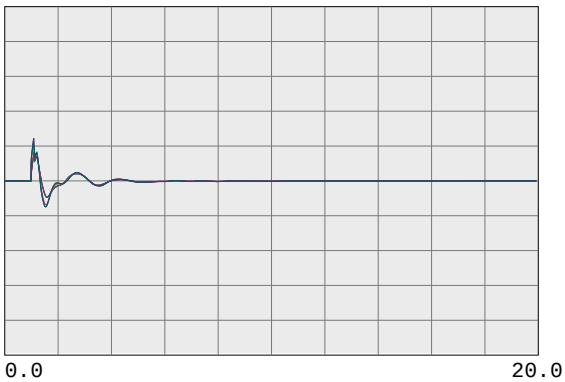
230-KV SYSTEM FREQUENCIES



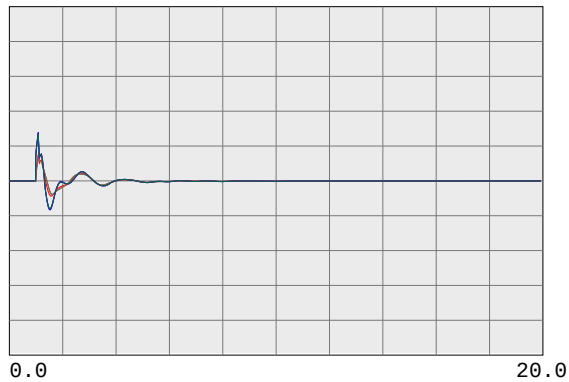
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



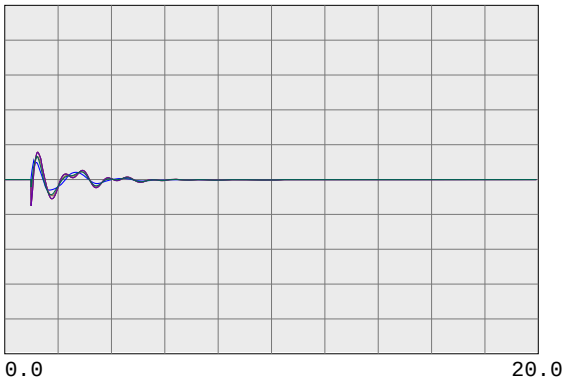
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



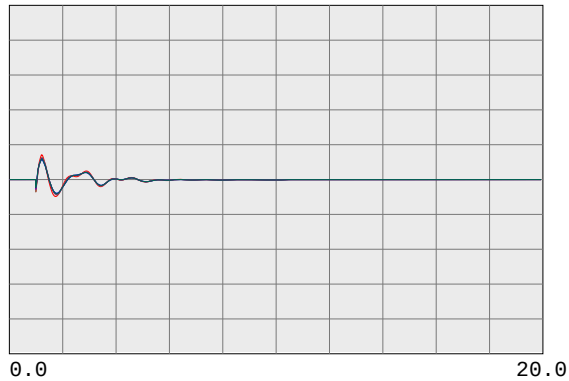
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



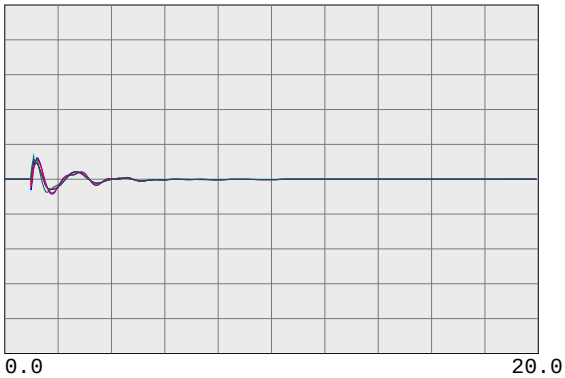
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



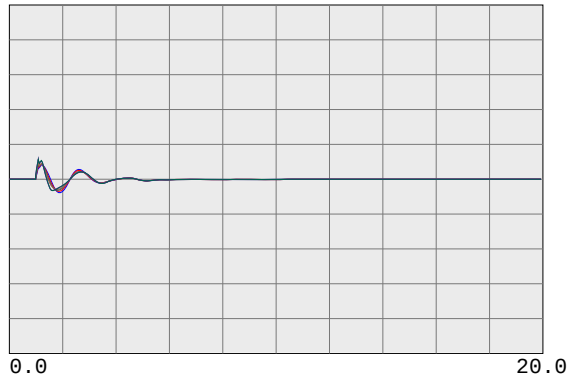
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

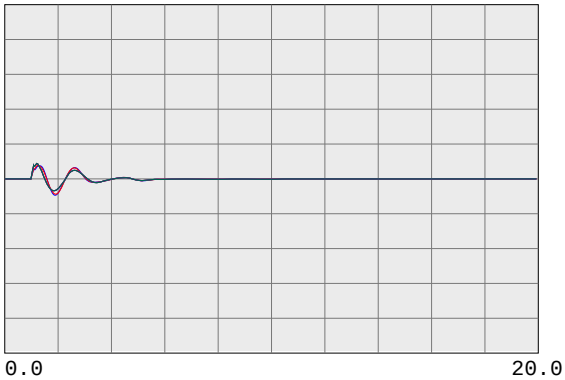
230-KV SYSTEM FREQUENCIES



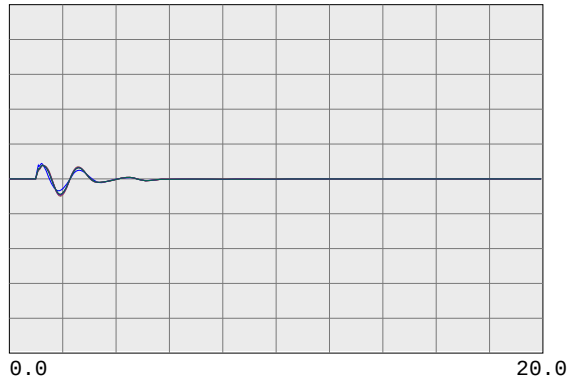
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



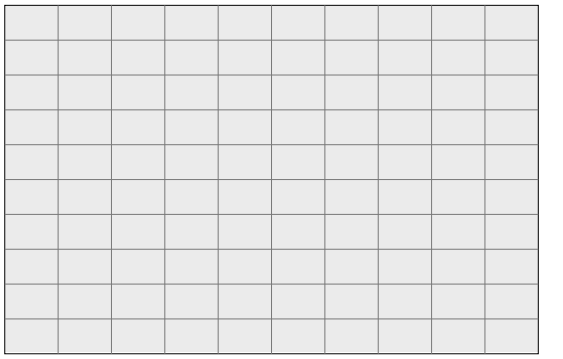
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

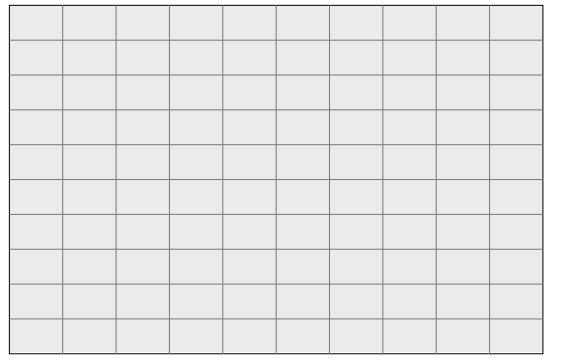


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



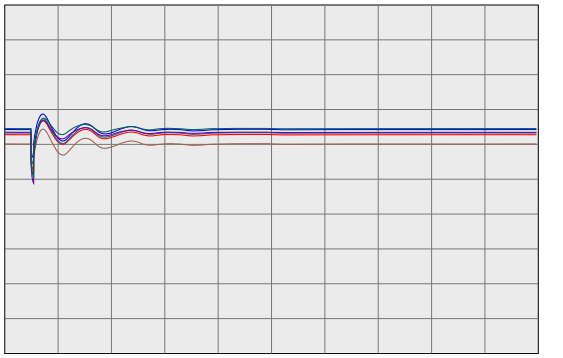
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



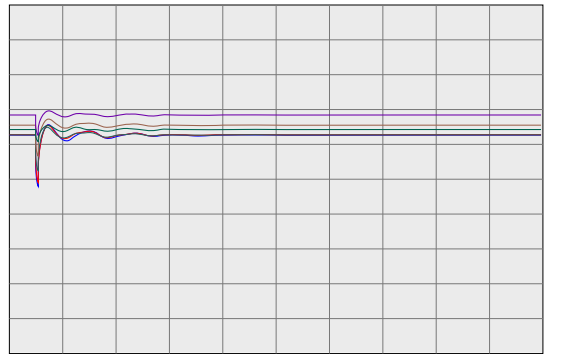


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

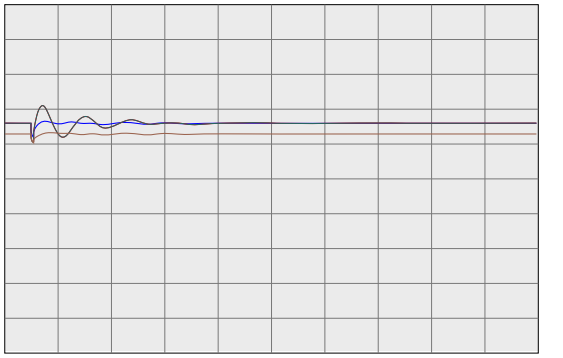
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



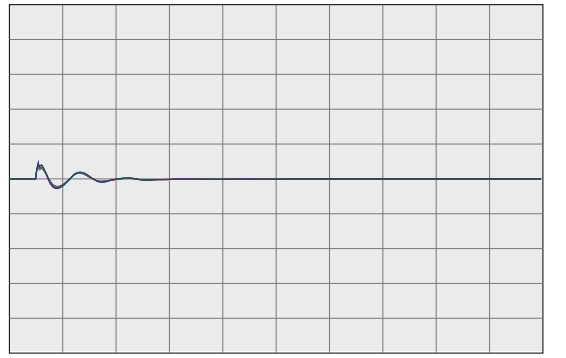
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



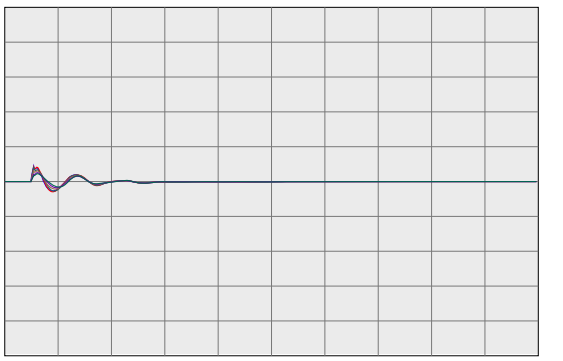
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



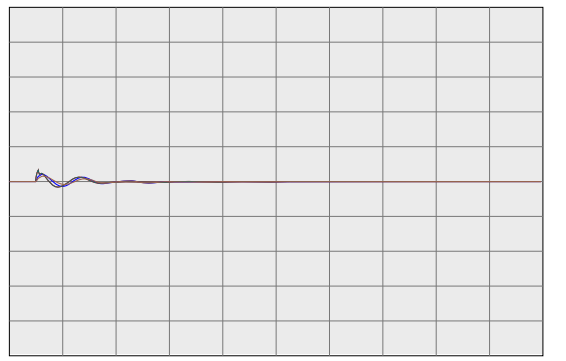
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



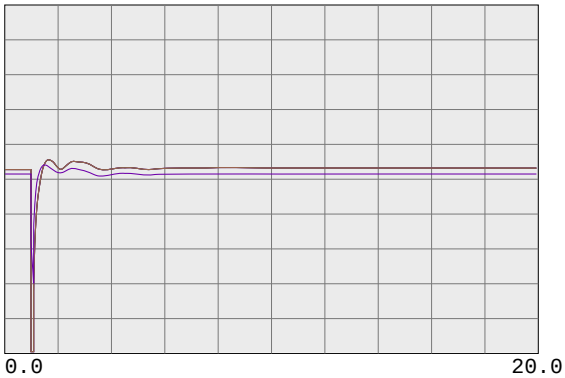
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

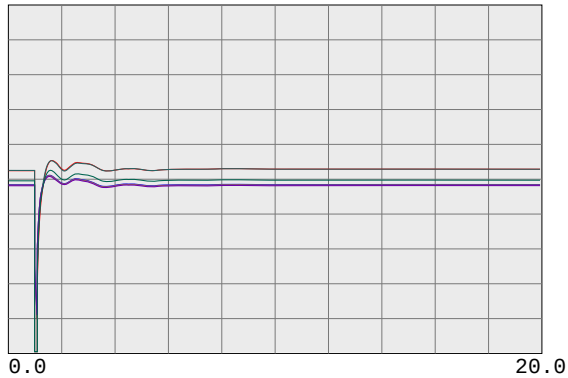
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

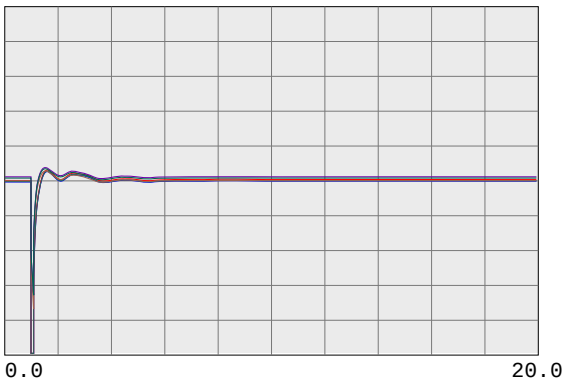
230-KV SYSTEM VOLTAGES



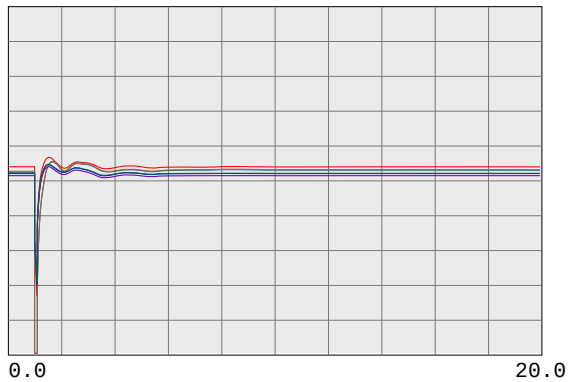
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



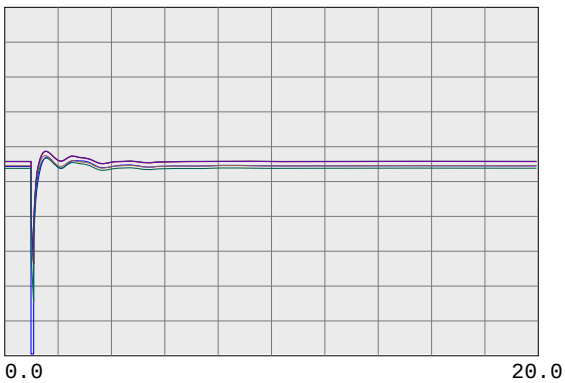
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



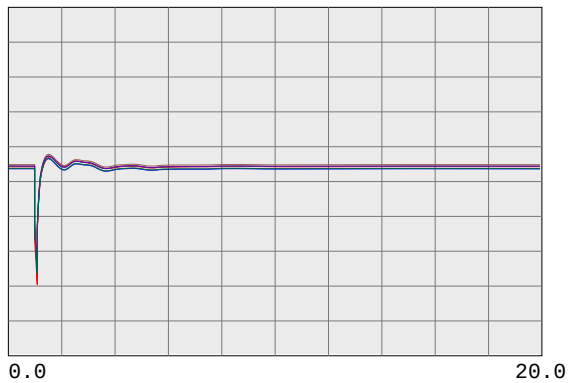
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



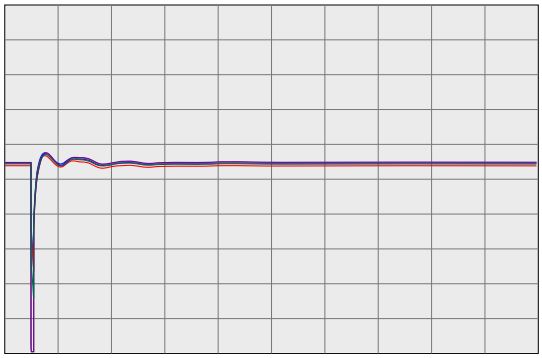
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

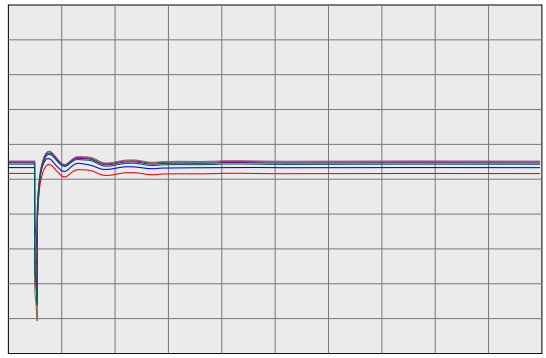
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

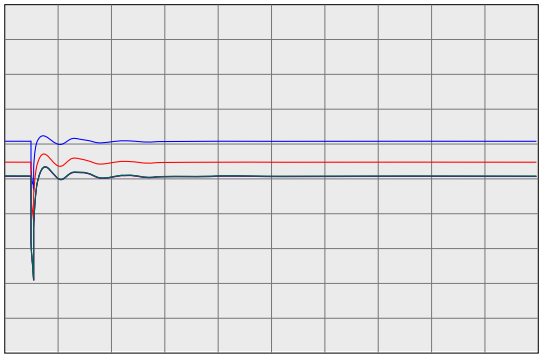
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

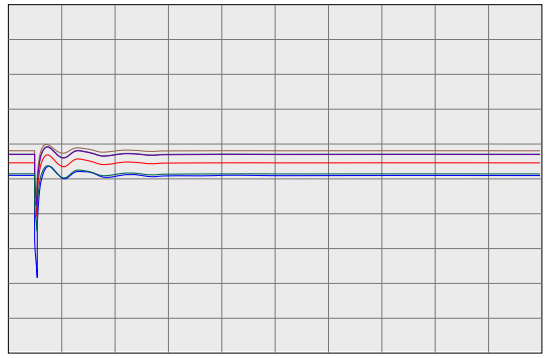
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

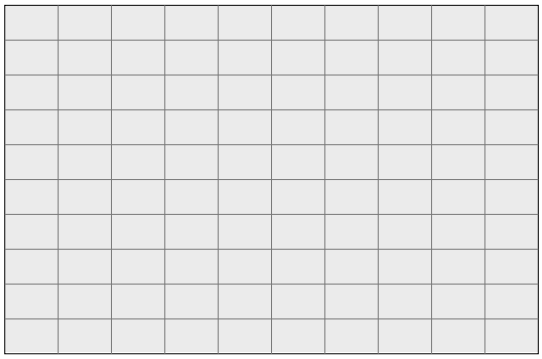
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

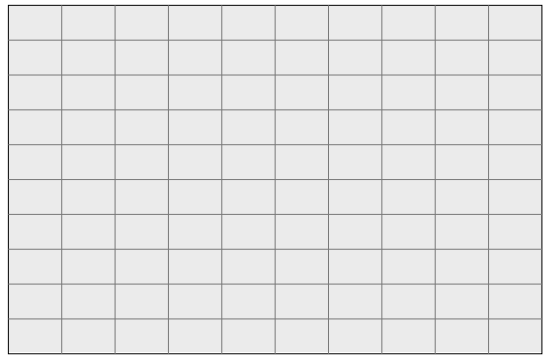


0.0 20.0

Time(sec)

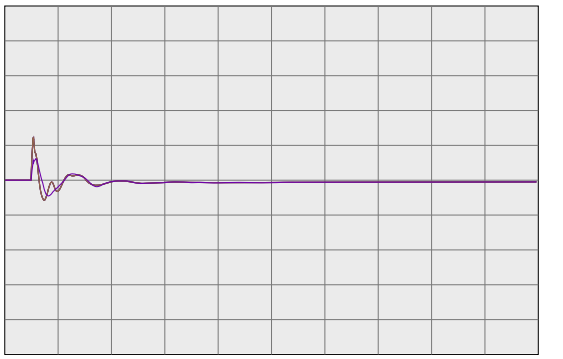
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



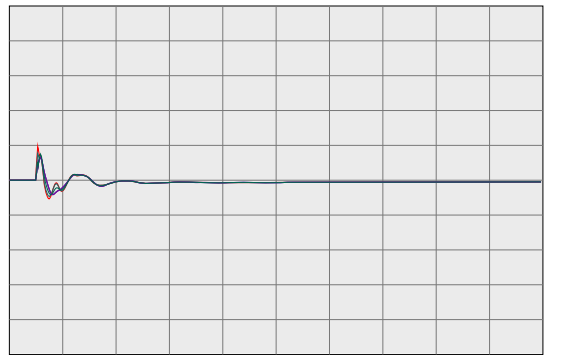


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

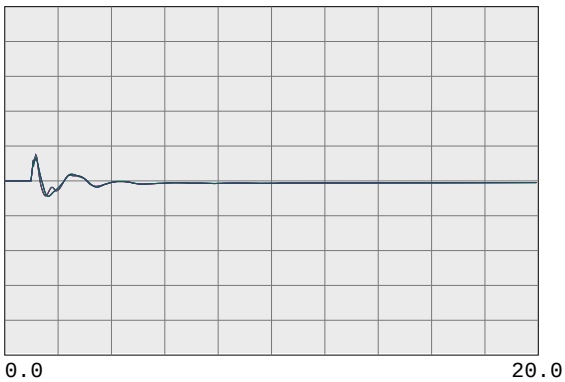
230-KV SYSTEM FREQUENCIES



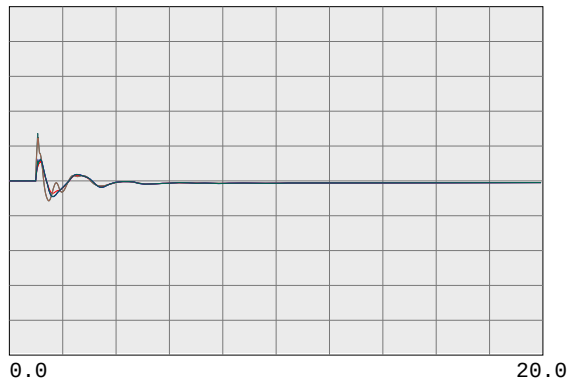
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



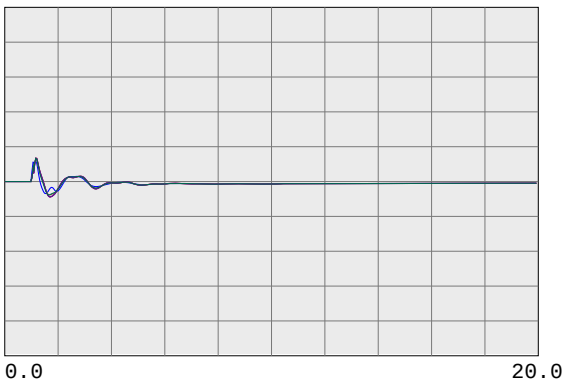
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



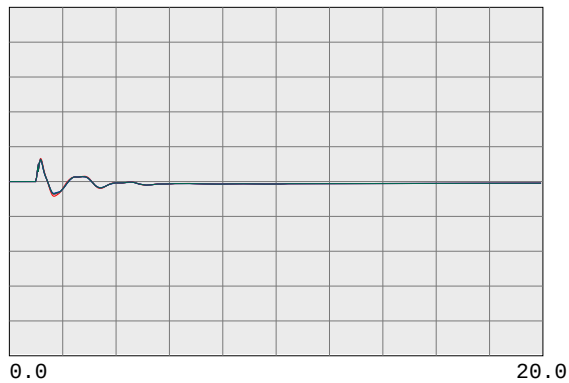
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



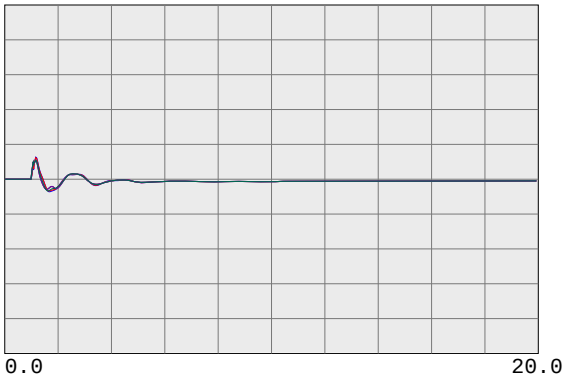
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



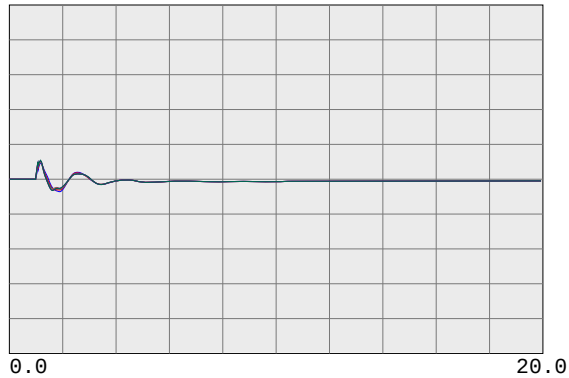
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

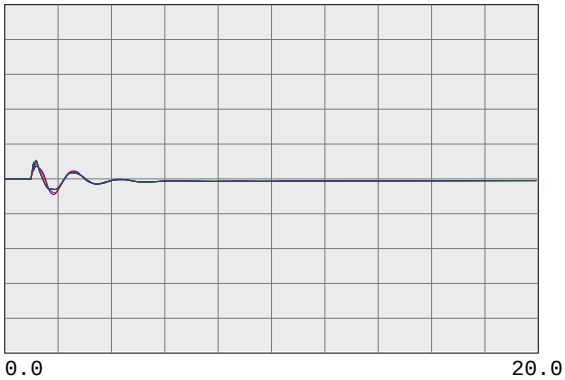
230-KV SYSTEM FREQUENCIES



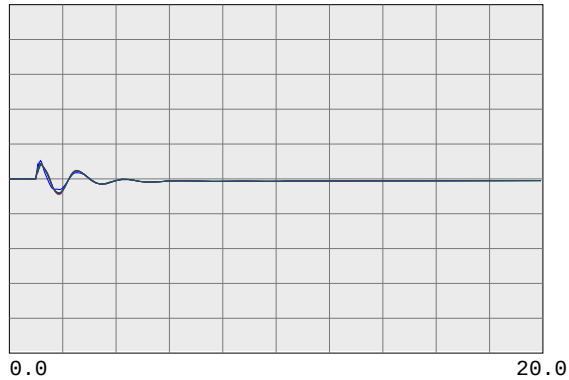
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



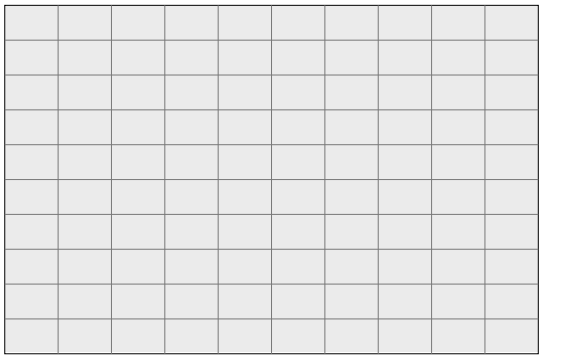
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

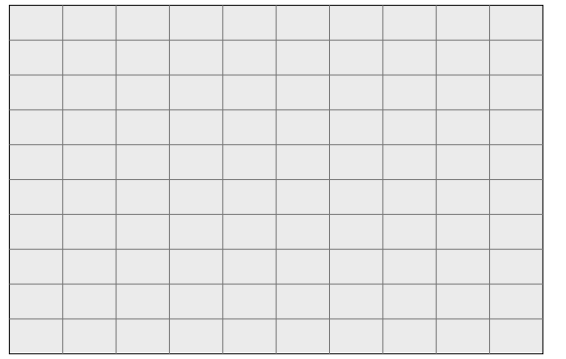


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



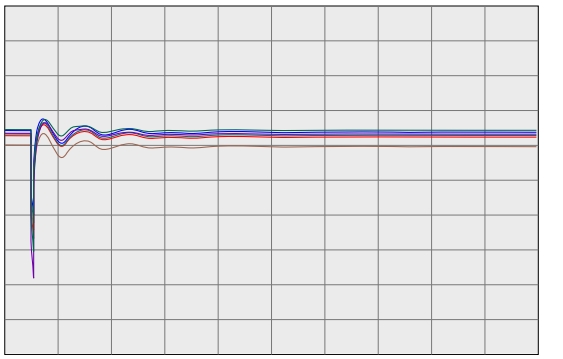
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



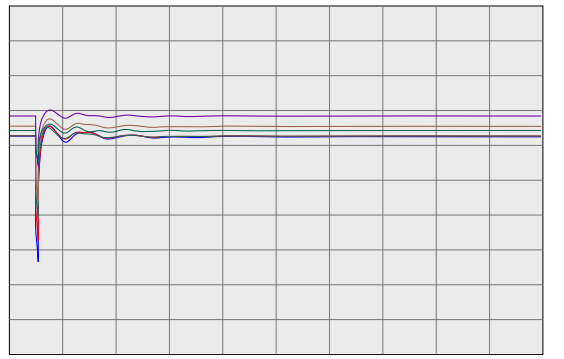


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

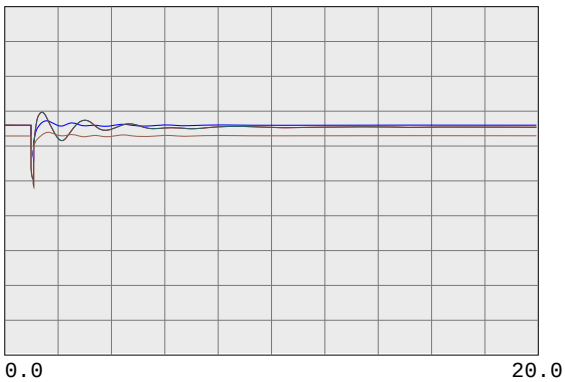
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



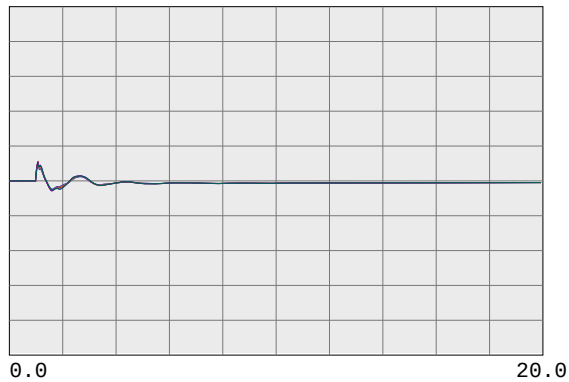
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



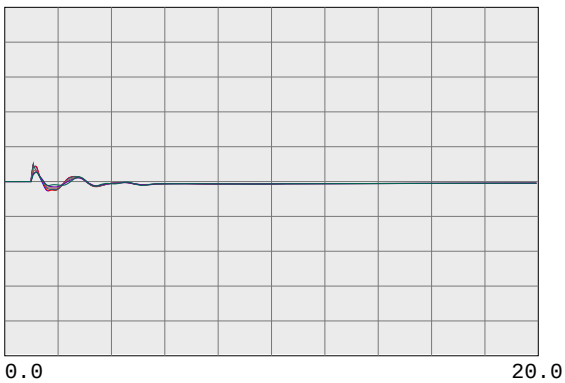
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



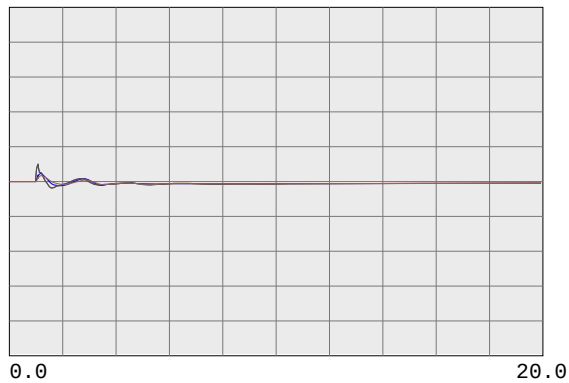
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



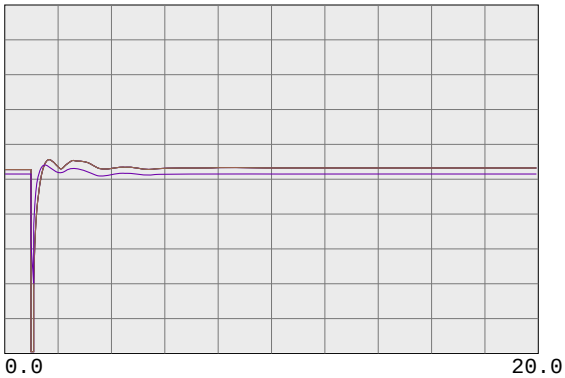
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

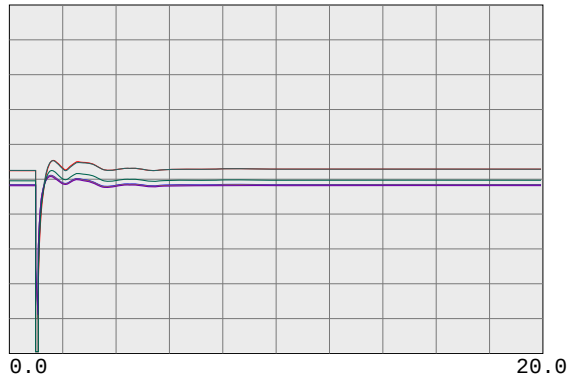
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

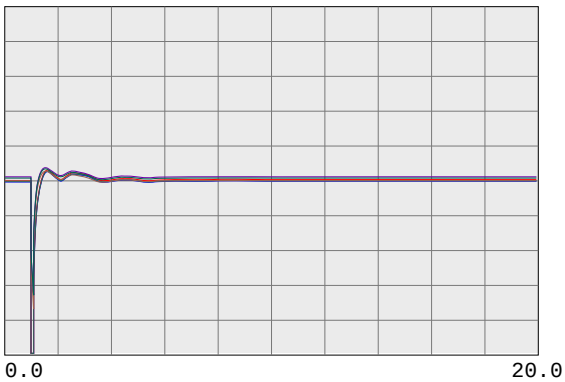
230-KV SYSTEM VOLTAGES



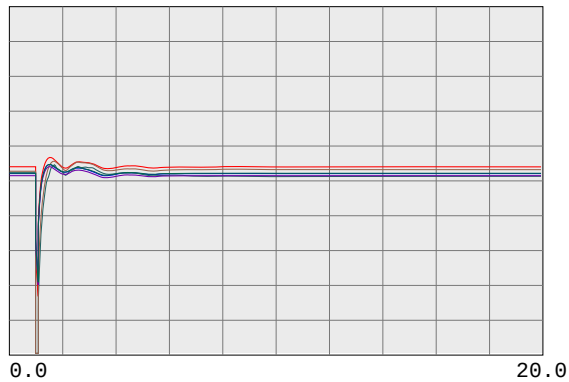
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



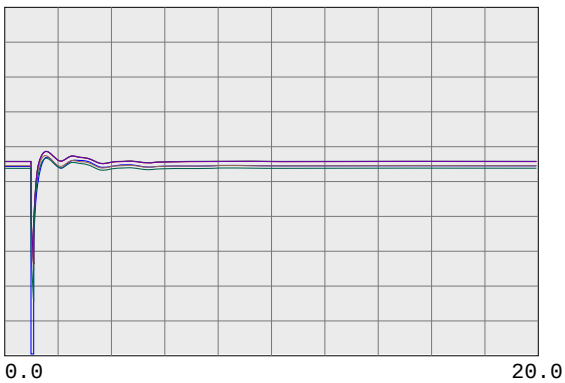
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



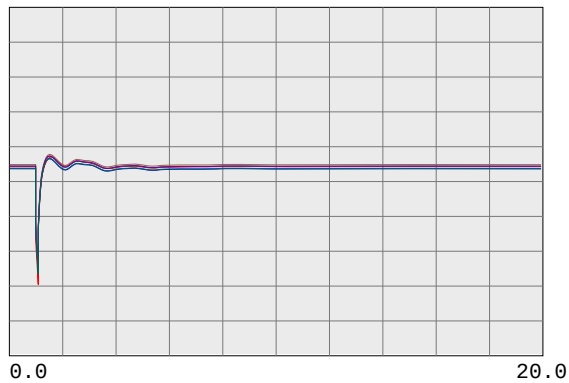
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



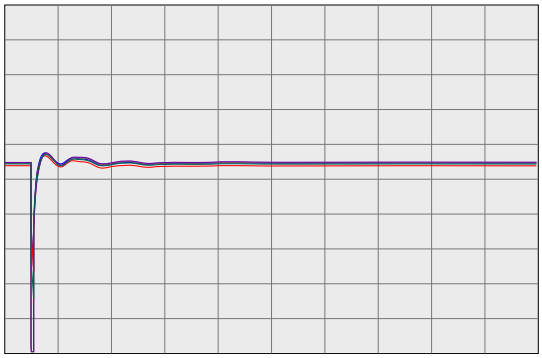
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

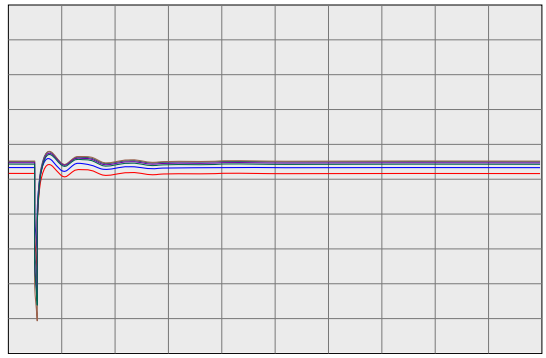
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

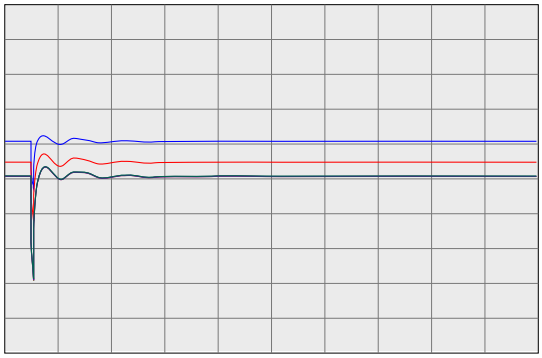
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

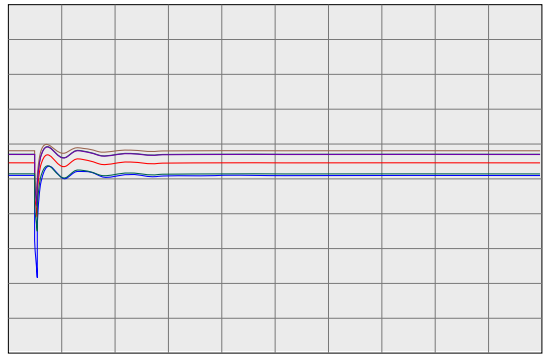
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

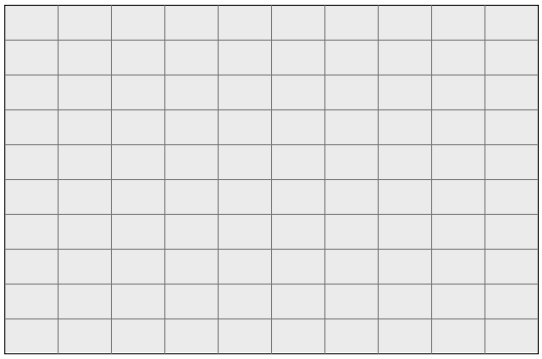
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

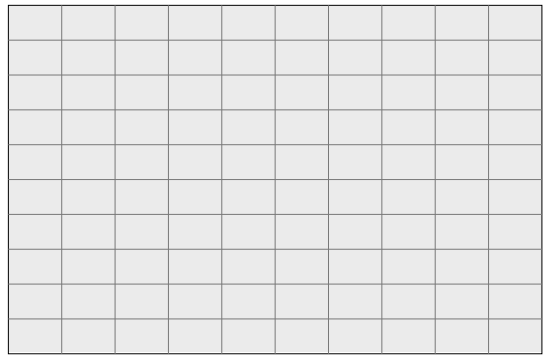


0.0 20.0

Time(sec)

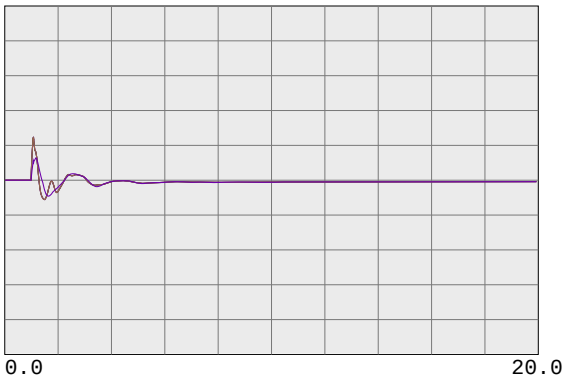
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



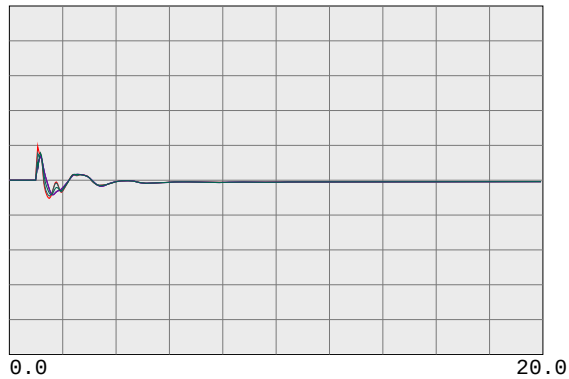


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

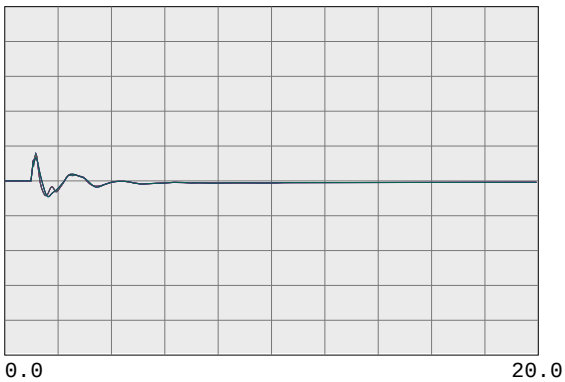
230-KV SYSTEM FREQUENCIES



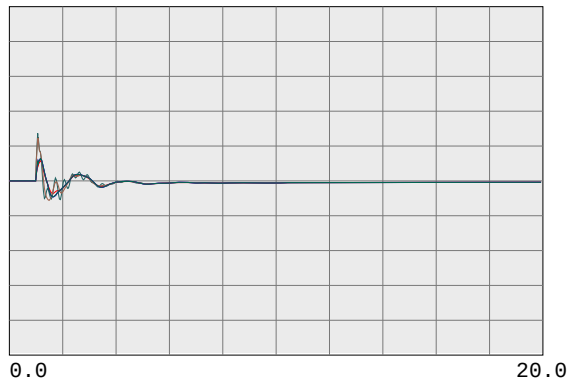
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



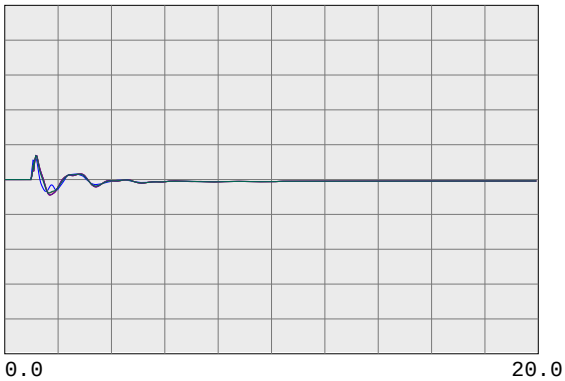
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



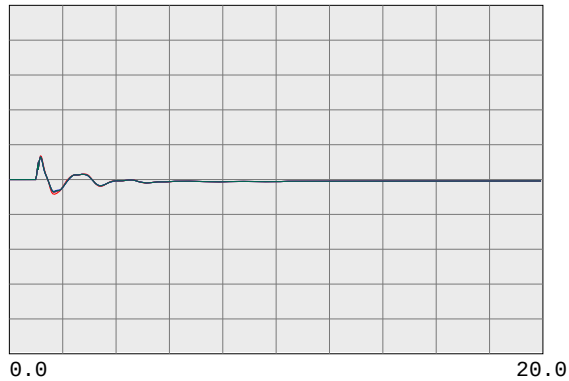
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



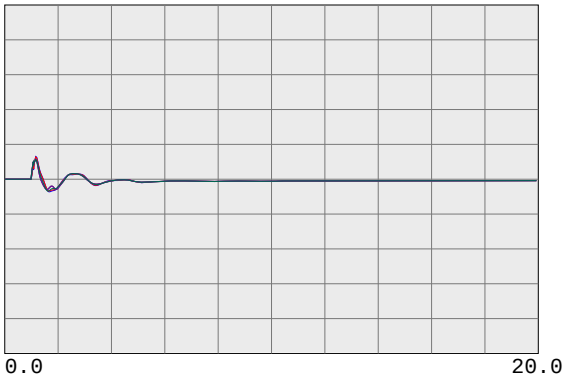
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



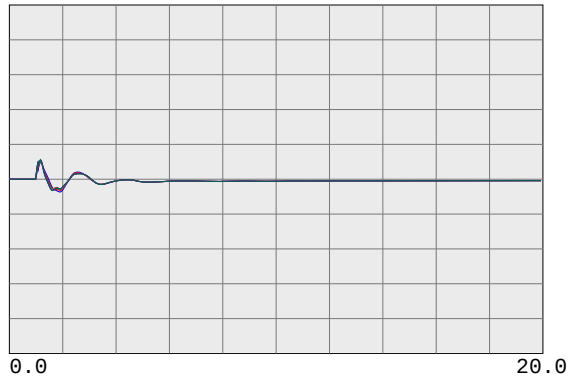
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

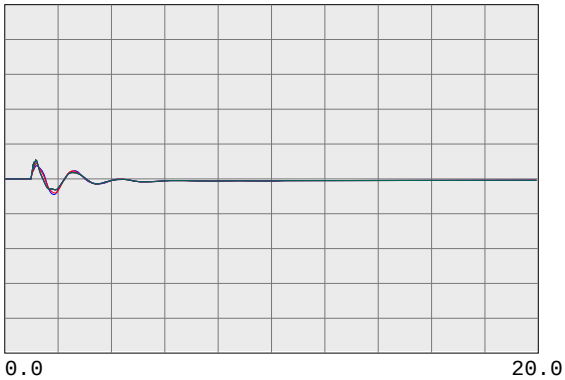
230-KV SYSTEM FREQUENCIES



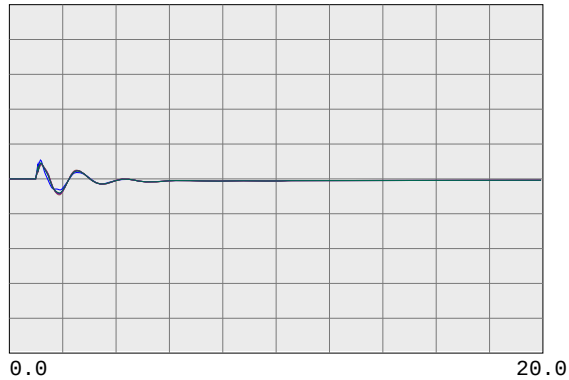
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



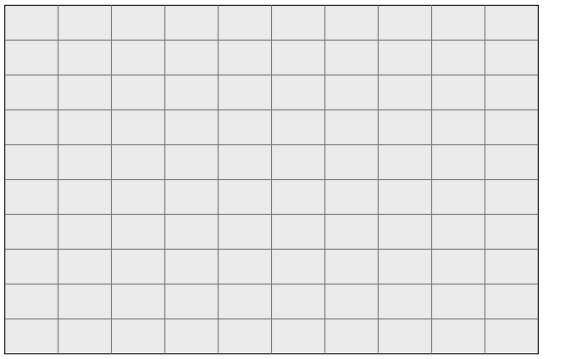
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

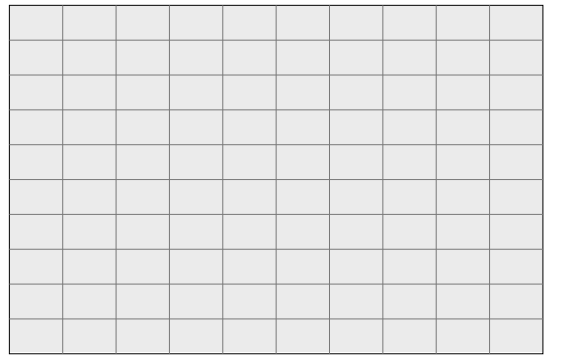


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



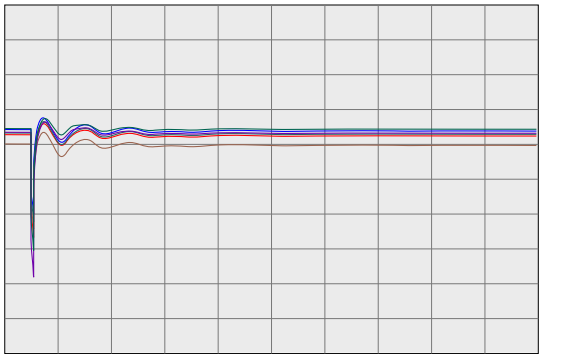
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



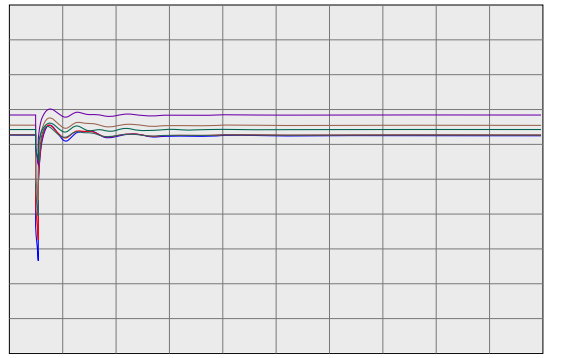


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

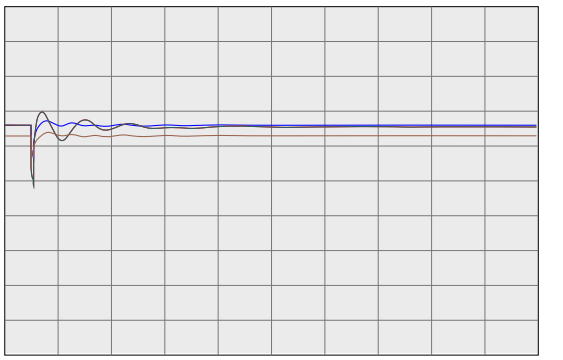
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



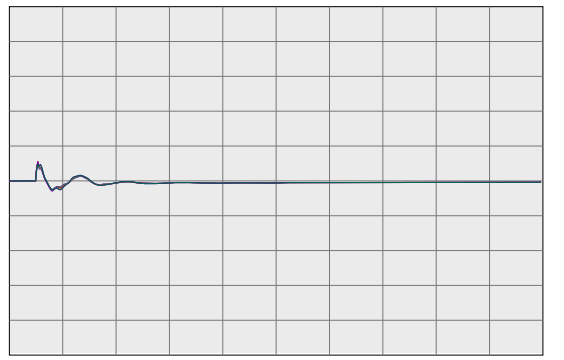
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



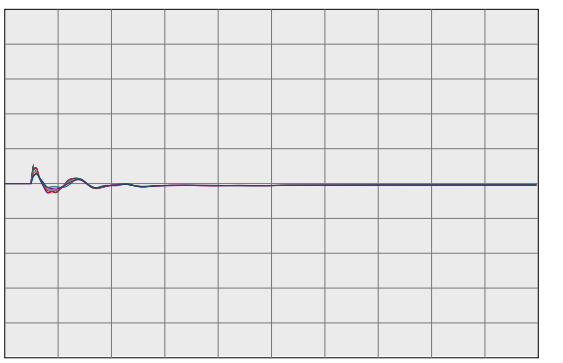
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



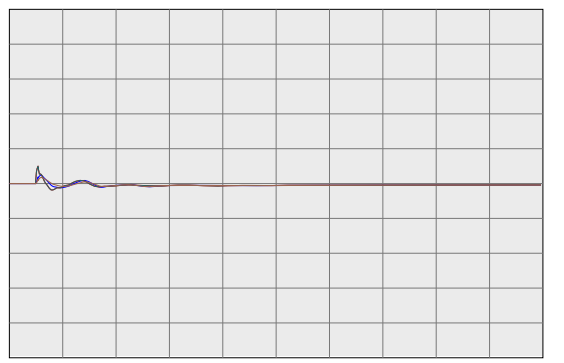
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



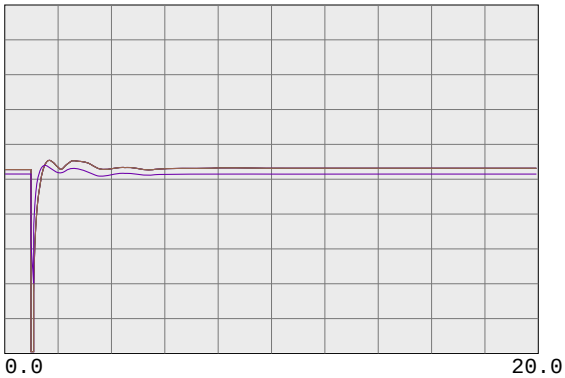
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

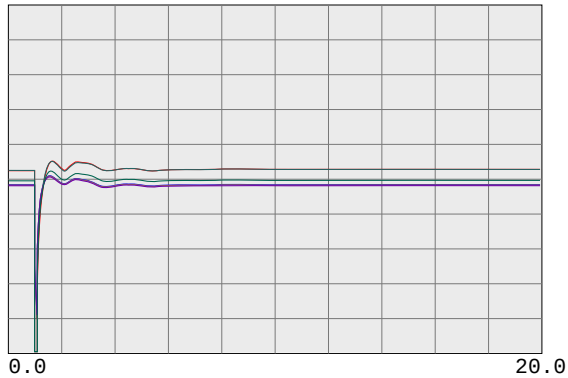
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

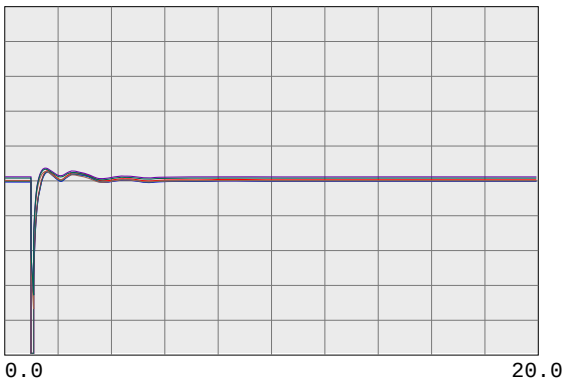
230-KV SYSTEM VOLTAGES



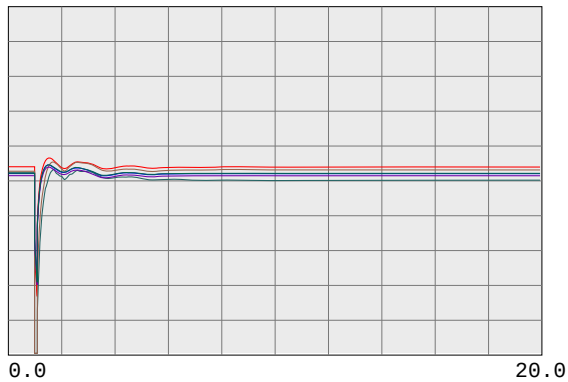
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



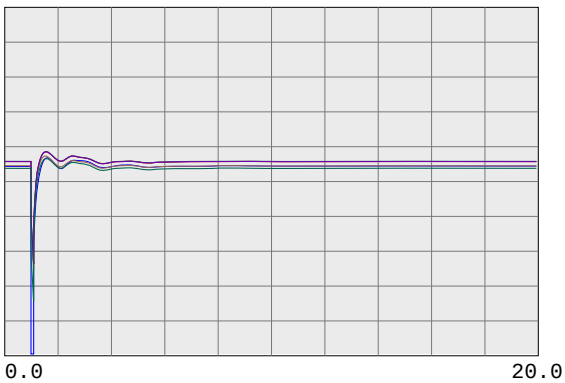
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



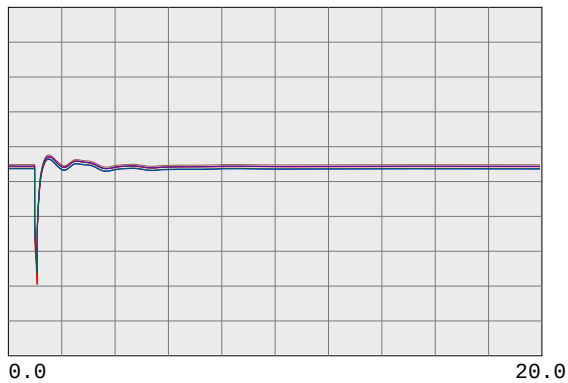
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



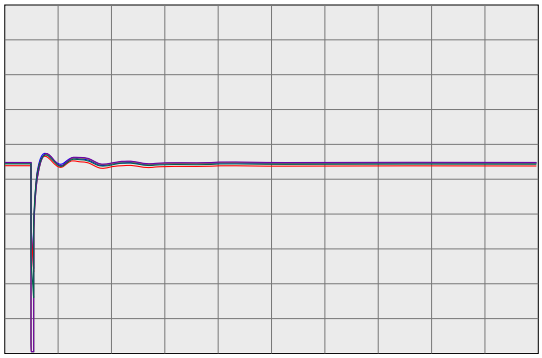
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

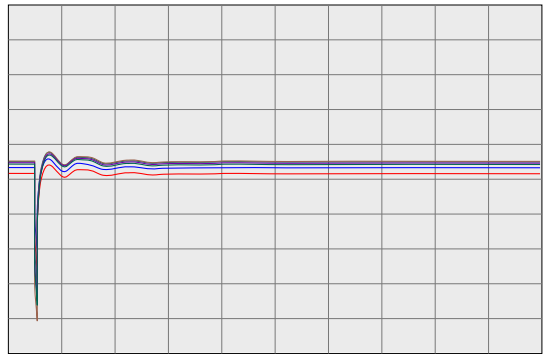
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

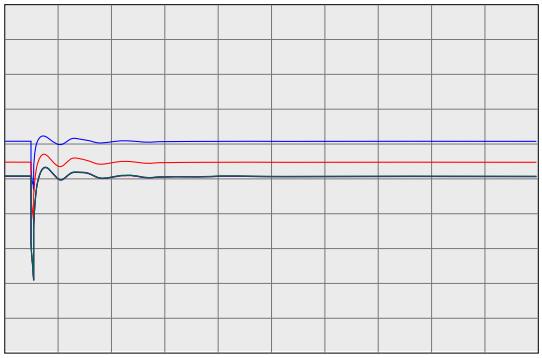
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

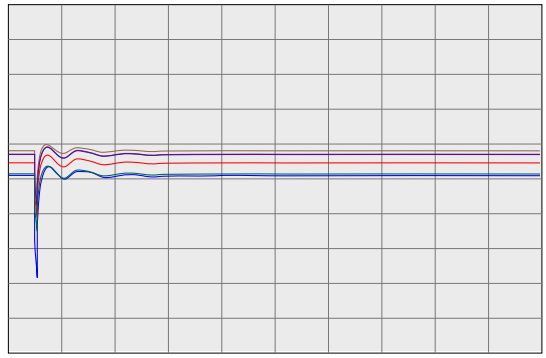
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

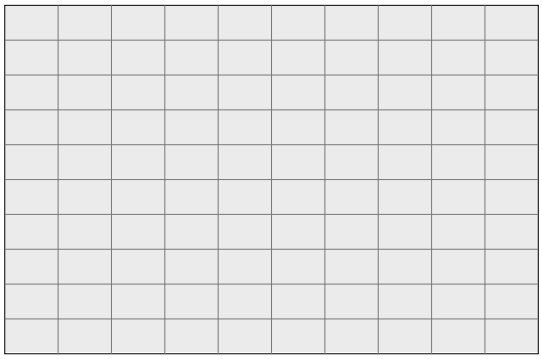
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

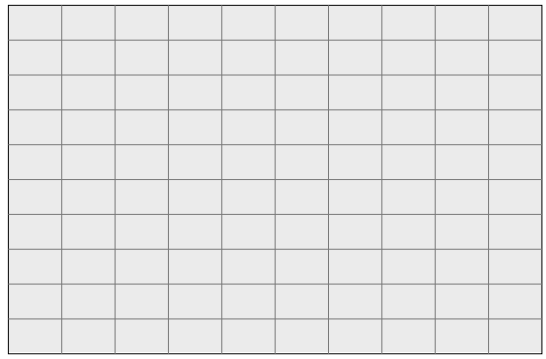


0.0 20.0

Time(sec)

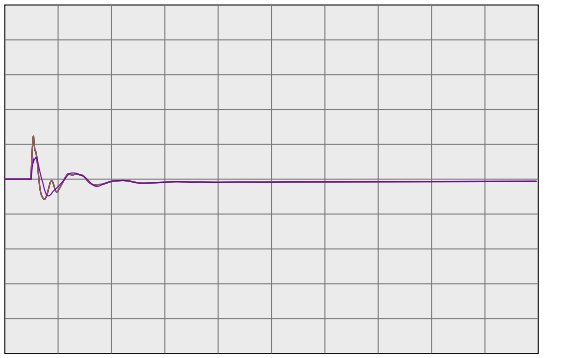
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



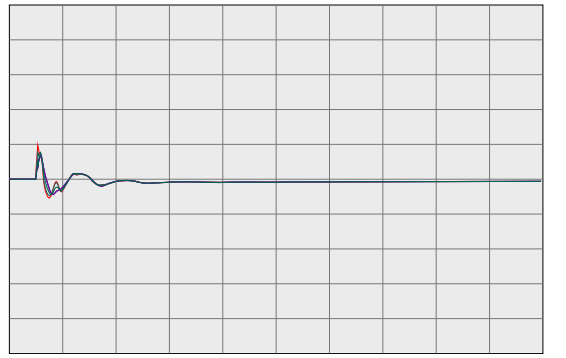


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

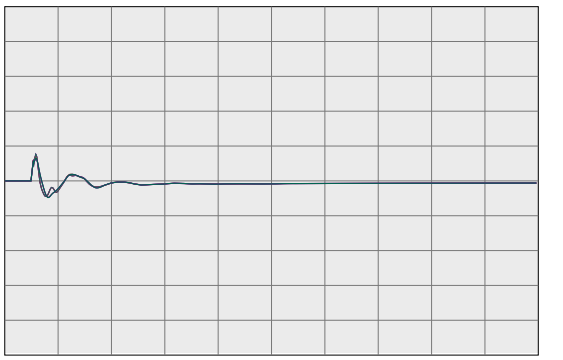
230-KV SYSTEM FREQUENCIES



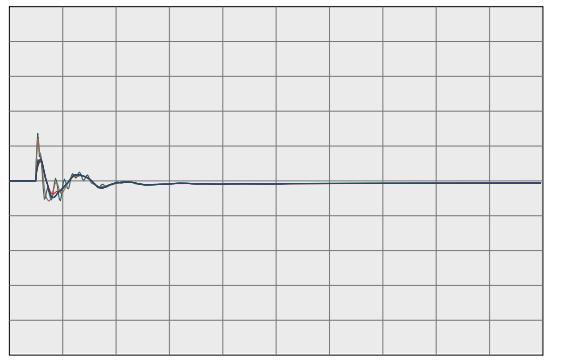
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



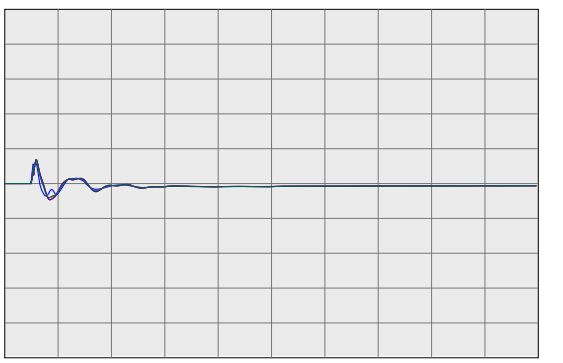
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



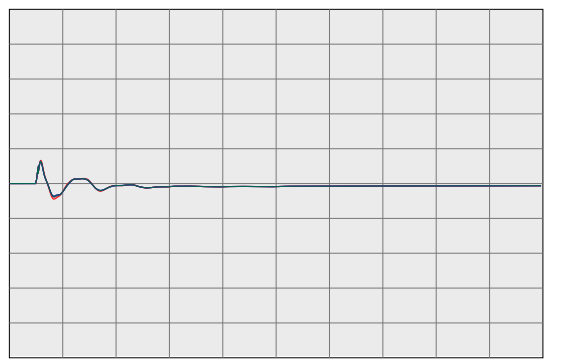
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



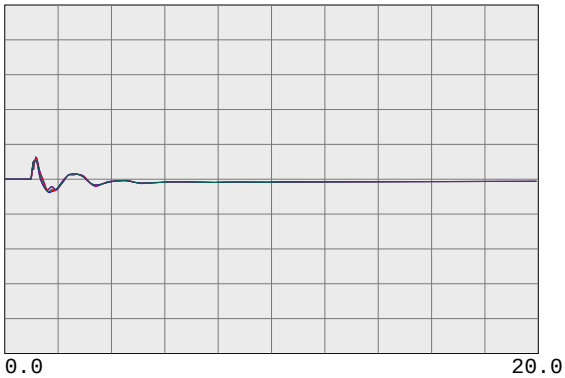
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



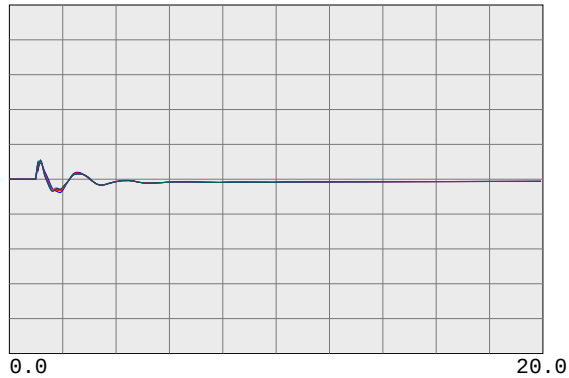
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

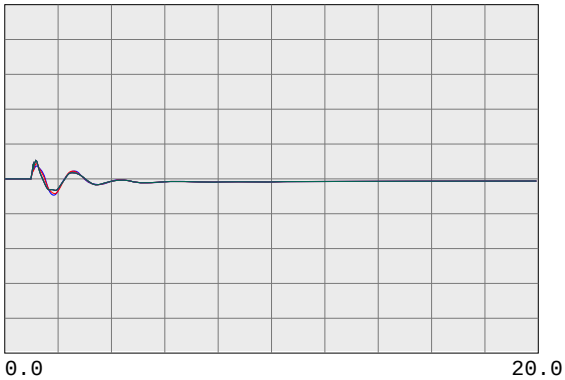
230-KV SYSTEM FREQUENCIES



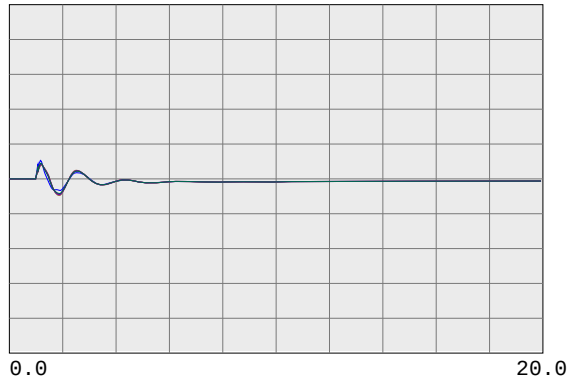
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



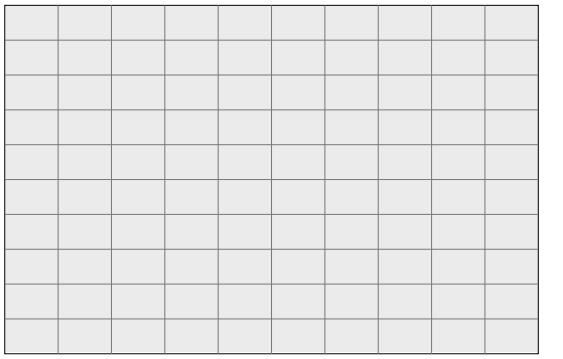
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

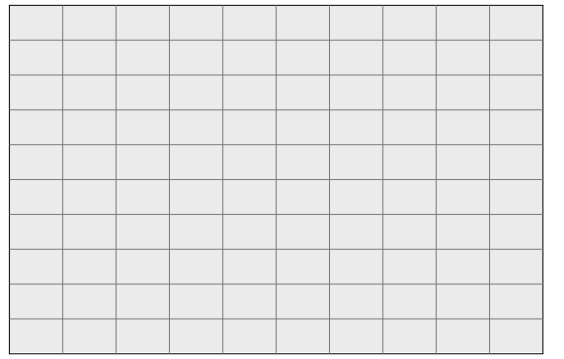


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



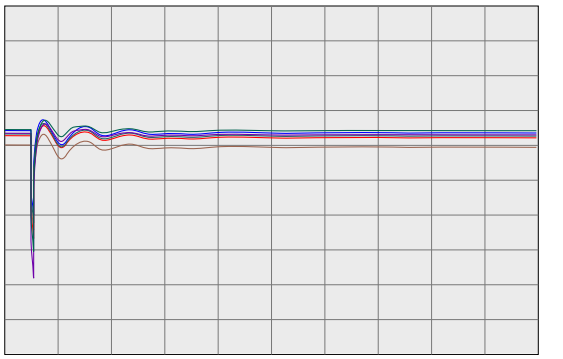
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



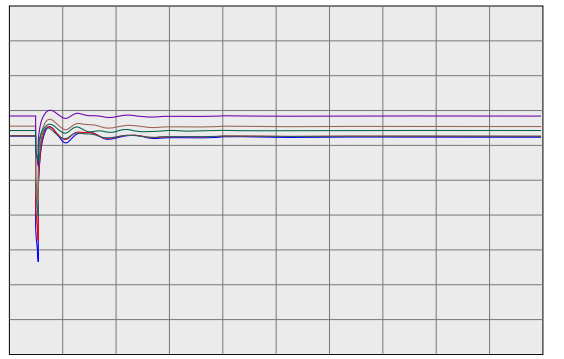


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

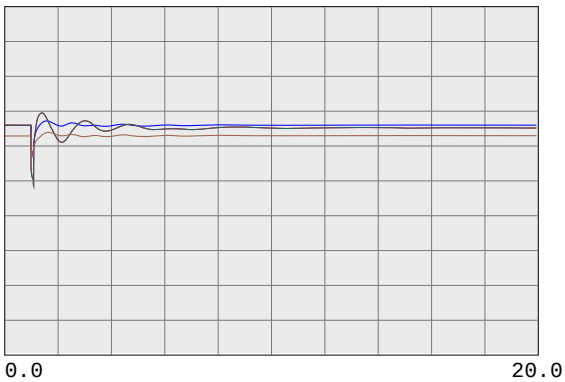
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



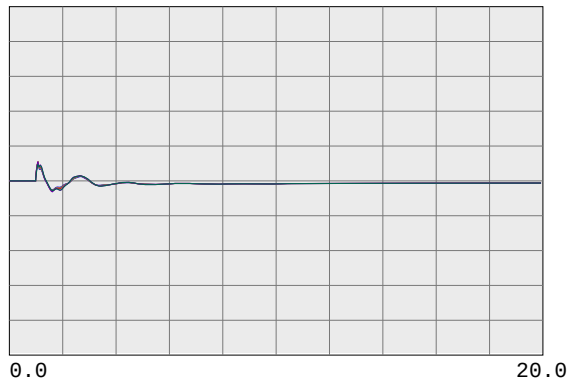
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



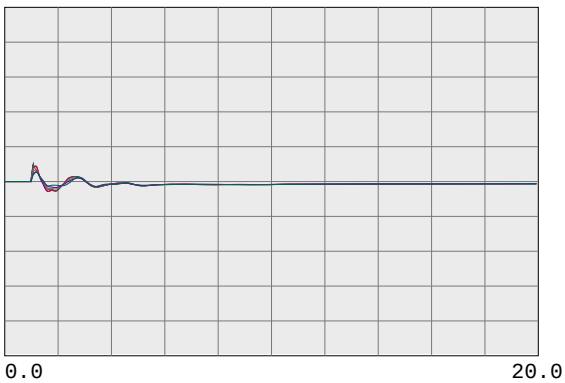
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



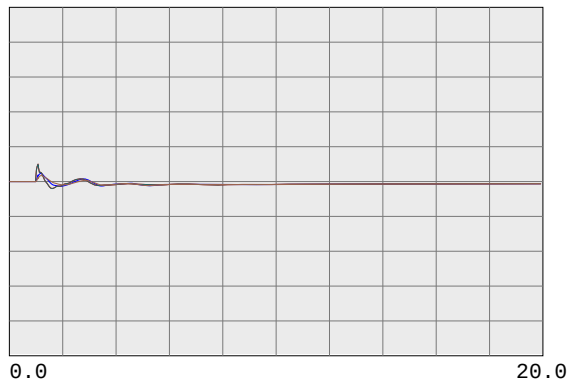
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



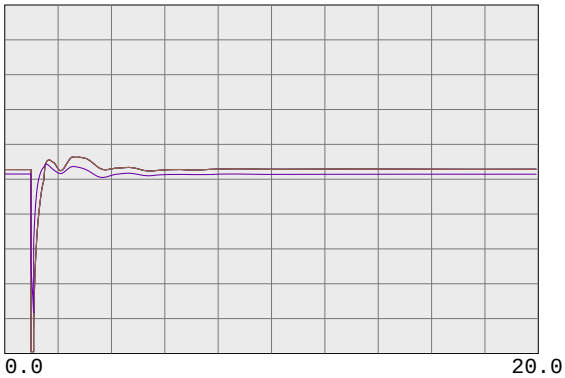
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

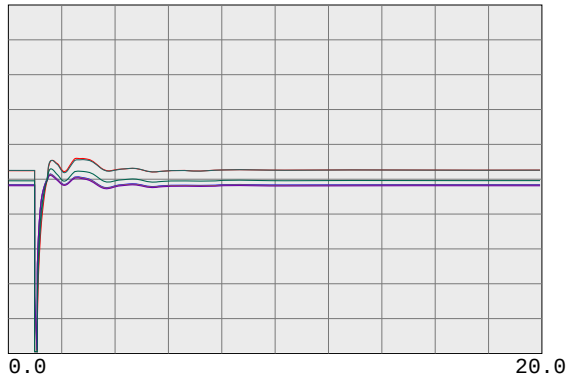
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

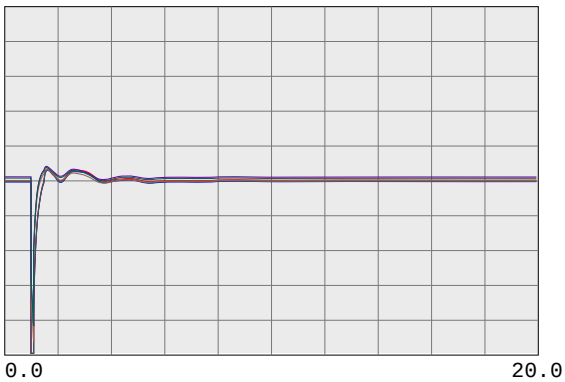
230-KV SYSTEM VOLTAGES



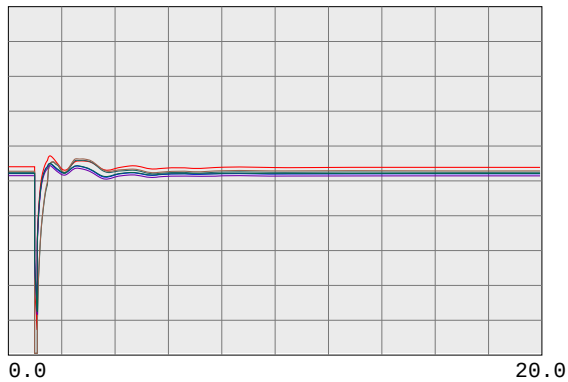
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



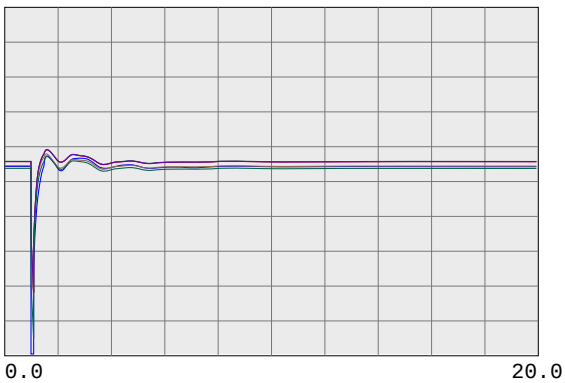
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



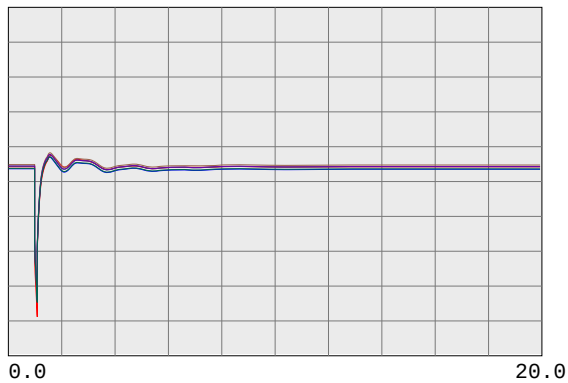
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



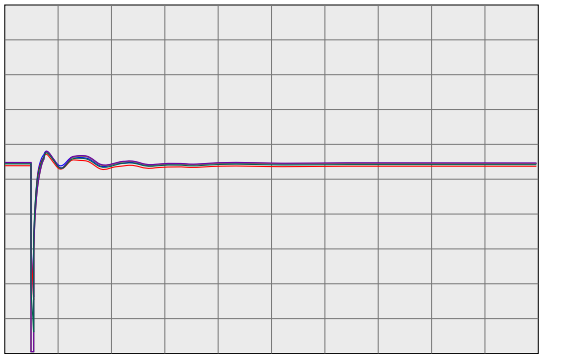
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



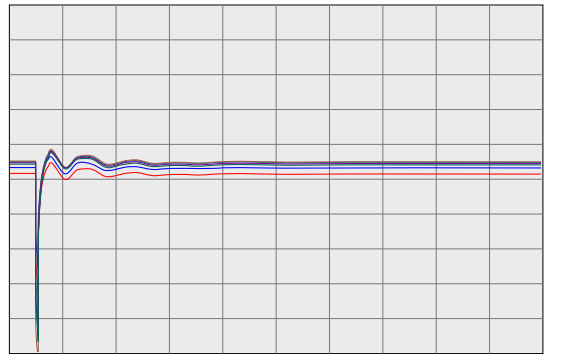
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

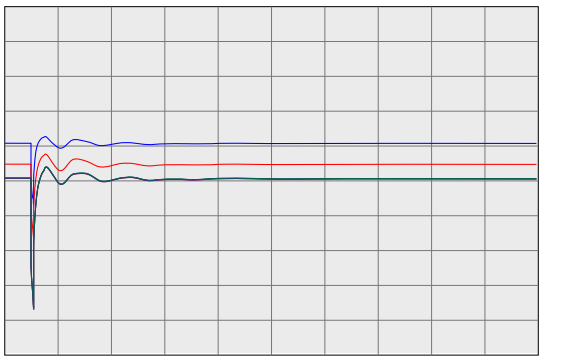
230-KV SYSTEM VOLTAGES



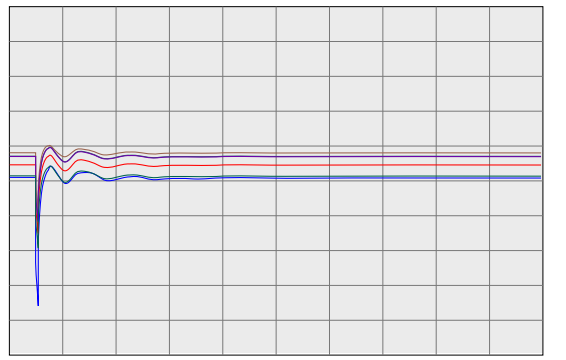
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



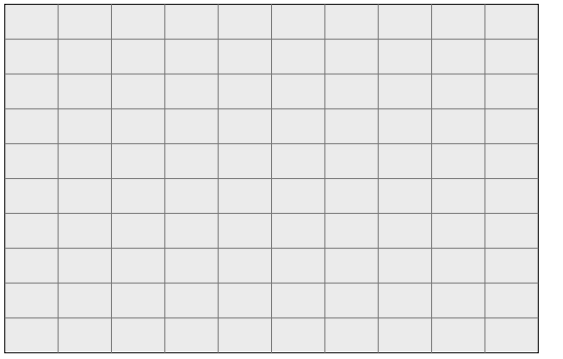
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

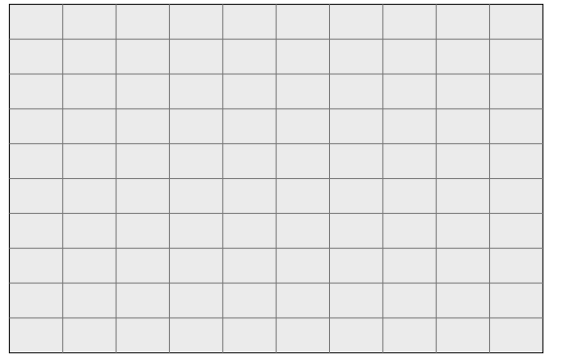


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



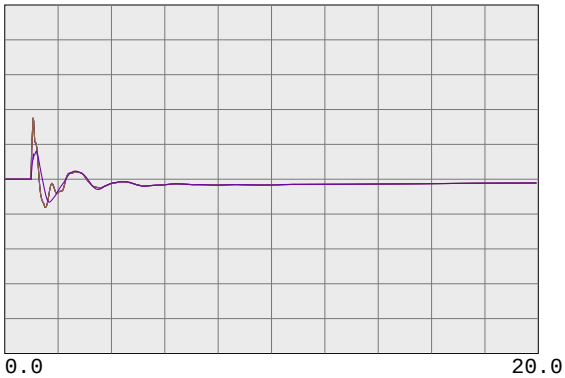
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



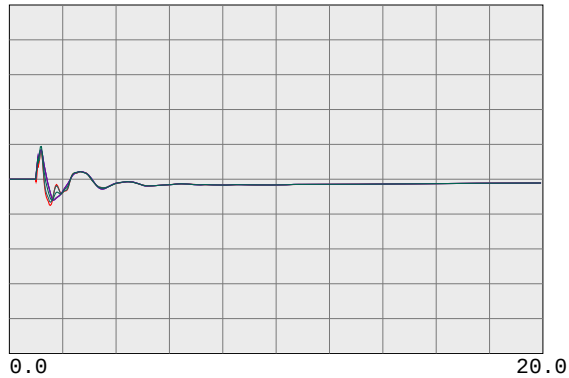


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

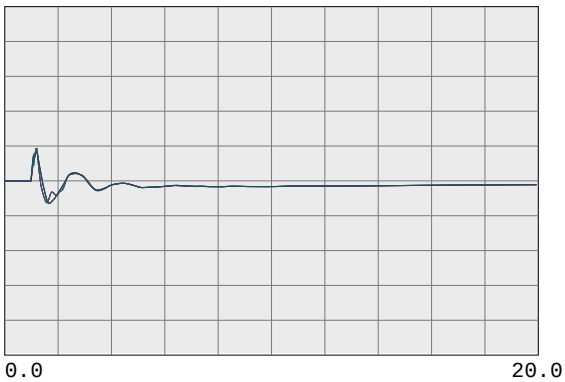
230-KV SYSTEM FREQUENCIES



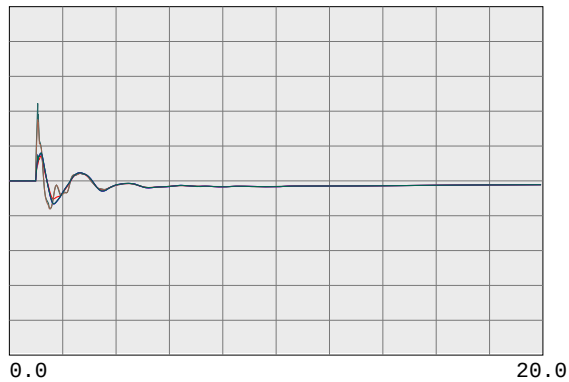
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



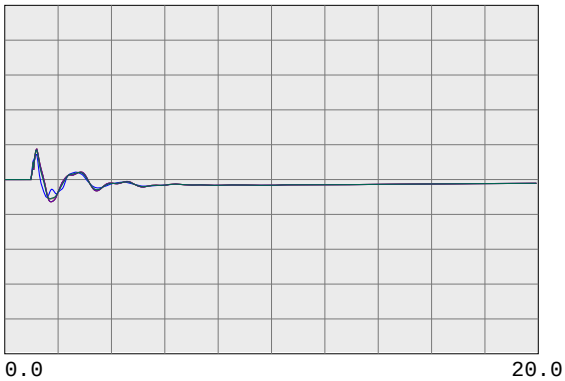
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



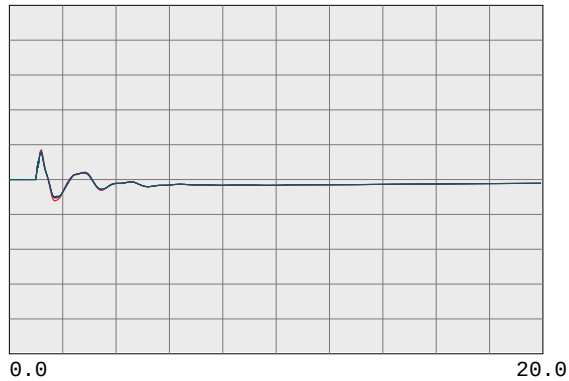
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



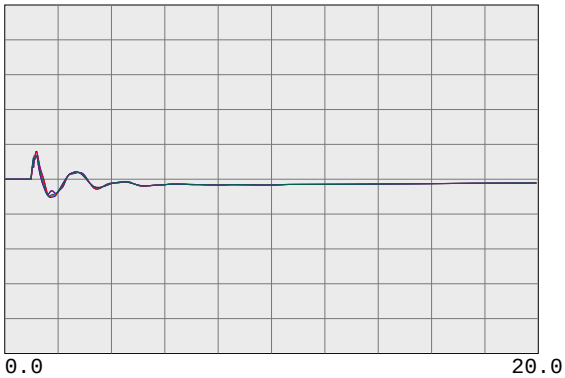
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



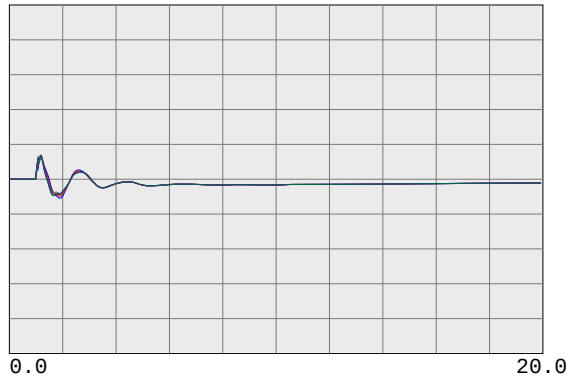
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

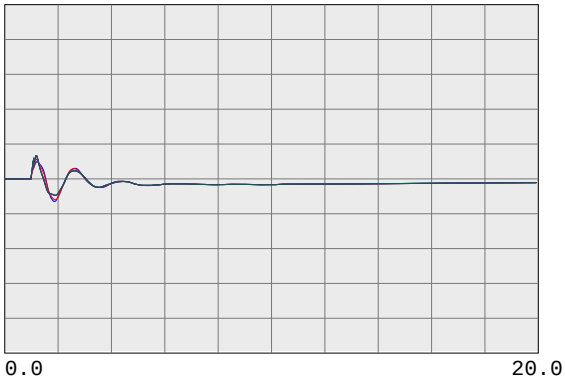
230-KV SYSTEM FREQUENCIES



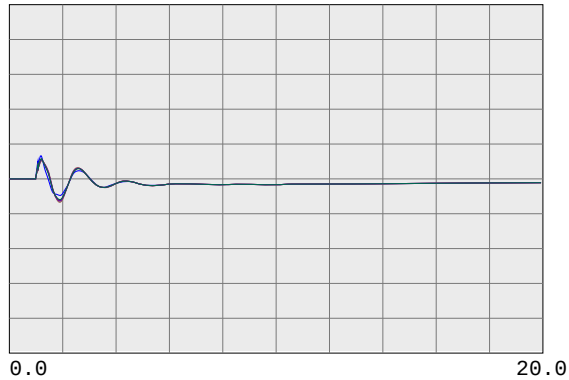
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



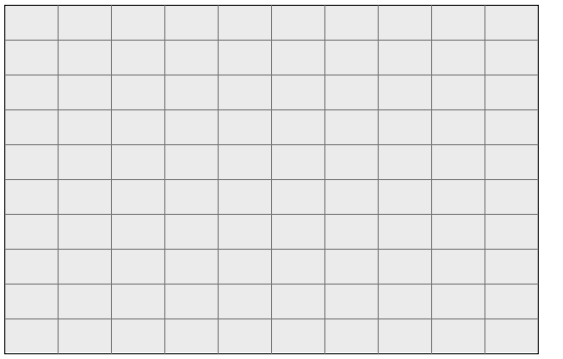
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

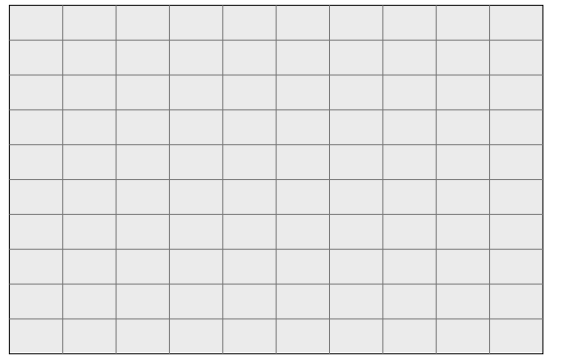


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



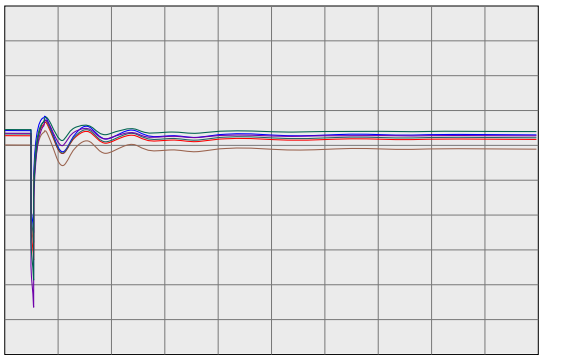
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



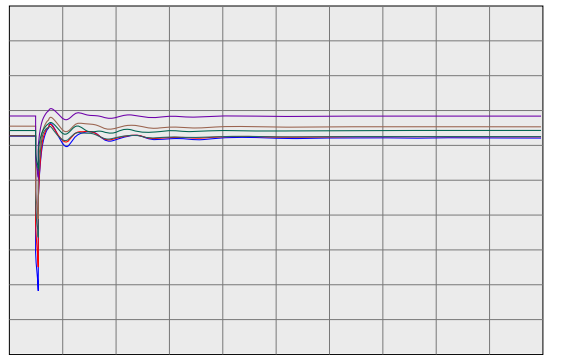


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

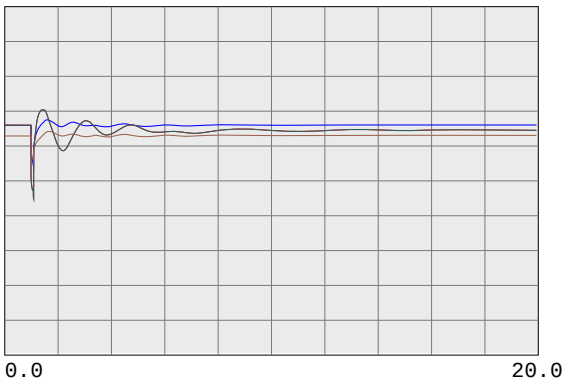
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



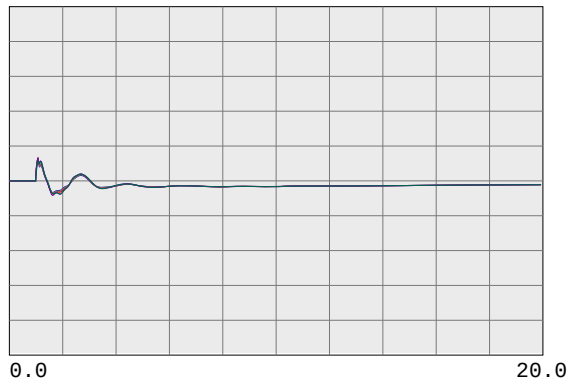
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



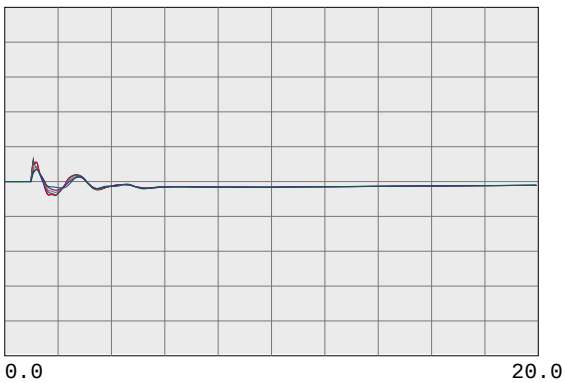
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



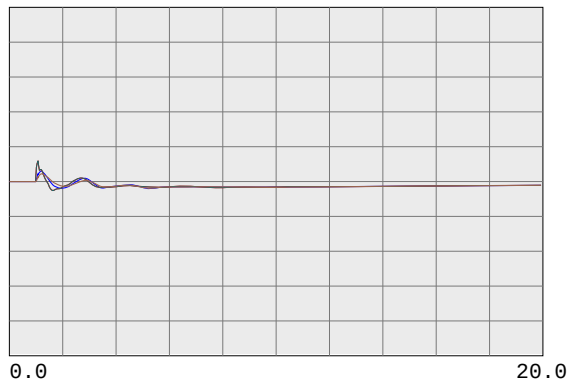
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



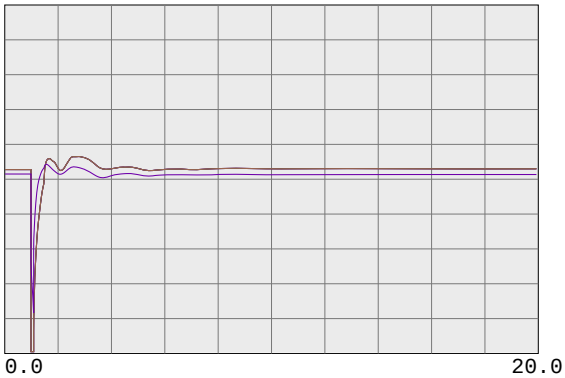
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

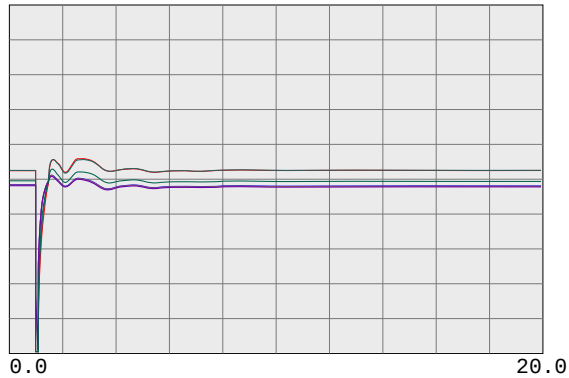
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

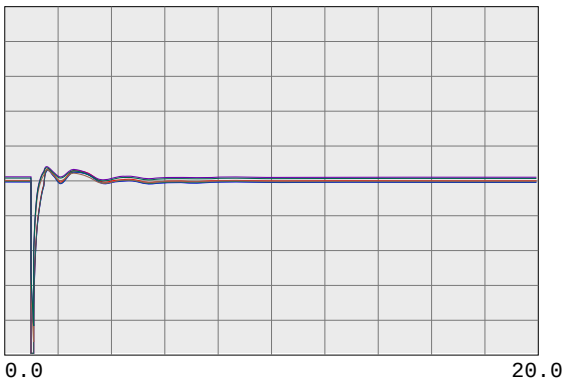
230-KV SYSTEM VOLTAGES



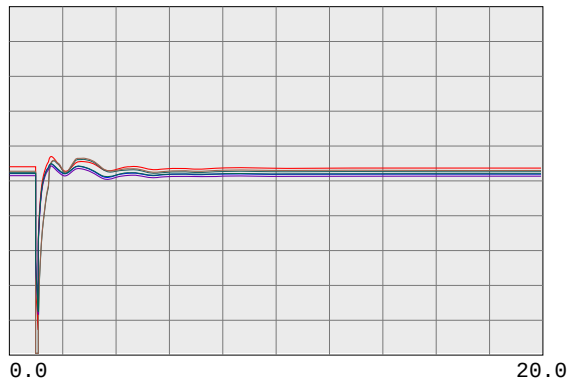
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



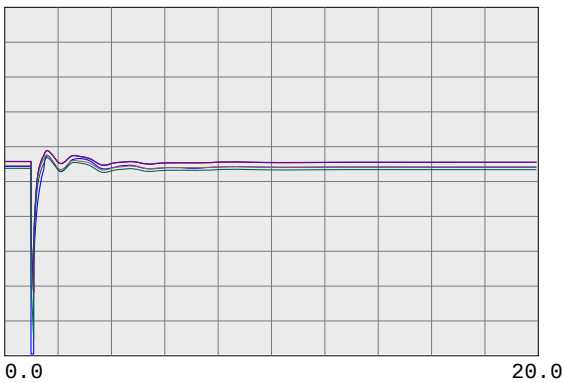
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



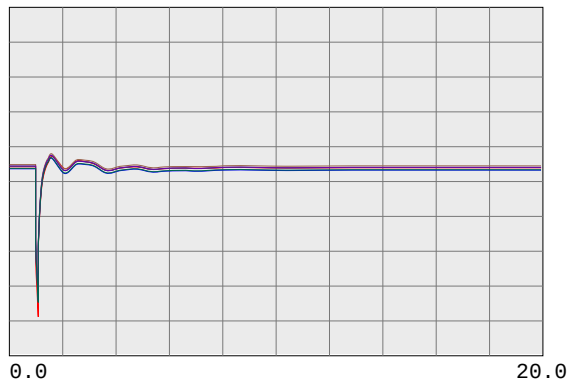
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



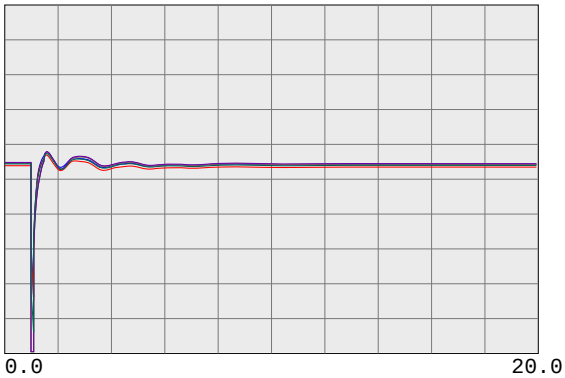
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



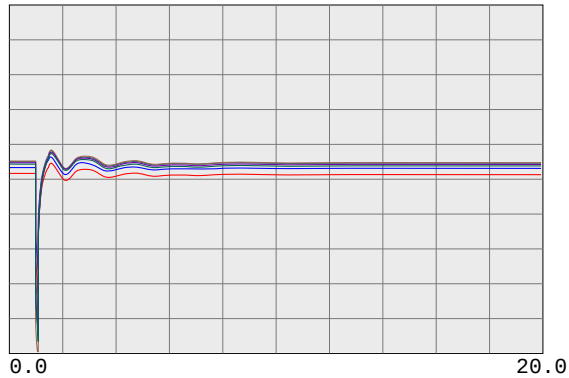
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

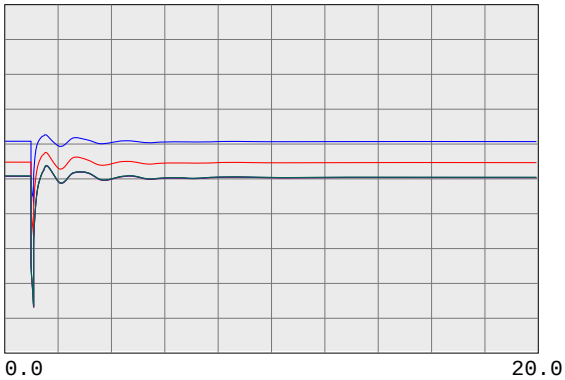
230-KV SYSTEM VOLTAGES



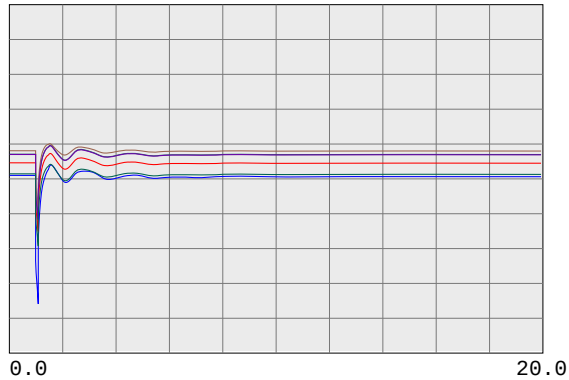
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



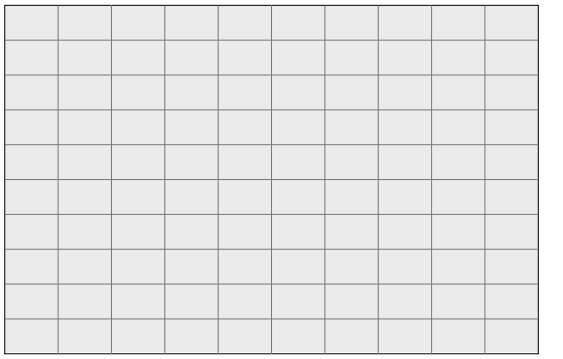
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

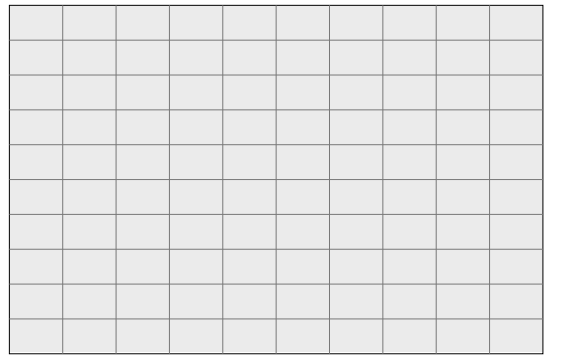


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



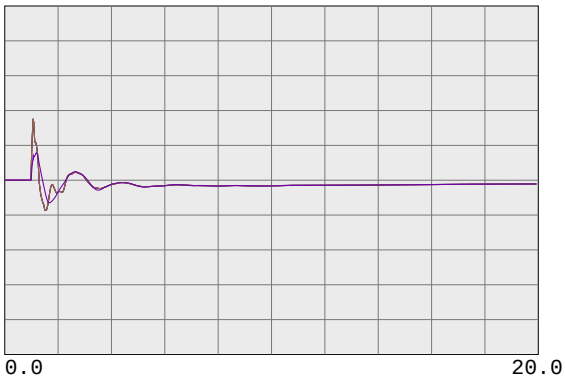
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



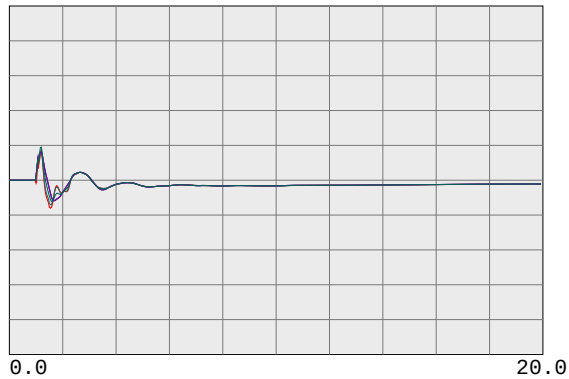


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

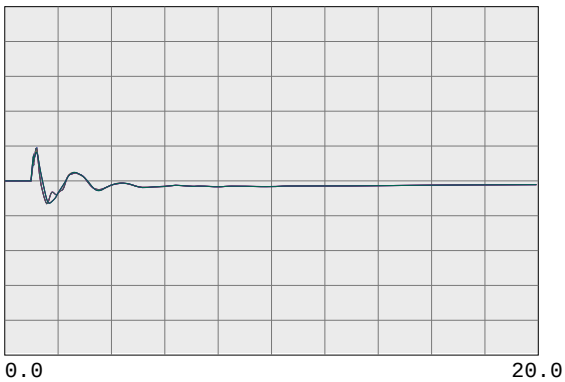
230-KV SYSTEM FREQUENCIES



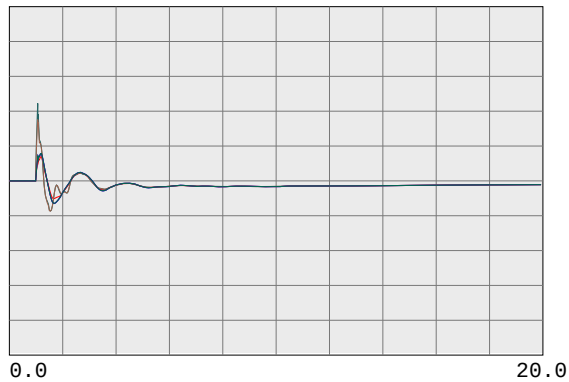
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



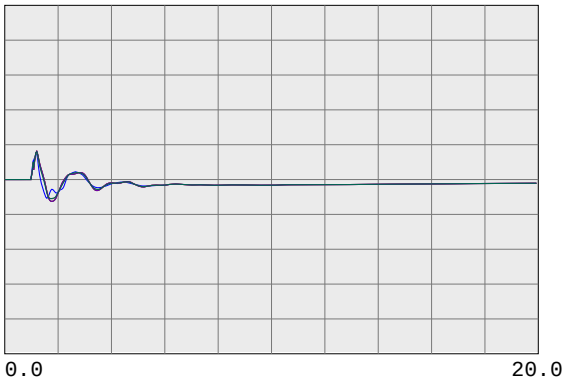
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



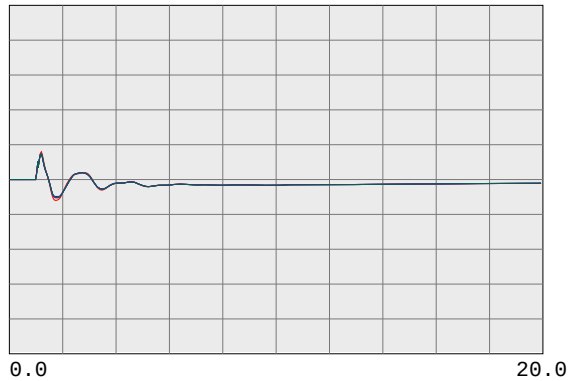
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



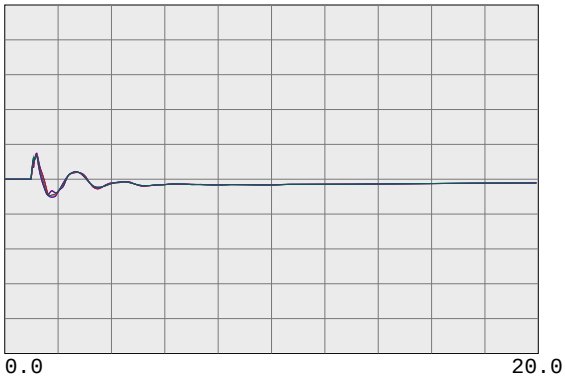
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



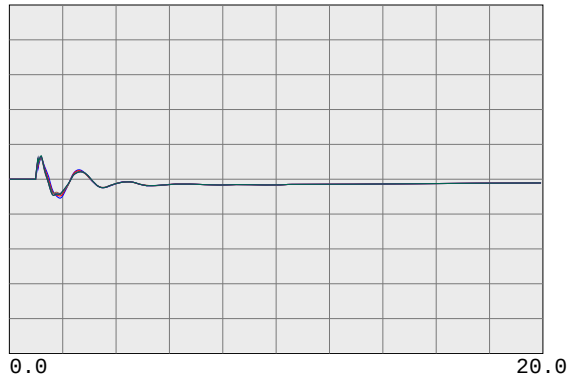
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

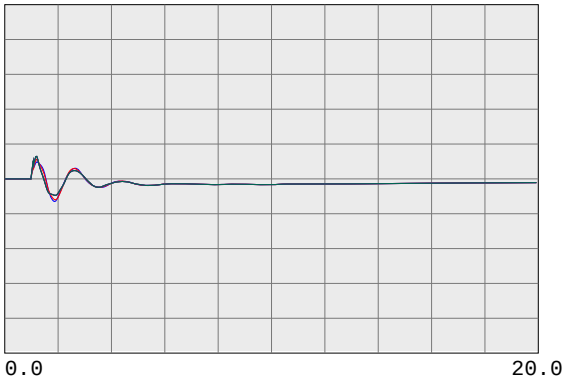
230-KV SYSTEM FREQUENCIES



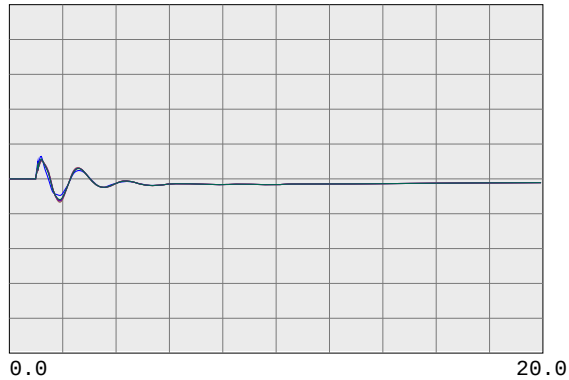
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



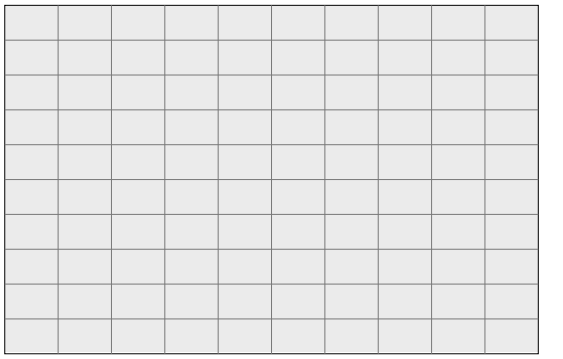
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

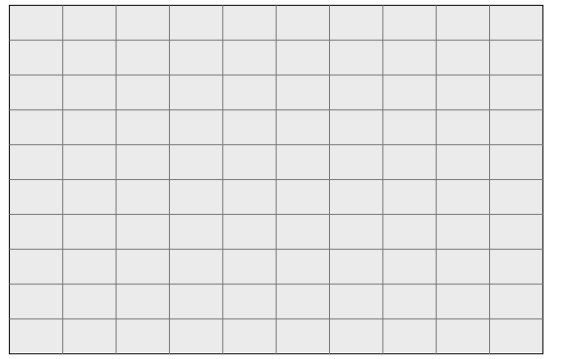


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



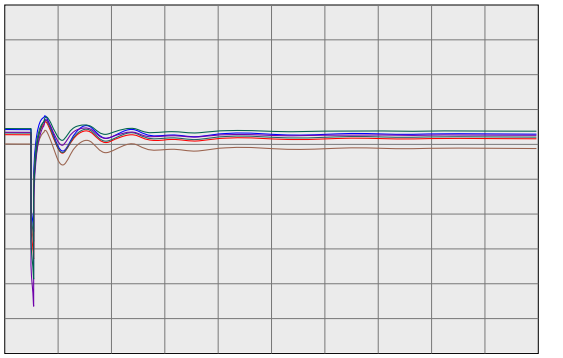
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



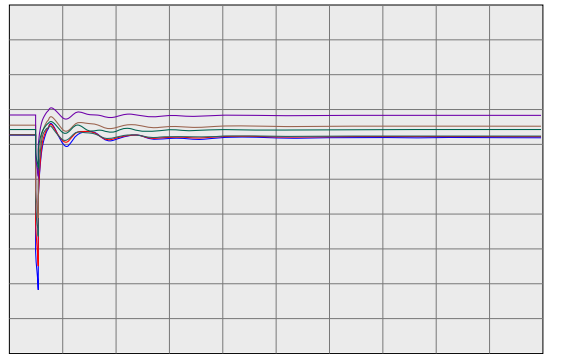


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

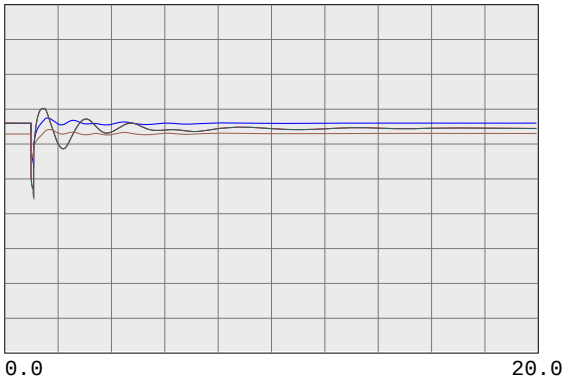
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



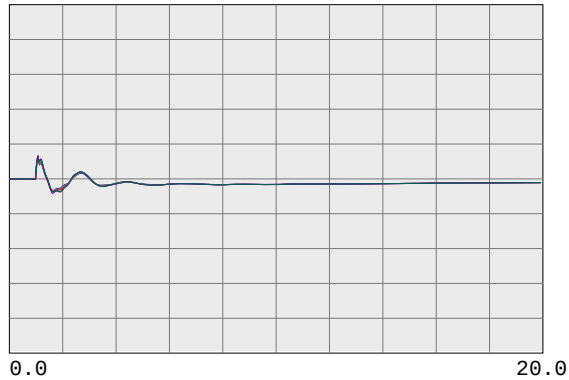
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



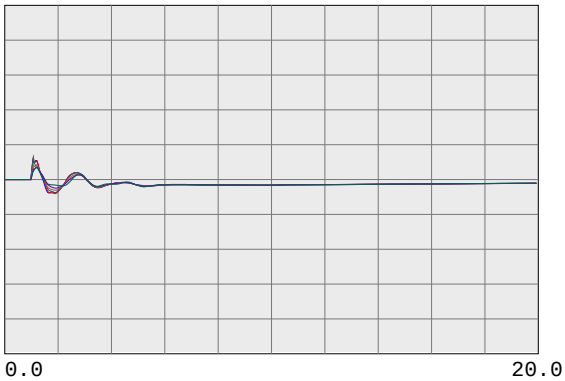
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



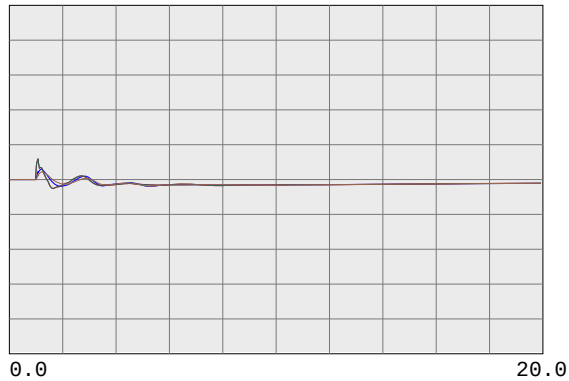
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



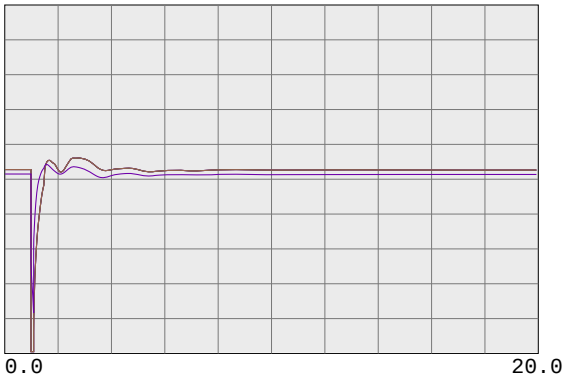
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

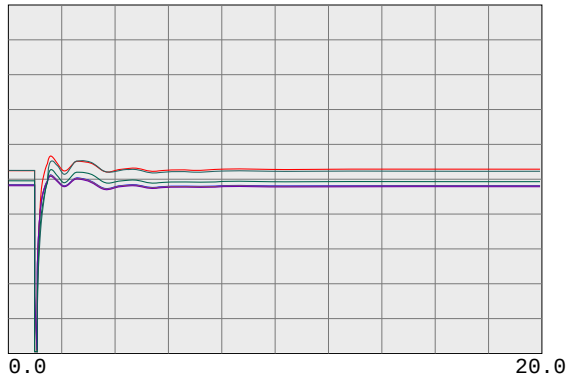
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

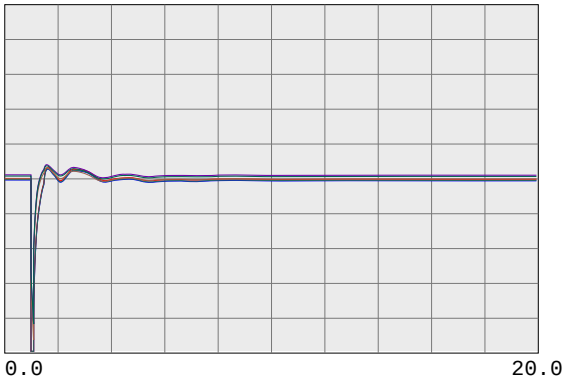
230-KV SYSTEM VOLTAGES



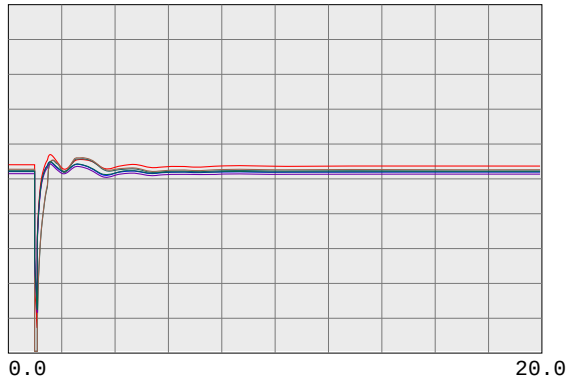
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



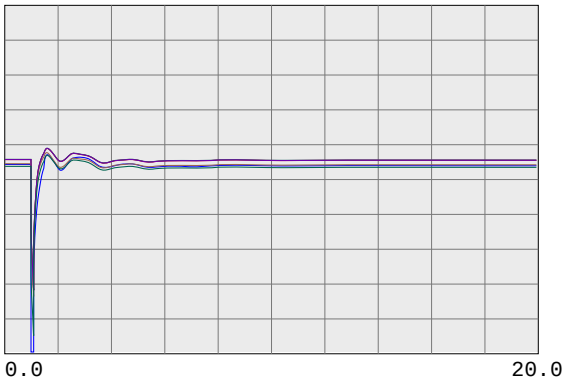
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



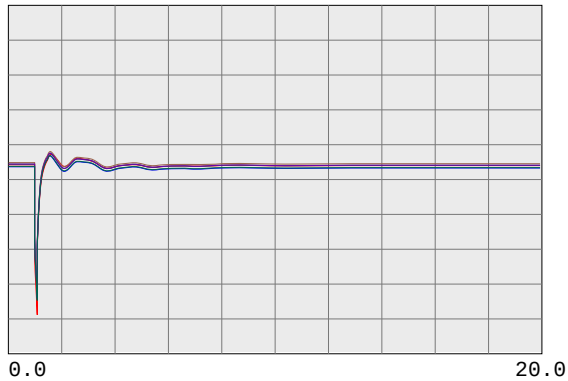
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



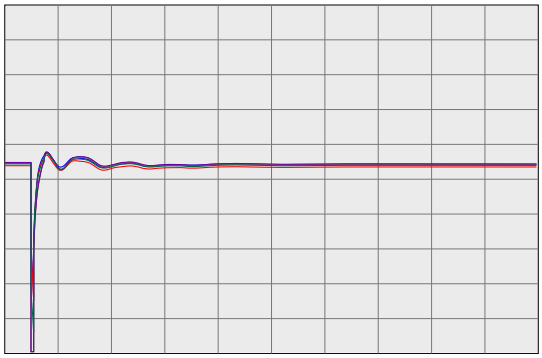
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

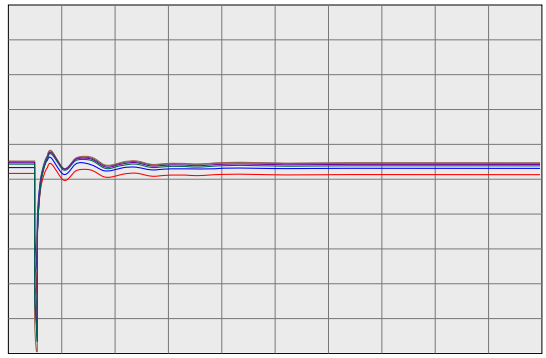
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

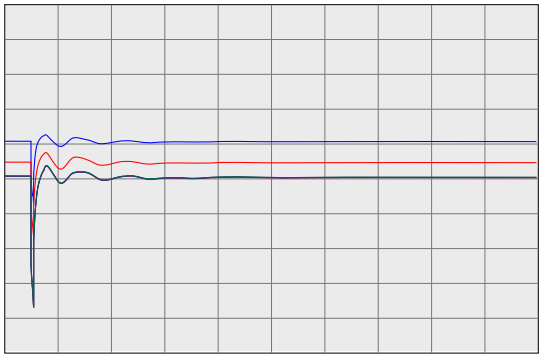
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

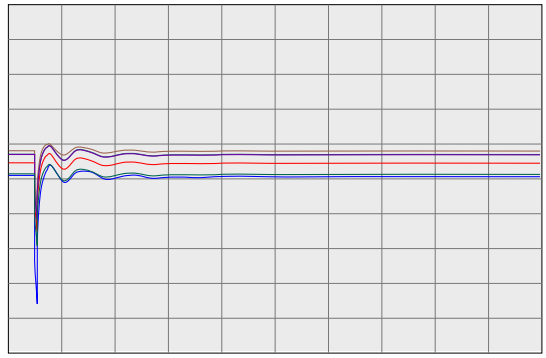
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

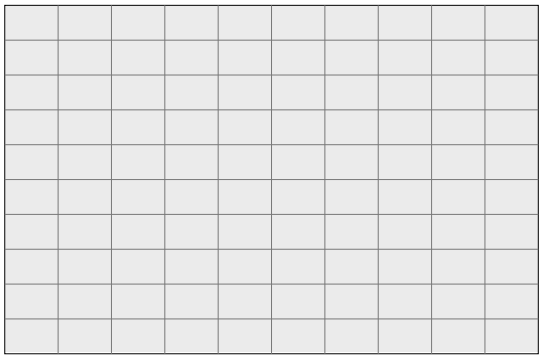
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

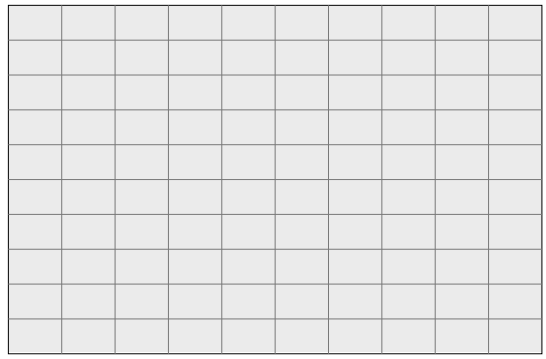


0.0 20.0

Time(sec)

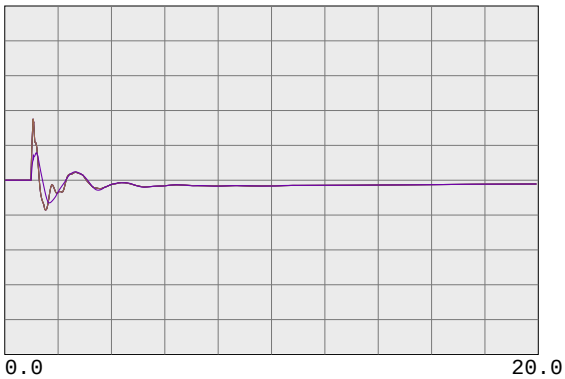
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



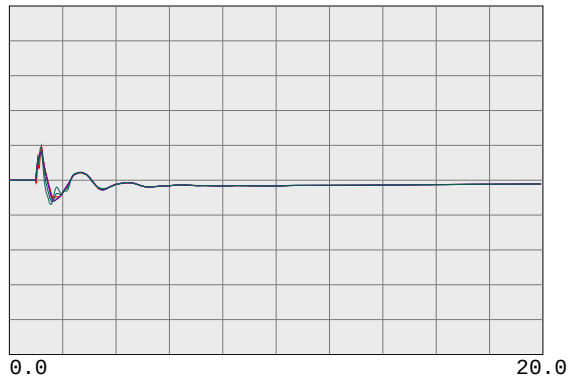


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

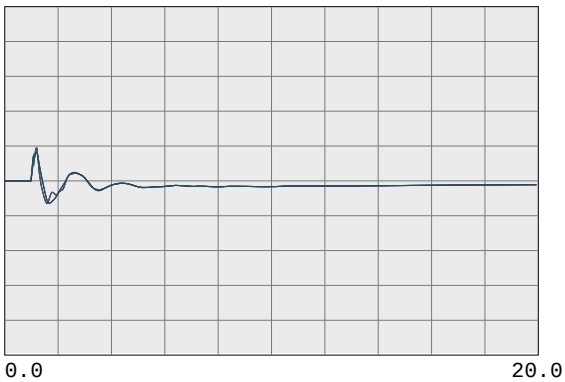
230-KV SYSTEM FREQUENCIES



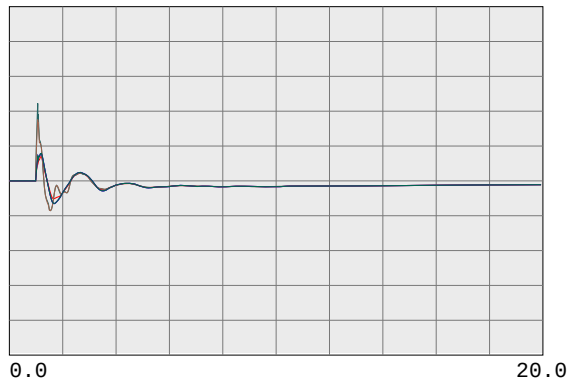
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



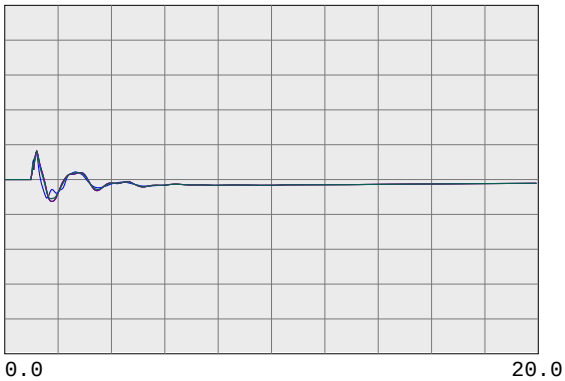
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



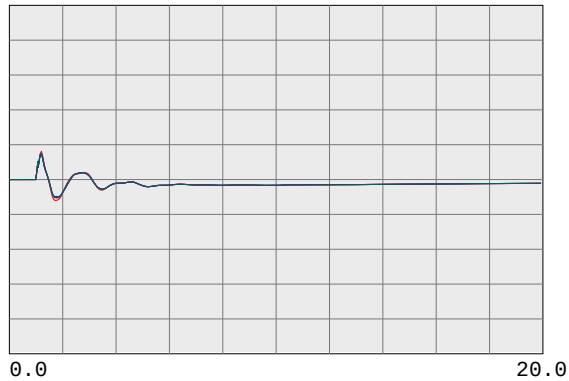
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



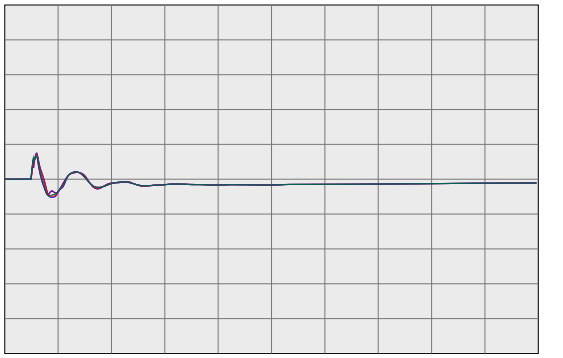
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



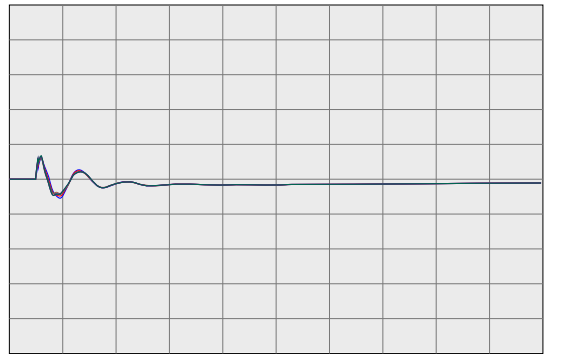
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

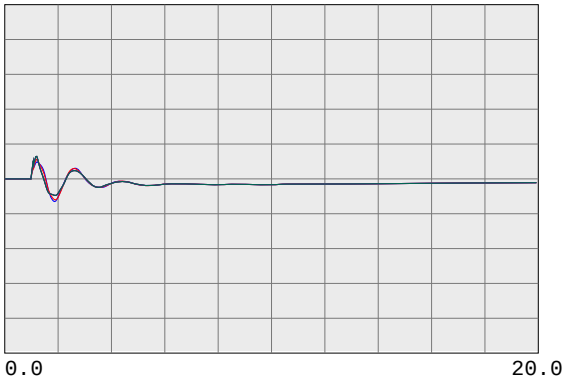
230-KV SYSTEM FREQUENCIES



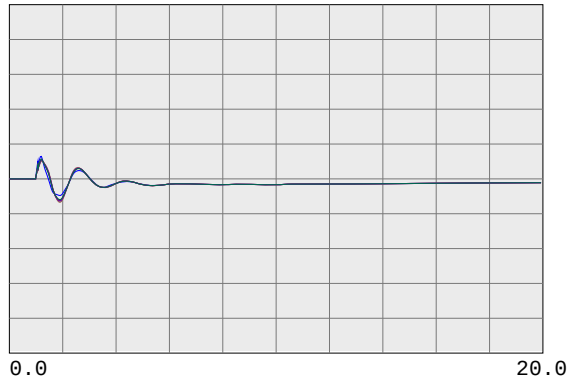
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



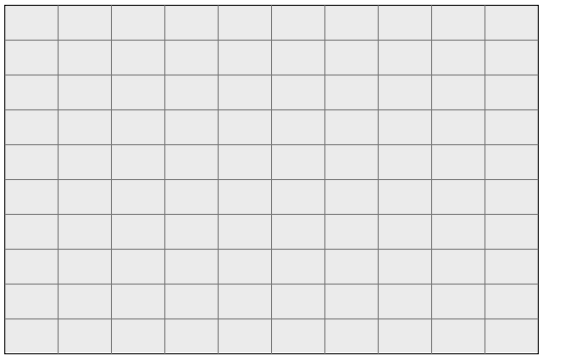
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

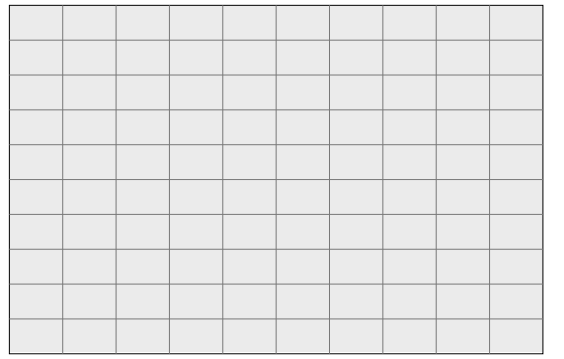


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



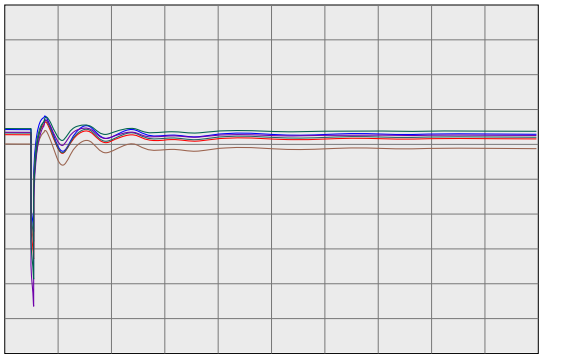
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



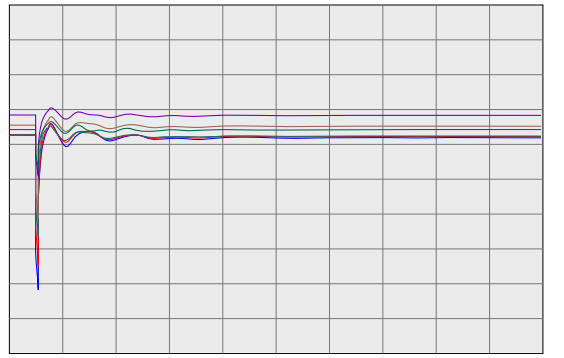


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

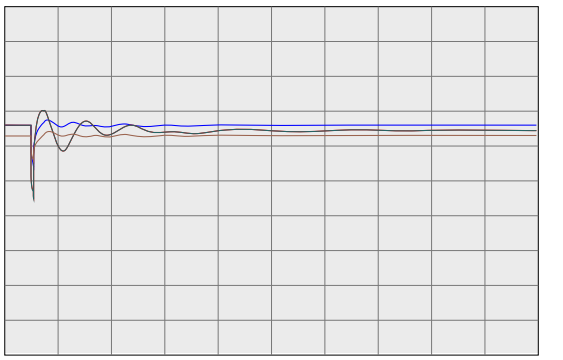
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



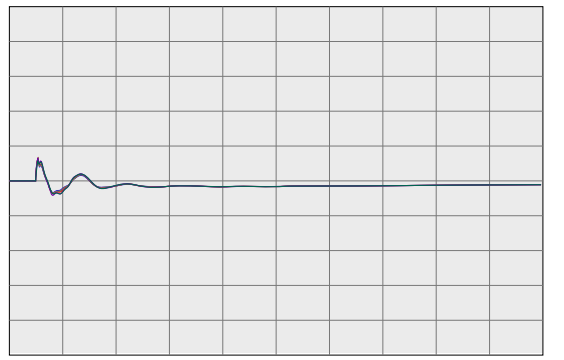
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



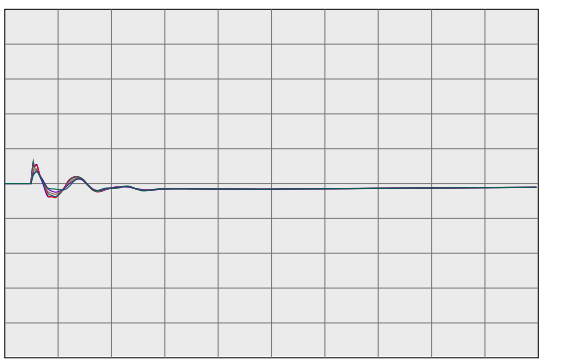
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



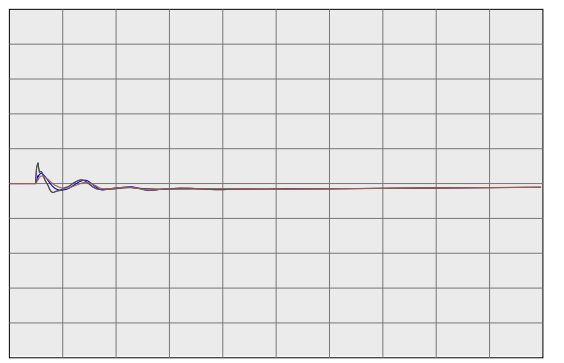
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



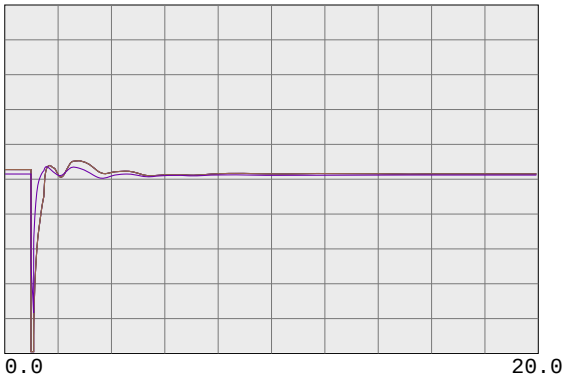
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

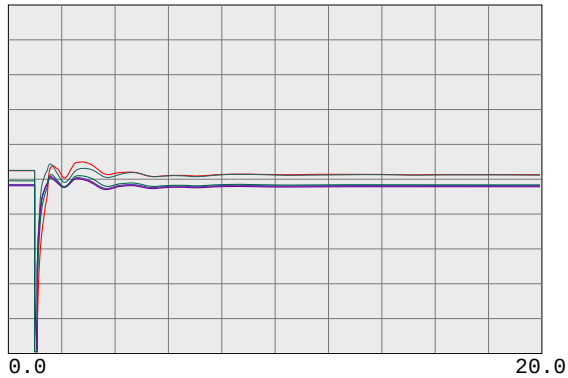
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

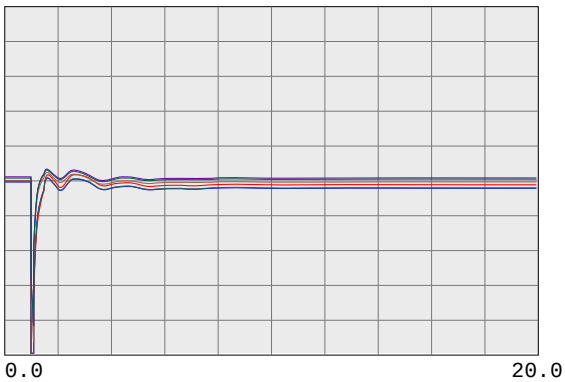
230-KV SYSTEM VOLTAGES



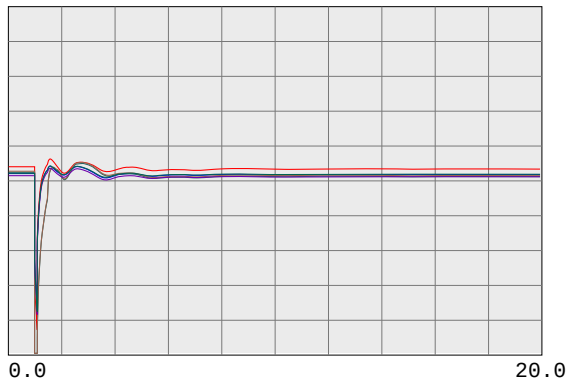
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



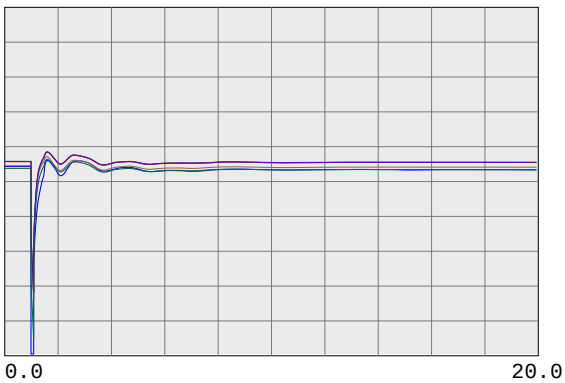
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



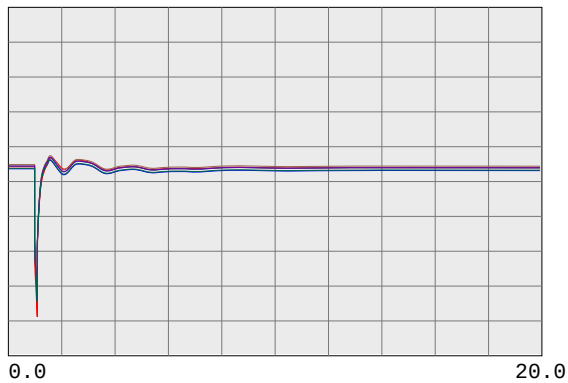
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



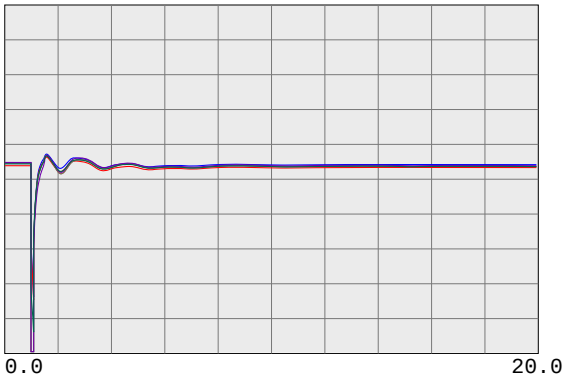
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



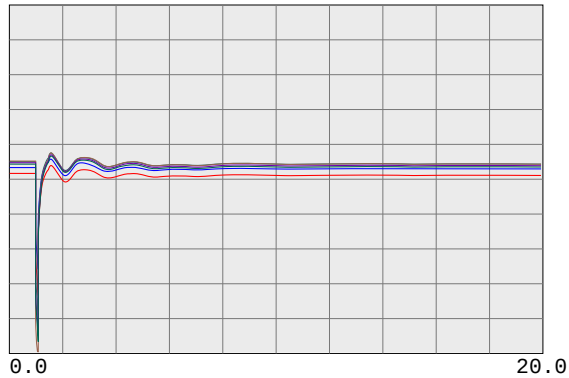
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

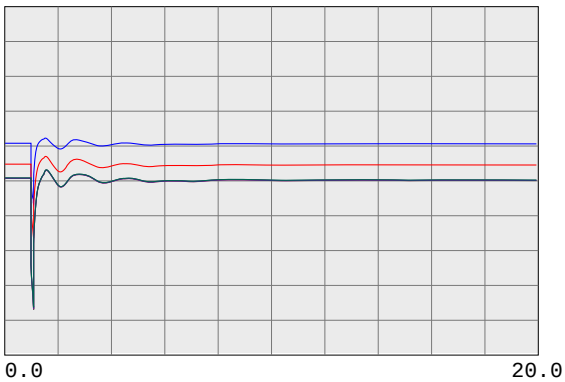
230-KV SYSTEM VOLTAGES



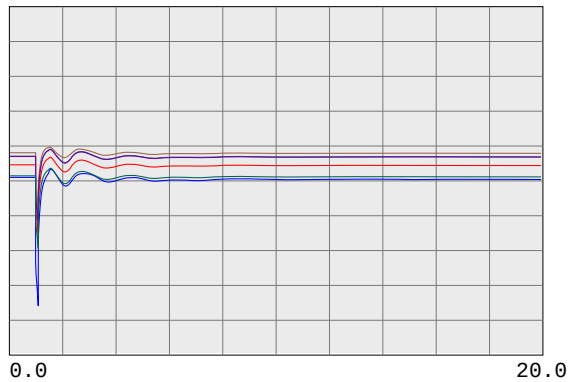
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



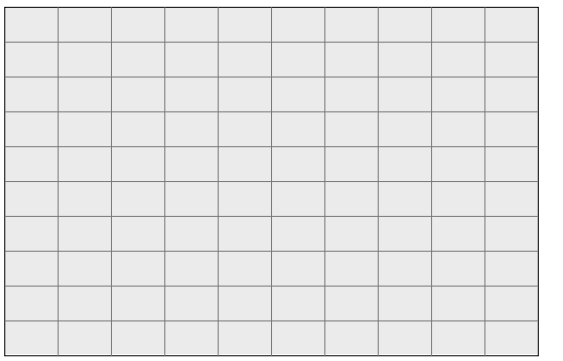
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

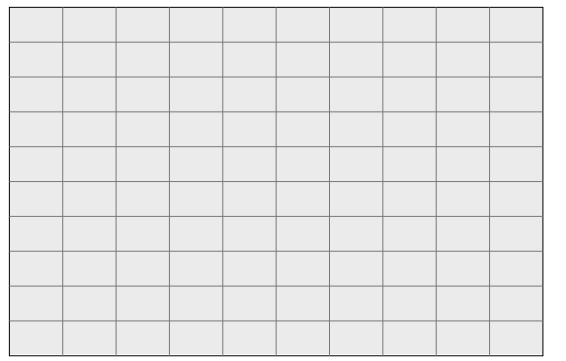


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



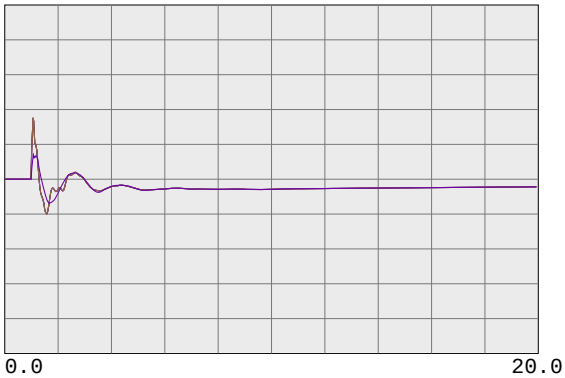
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



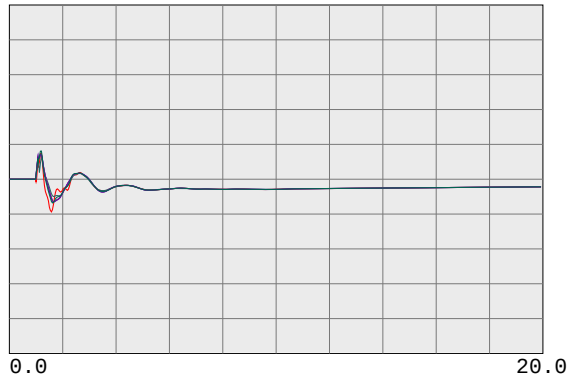


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

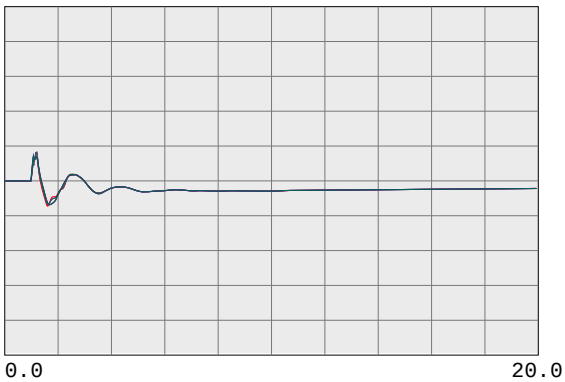
230-KV SYSTEM FREQUENCIES



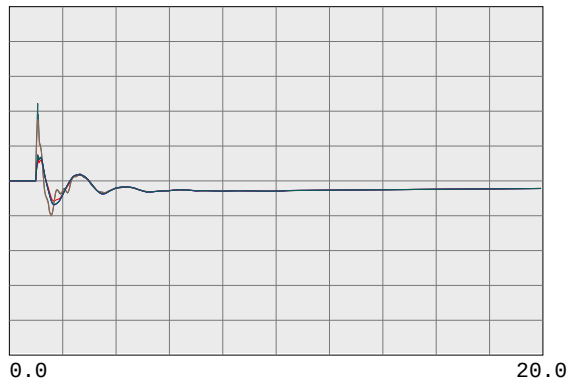
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



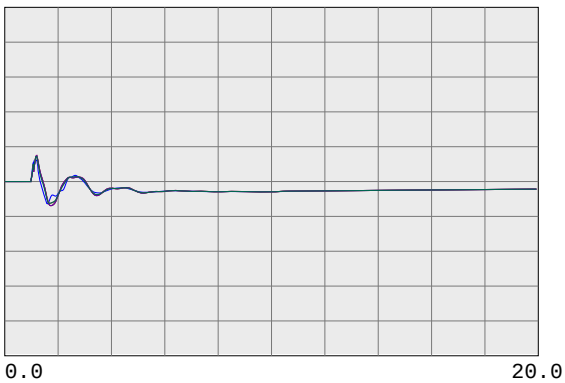
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



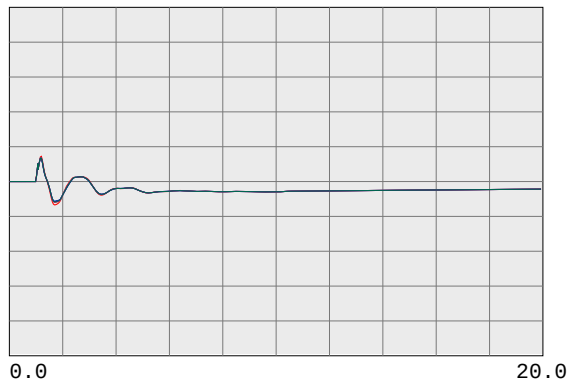
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



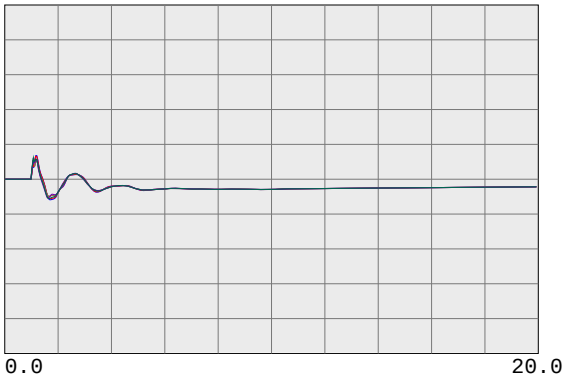
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



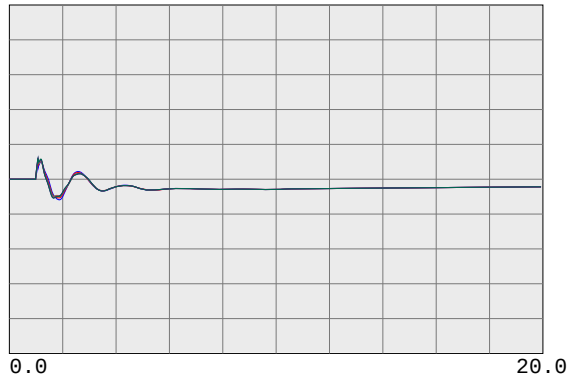
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

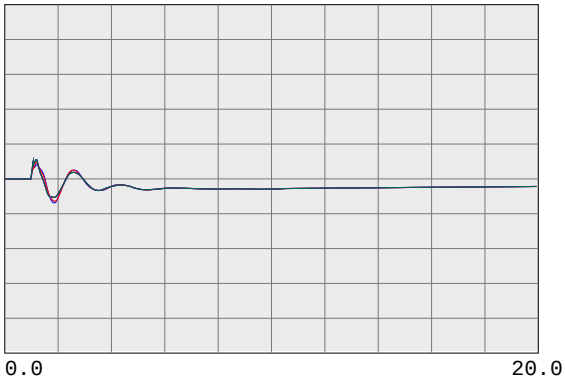
230-KV SYSTEM FREQUENCIES



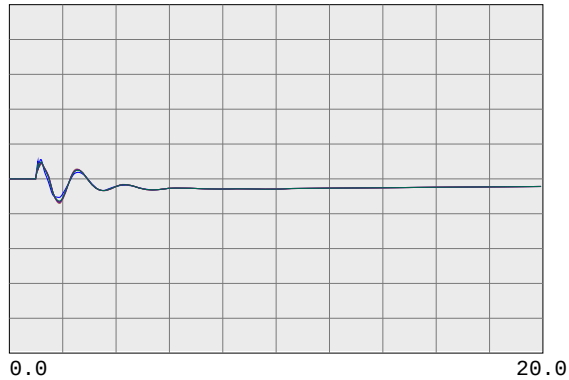
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



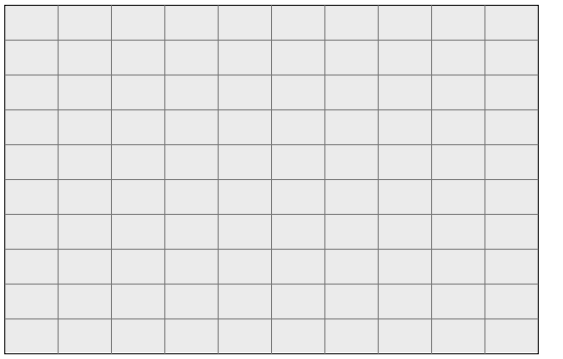
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

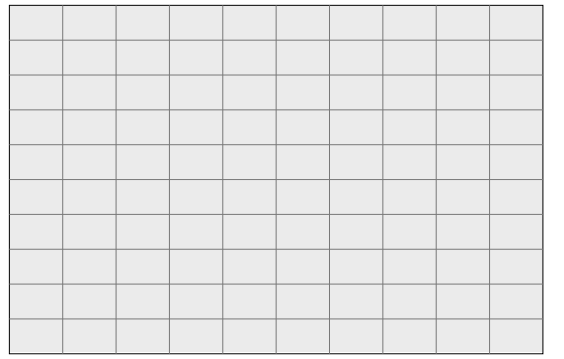


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



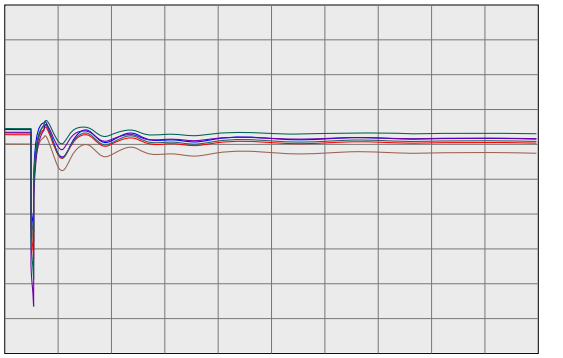
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



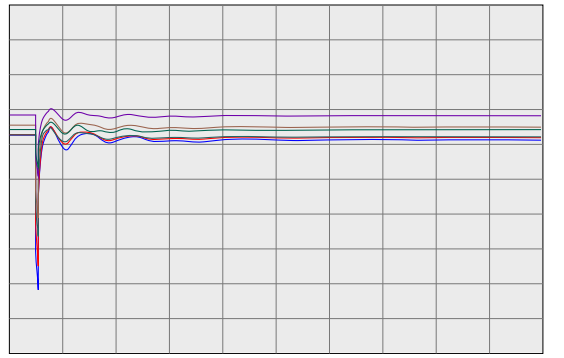


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

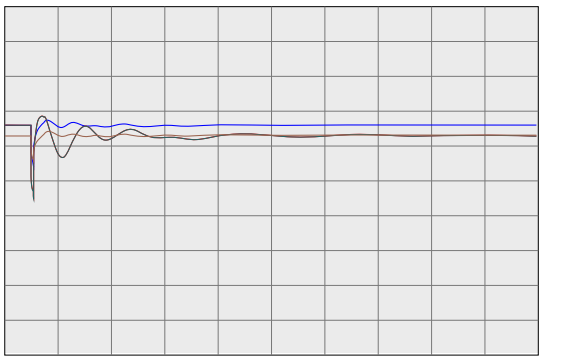
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



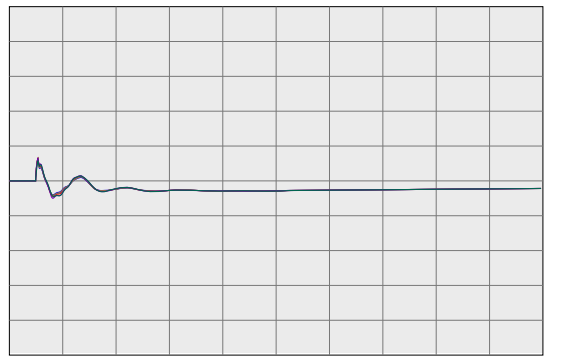
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



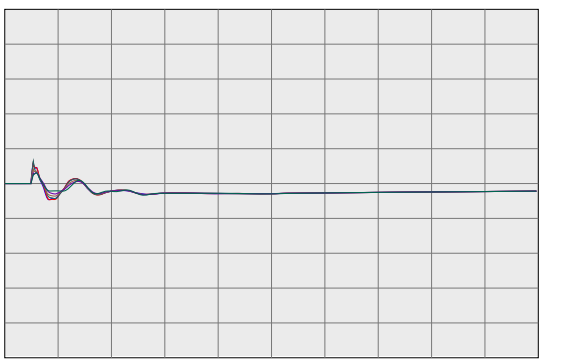
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



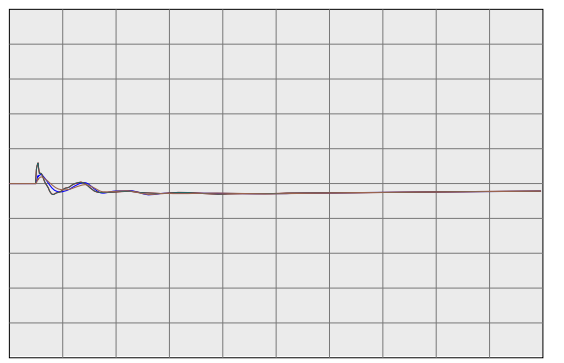
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



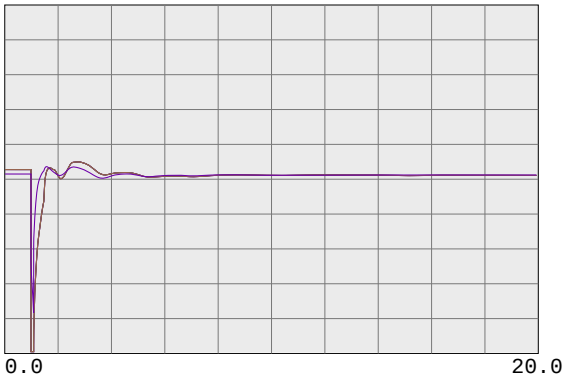
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

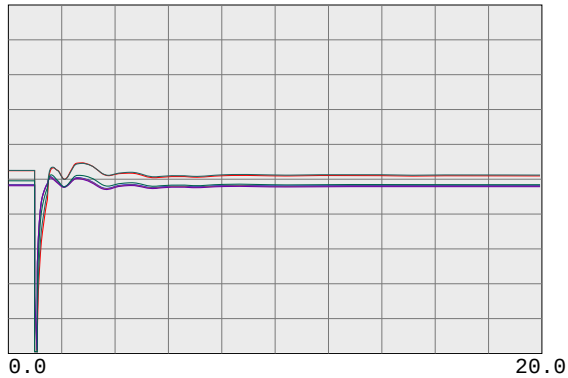
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

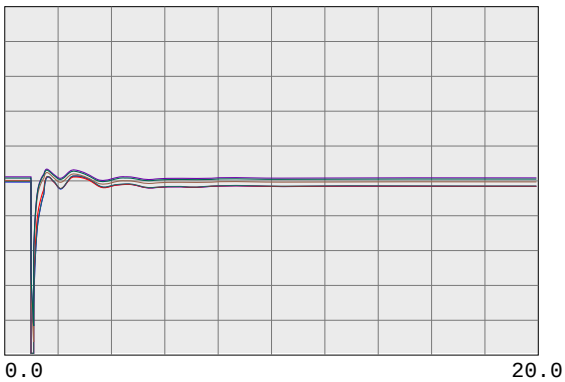
230-KV SYSTEM VOLTAGES



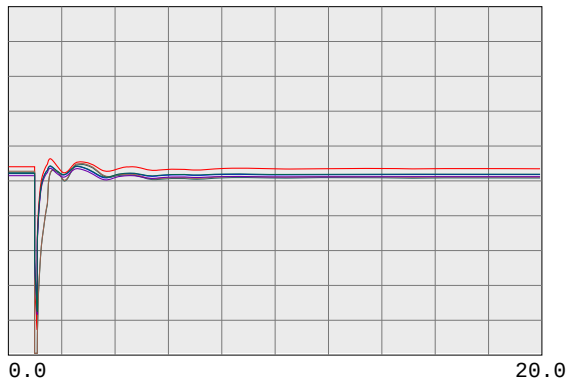
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



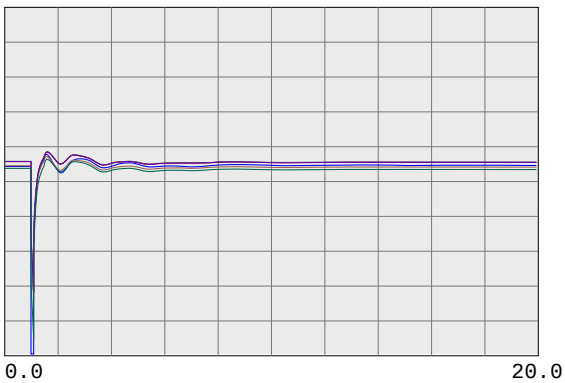
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



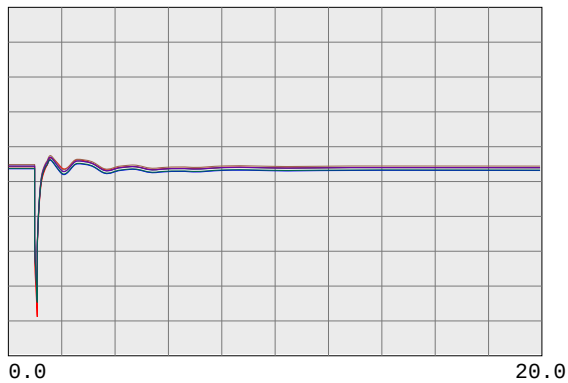
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



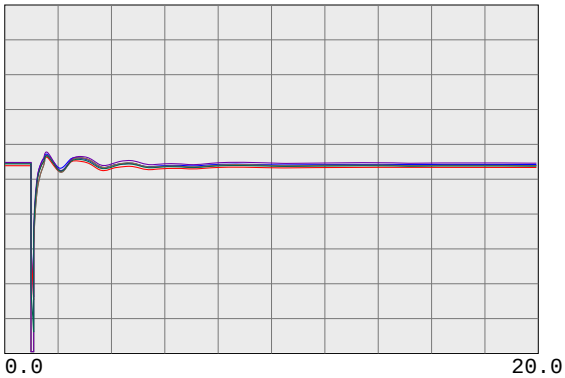
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



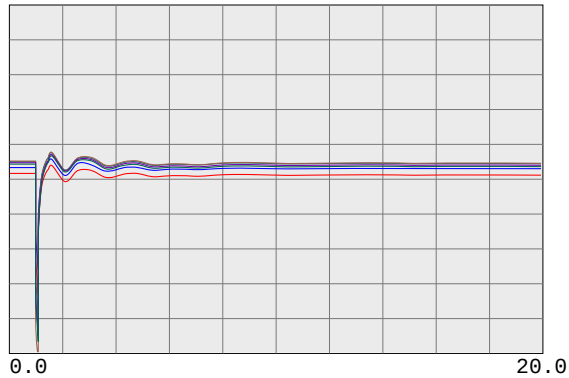
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

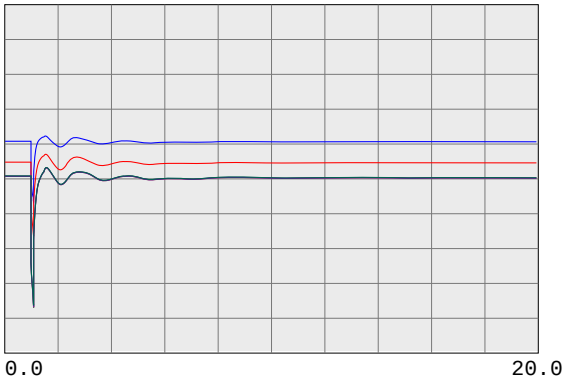
230-KV SYSTEM VOLTAGES



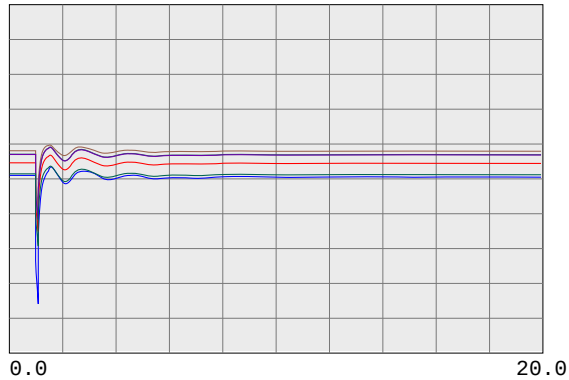
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



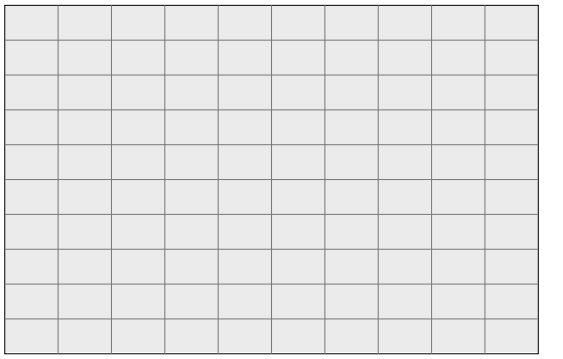
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

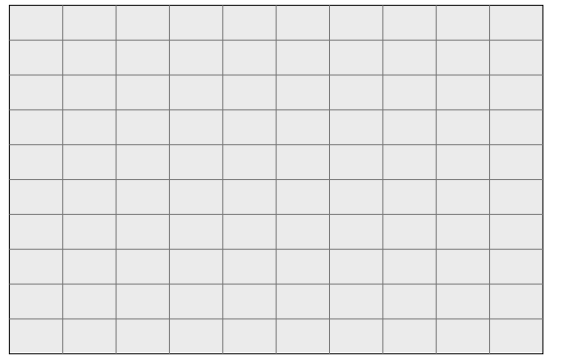


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



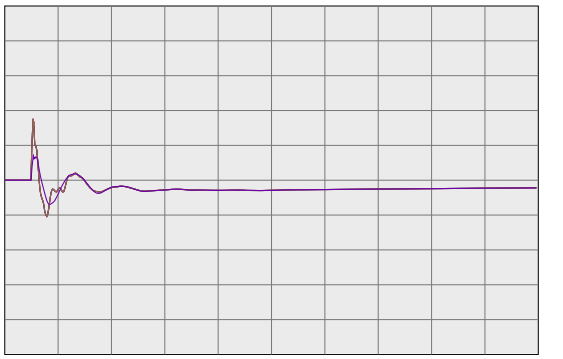
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



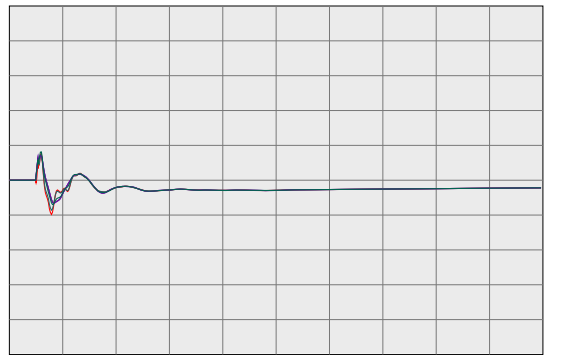


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

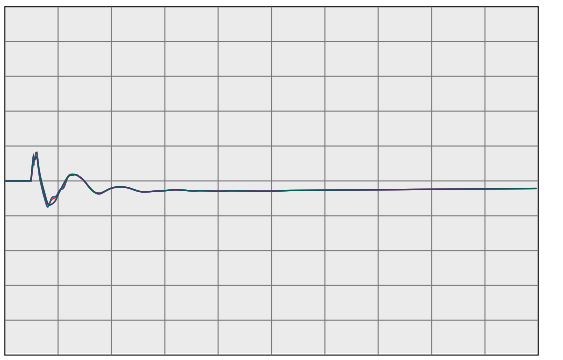
230-KV SYSTEM FREQUENCIES



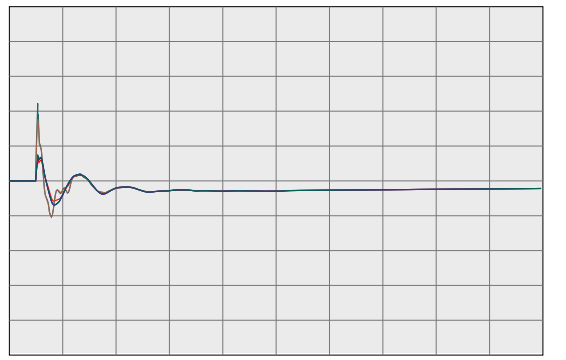
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



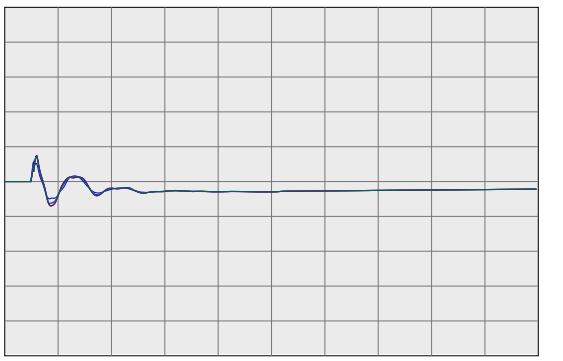
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



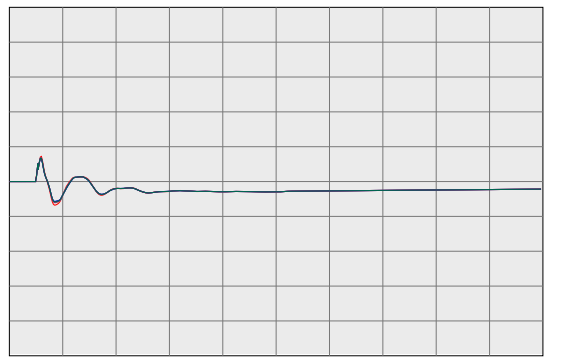
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



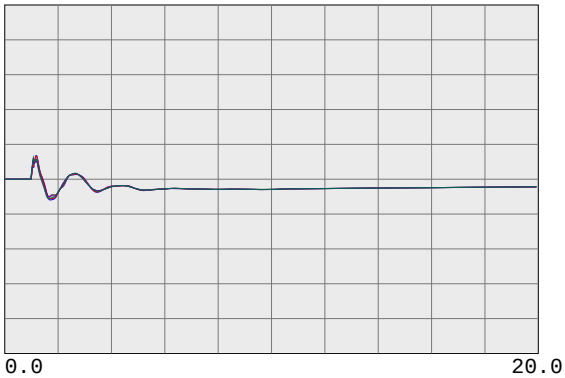
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



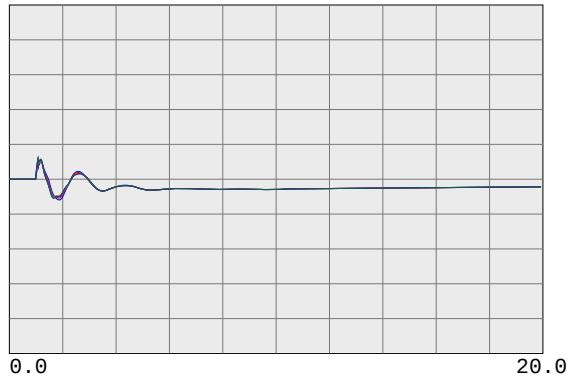
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

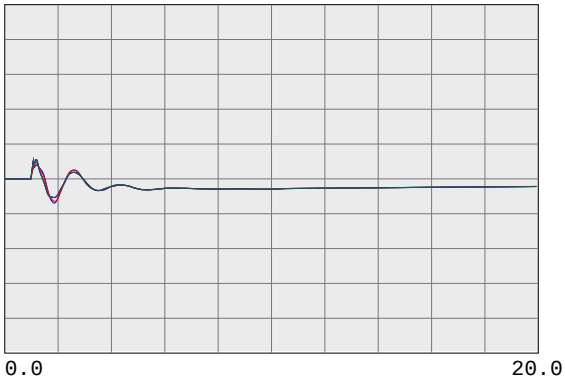
230-KV SYSTEM FREQUENCIES



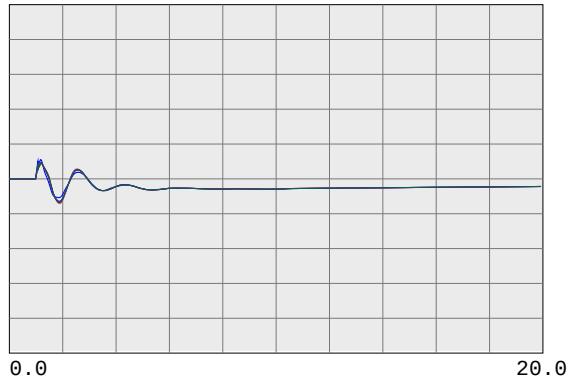
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



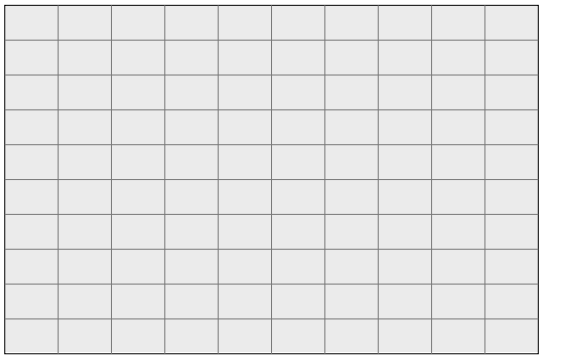
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

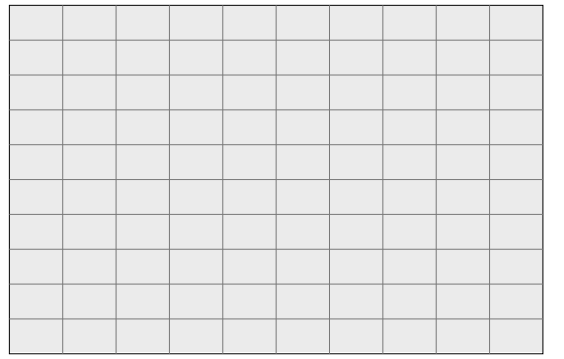


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



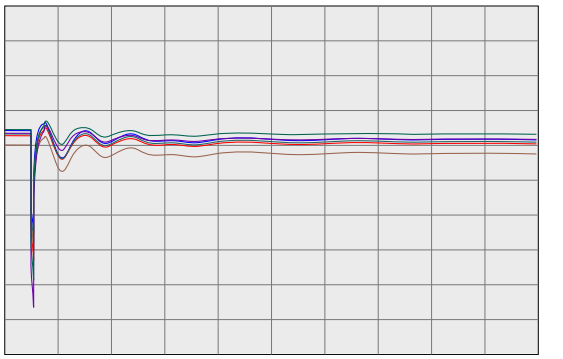
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



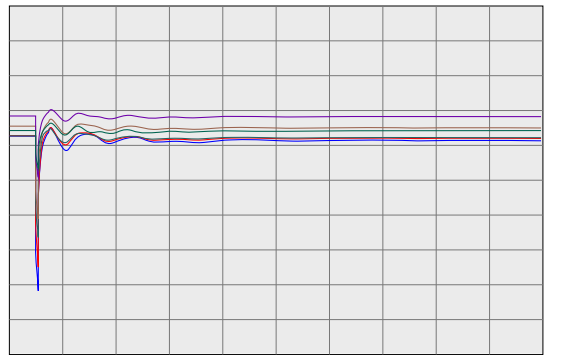


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

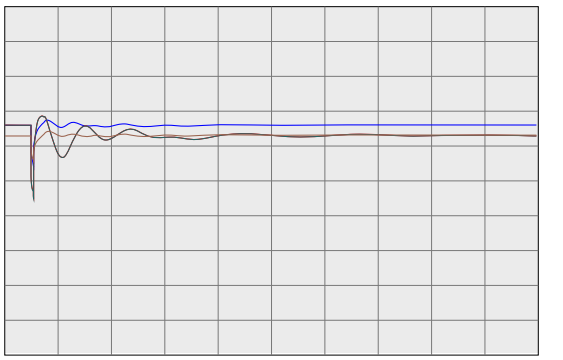
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



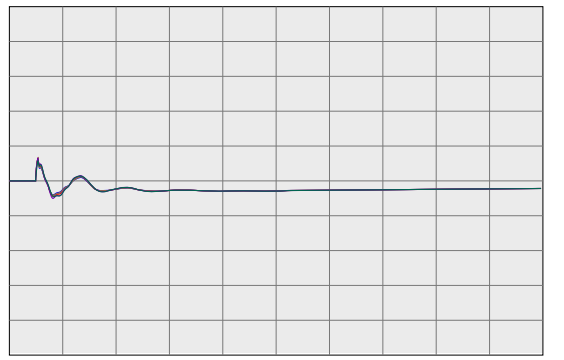
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



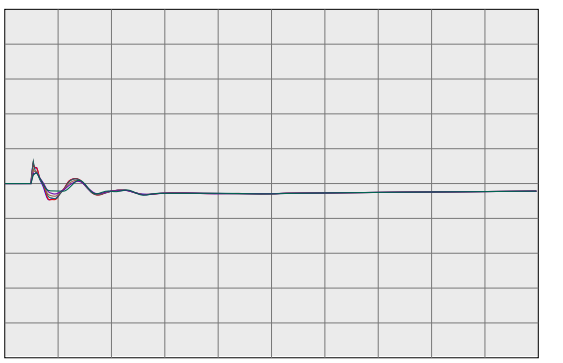
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



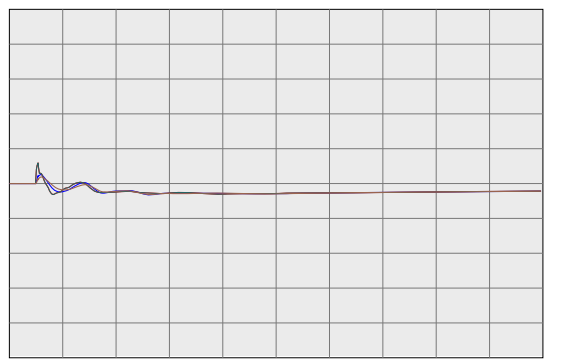
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



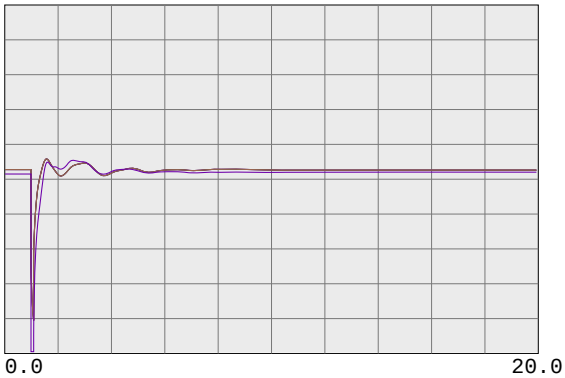
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

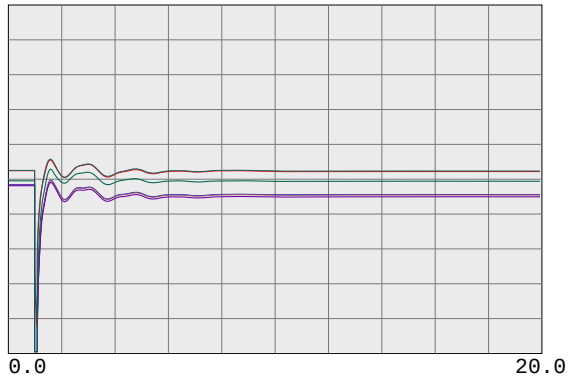
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

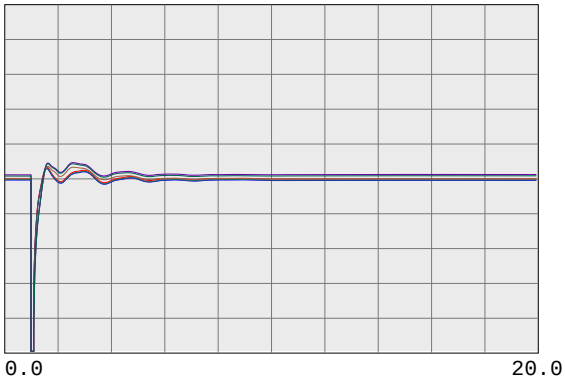
230-KV SYSTEM VOLTAGES



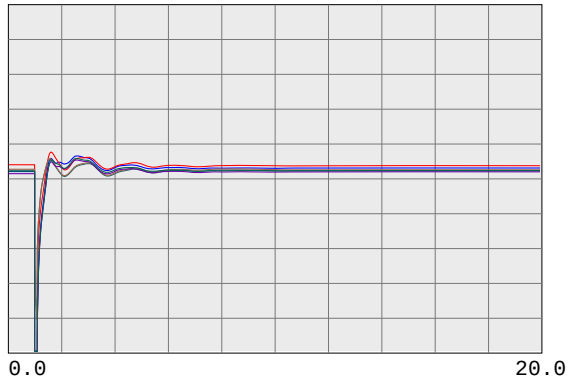
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



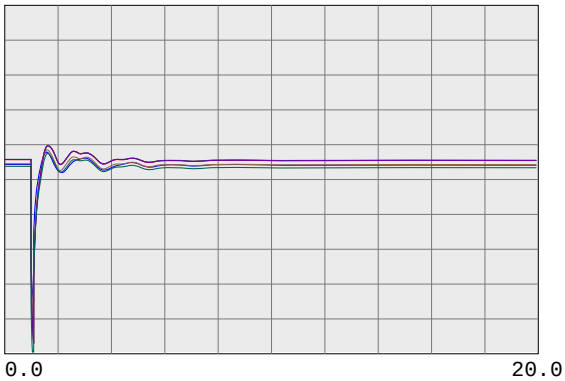
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



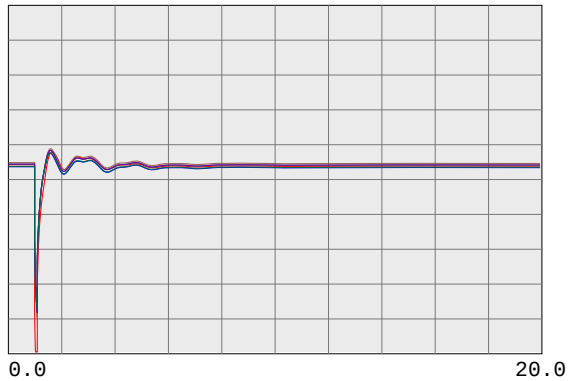
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



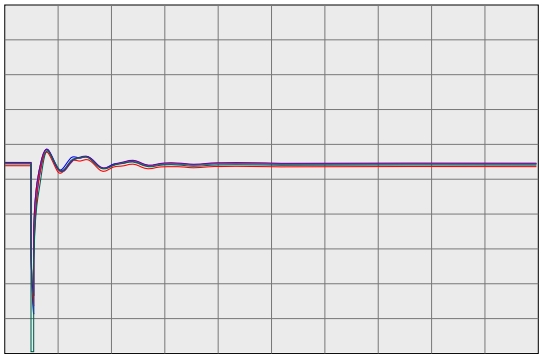
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

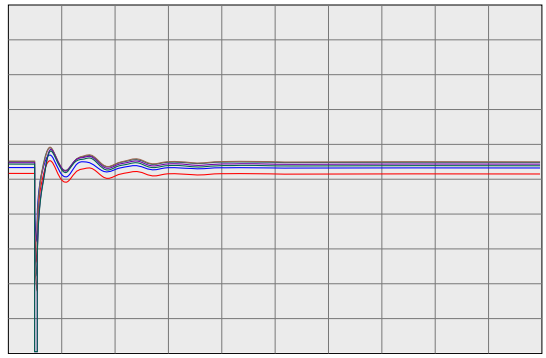
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

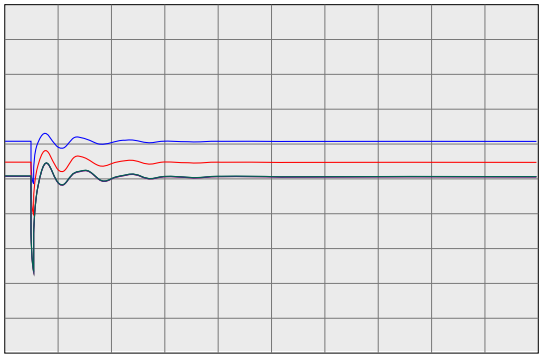
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

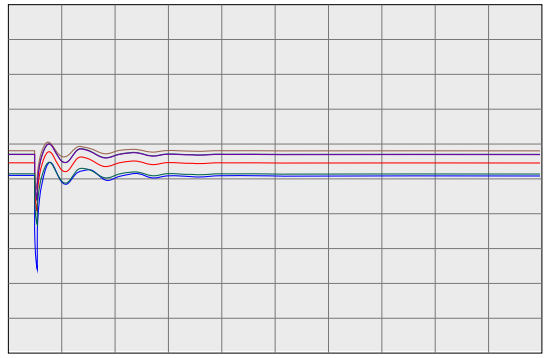
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

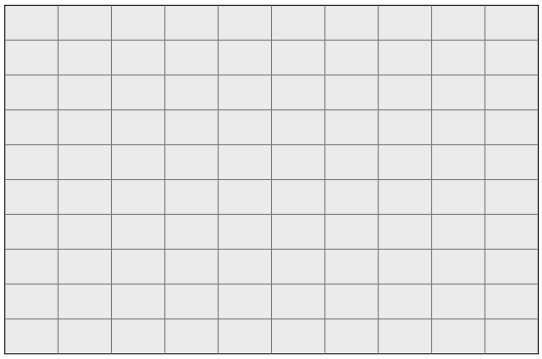
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

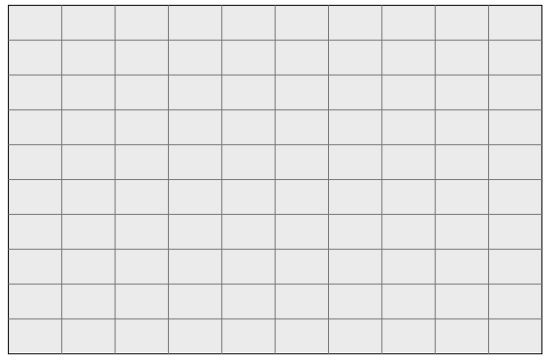


0.0 20.0

Time(sec)

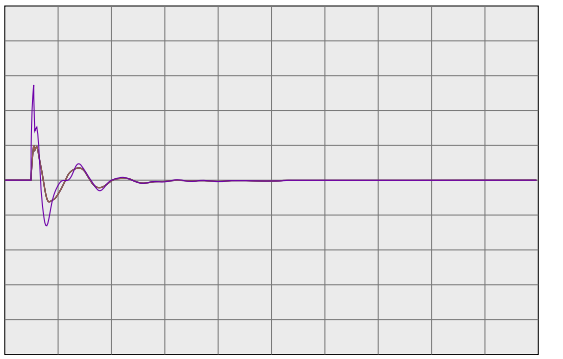
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



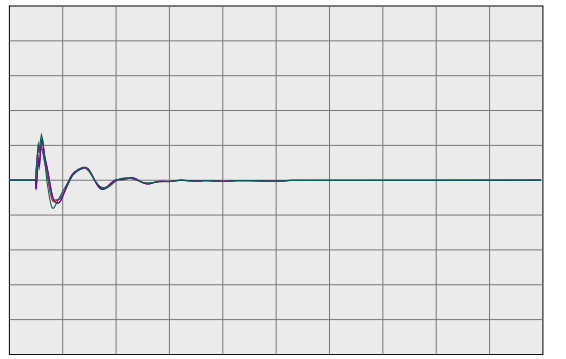


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

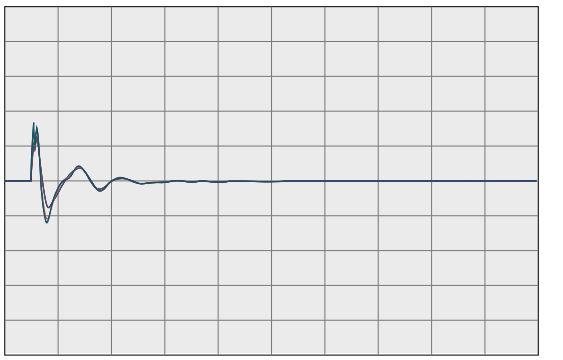
230-KV SYSTEM FREQUENCIES



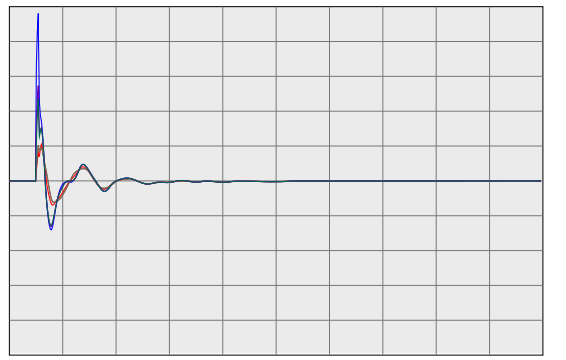
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



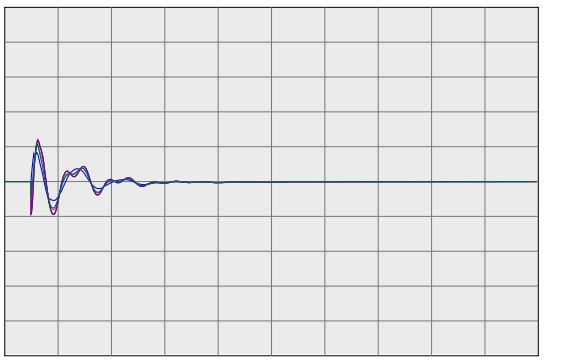
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



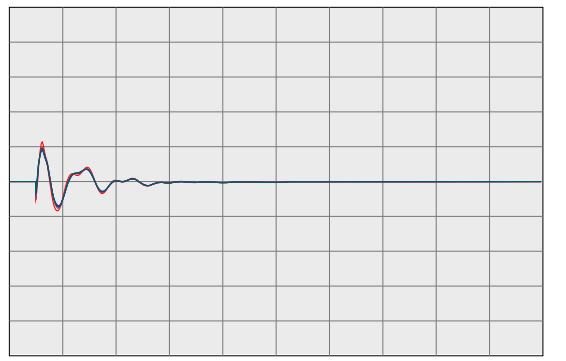
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



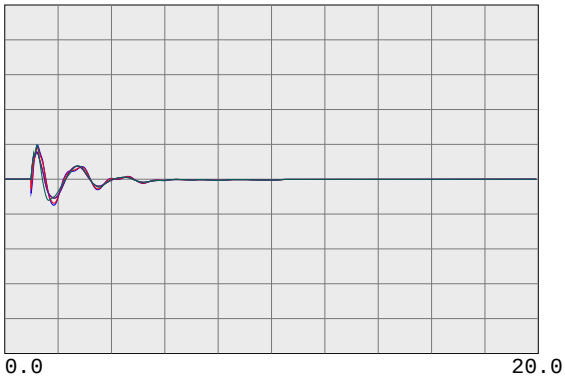
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



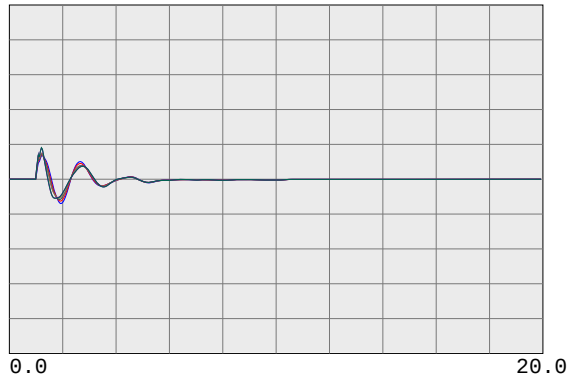
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

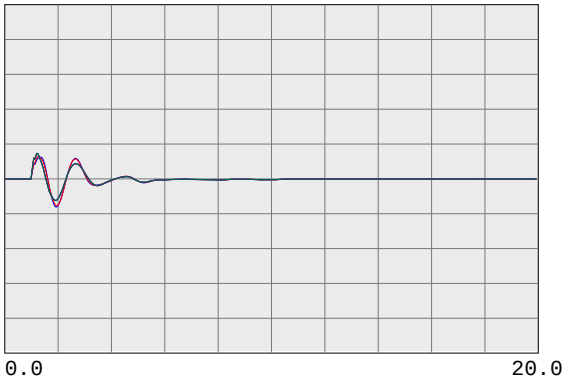
230-KV SYSTEM FREQUENCIES



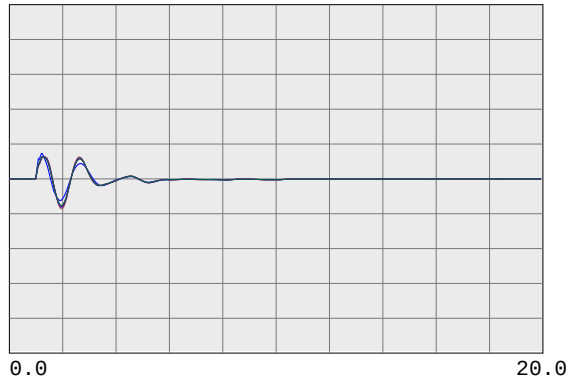
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



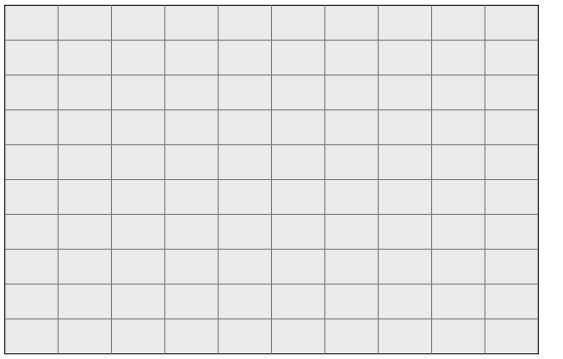
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

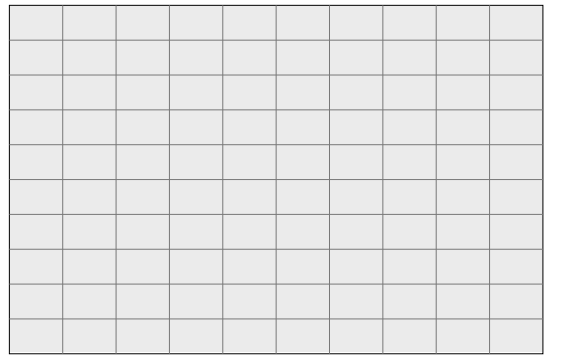


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



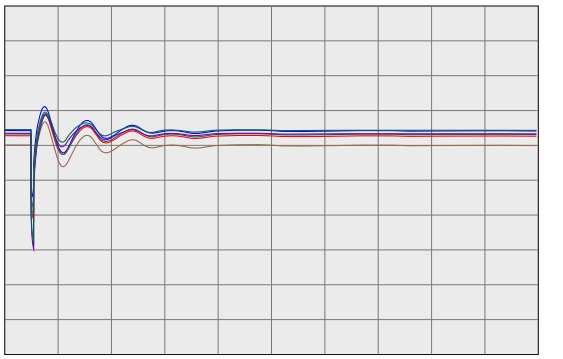
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



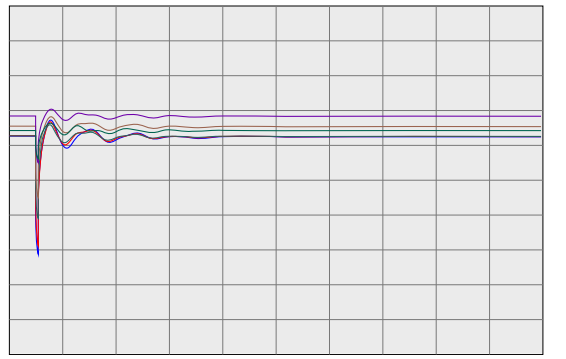


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

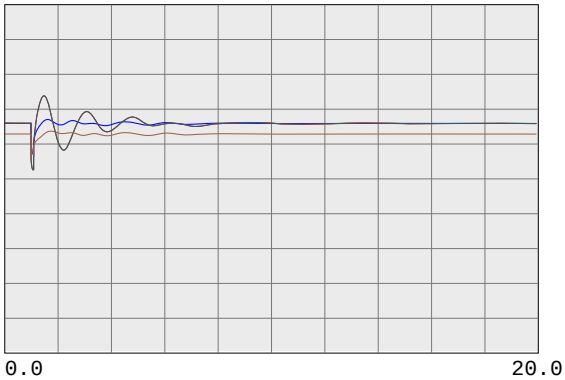
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



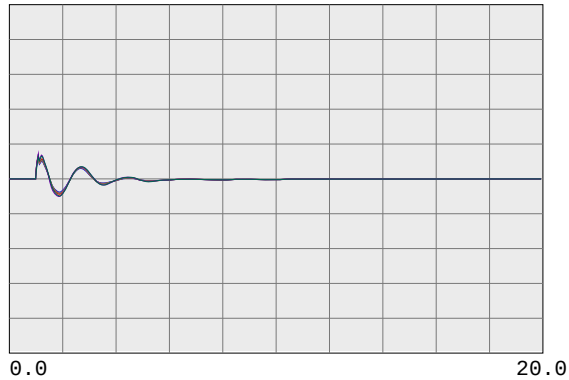
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



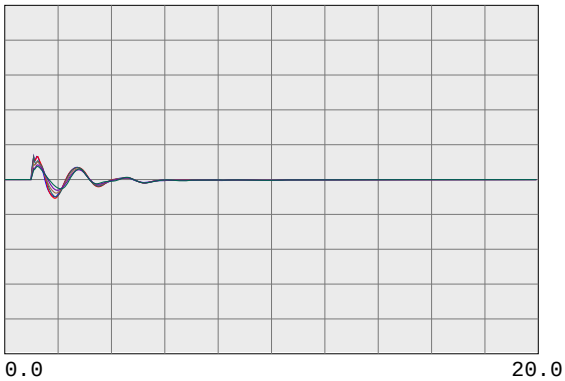
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



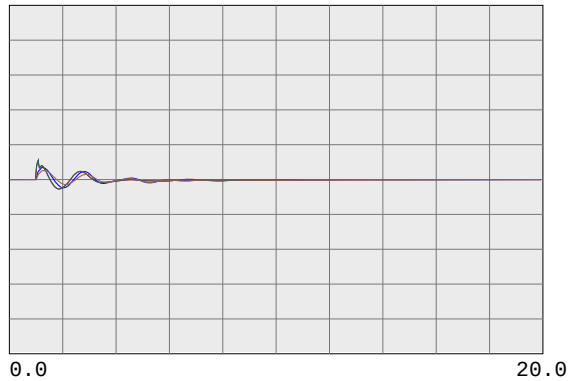
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



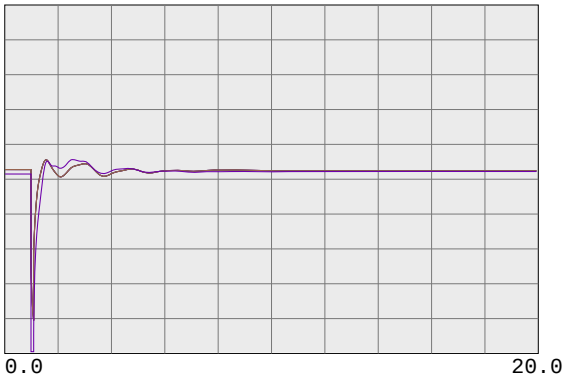
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

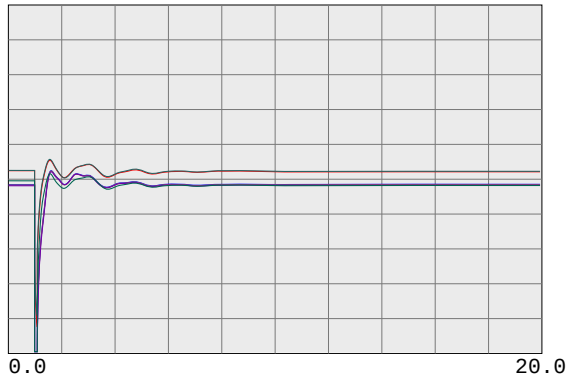
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

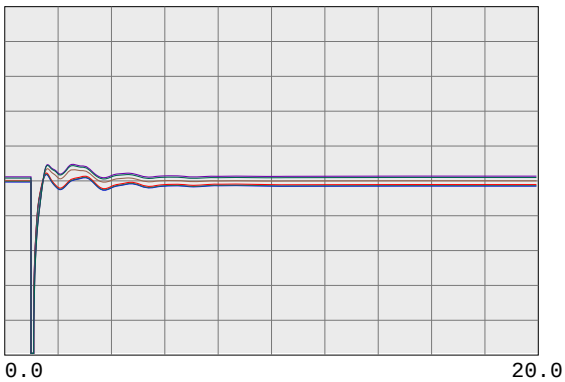
230-KV SYSTEM VOLTAGES



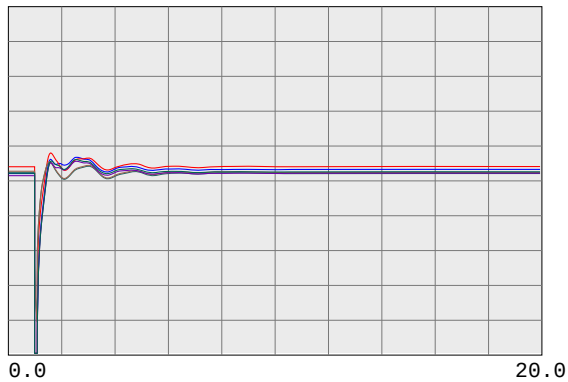
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



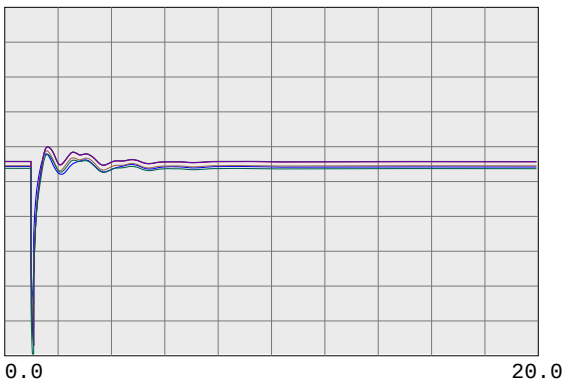
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



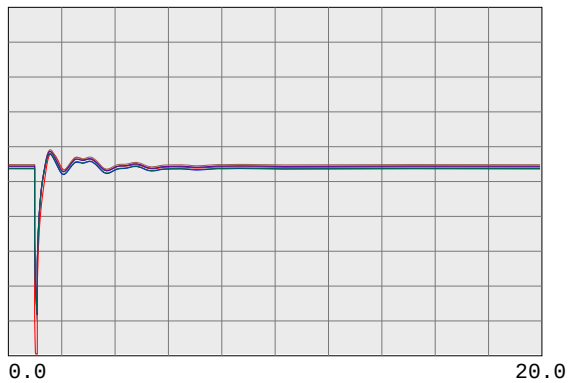
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



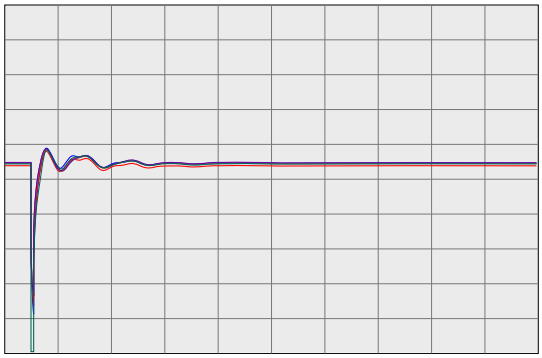
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

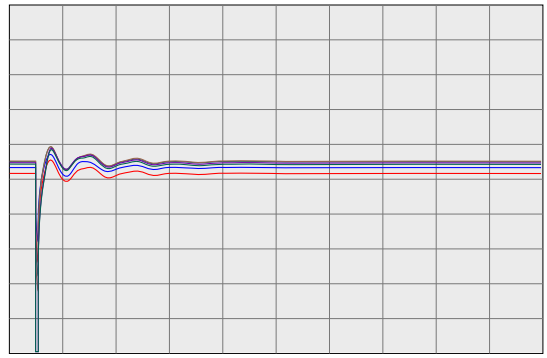
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

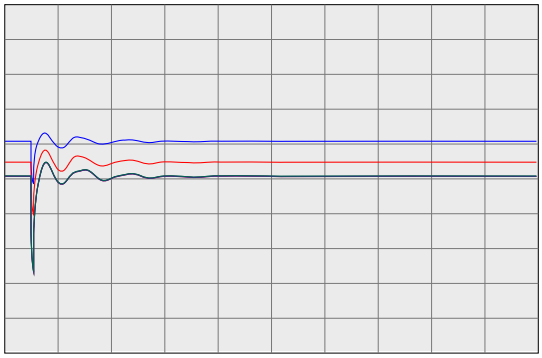
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

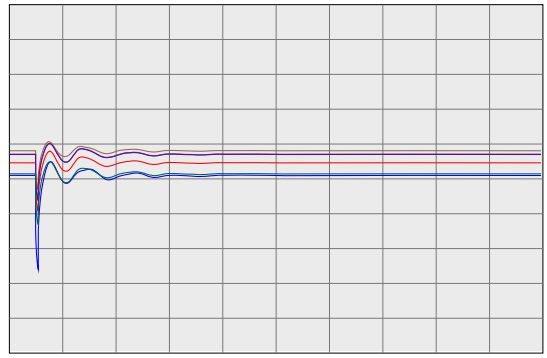
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

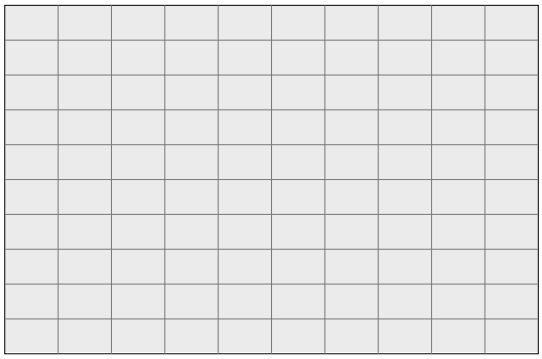
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

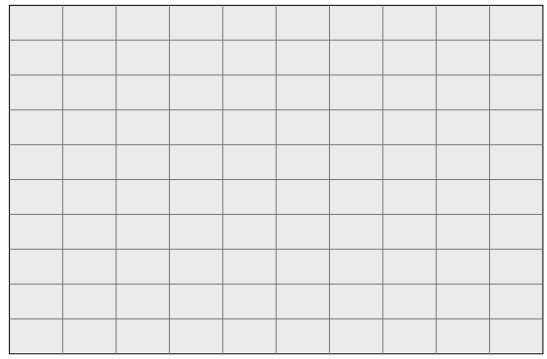


0.0 20.0

Time(sec)

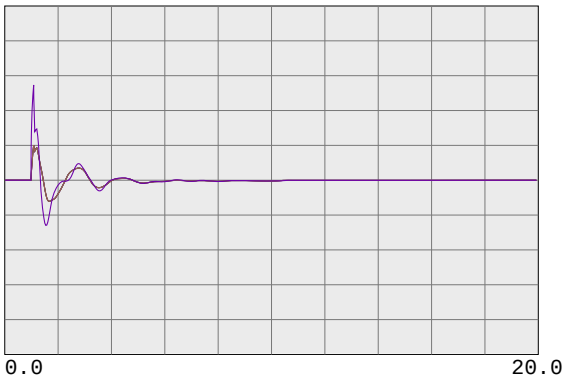
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



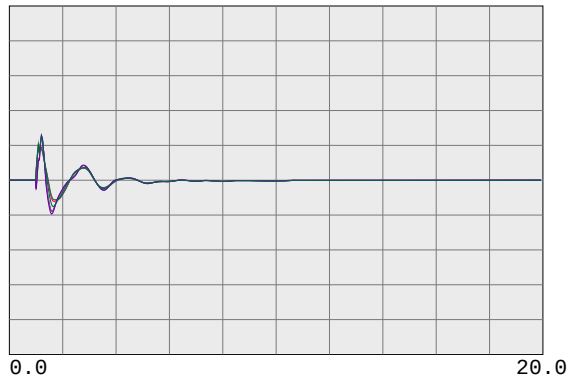


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

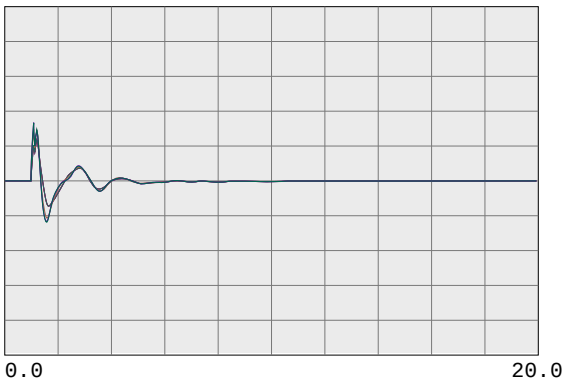
230-KV SYSTEM FREQUENCIES



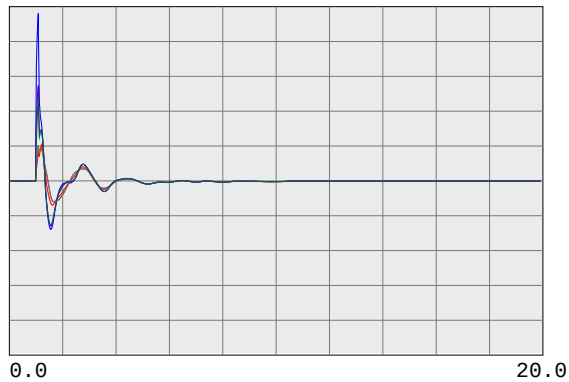
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



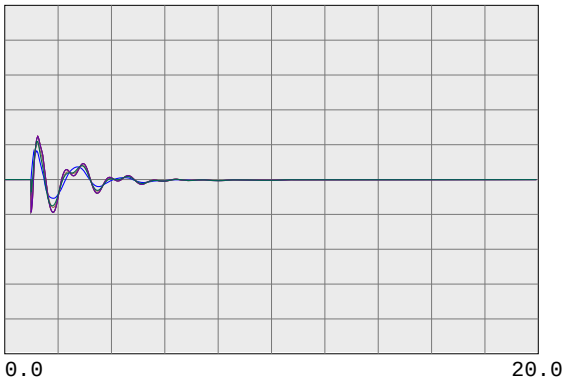
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



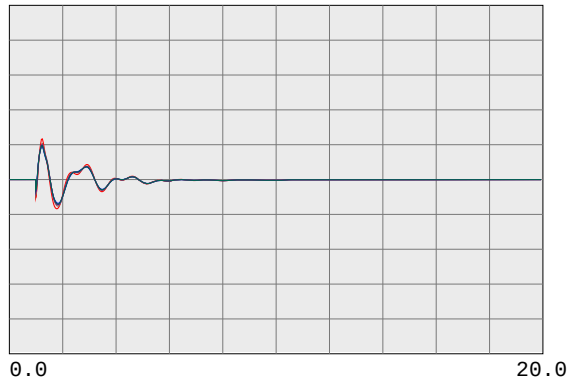
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



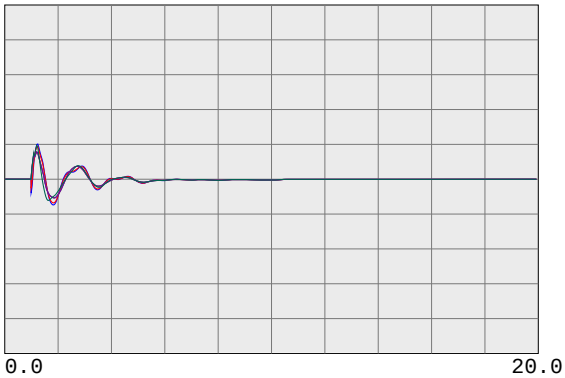
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



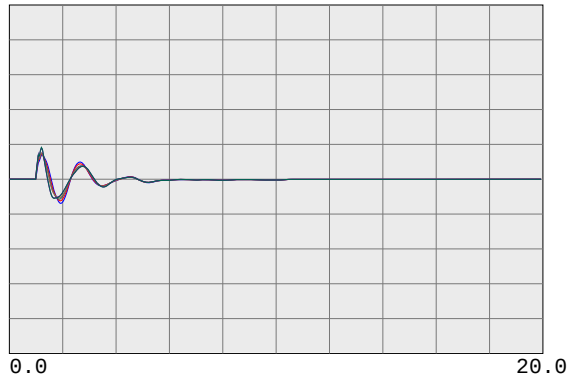
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

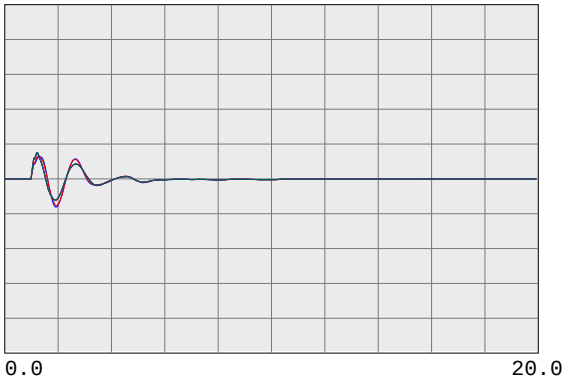
230-KV SYSTEM FREQUENCIES



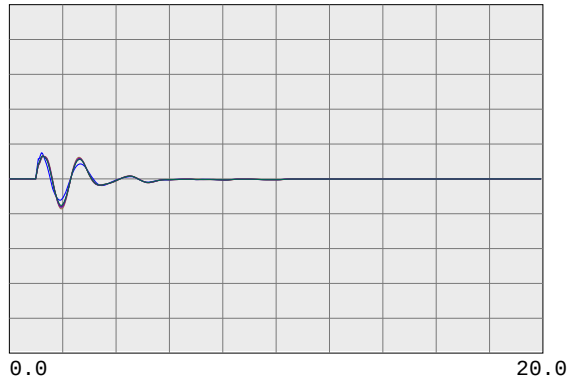
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



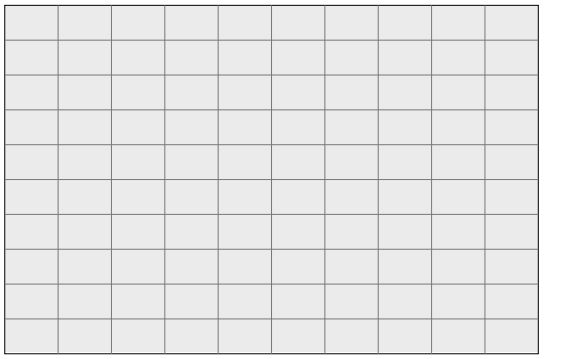
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

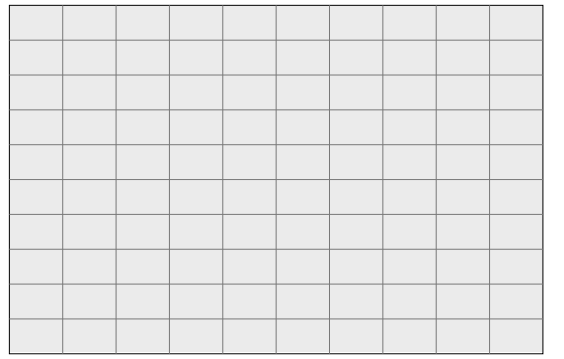


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



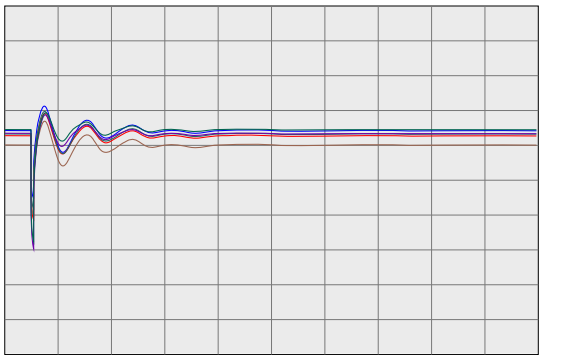
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



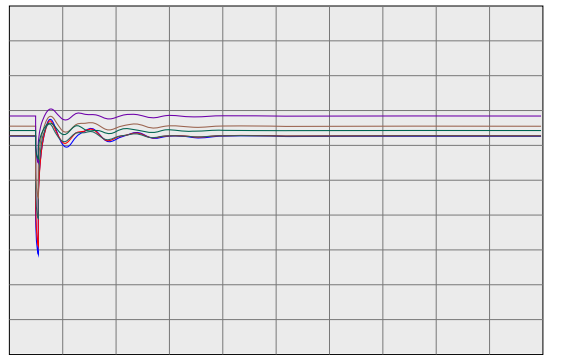


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

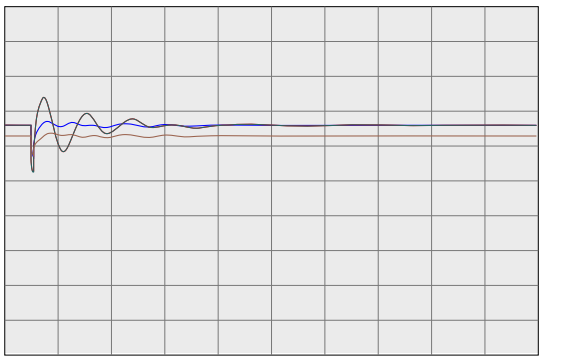
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



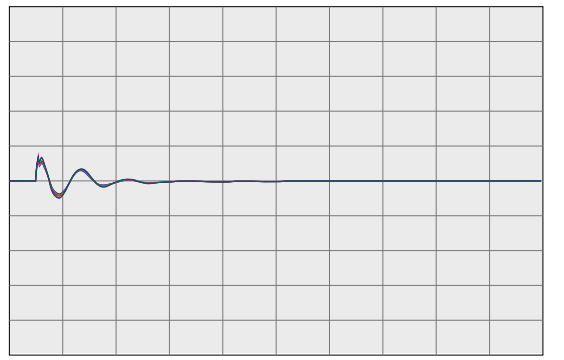
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



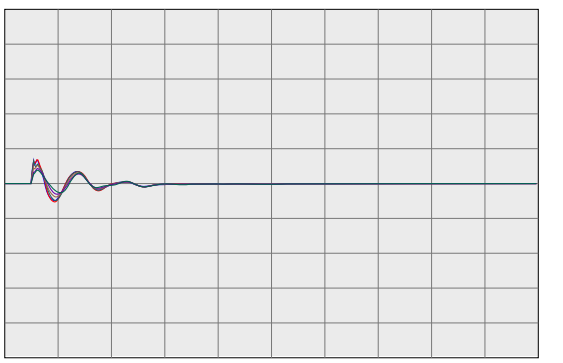
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



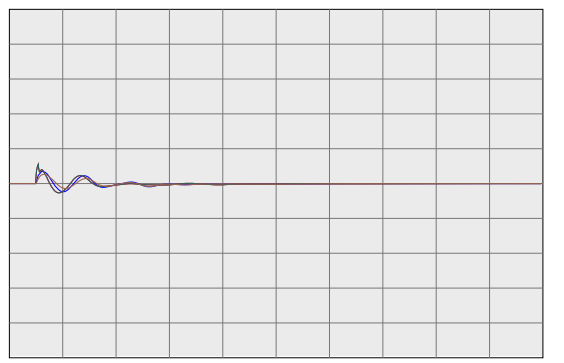
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



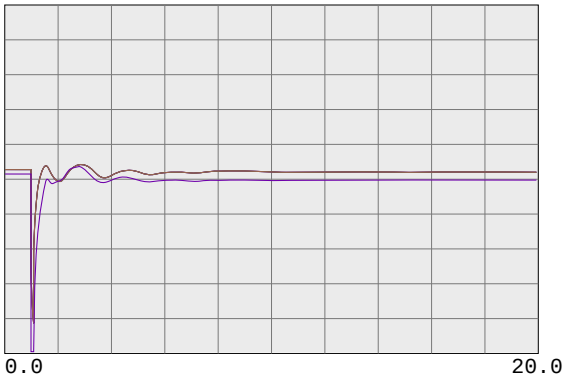
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

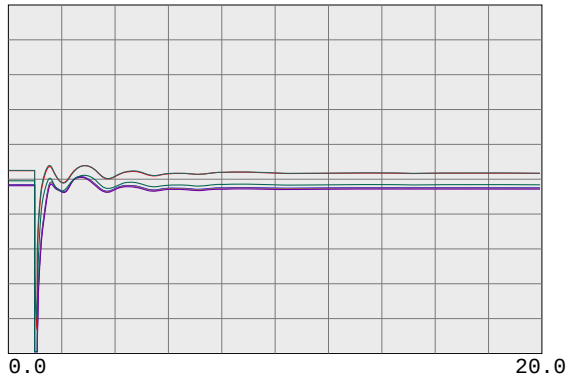
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

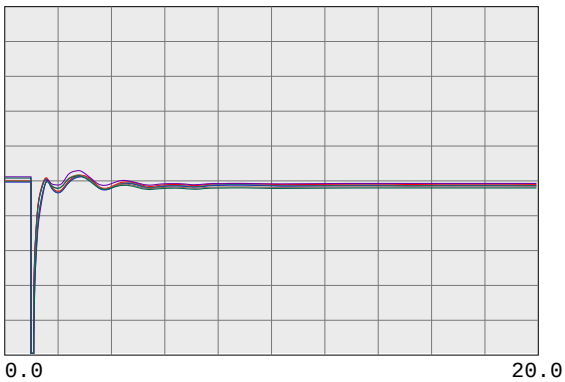
230-KV SYSTEM VOLTAGES



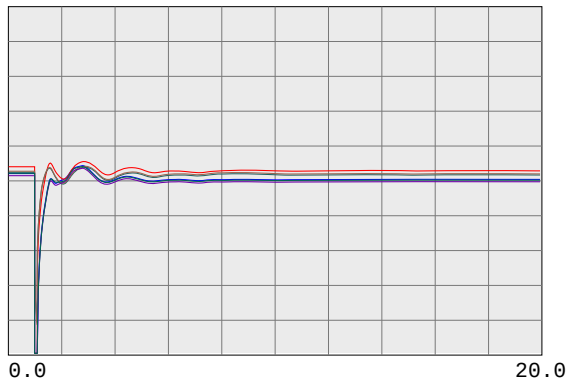
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



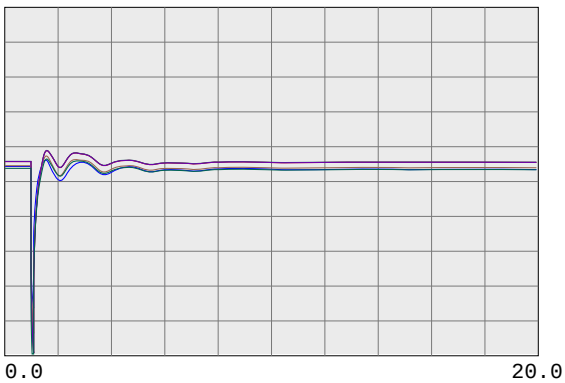
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



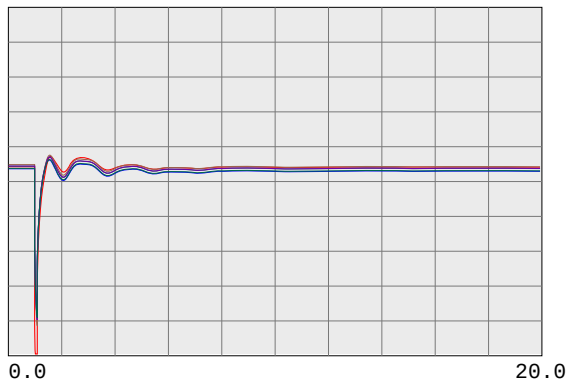
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



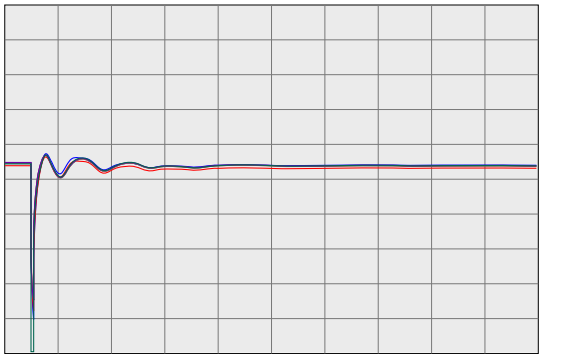
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



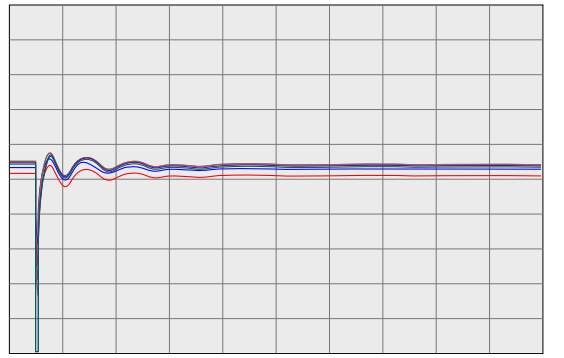
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

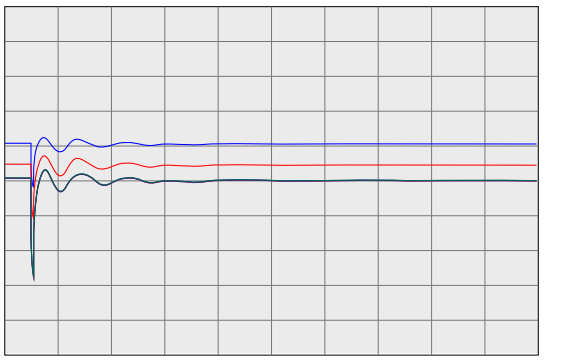
230-KV SYSTEM VOLTAGES



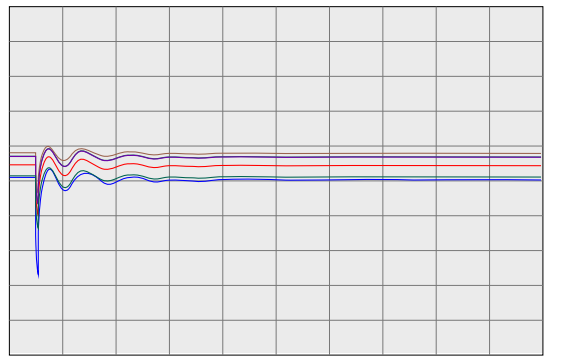
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



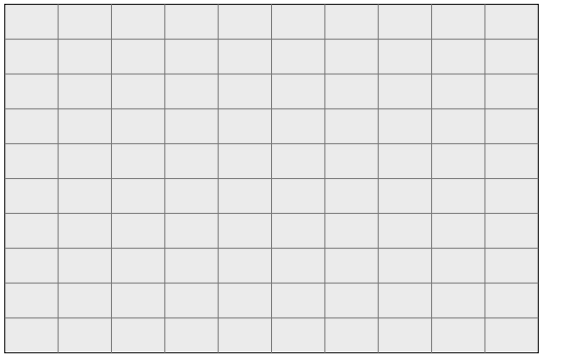
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

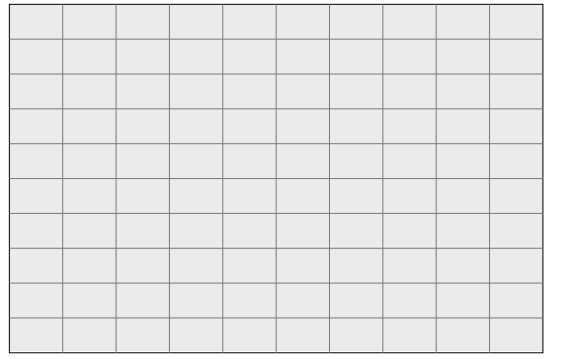


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



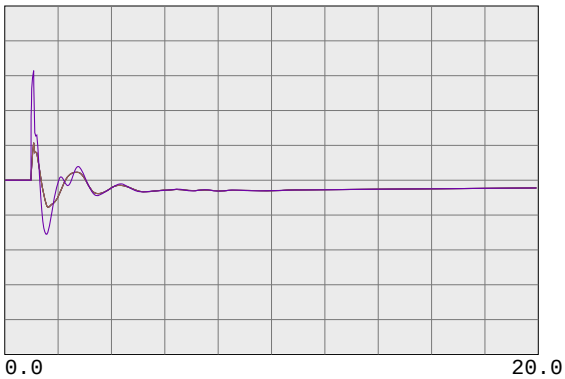
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



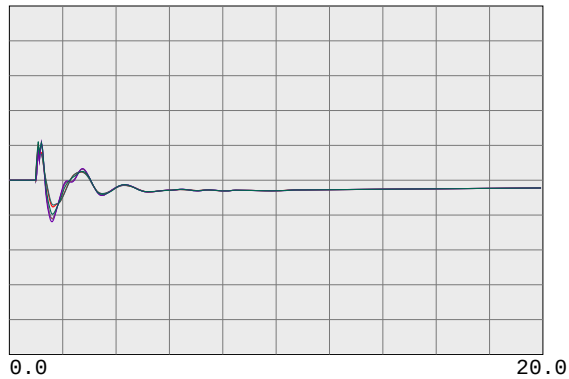


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

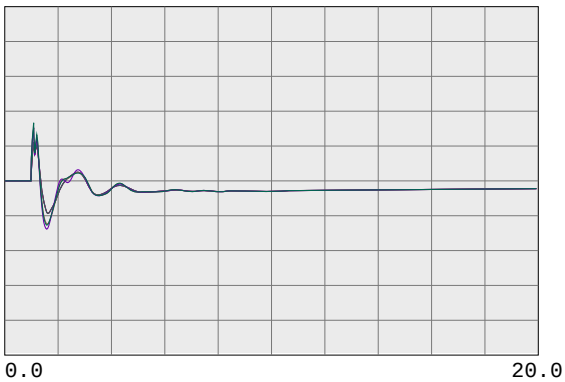
230-KV SYSTEM FREQUENCIES



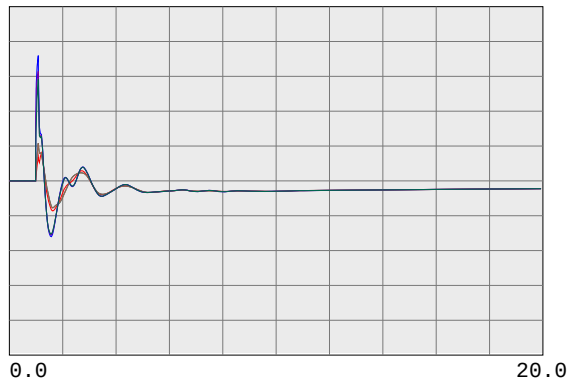
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



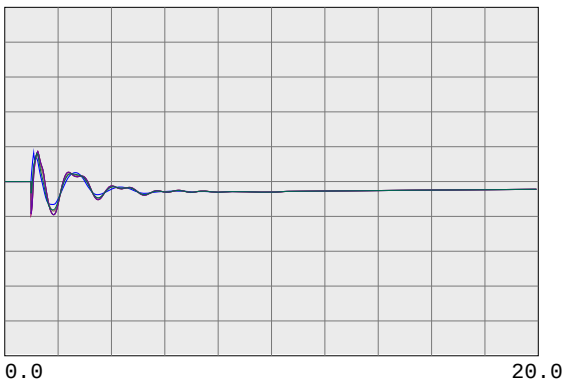
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



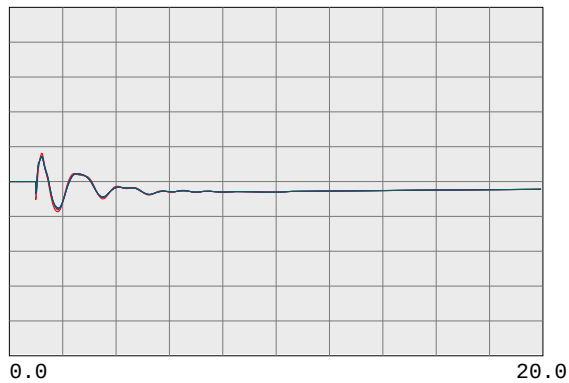
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



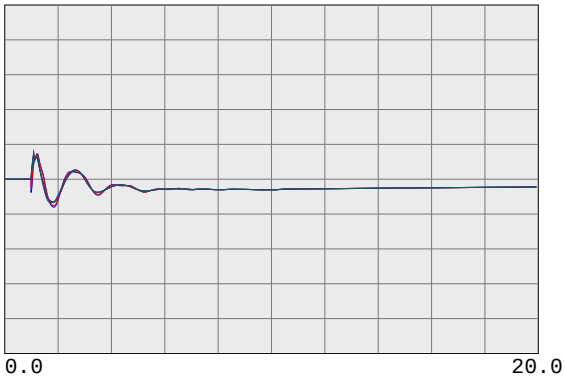
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



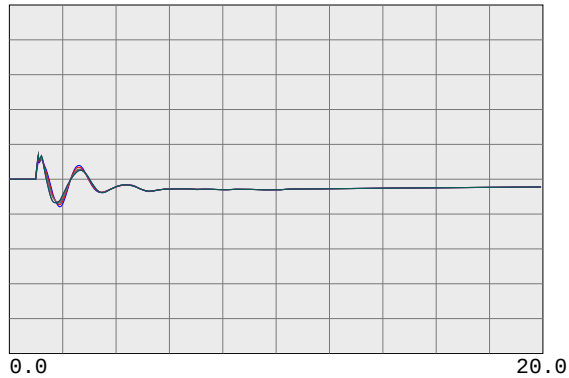
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

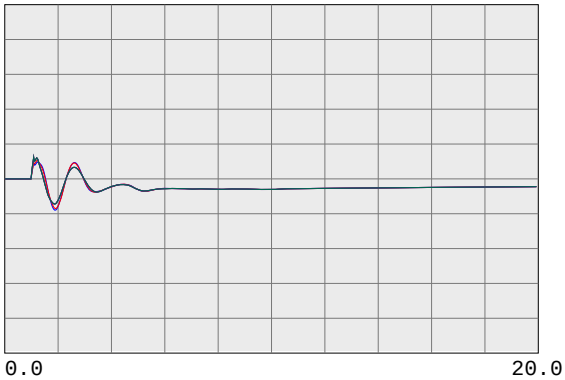
230-KV SYSTEM FREQUENCIES



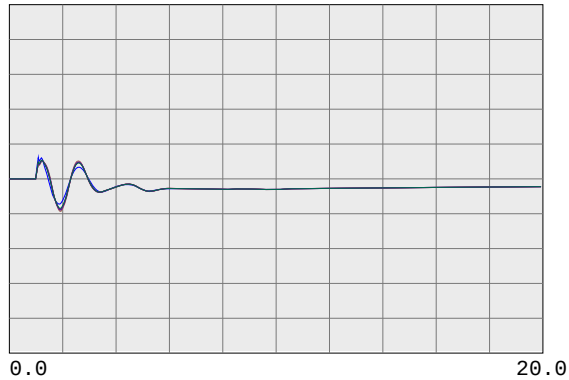
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



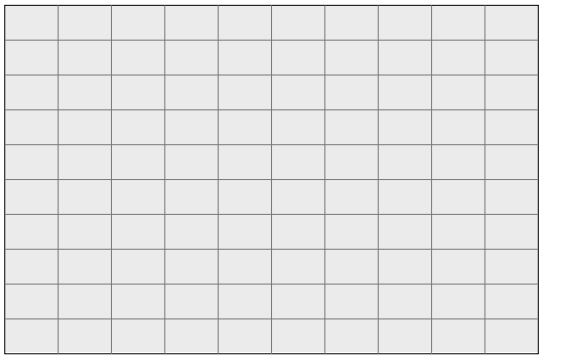
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

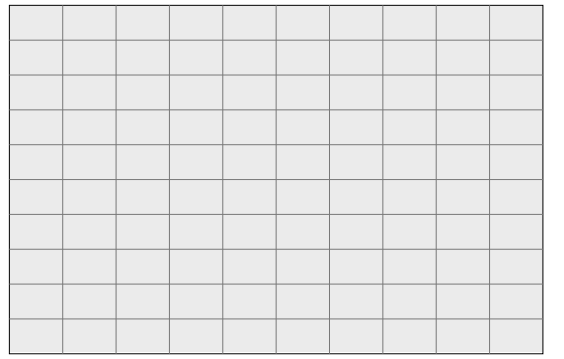


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



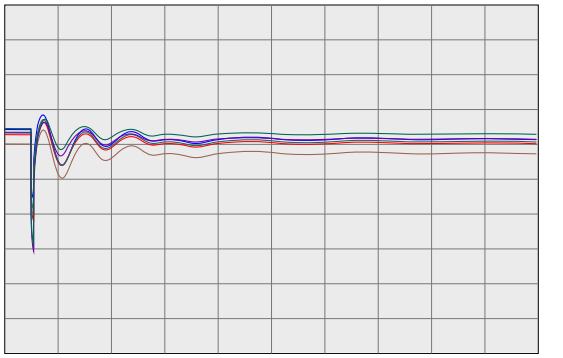
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



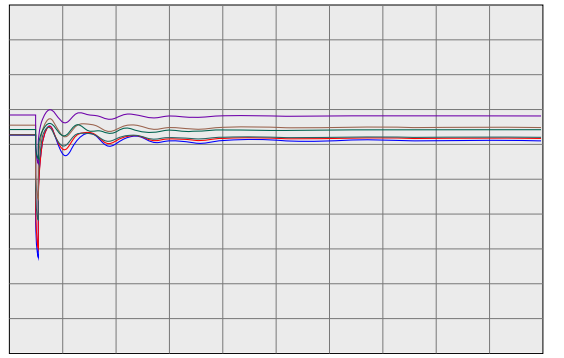


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

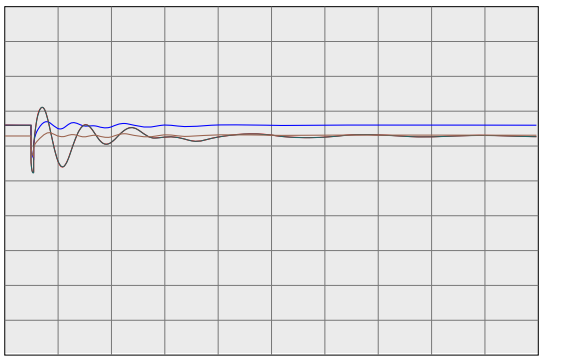
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



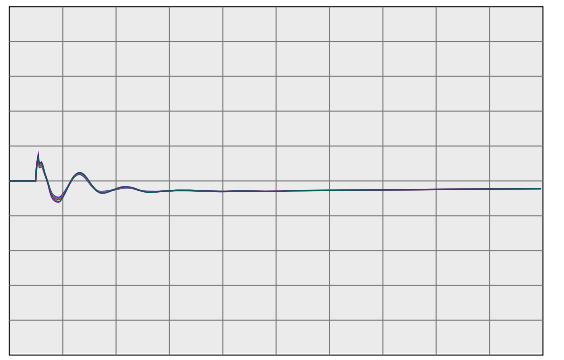
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



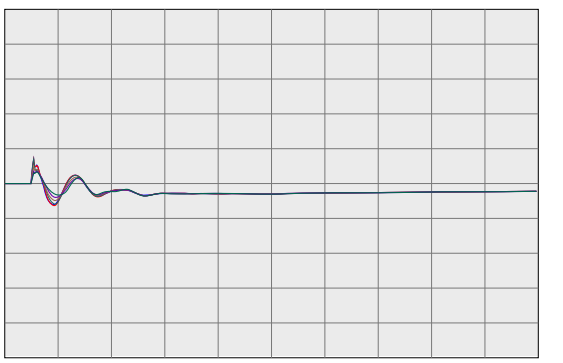
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



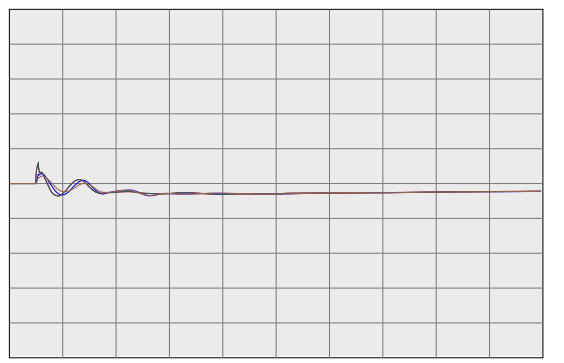
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



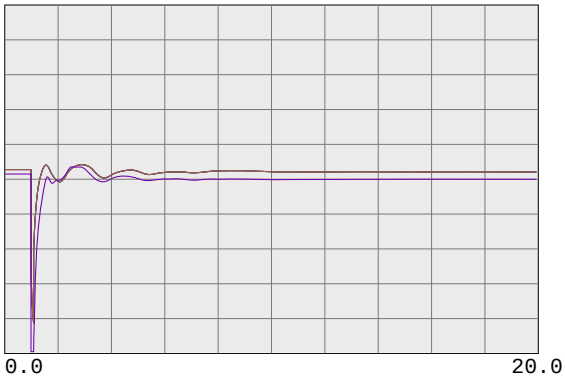
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

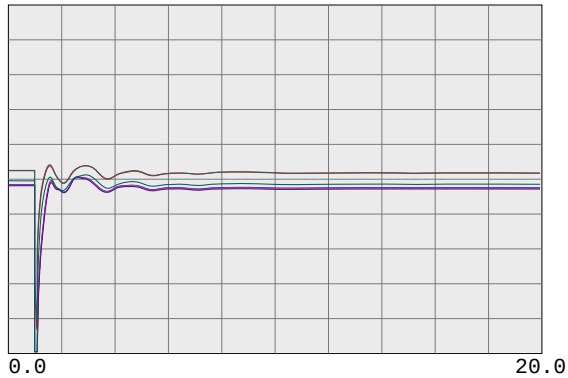
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

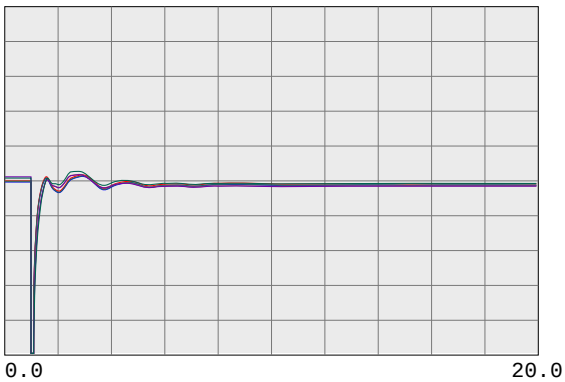
230-KV SYSTEM VOLTAGES



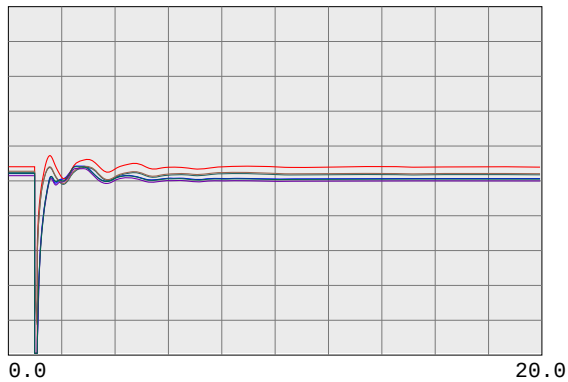
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



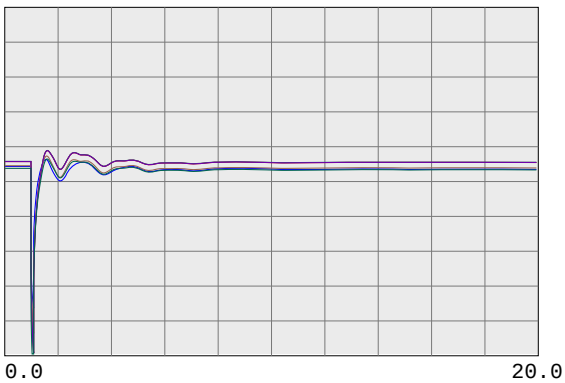
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



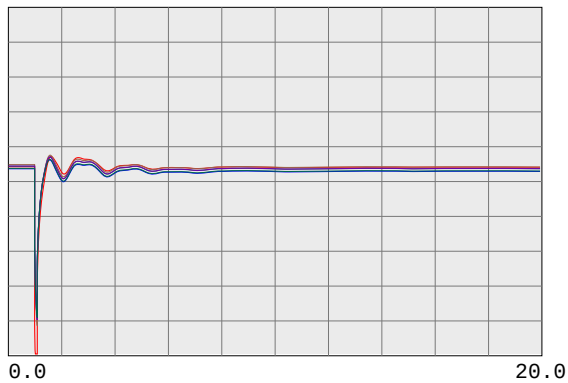
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



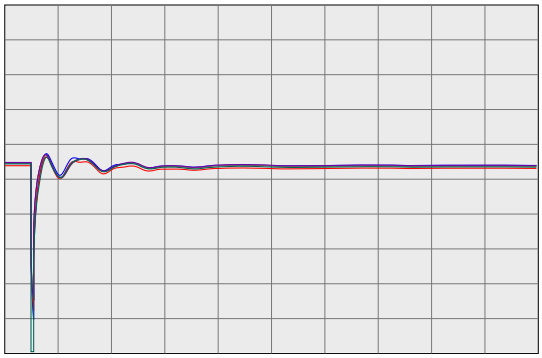
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

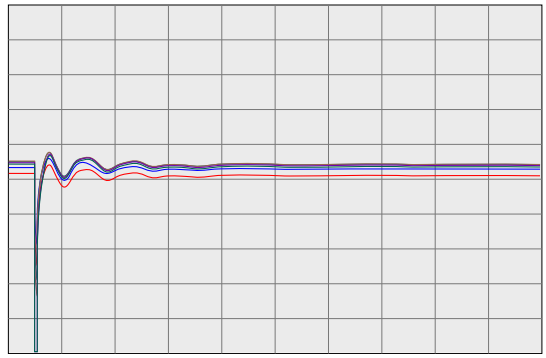
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

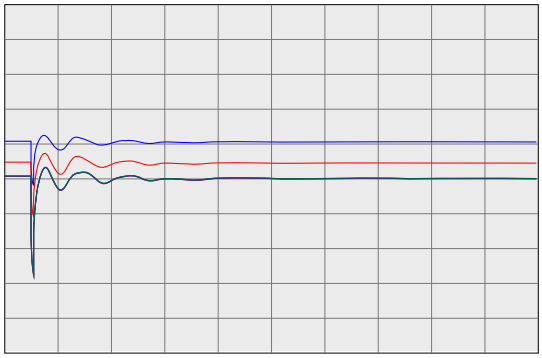
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

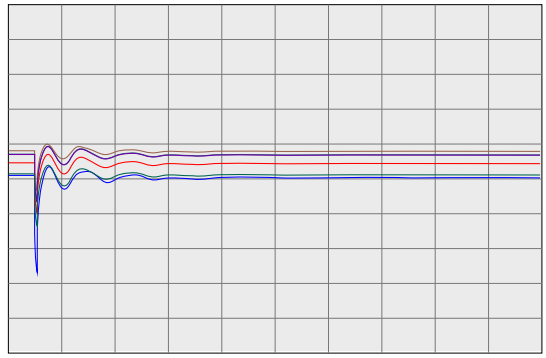
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

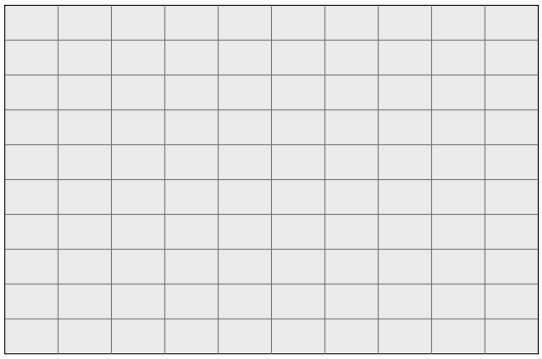
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

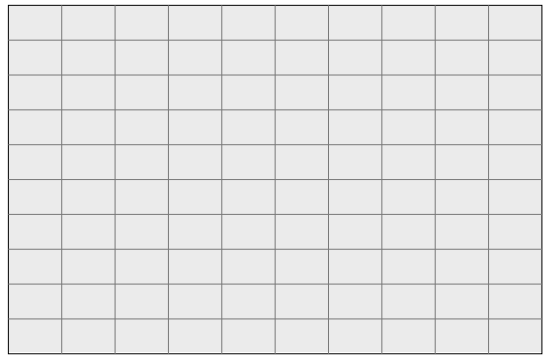


0.0 20.0

Time(sec)

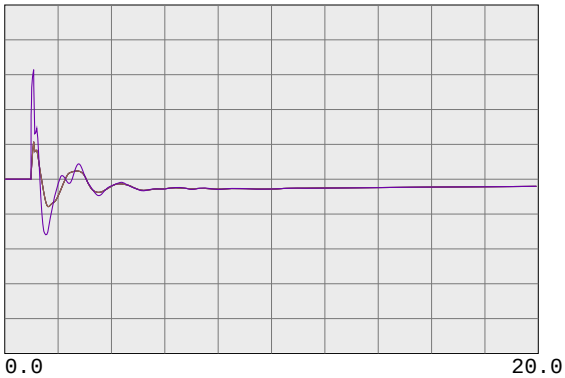
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



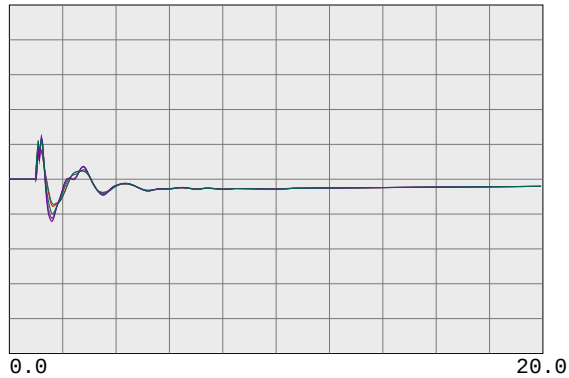


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

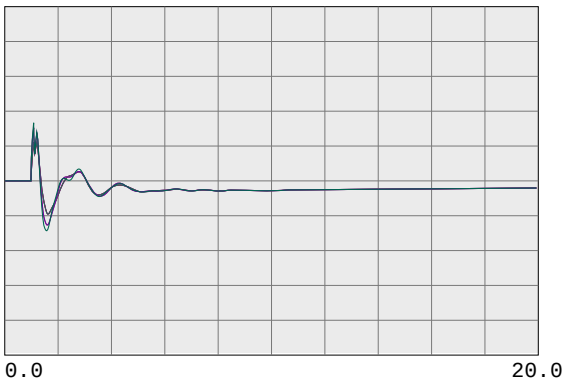
230-KV SYSTEM FREQUENCIES



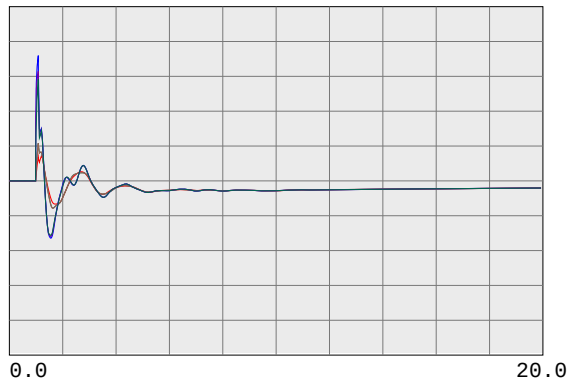
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



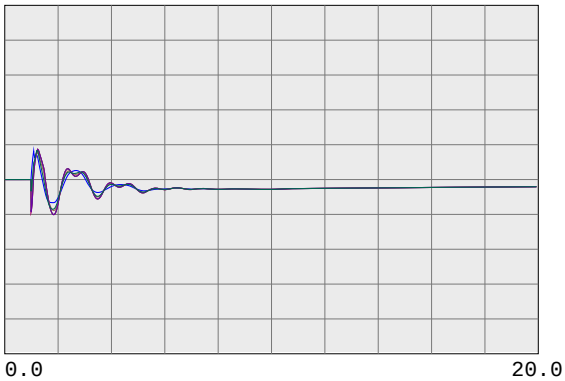
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



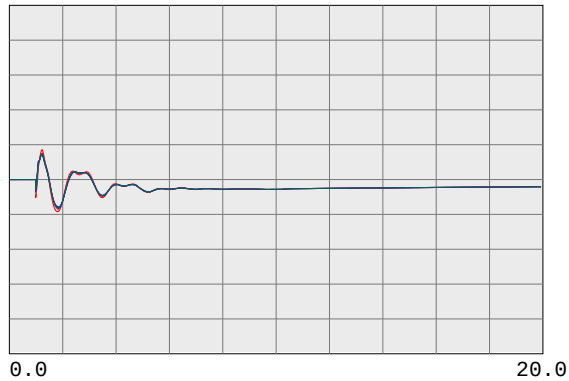
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



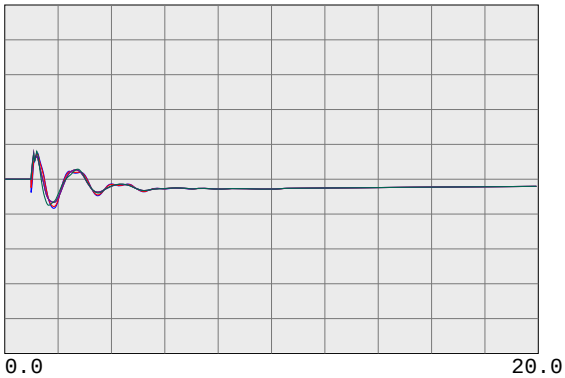
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



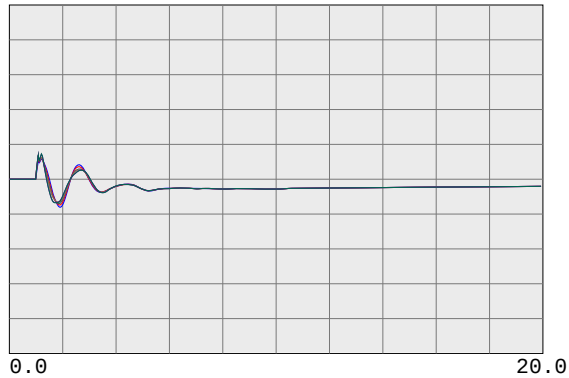
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

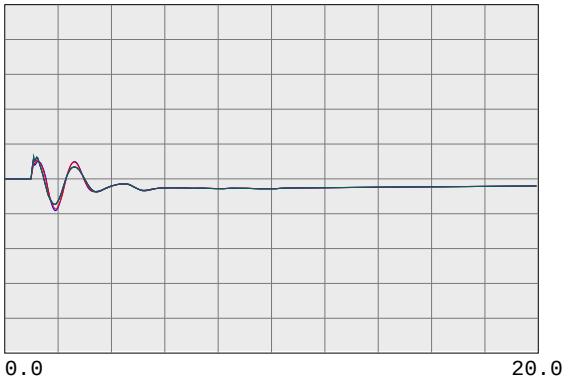
230-KV SYSTEM FREQUENCIES



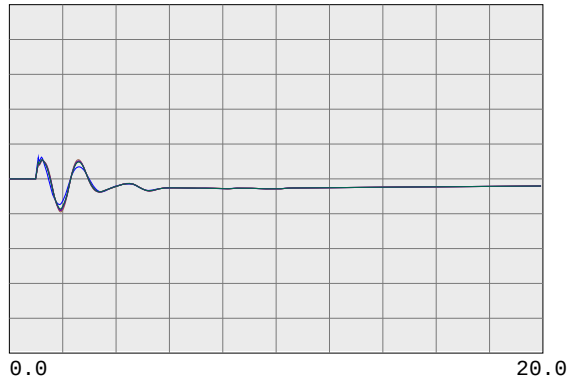
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



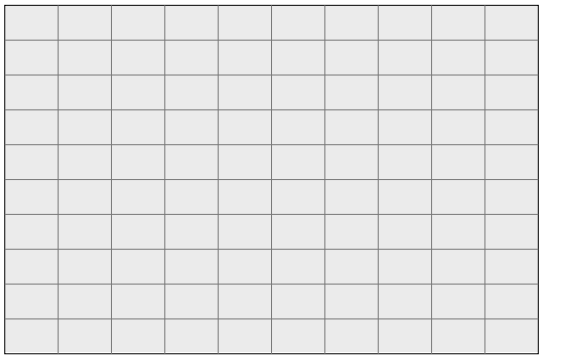
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

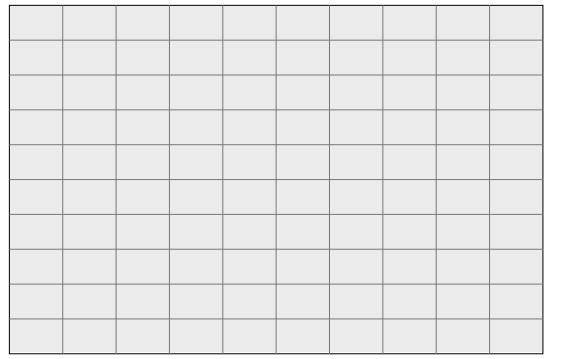


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



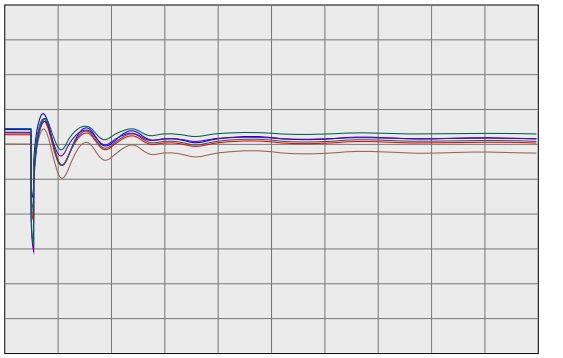
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



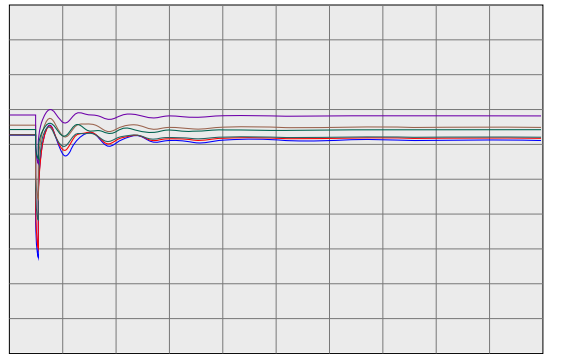


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

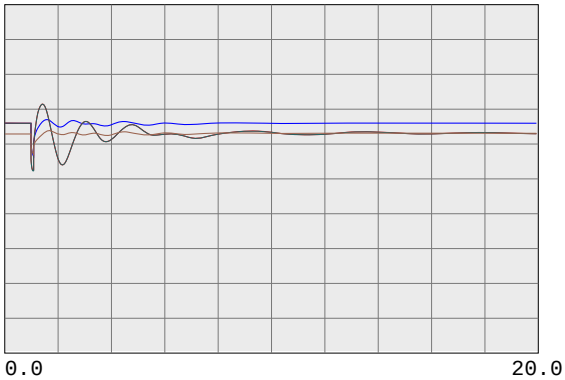
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



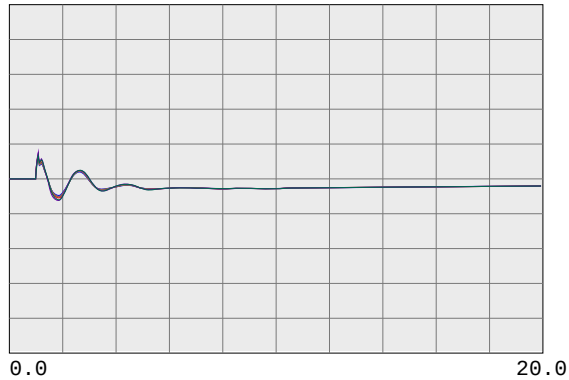
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



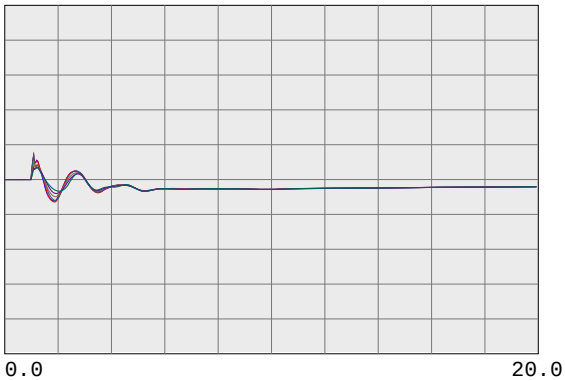
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



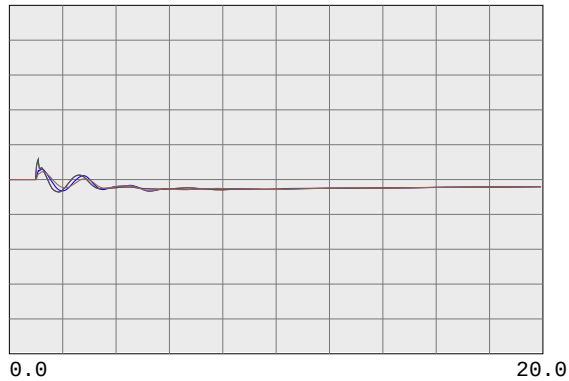
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



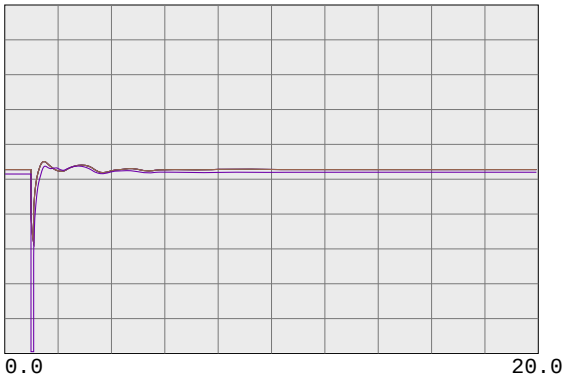
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

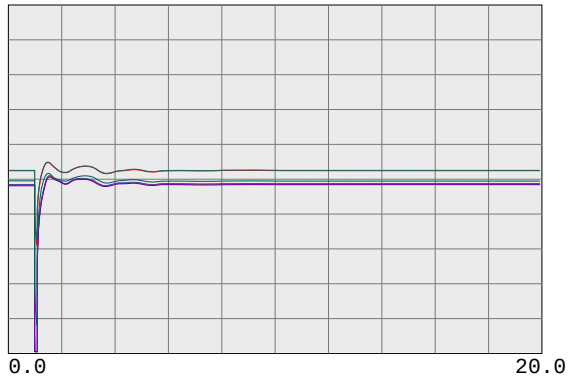
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

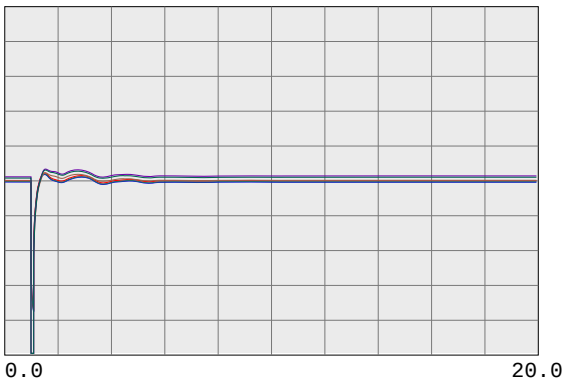
230-KV SYSTEM VOLTAGES



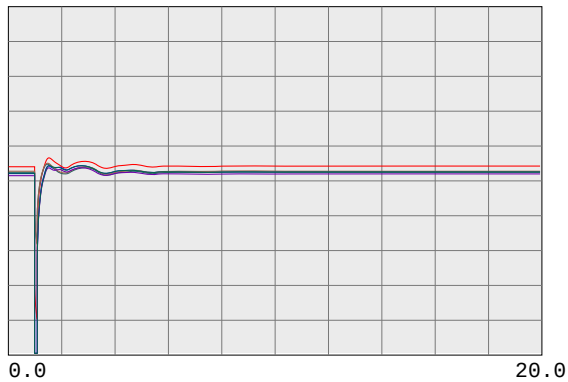
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



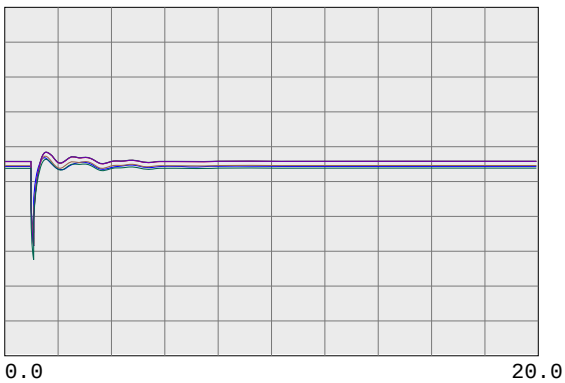
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



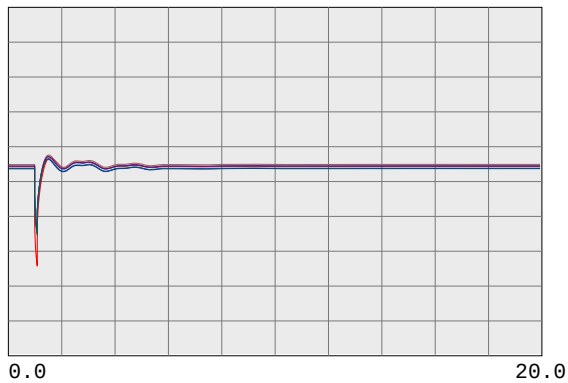
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



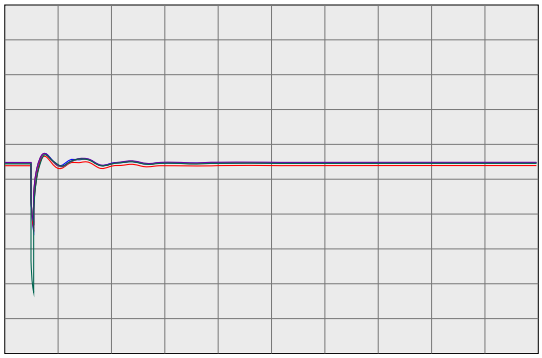
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

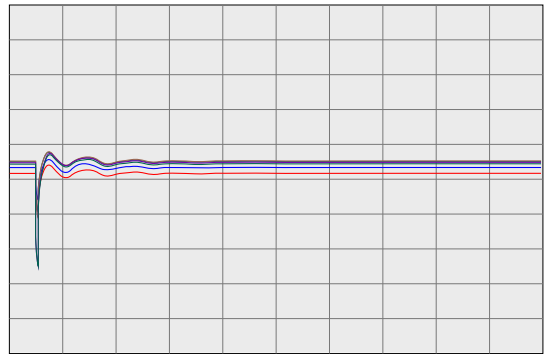
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

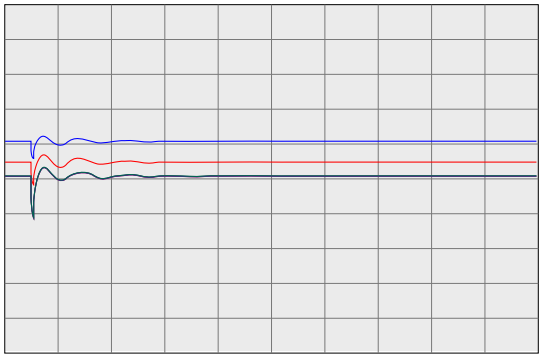
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

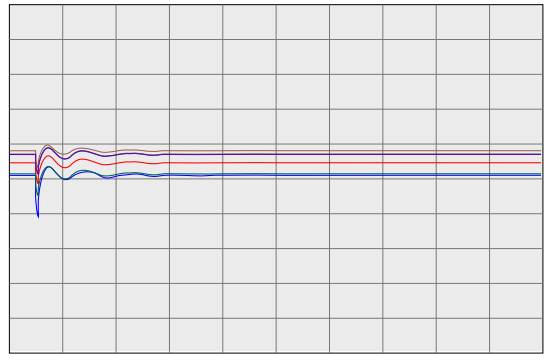
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

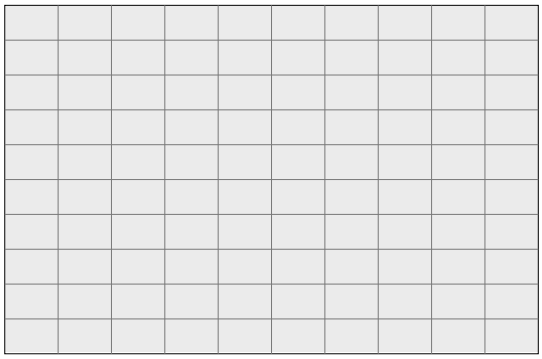
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

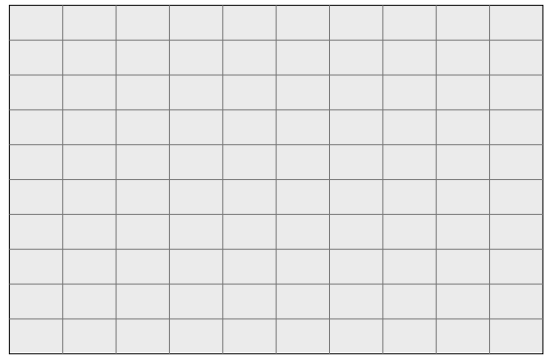


0.0 20.0

Time(sec)

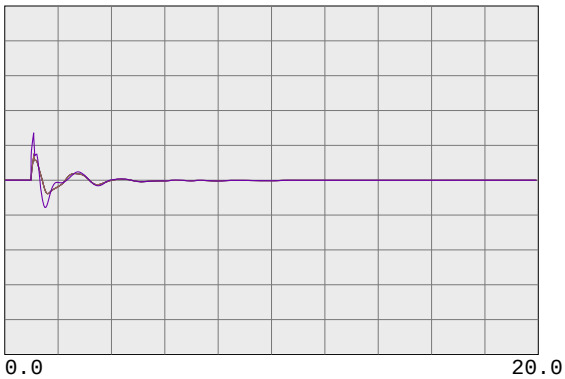
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



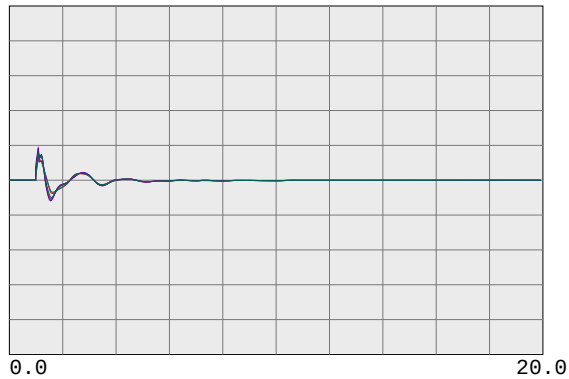


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

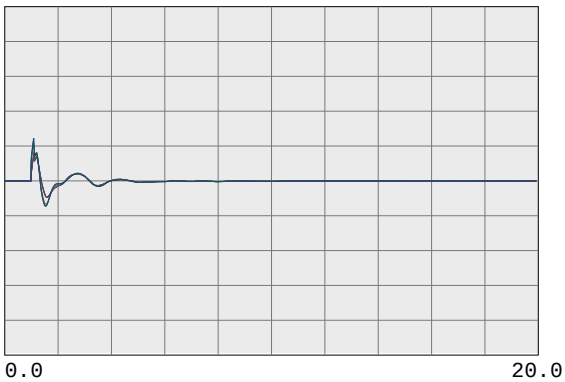
230-KV SYSTEM FREQUENCIES



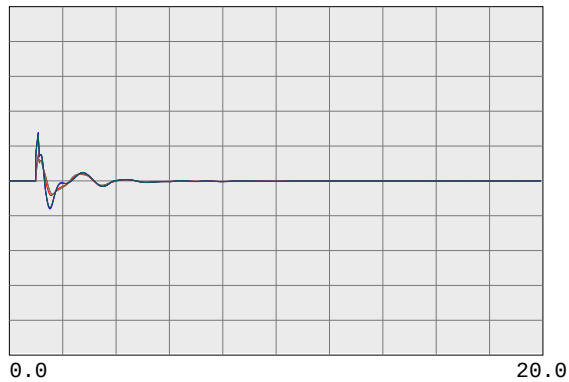
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



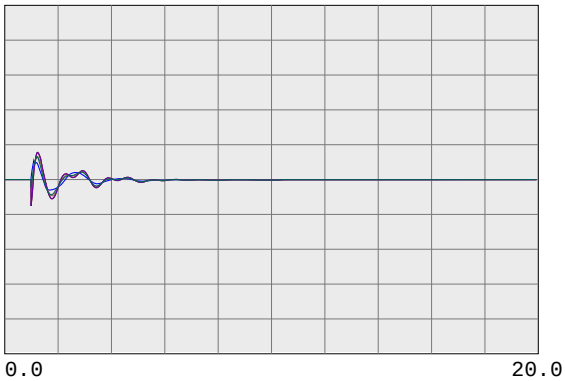
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



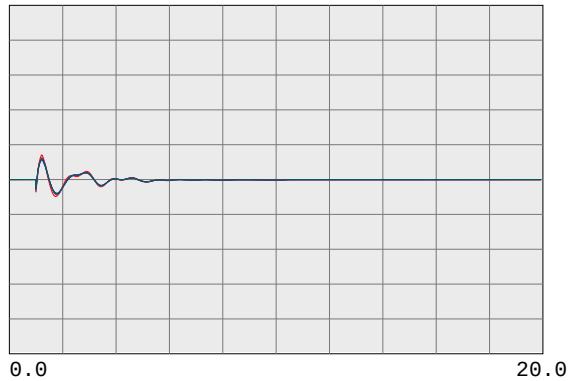
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



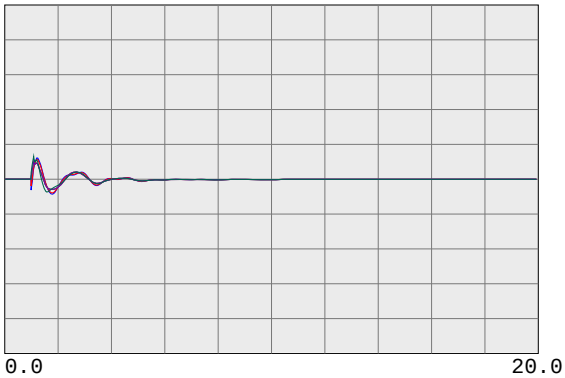
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



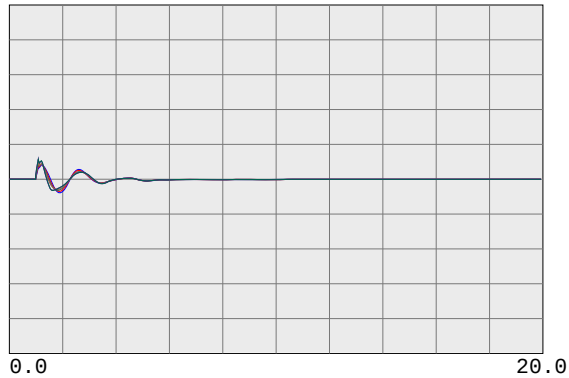
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

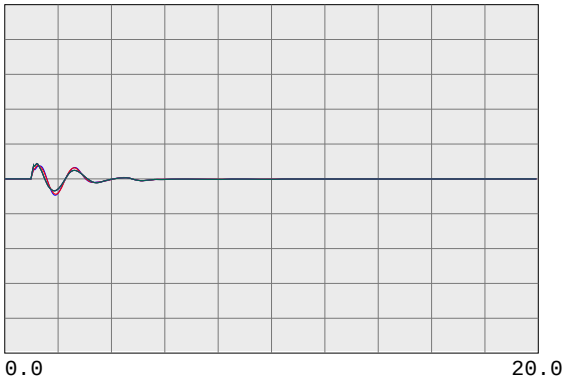
230-KV SYSTEM FREQUENCIES



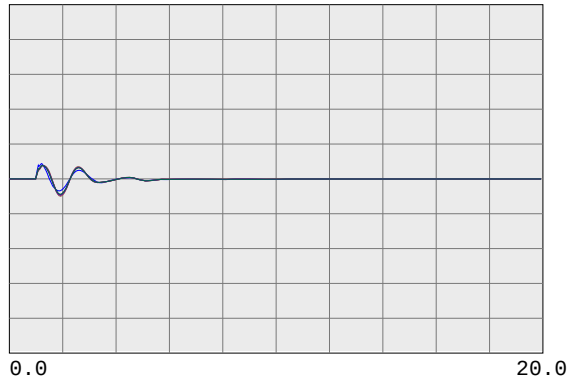
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



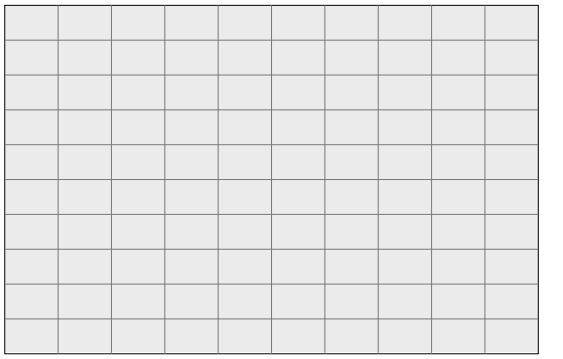
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

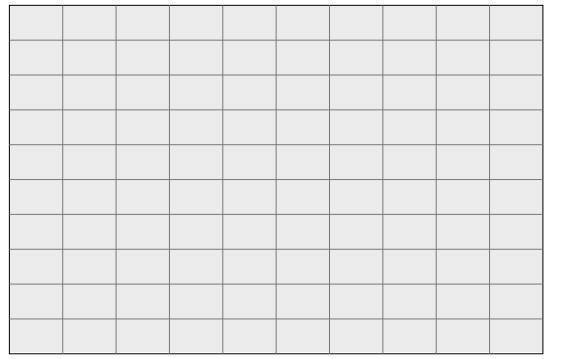


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



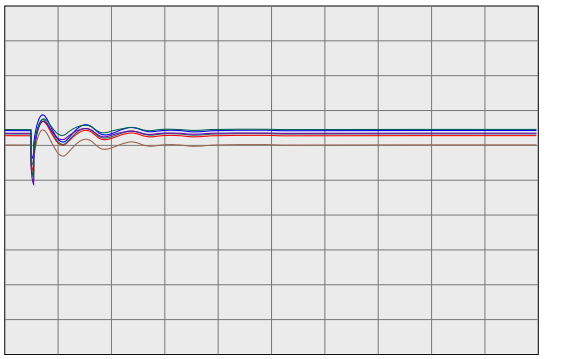
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



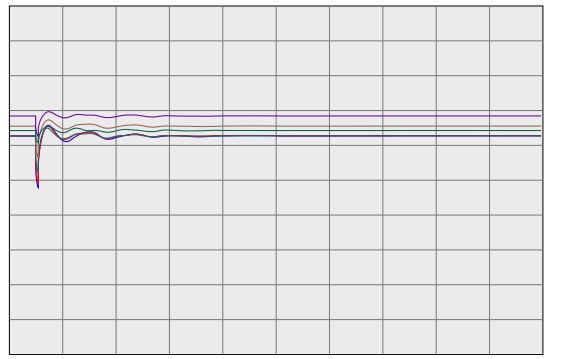


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

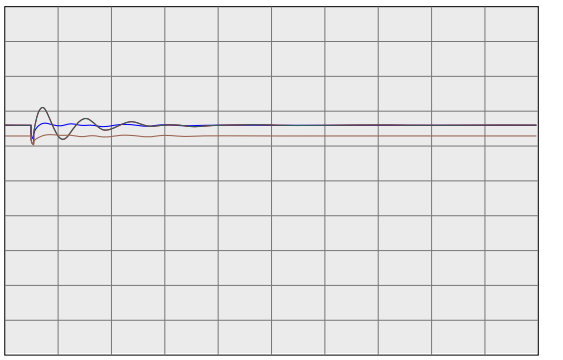
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



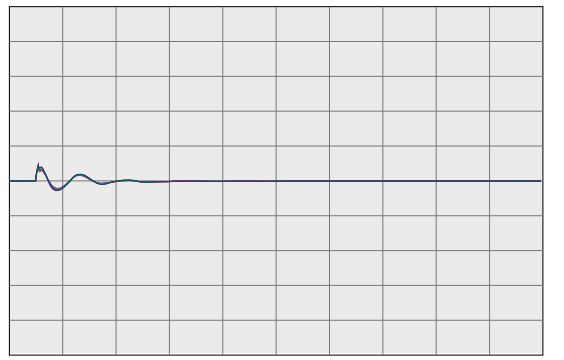
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



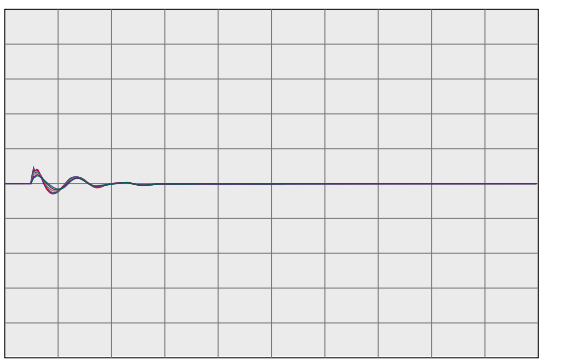
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



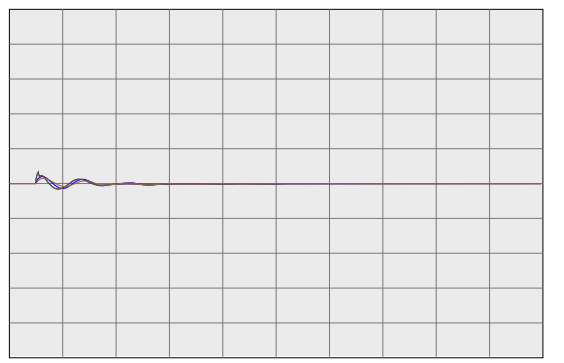
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



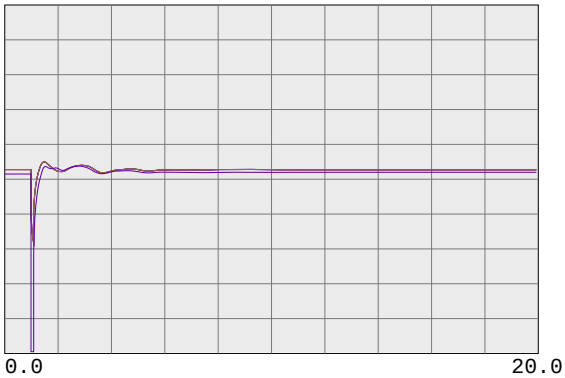
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

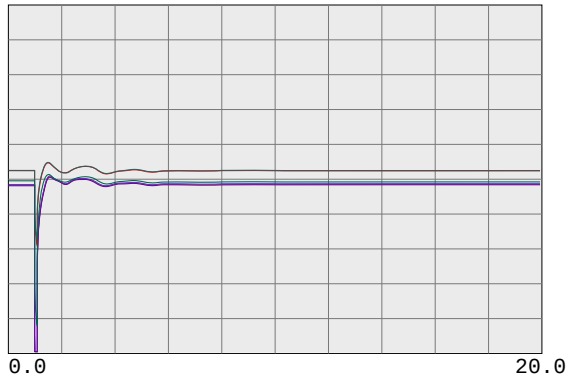
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

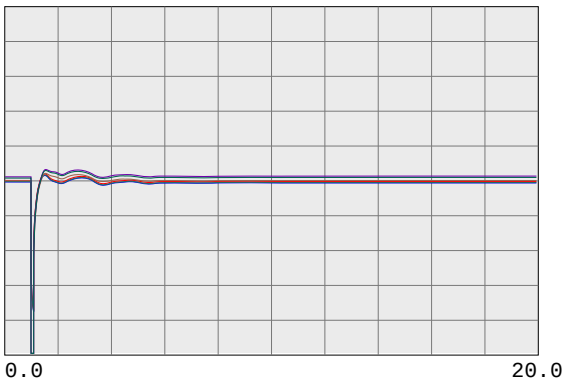
230-KV SYSTEM VOLTAGES



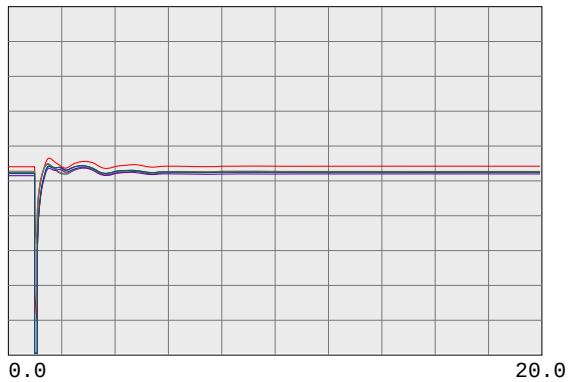
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



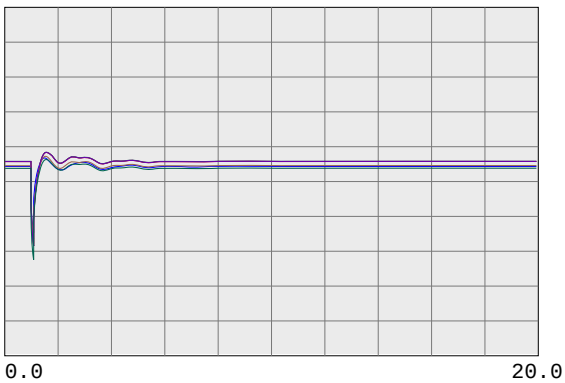
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



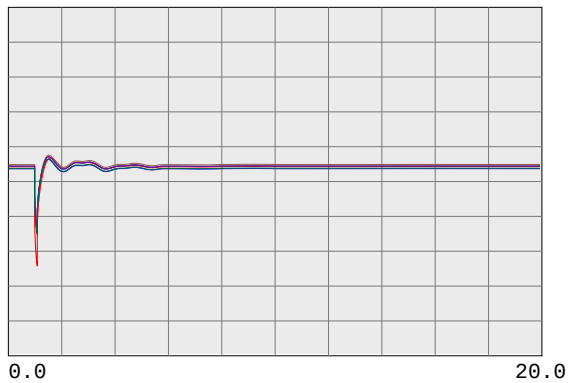
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



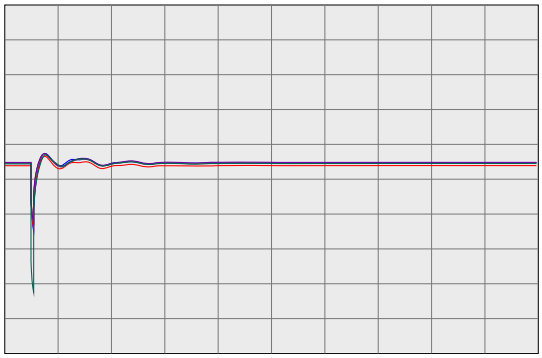
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

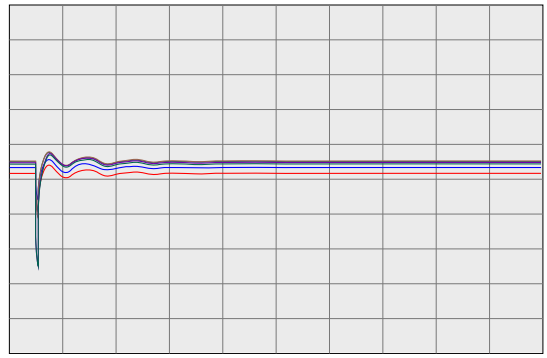
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

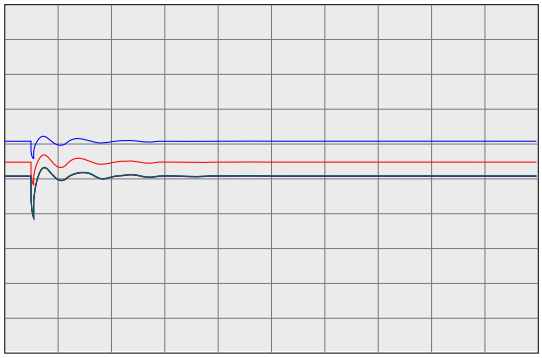
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

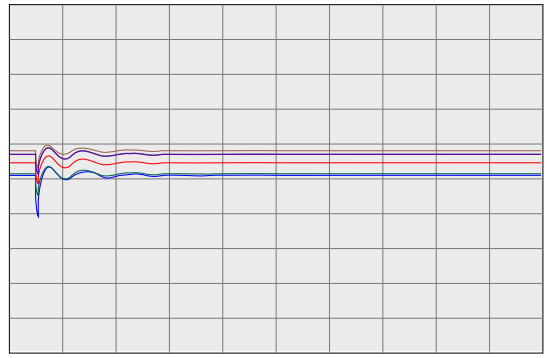
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

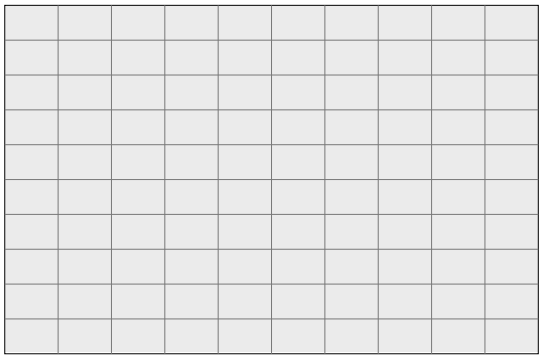
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

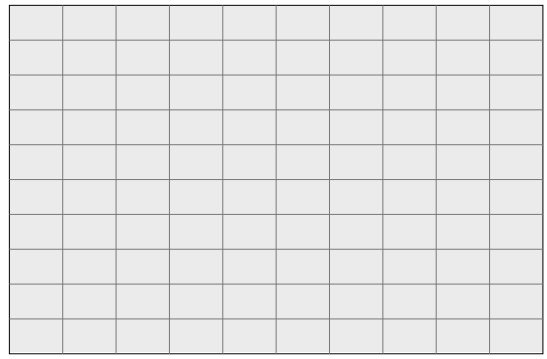


0.0 20.0

Time(sec)

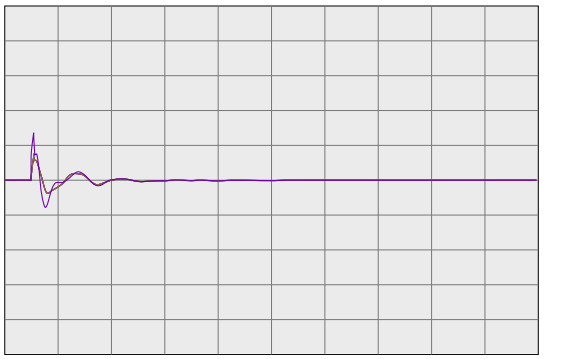
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



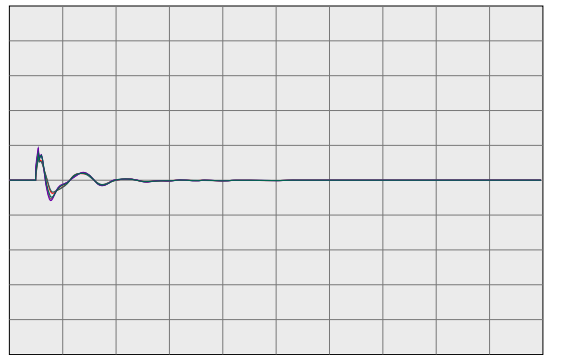


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

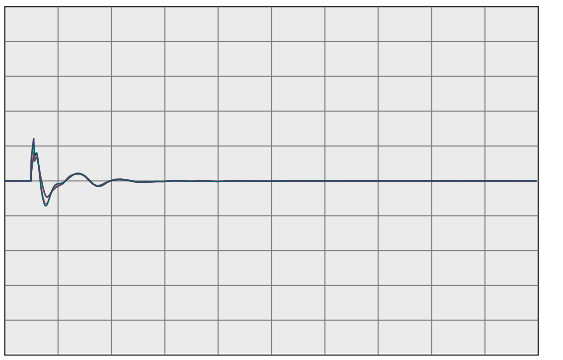
230-KV SYSTEM FREQUENCIES



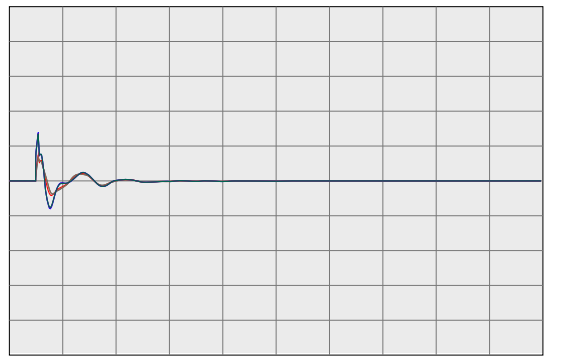
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



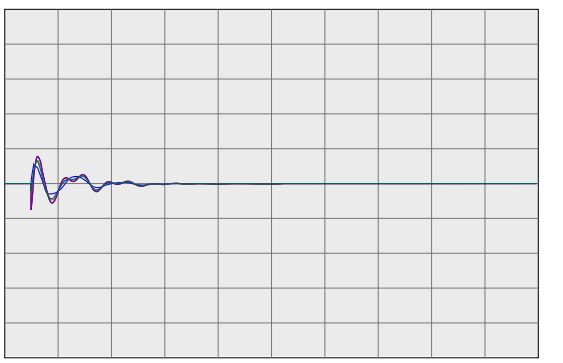
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



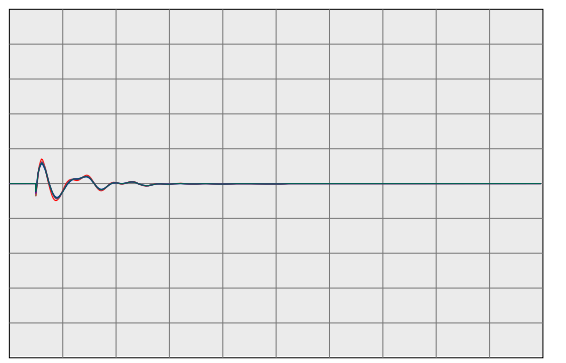
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



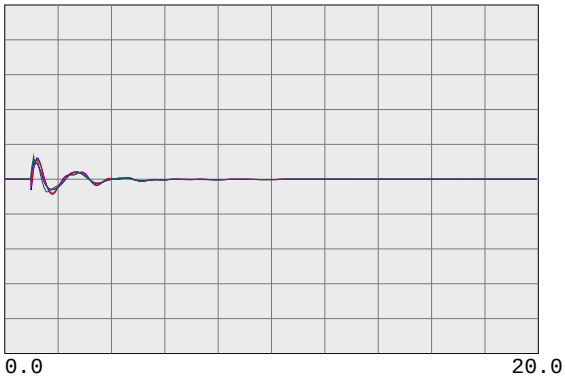
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



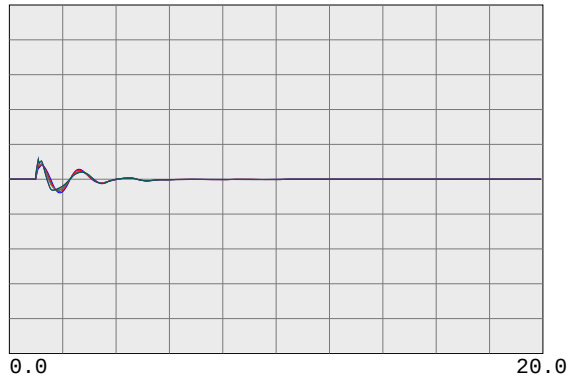
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

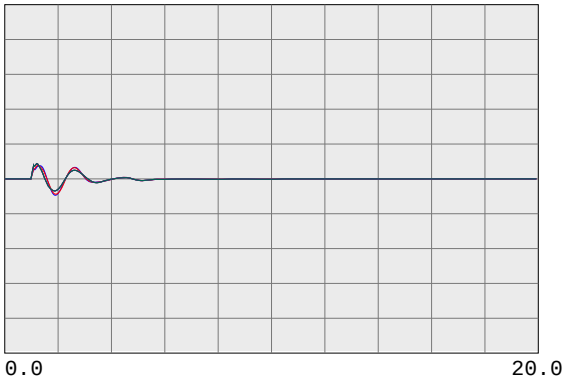
230-KV SYSTEM FREQUENCIES



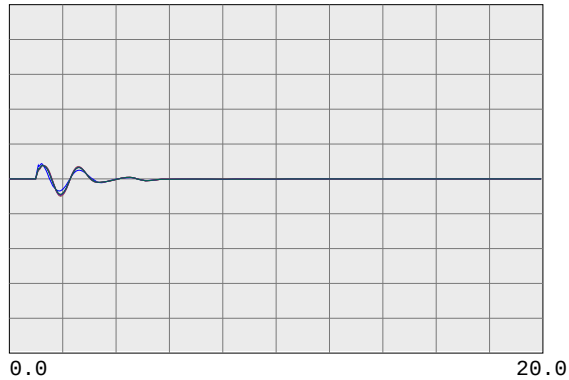
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



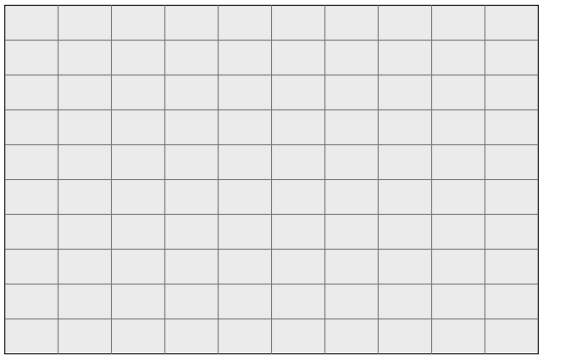
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

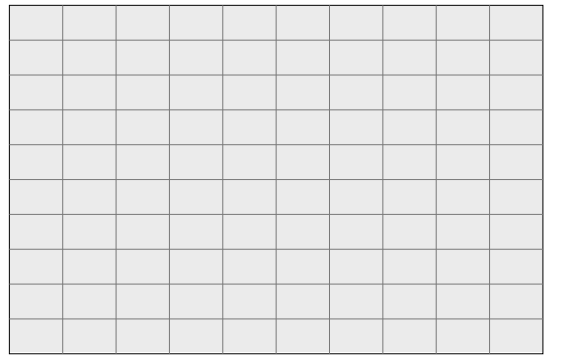


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



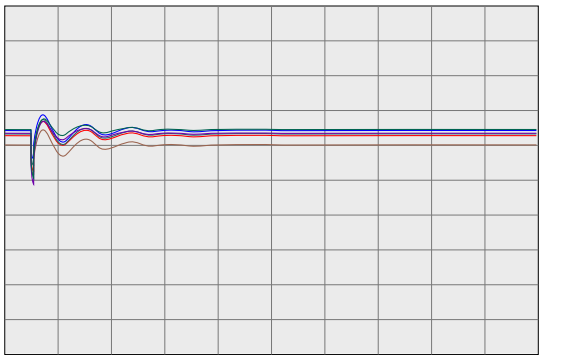
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



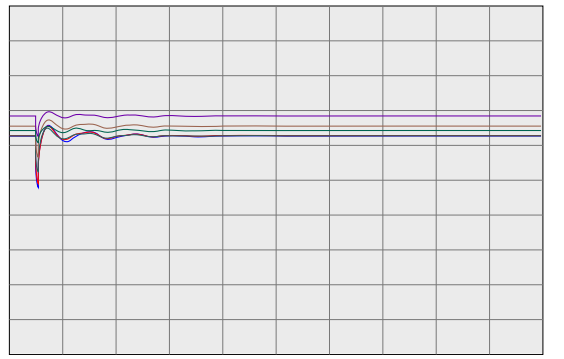


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

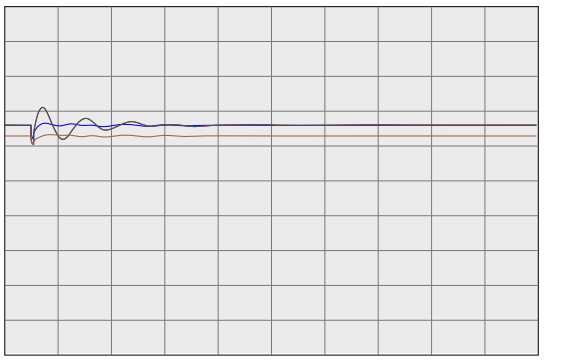
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



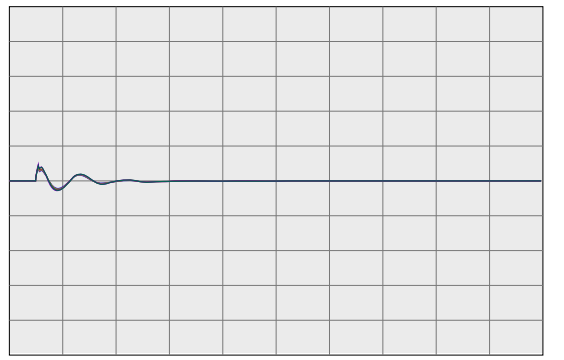
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



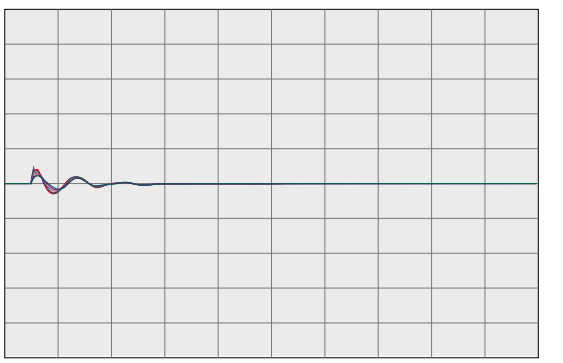
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



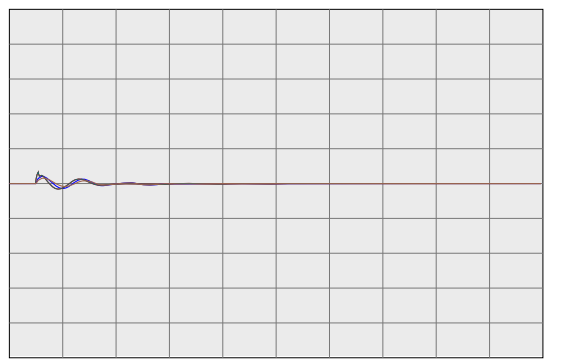
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



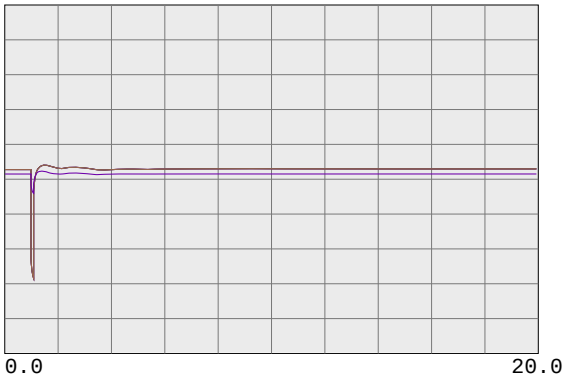
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

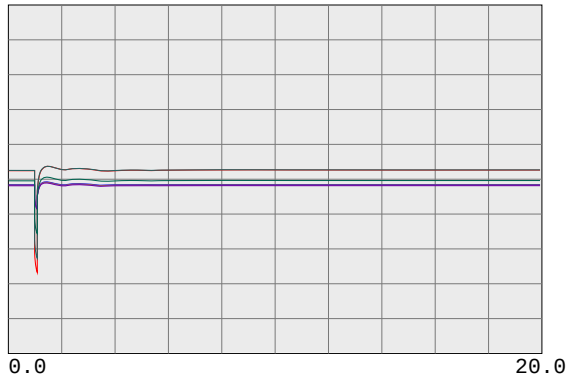
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

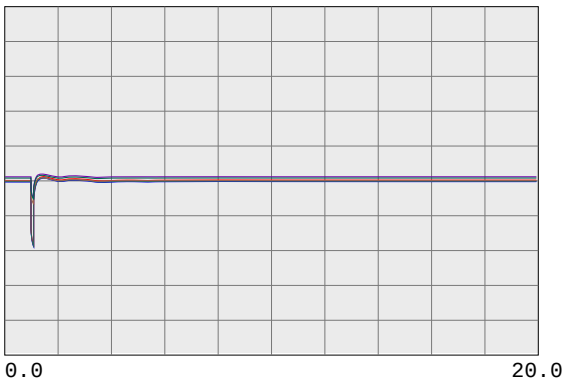
230-KV SYSTEM VOLTAGES



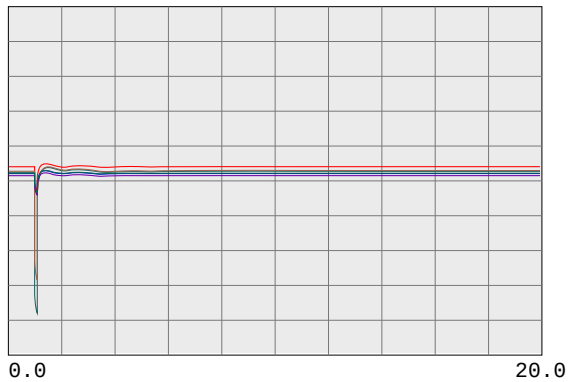
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



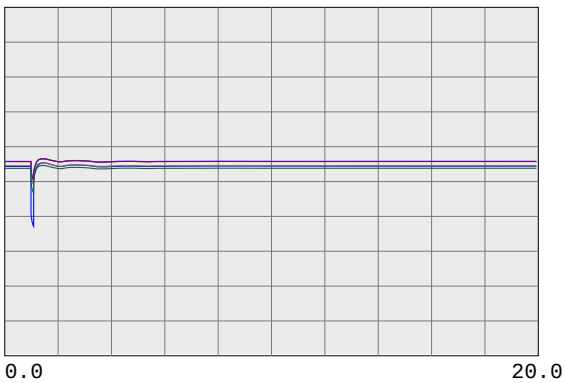
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



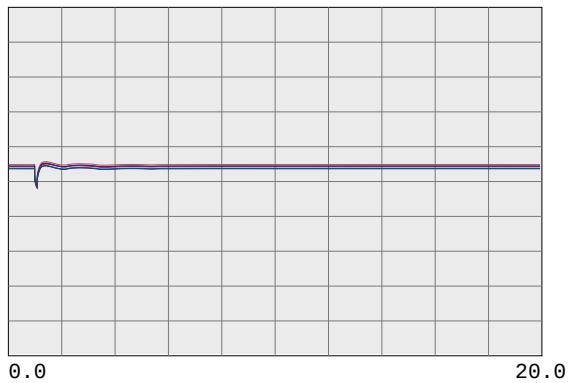
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



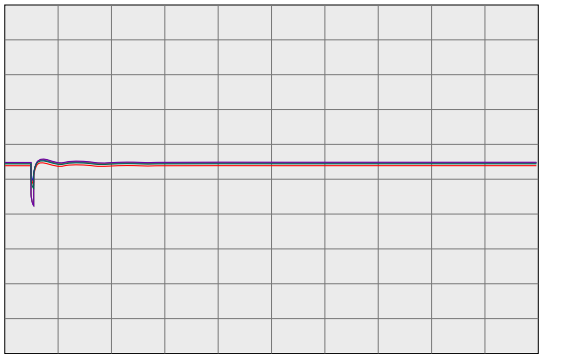
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



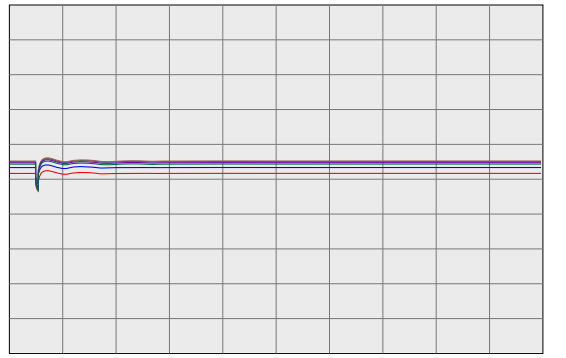
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

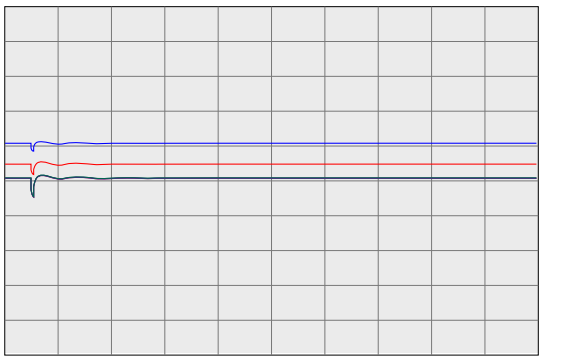
230-KV SYSTEM VOLTAGES



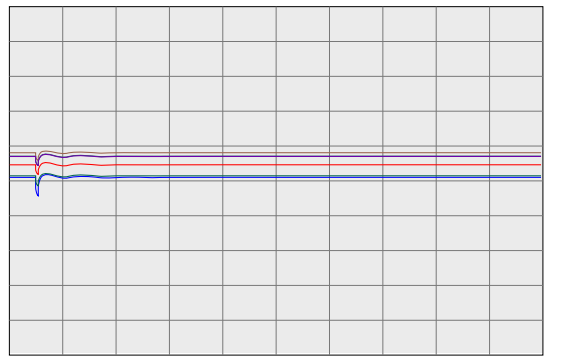
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



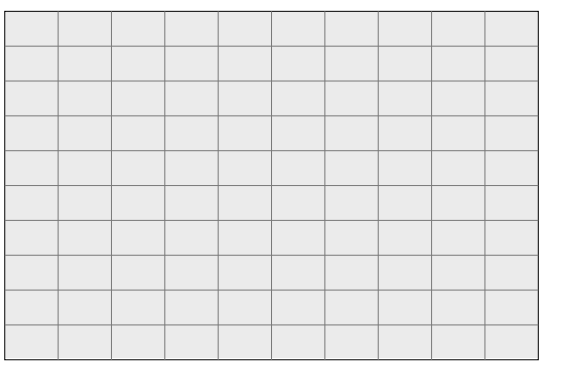
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

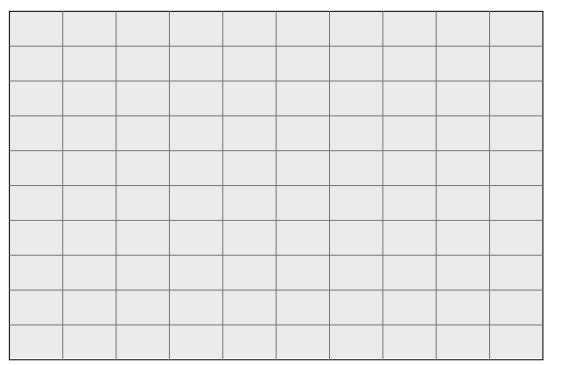


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



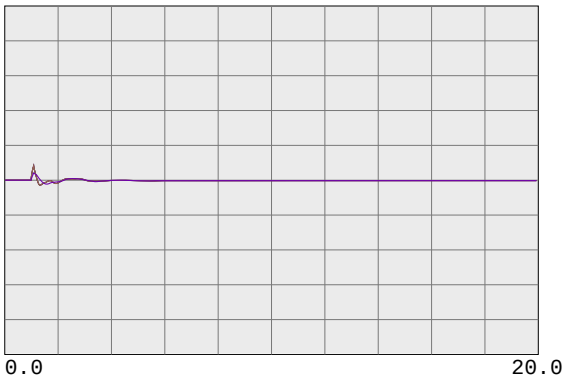
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





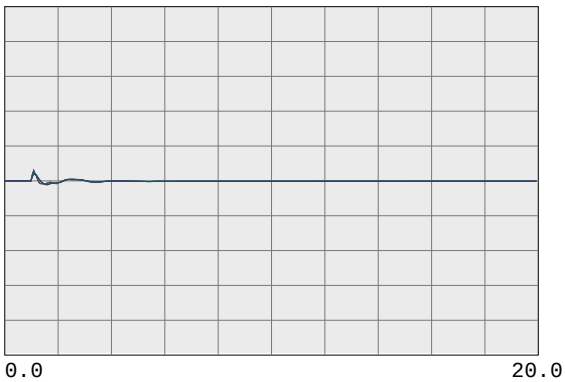
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



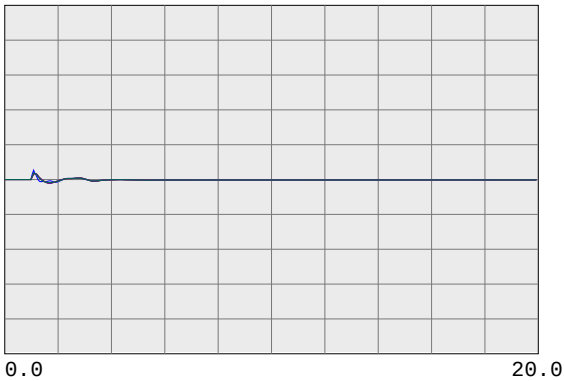
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

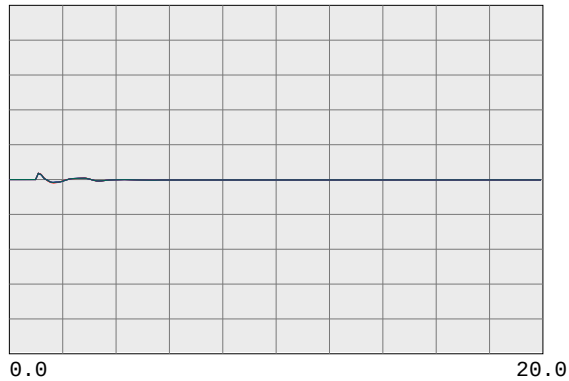


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



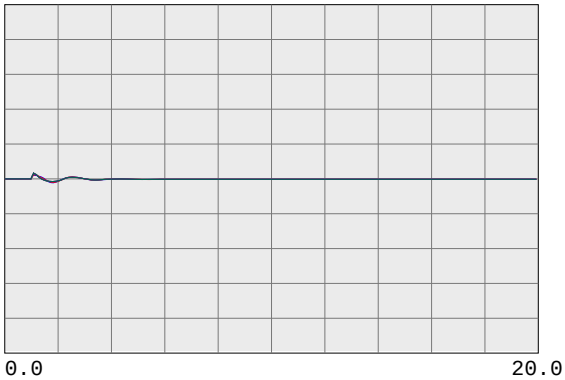
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

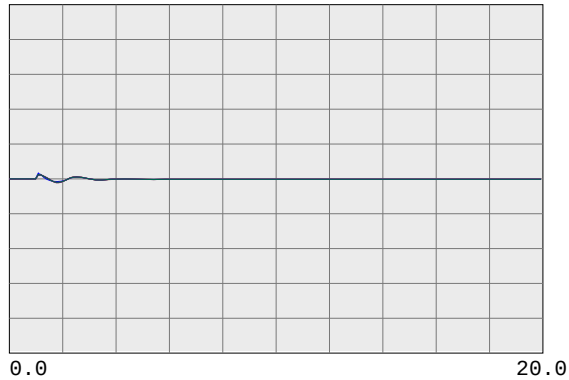
230-KV SYSTEM FREQUENCIES

59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

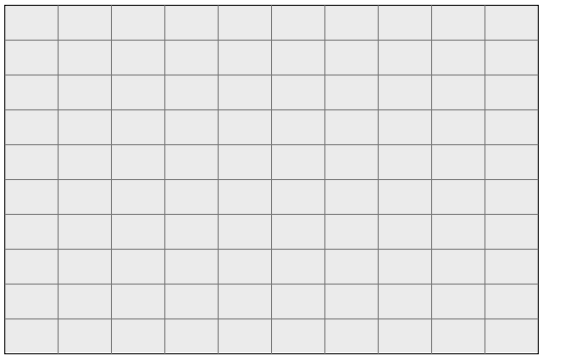
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

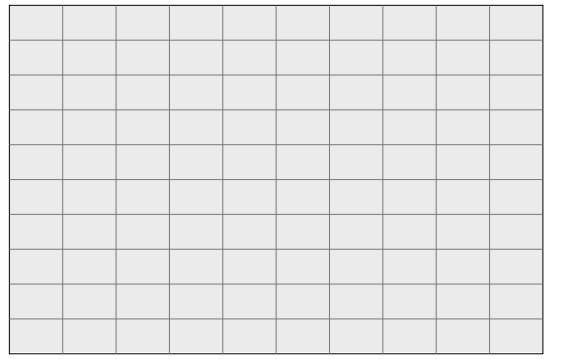


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



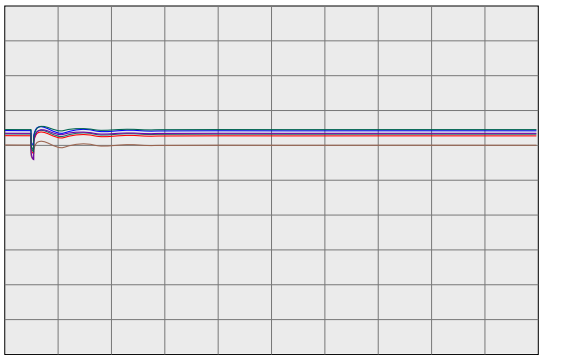
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



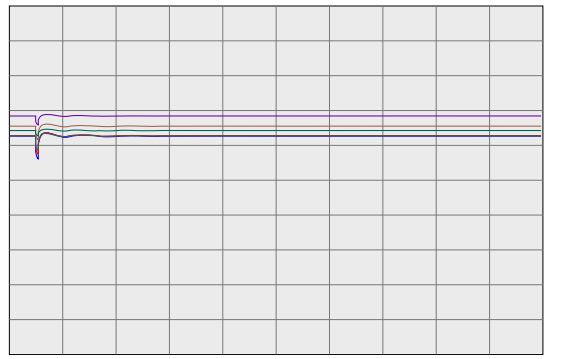


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

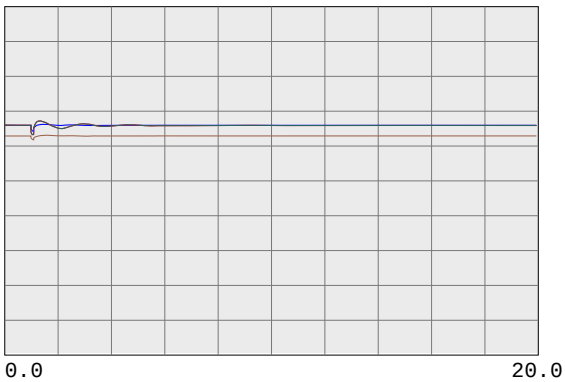
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500

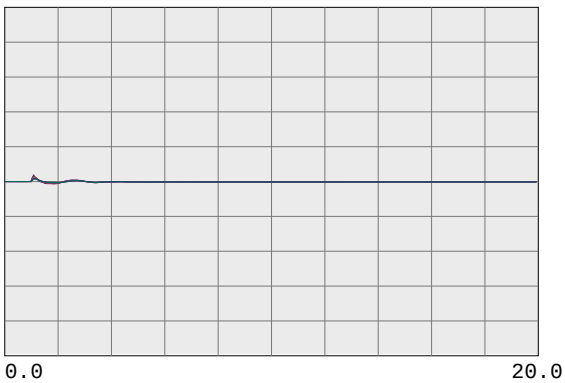


0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

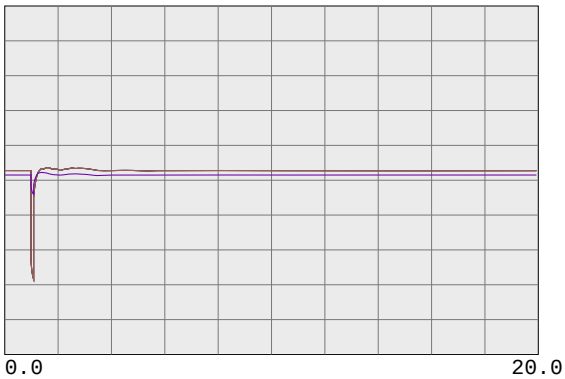
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

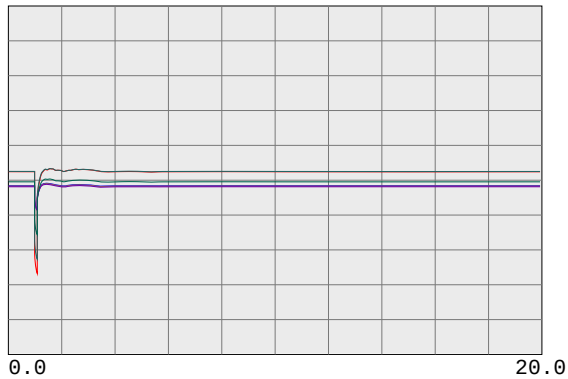
WILLOW PASS GENERATION PLANT

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

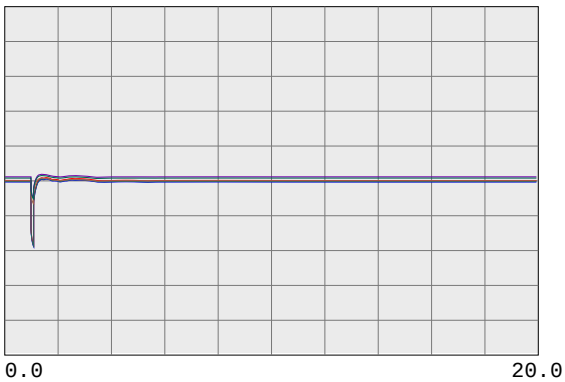
230-KV SYSTEM VOLTAGES



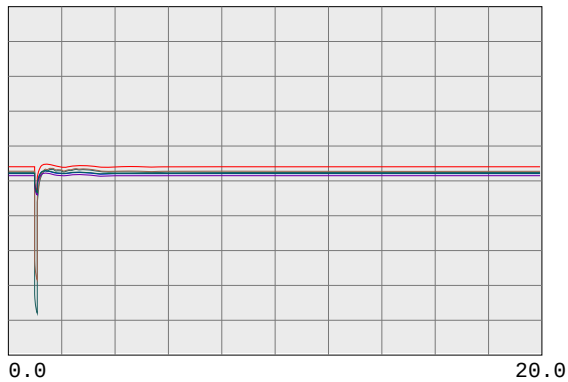
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



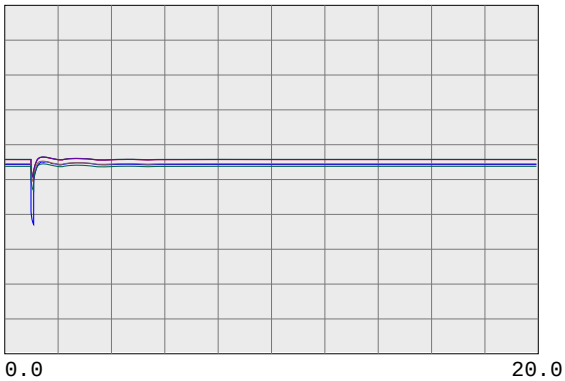
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



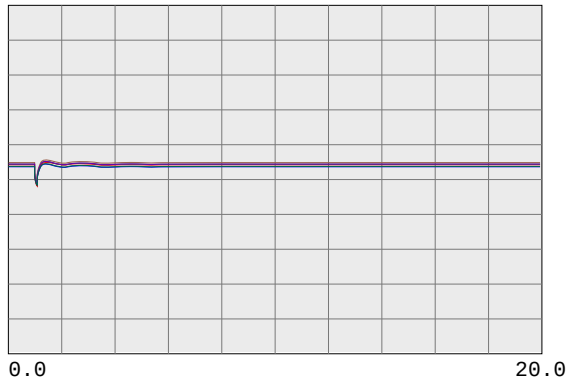
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



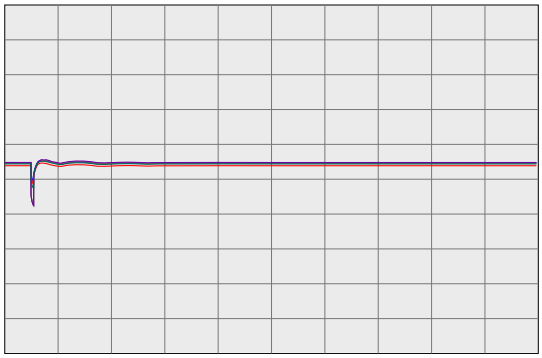
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

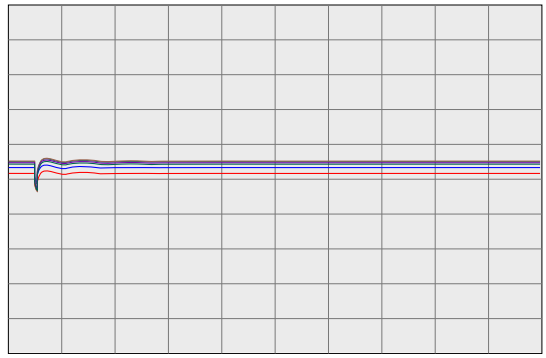
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

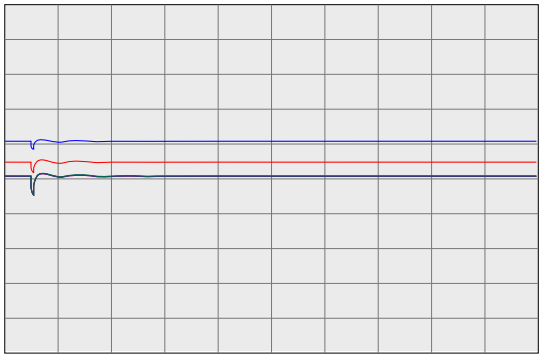
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

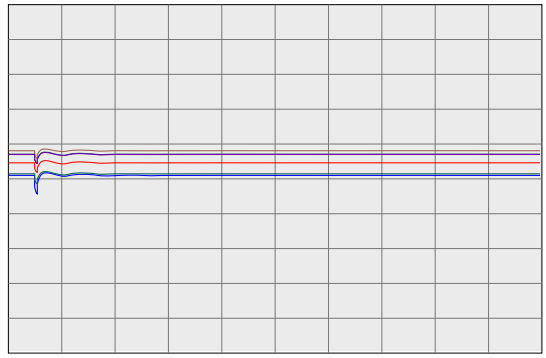
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

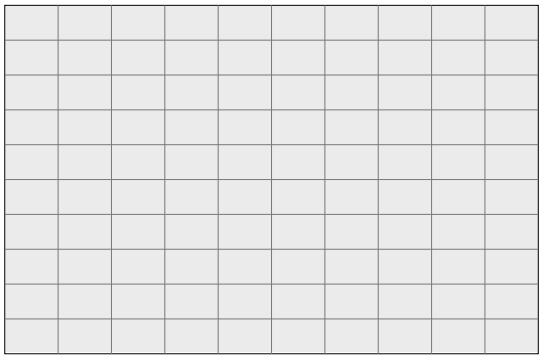
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

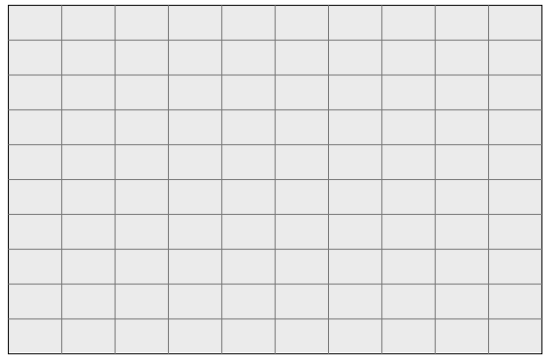


0.0 20.0

Time(sec)

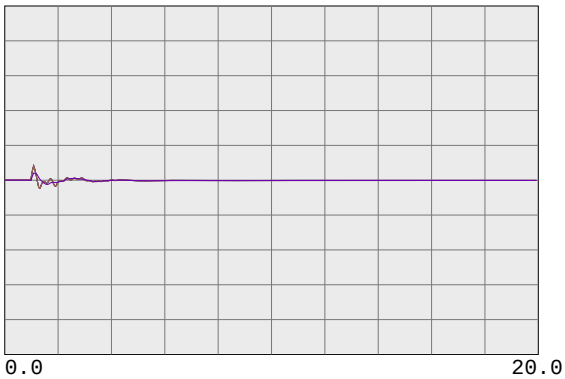
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500





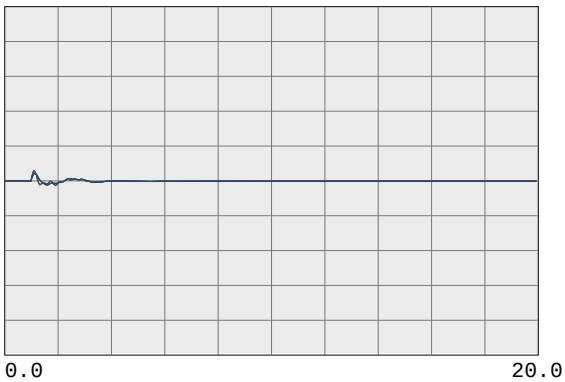
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000

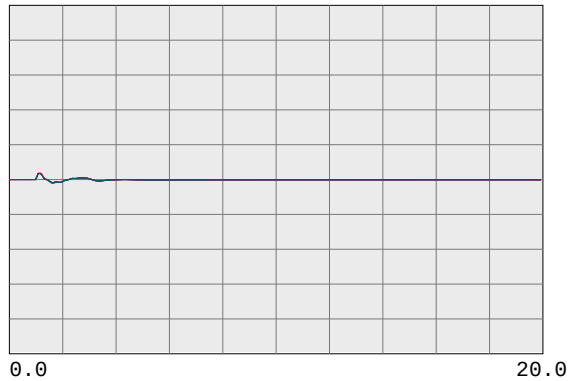
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

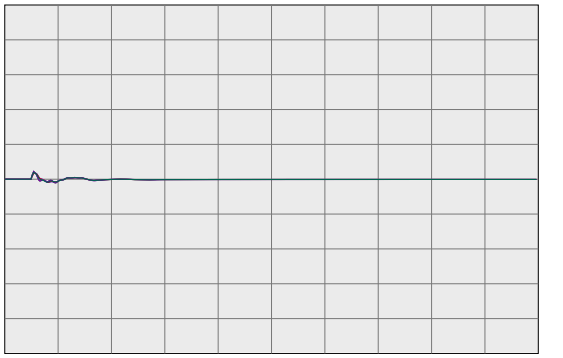
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



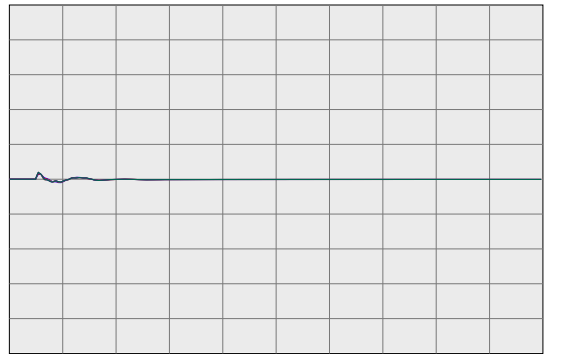
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

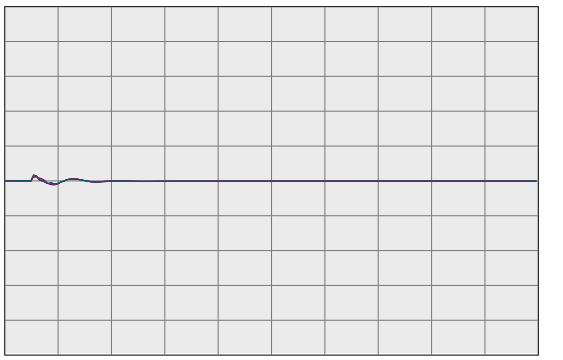
230-KV SYSTEM FREQUENCIES



59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

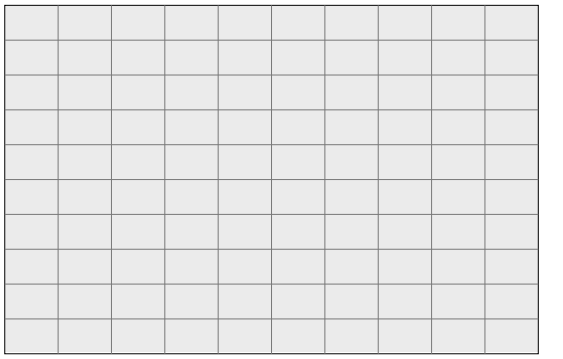


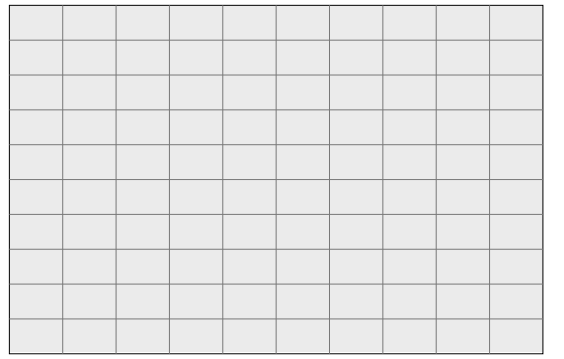
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

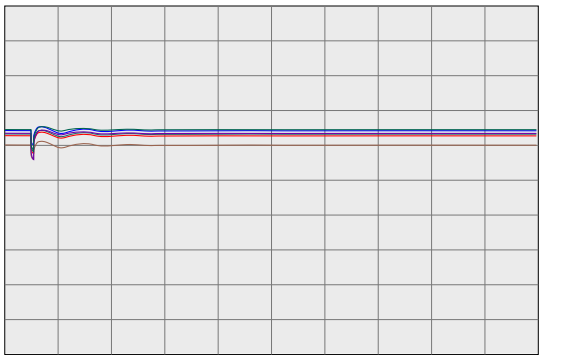
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



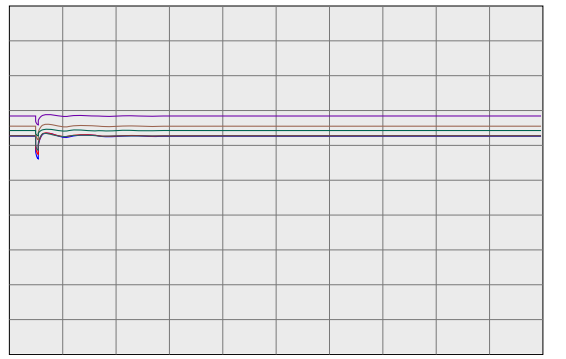


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

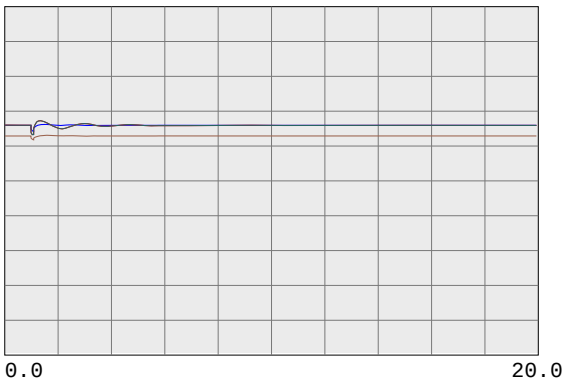
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



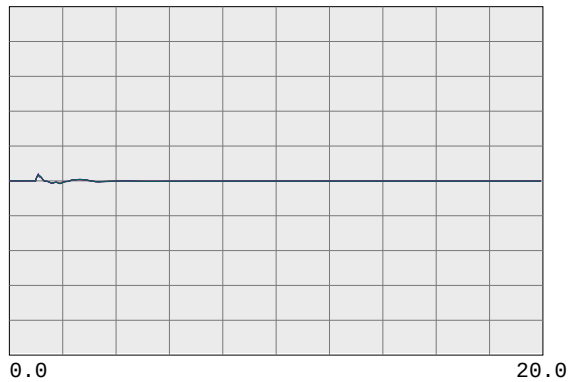
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



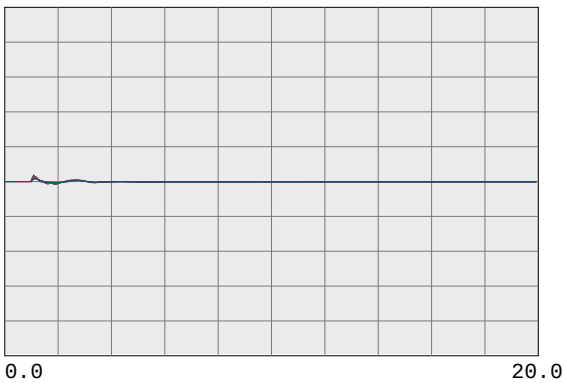
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

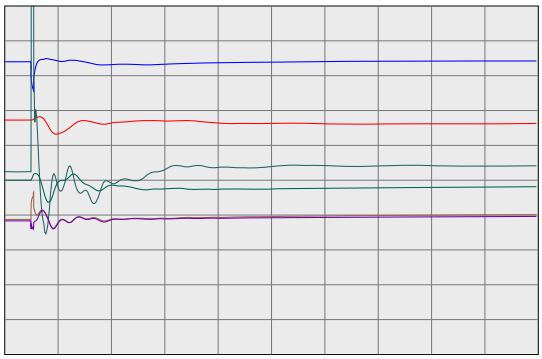


59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

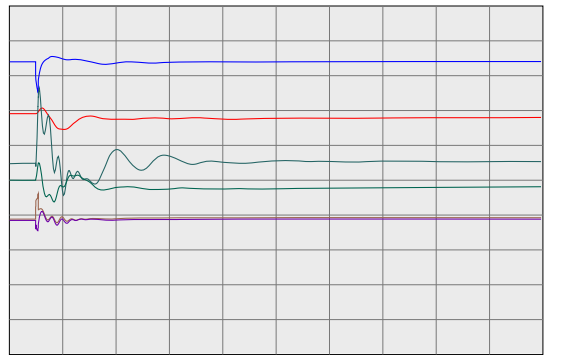
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

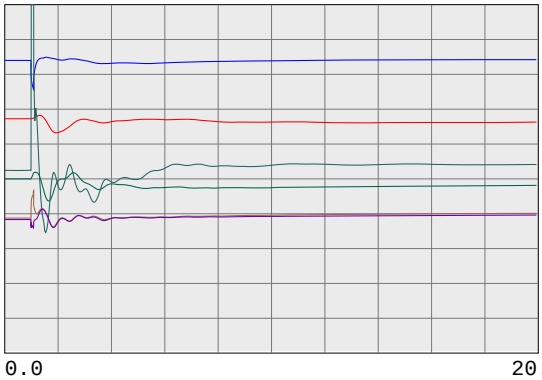
WILLOW PASS GENERATION PLANT



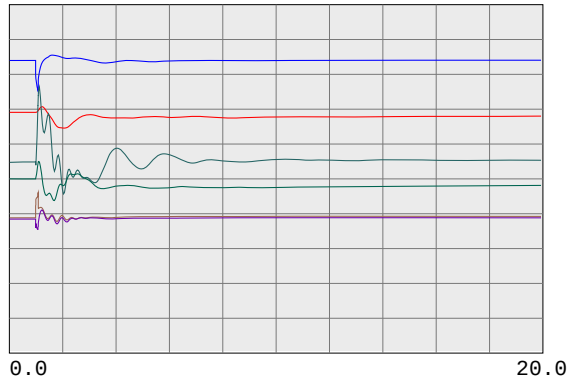
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



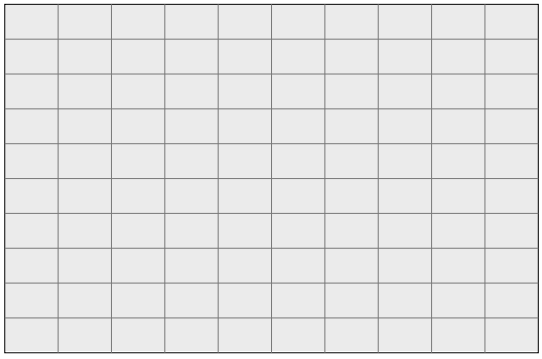
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

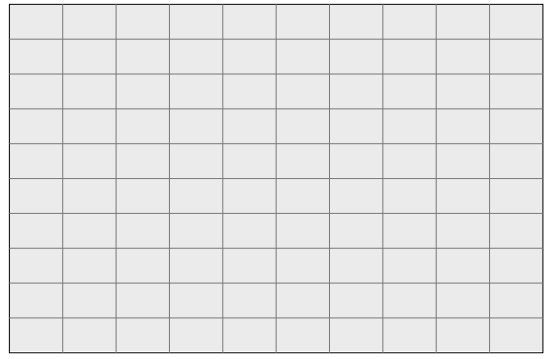


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



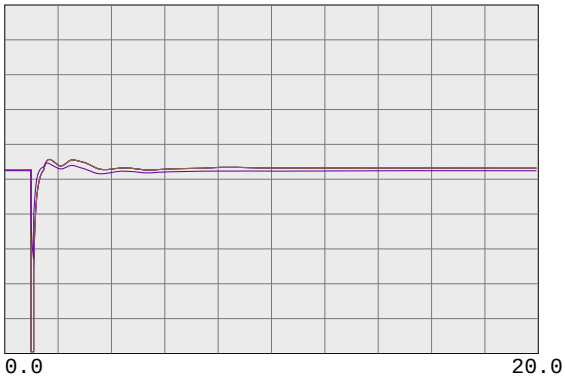
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



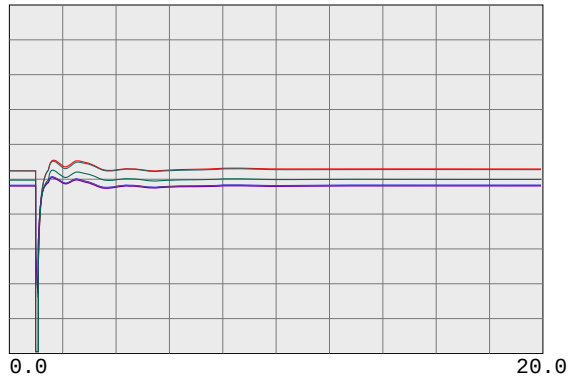


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

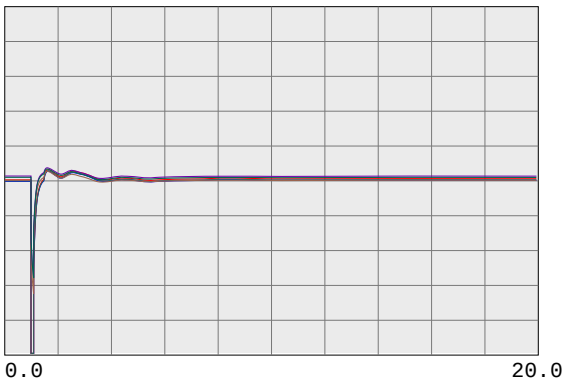
230-KV SYSTEM VOLTAGES



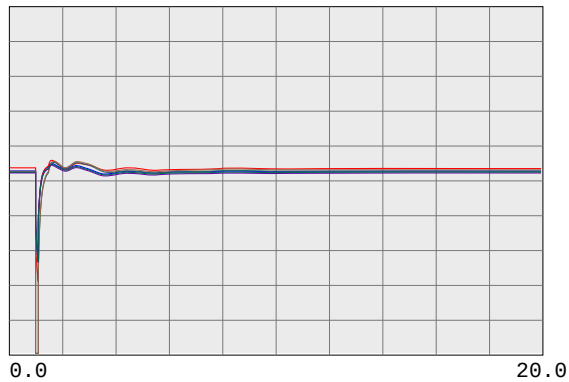
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



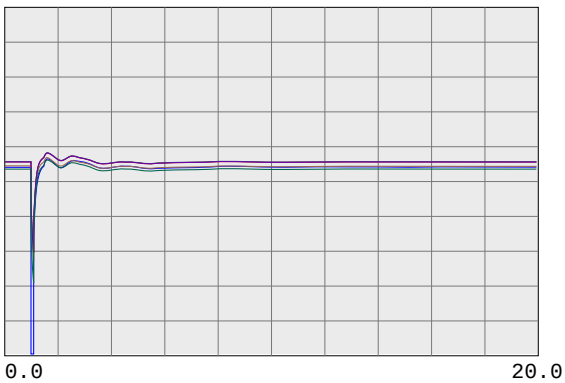
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



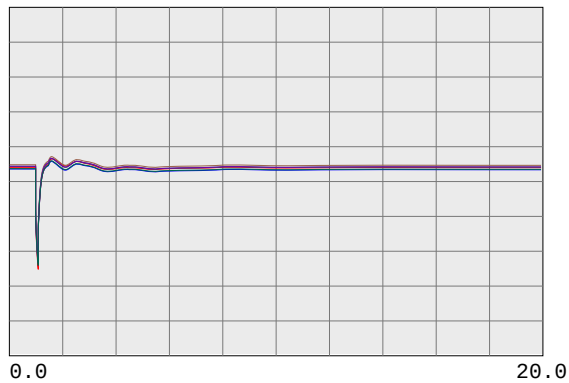
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



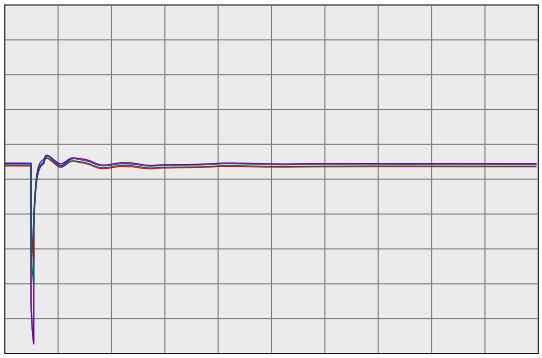
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

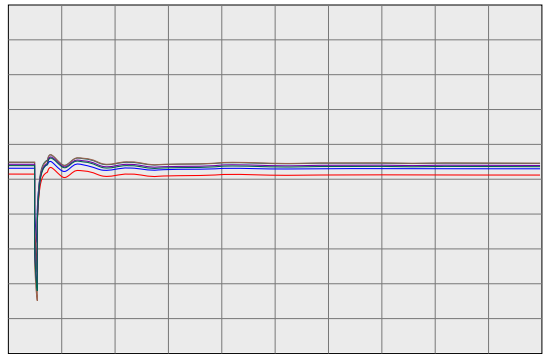
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

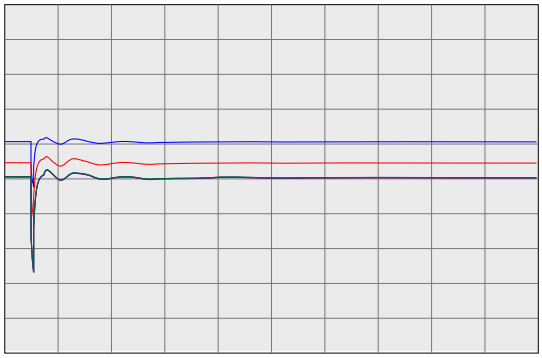
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

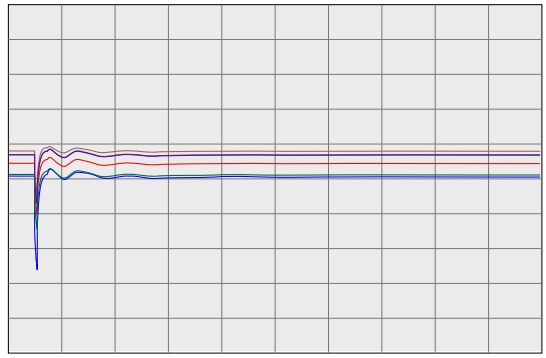
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

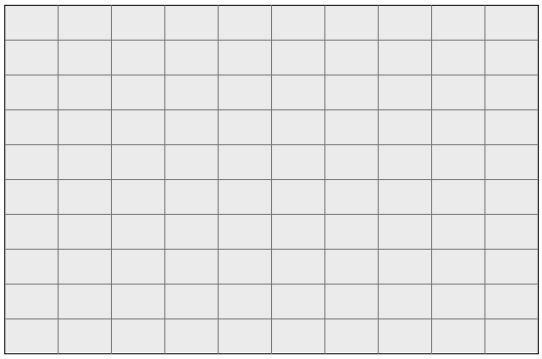
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

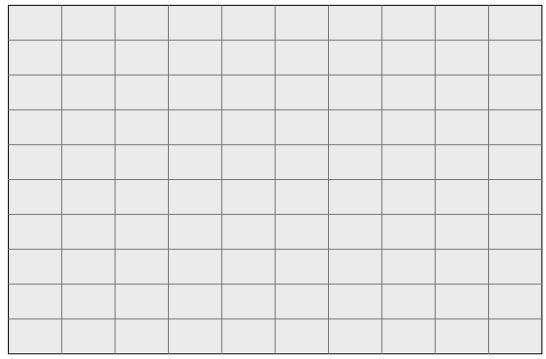


0.0 20.0

Time(sec)

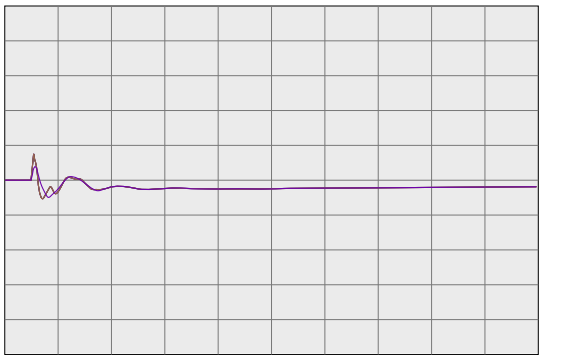
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



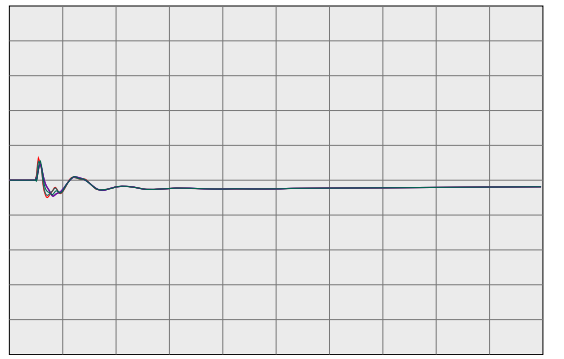


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

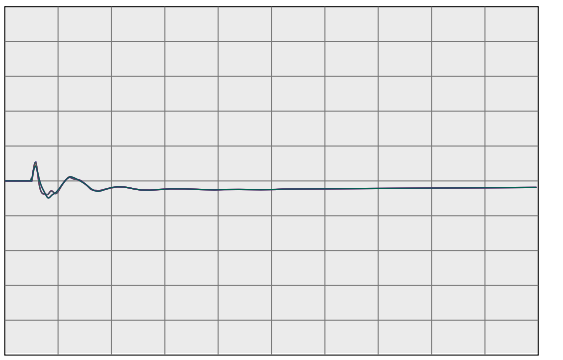
230-KV SYSTEM FREQUENCIES



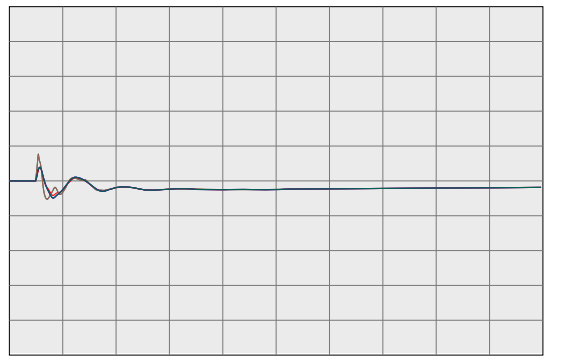
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



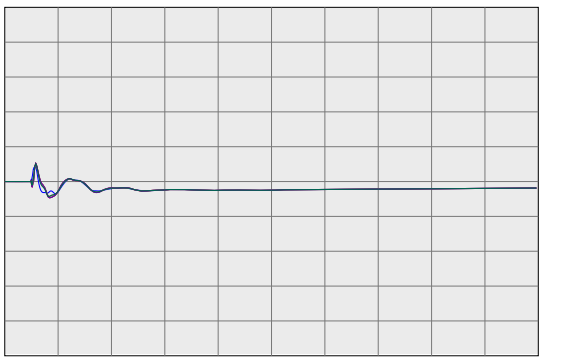
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



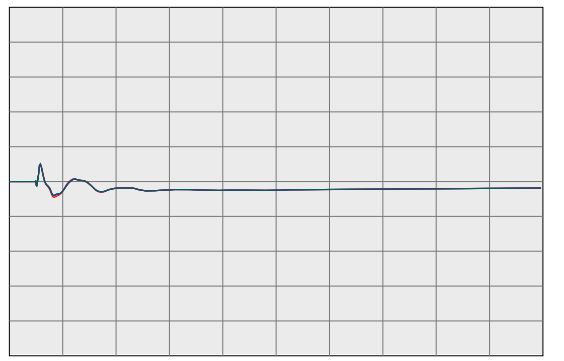
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



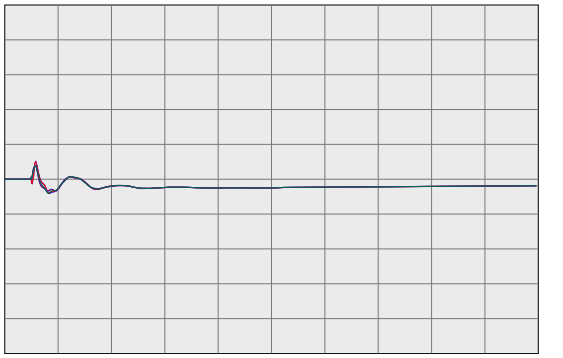
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



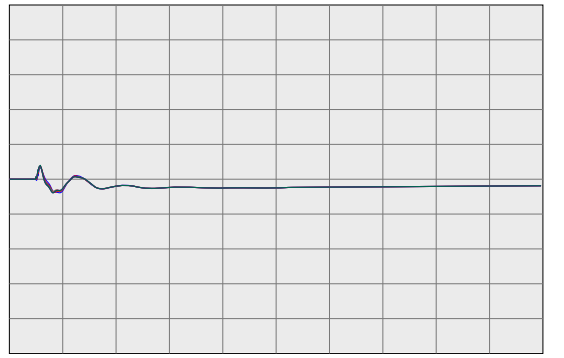
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

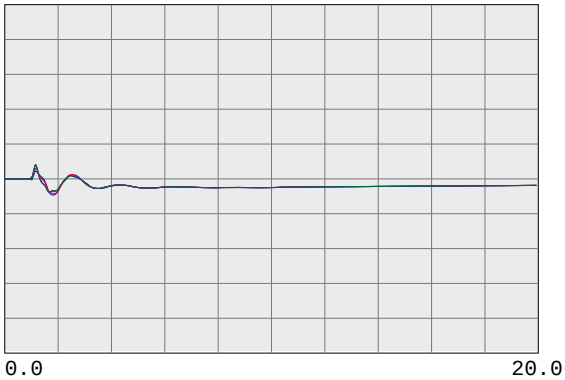
230-KV SYSTEM FREQUENCIES



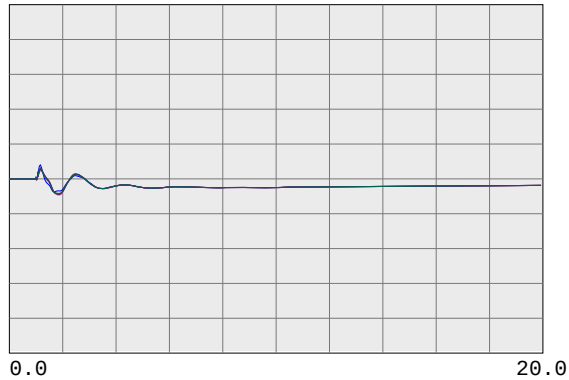
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



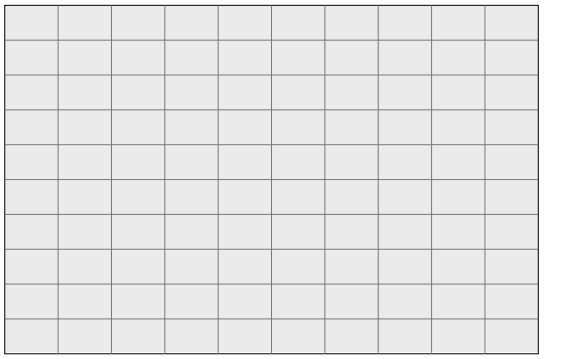
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

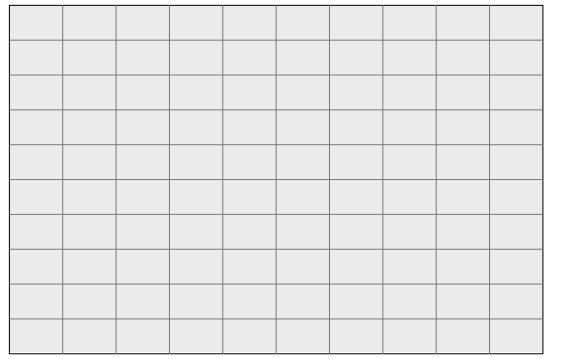


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



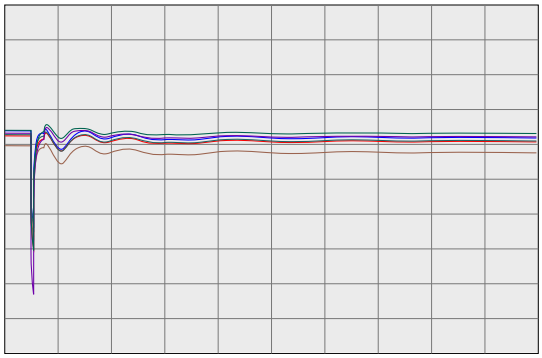
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

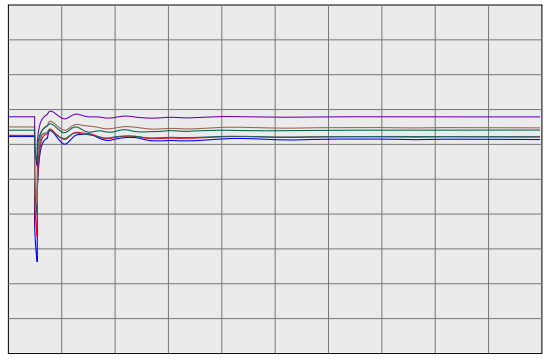
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.0 20.0

Time(sec)

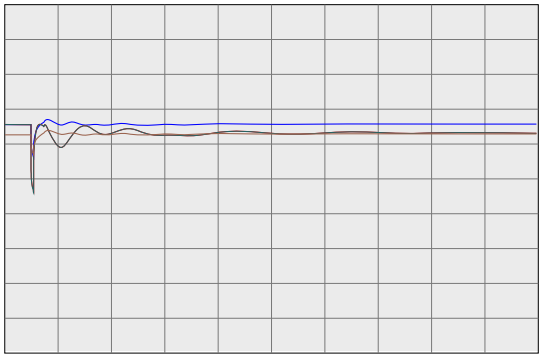
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

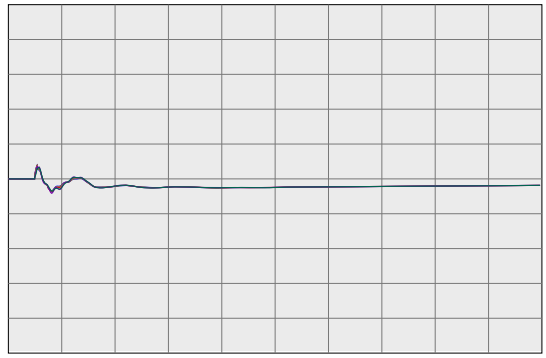
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

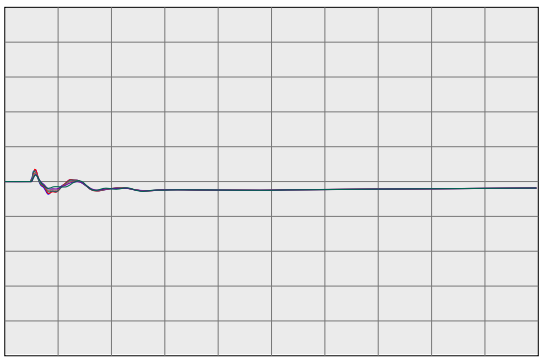
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

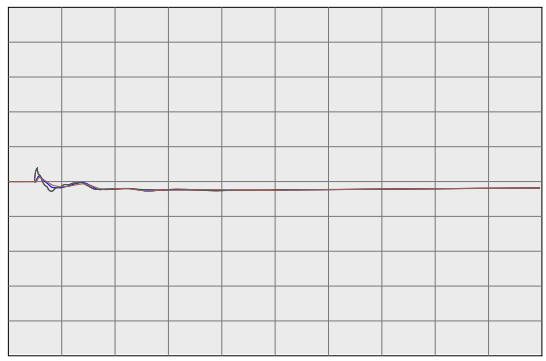
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



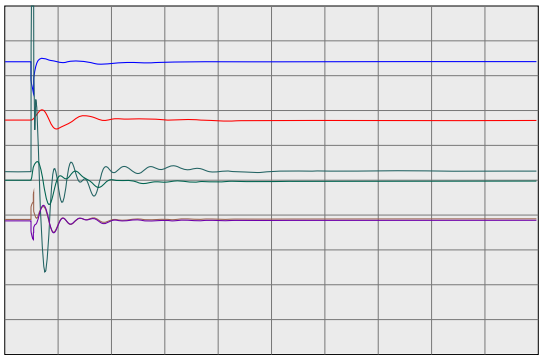
0.0 20.0

Time(sec)

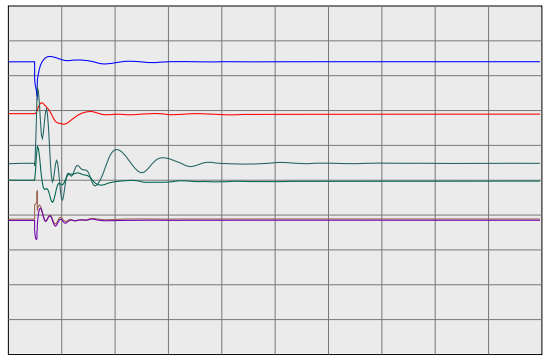
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

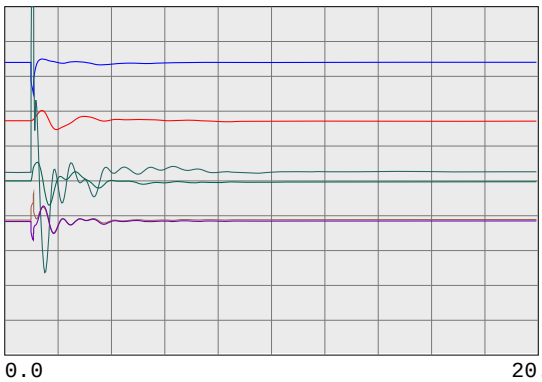
WILLOW PASS GENERATION PLANT



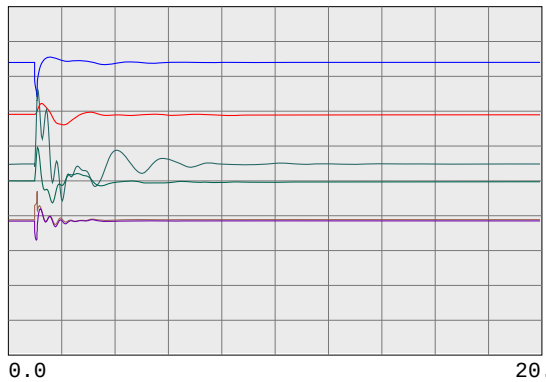
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



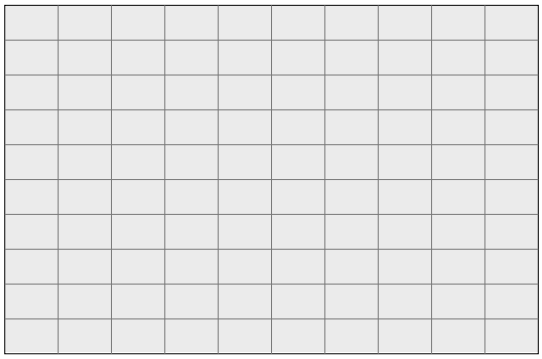
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

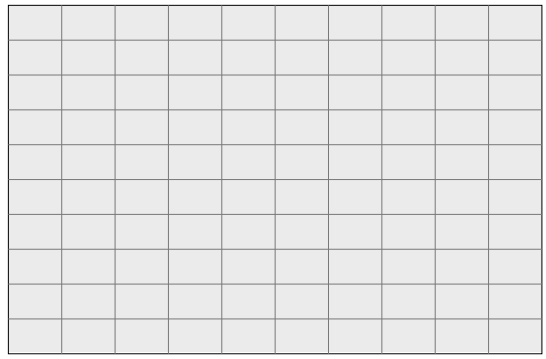


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



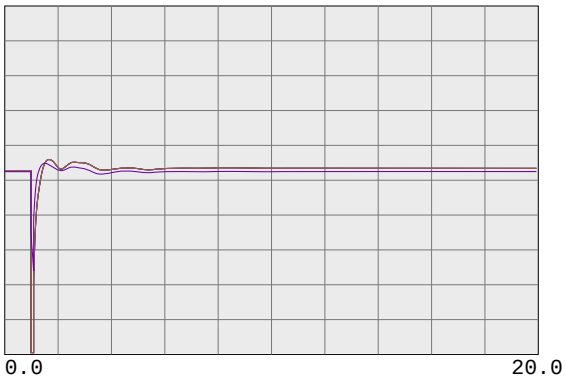
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



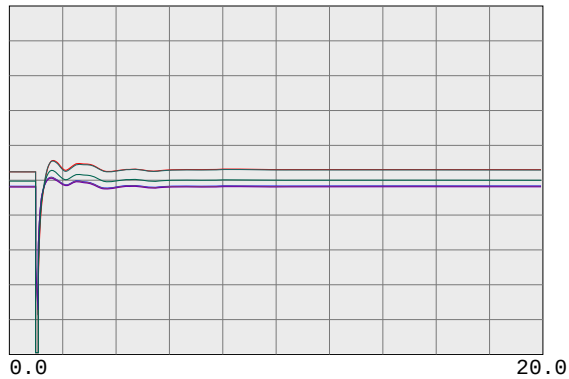


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

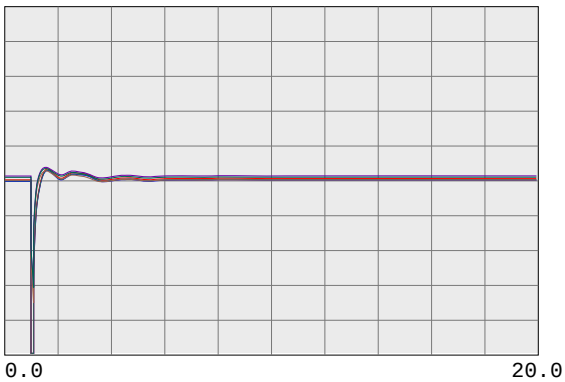
230-KV SYSTEM VOLTAGES



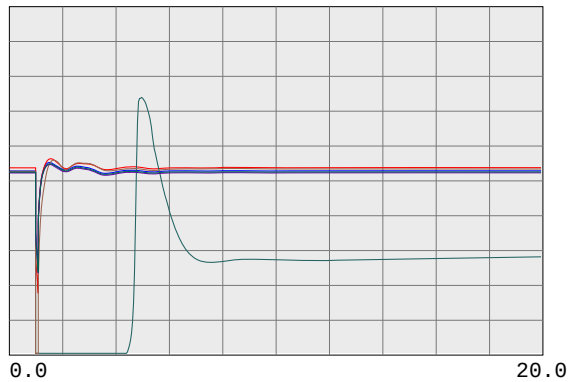
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



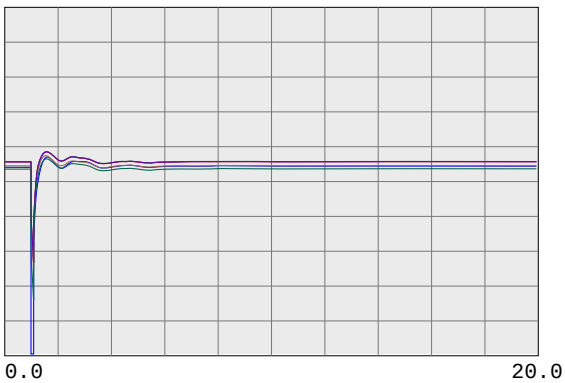
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



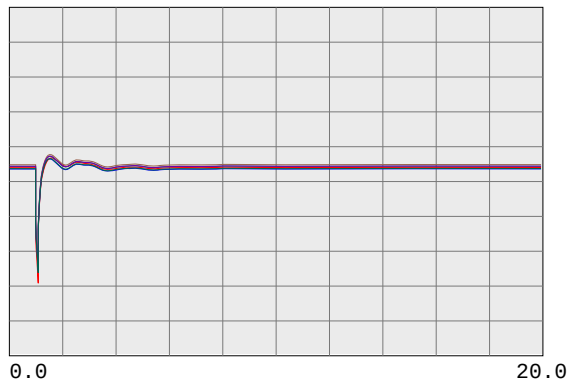
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



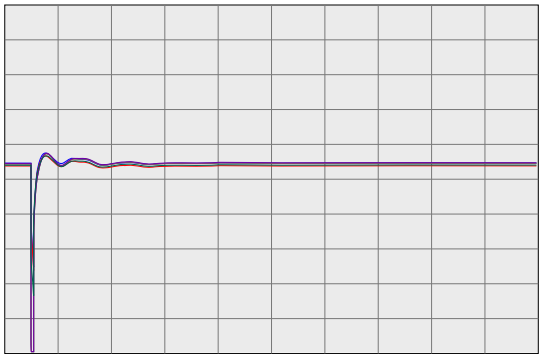
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

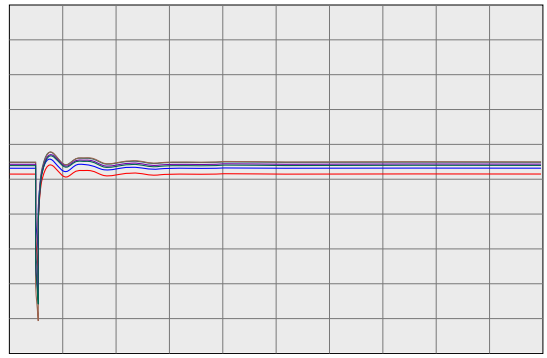
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

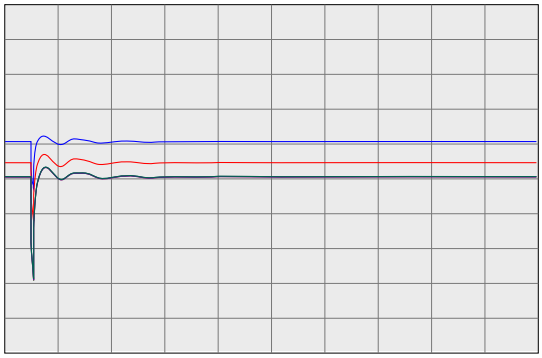
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

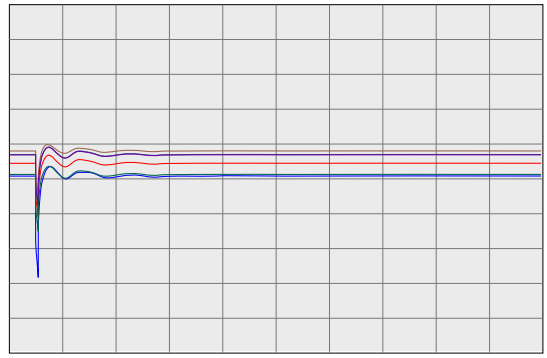
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

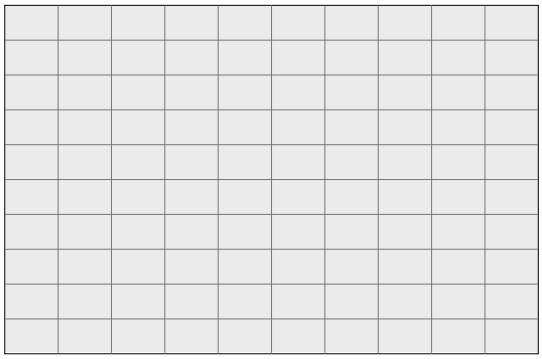
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

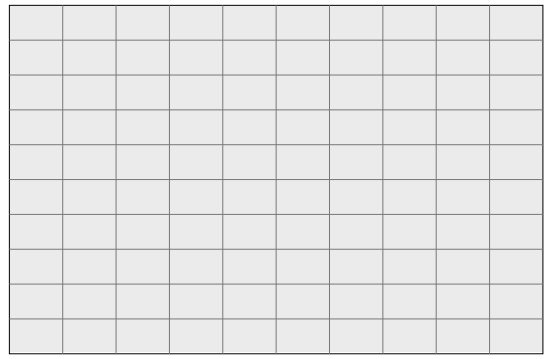


0.0 20.0

Time(sec)

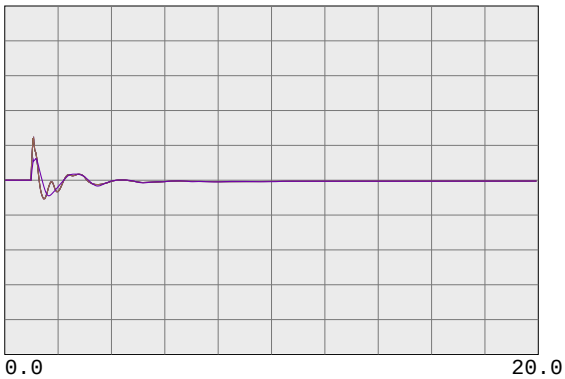
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



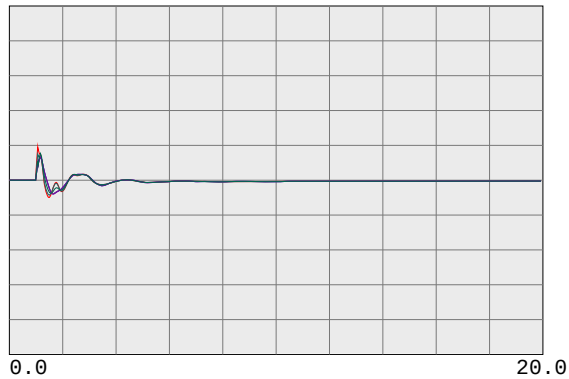


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

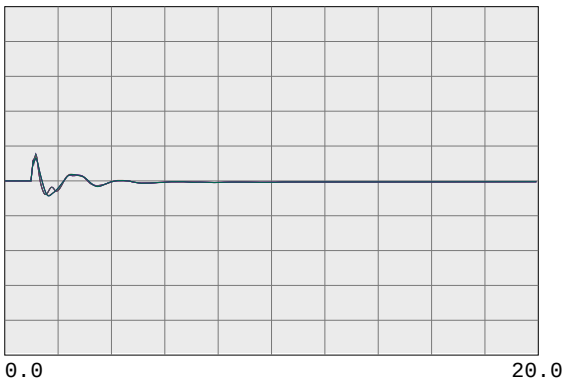
230-KV SYSTEM FREQUENCIES



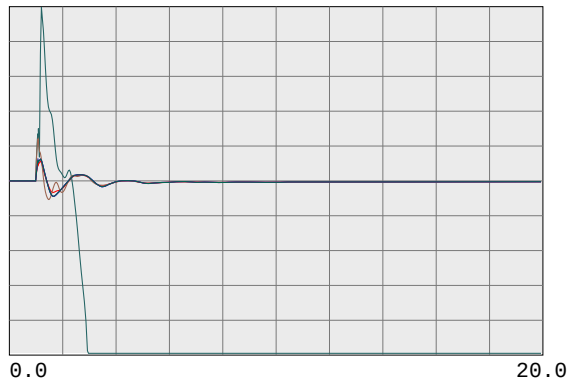
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



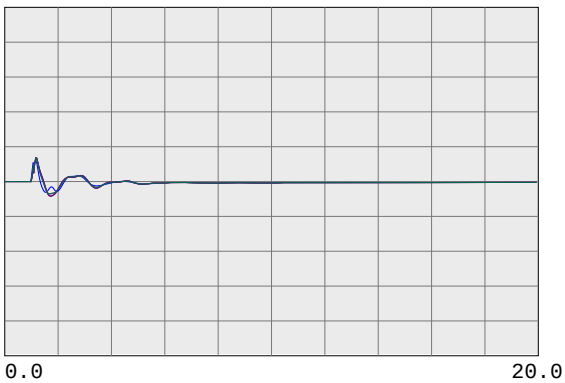
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



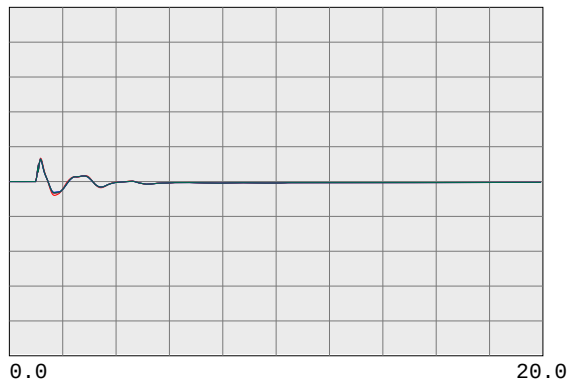
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



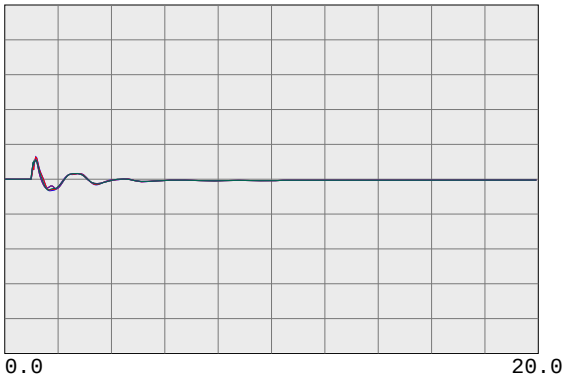
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



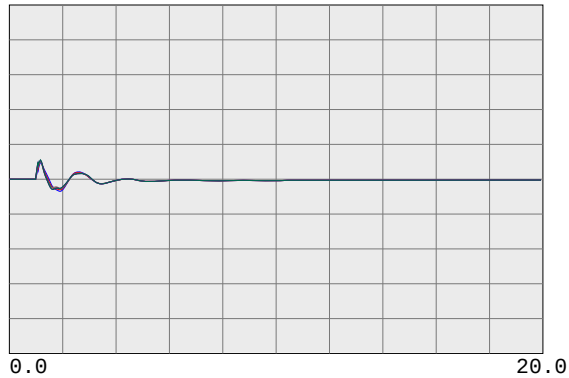
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

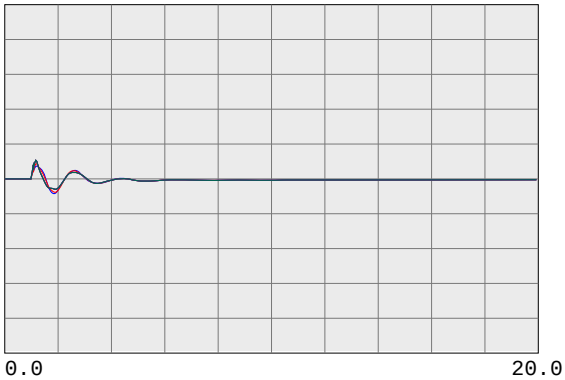
230-KV SYSTEM FREQUENCIES



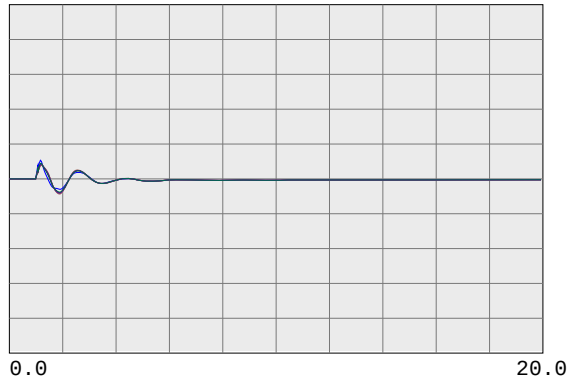
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



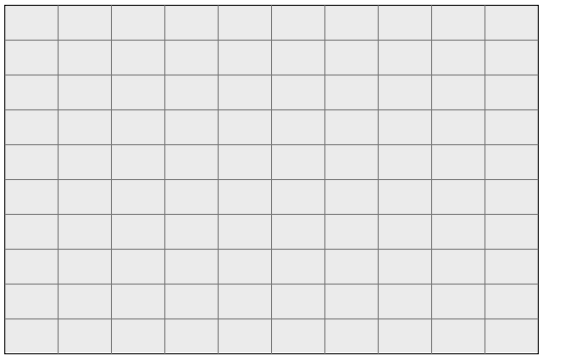
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

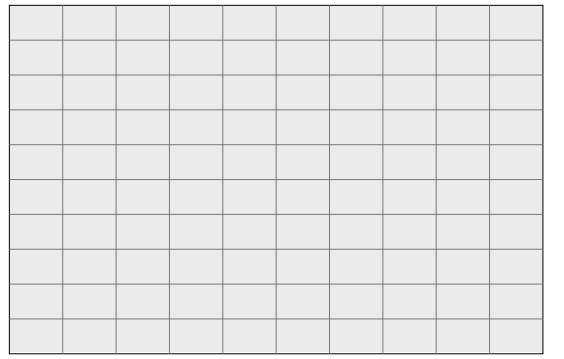


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



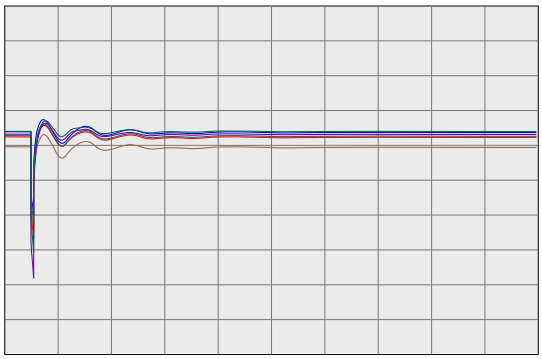
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000





PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

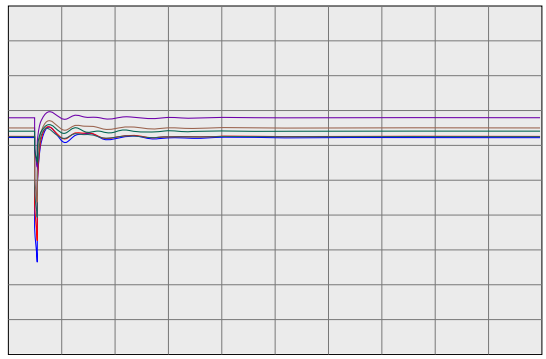
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.0 20.0

Time(sec)

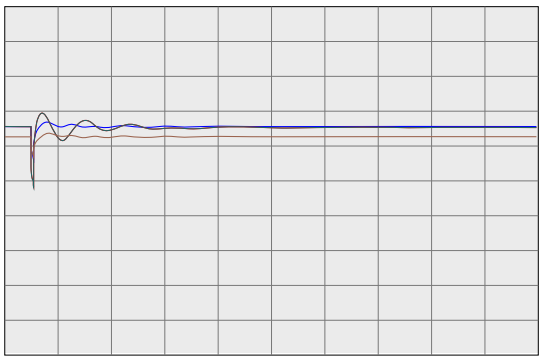
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

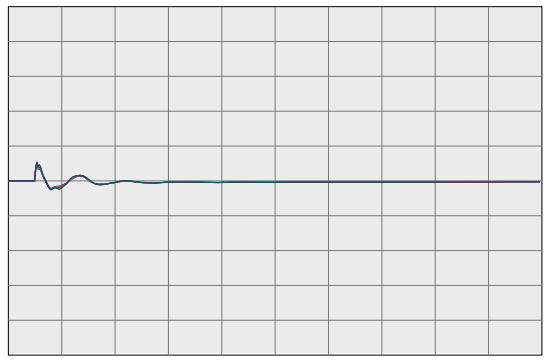
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

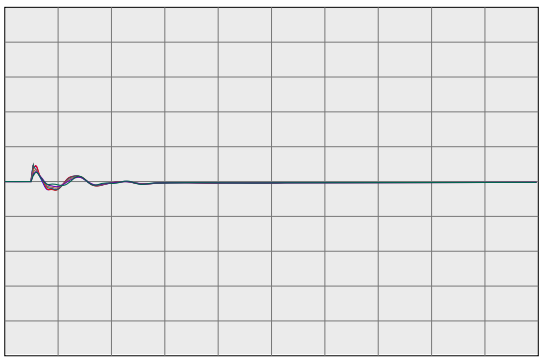
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

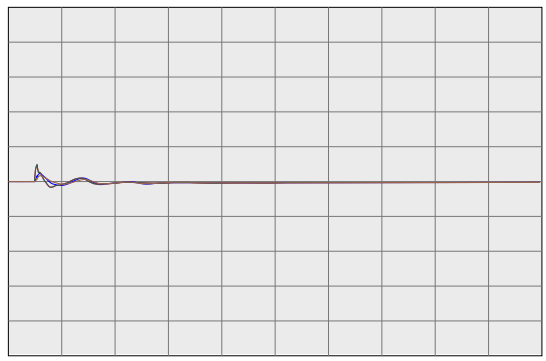
59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



0.0 20.0

Time(sec)

59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



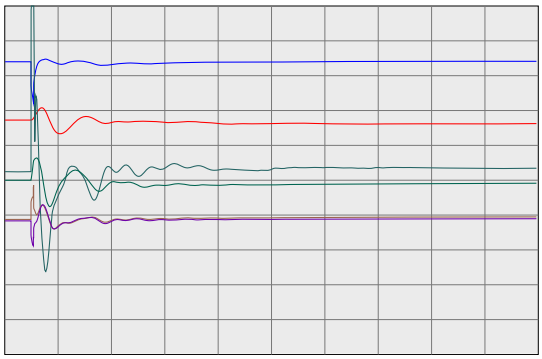
0.0 20.0

Time(sec)

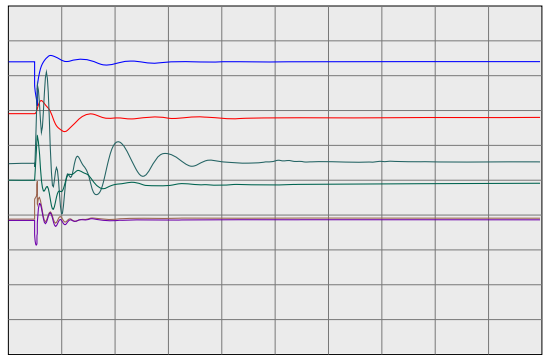
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

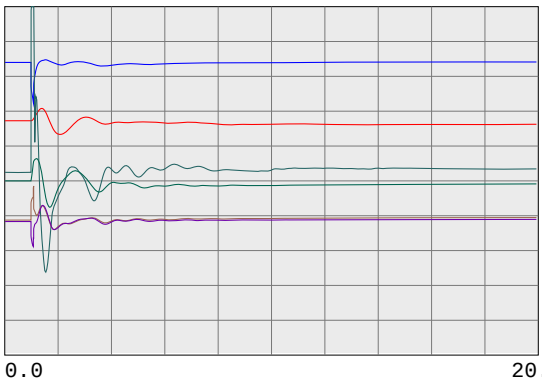
WILLOW PASS GENERATION PLANT



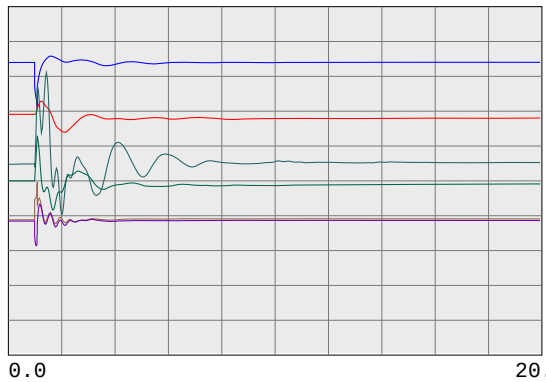
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



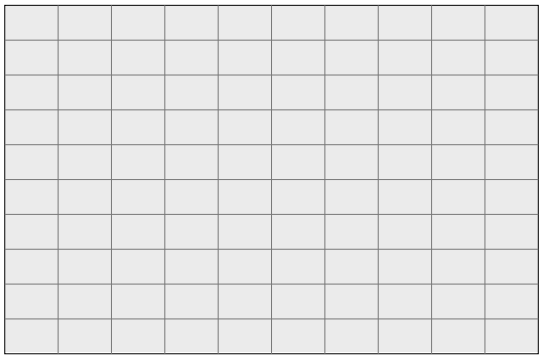
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

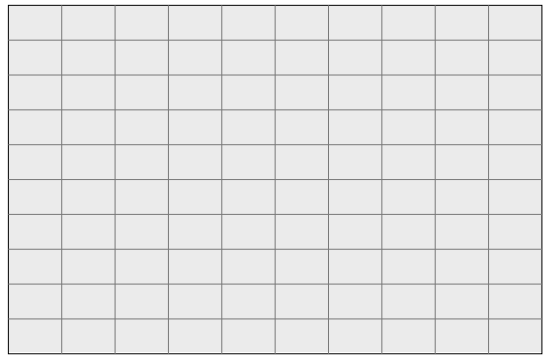


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



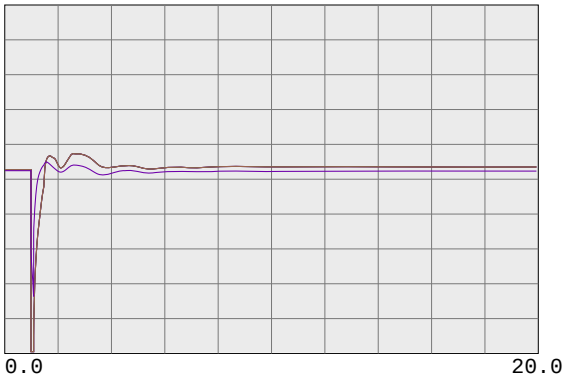
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



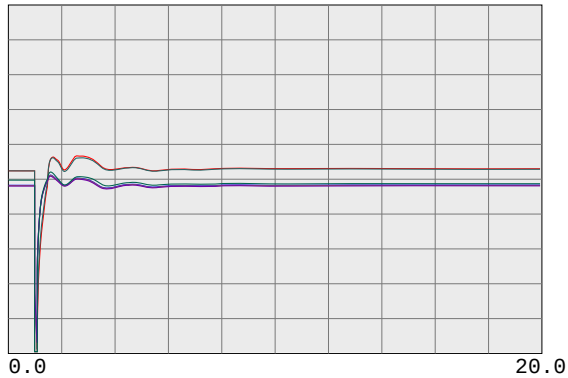


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

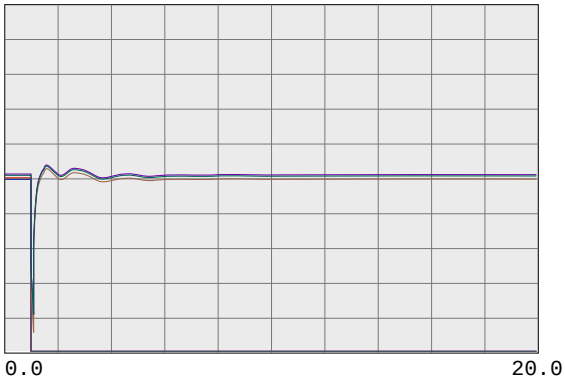
230-KV SYSTEM VOLTAGES



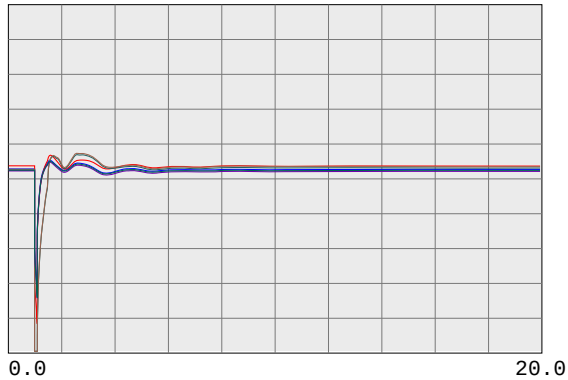
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



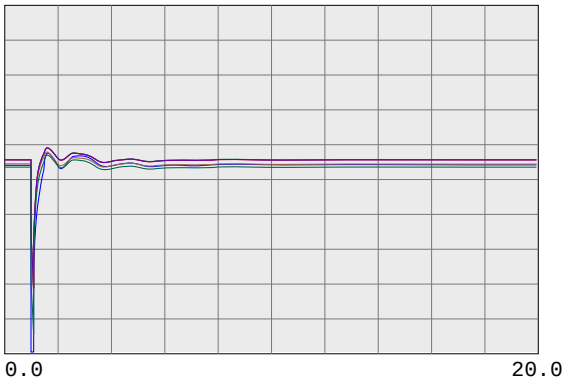
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



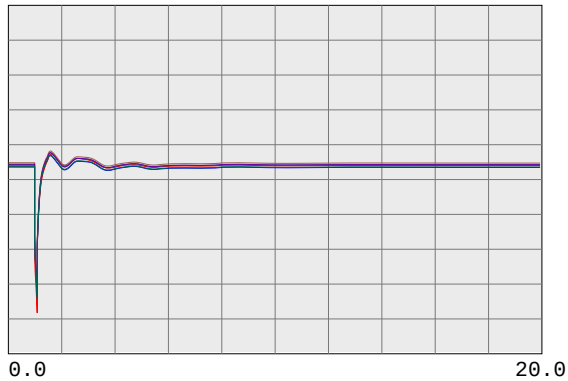
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



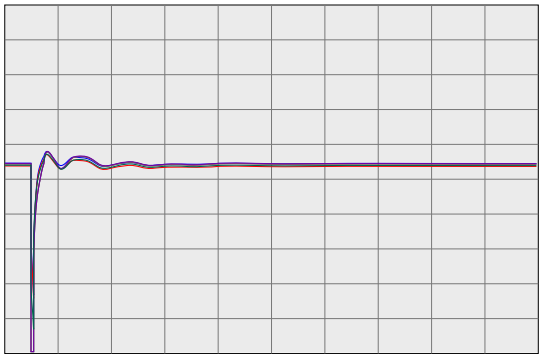
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

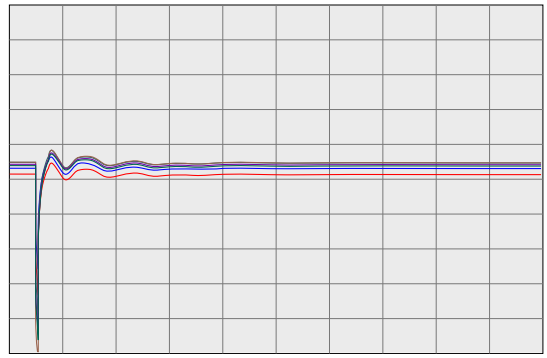
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

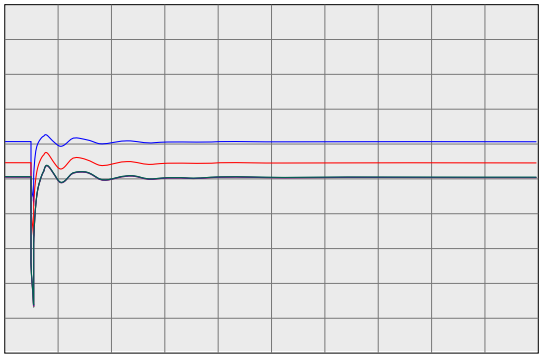
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

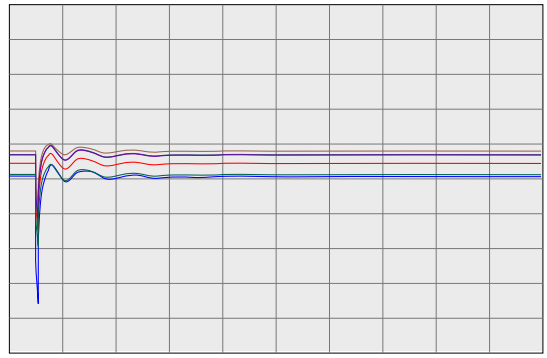
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

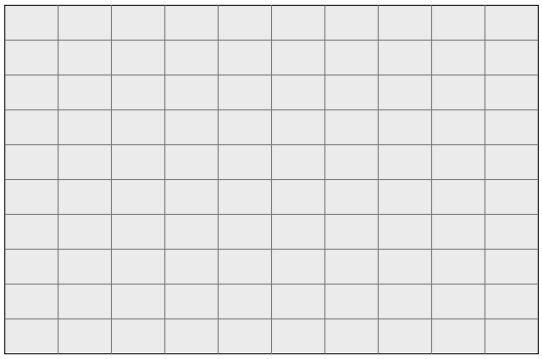
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

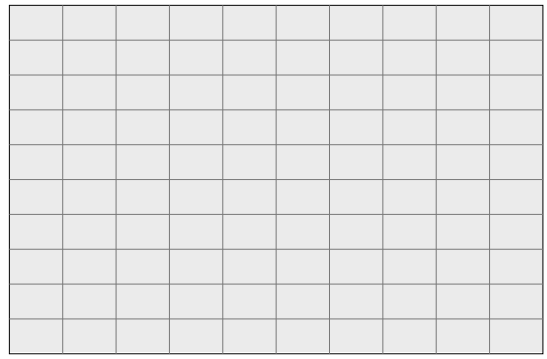


0.0 20.0

Time(sec)

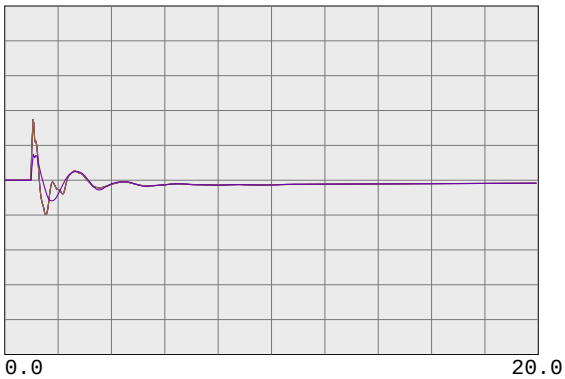
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



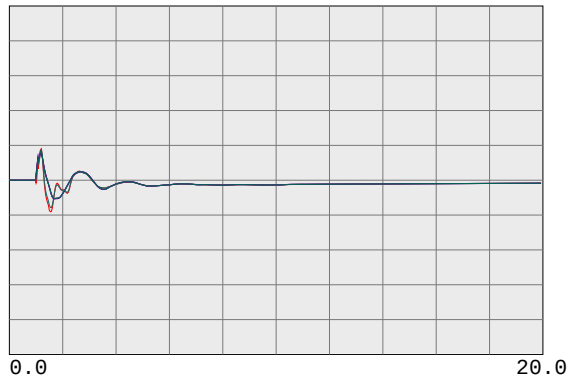


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

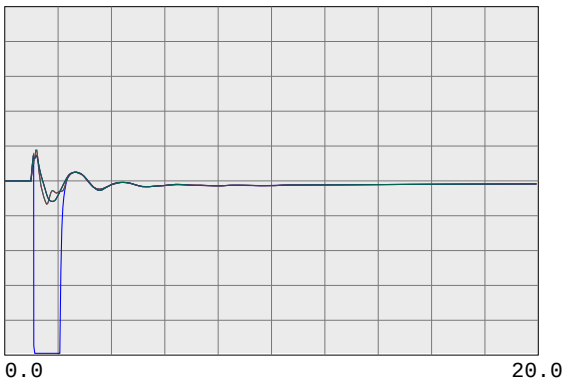
230-KV SYSTEM FREQUENCIES



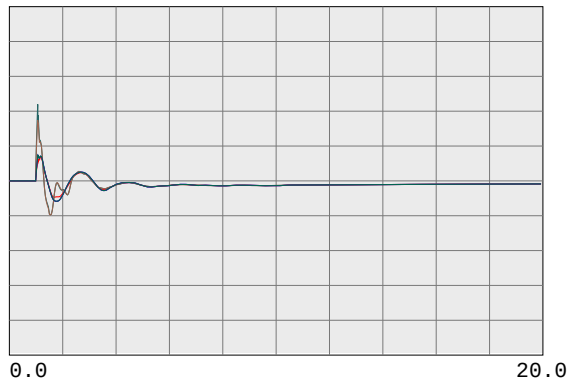
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



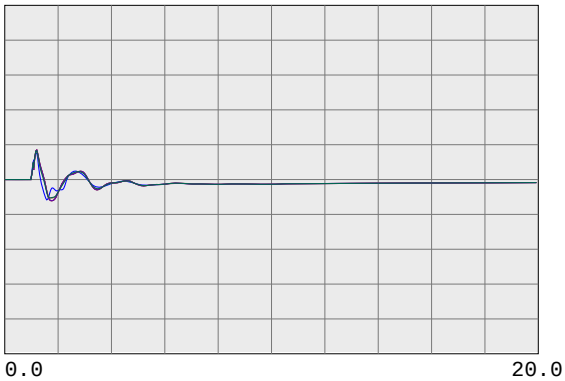
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



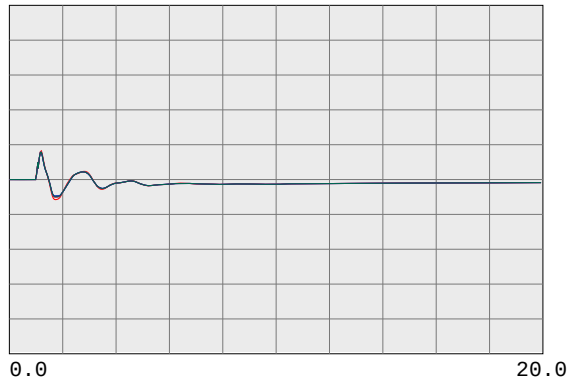
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



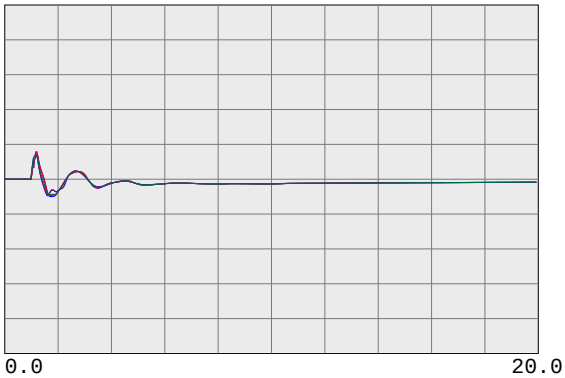
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



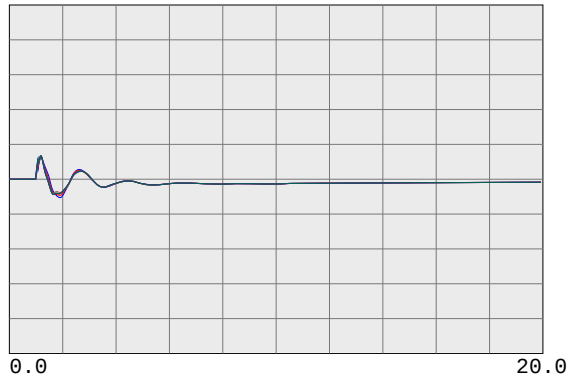
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

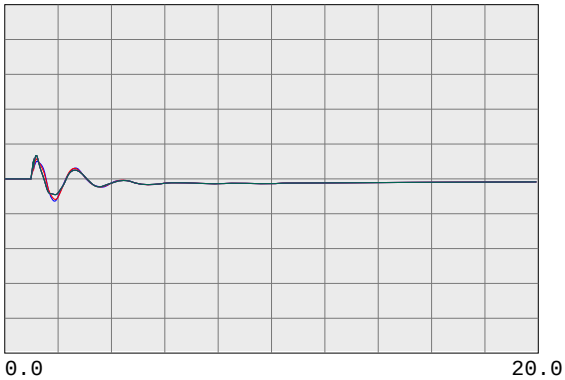
230-KV SYSTEM FREQUENCIES



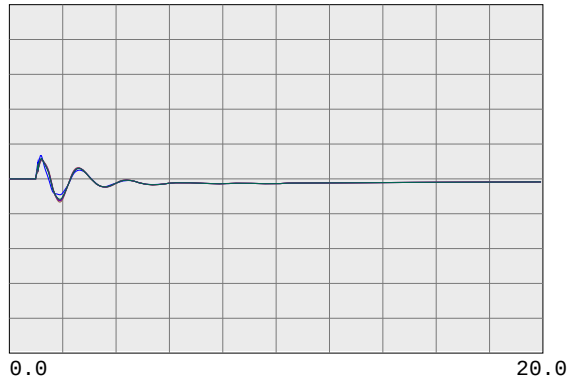
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



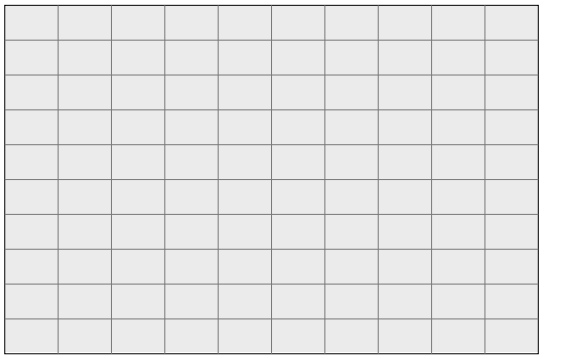
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

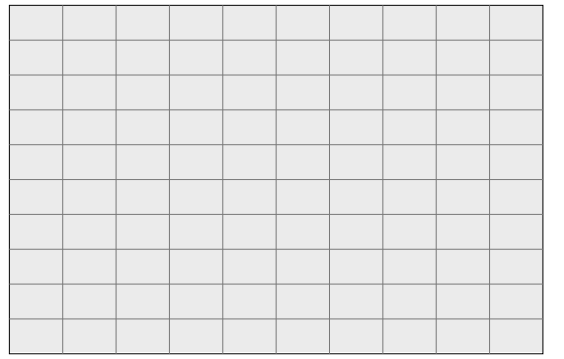


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



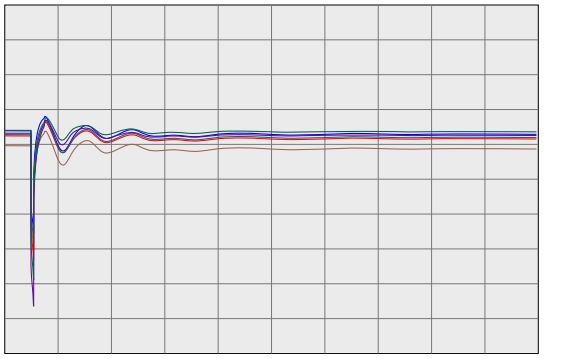
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



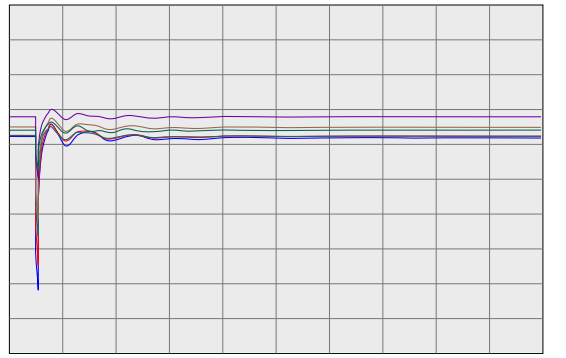


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

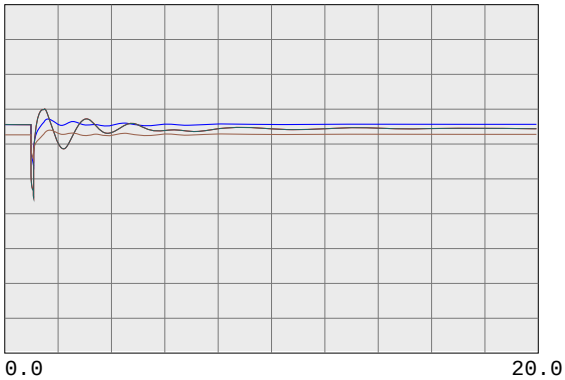
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



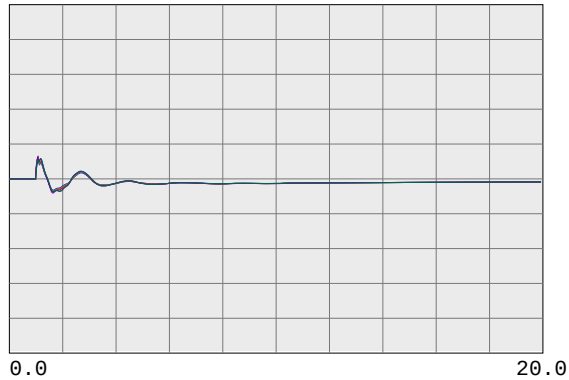
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



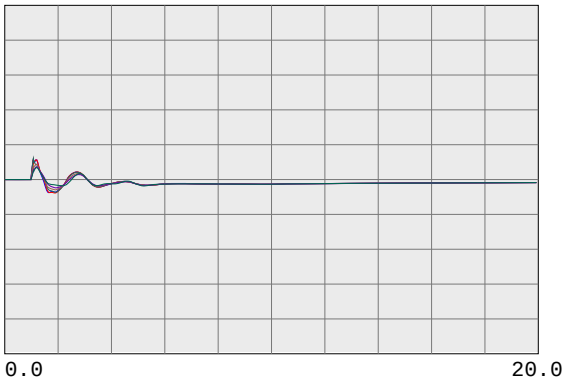
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



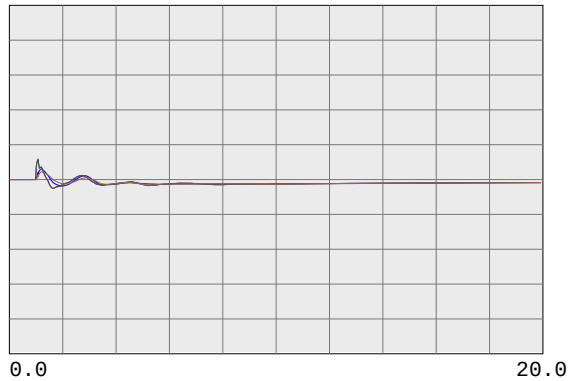
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



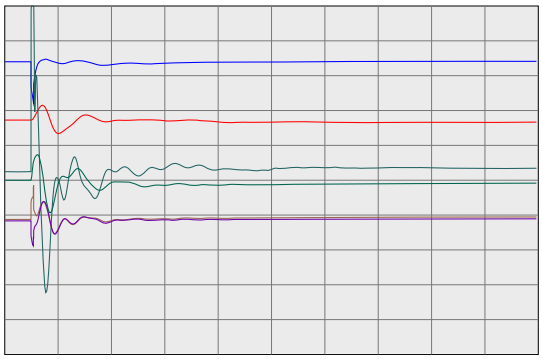
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



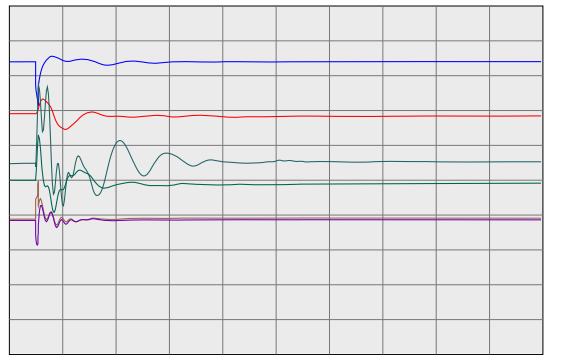
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

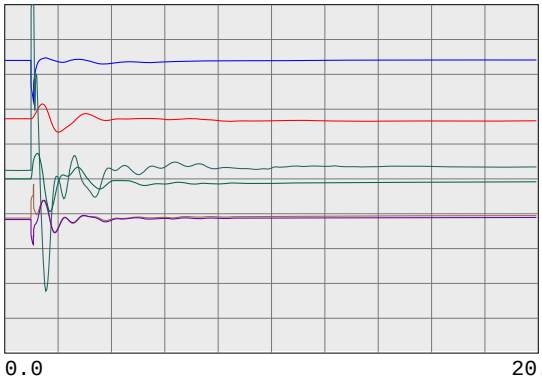
WILLOW PASS GENERATION PLANT



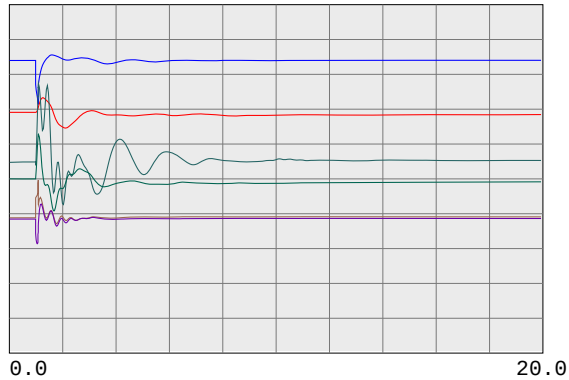
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



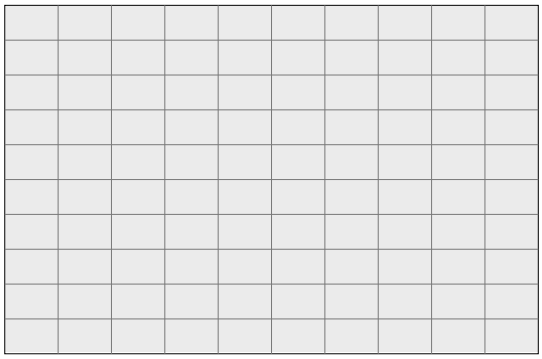
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

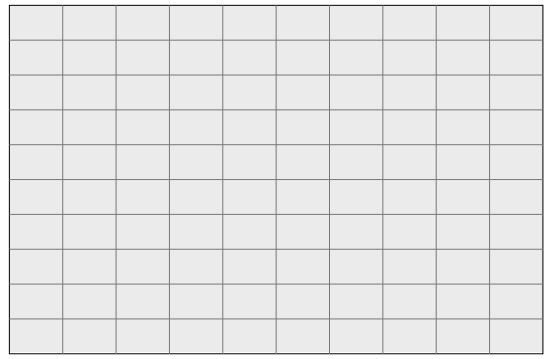


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



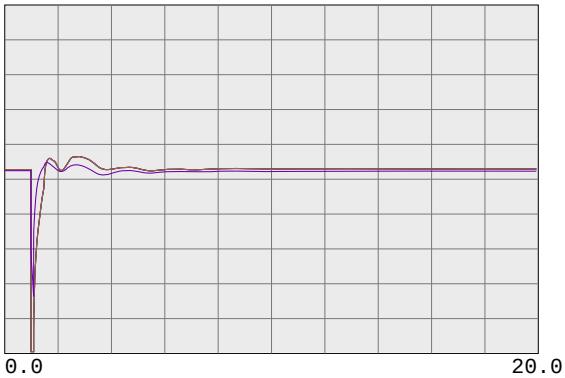
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



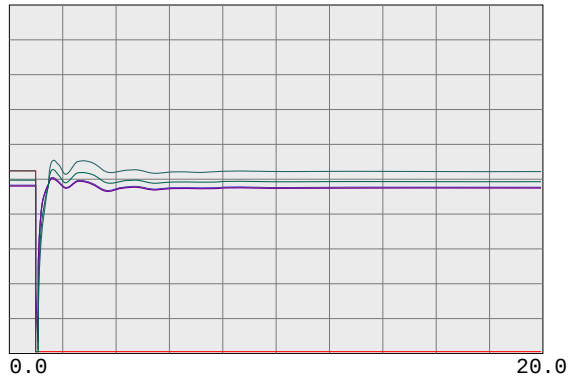


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

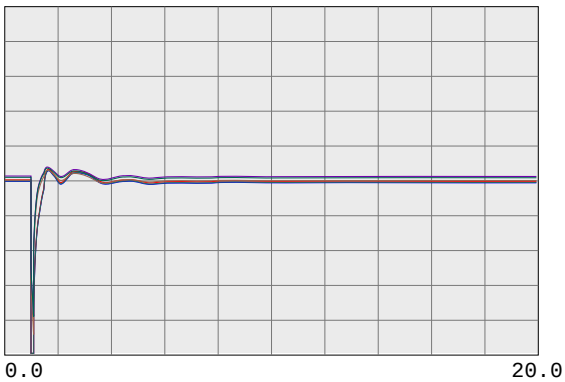
230-KV SYSTEM VOLTAGES



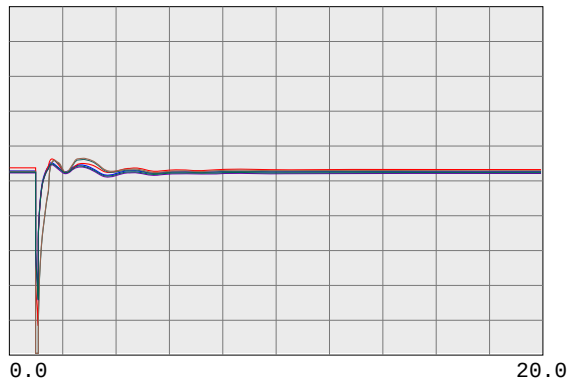
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



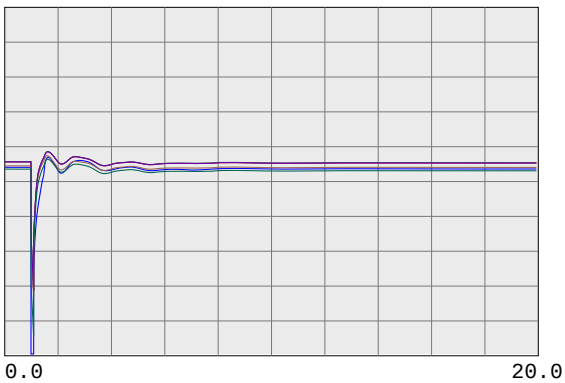
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



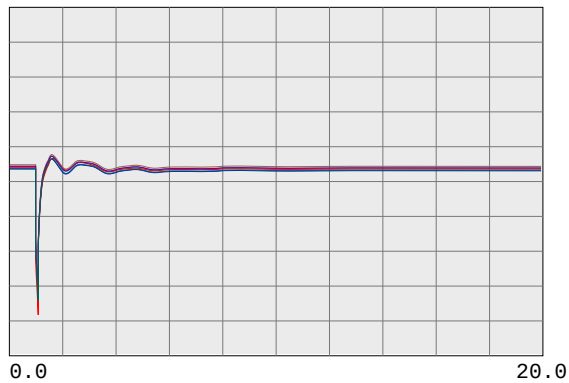
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



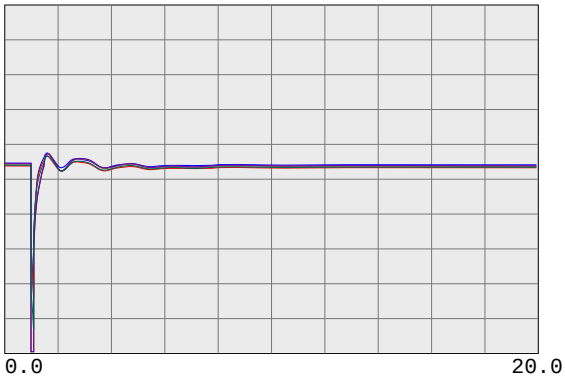
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



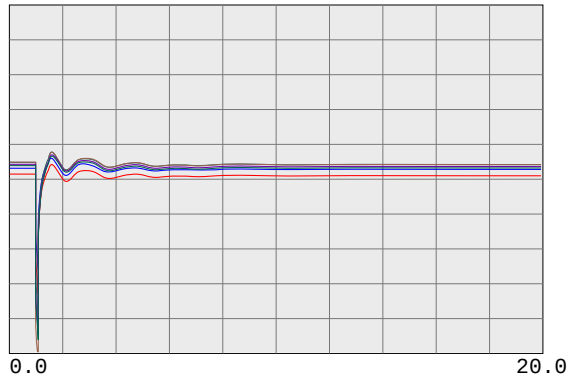
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

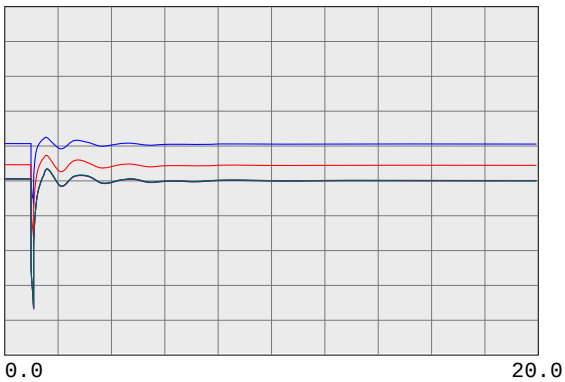
230-KV SYSTEM VOLTAGES



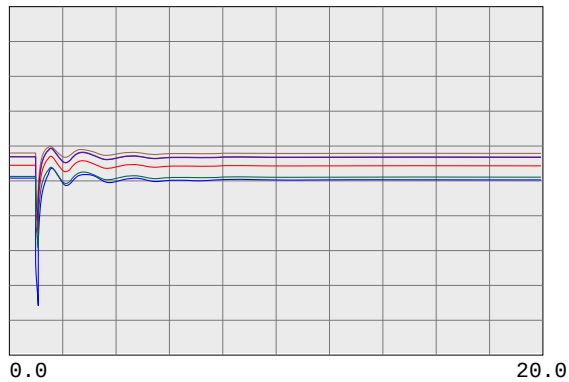
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



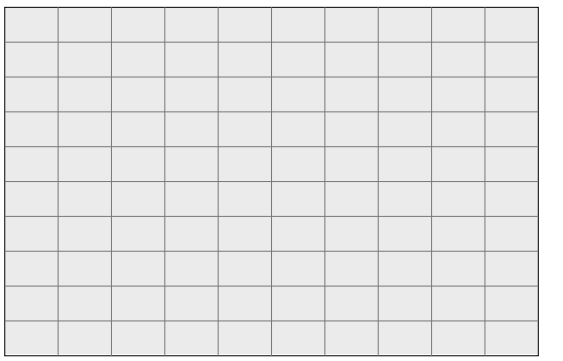
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

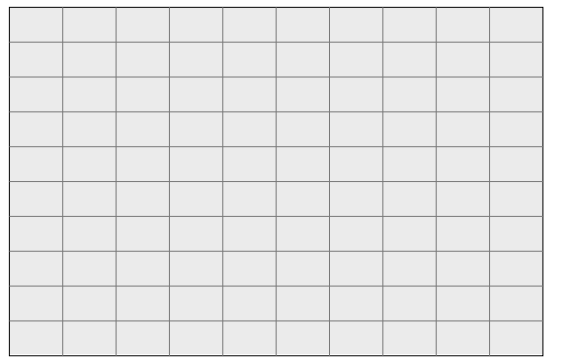


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



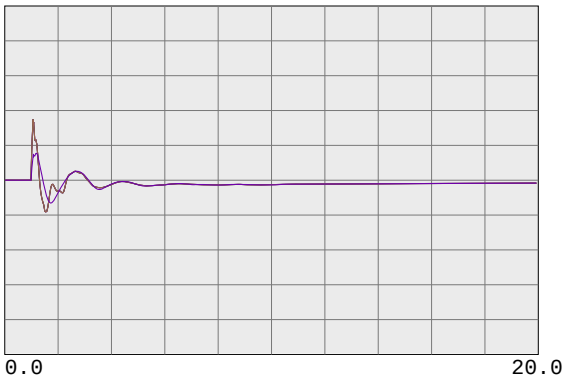
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



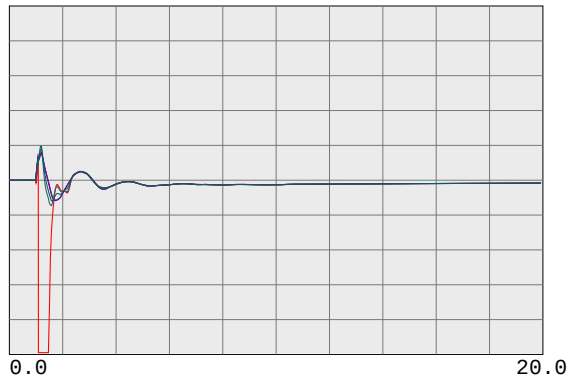


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

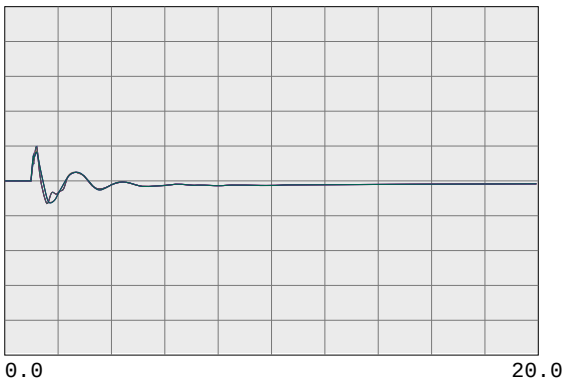
230-KV SYSTEM FREQUENCIES



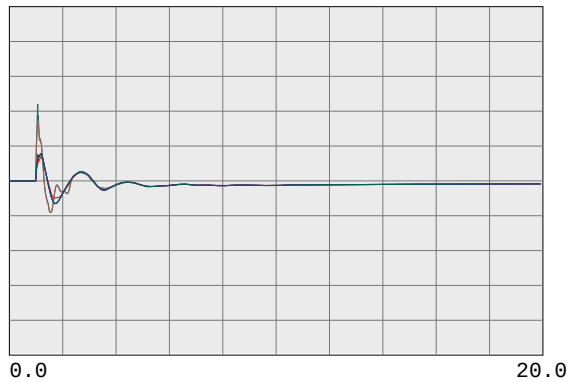
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



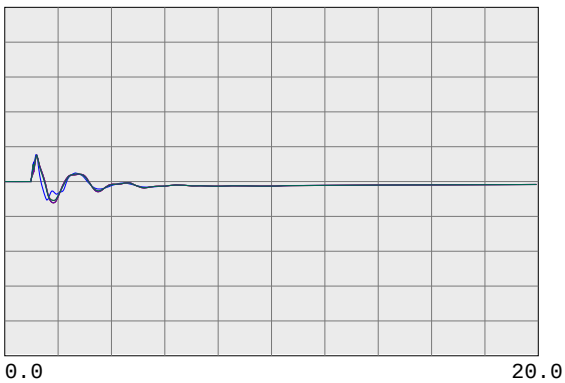
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



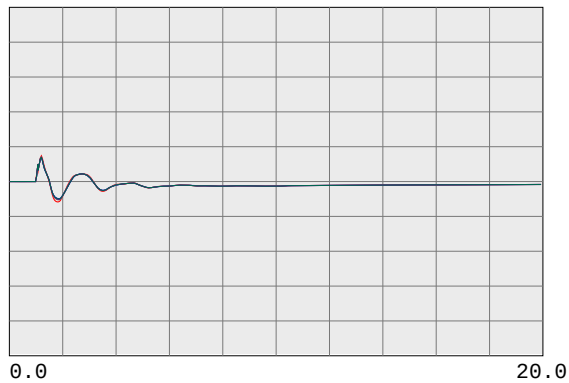
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



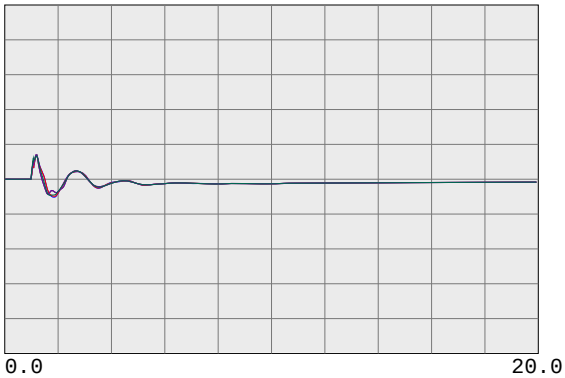
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



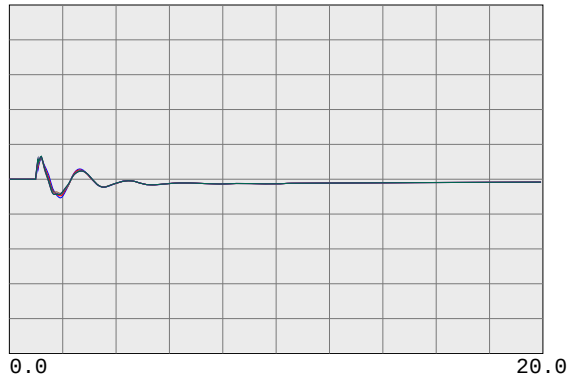
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

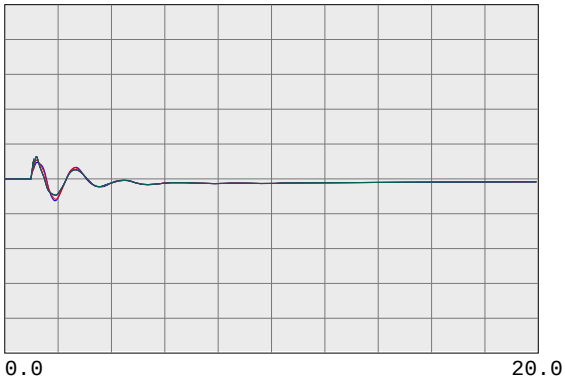
230-KV SYSTEM FREQUENCIES



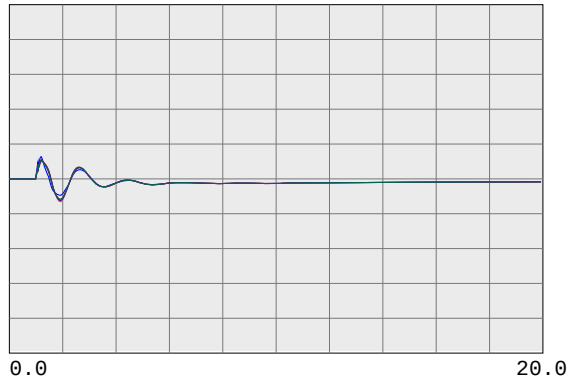
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



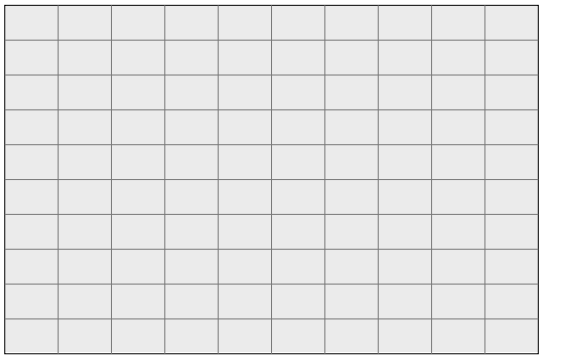
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

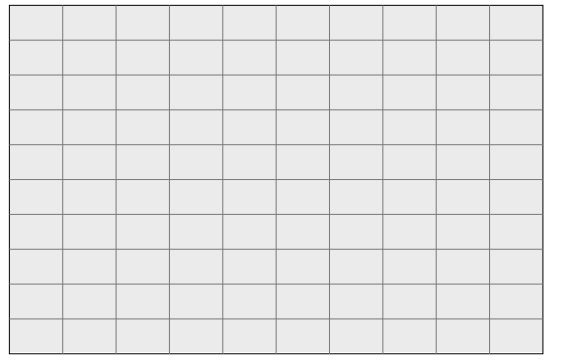


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



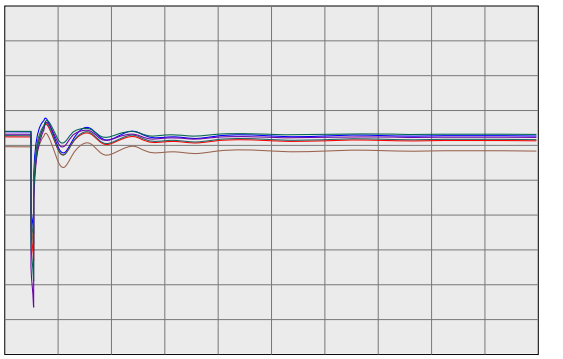
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



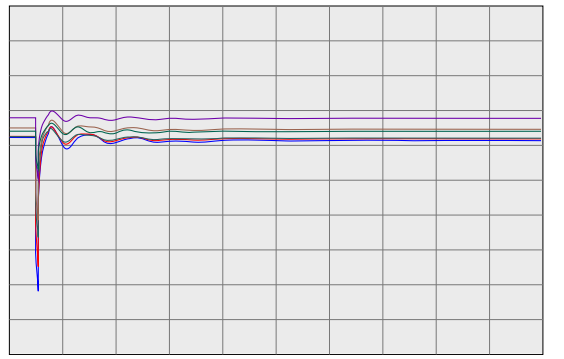


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

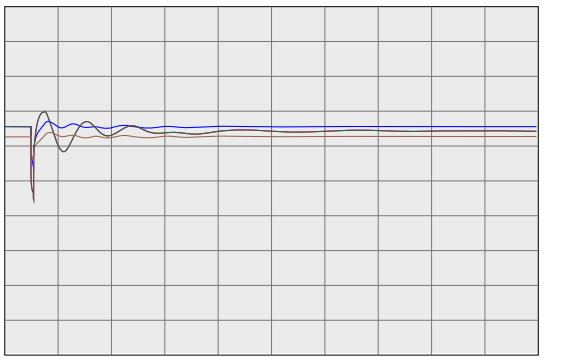
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



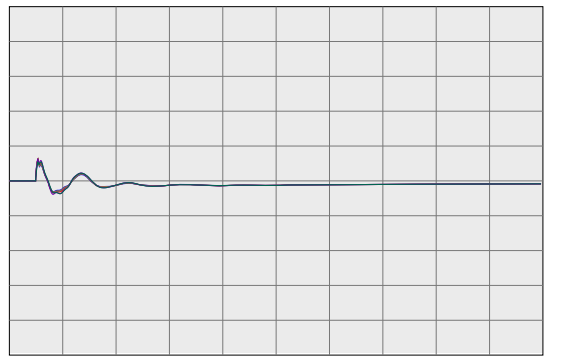
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



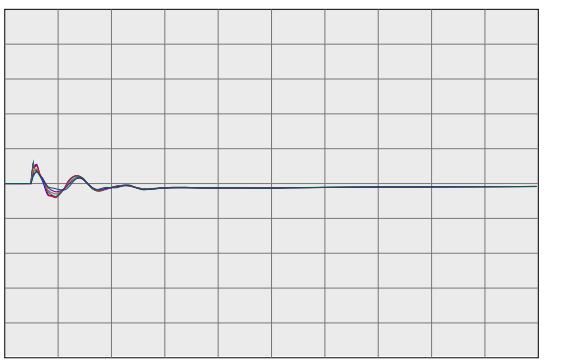
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



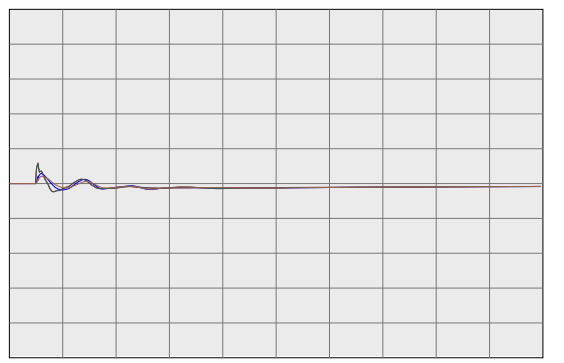
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



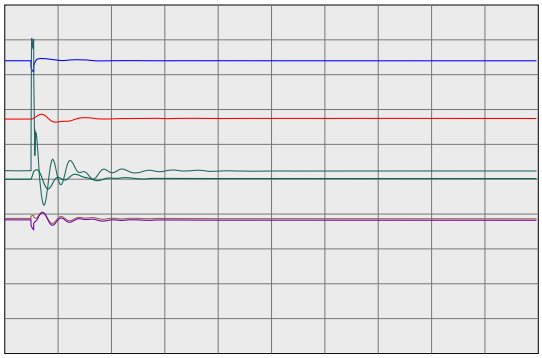
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



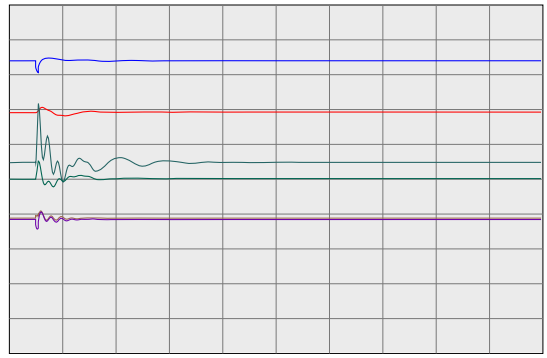
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

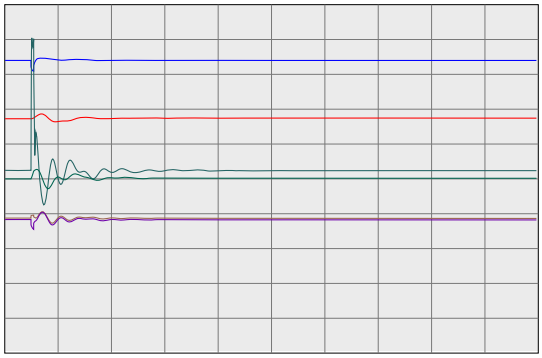
WILLOW PASS GENERATION PLANT



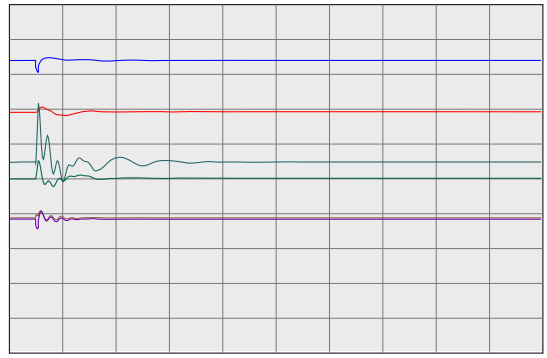
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



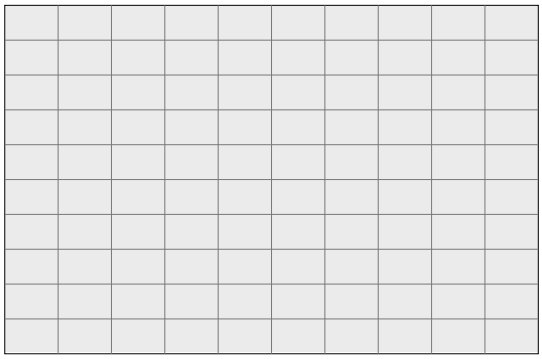
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

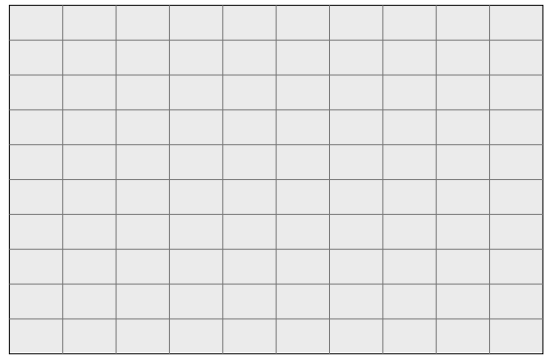


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



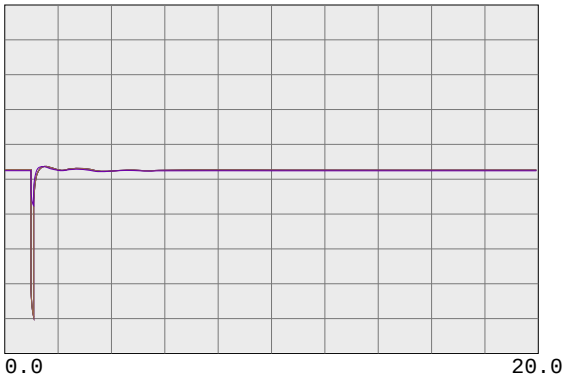
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



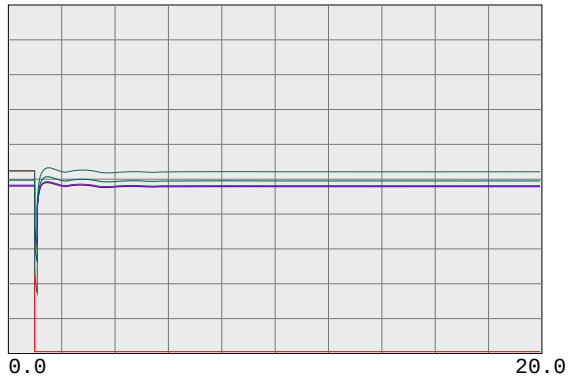


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

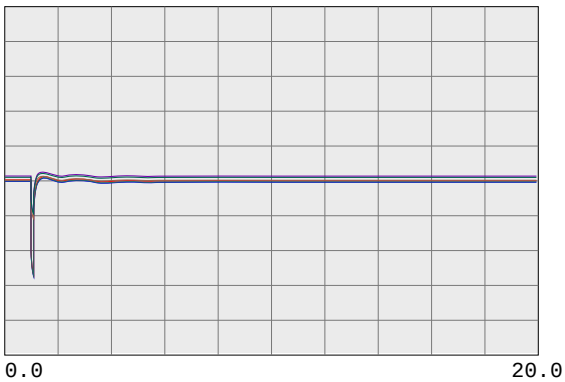
230-KV SYSTEM VOLTAGES



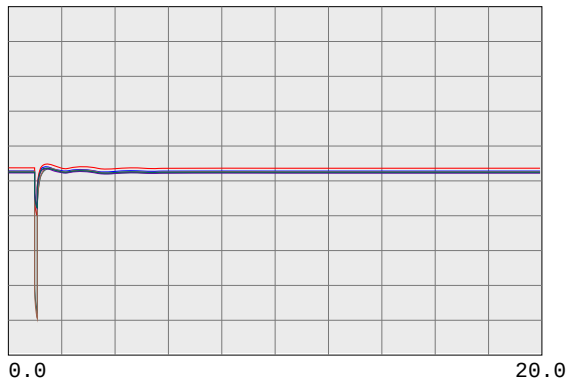
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



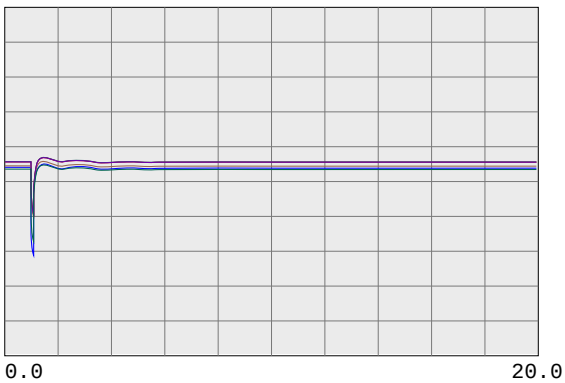
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



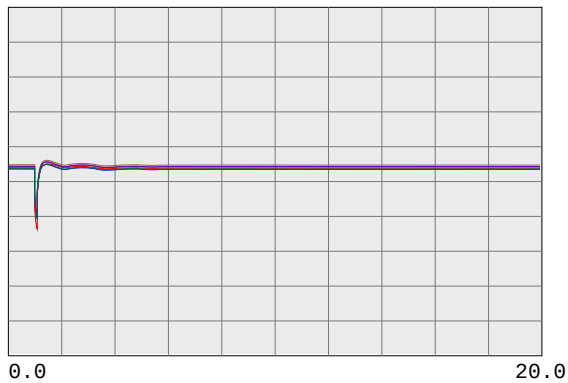
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



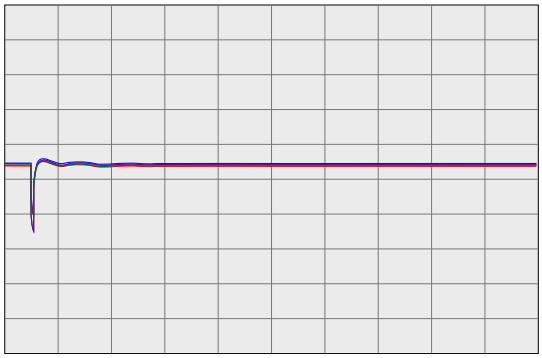
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

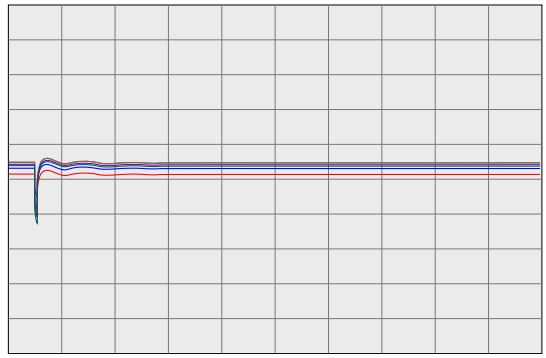
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

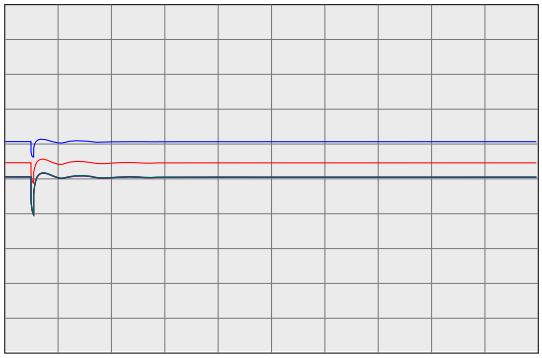
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

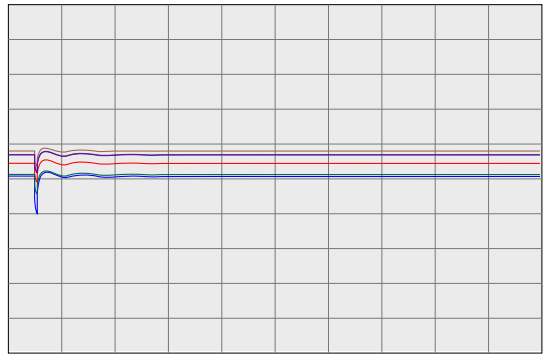
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

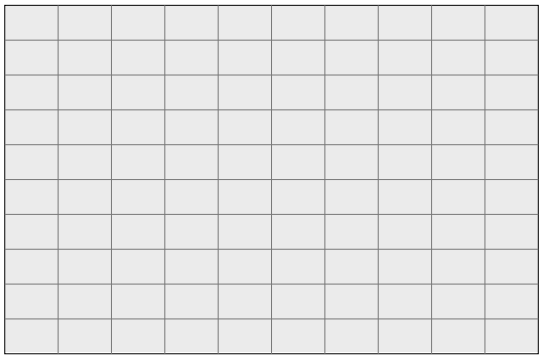
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

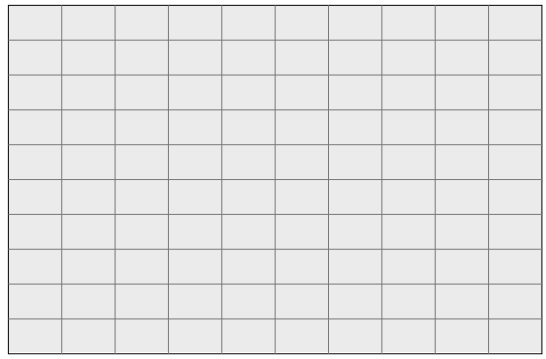


0.0 20.0

Time(sec)

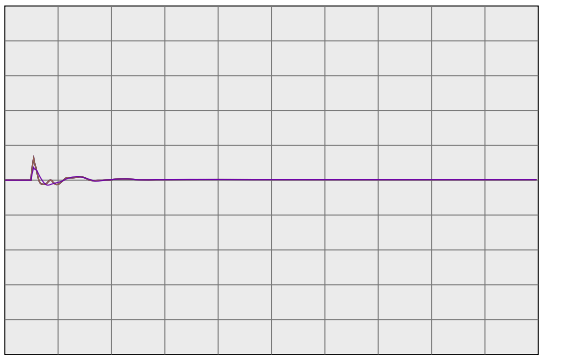
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



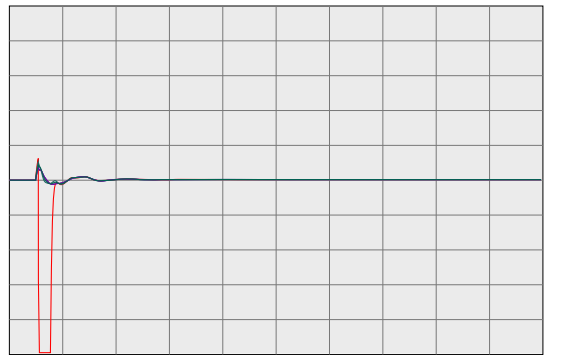


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

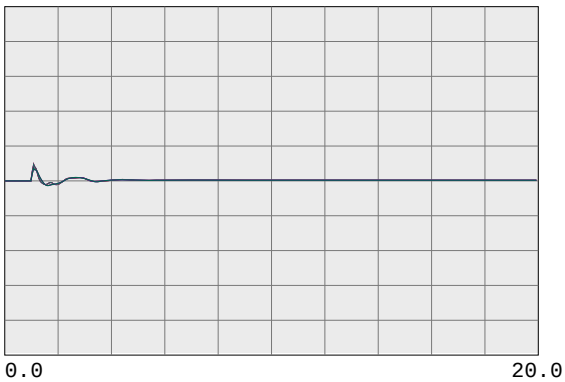
230-KV SYSTEM FREQUENCIES



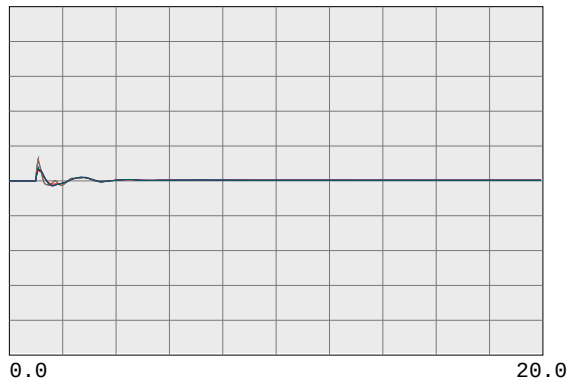
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

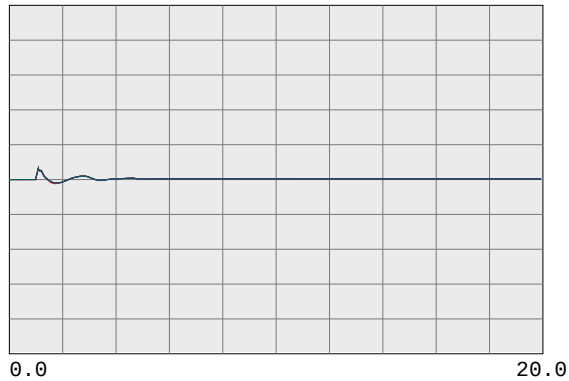


59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000

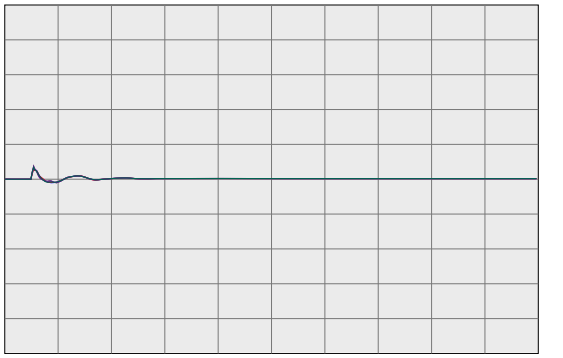
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



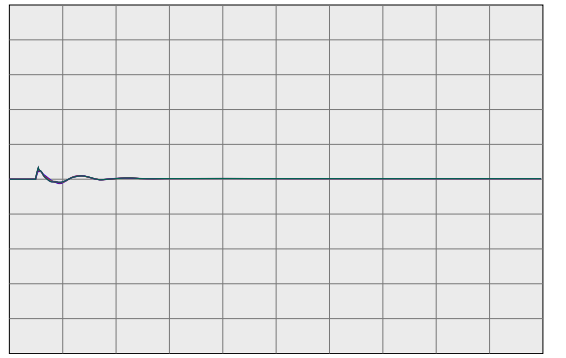
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



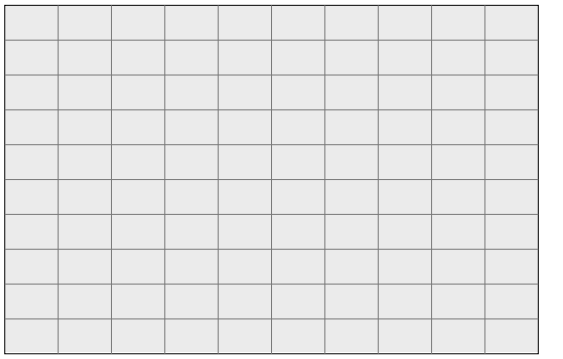
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000

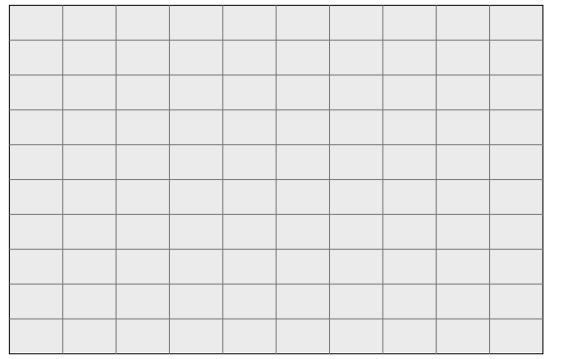


59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000

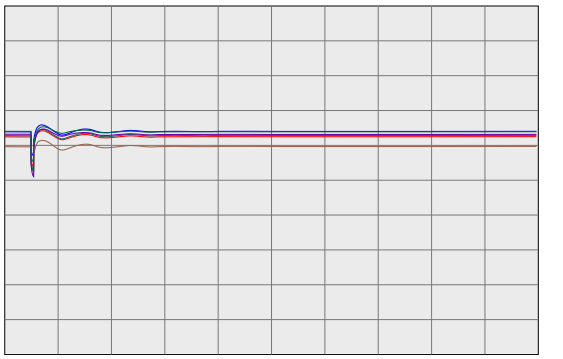
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



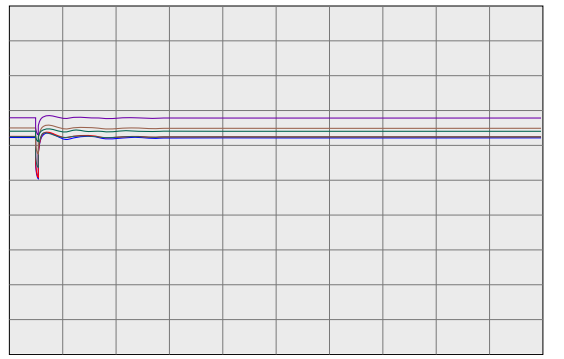


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

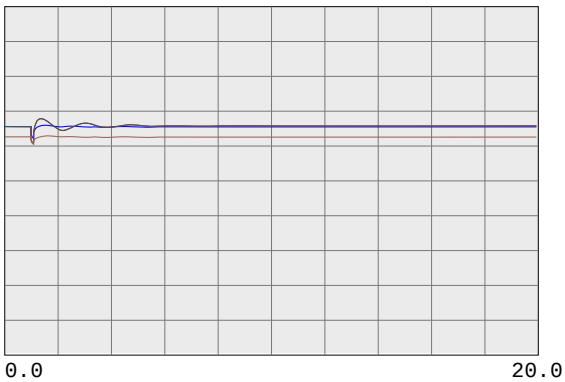
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500

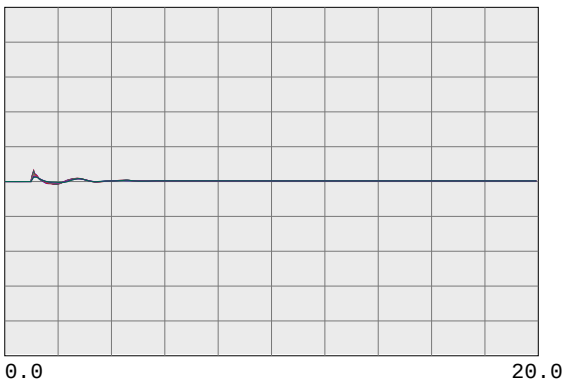


0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500

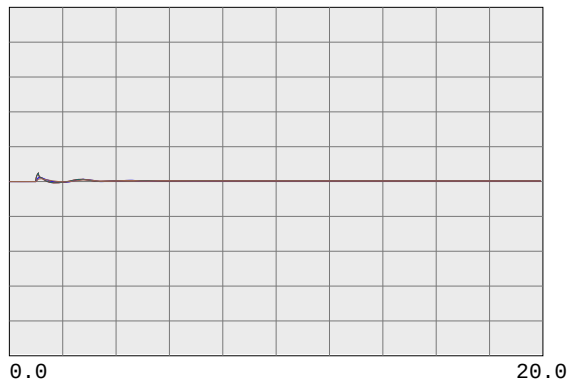


0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



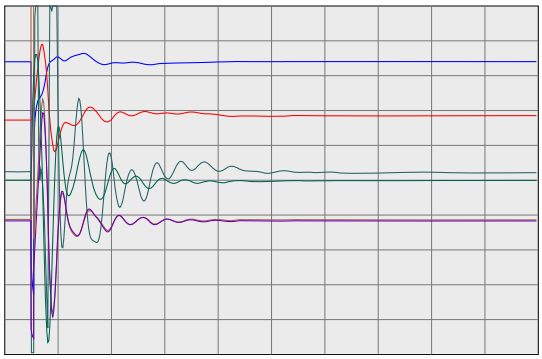
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



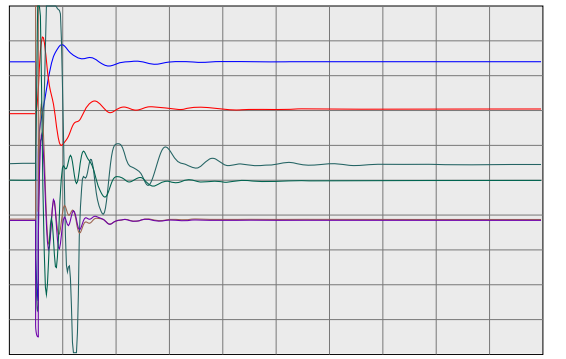
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

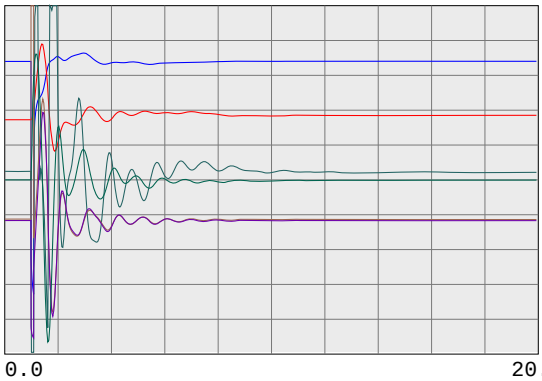
WILLOW PASS GENERATION PLANT



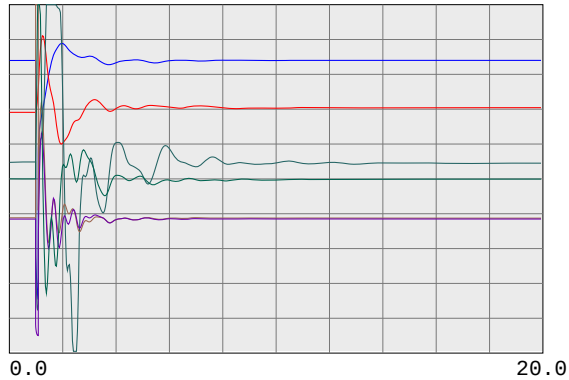
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



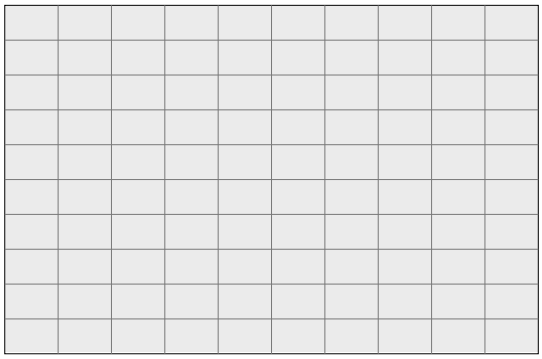
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

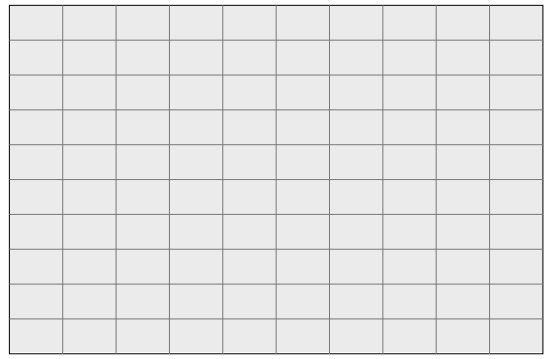


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



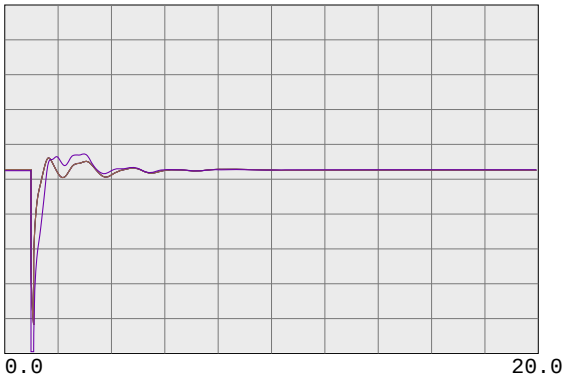
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



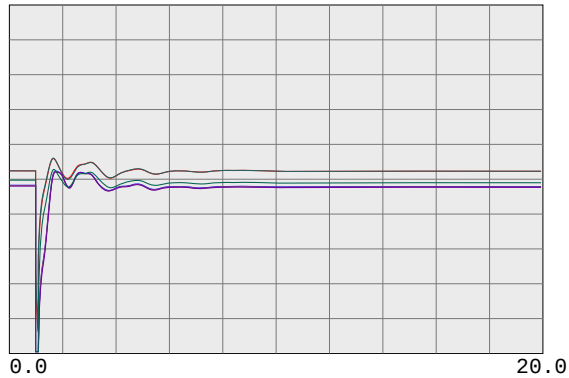


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

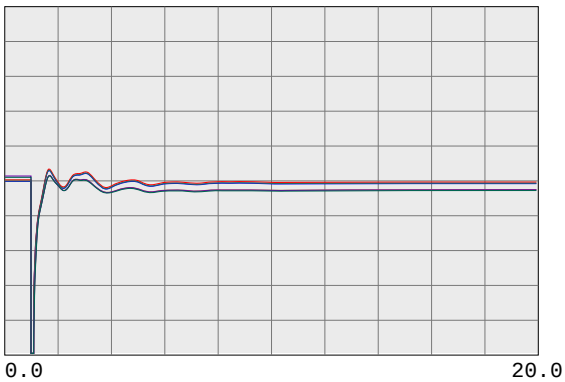
230-KV SYSTEM VOLTAGES



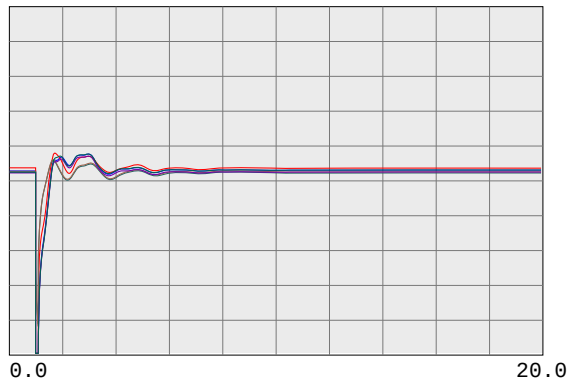
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



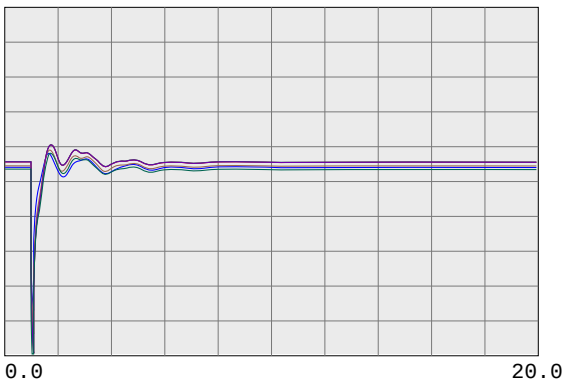
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



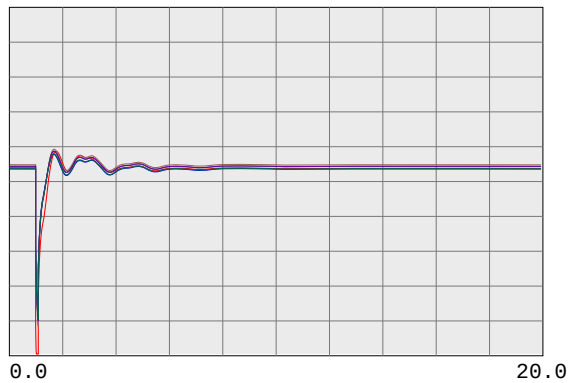
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

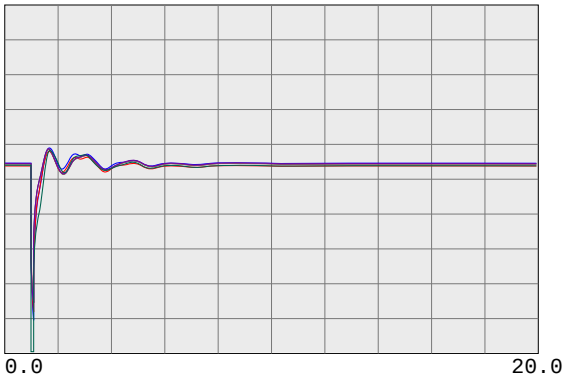
PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

HS13_PST_WLLW_PSS_C-116_N-2_PITSBG_E-TESORO-TIDEWATR_230.chf

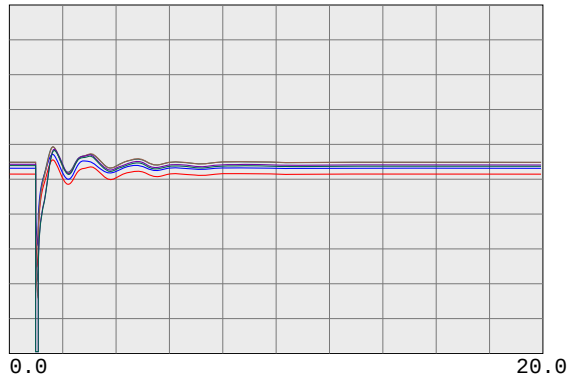
.

Fri Feb 27 00:04:10 2009

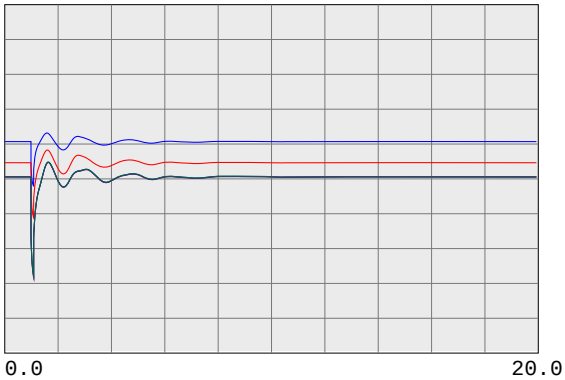
230-KV SYSTEM VOLTAGES



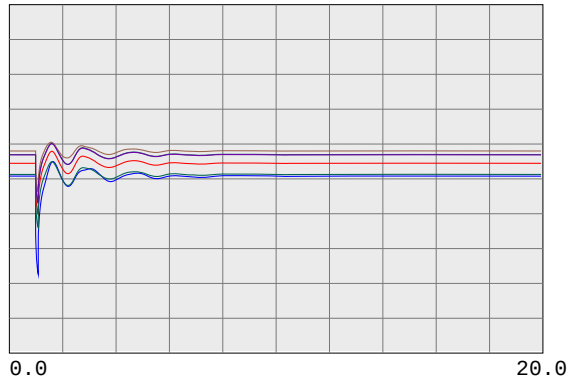
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



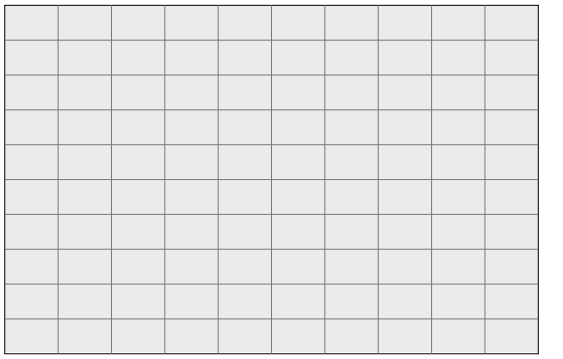
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

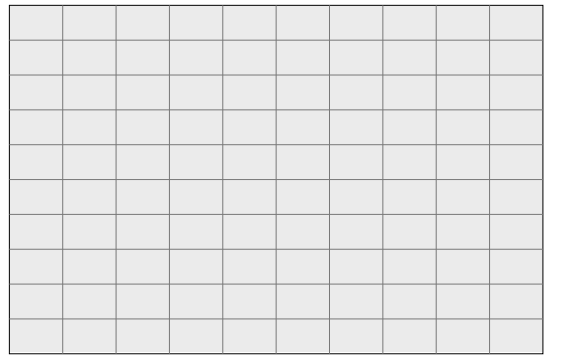


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



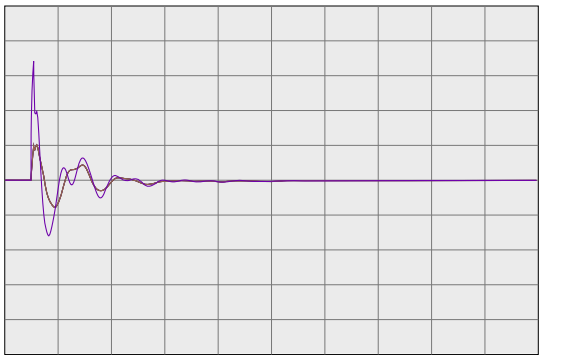
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



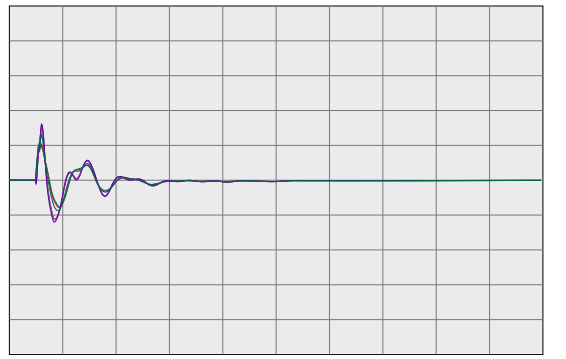


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

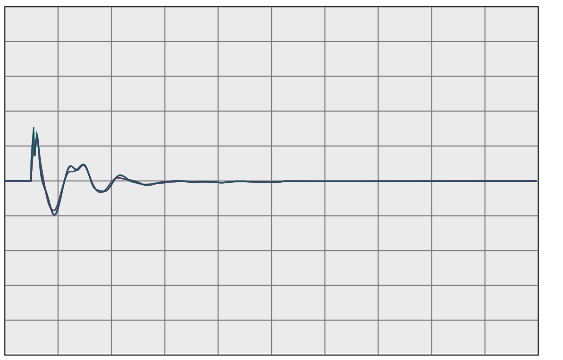
230-KV SYSTEM FREQUENCIES



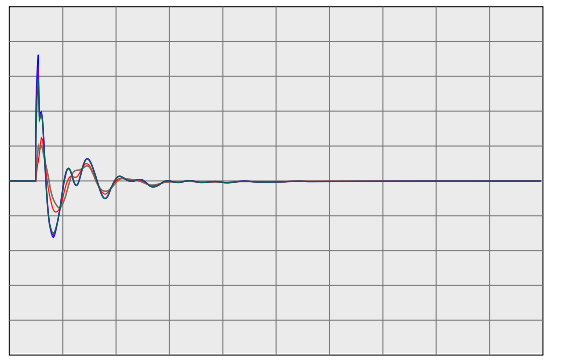
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



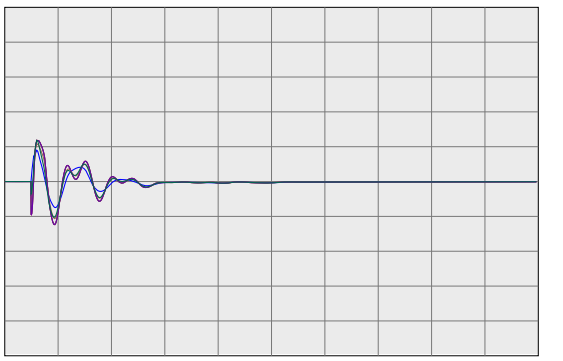
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



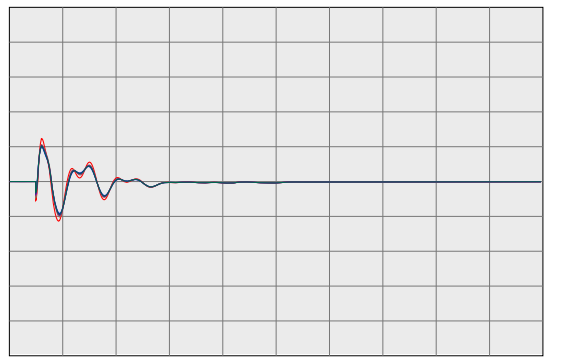
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



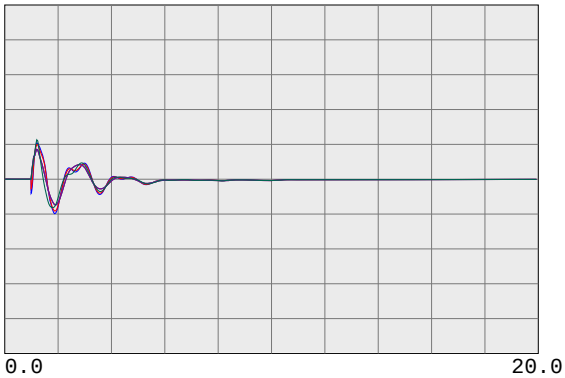
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



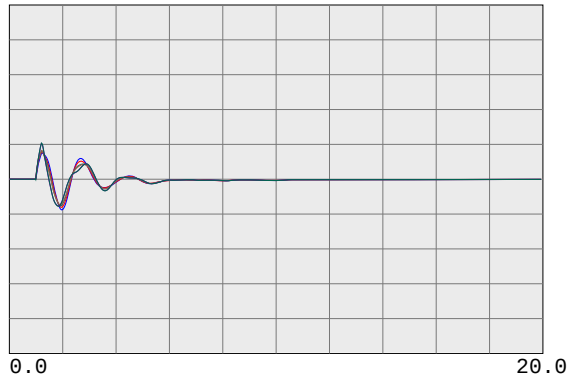
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

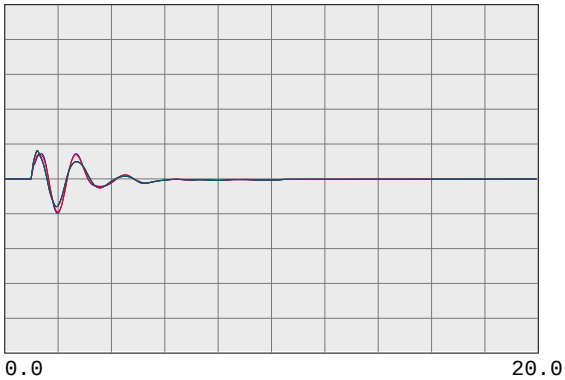
230-KV SYSTEM FREQUENCIES



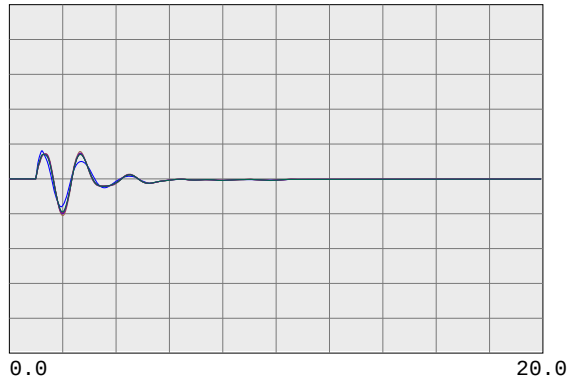
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



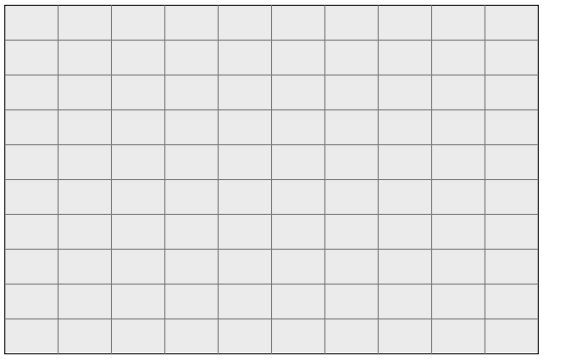
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

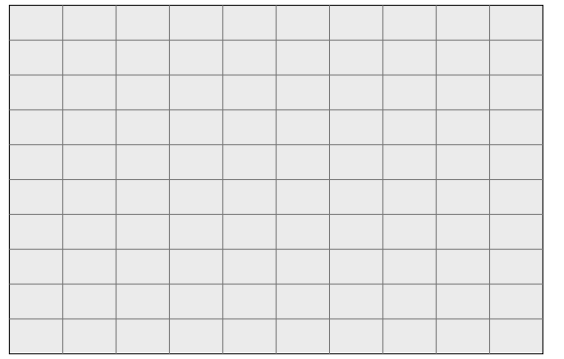


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



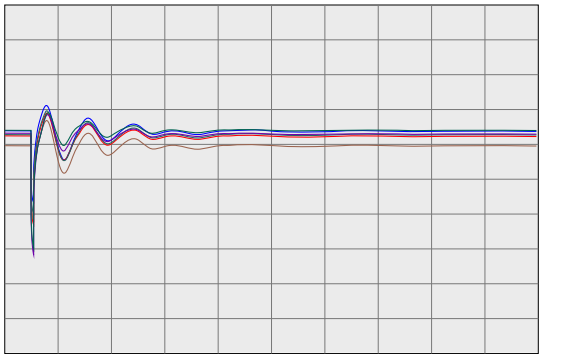
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



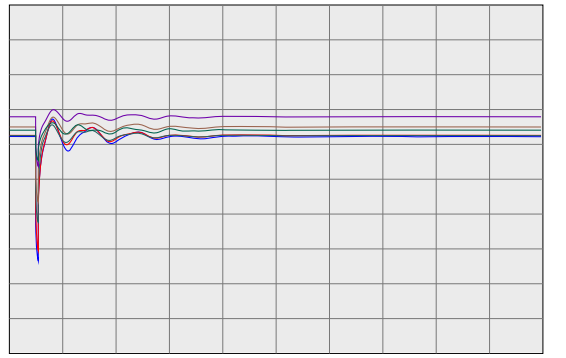


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

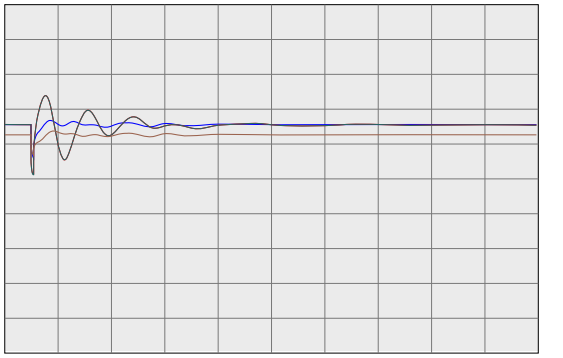
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



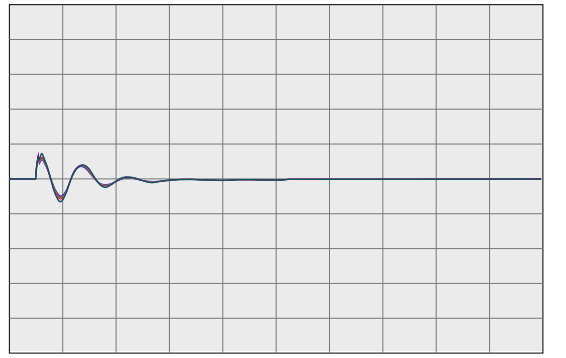
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



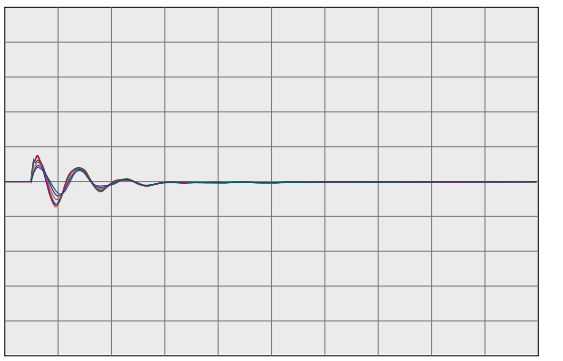
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



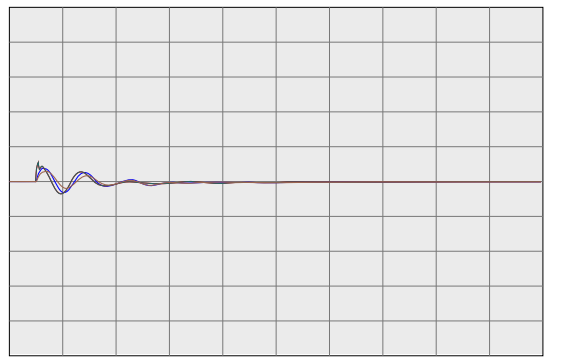
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



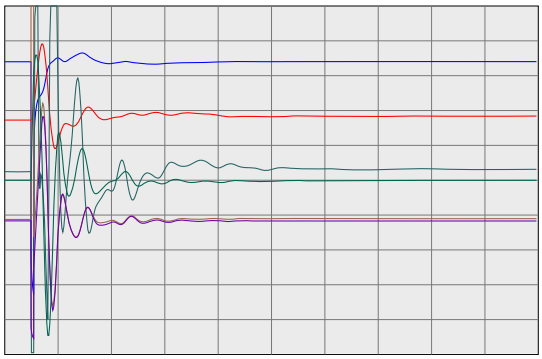
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



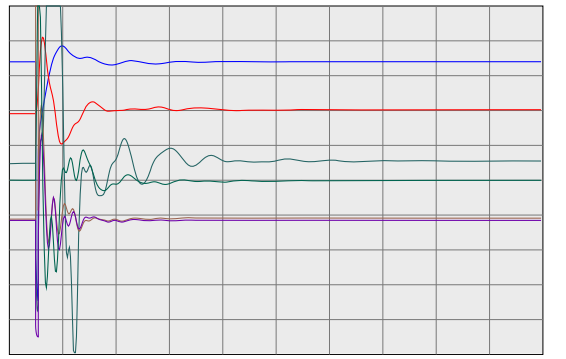
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

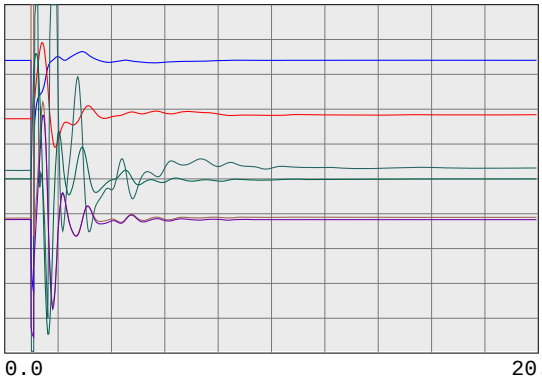
WILLOW PASS GENERATION PLANT



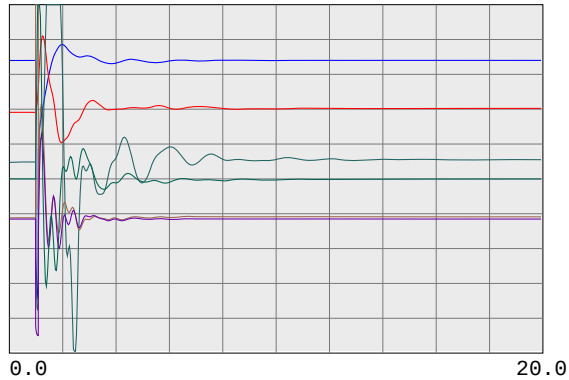
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



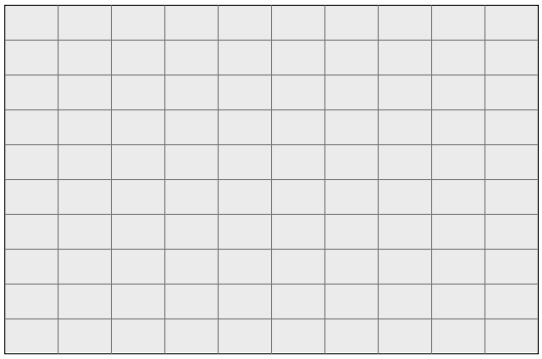
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

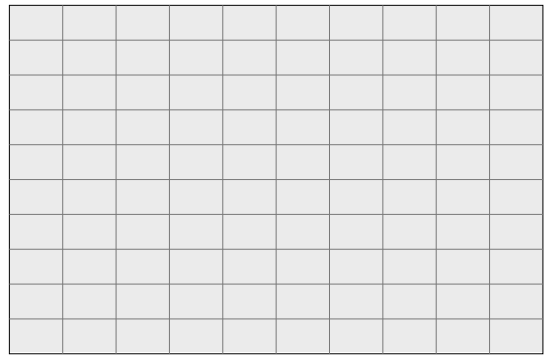


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



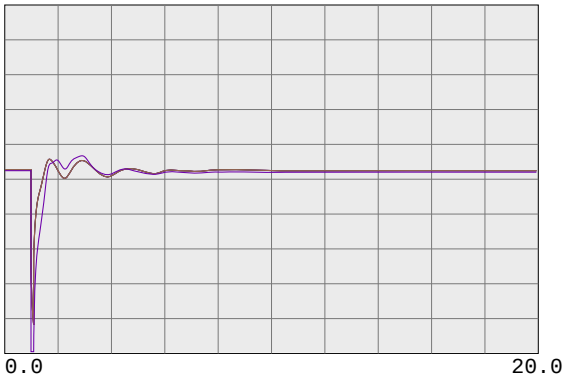
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



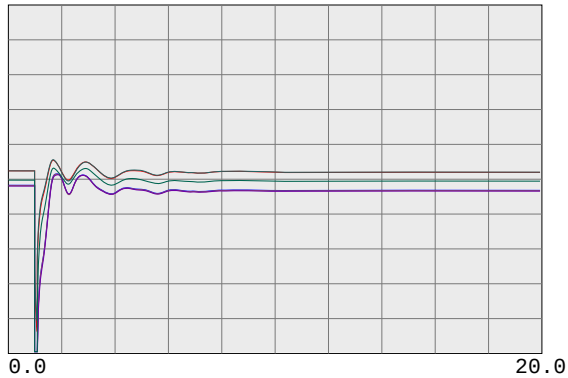


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

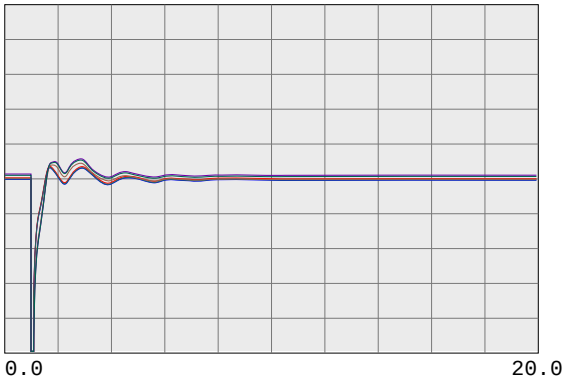
230-KV SYSTEM VOLTAGES



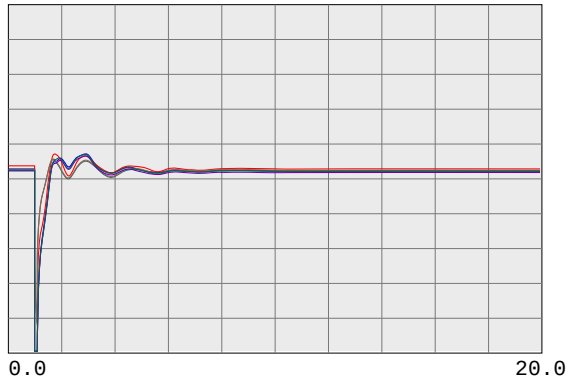
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



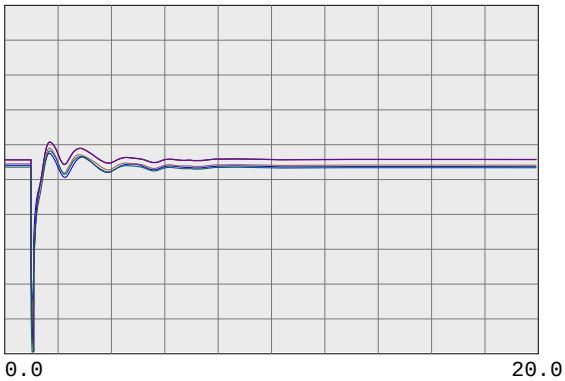
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



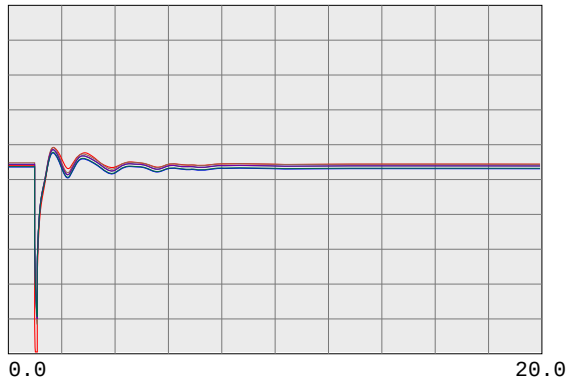
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



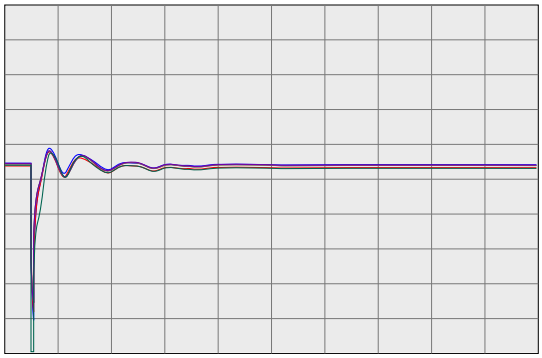
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

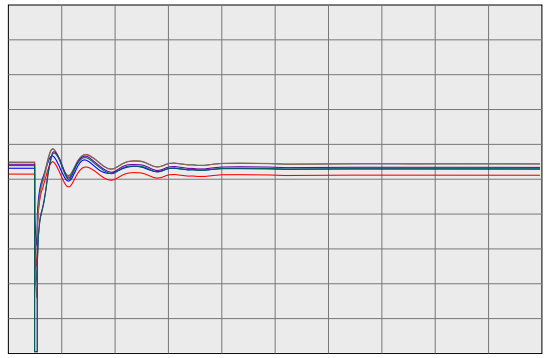
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

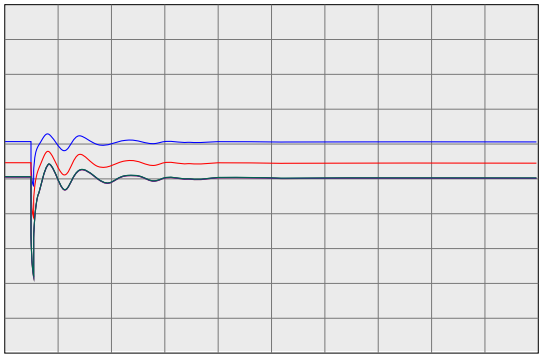
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

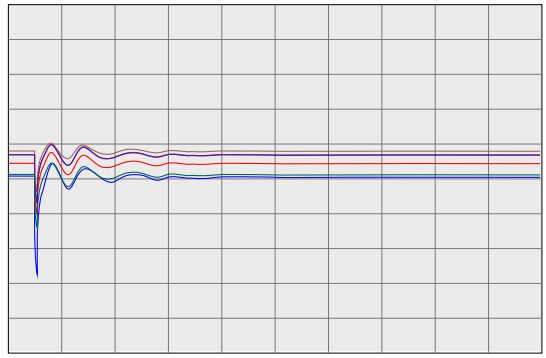
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

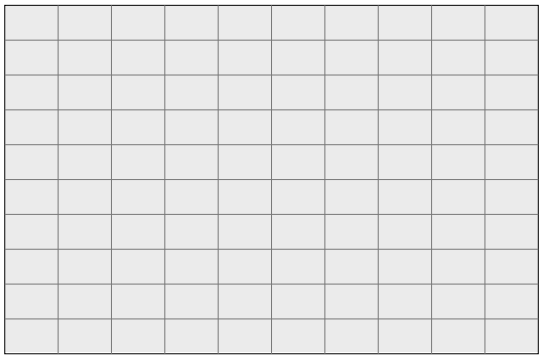
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

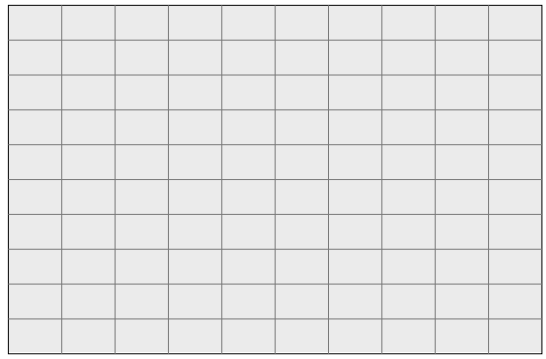


0.0 20.0

Time(sec)

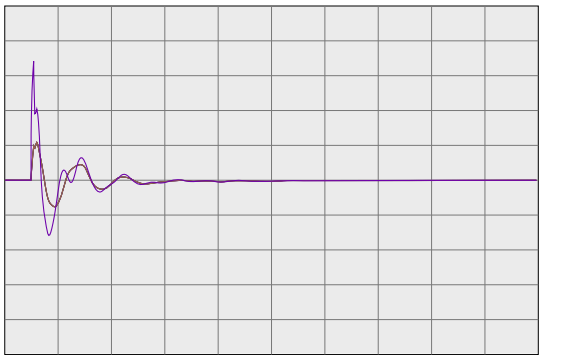
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



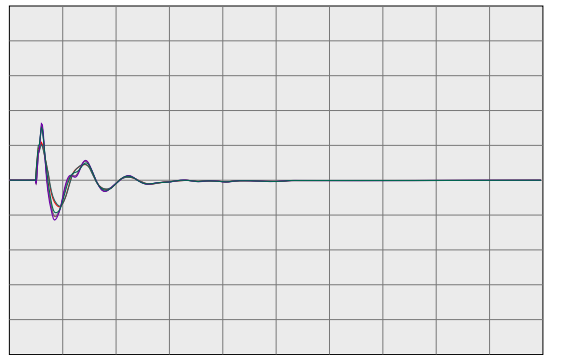


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

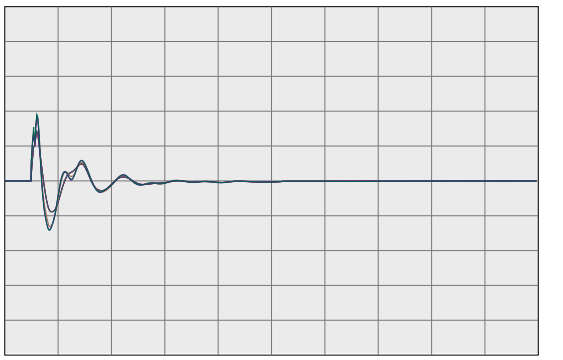
230-KV SYSTEM FREQUENCIES



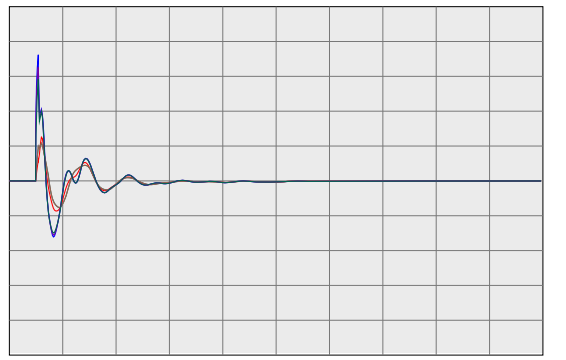
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



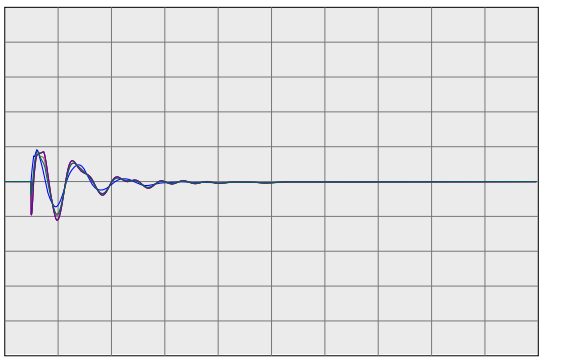
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



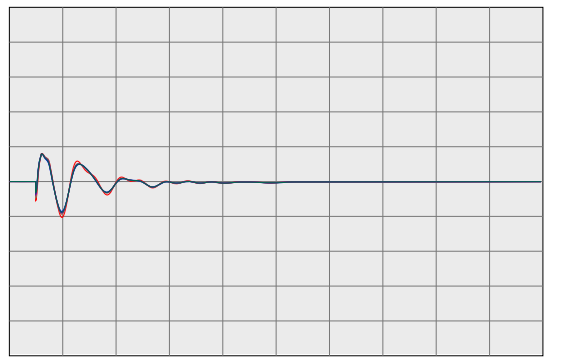
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



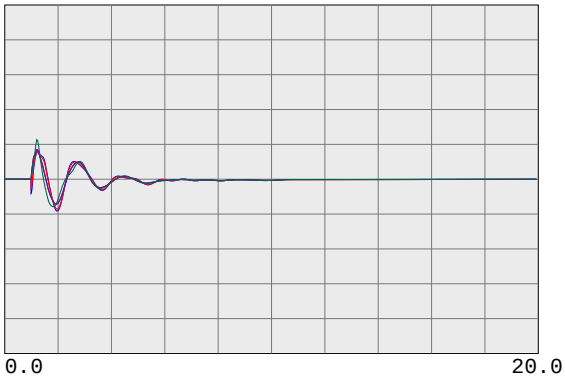
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



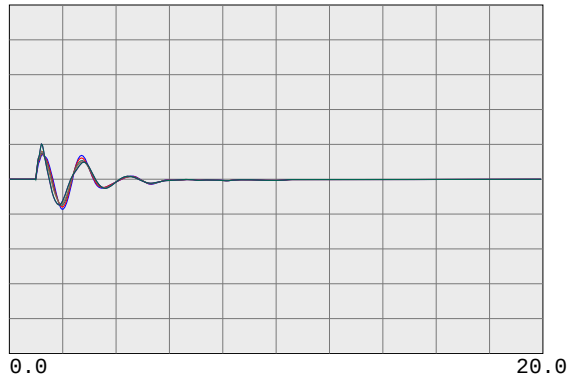
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

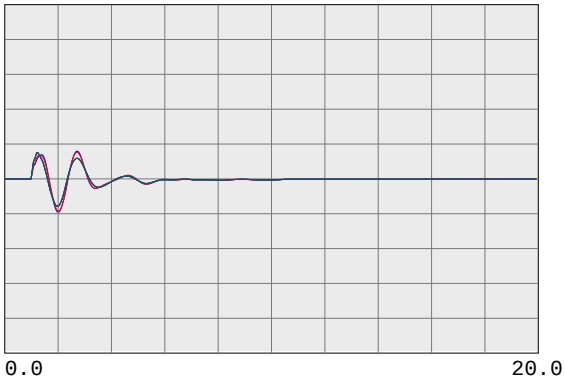
230-KV SYSTEM FREQUENCIES



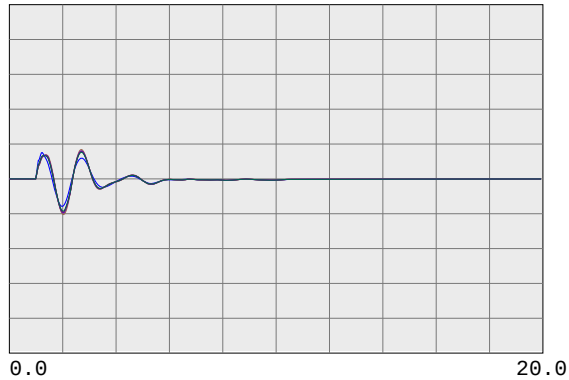
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



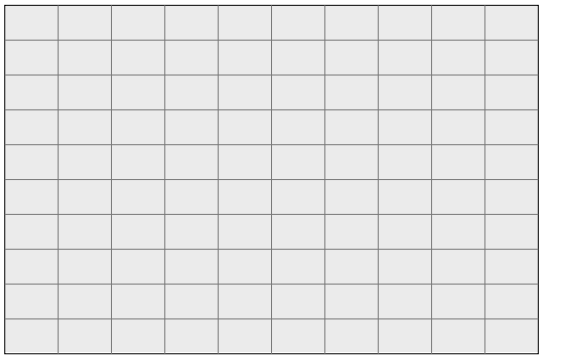
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

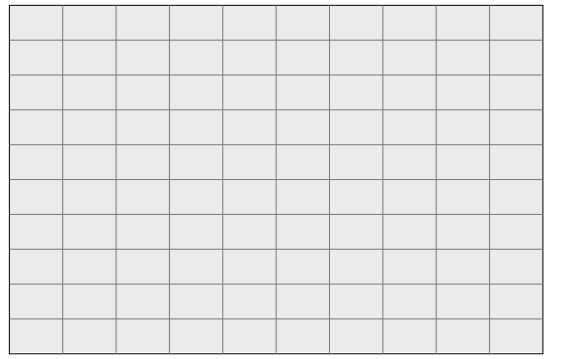


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



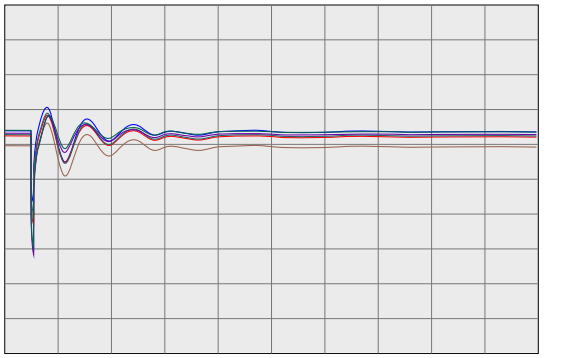
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



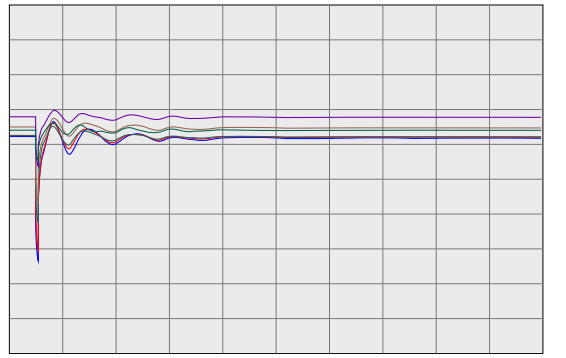


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

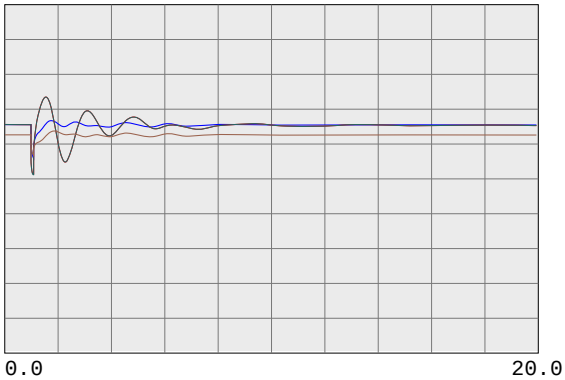
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



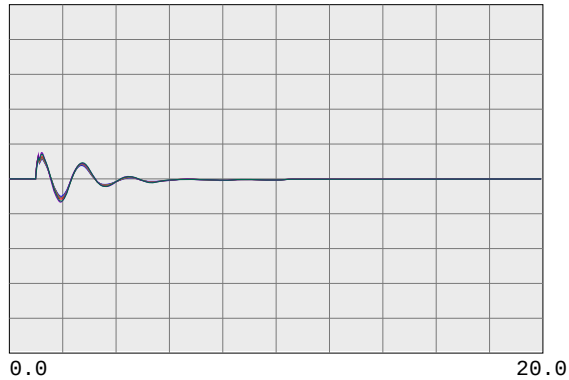
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



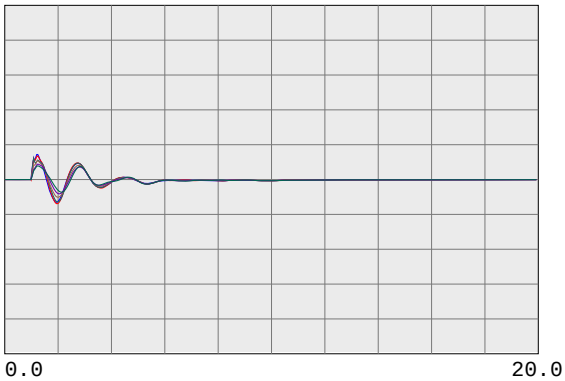
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



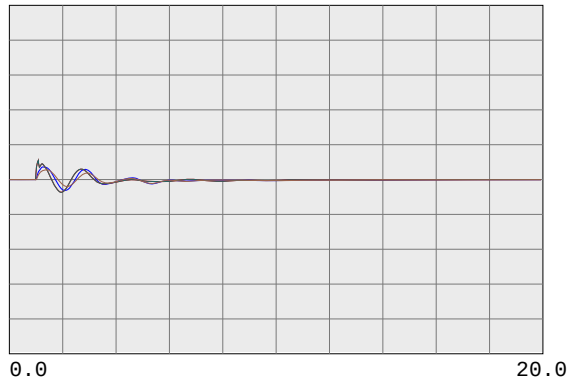
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



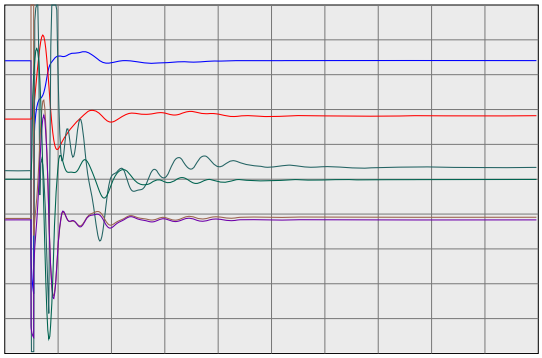
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



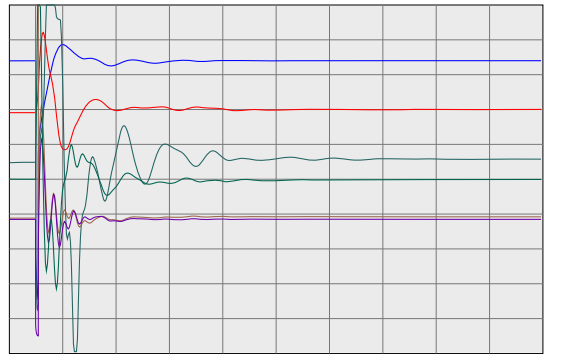
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

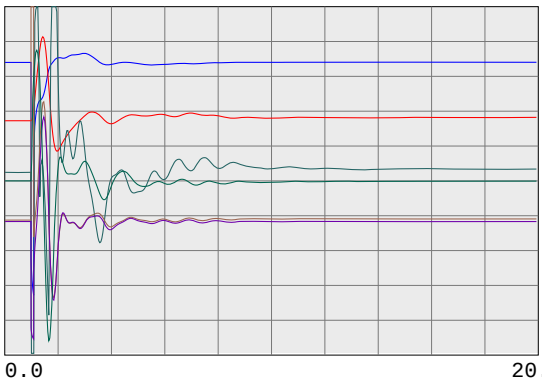
WILLOW PASS GENERATION PLANT



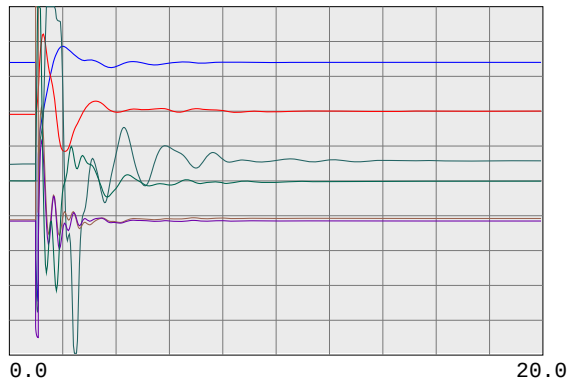
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



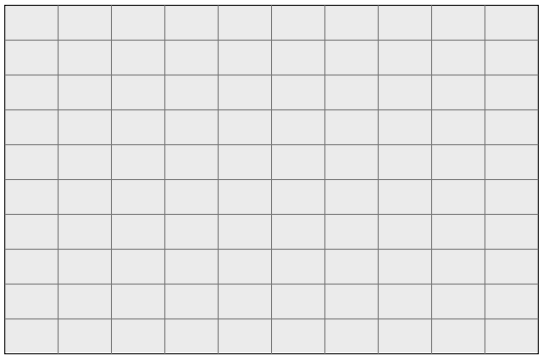
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

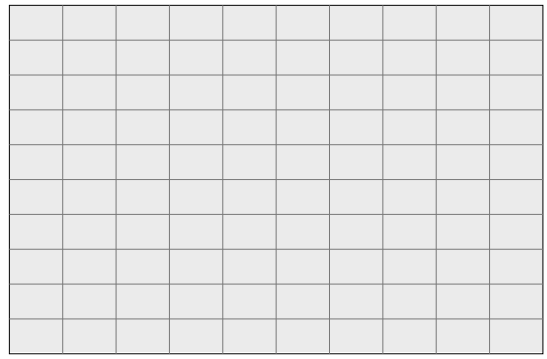


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



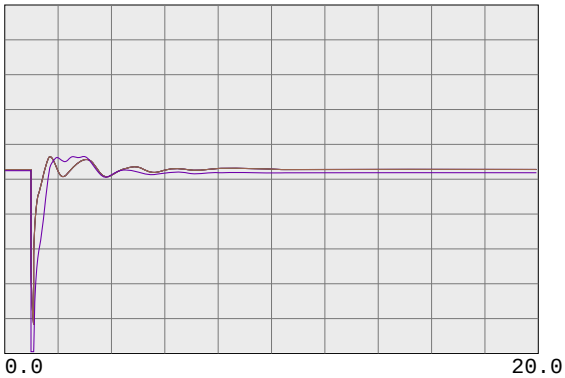
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



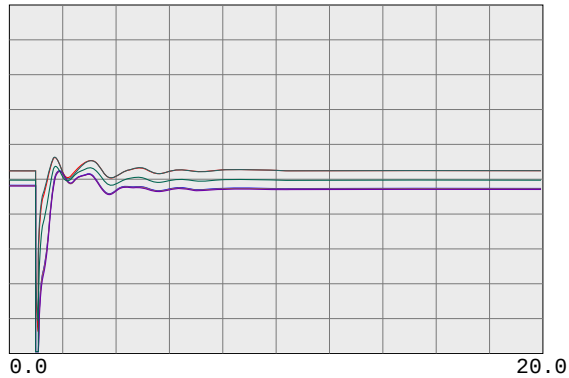


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

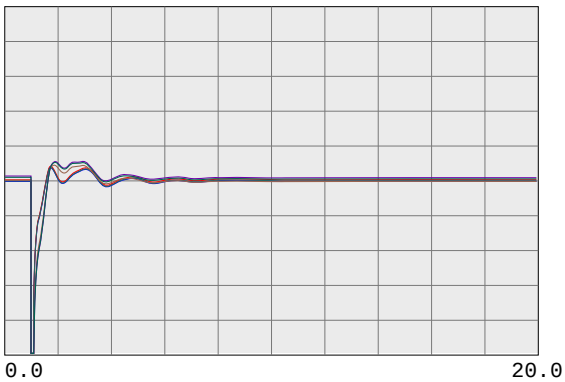
230-KV SYSTEM VOLTAGES



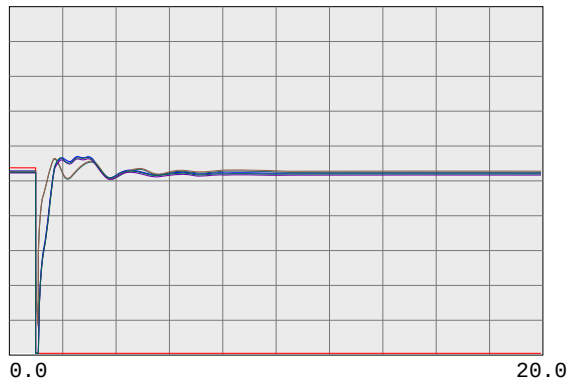
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



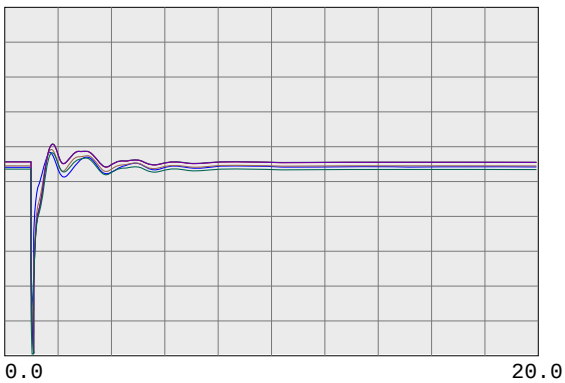
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



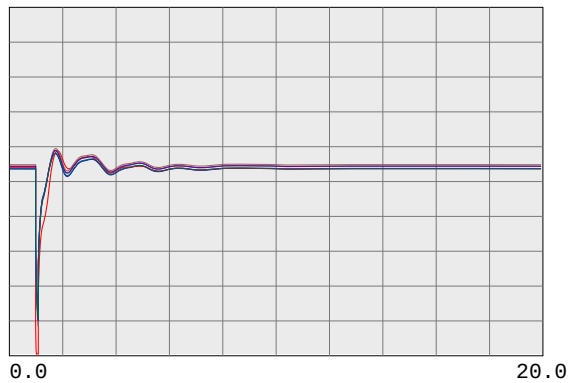
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



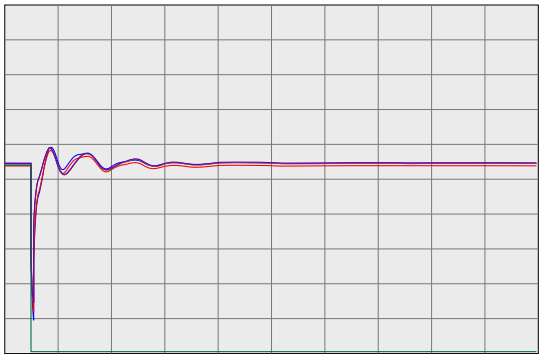
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

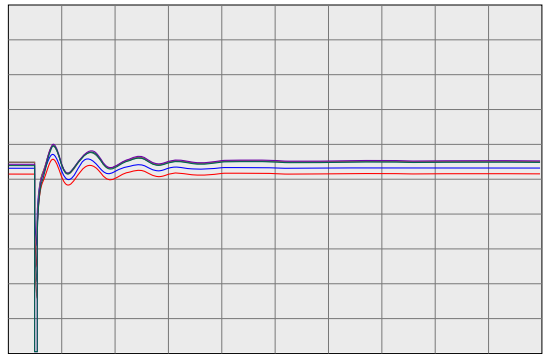
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

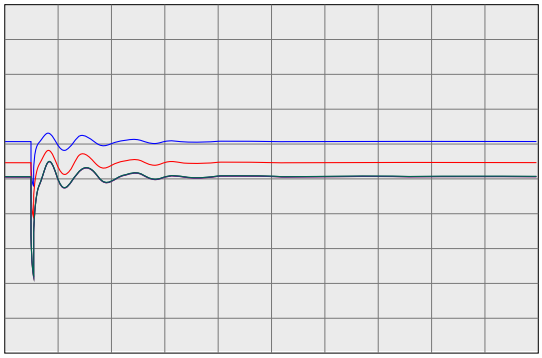
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

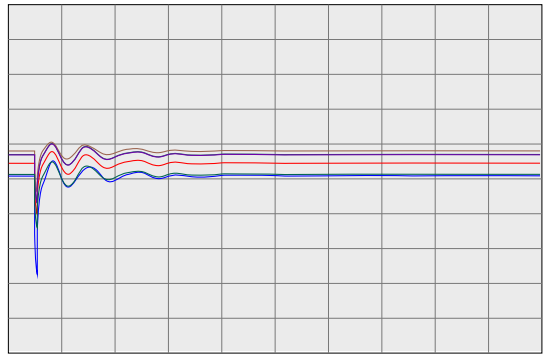
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

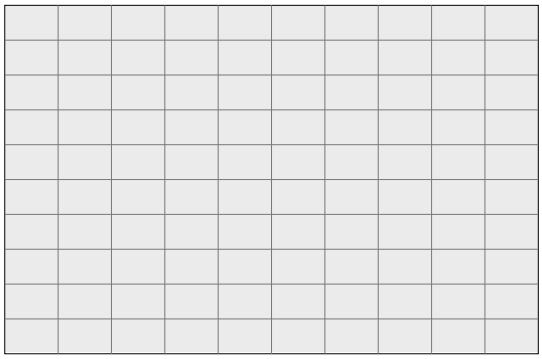
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

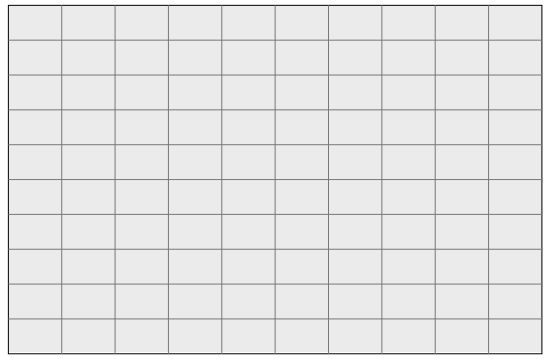


0.0 20.0

Time(sec)

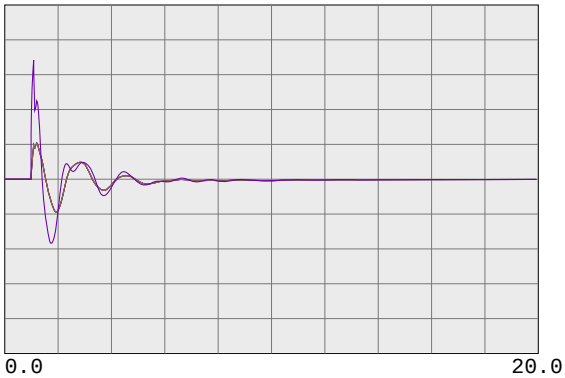
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



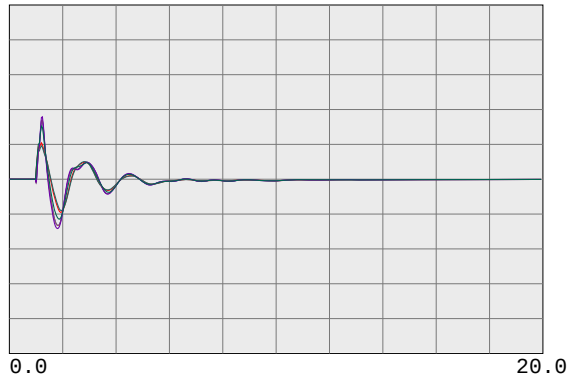


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

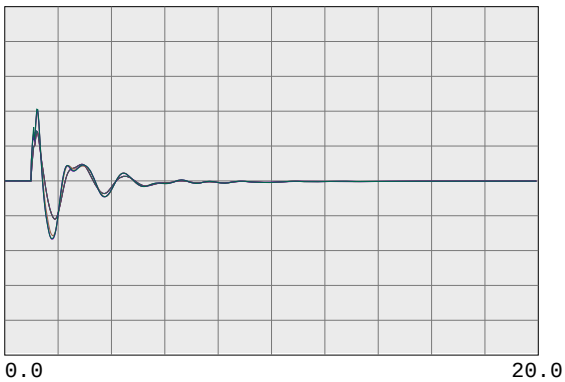
230-KV SYSTEM FREQUENCIES



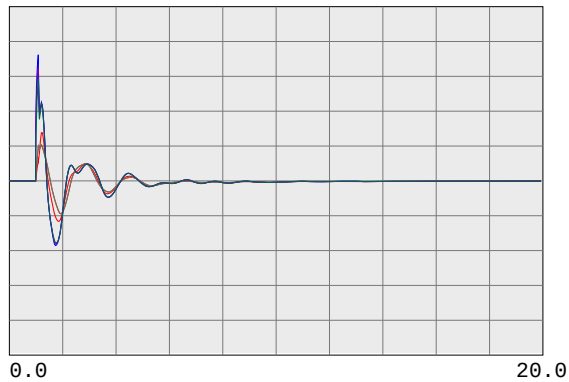
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



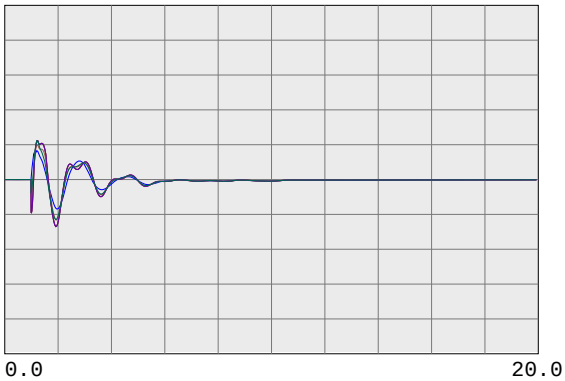
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



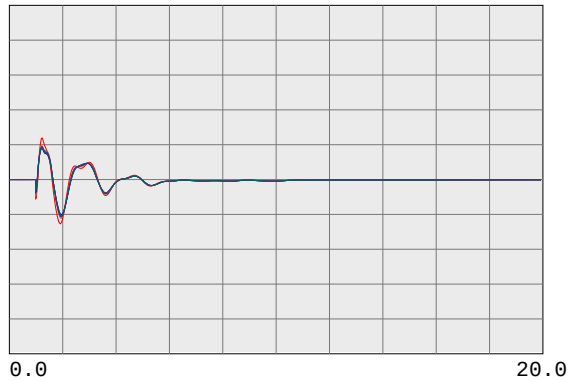
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



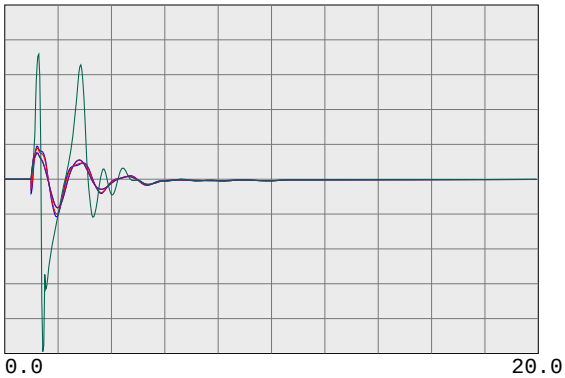
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



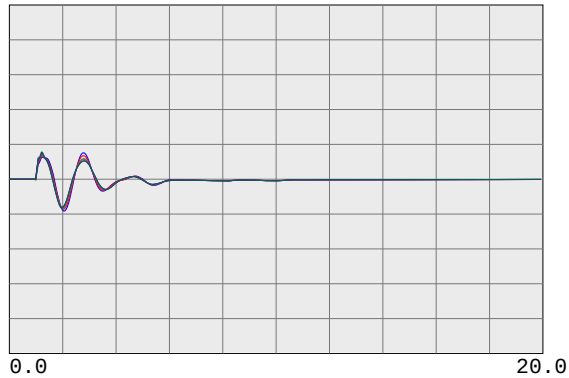
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

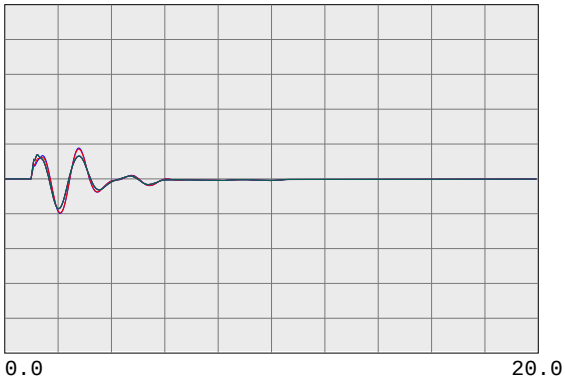
230-KV SYSTEM FREQUENCIES



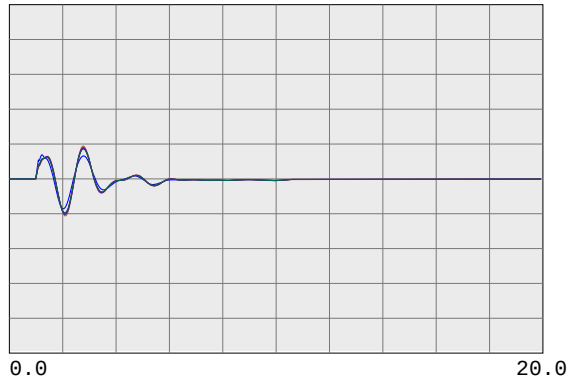
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



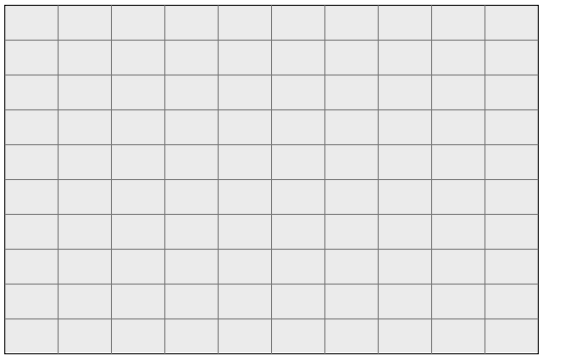
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

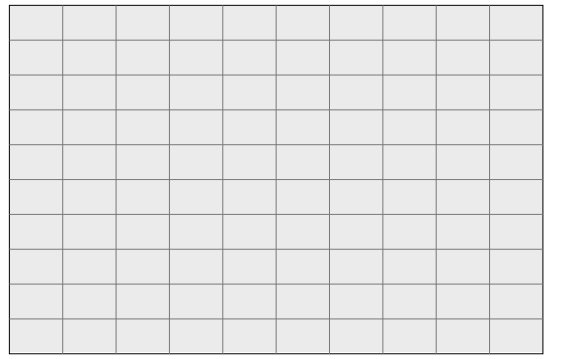


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



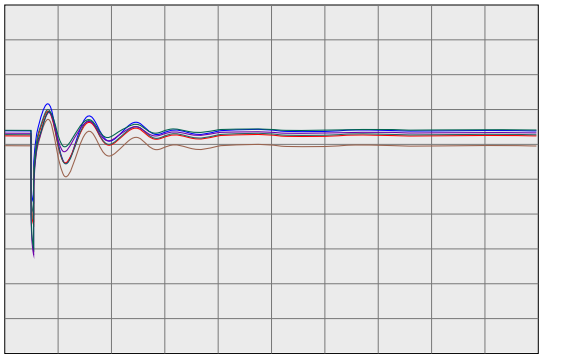
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



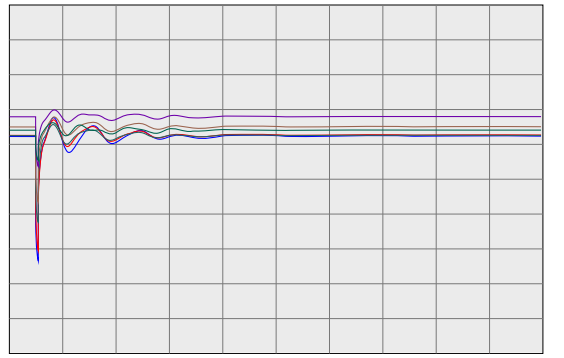


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

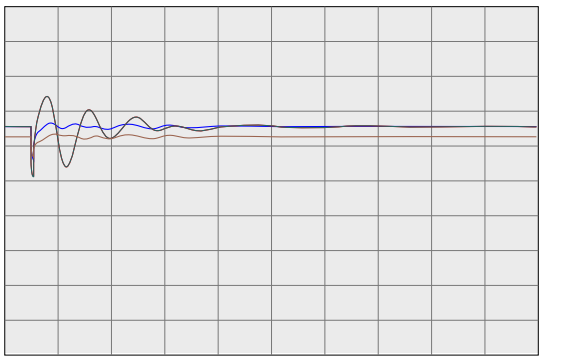
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



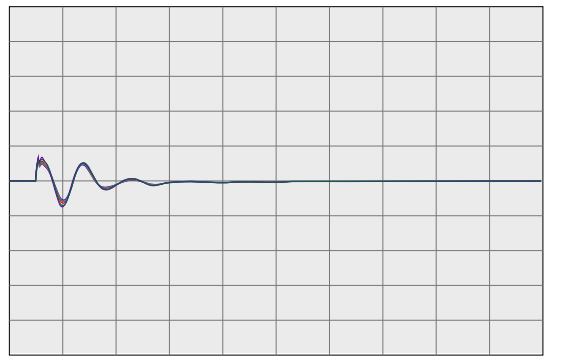
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



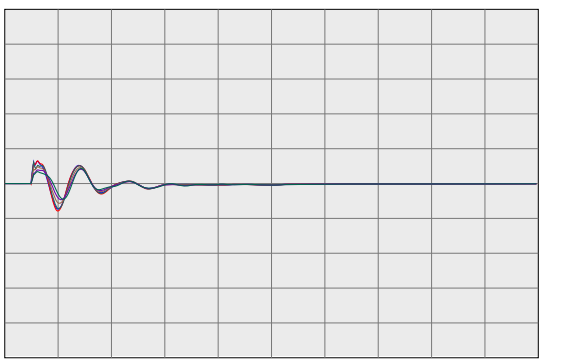
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



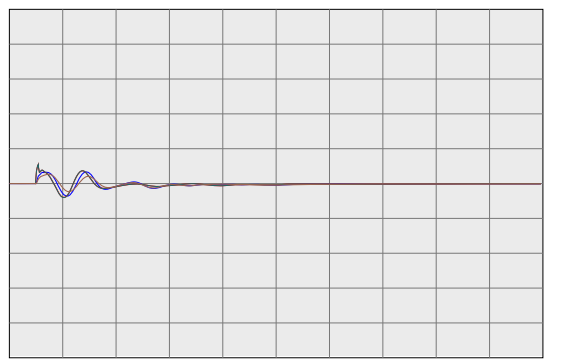
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



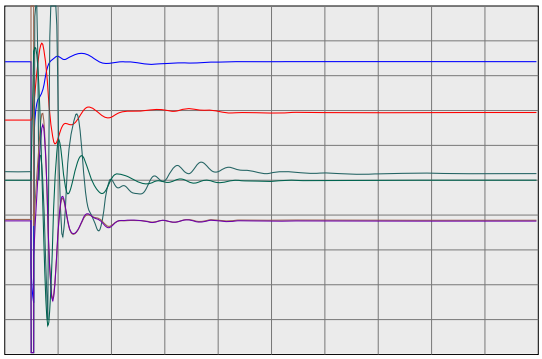
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



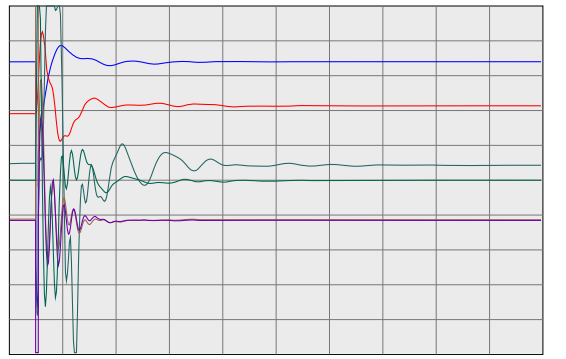
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

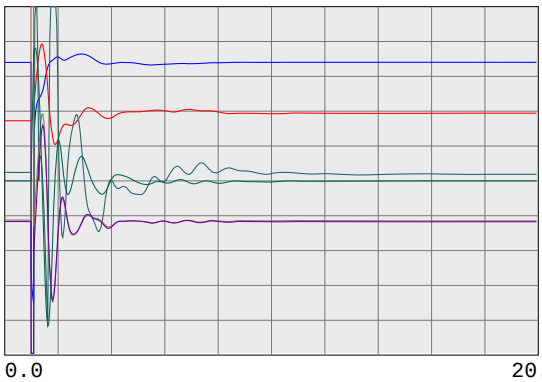
WILLOW PASS GENERATION PLANT



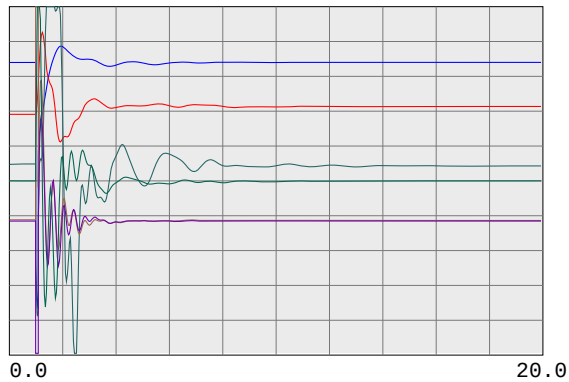
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



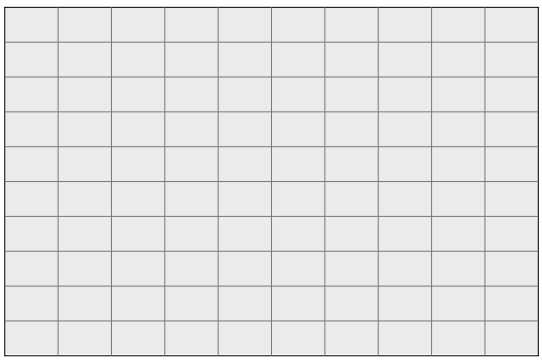
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

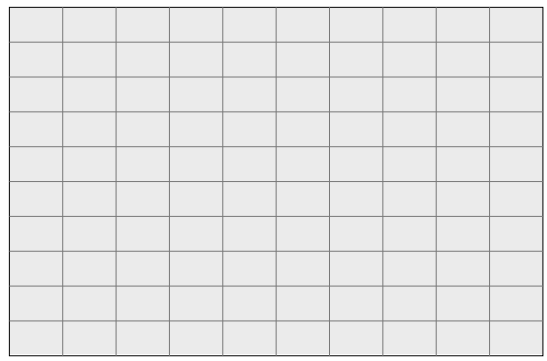


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



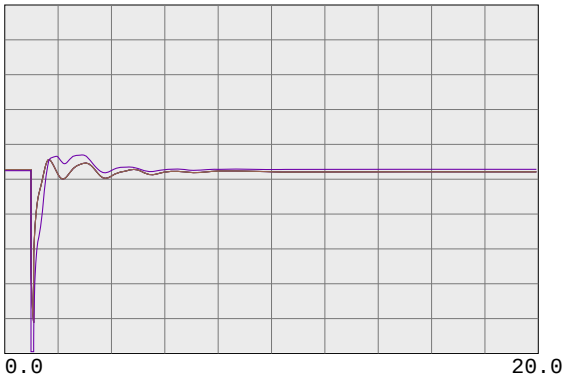
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



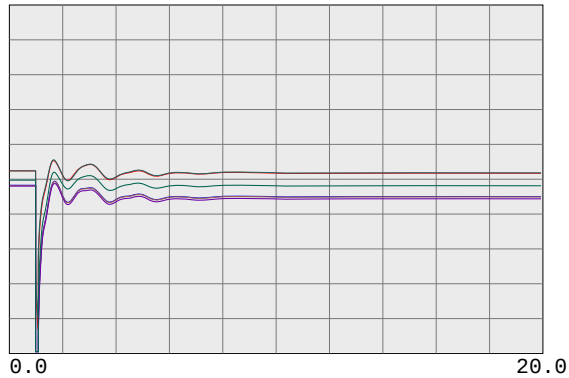


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

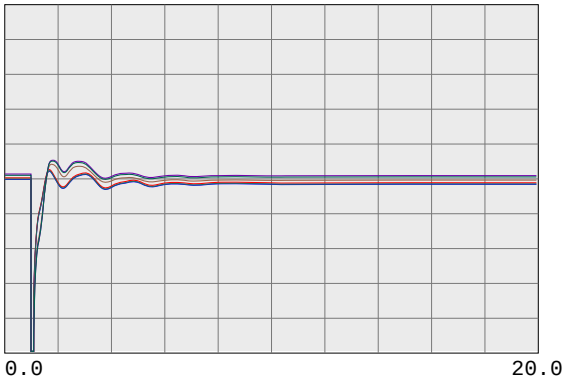
230-KV SYSTEM VOLTAGES



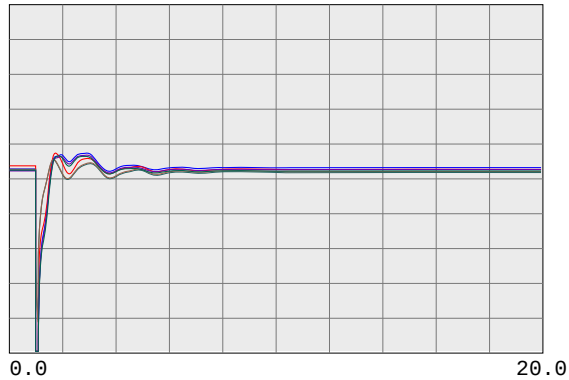
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



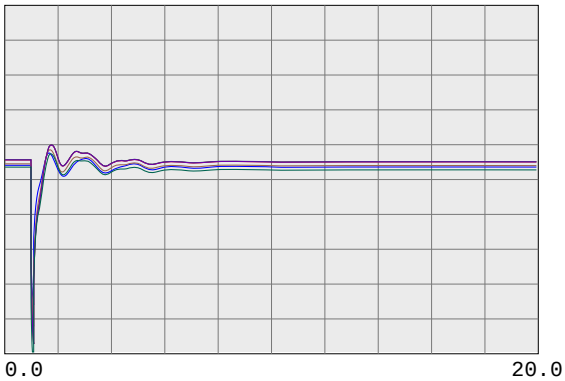
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



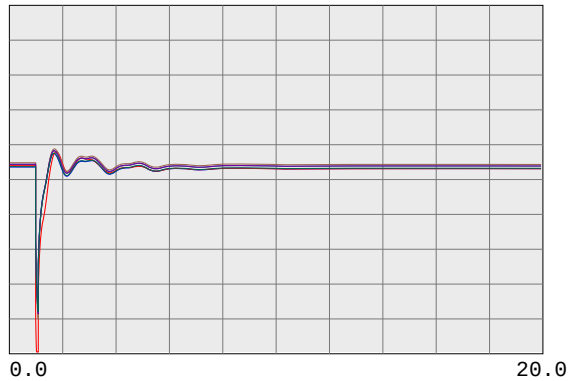
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



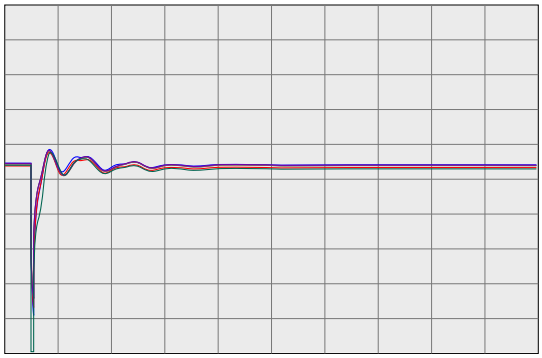
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

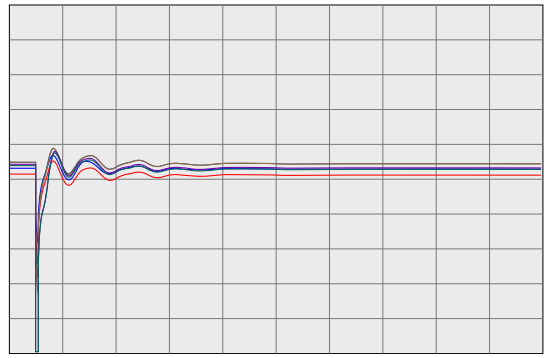
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

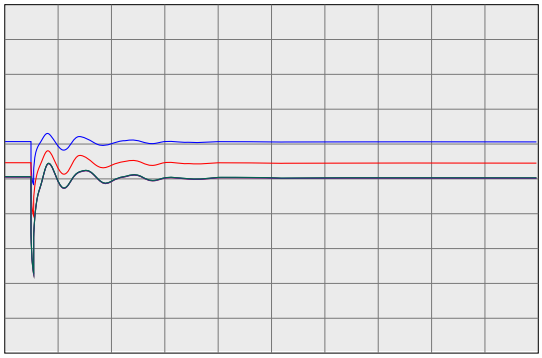
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

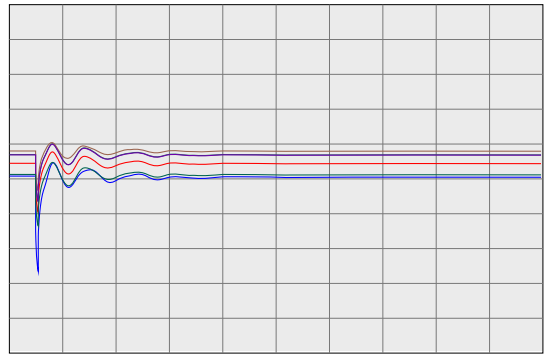
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

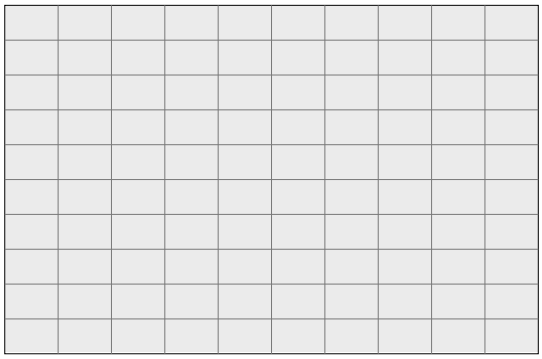
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

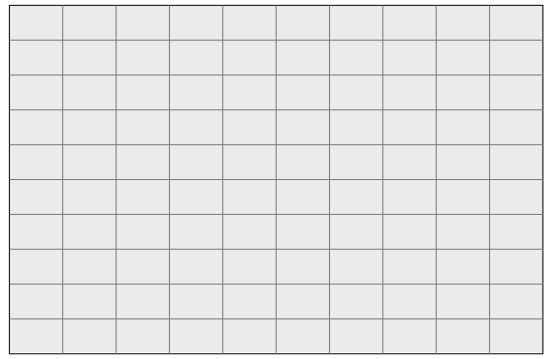


0.0 20.0

Time(sec)

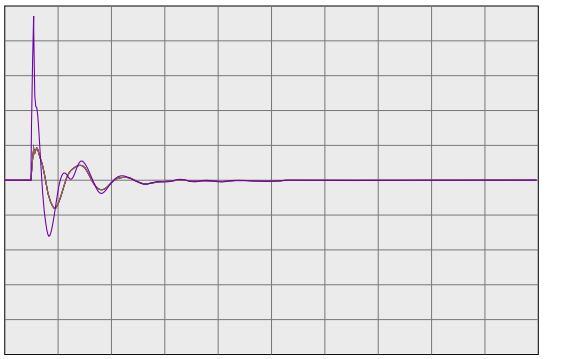
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



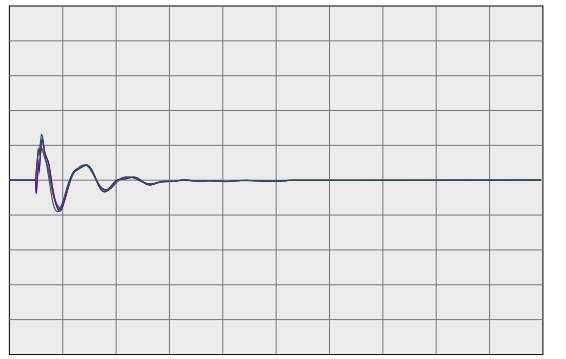


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

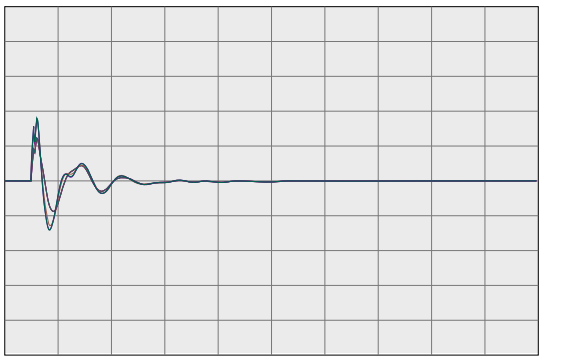
230-KV SYSTEM FREQUENCIES



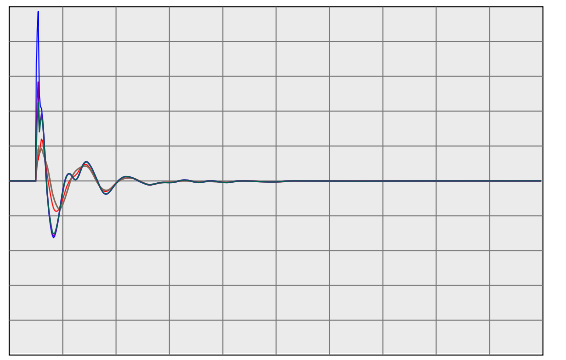
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



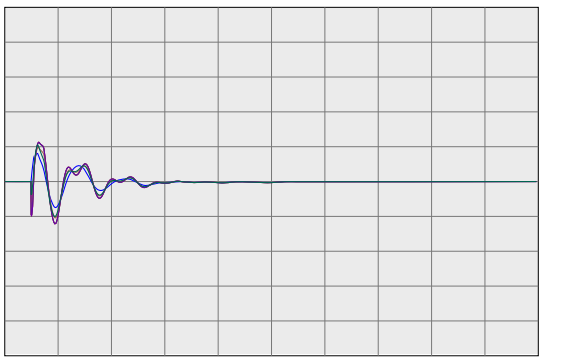
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



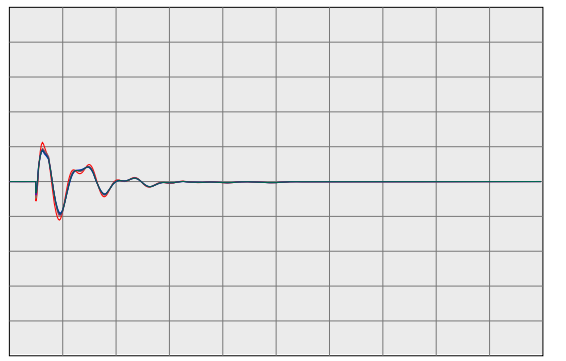
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



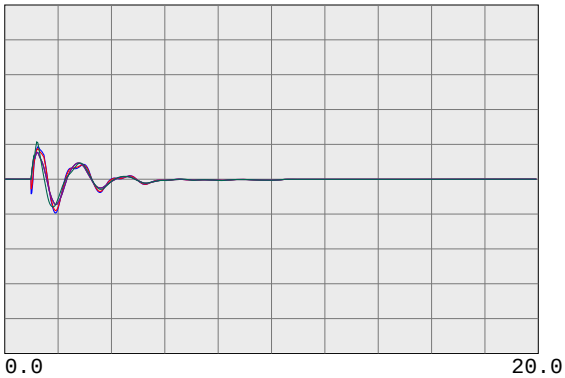
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



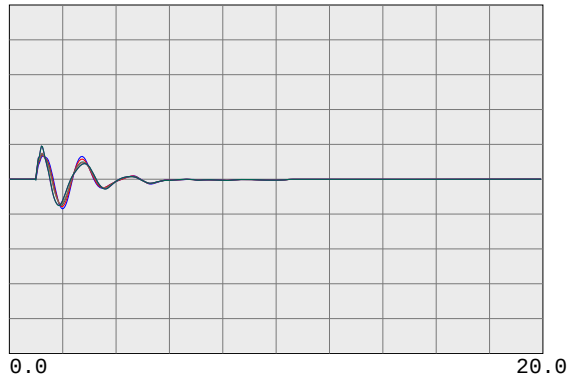
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

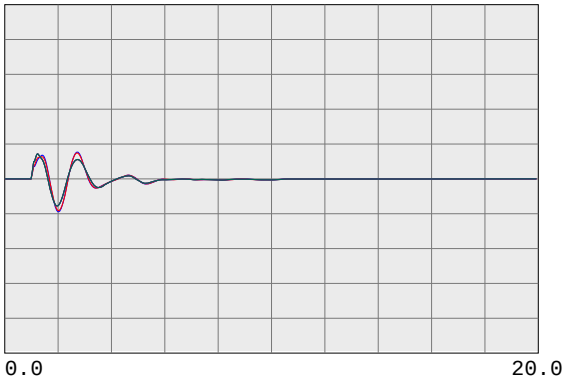
230-KV SYSTEM FREQUENCIES



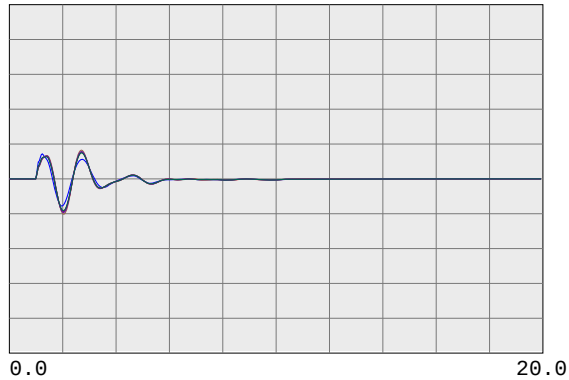
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



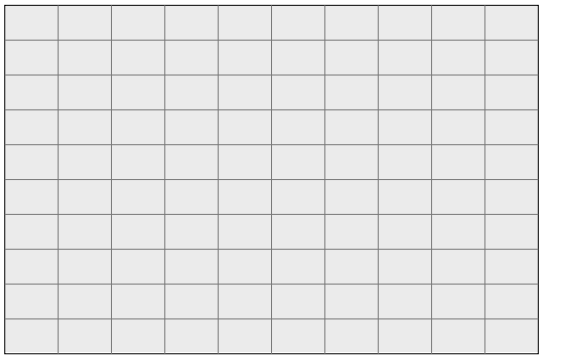
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

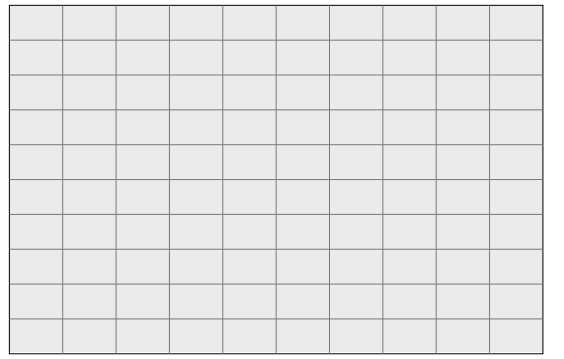


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



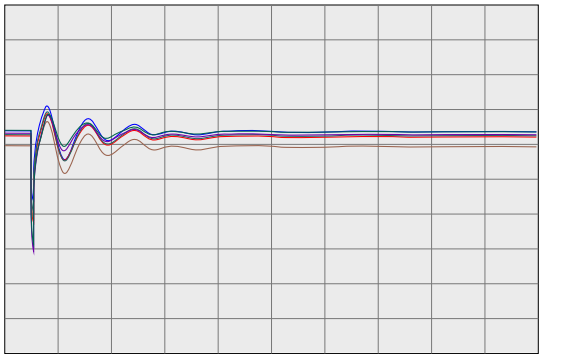
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



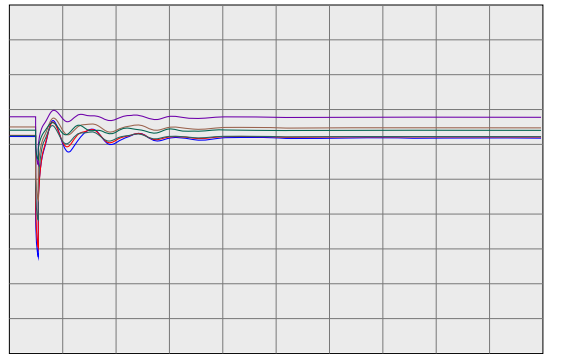


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

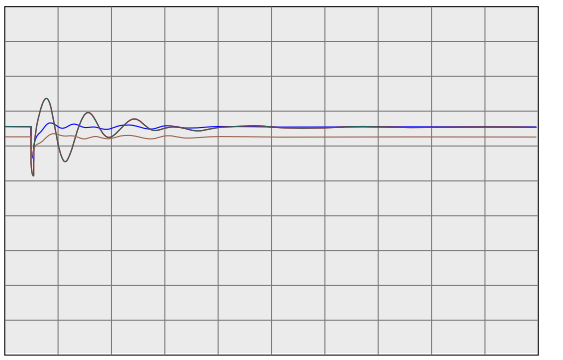
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



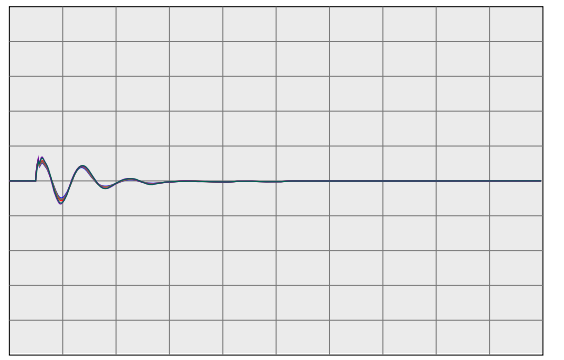
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



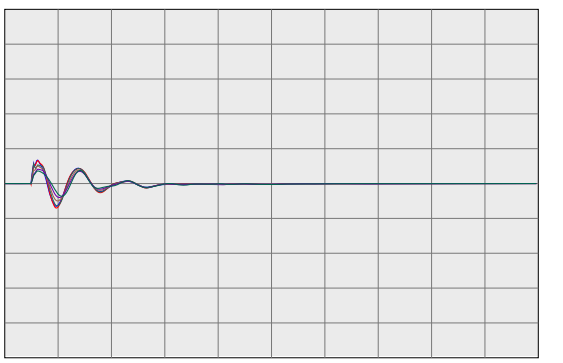
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



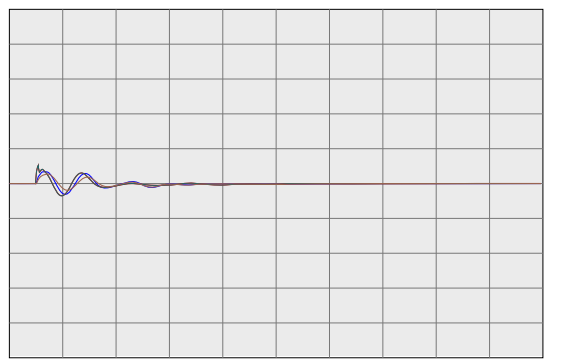
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



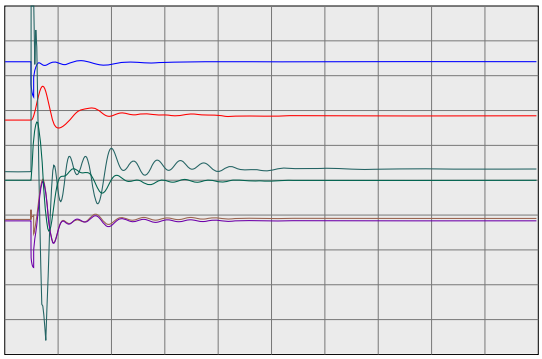
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



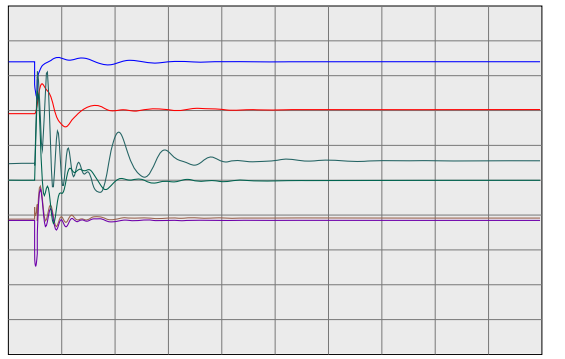
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

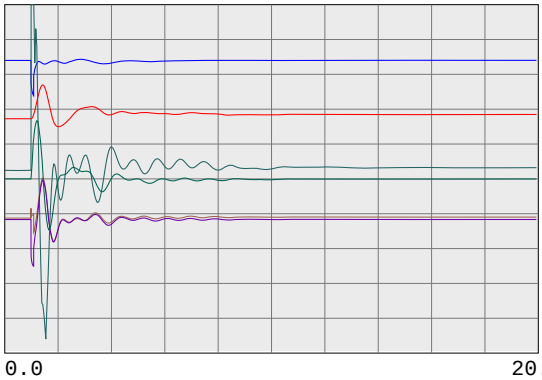
WILLOW PASS GENERATION PLANT



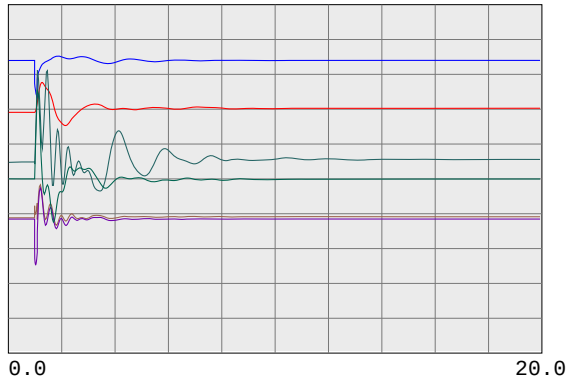
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



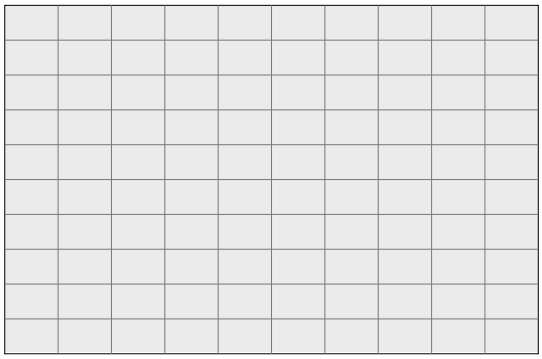
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

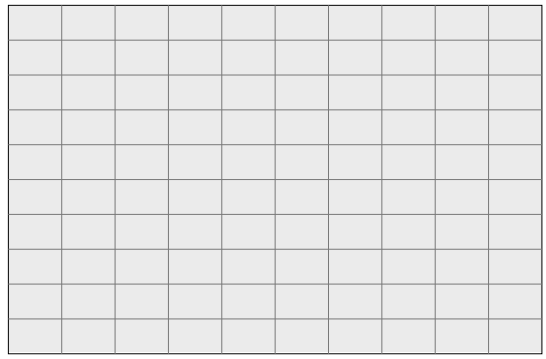


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



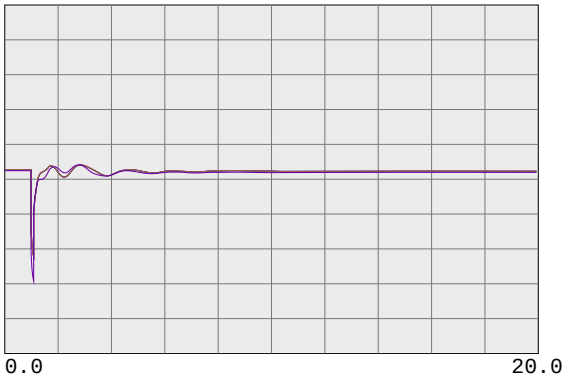
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



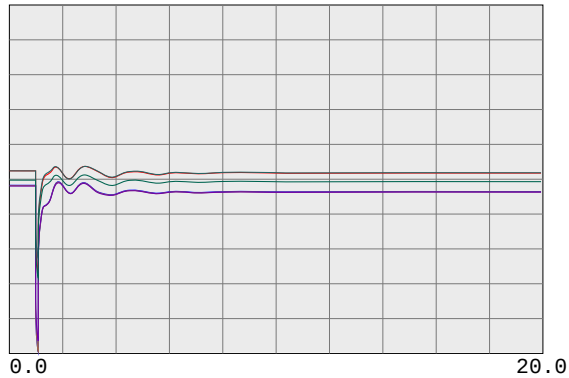


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

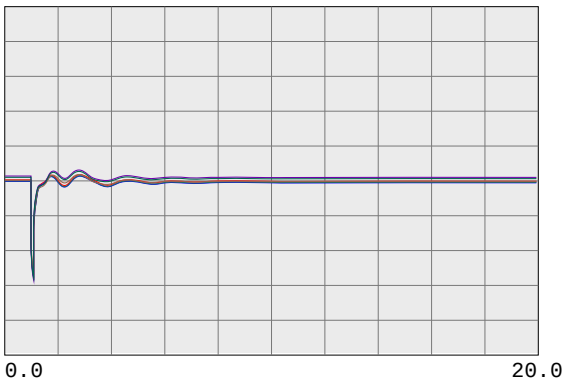
230-KV SYSTEM VOLTAGES



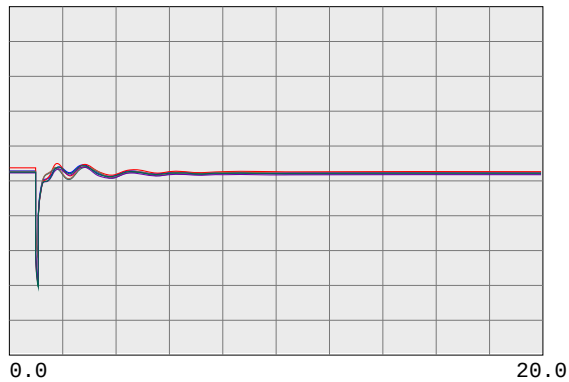
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



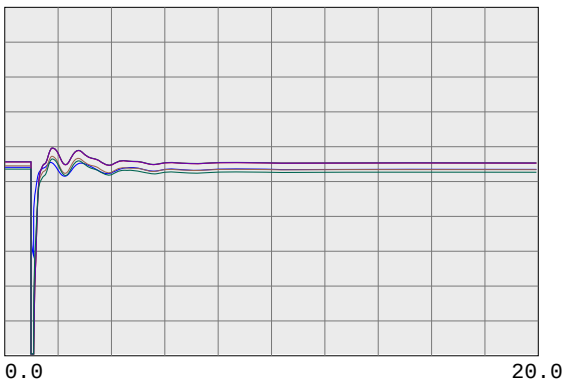
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



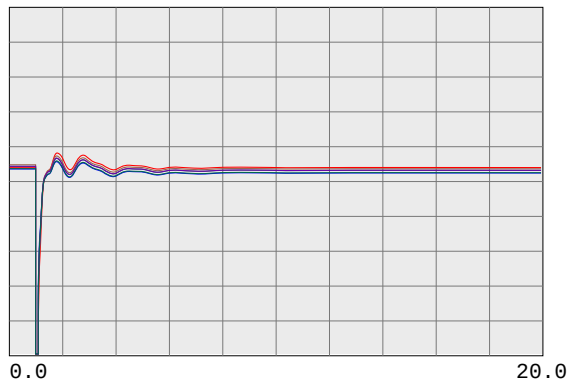
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



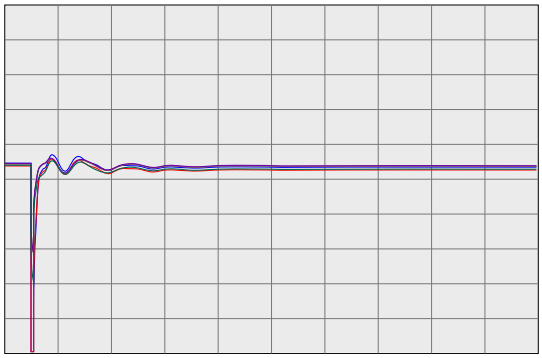
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

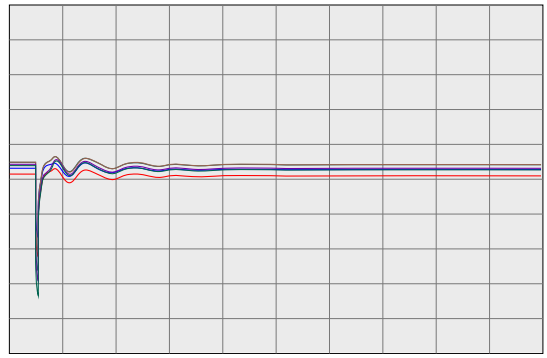
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

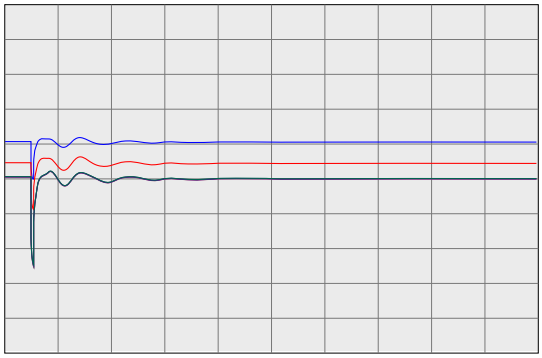
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

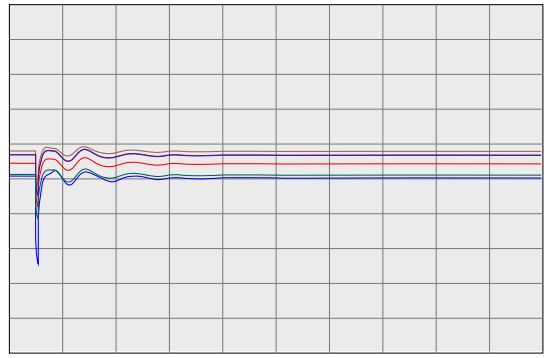
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

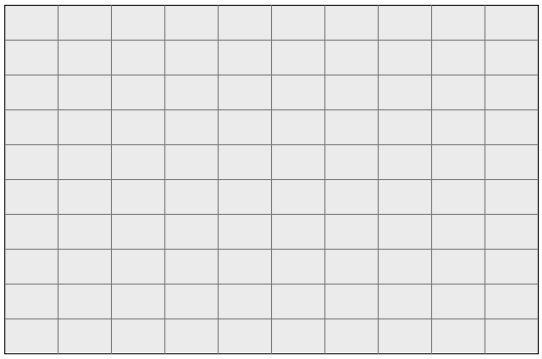
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

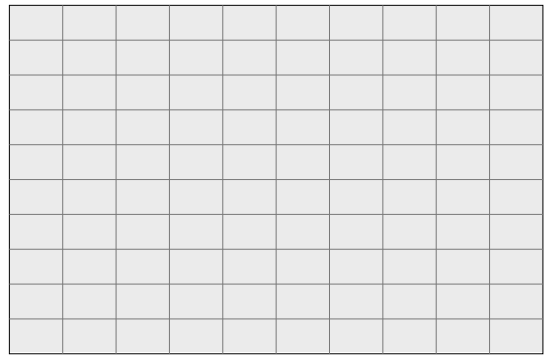


0.0 20.0

Time(sec)

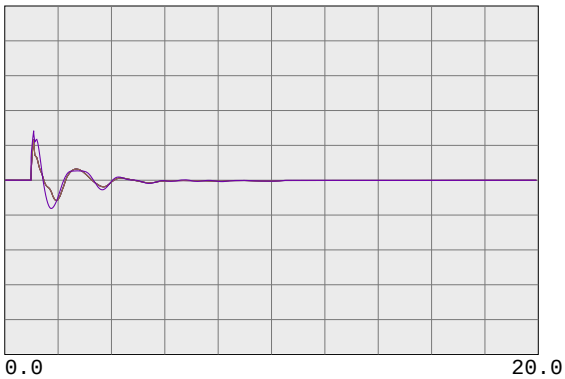
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



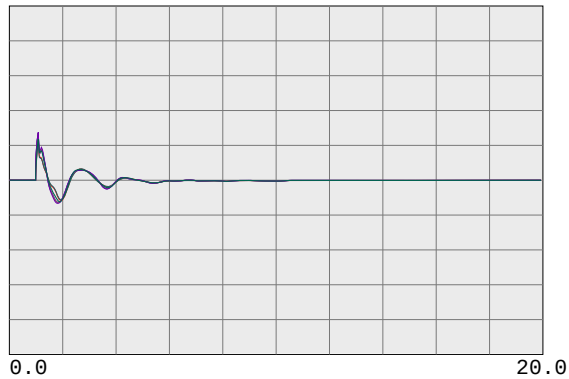


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

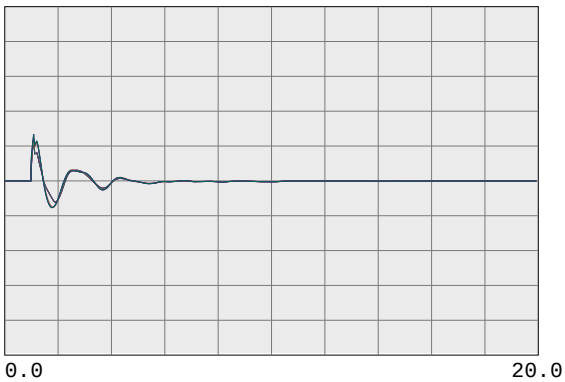
230-KV SYSTEM FREQUENCIES



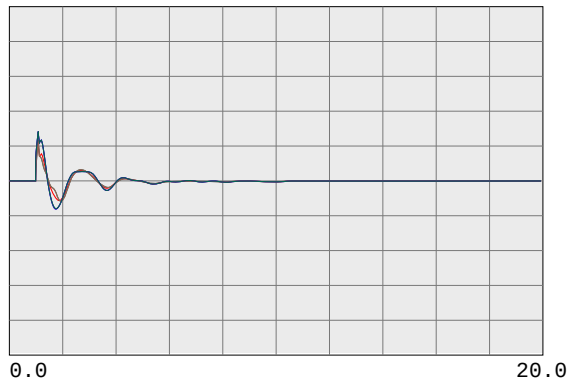
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



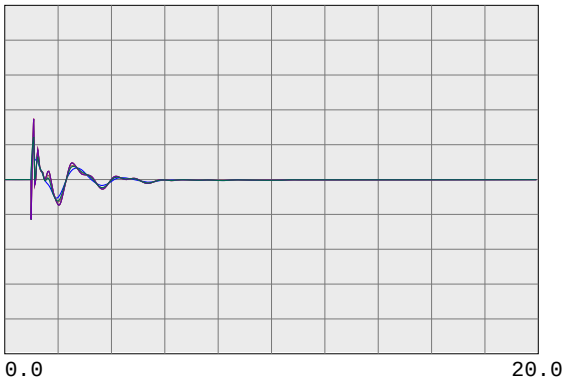
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



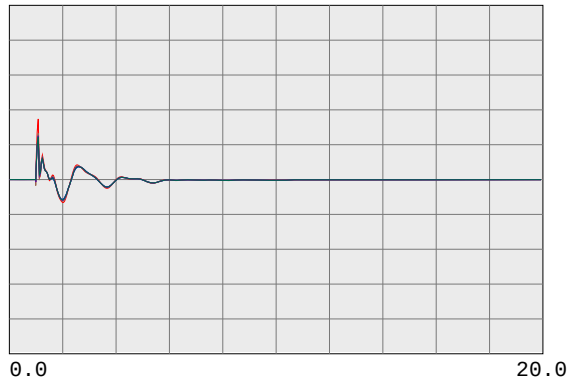
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



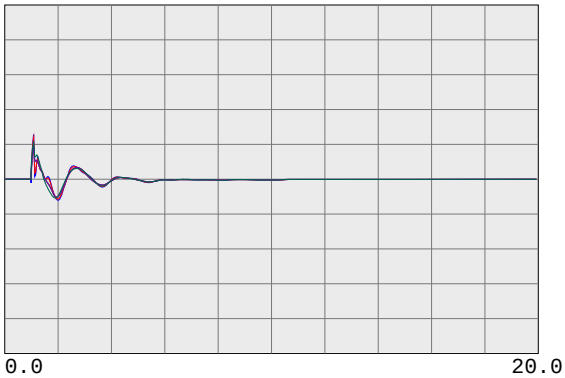
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



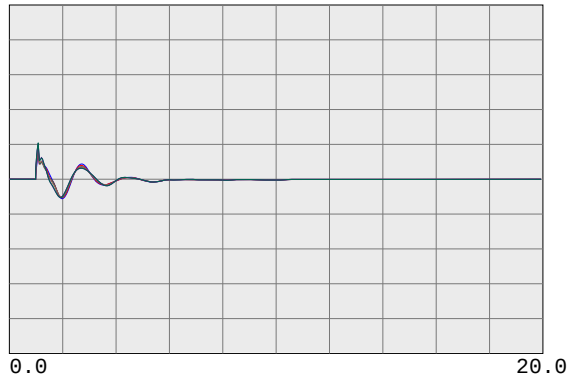
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

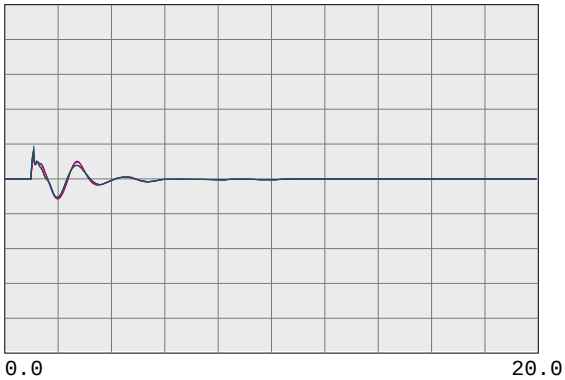
230-KV SYSTEM FREQUENCIES



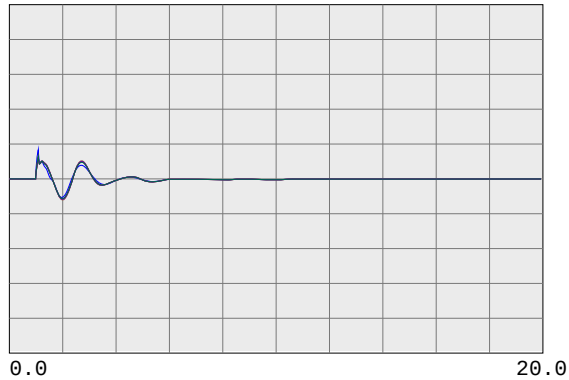
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



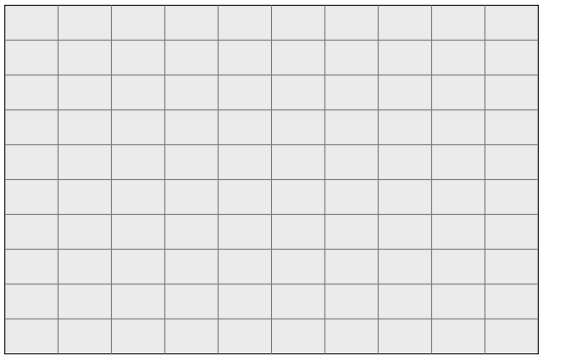
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

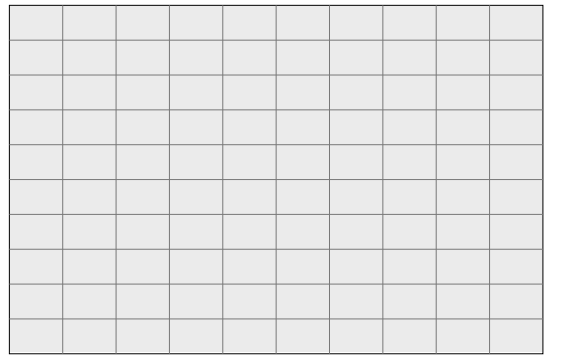


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



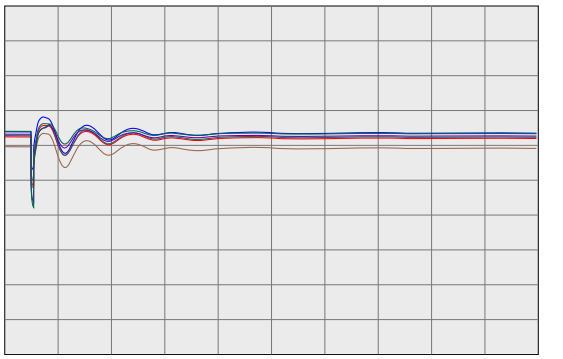
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



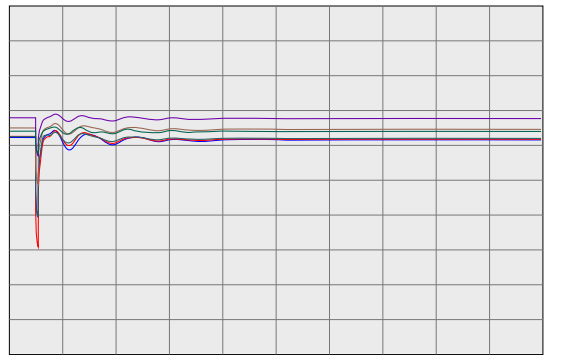


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

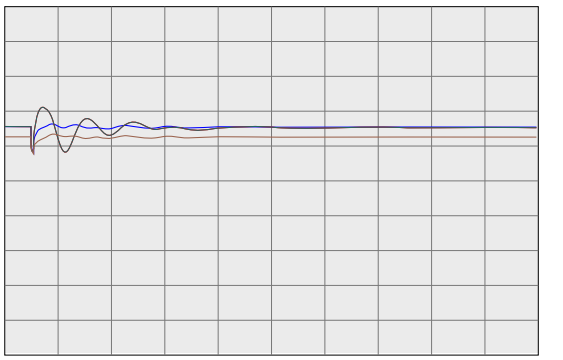
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



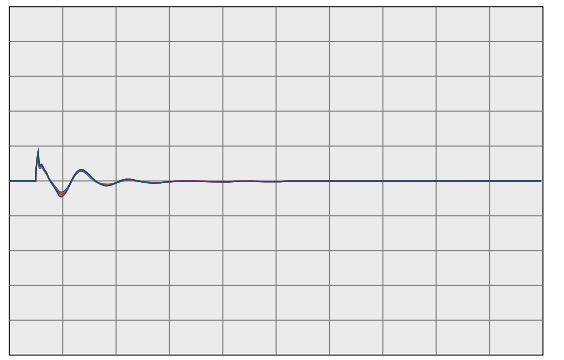
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



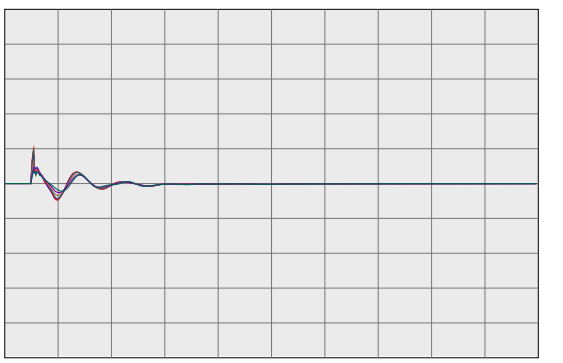
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



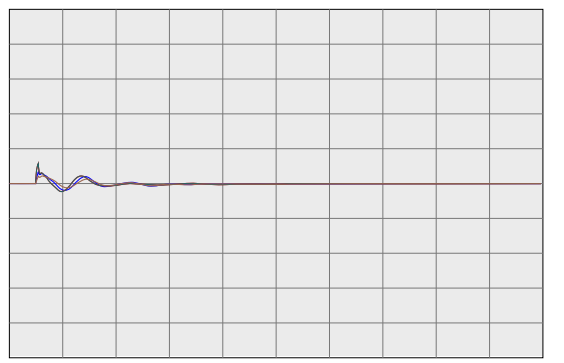
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



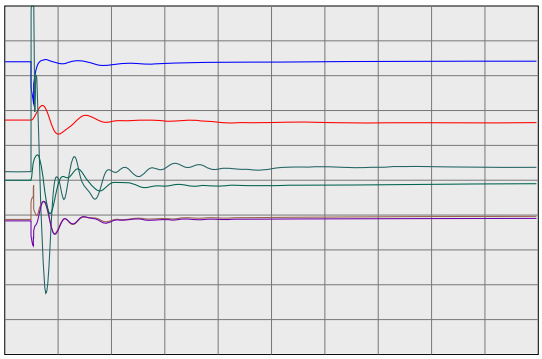
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



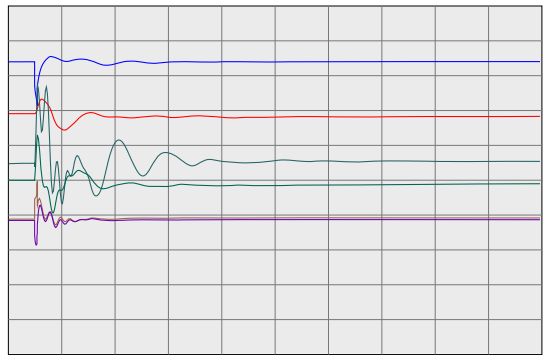
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

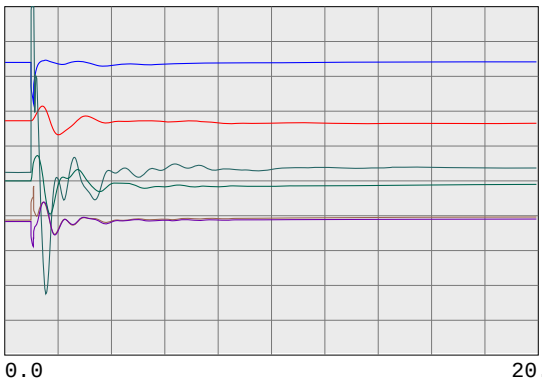
WILLOW PASS GENERATION PLANT



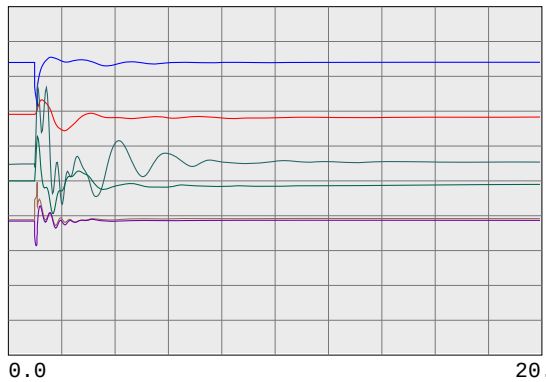
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



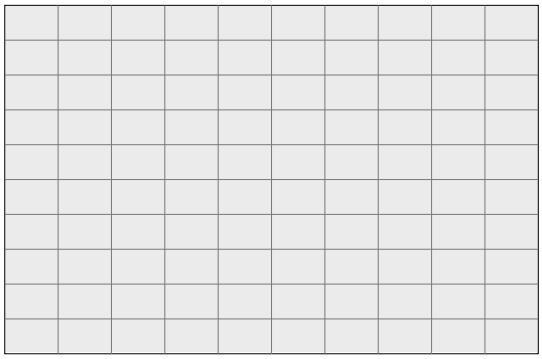
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

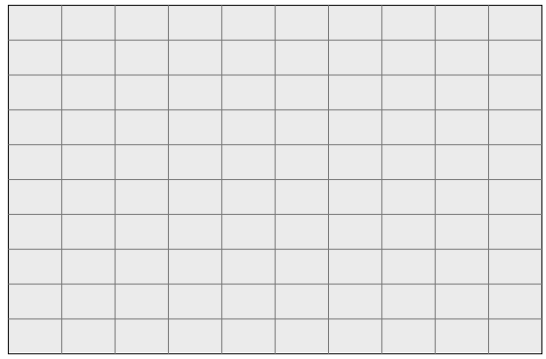


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



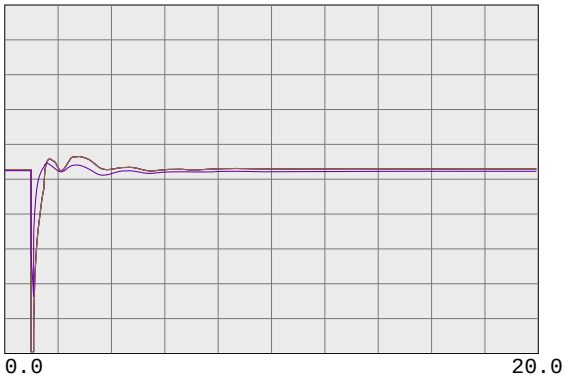
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



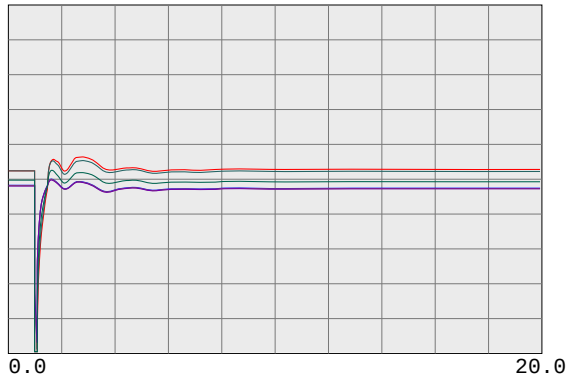


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

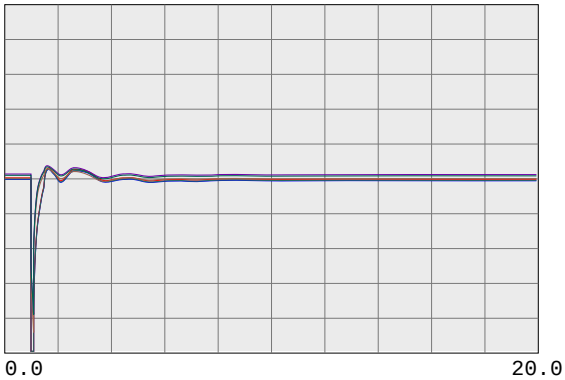
230-KV SYSTEM VOLTAGES



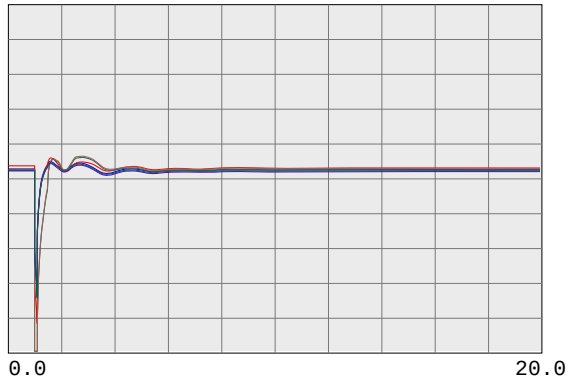
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



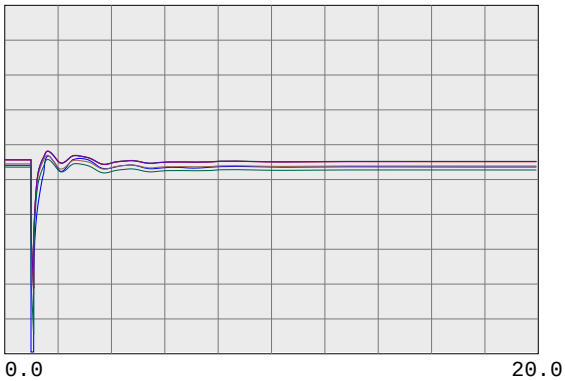
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



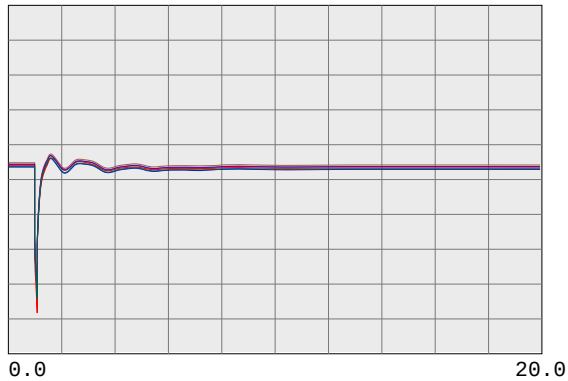
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



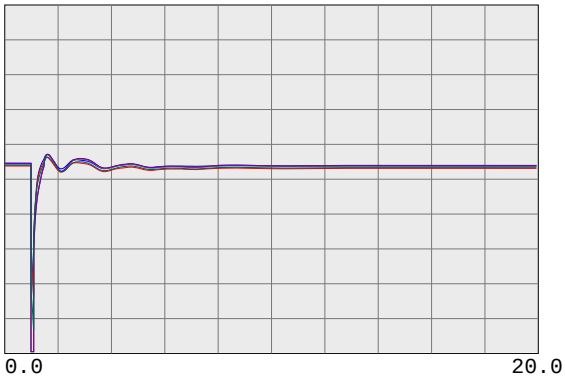
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



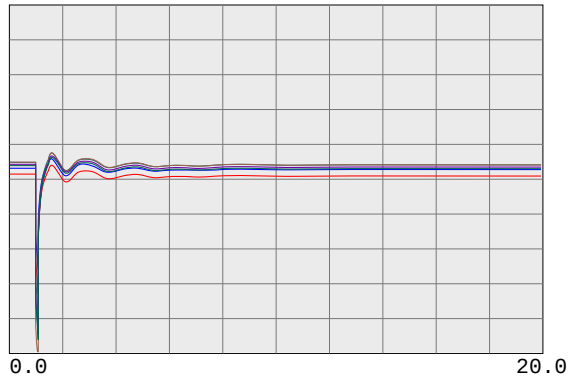
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

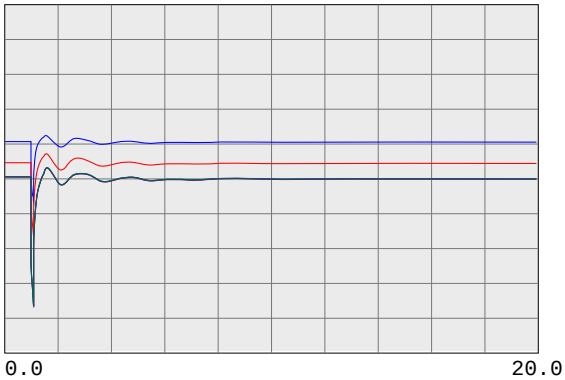
230-KV SYSTEM VOLTAGES



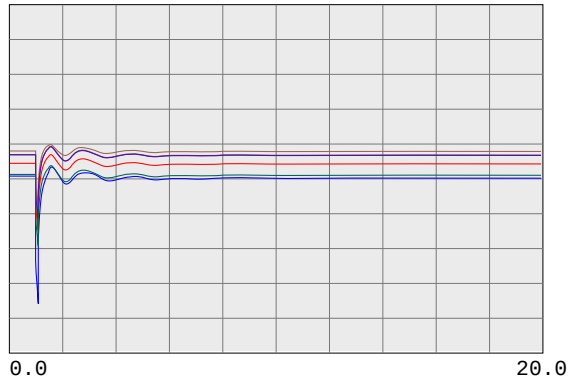
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



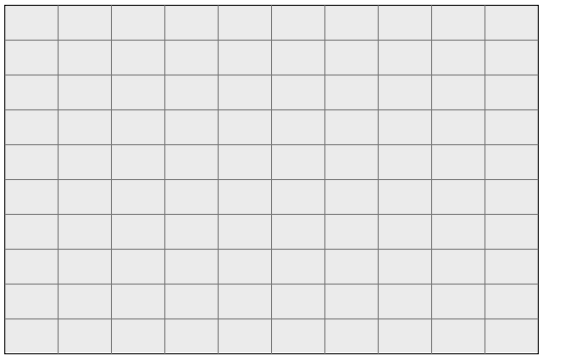
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

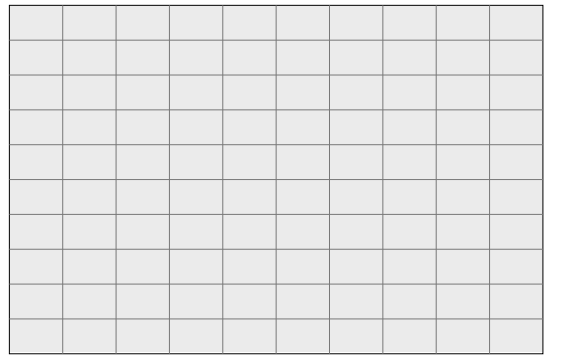


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



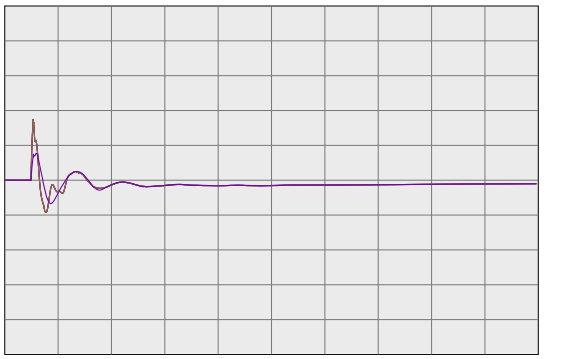
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



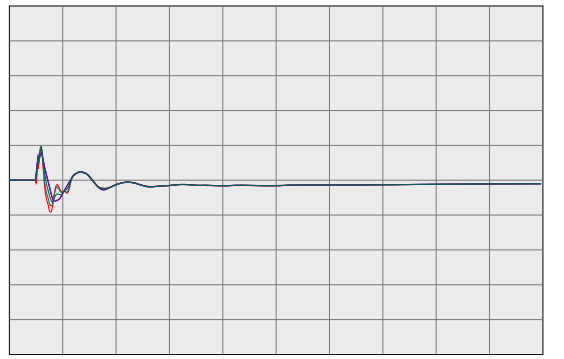


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

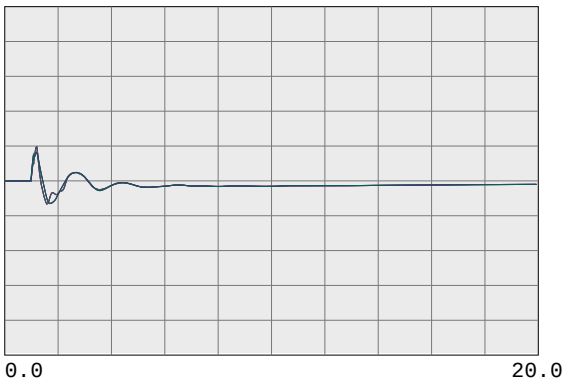
230-KV SYSTEM FREQUENCIES



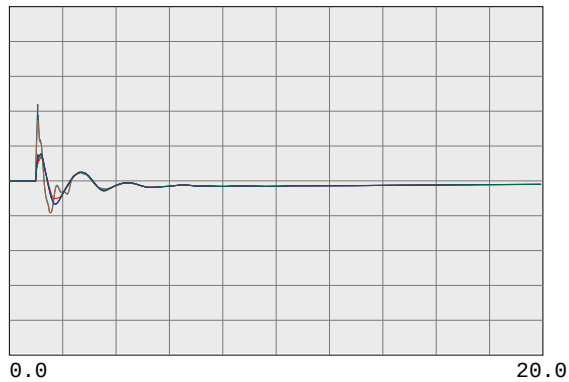
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



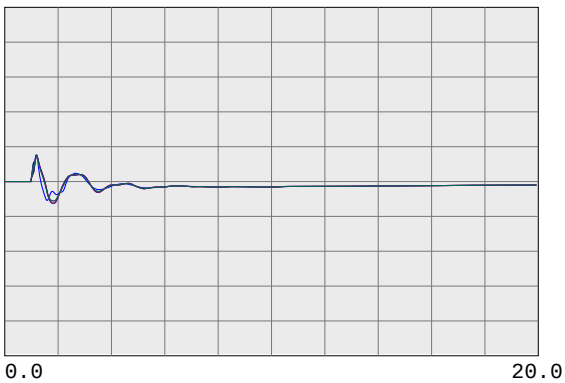
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



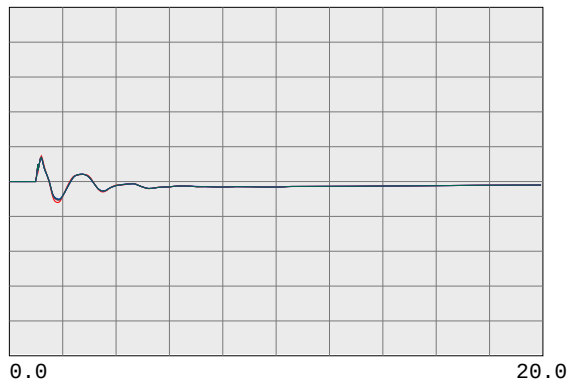
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



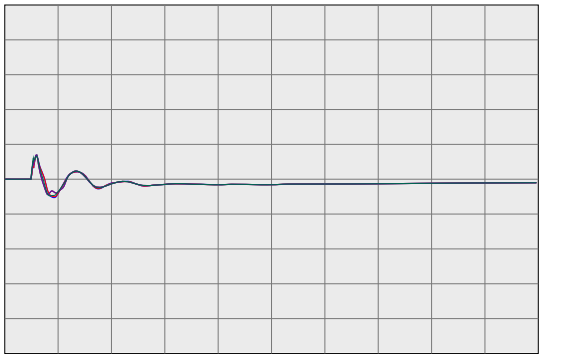
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



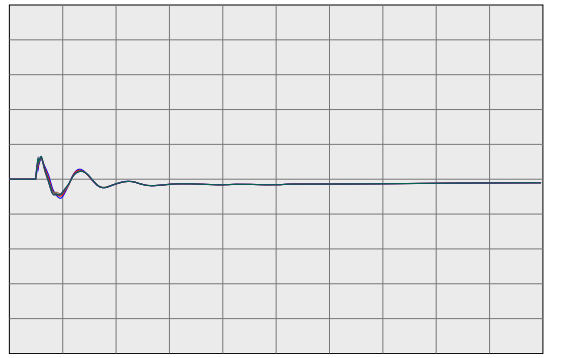
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

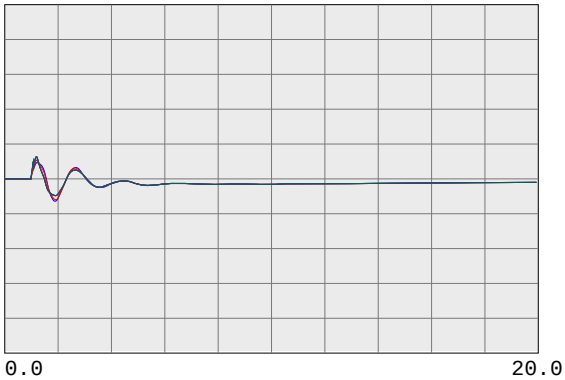
230-KV SYSTEM FREQUENCIES



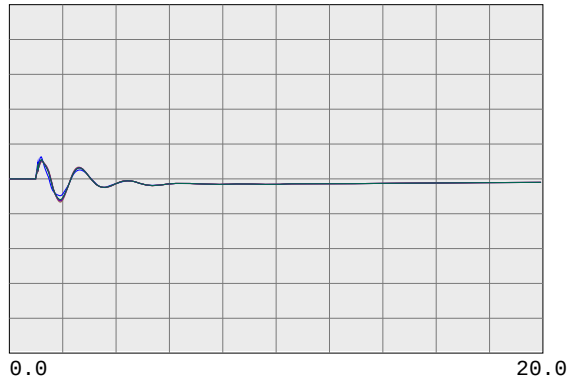
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



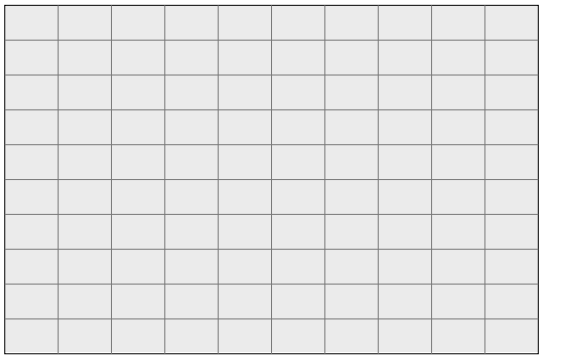
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

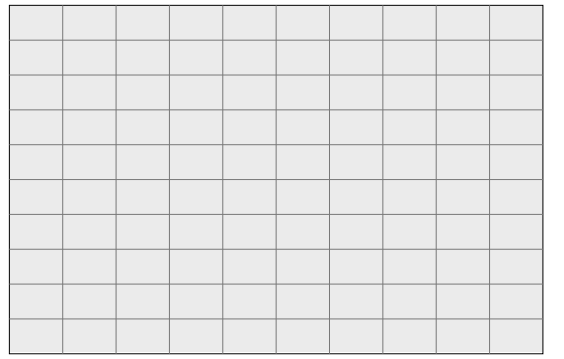


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



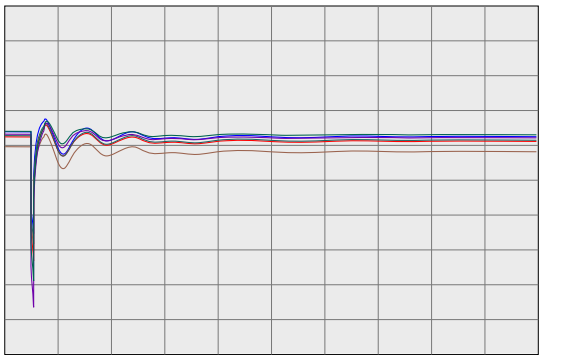
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



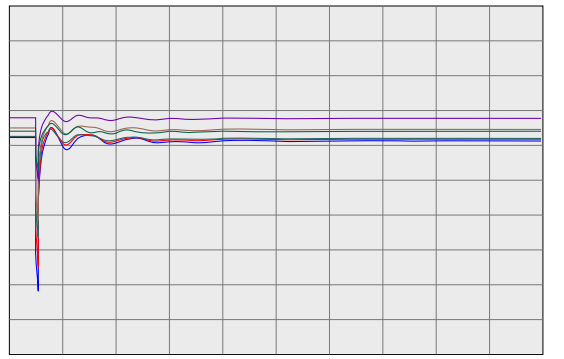


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

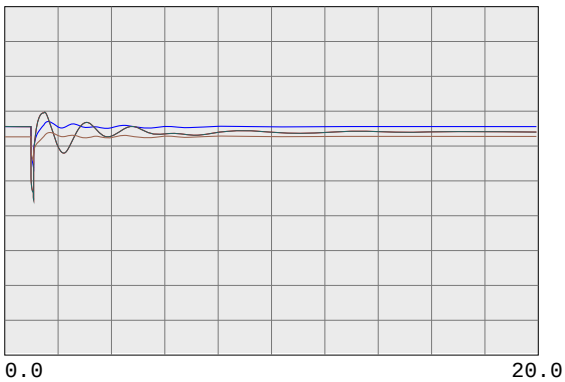
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



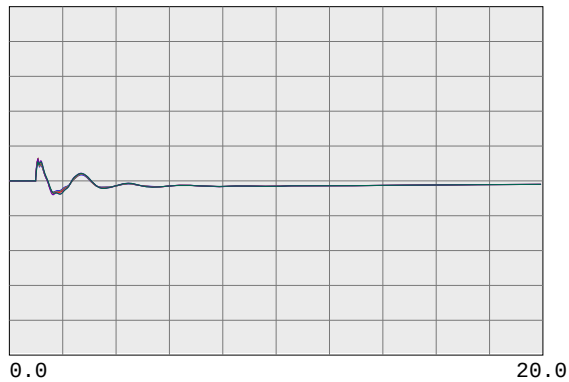
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



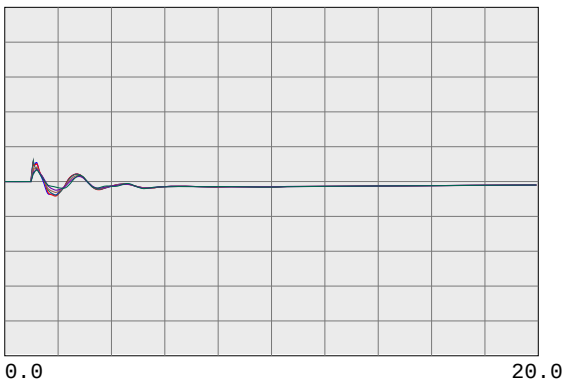
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



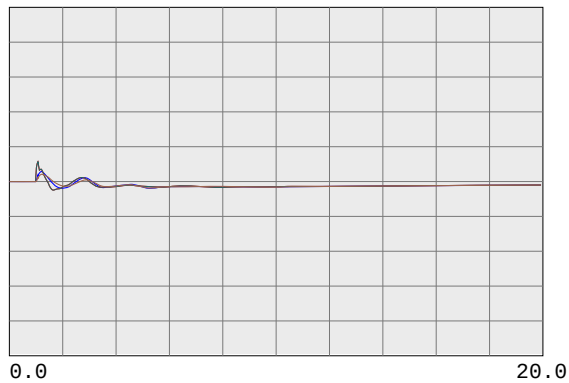
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



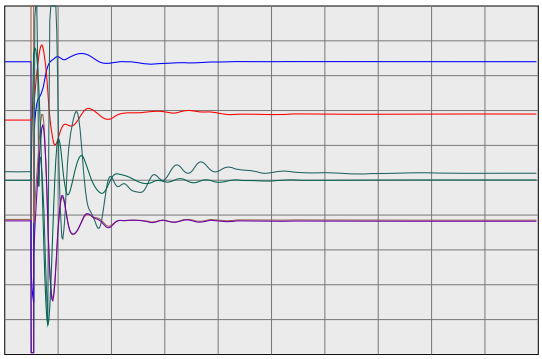
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



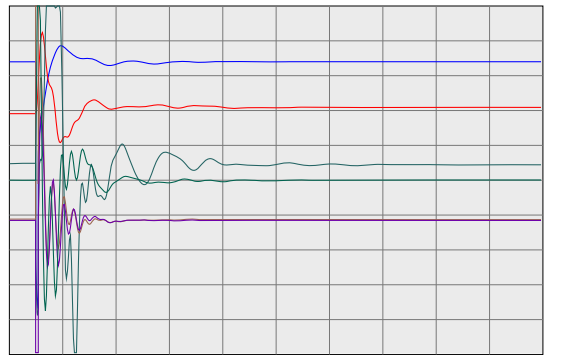
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

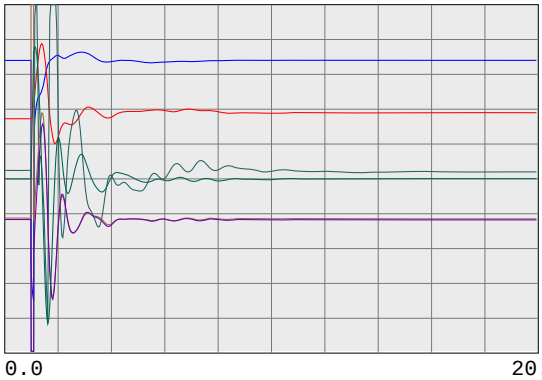
WILLOW PASS GENERATION PLANT



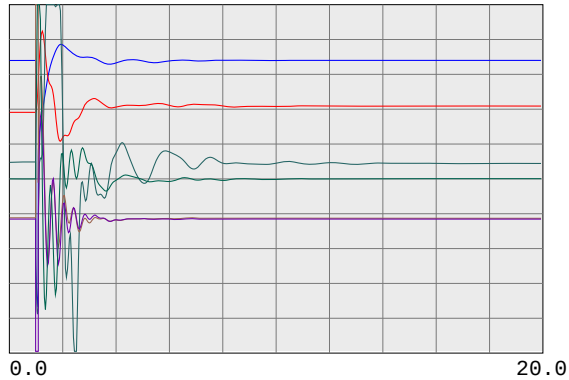
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



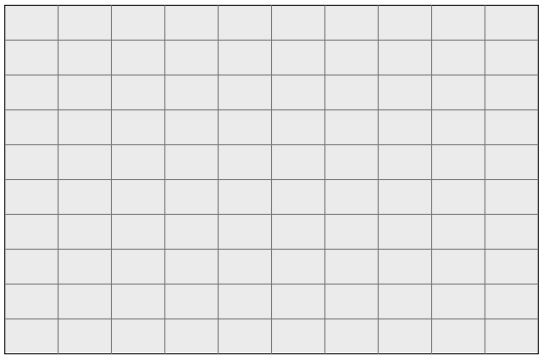
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

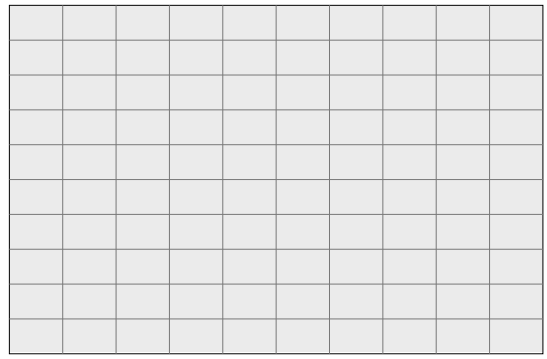


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



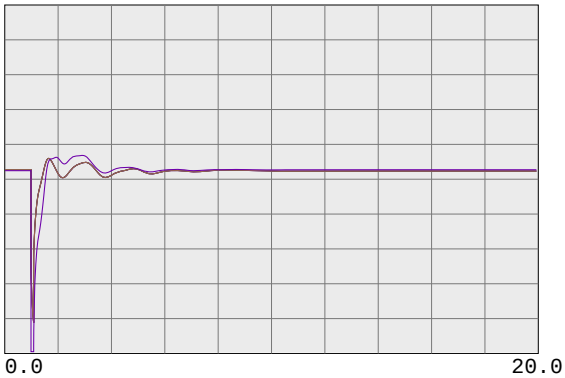
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



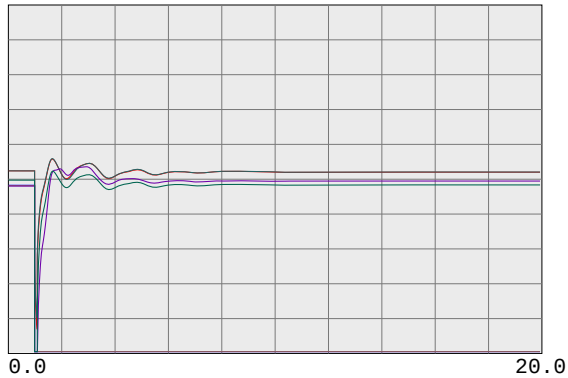


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

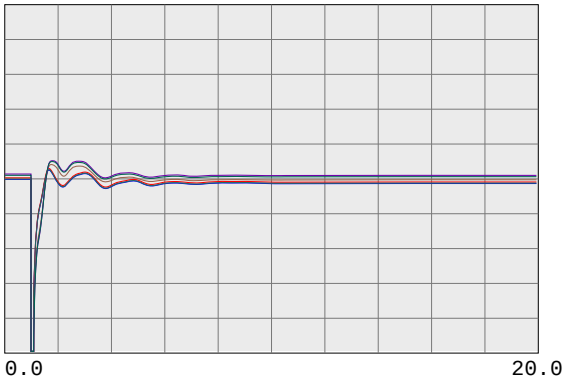
230-KV SYSTEM VOLTAGES



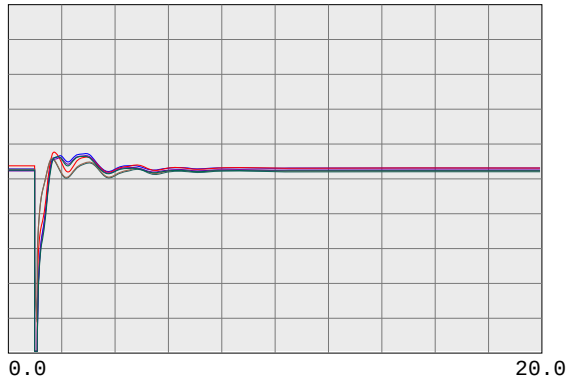
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



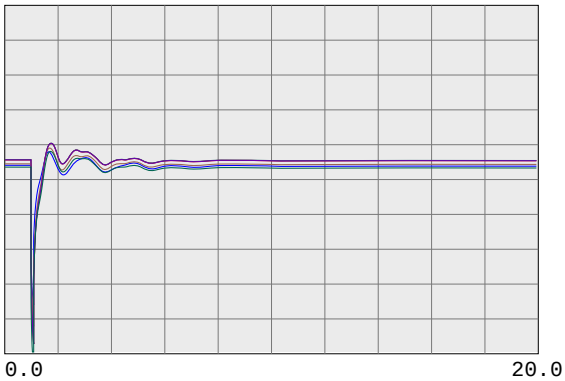
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



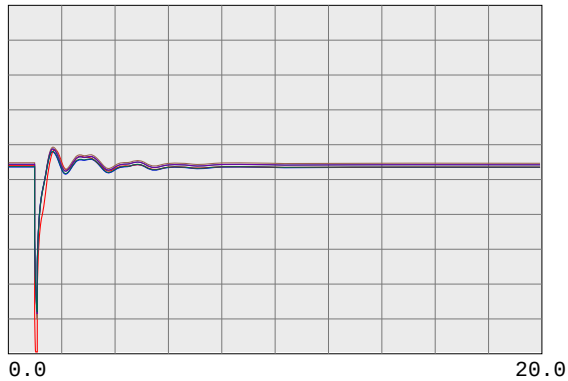
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



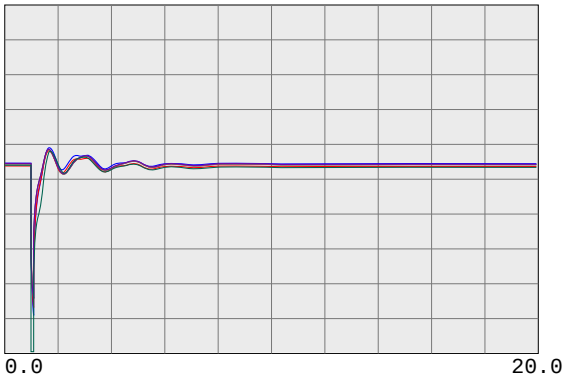
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



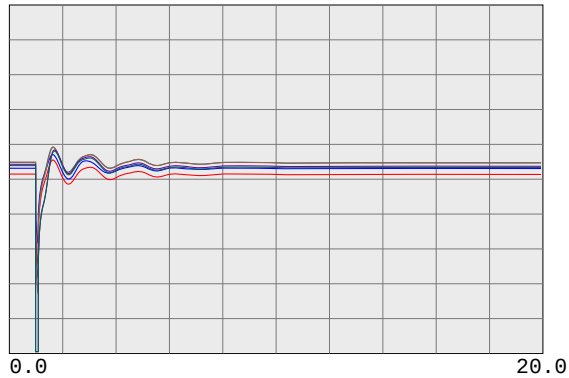
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

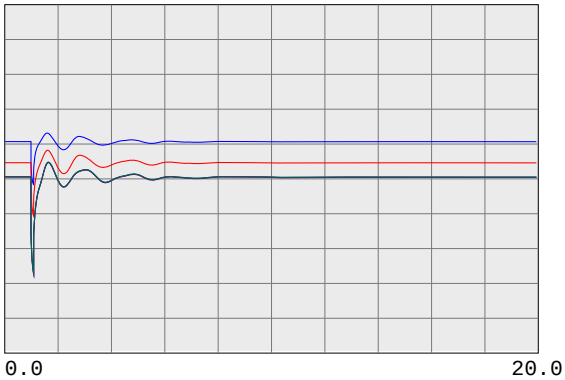
230-KV SYSTEM VOLTAGES



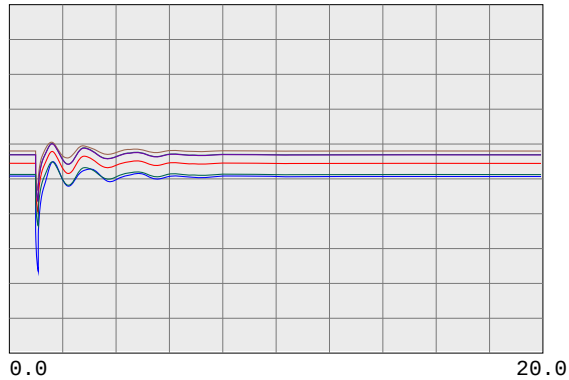
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



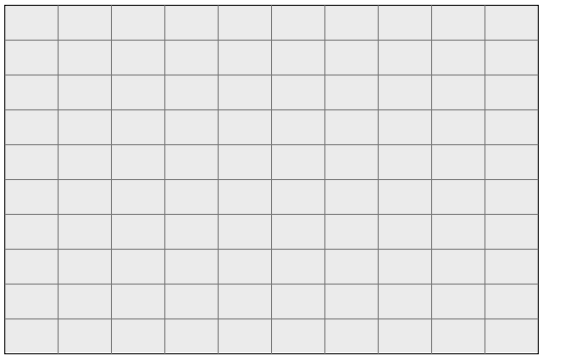
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

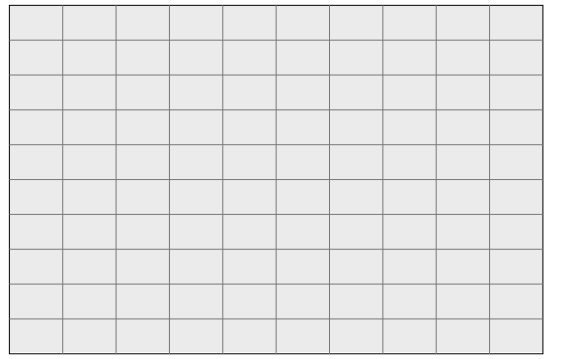


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



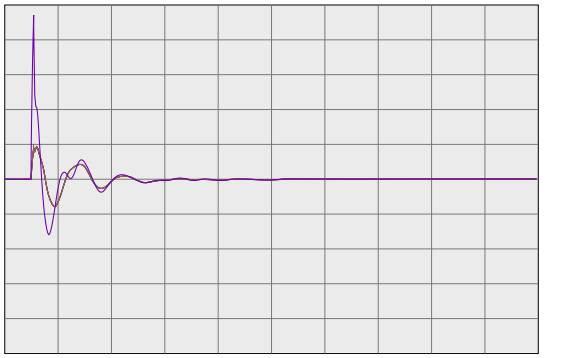
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



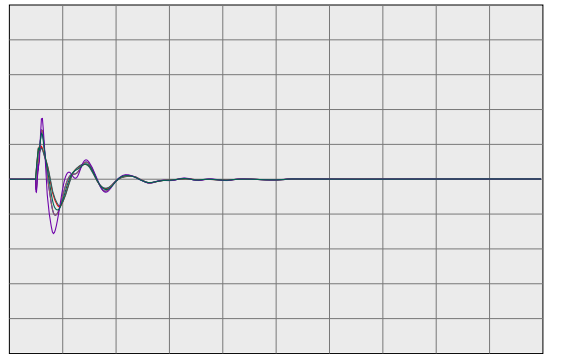


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

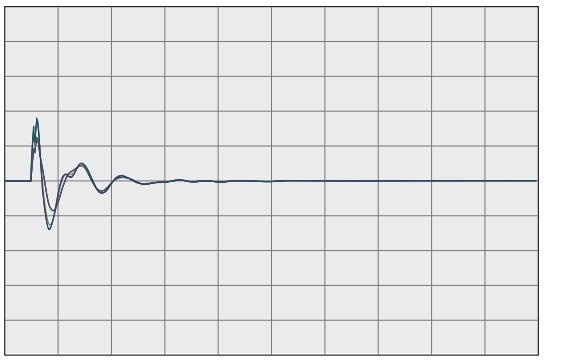
230-KV SYSTEM FREQUENCIES



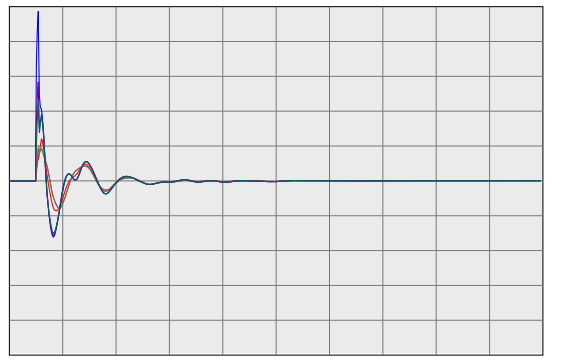
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



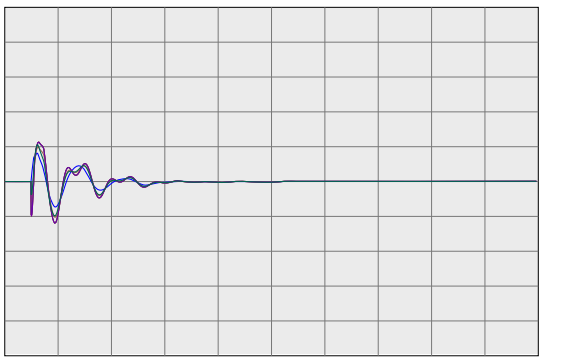
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



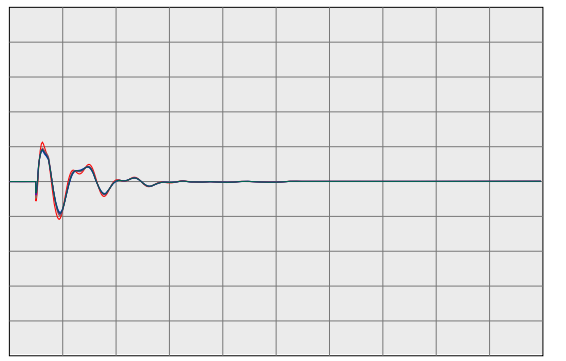
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



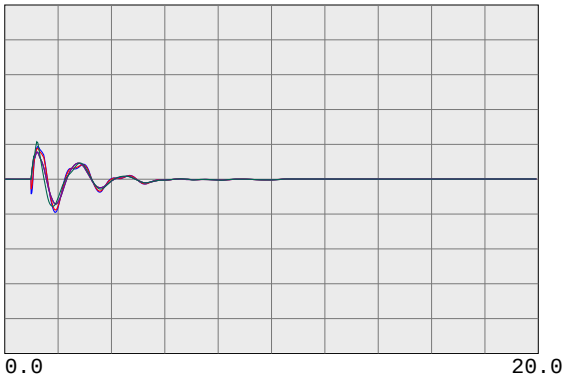
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



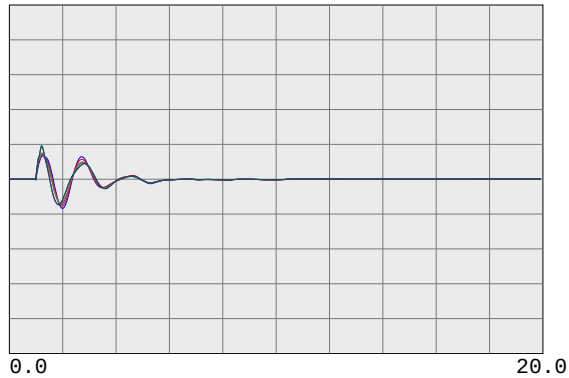
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

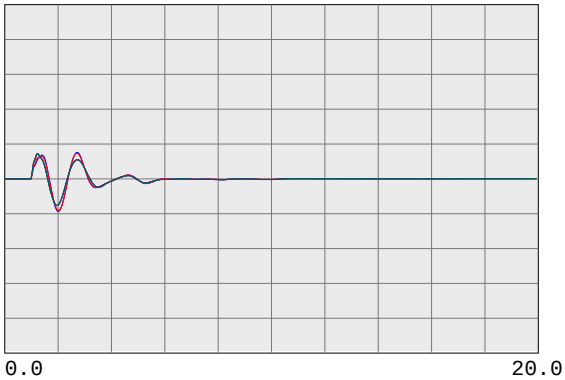
230-KV SYSTEM FREQUENCIES



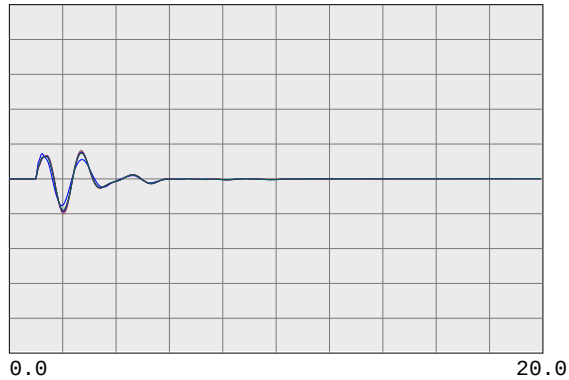
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



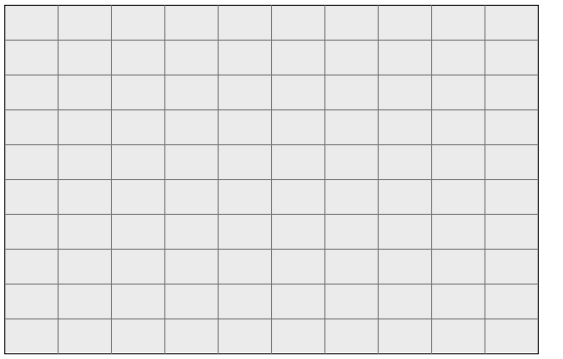
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

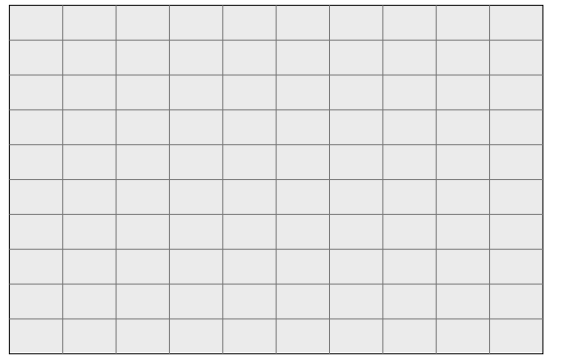


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



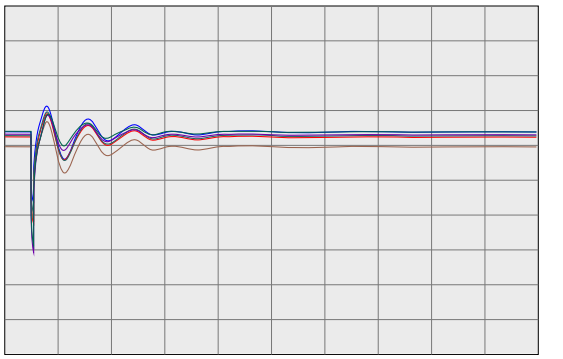
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



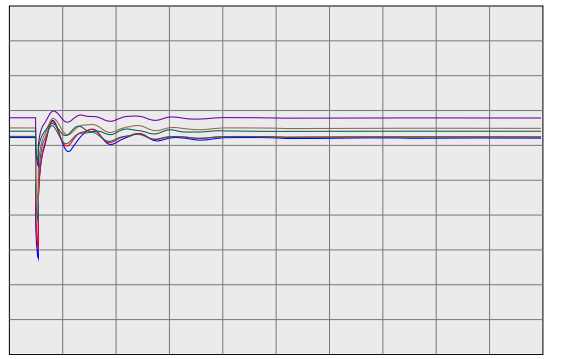


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

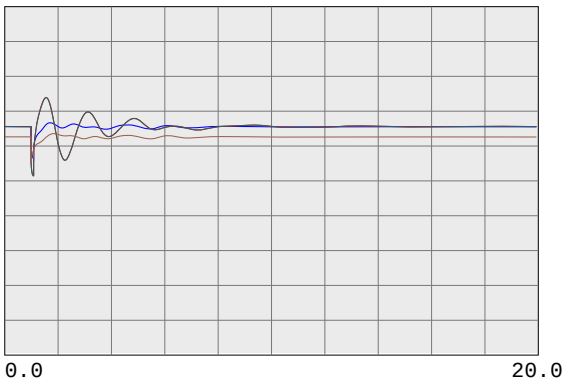
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



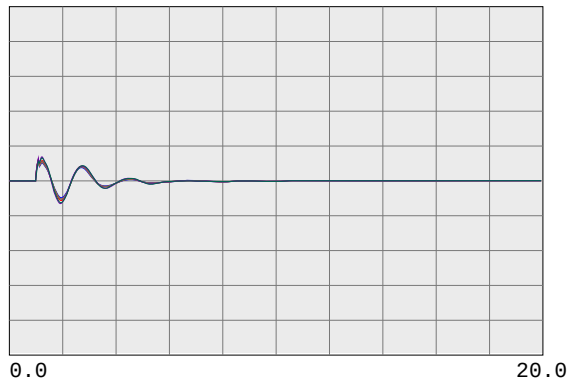
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



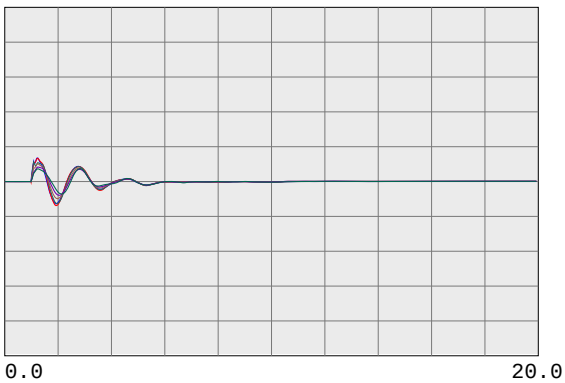
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



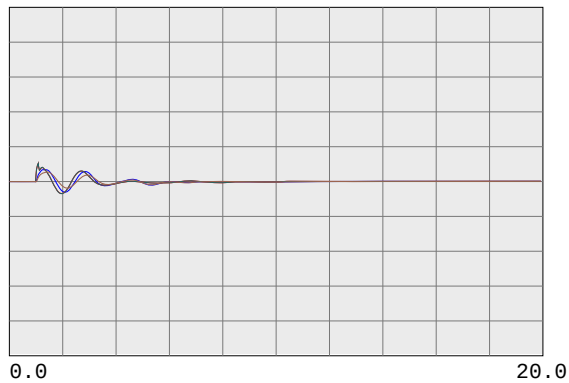
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

HS13_PST_WLLW_PSS_C-139_N-2_PITSBGD-SNRAMN_TASSJR-NWRK_230.chf

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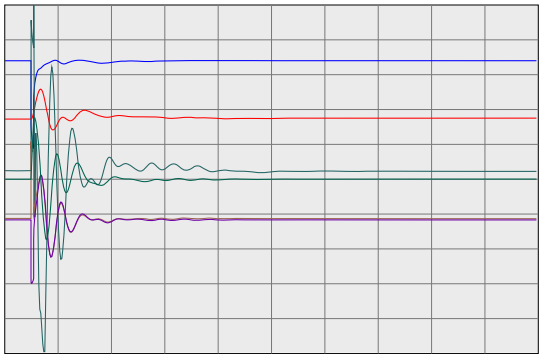
Fri Feb 27 00:31:09 2009

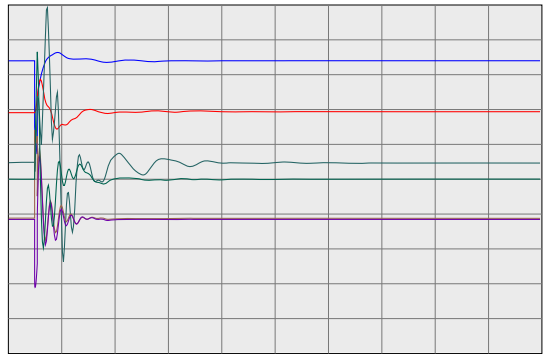
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

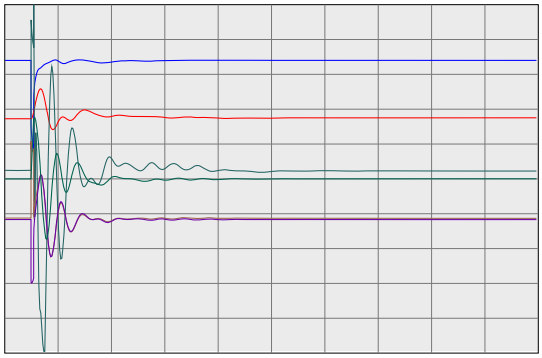
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

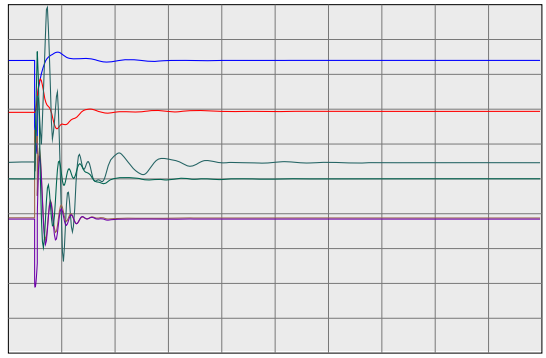
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

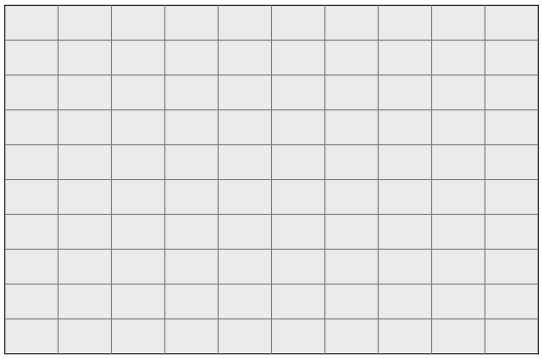
0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

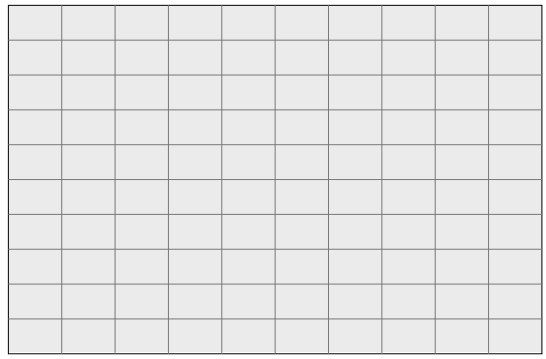


0.0 20.0

Time(sec)

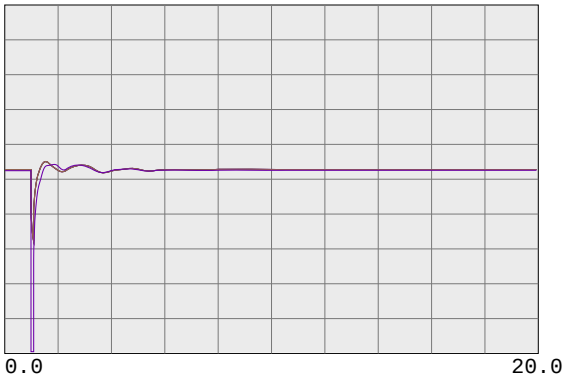
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



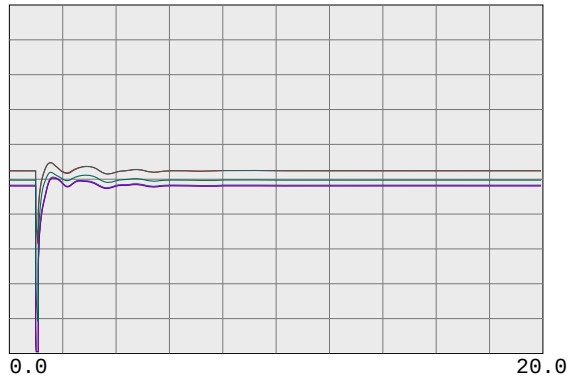


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

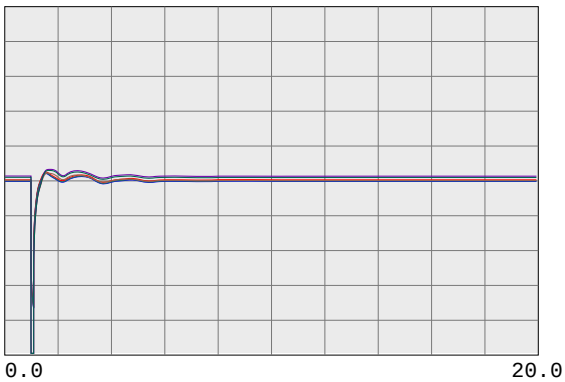
230-KV SYSTEM VOLTAGES



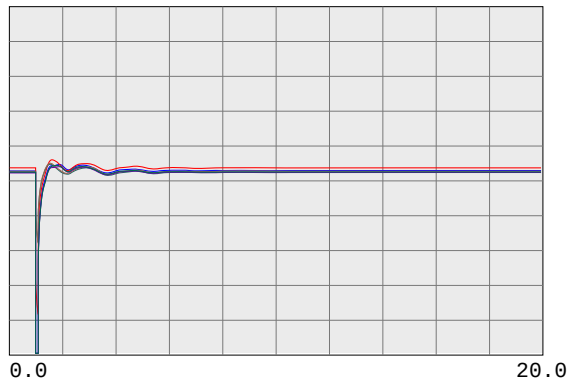
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



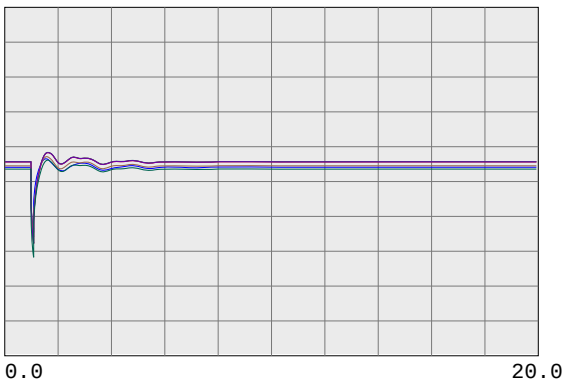
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



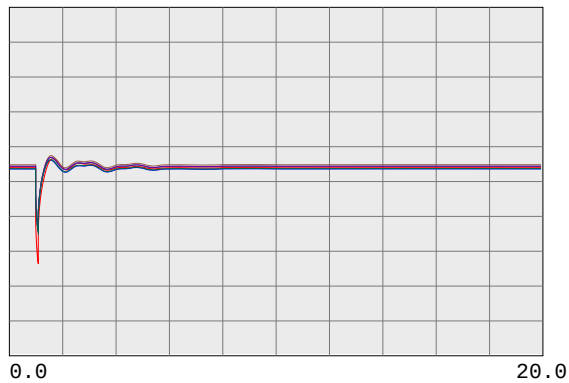
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



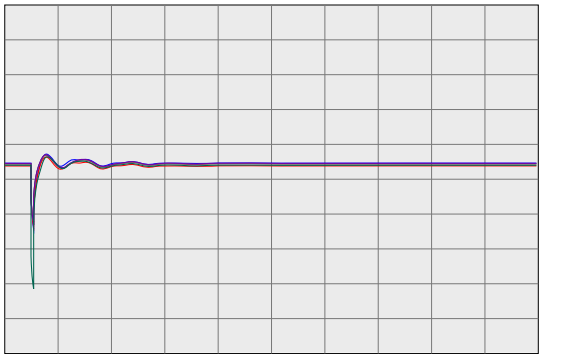
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



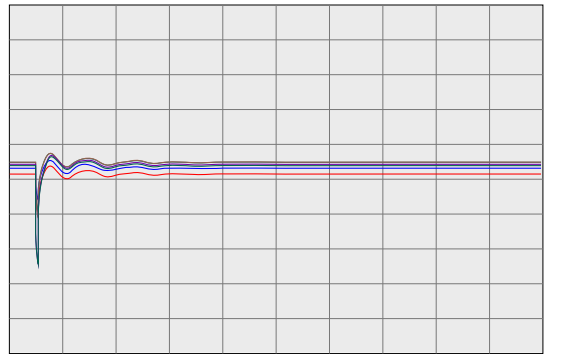
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

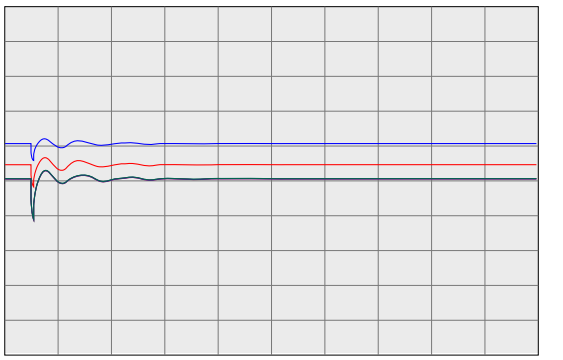
230-KV SYSTEM VOLTAGES



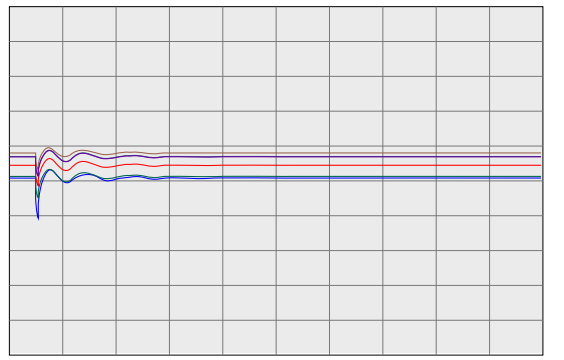
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



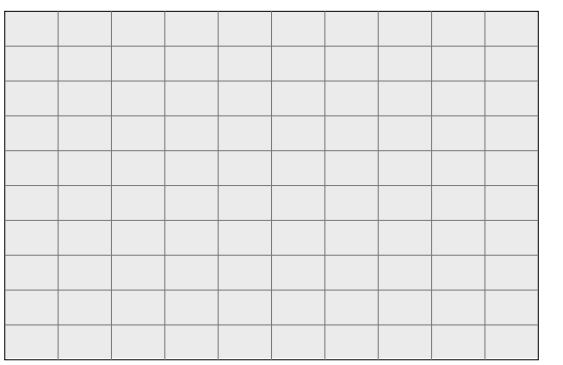
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

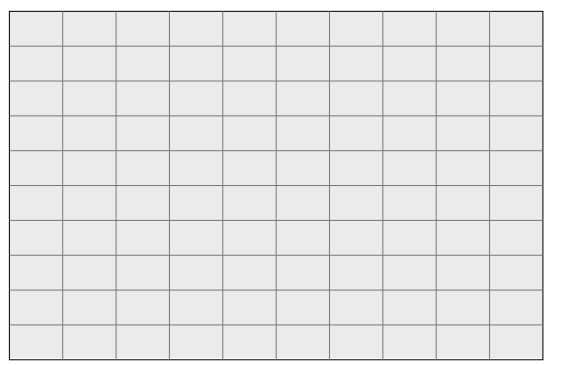


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



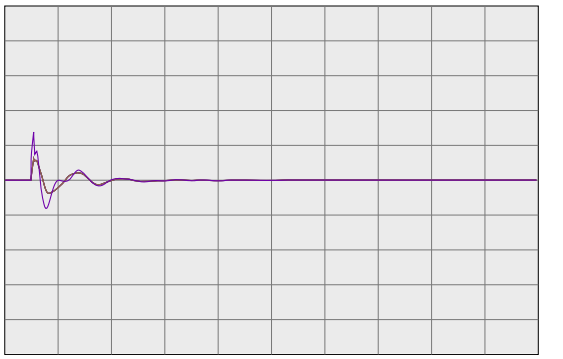
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



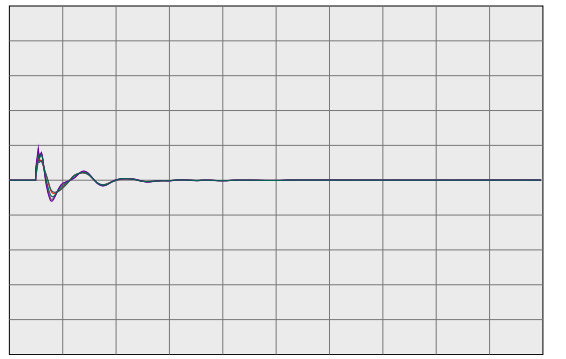


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

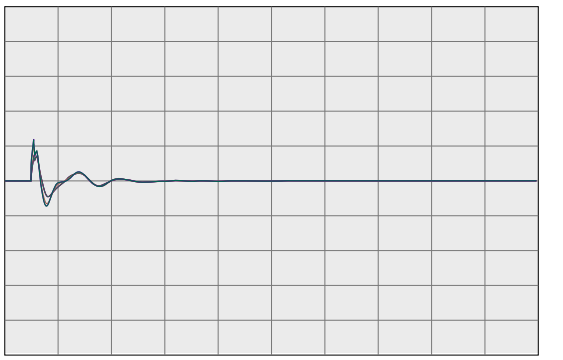
230-KV SYSTEM FREQUENCIES



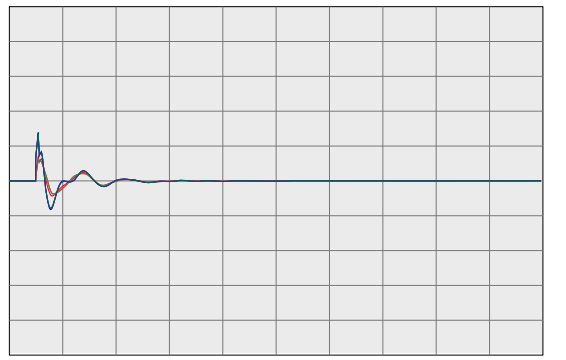
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



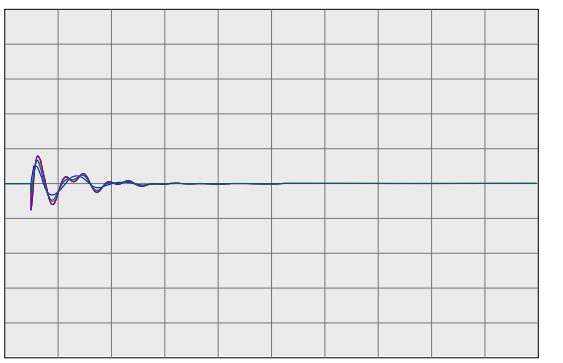
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



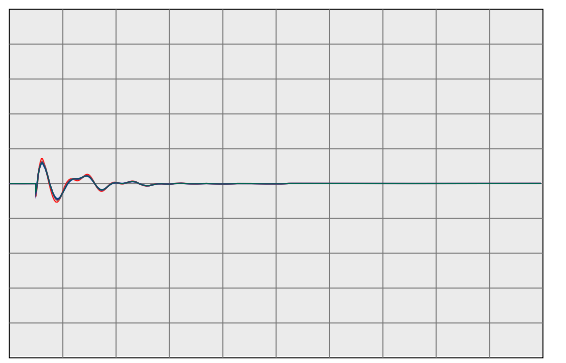
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



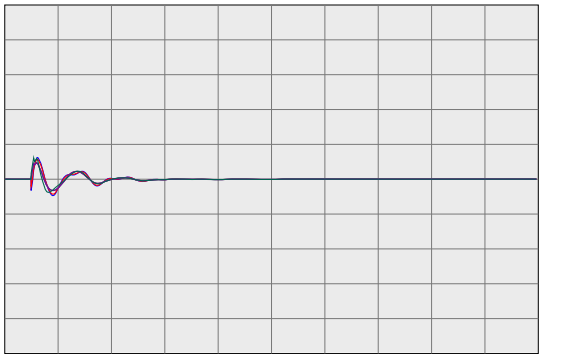
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



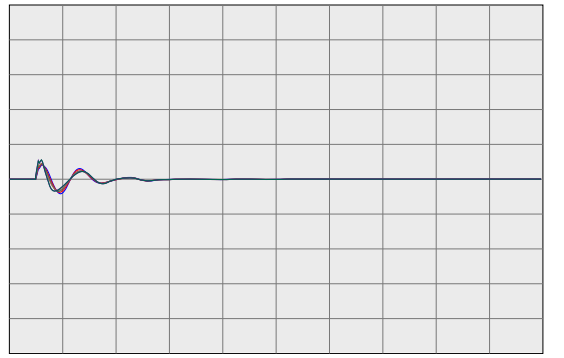
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

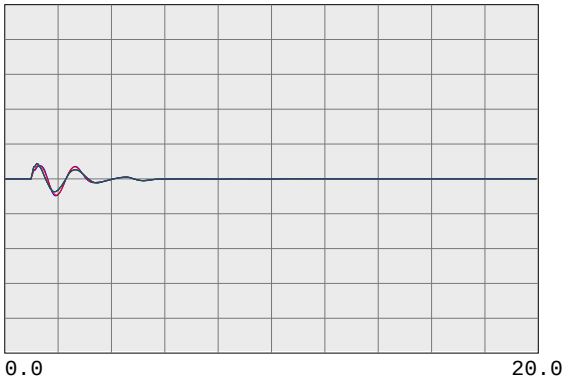
230-KV SYSTEM FREQUENCIES



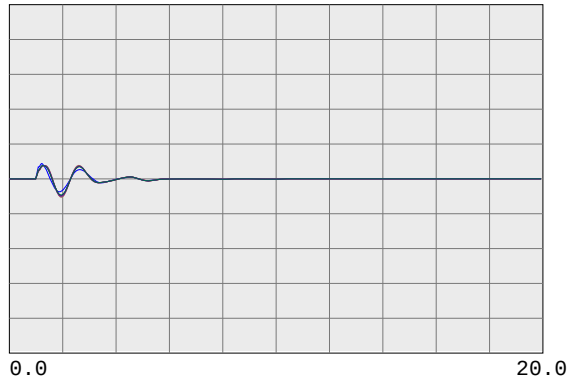
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



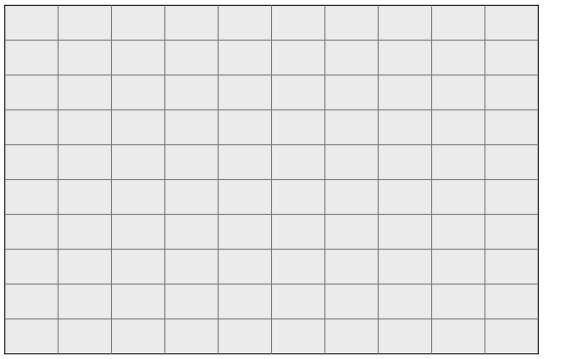
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

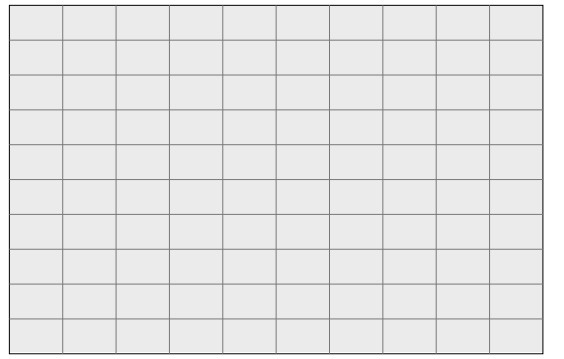


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



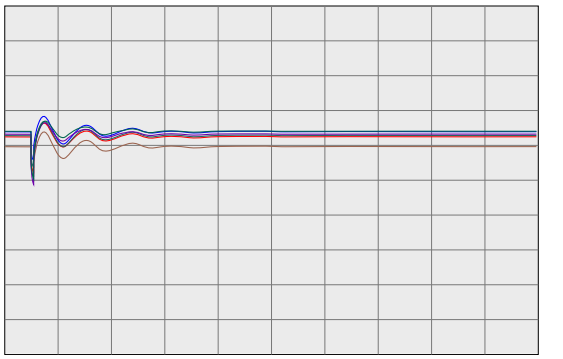
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



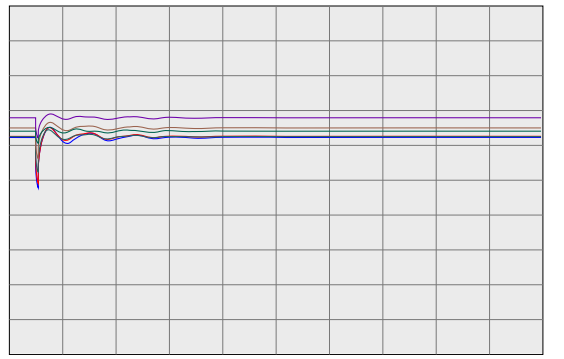


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

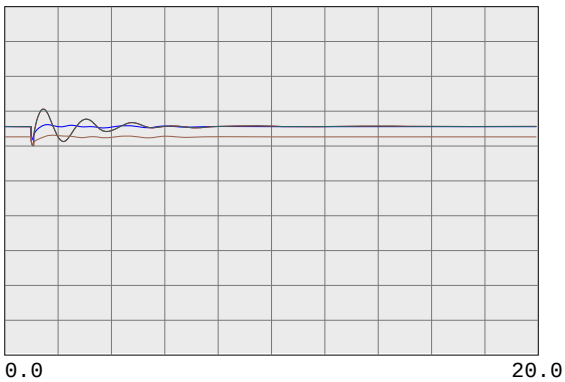
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



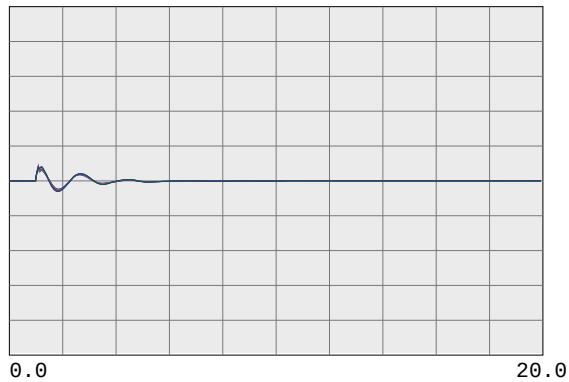
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



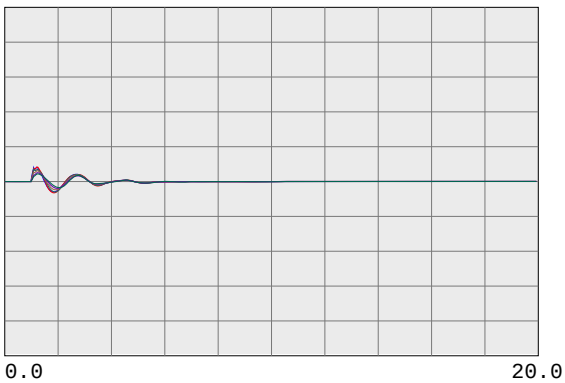
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



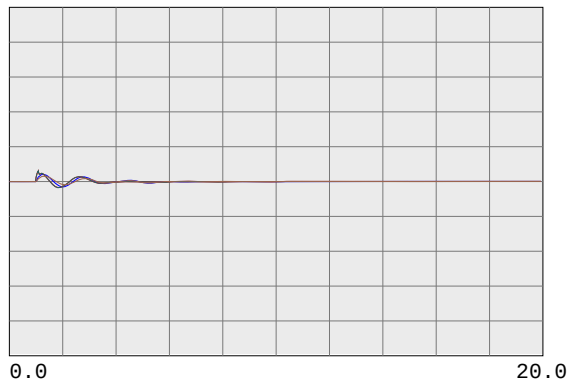
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



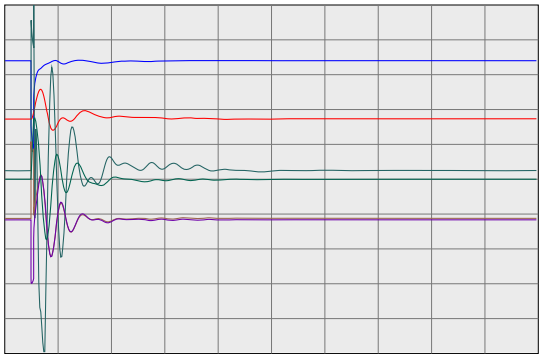
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



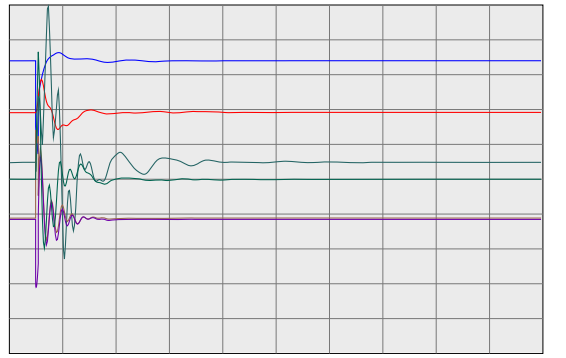
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

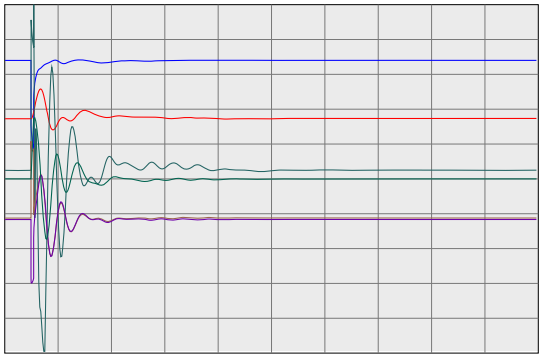
WILLOW PASS GENERATION PLANT



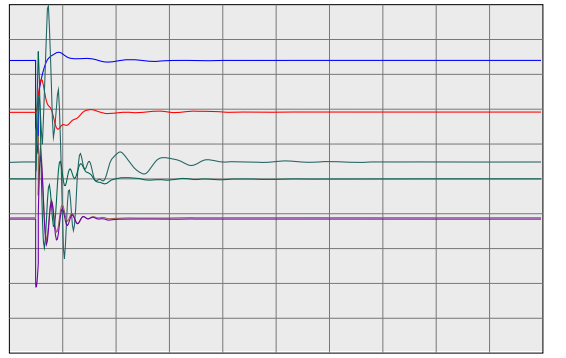
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



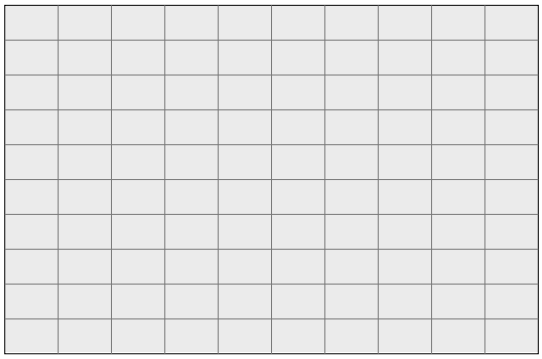
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

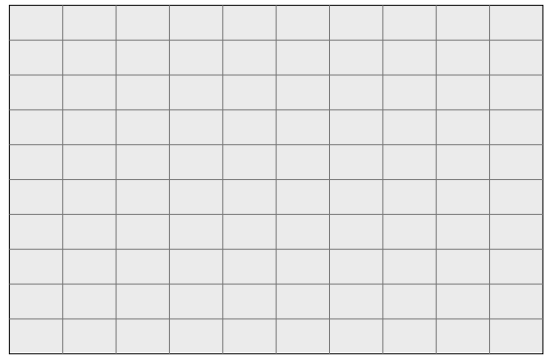


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



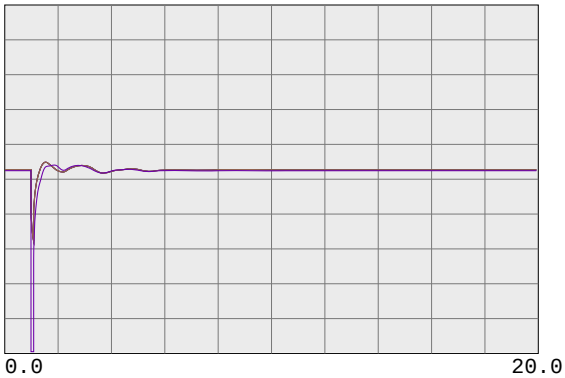
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



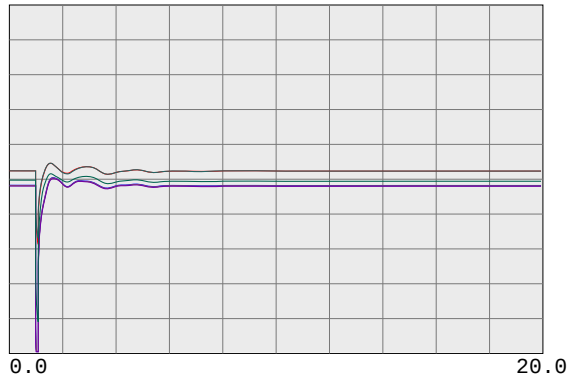


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

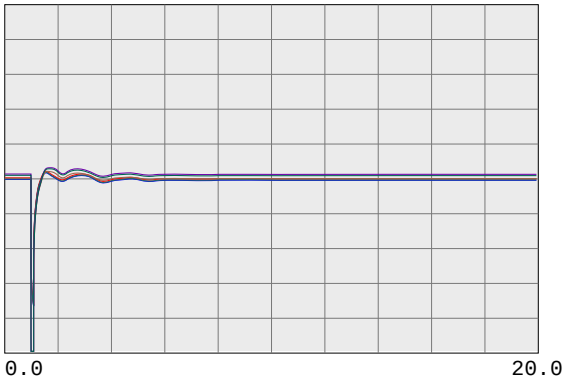
230-KV SYSTEM VOLTAGES



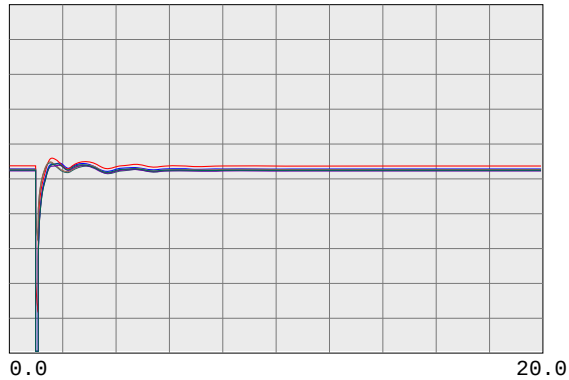
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



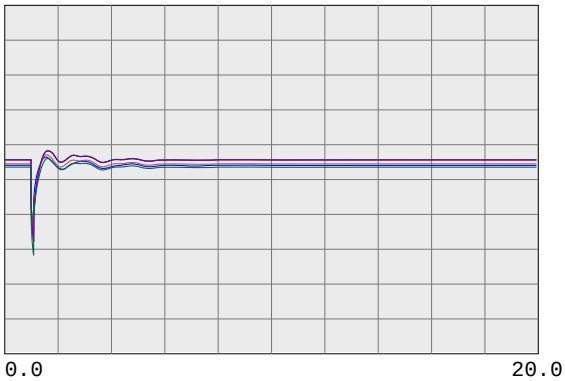
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



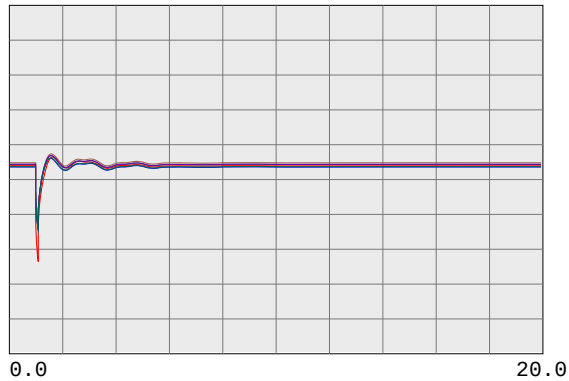
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



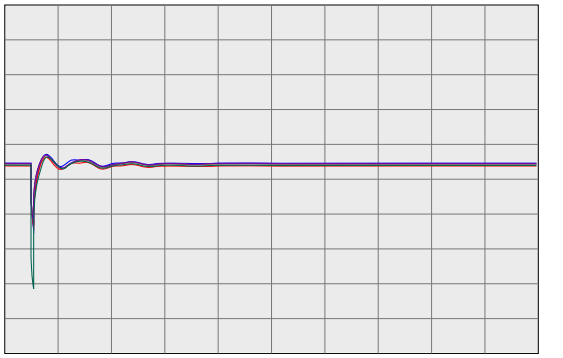
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



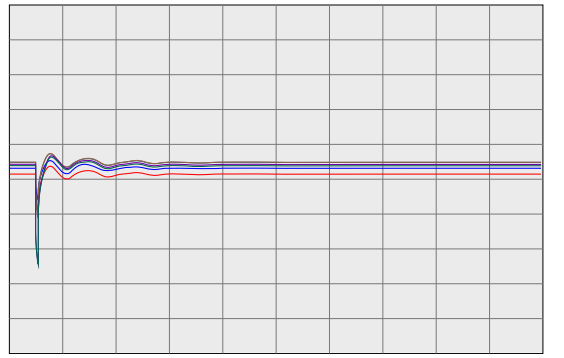
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

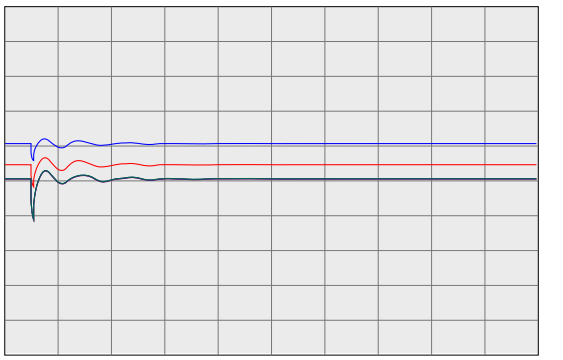
230-KV SYSTEM VOLTAGES



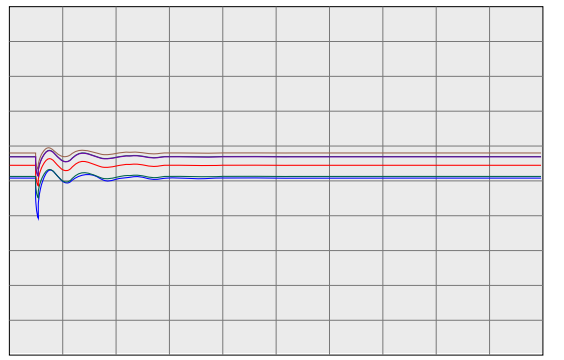
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



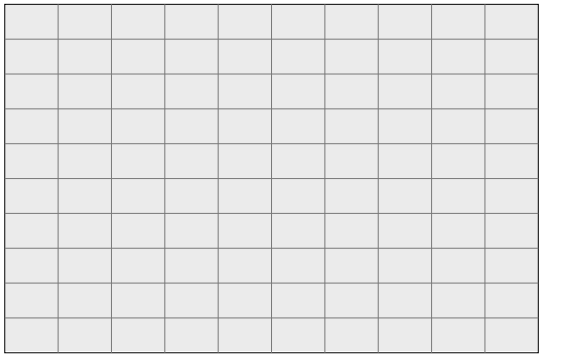
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

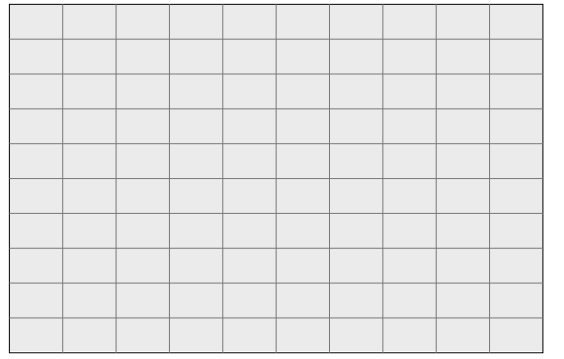


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



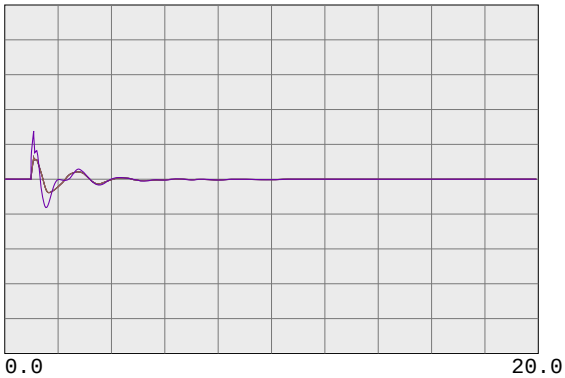
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



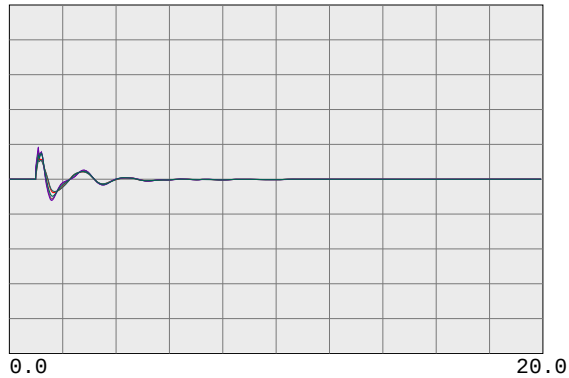


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

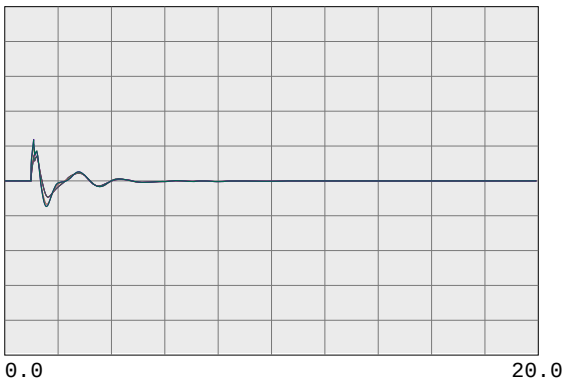
230-KV SYSTEM FREQUENCIES



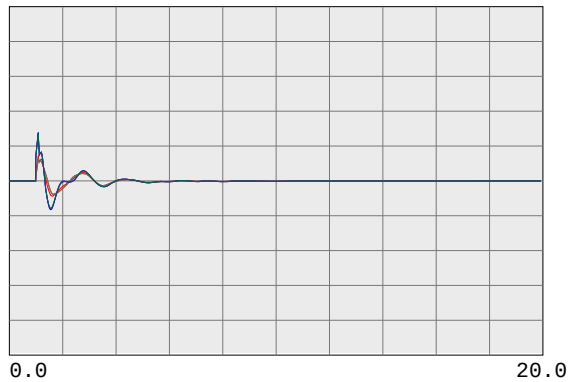
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



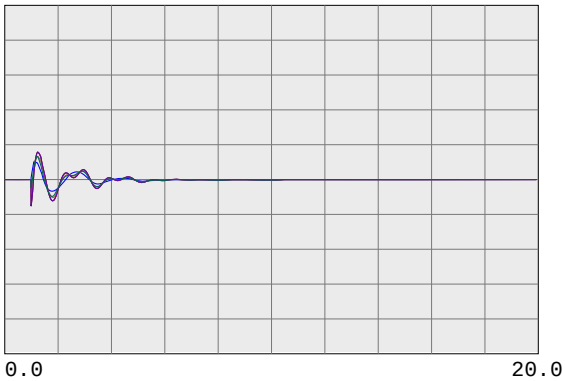
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



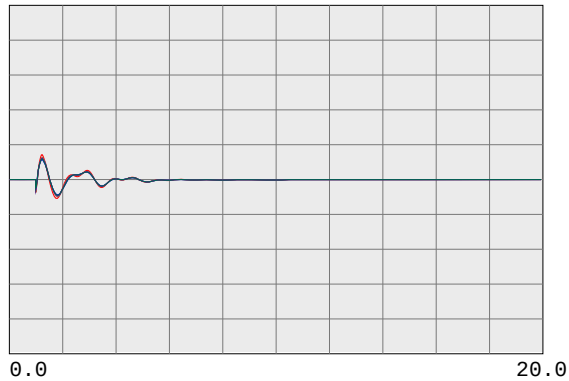
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



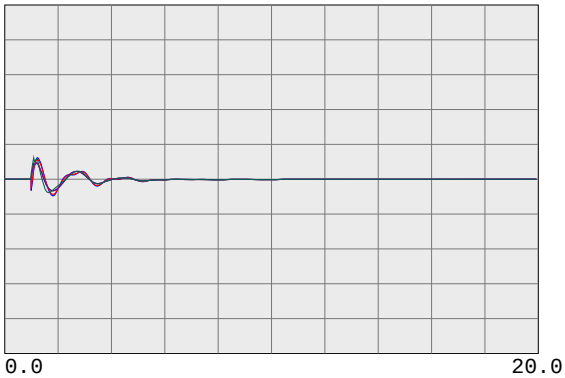
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



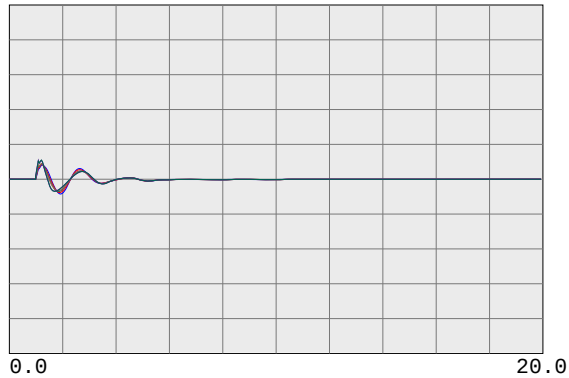
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

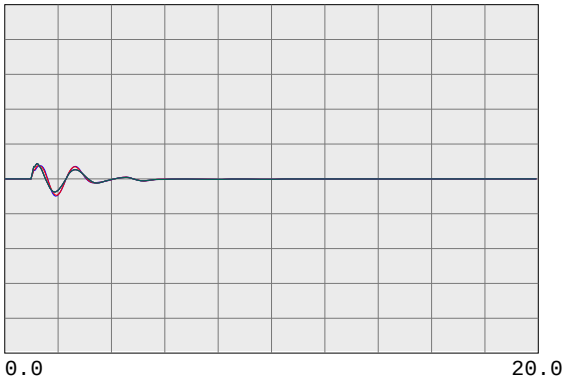
230-KV SYSTEM FREQUENCIES



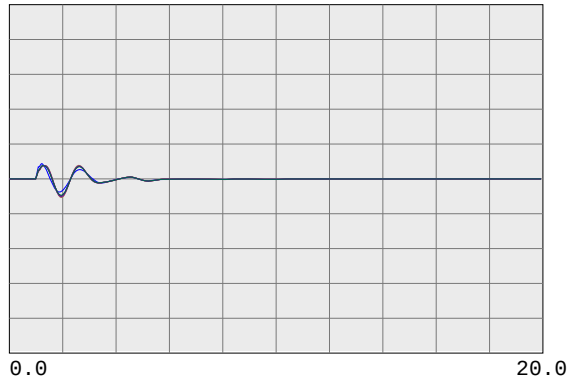
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



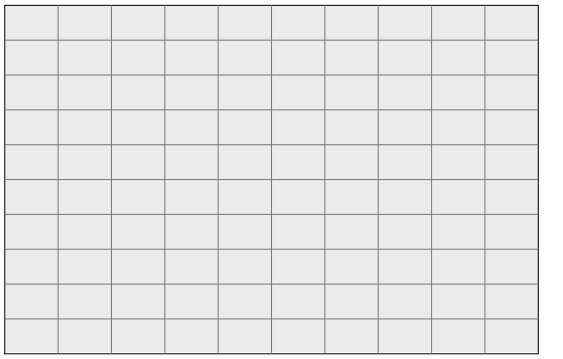
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

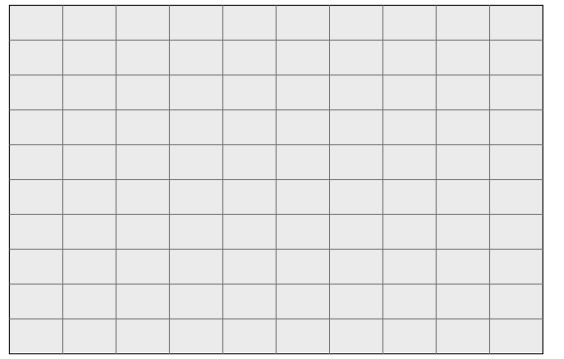


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



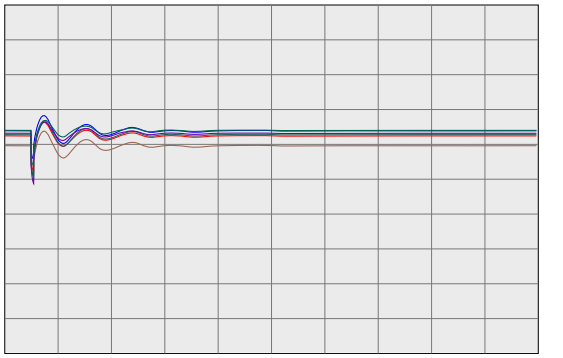
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



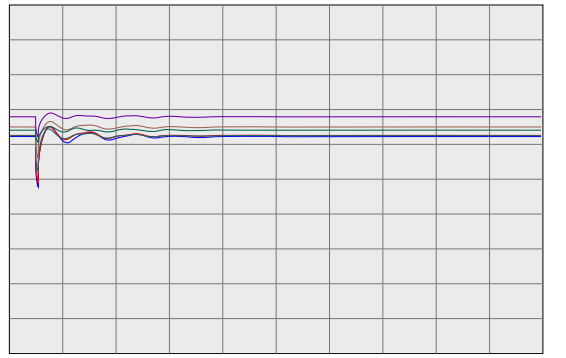


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

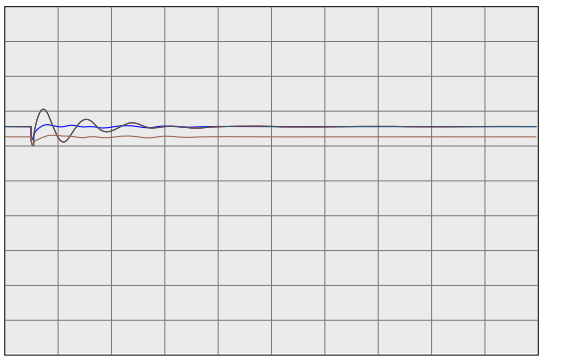
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



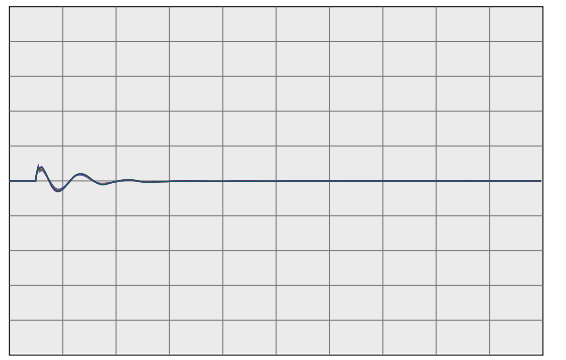
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



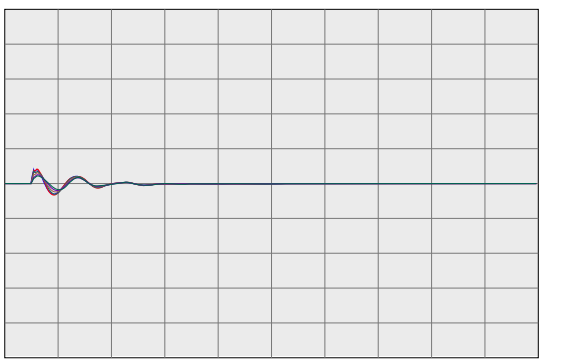
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



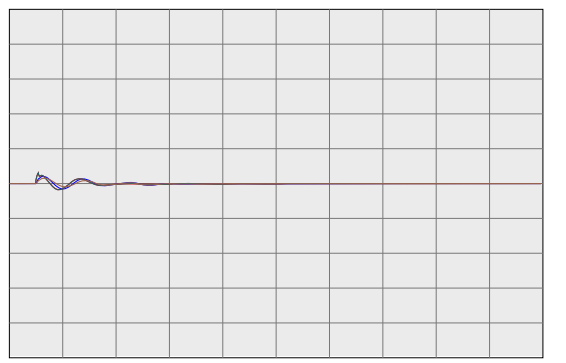
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



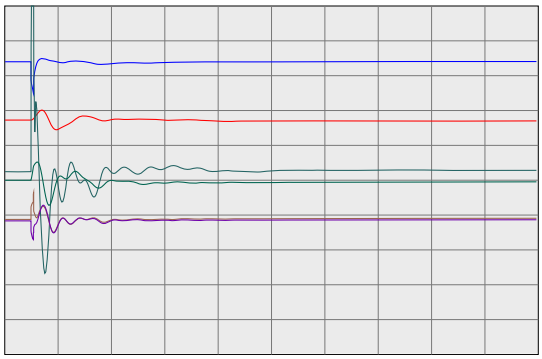
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

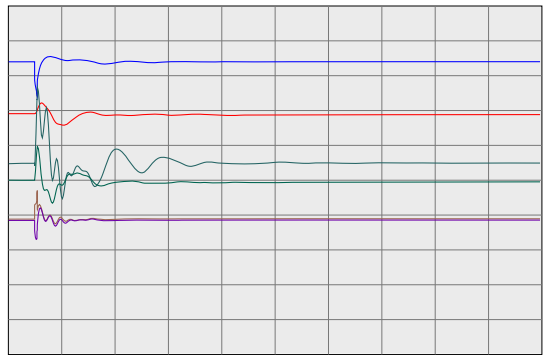
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

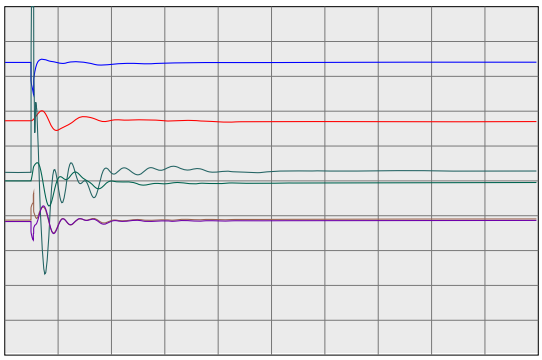
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

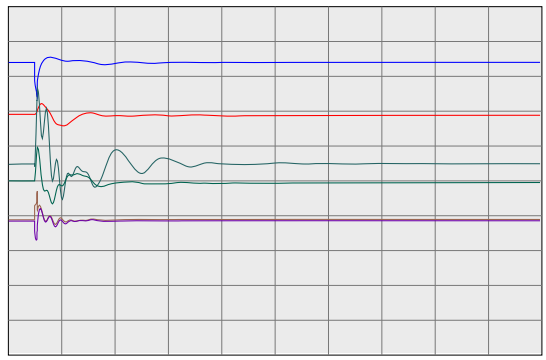
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

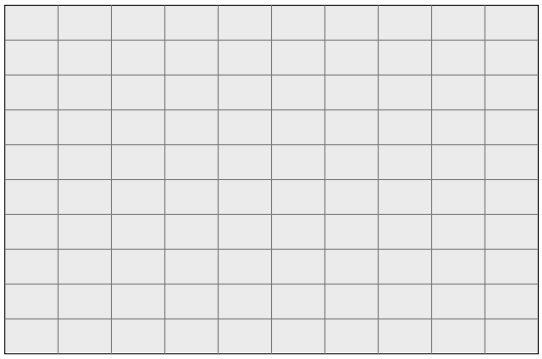
0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

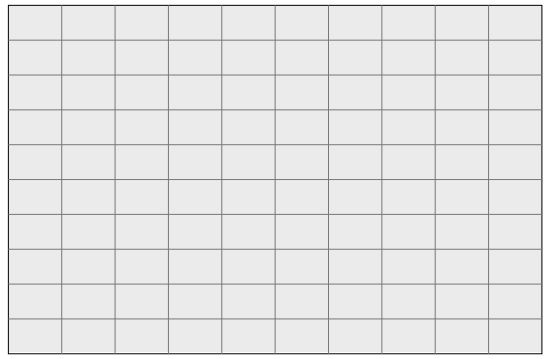


0.0 20.0

Time(sec)

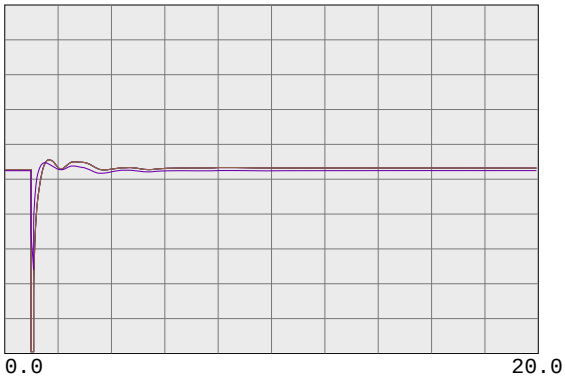
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



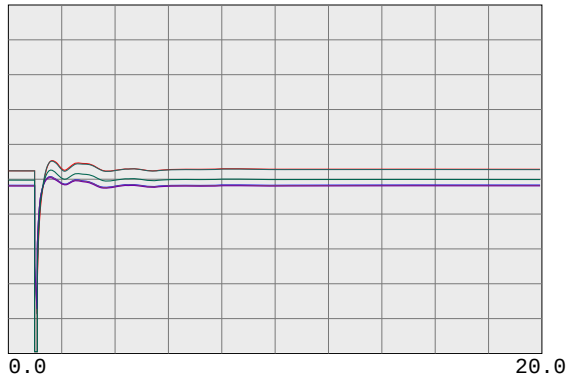


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

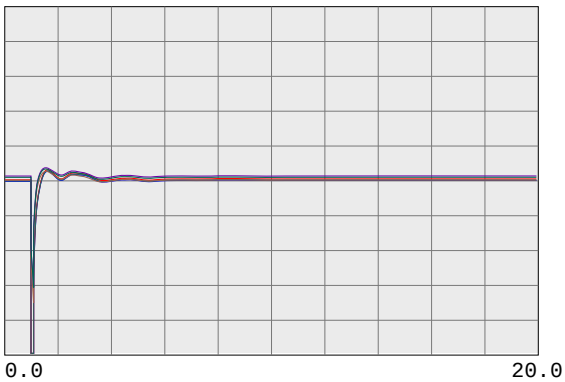
230-KV SYSTEM VOLTAGES



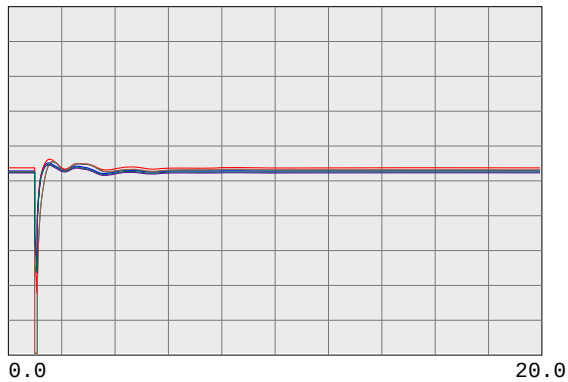
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



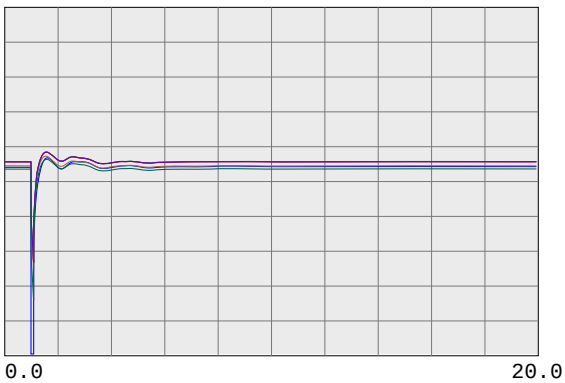
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



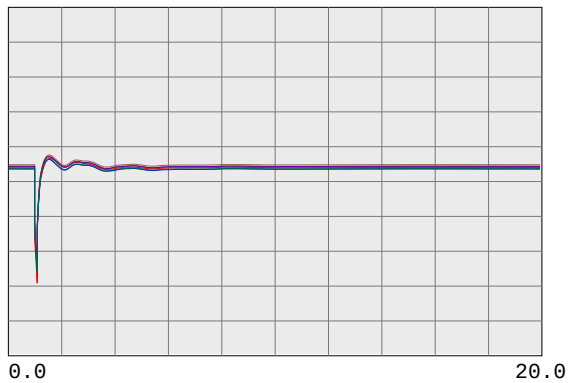
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



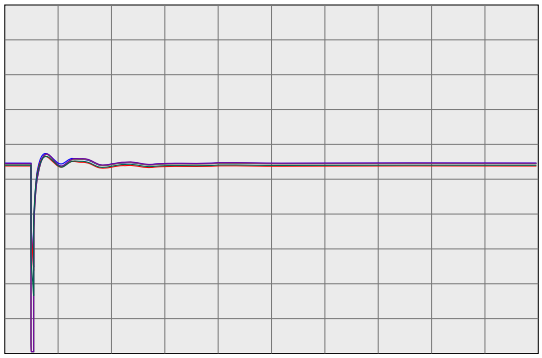
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

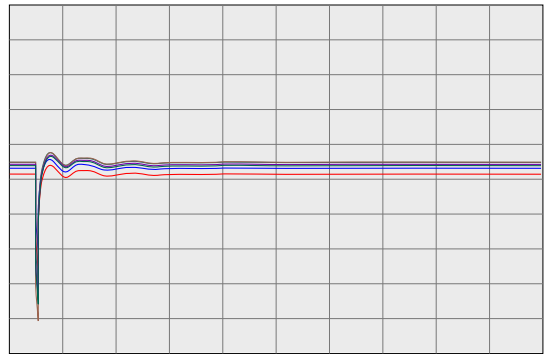
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

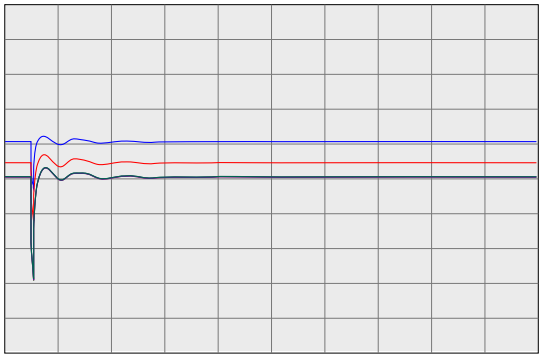
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

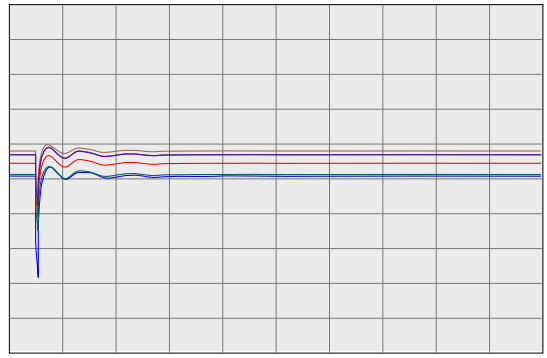
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

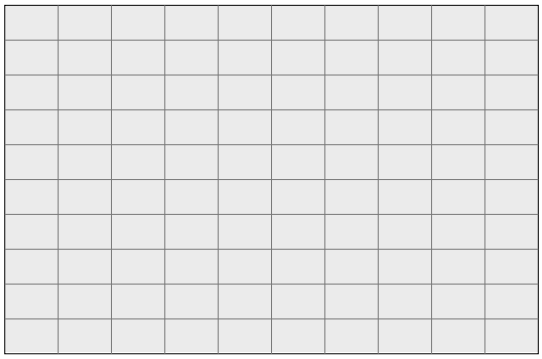
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

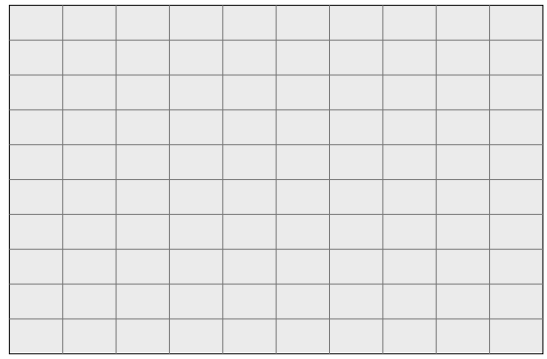


0.0 20.0

Time(sec)

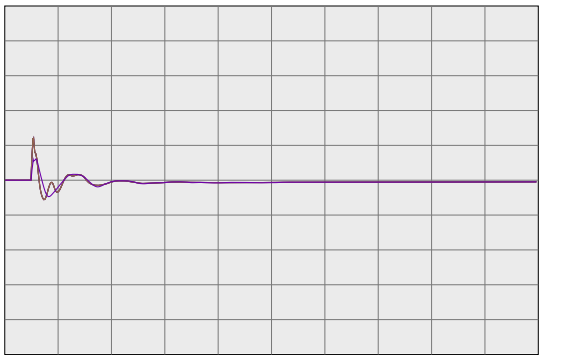
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



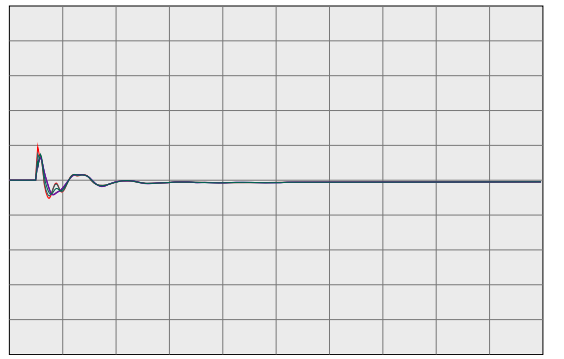


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

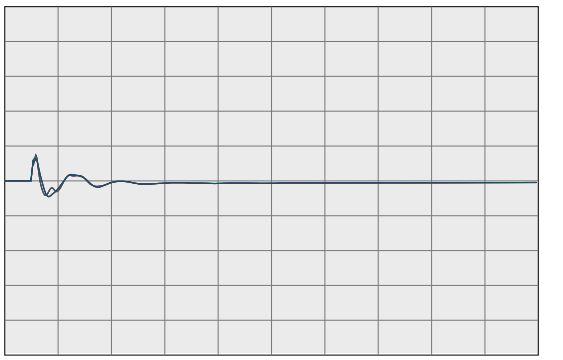
230-KV SYSTEM FREQUENCIES



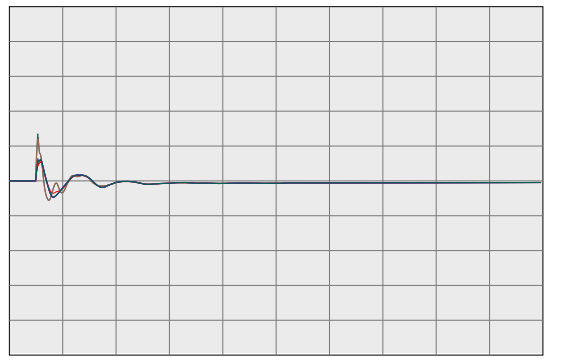
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



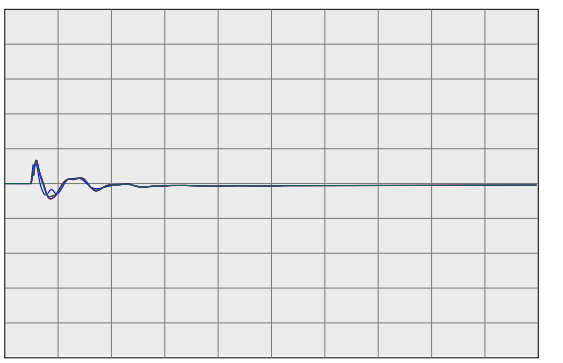
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



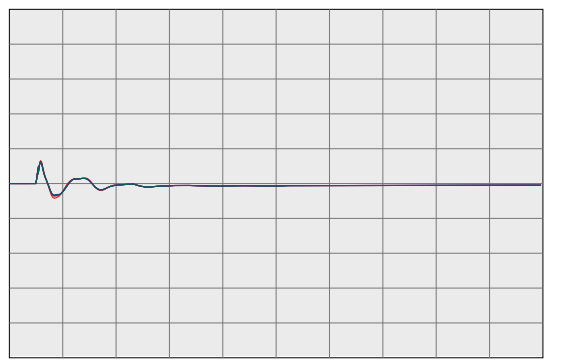
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



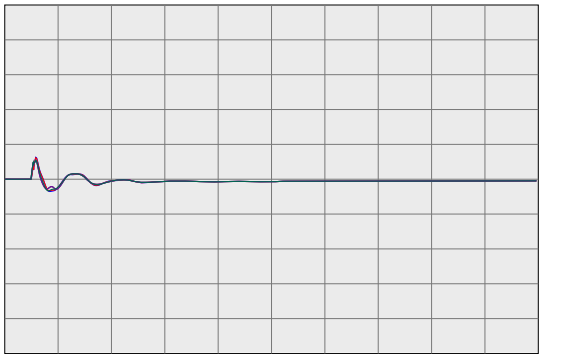
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



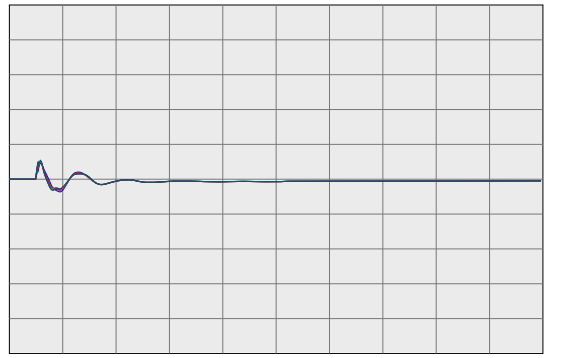
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

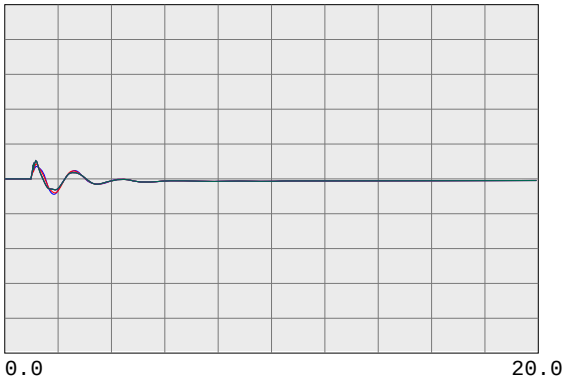
230-KV SYSTEM FREQUENCIES



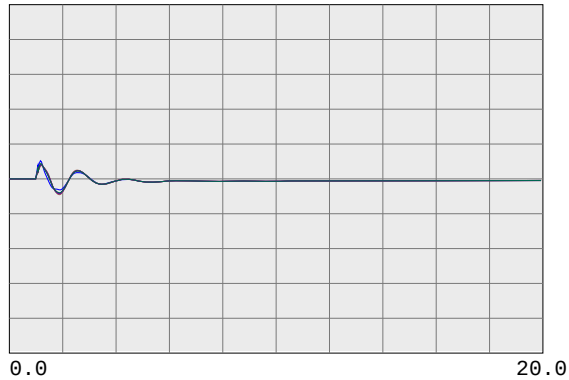
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



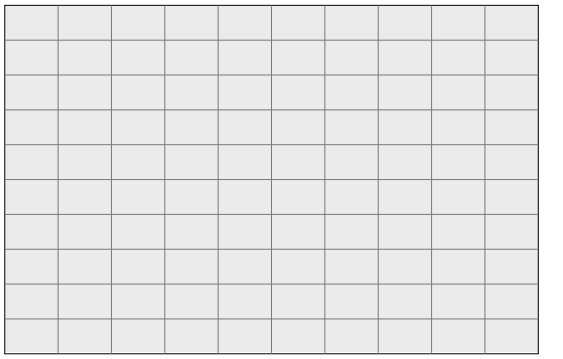
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

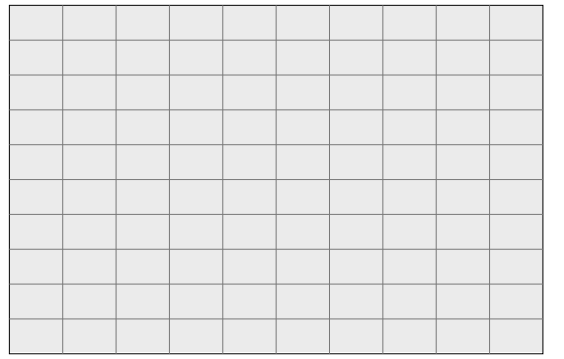


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



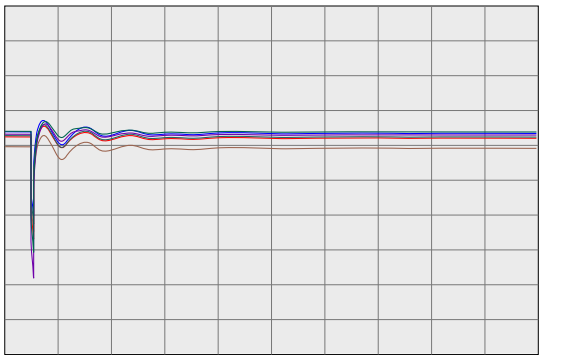
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



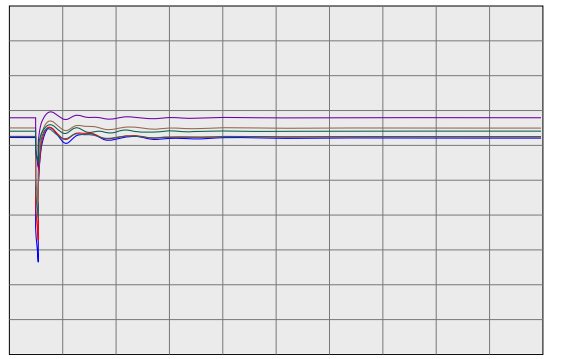


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

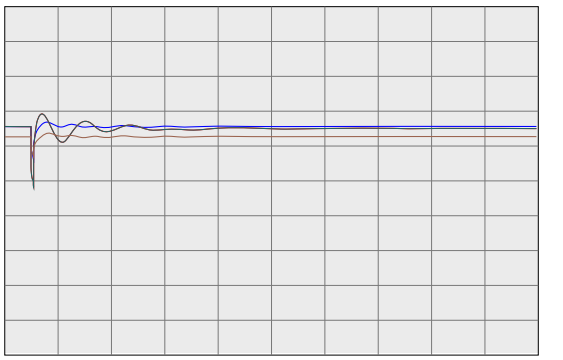
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



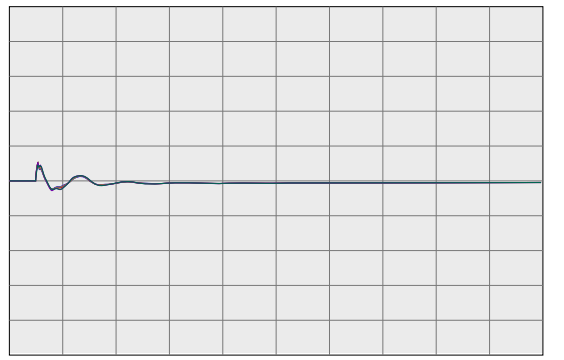
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



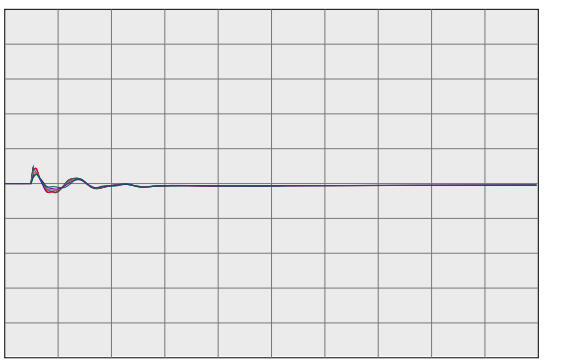
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



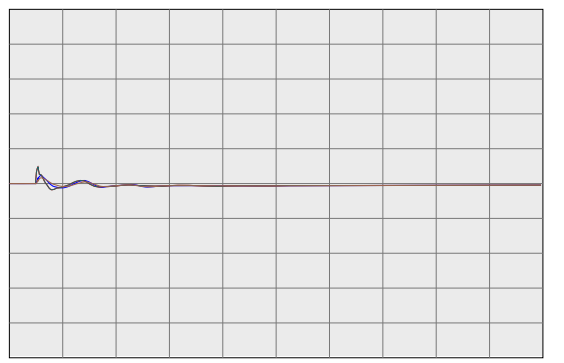
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



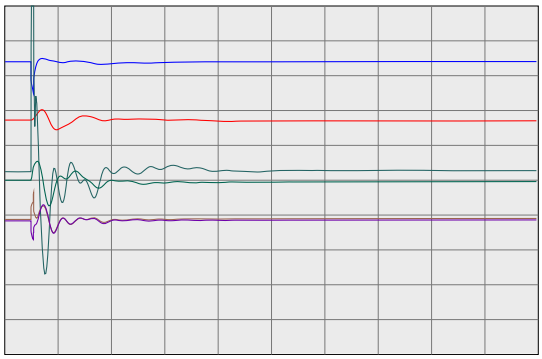
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

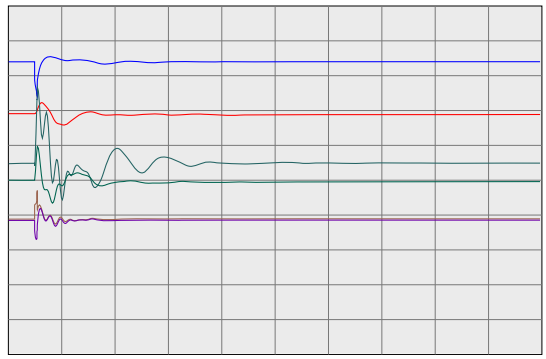
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

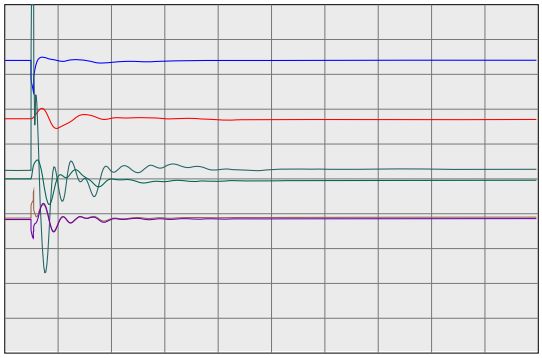
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

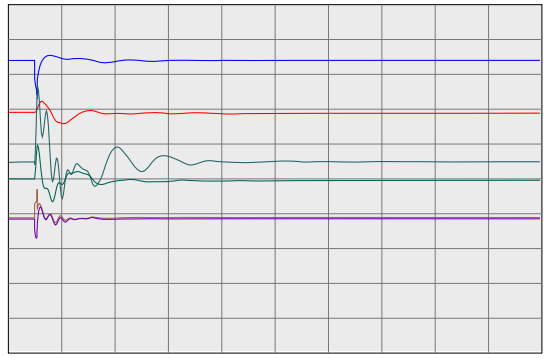
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

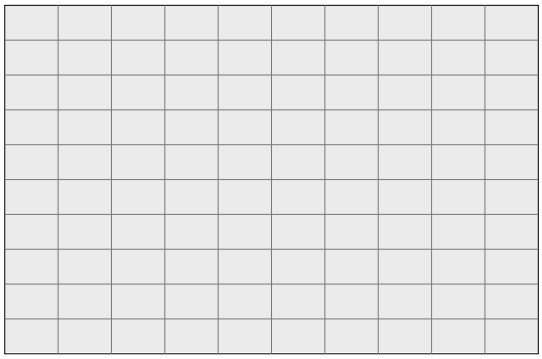
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

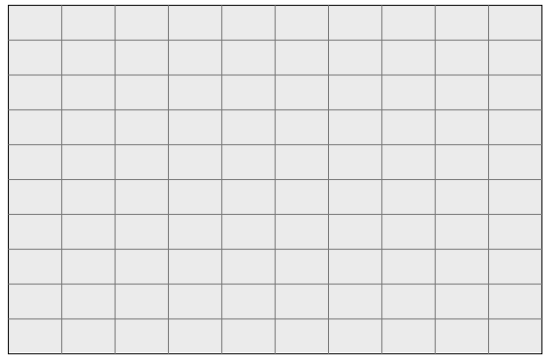


0.0 20.0

Time(sec)

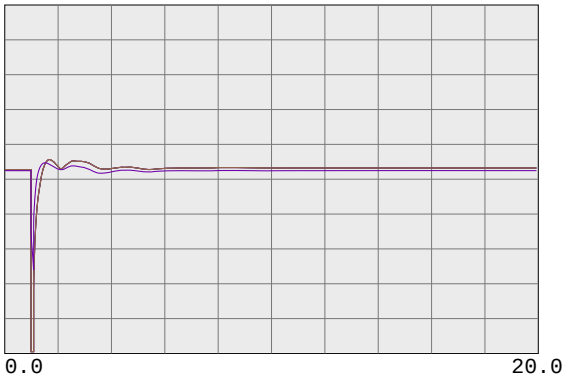
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



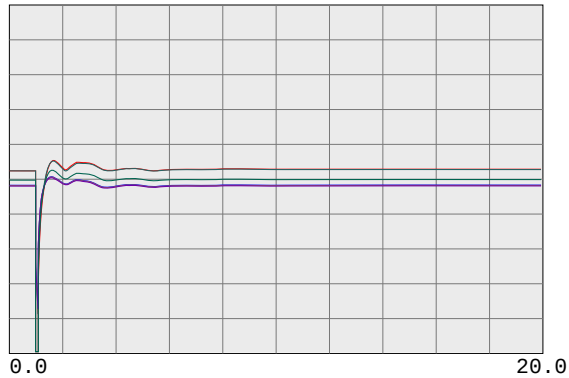


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

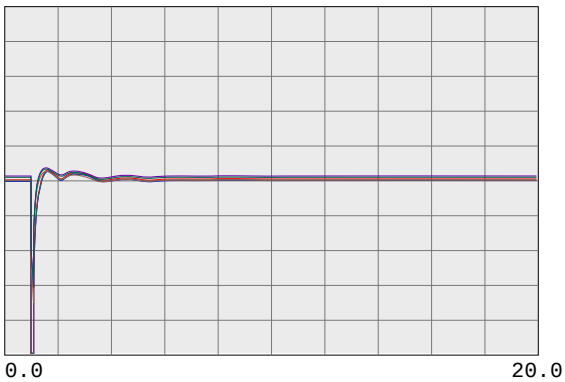
230-KV SYSTEM VOLTAGES



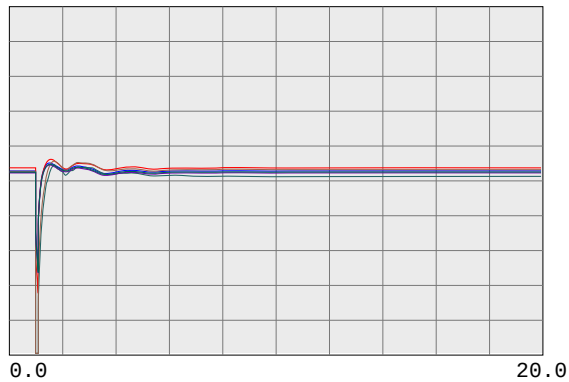
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



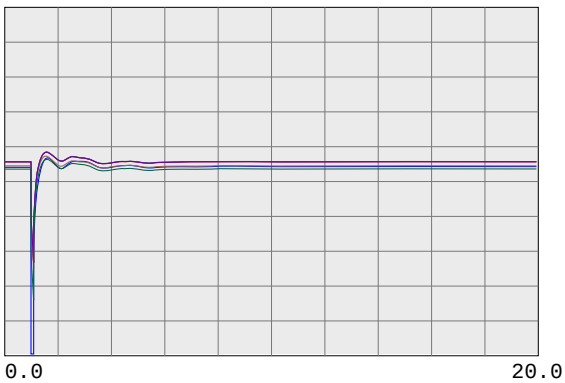
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



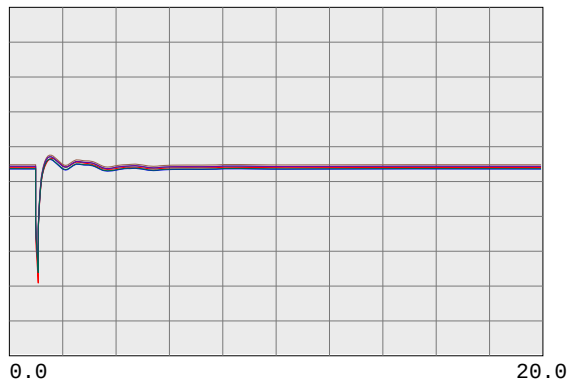
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



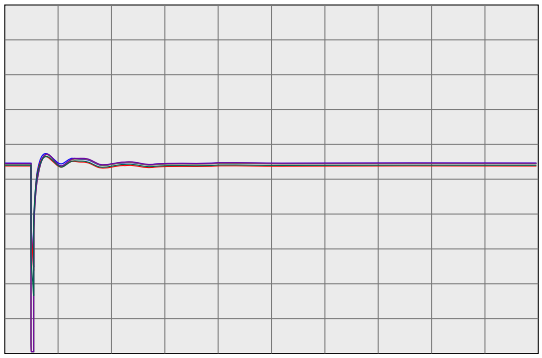
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

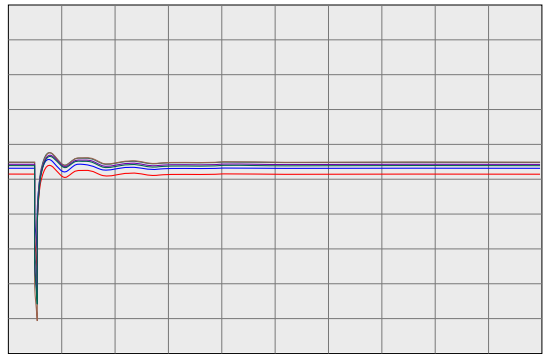
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

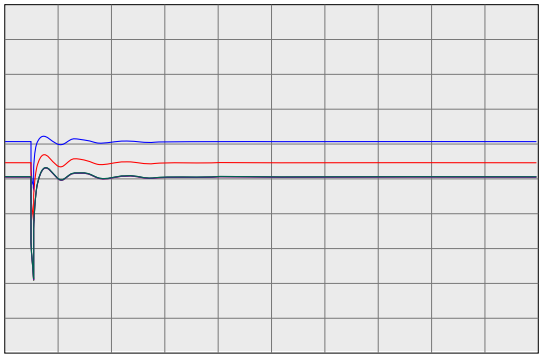
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

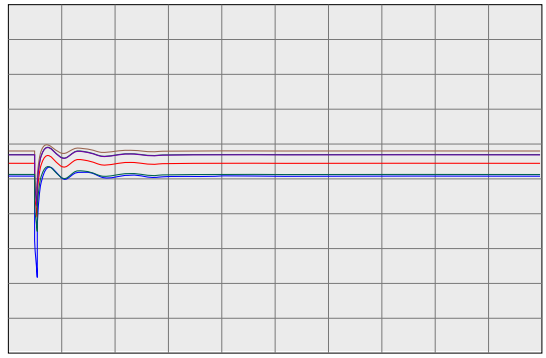
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

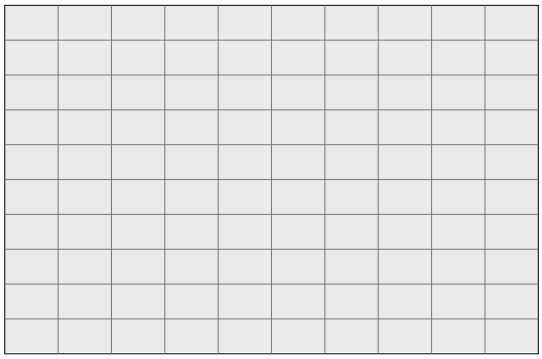
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

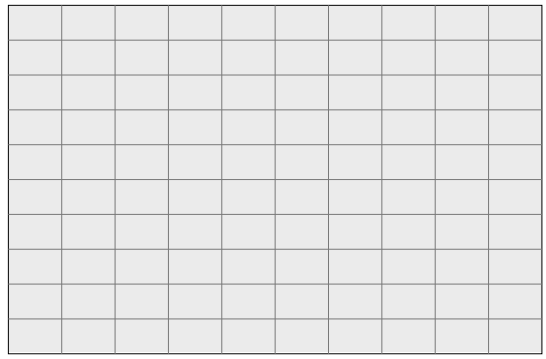


0.0 20.0

Time(sec)

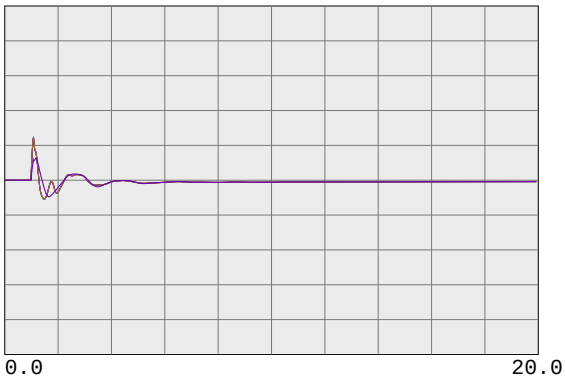
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



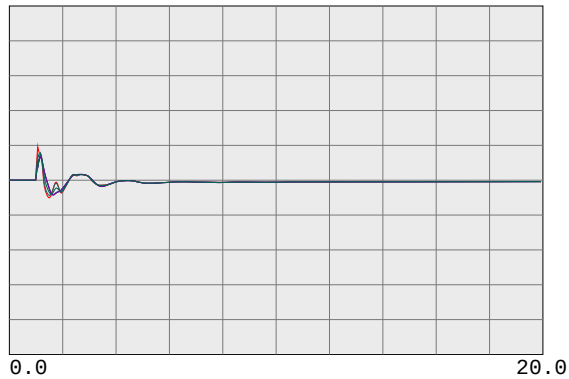


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

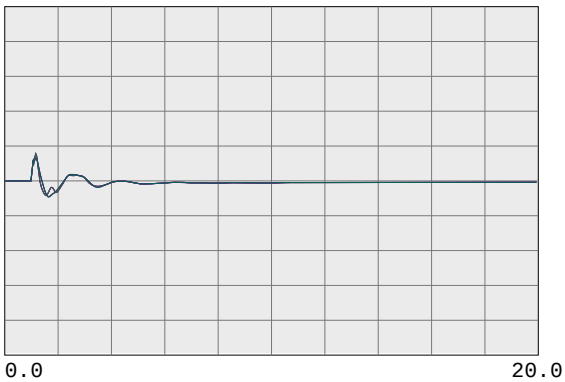
230-KV SYSTEM FREQUENCIES



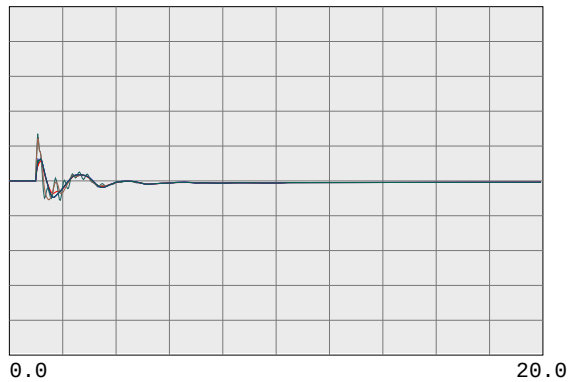
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



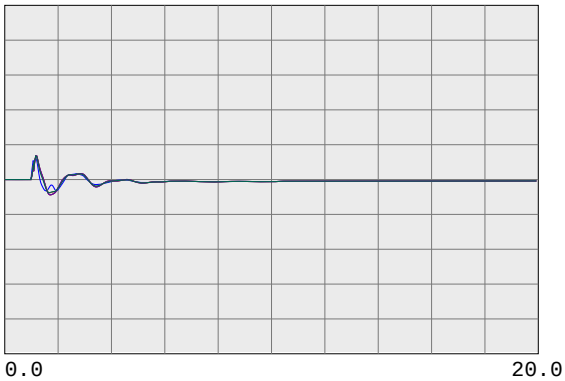
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



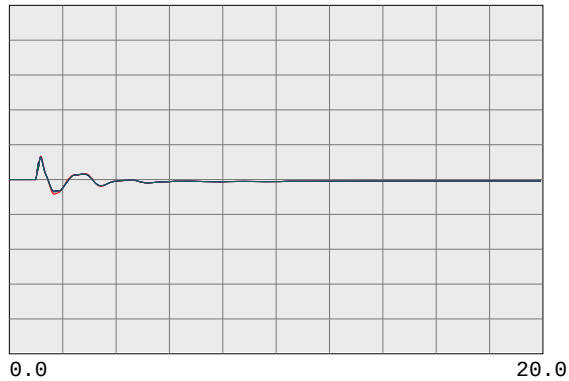
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



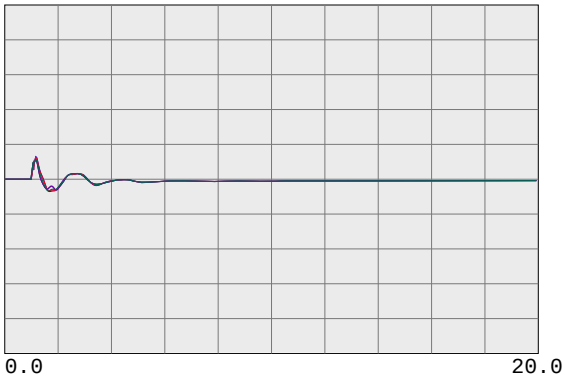
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



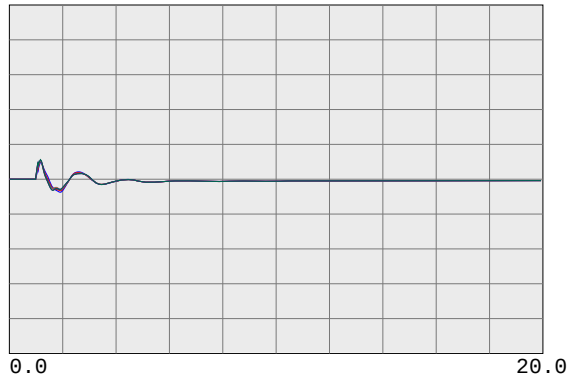
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

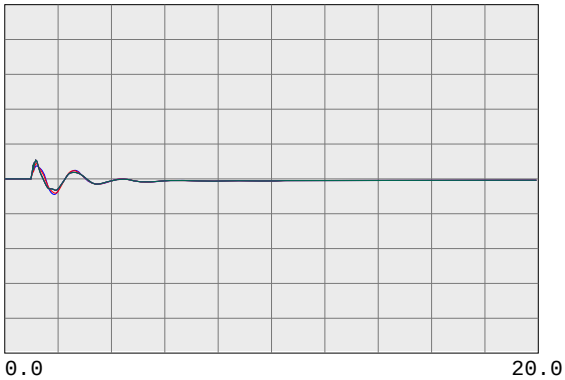
230-KV SYSTEM FREQUENCIES



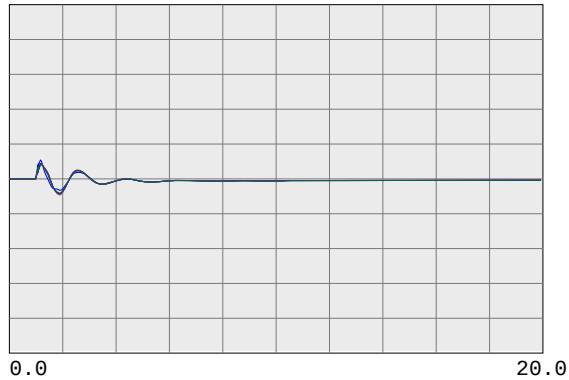
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



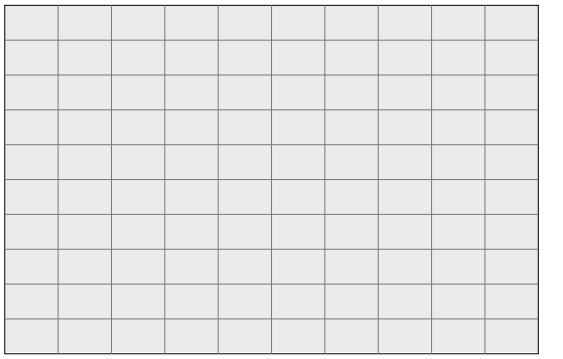
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

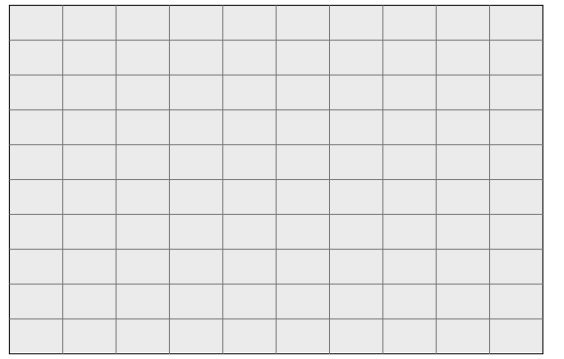


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



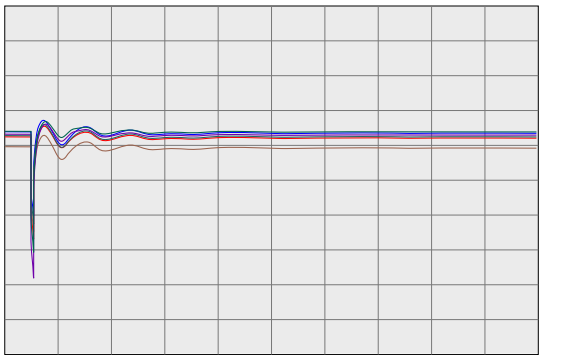
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



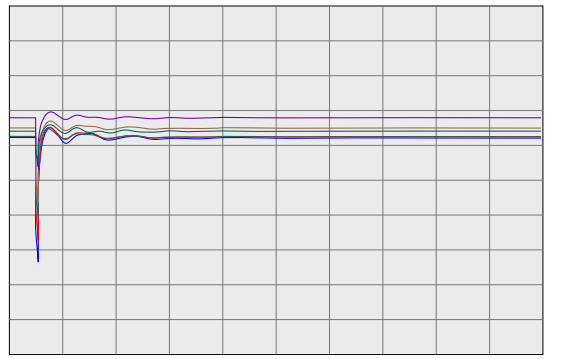


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

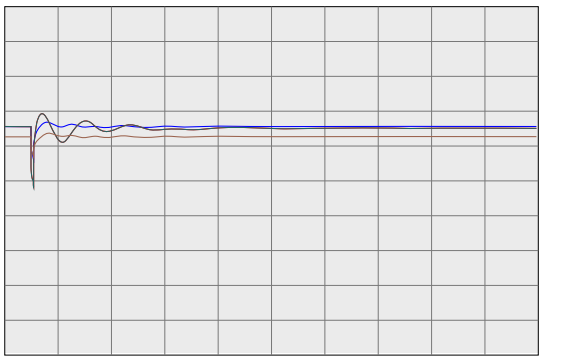
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



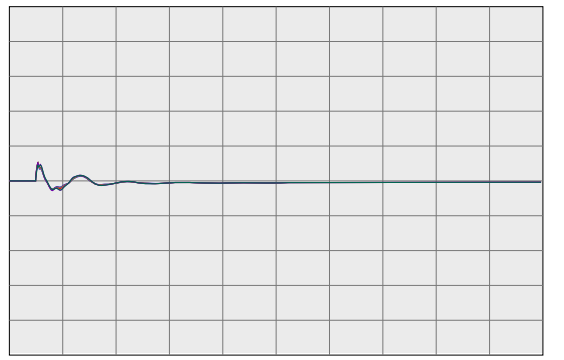
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



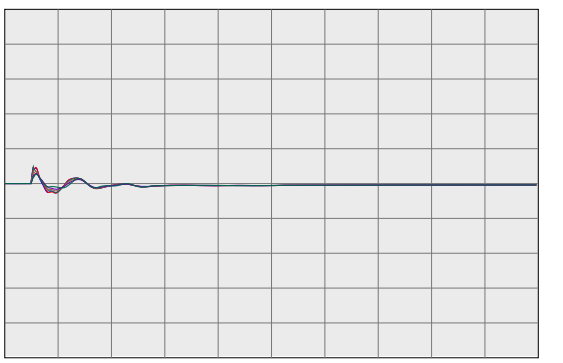
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



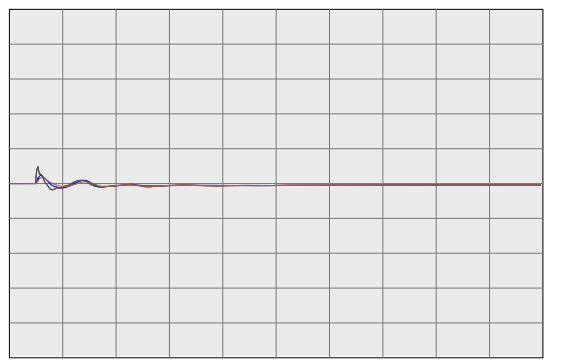
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



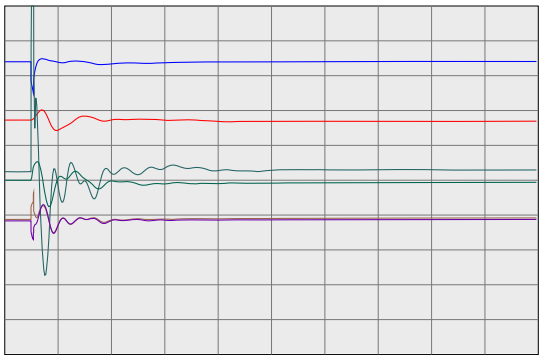
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



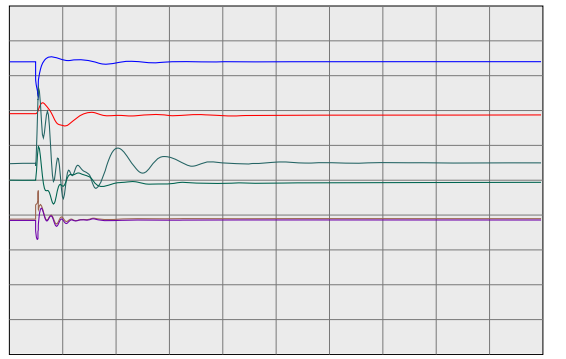
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

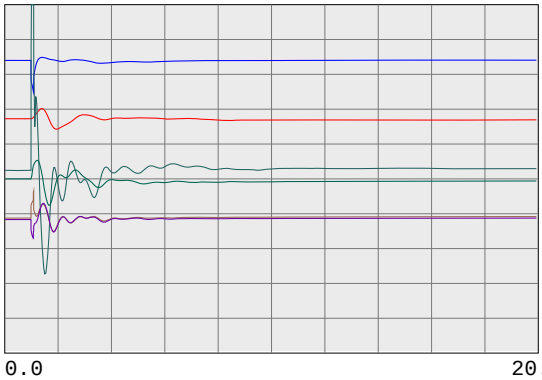
WILLOW PASS GENERATION PLANT



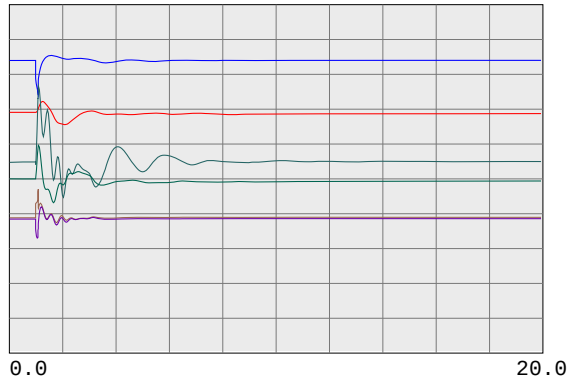
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



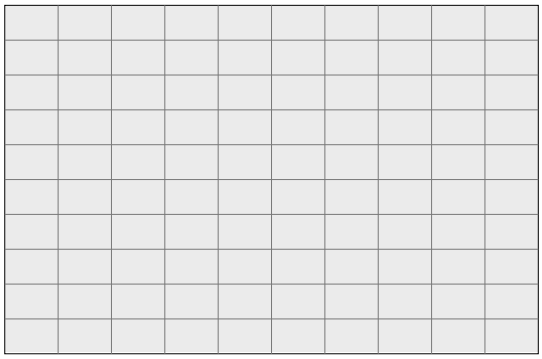
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

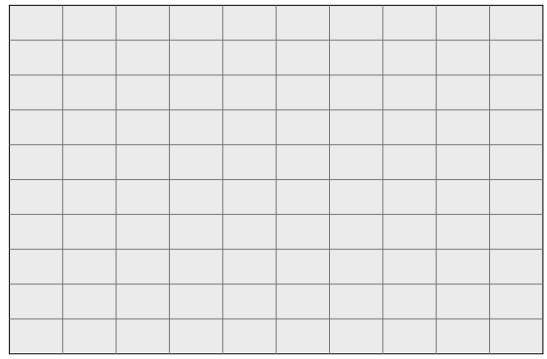


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



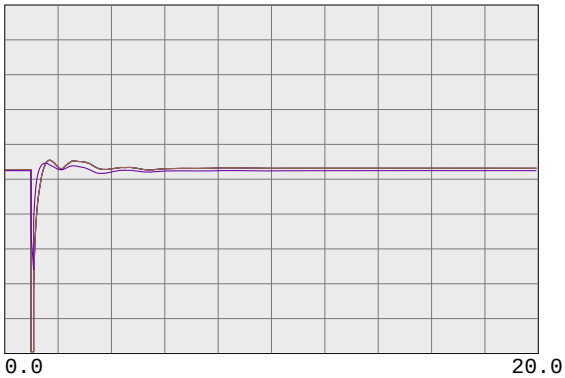
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



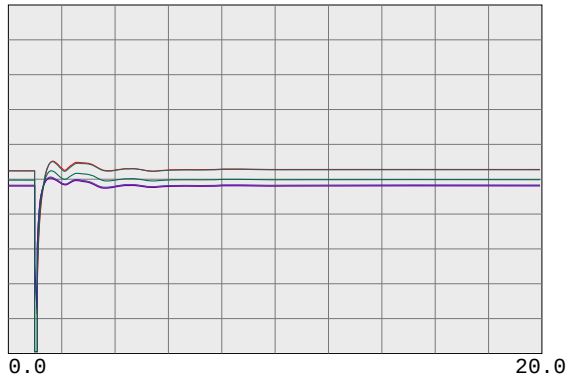


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

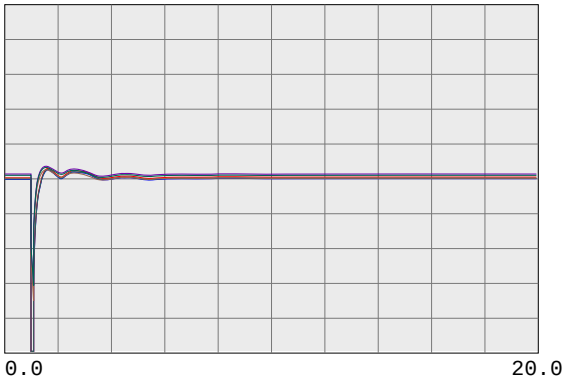
230-KV SYSTEM VOLTAGES



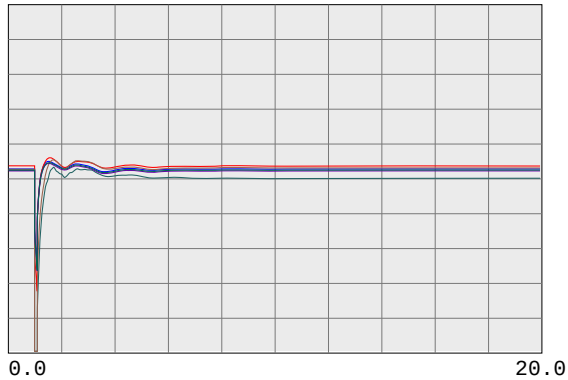
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



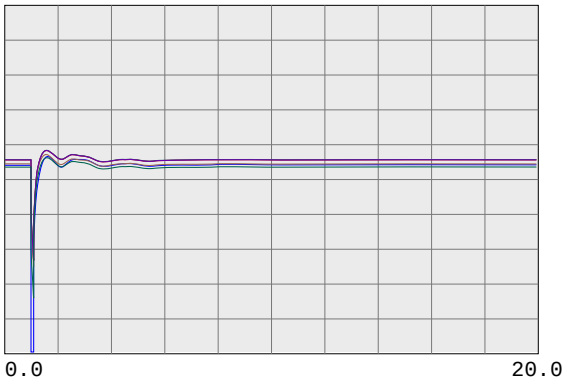
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



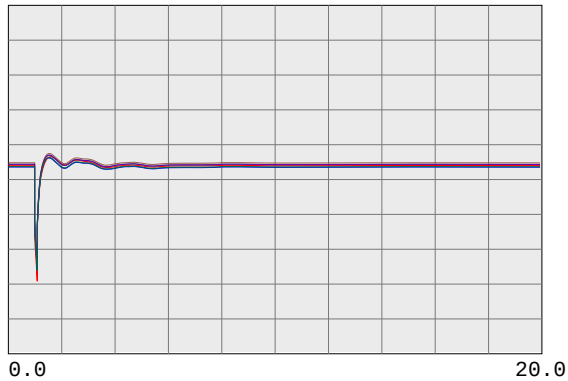
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



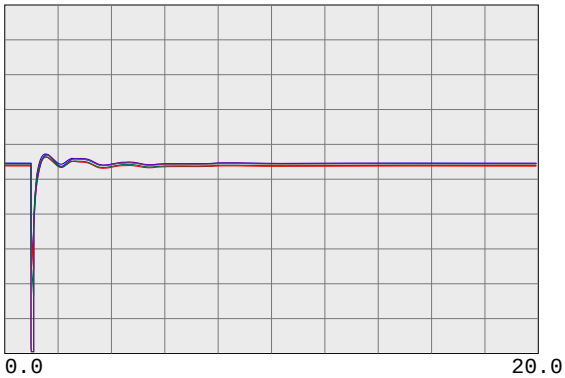
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



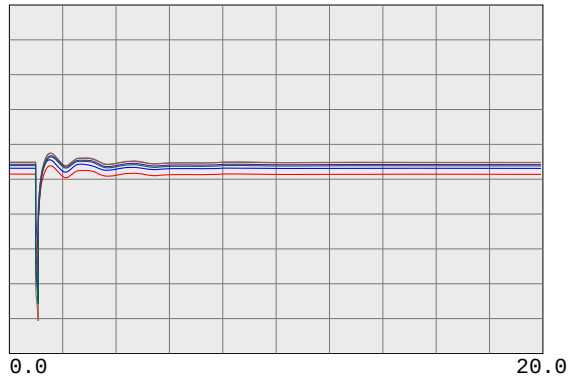
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

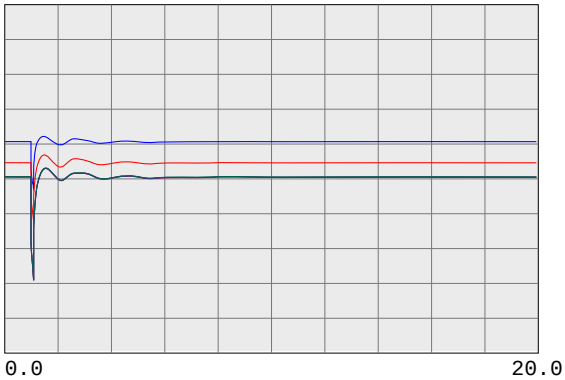
230-KV SYSTEM VOLTAGES



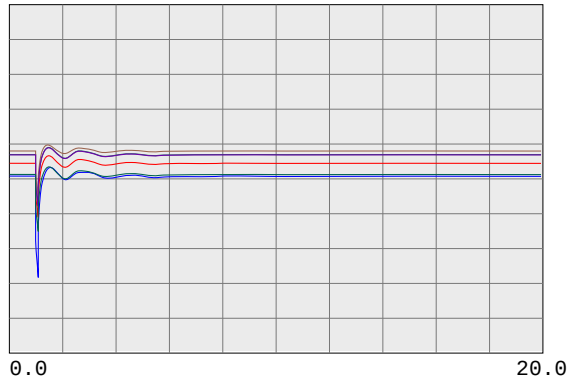
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



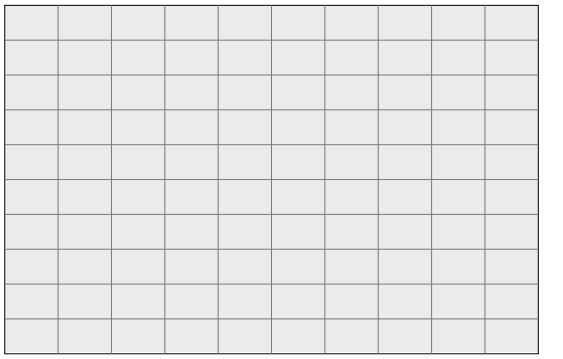
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

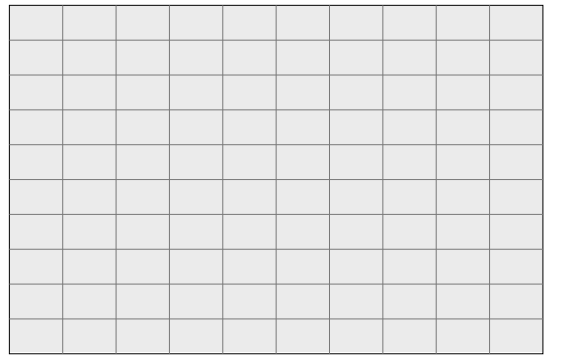


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



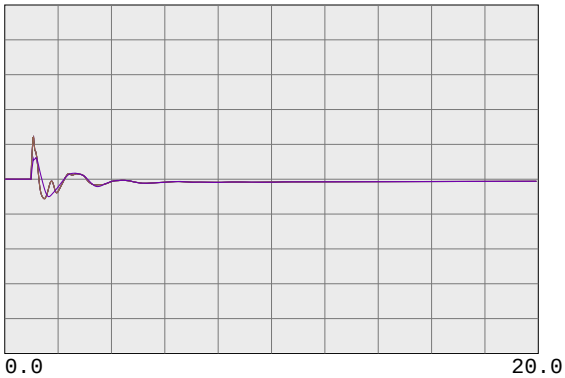
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



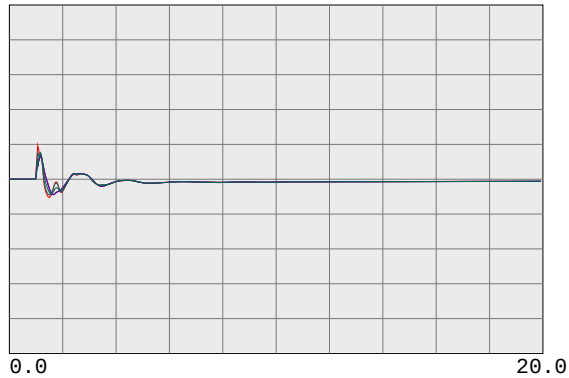


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

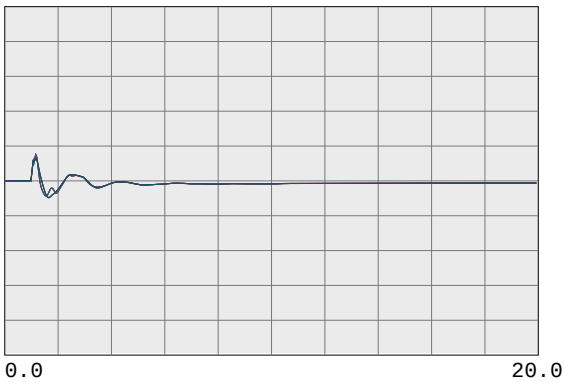
230-KV SYSTEM FREQUENCIES



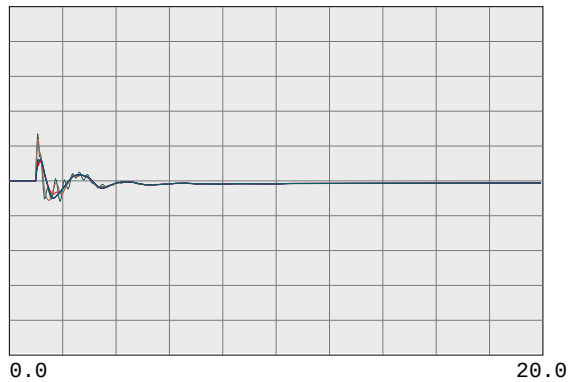
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



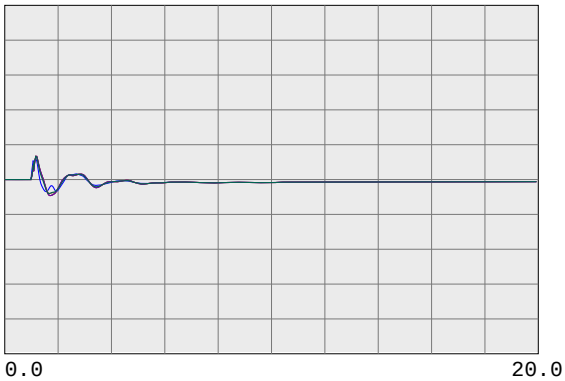
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



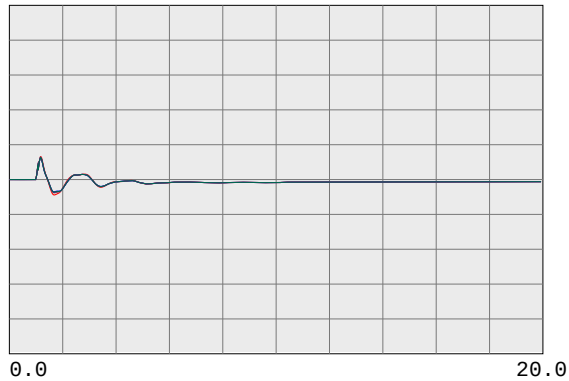
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



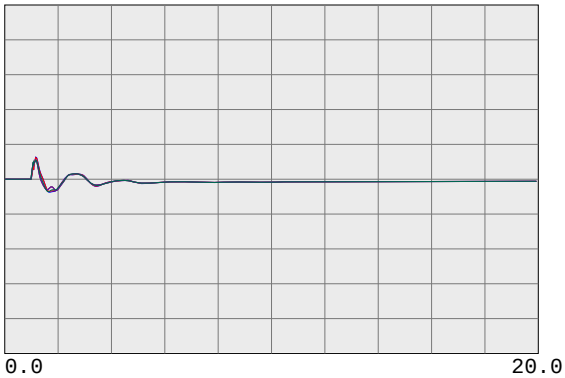
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



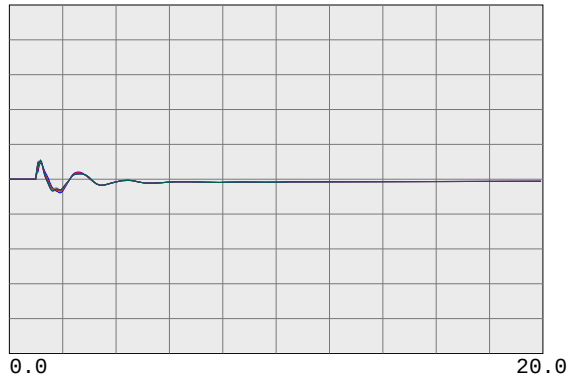
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

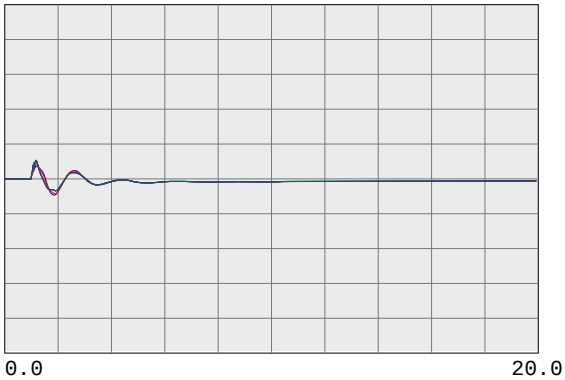
230-KV SYSTEM FREQUENCIES



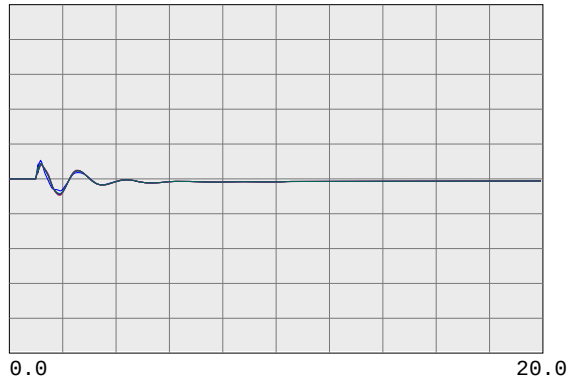
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



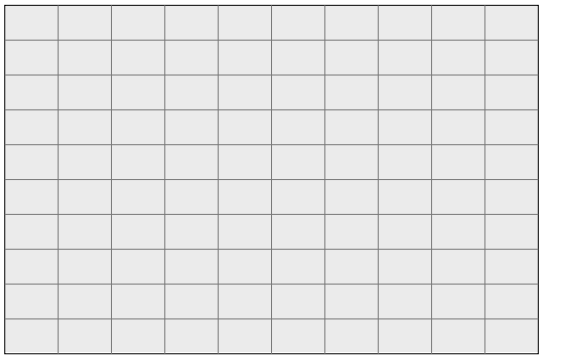
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

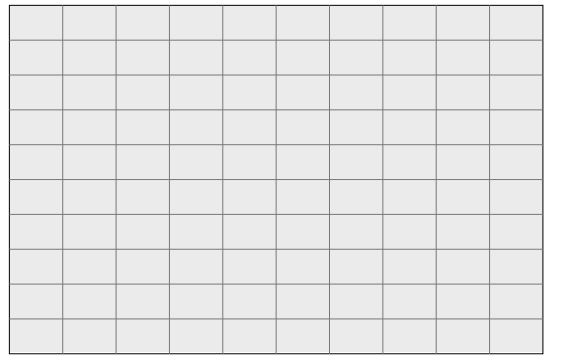


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



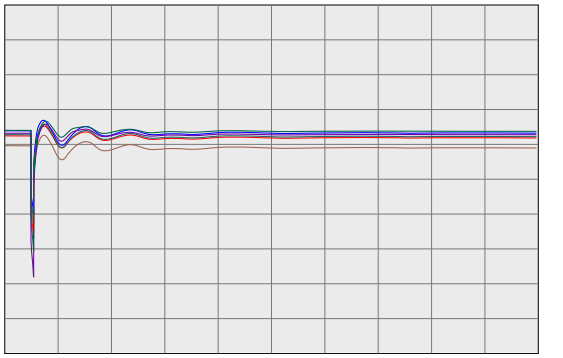
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



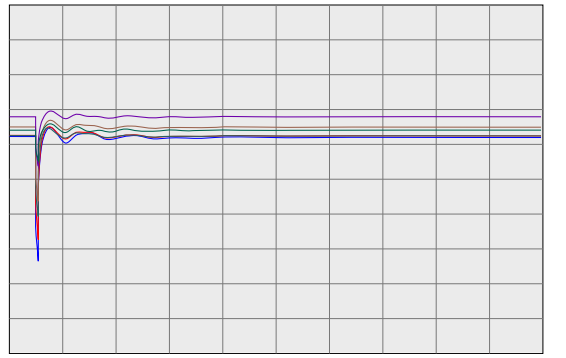


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

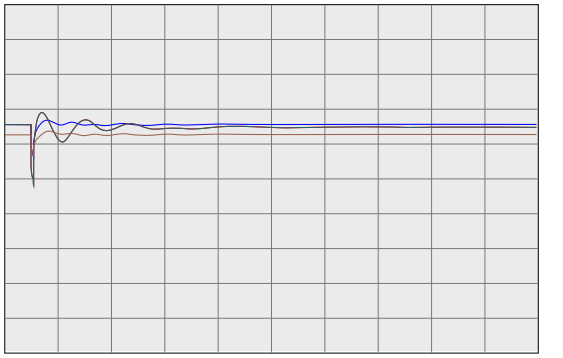
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



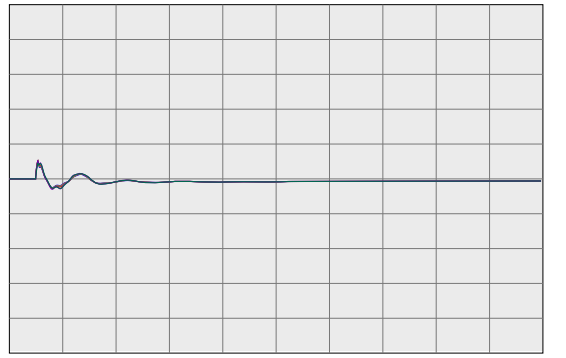
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



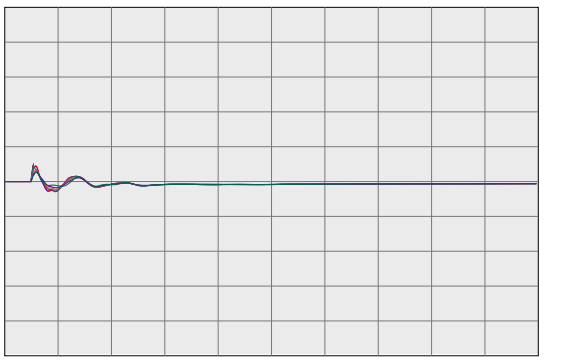
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



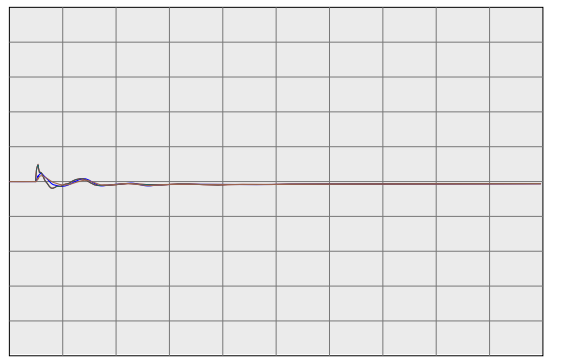
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



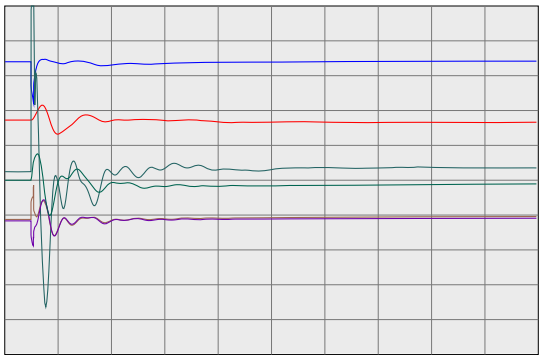
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



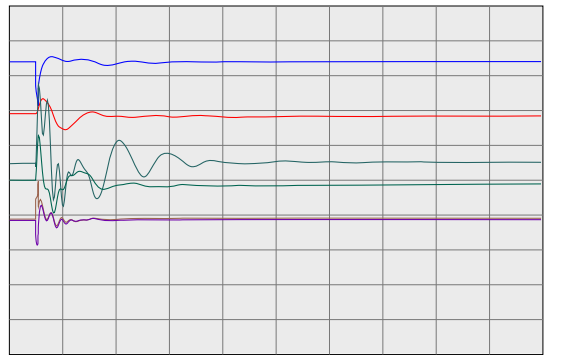
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

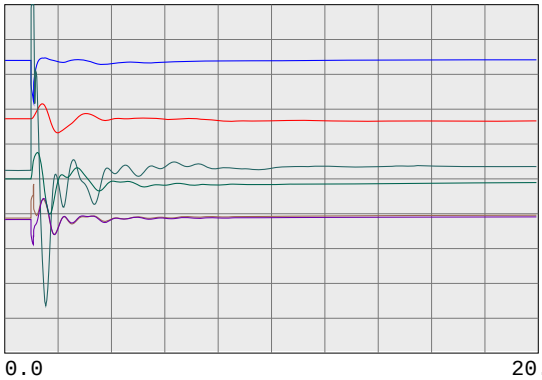
WILLOW PASS GENERATION PLANT



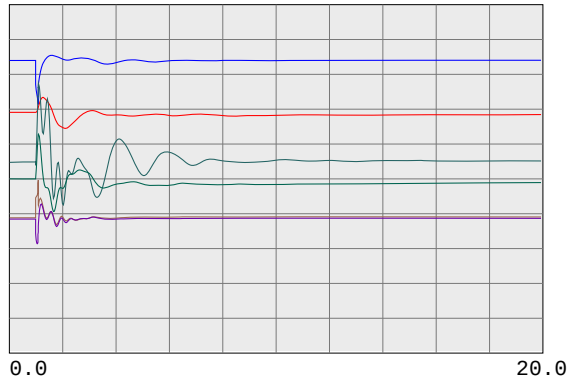
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



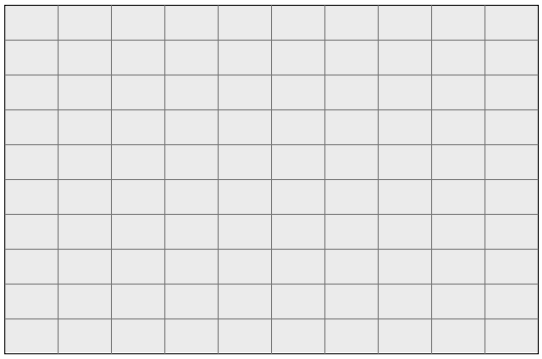
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

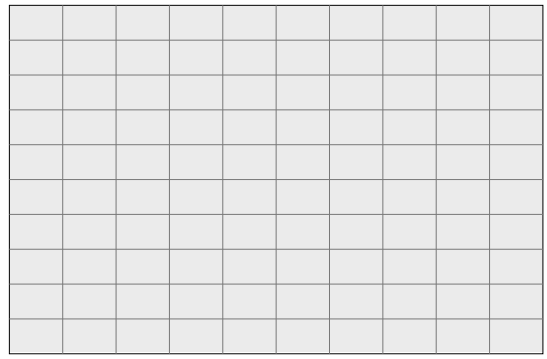


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



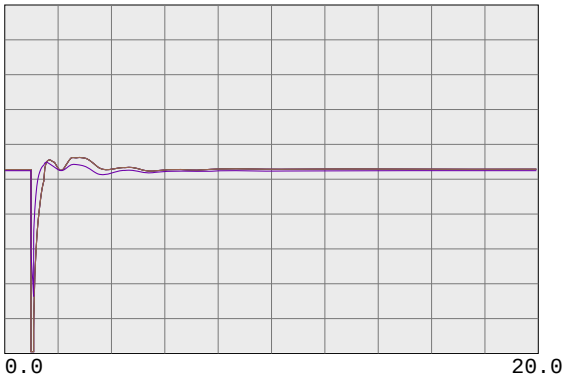
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



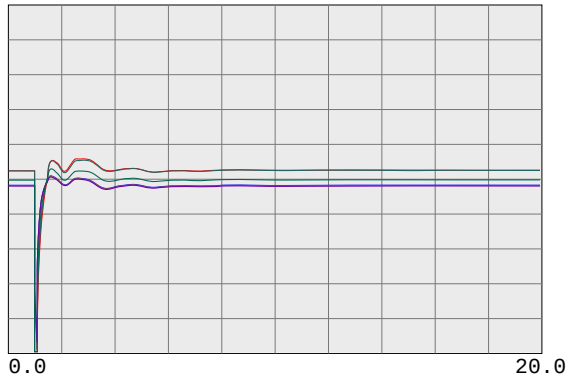


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

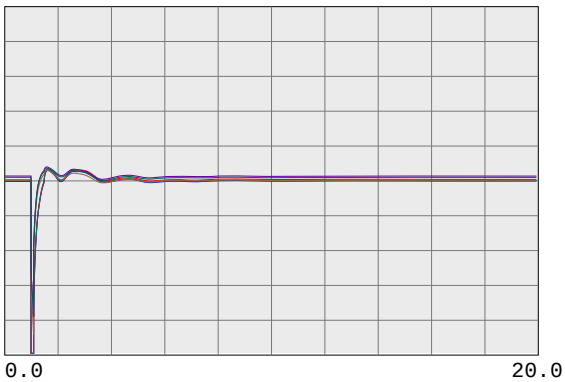
230-KV SYSTEM VOLTAGES



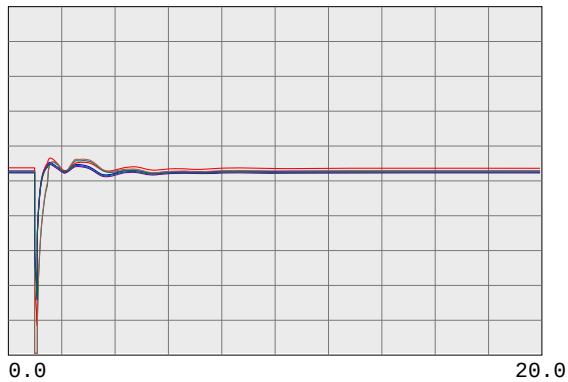
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



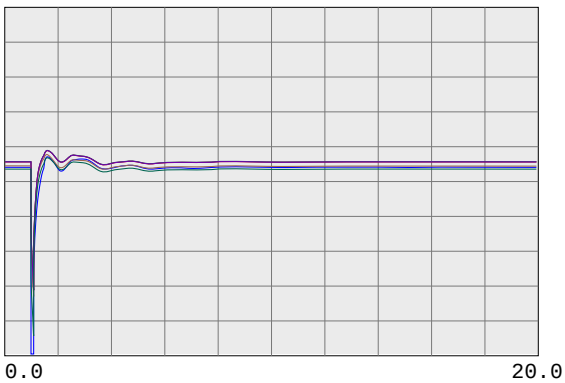
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



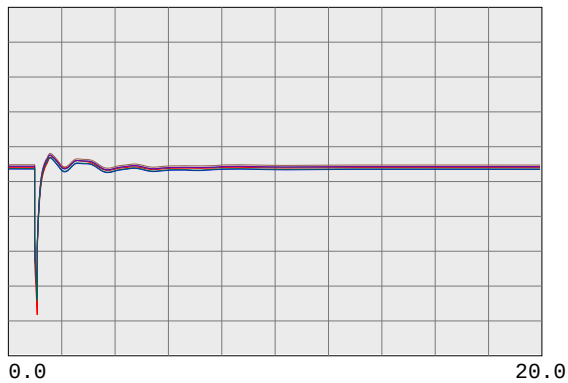
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



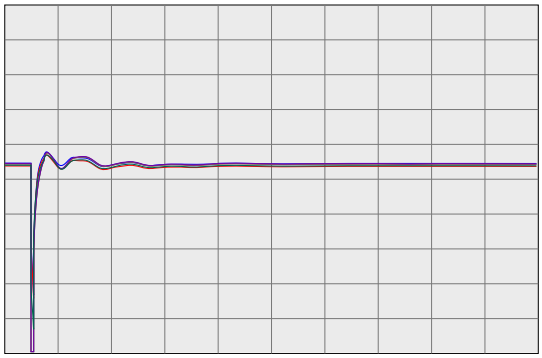
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

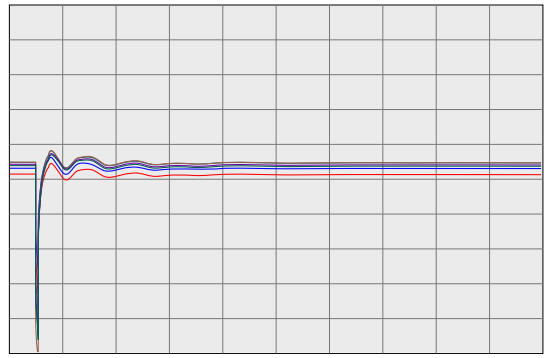
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

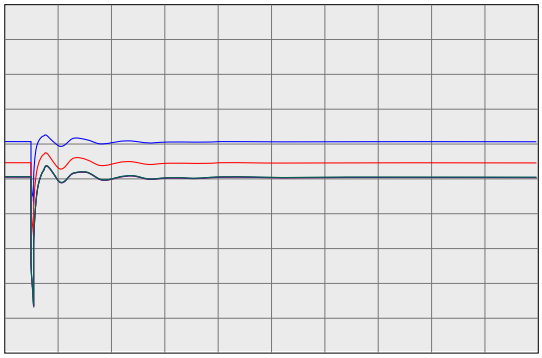
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

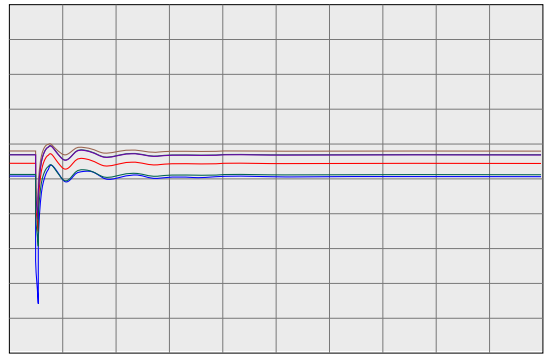
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

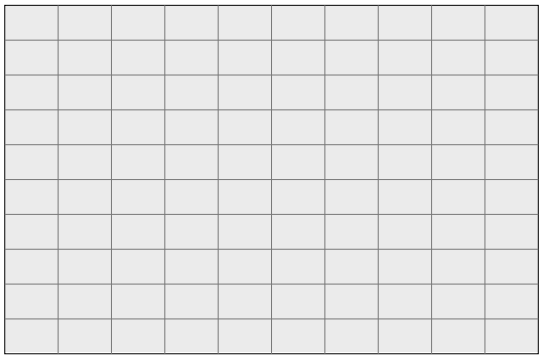
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

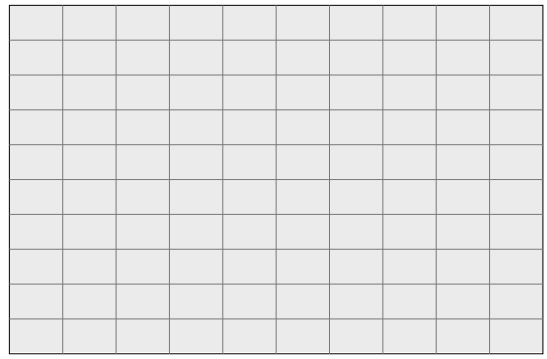


0.0 20.0

Time(sec)

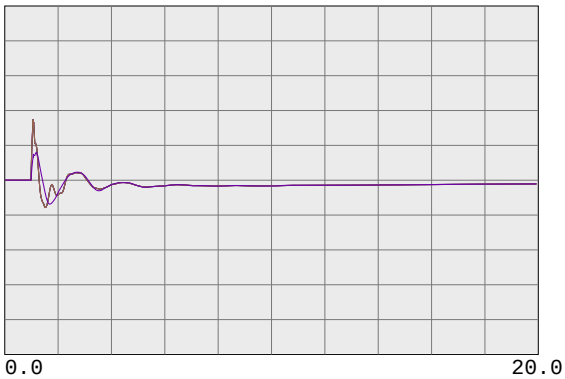
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



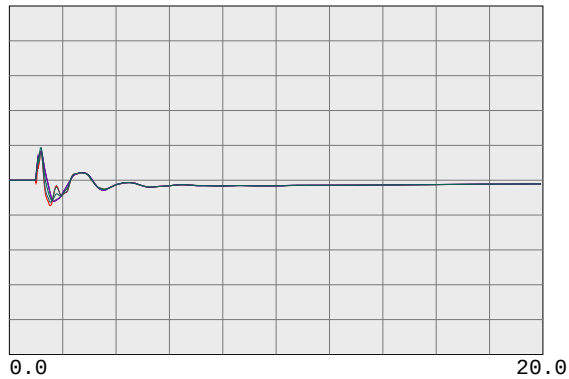


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

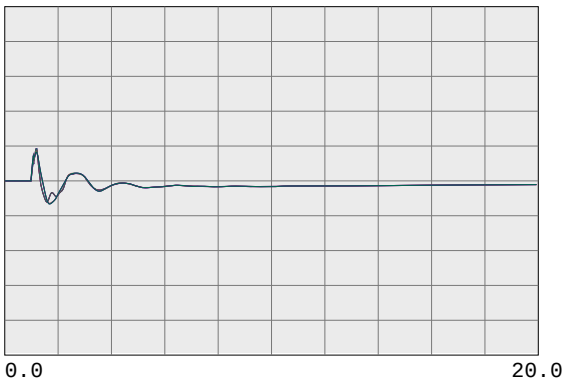
230-KV SYSTEM FREQUENCIES



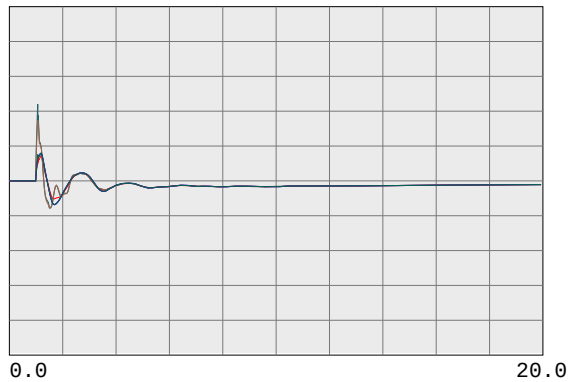
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



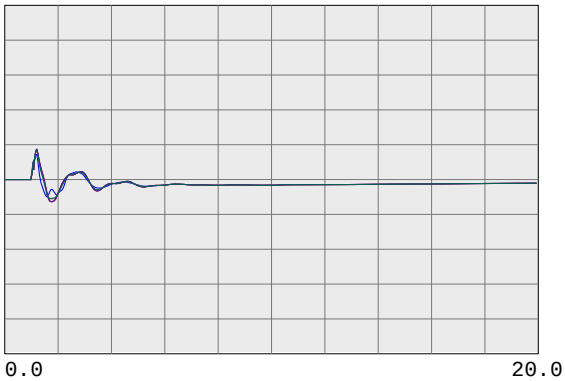
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



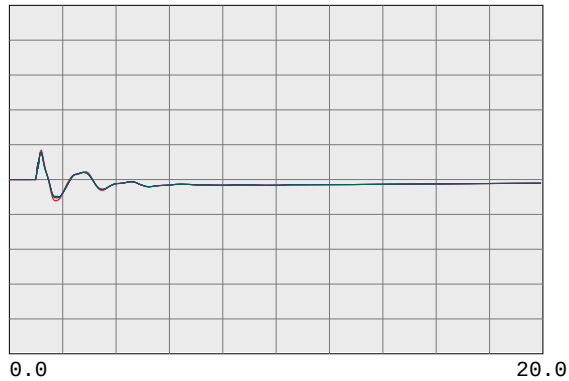
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



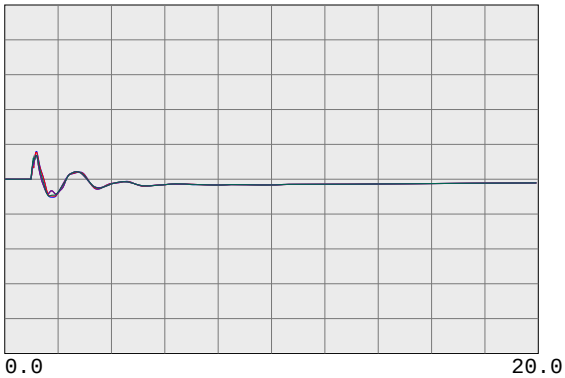
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



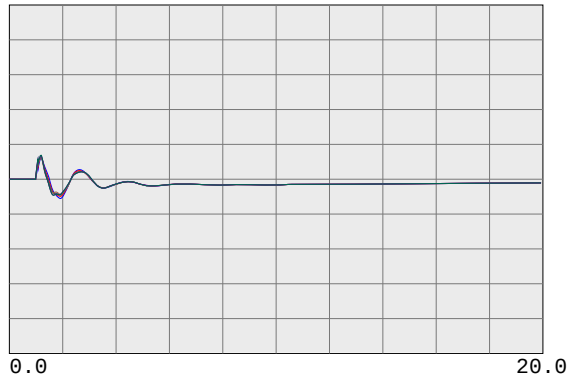
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

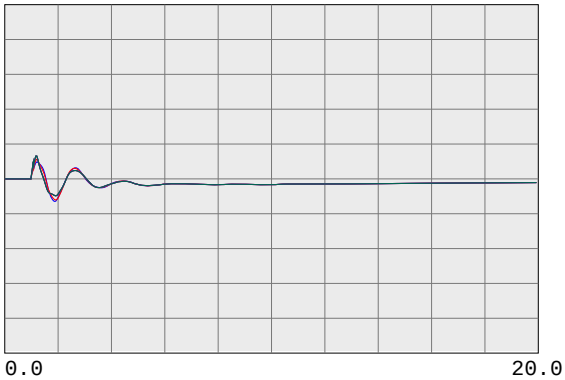
230-KV SYSTEM FREQUENCIES



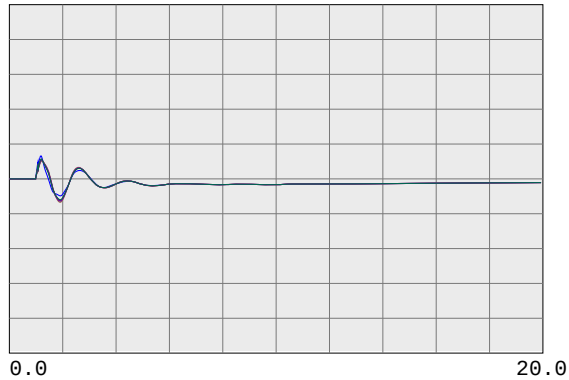
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



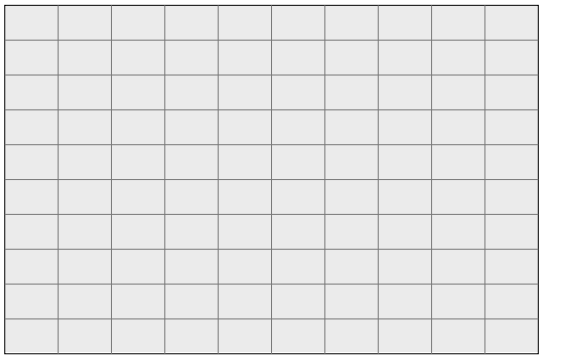
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

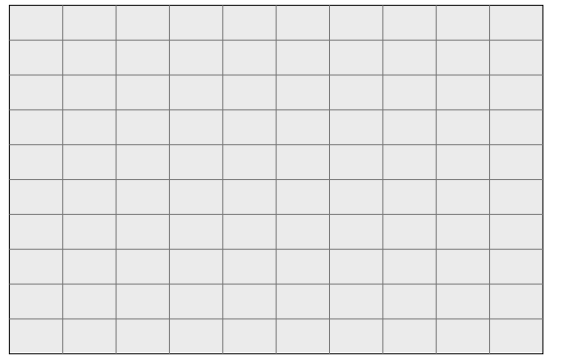


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



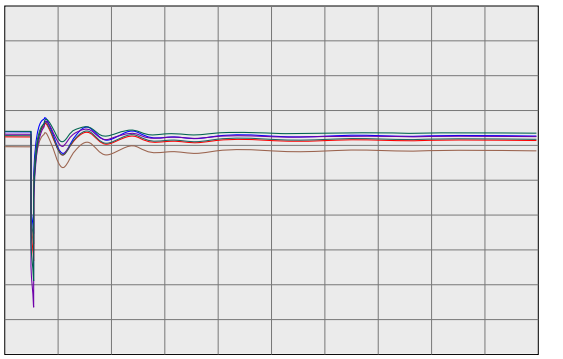
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



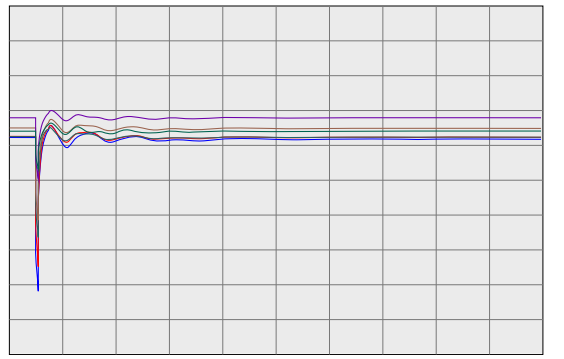


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

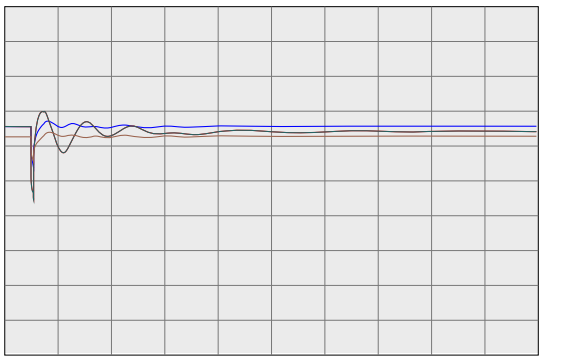
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



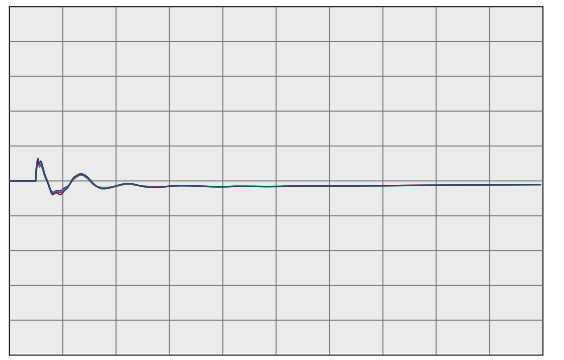
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



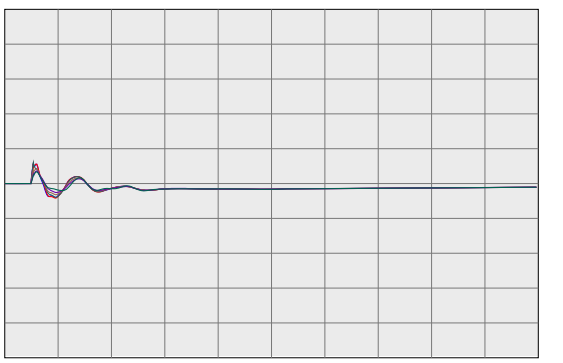
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



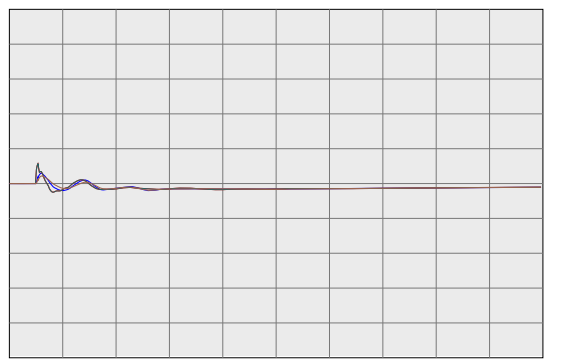
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



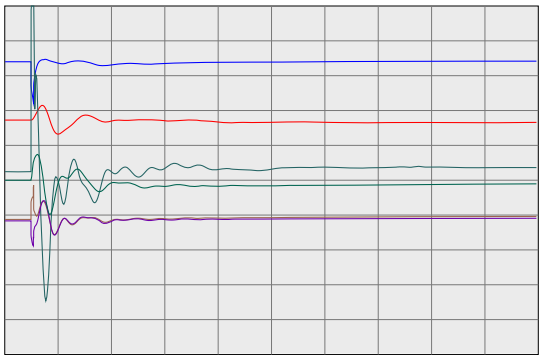
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



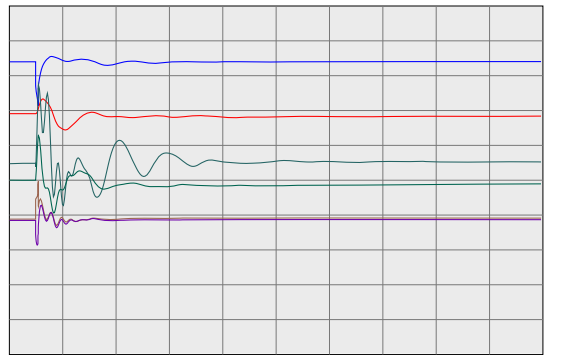
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

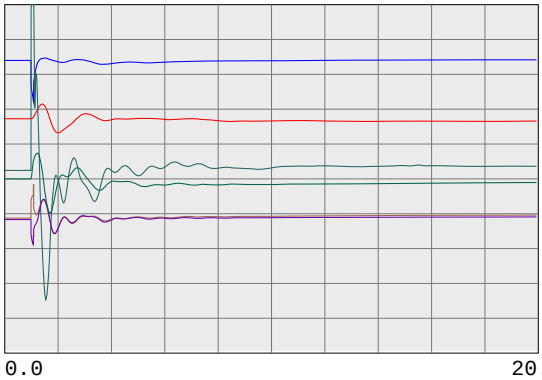
WILLOW PASS GENERATION PLANT



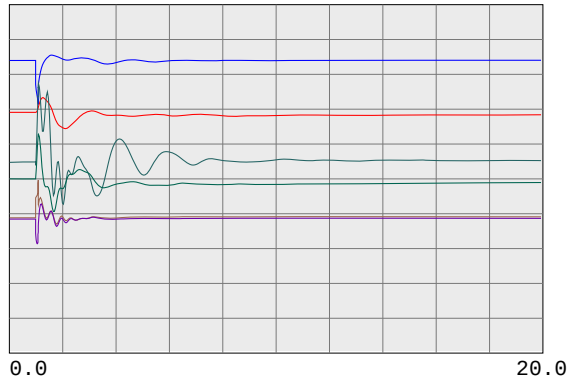
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



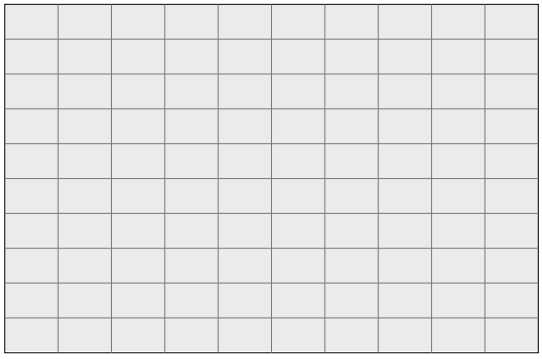
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

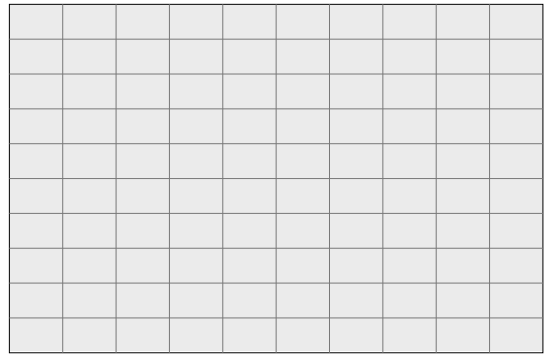


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



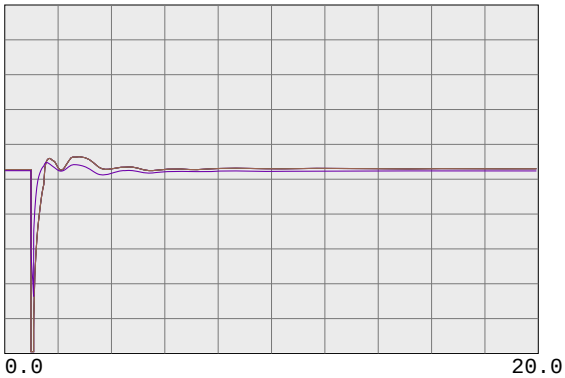
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



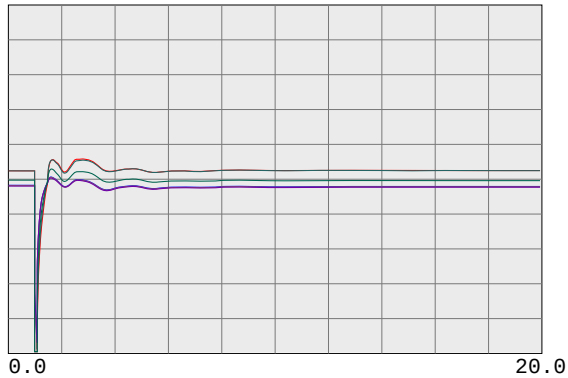


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

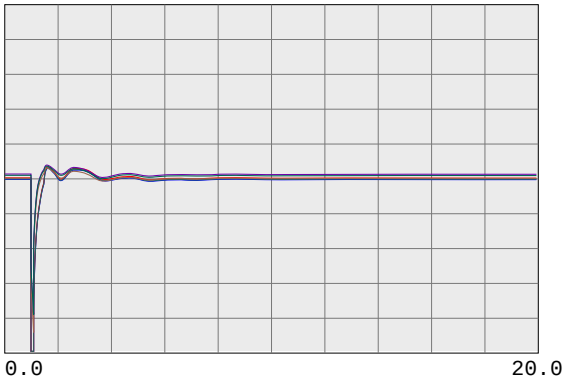
230-KV SYSTEM VOLTAGES



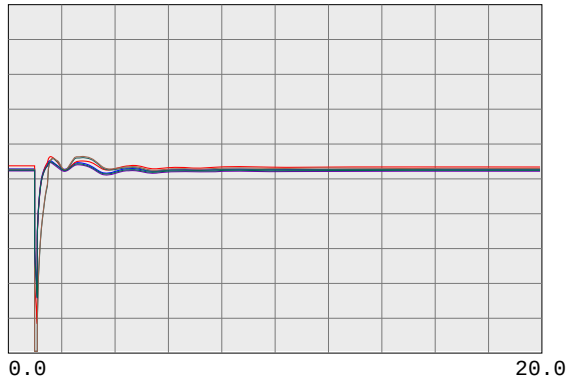
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



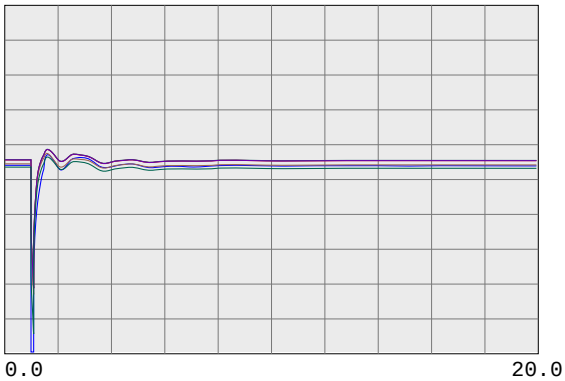
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



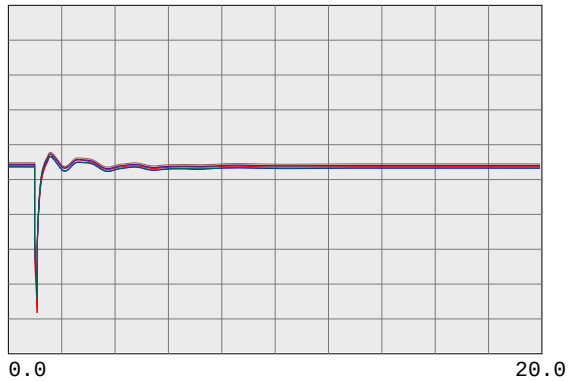
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



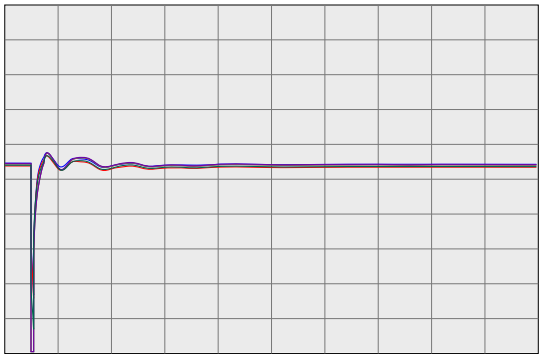
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

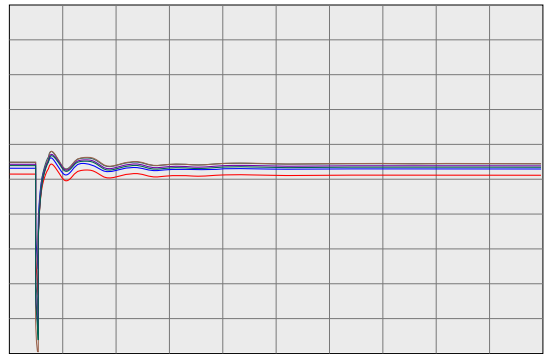
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

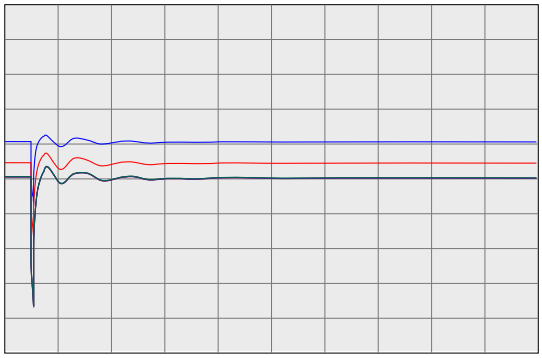
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

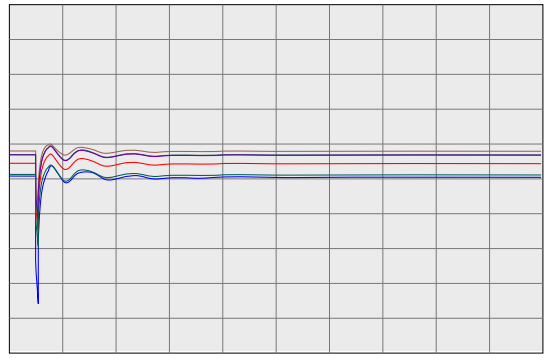
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

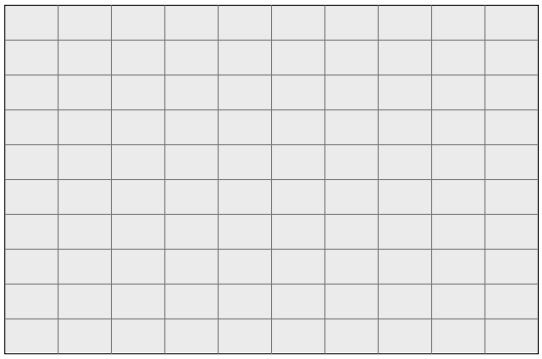
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

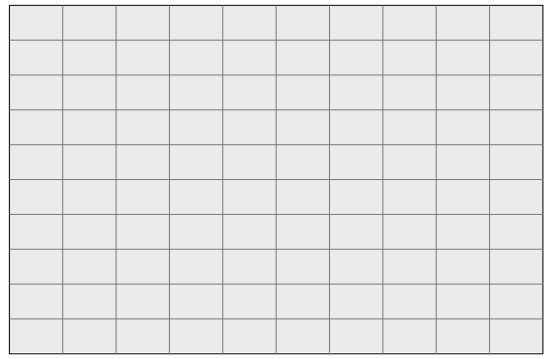


0.0 20.0

Time(sec)

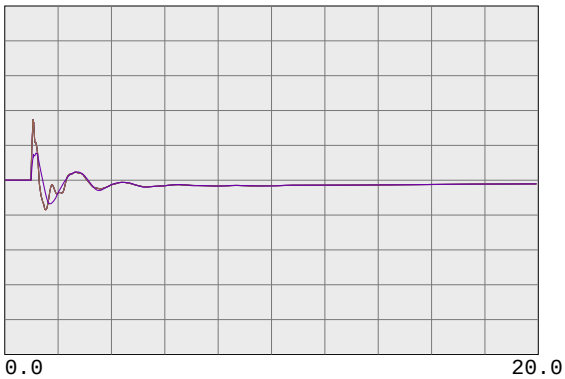
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



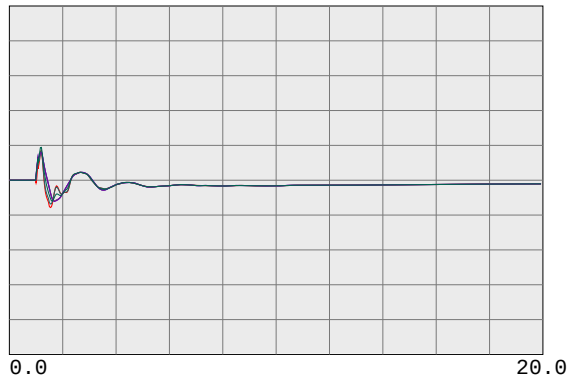


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

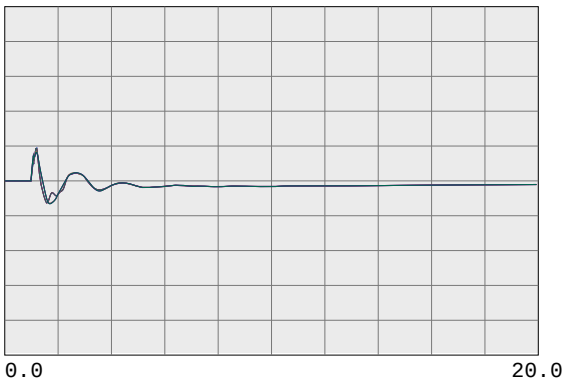
230-KV SYSTEM FREQUENCIES



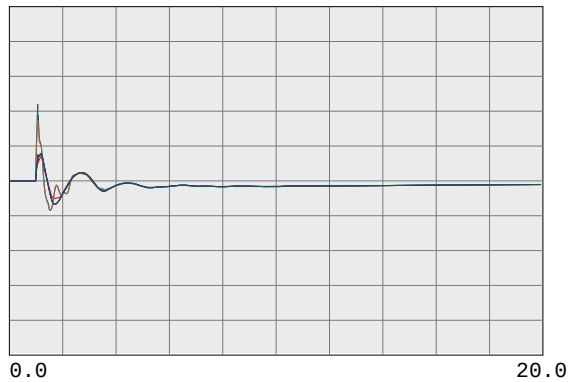
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



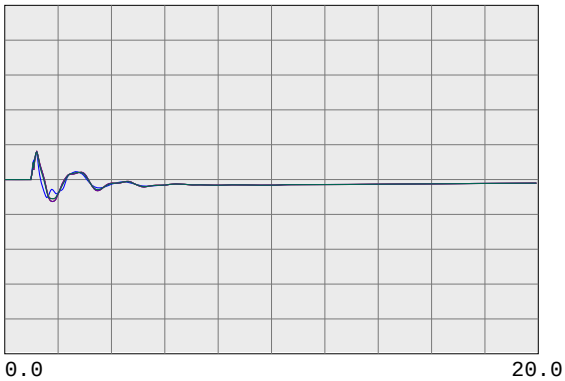
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



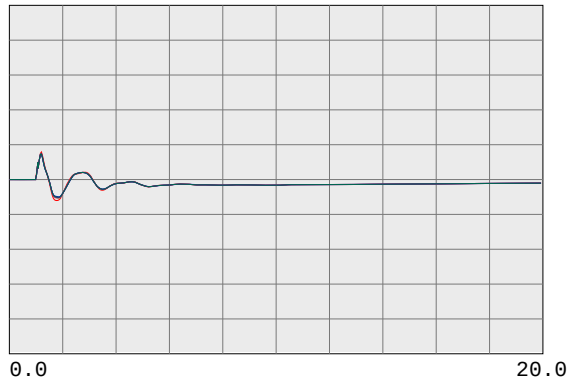
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



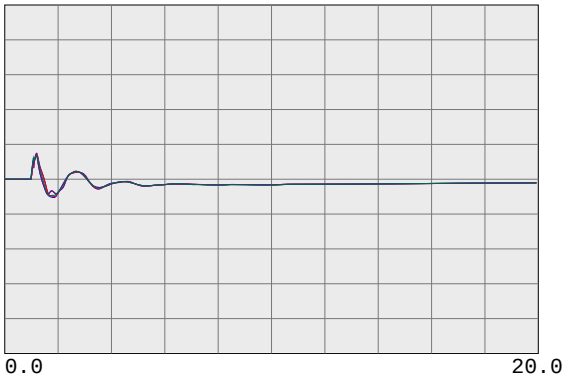
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



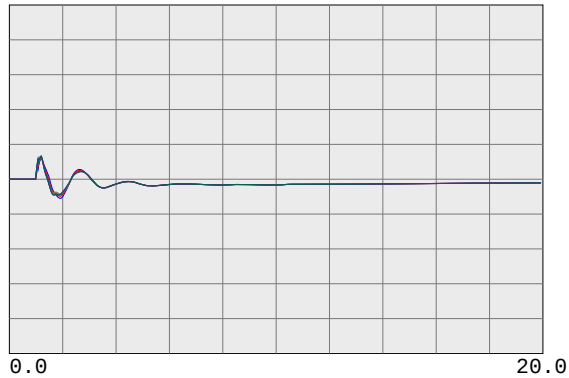
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

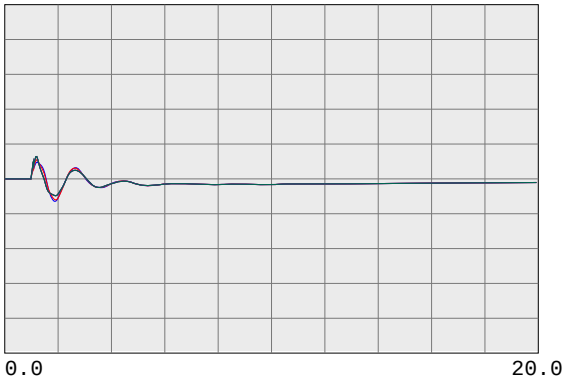
230-KV SYSTEM FREQUENCIES



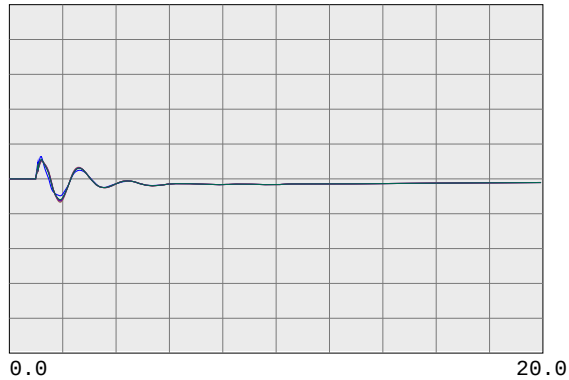
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



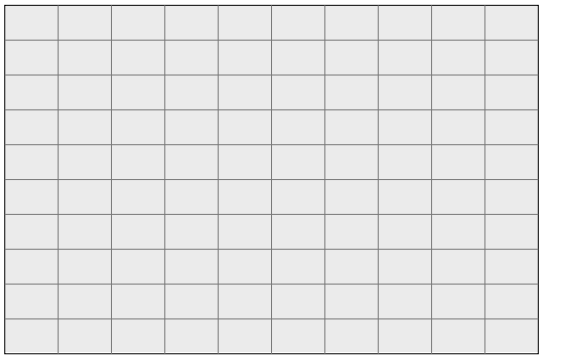
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

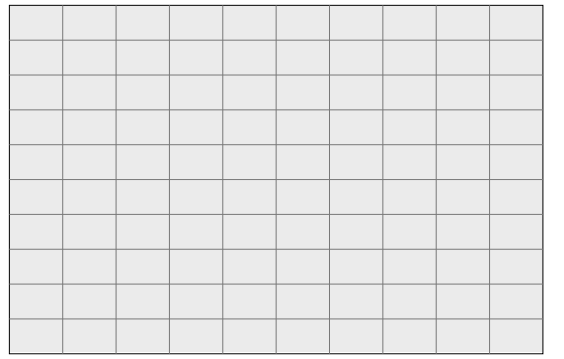


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



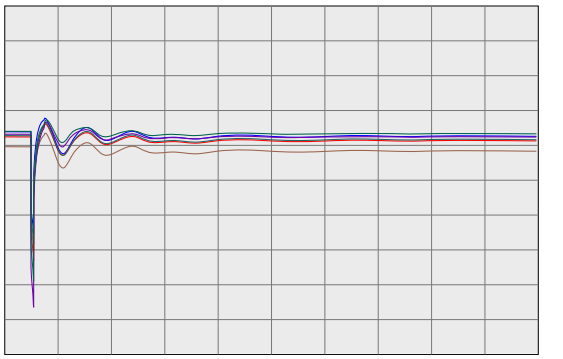
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



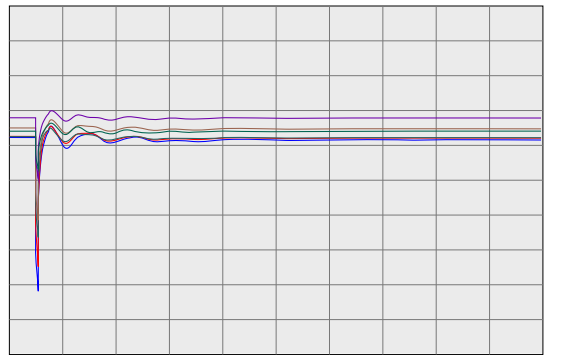


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

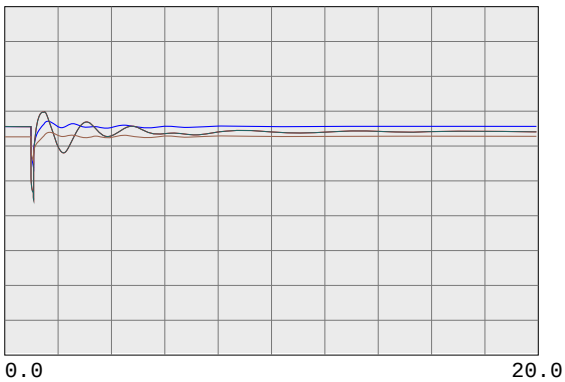
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



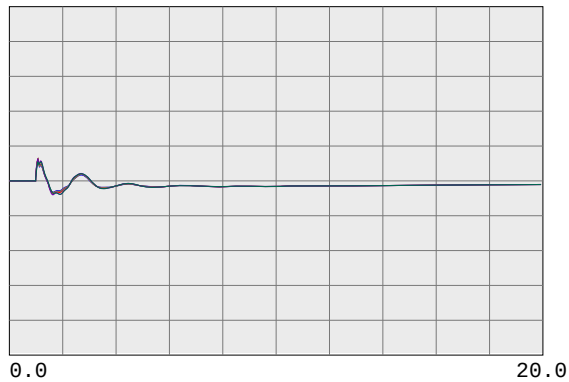
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



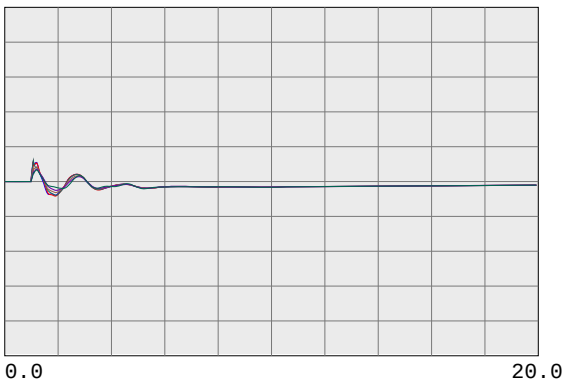
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



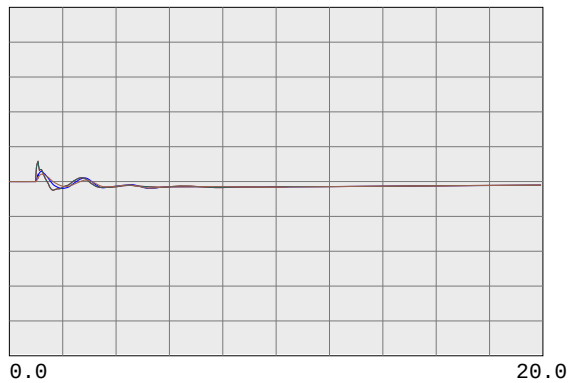
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



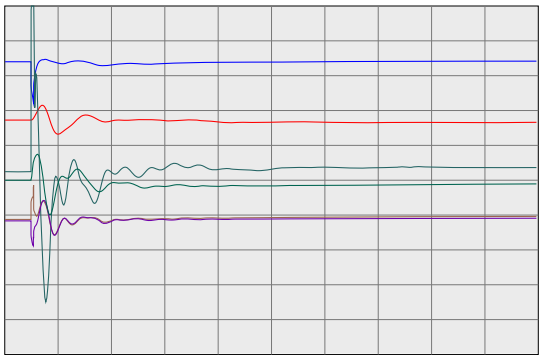
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



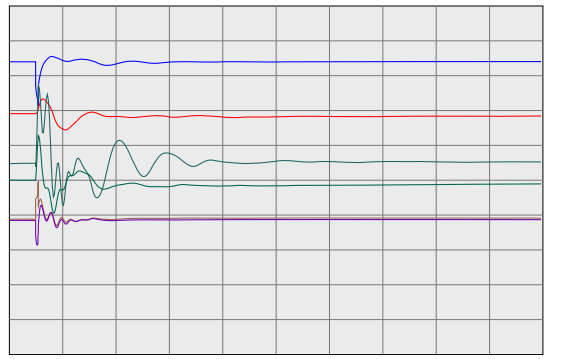
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

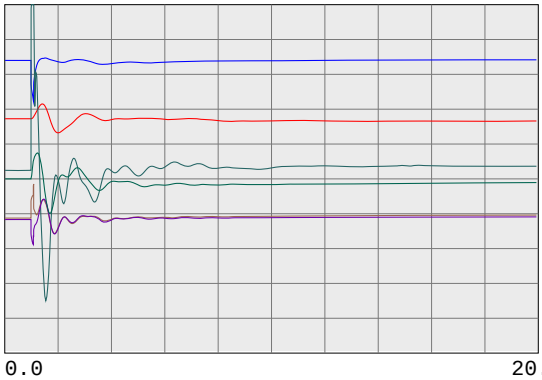
WILLOW PASS GENERATION PLANT



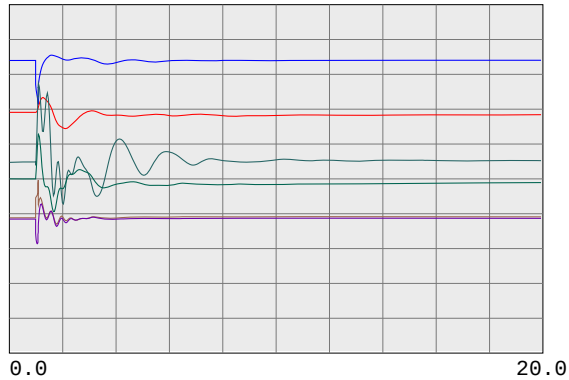
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



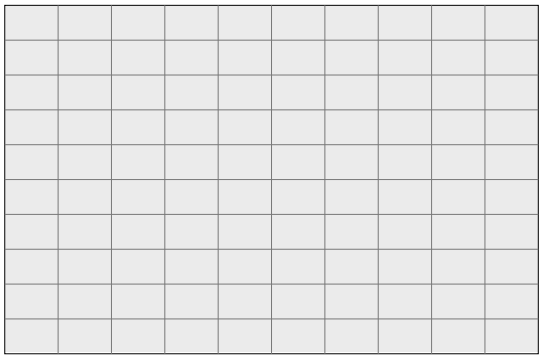
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

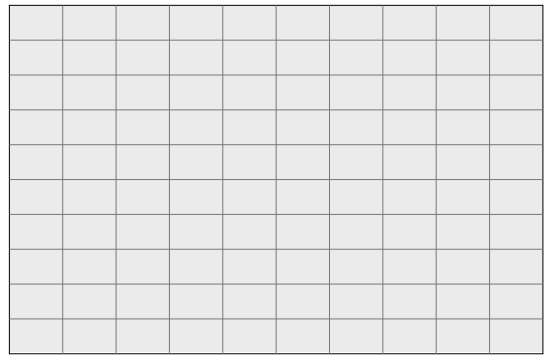


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



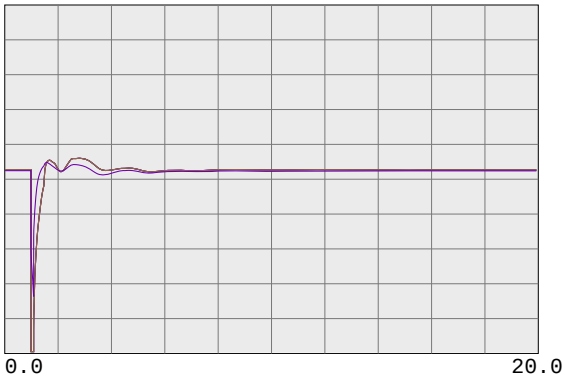
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



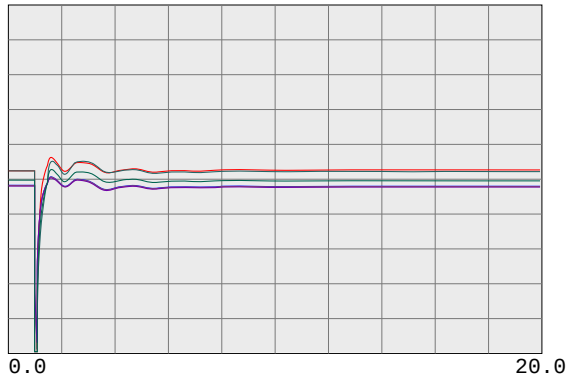


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

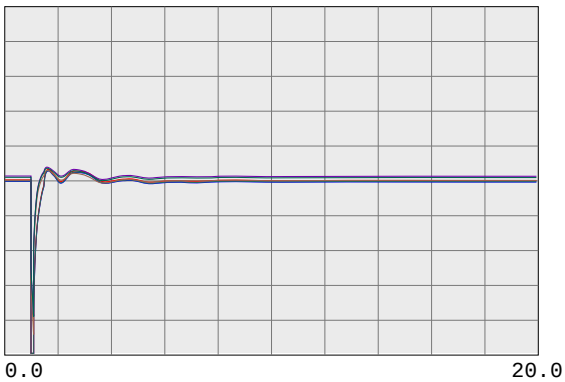
230-KV SYSTEM VOLTAGES



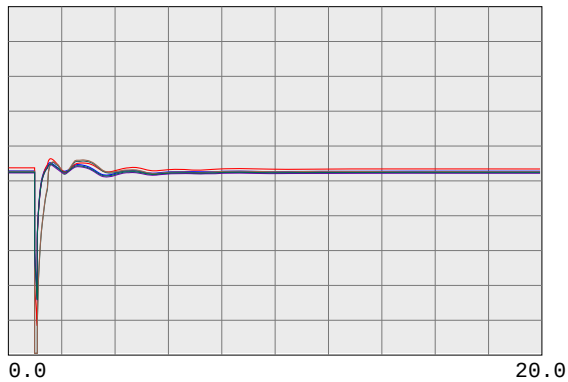
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



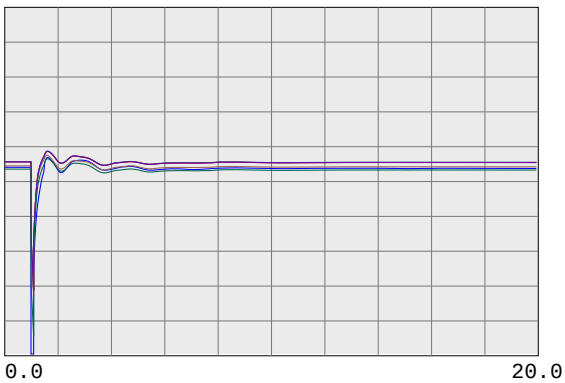
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



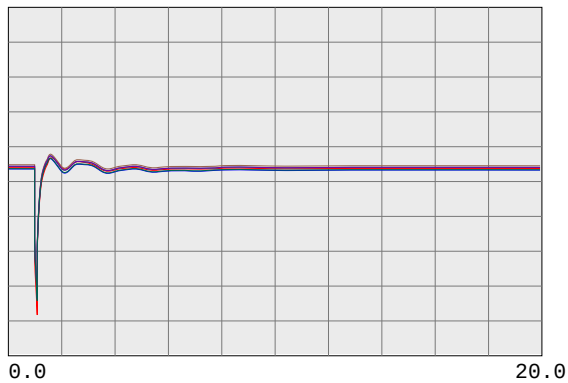
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



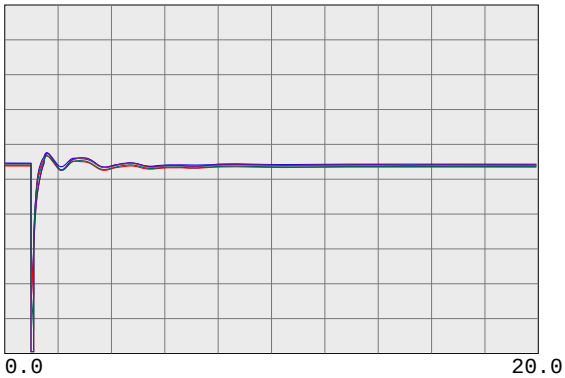
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



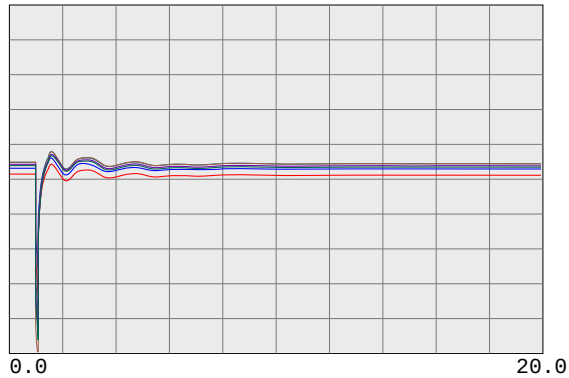
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

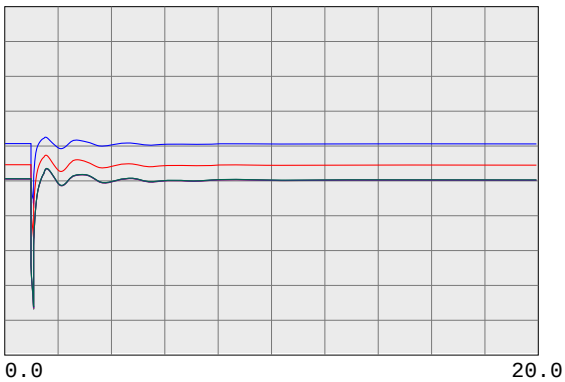
230-KV SYSTEM VOLTAGES



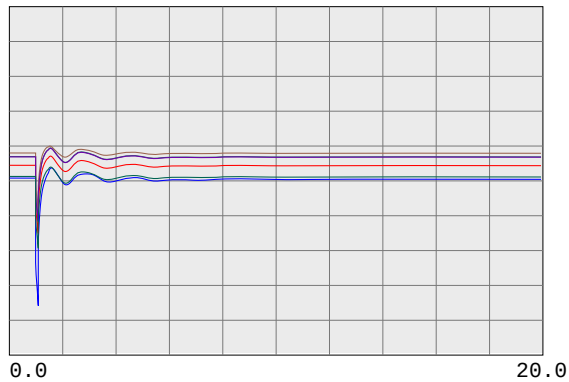
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



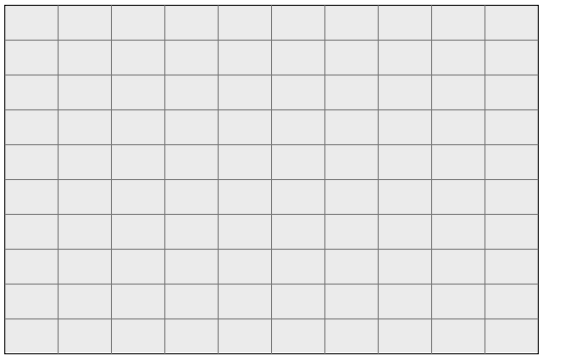
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

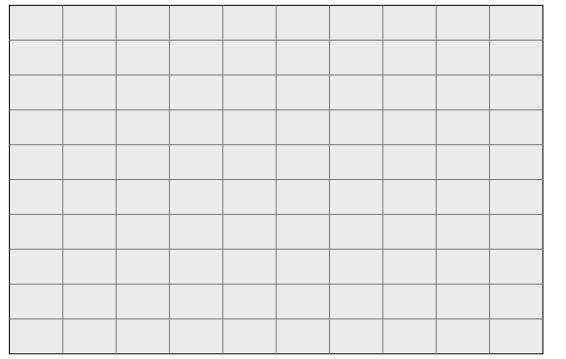


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



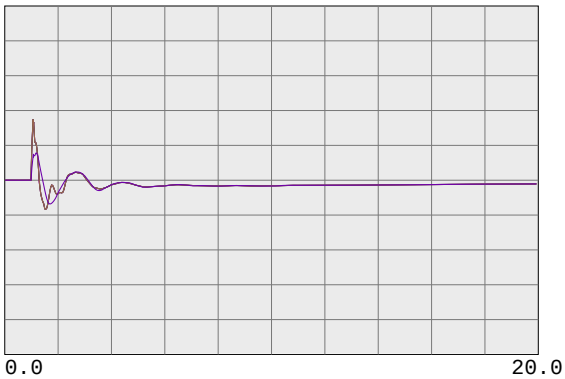
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



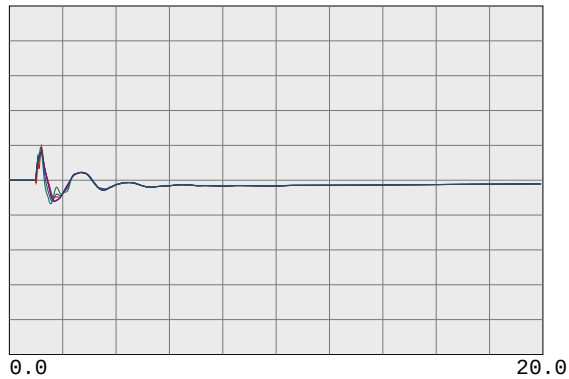


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

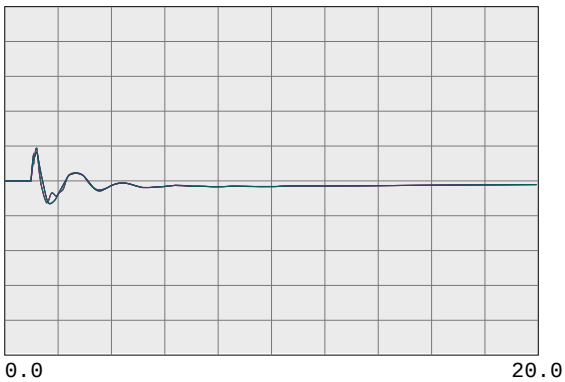
230-KV SYSTEM FREQUENCIES



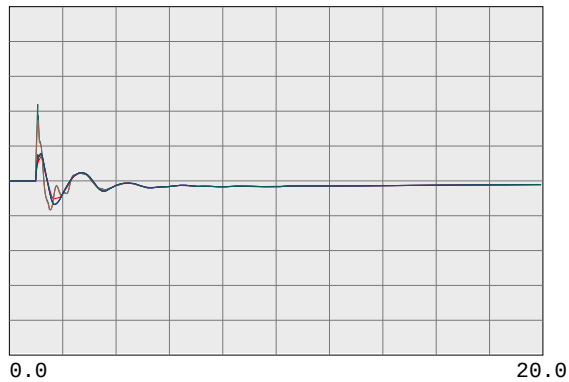
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



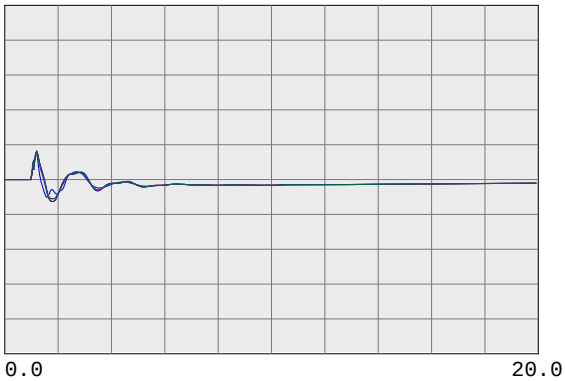
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



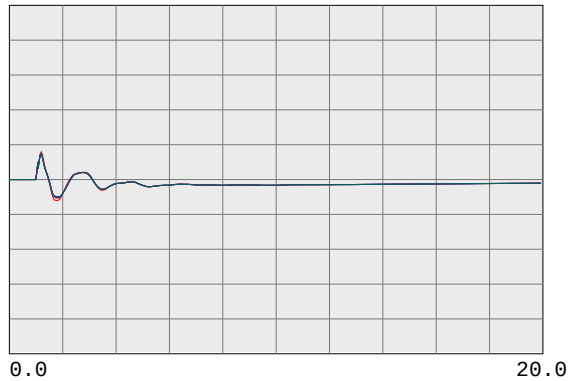
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



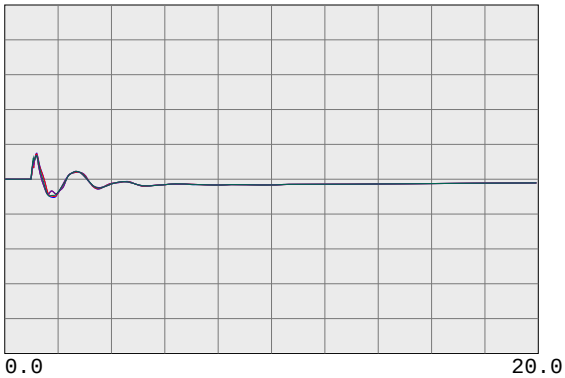
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



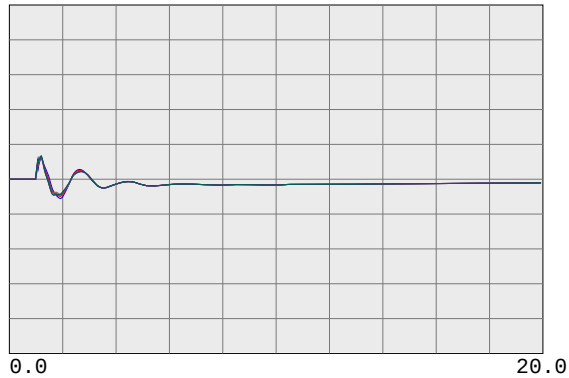
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

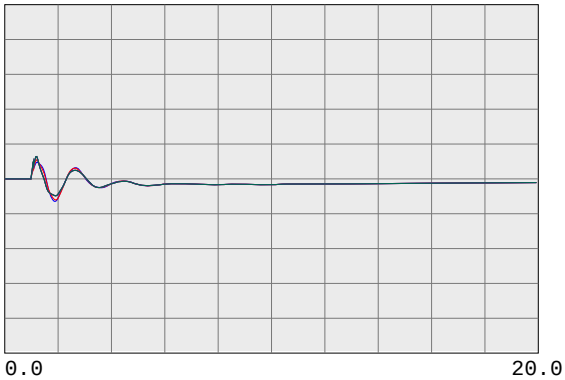
230-KV SYSTEM FREQUENCIES



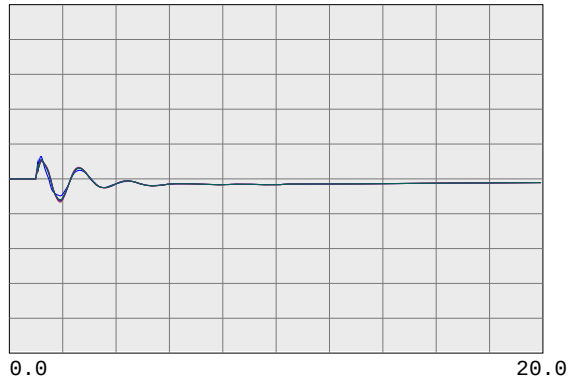
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



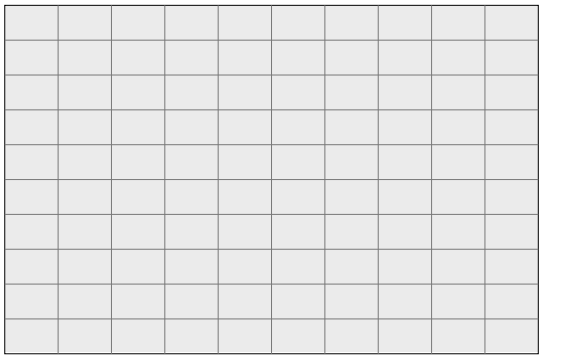
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

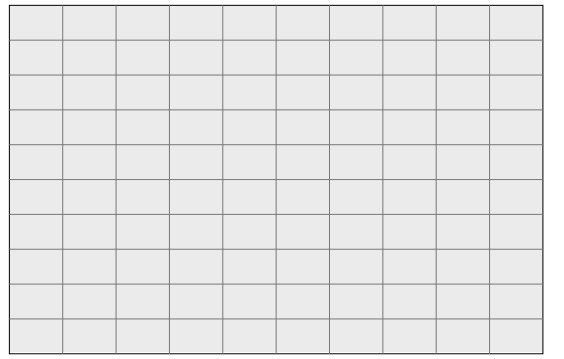


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



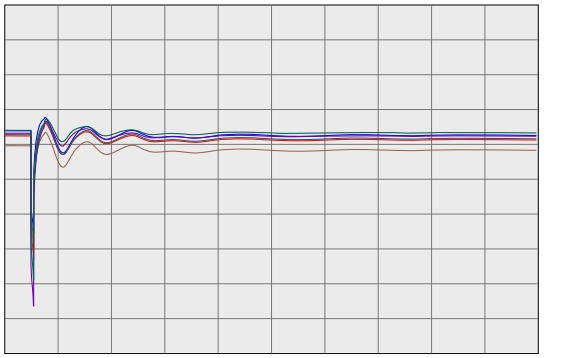
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



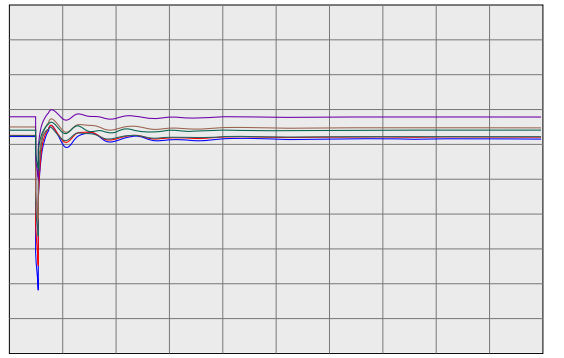


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

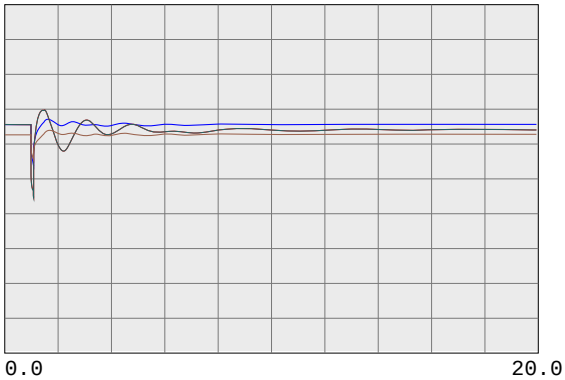
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



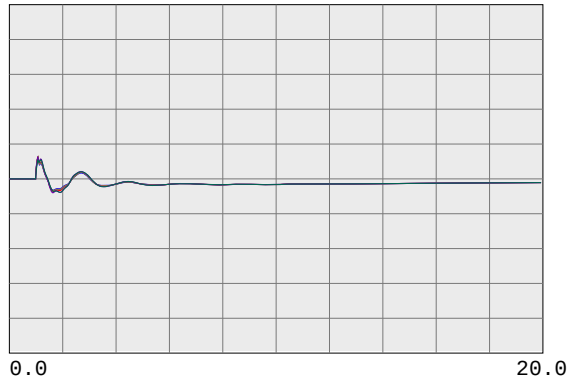
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



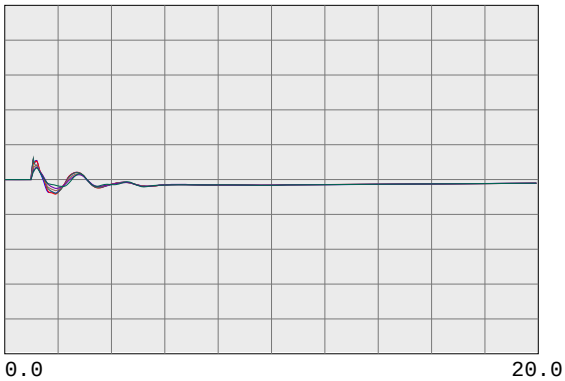
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



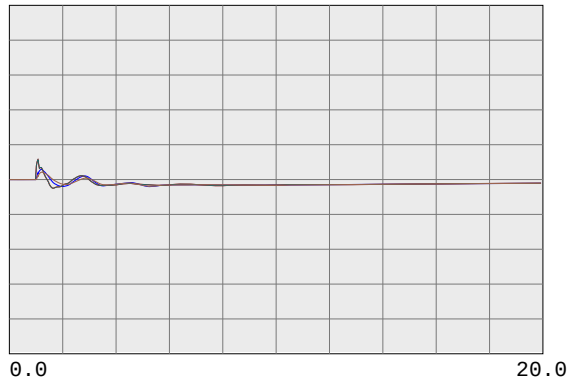
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



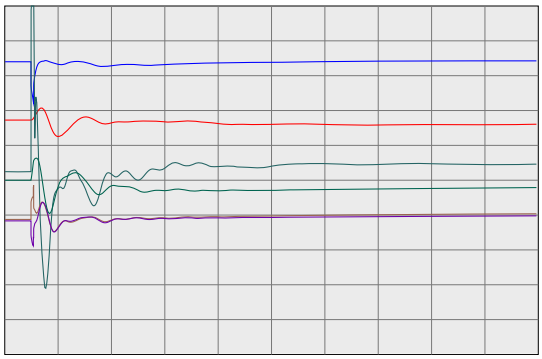
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



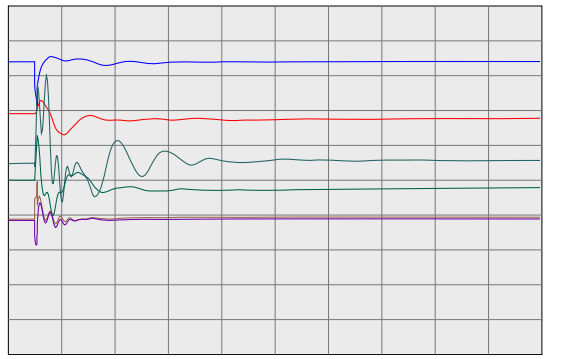
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

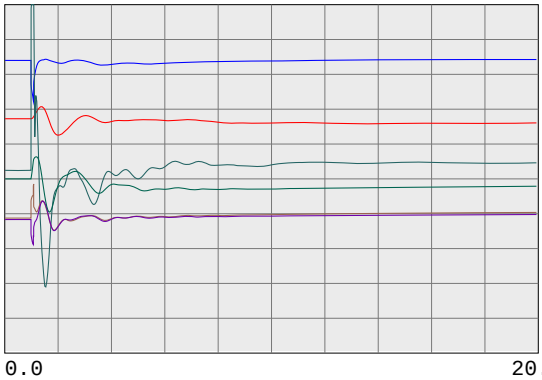
WILLOW PASS GENERATION PLANT



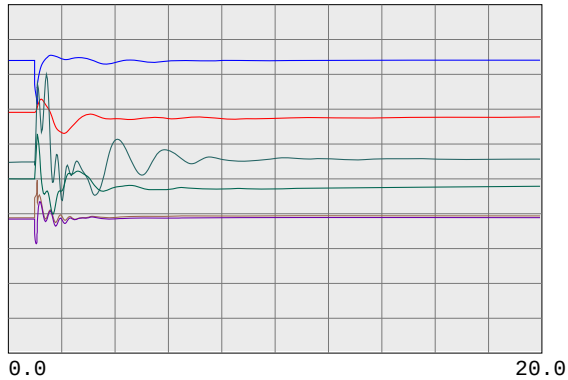
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



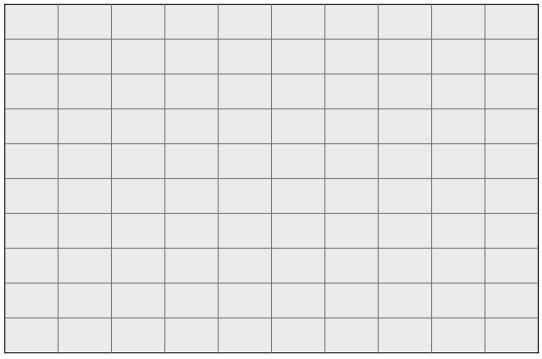
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

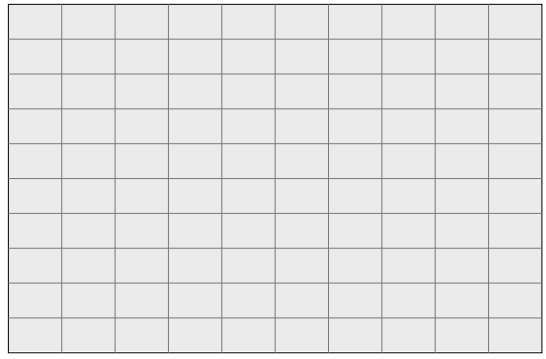


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



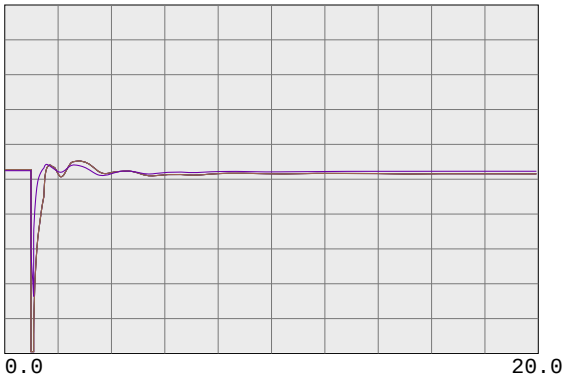
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



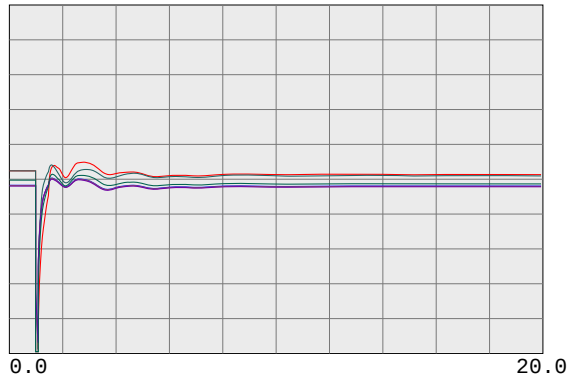


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

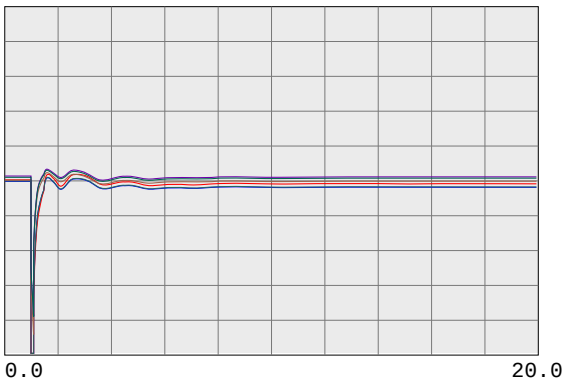
230-KV SYSTEM VOLTAGES



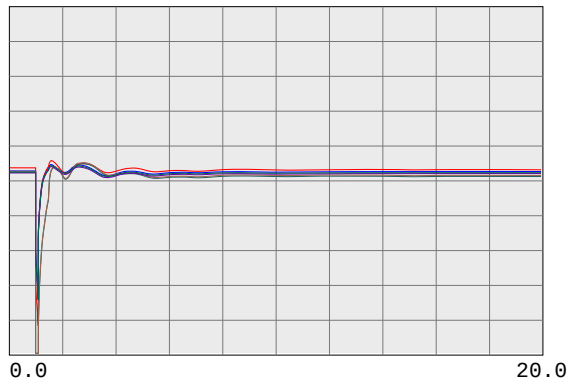
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



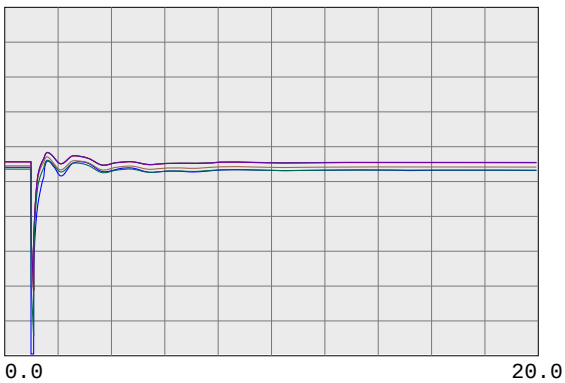
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



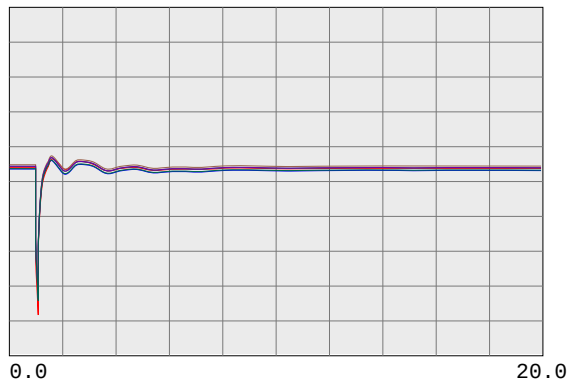
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



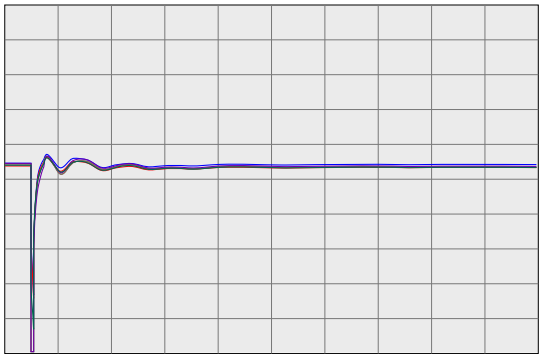
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



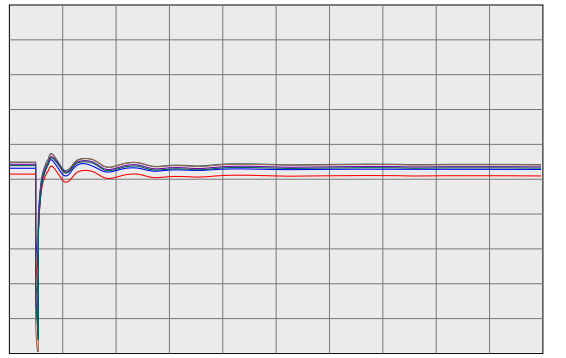
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

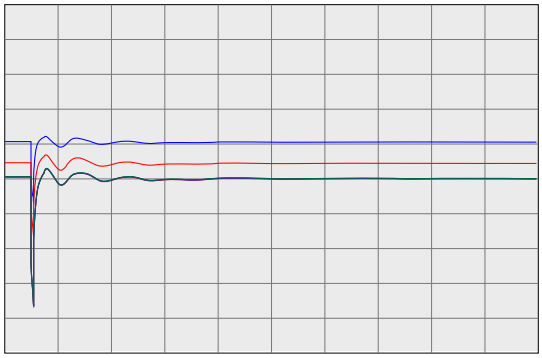
230-KV SYSTEM VOLTAGES



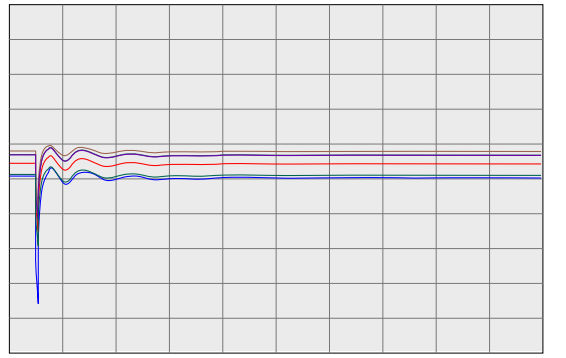
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



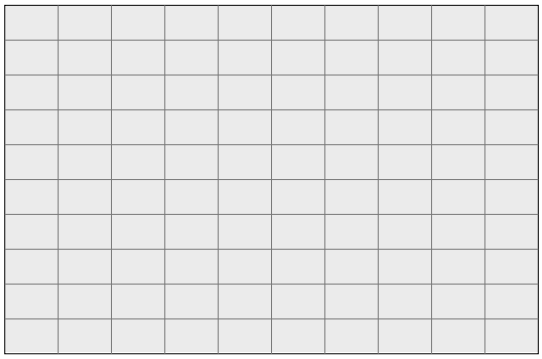
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

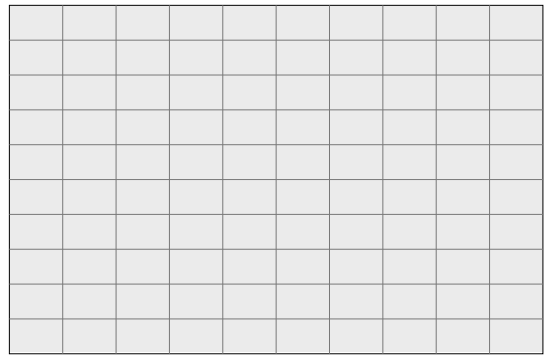


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



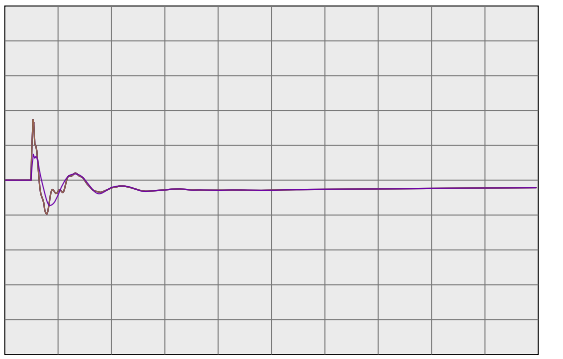
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



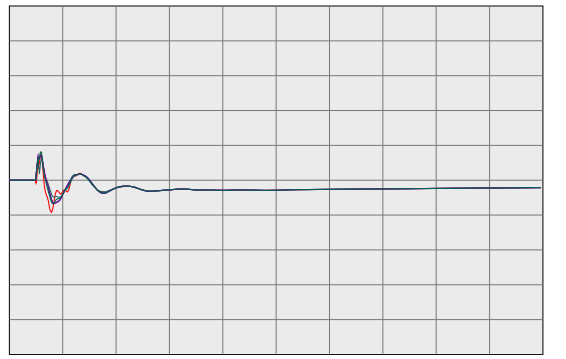


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

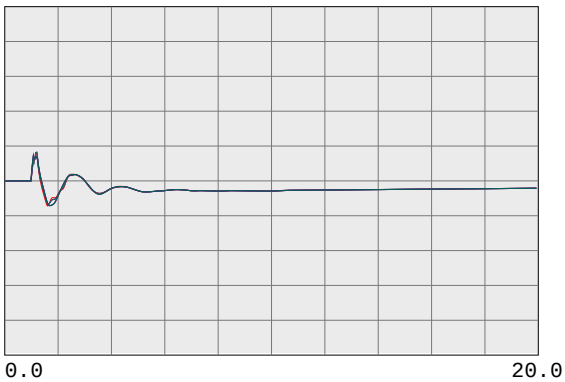
230-KV SYSTEM FREQUENCIES



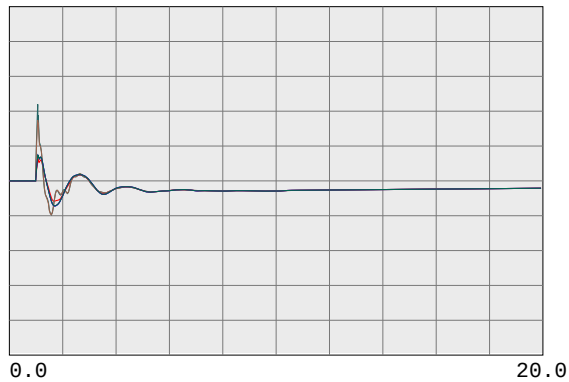
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



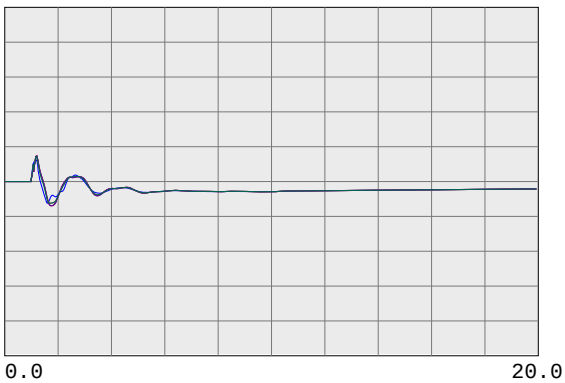
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



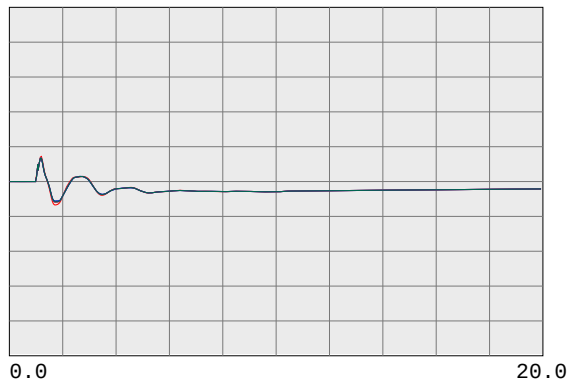
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



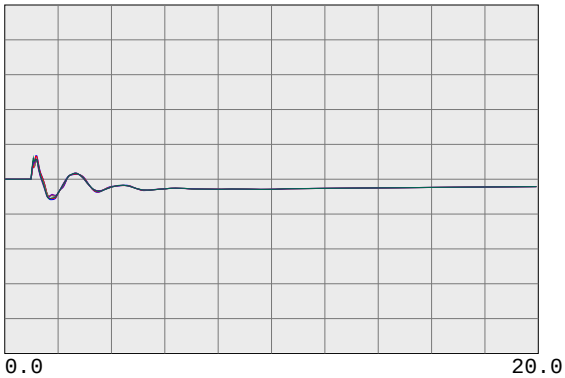
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



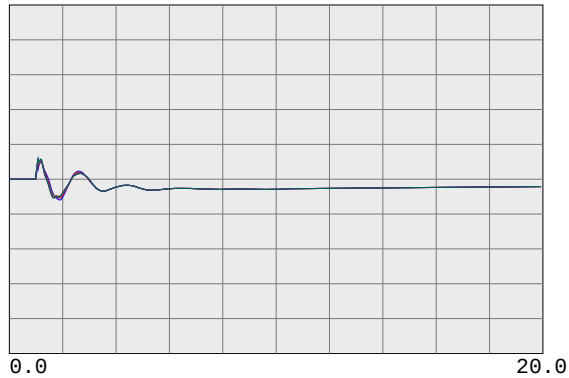
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

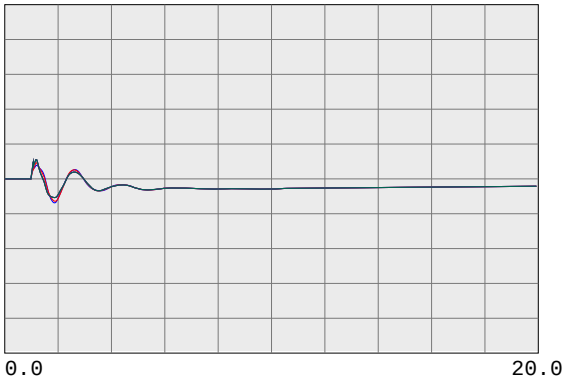
230-KV SYSTEM FREQUENCIES



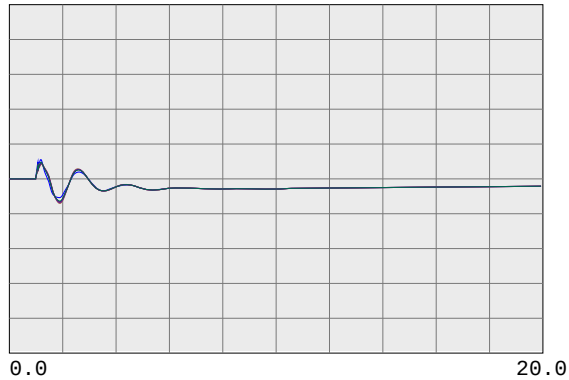
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



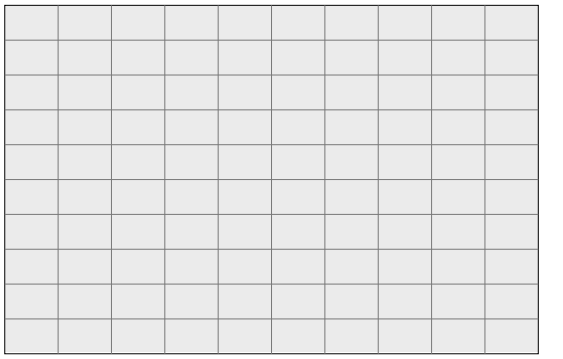
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

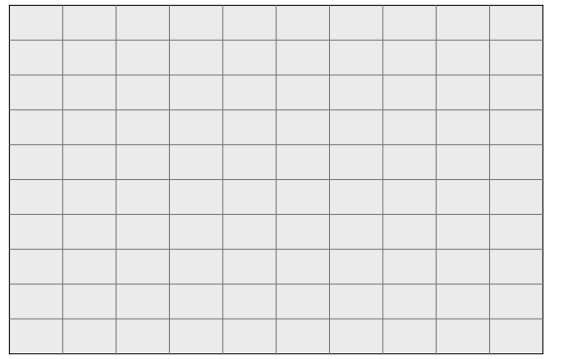


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



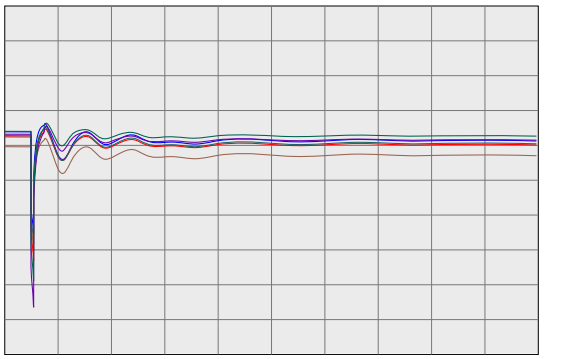
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



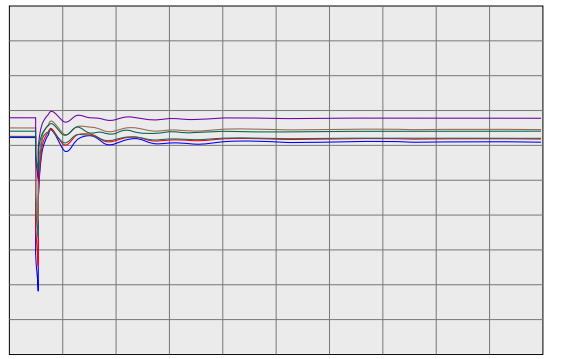


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

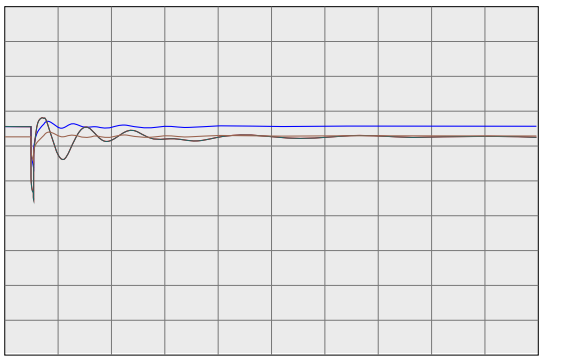
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



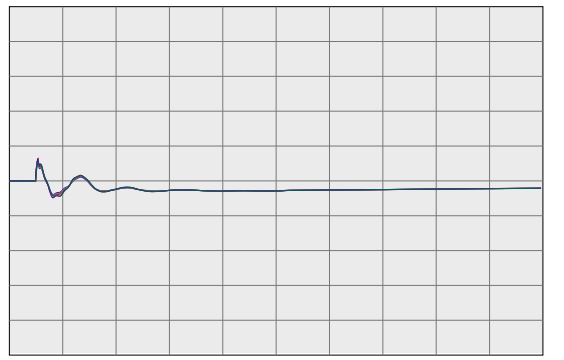
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



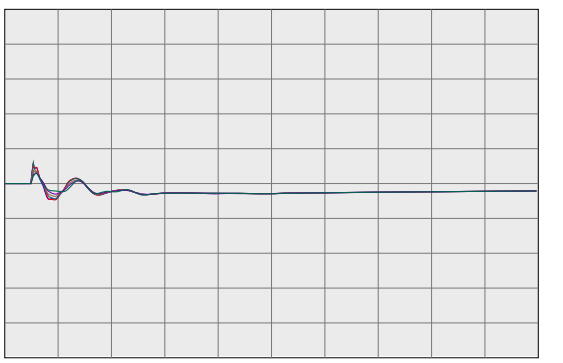
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



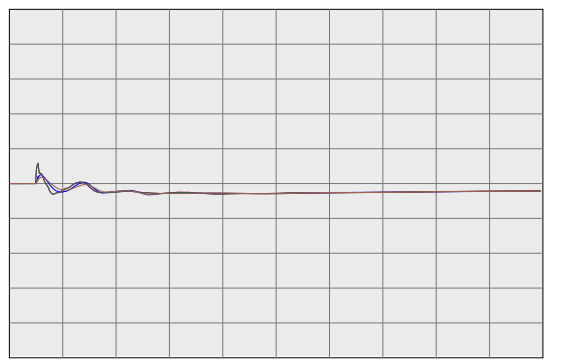
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



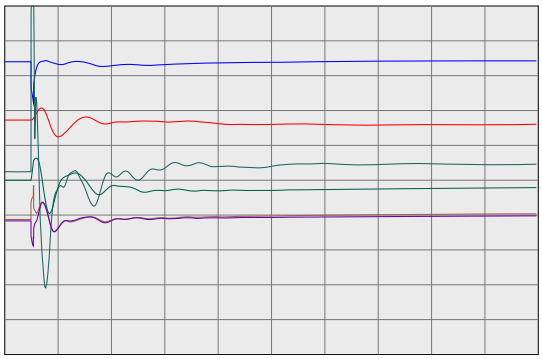
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

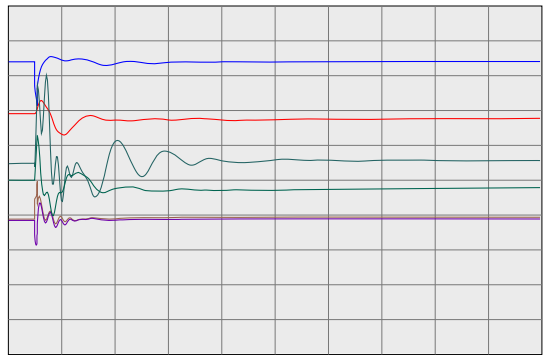
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

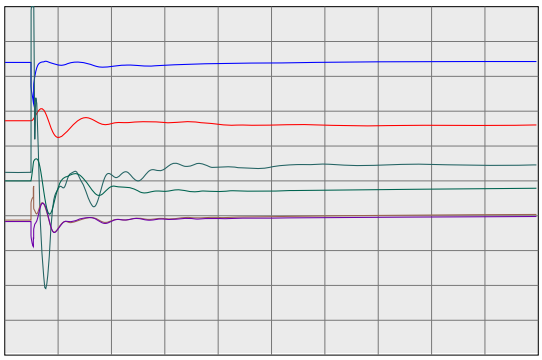
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

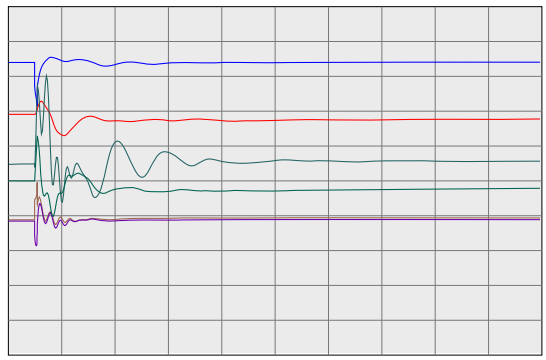
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

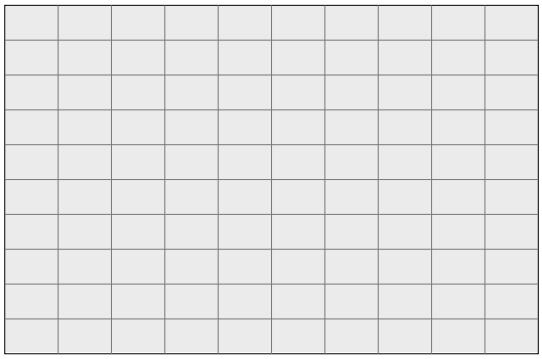
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

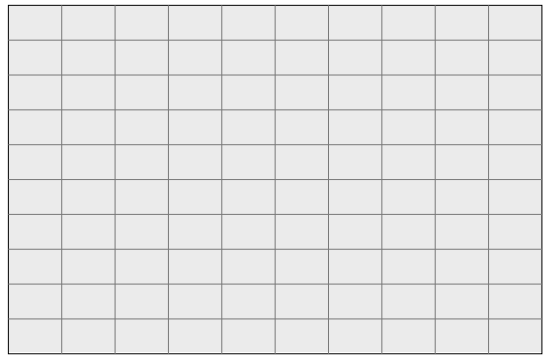


0.0 20.0

Time(sec)

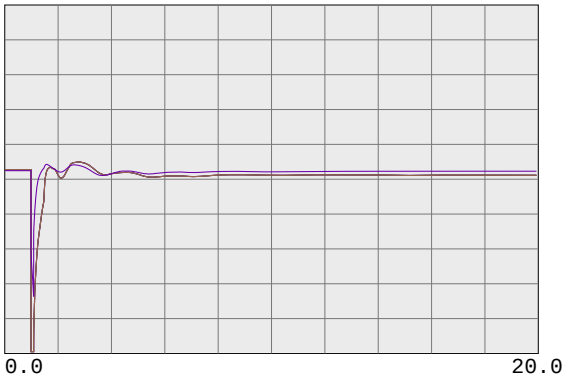
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



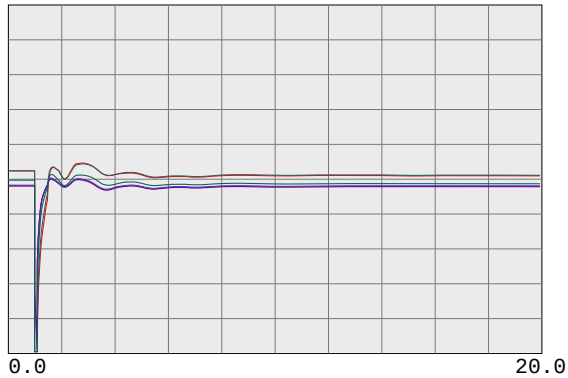


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

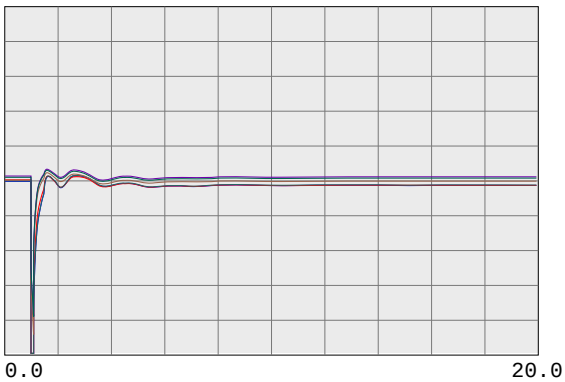
230-KV SYSTEM VOLTAGES



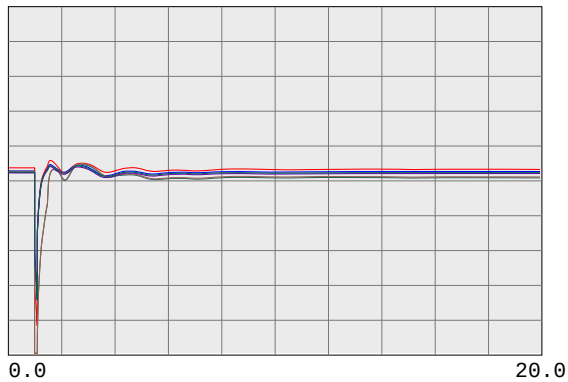
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



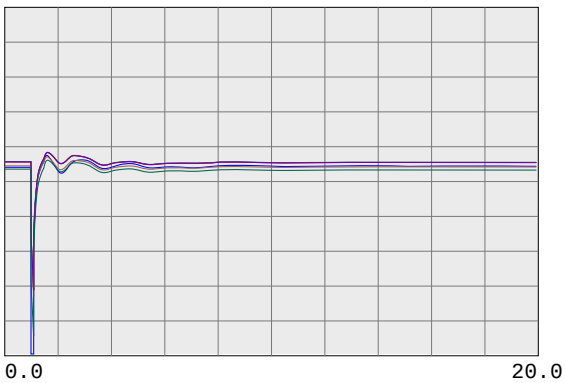
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



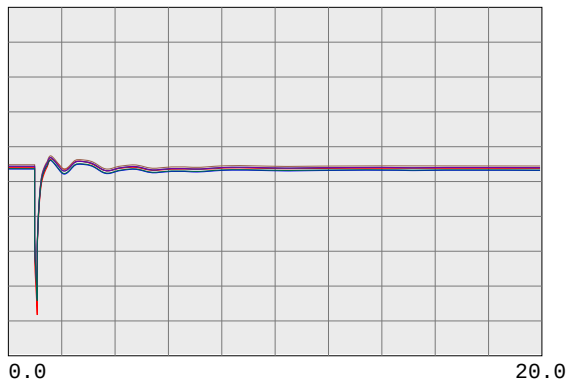
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



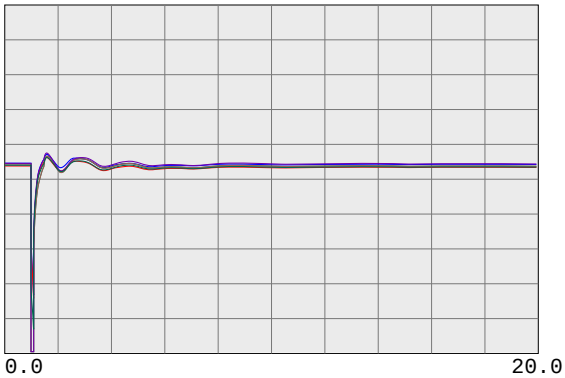
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



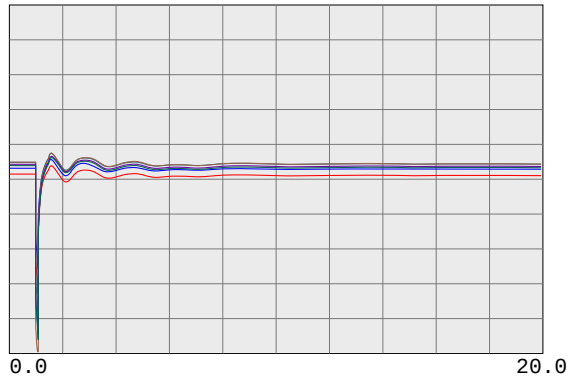
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

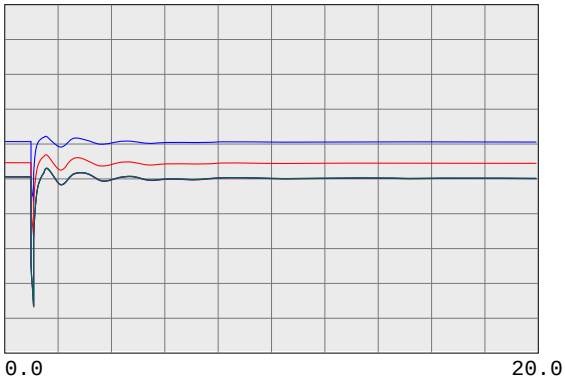
230-KV SYSTEM VOLTAGES



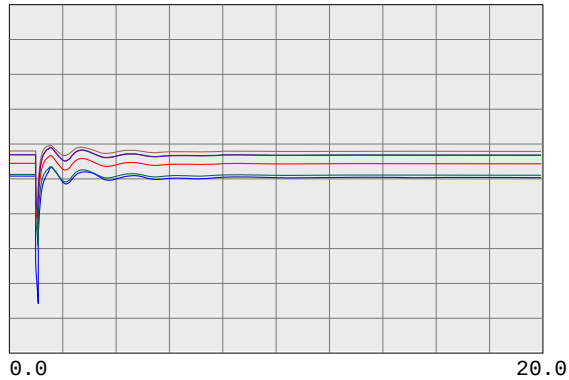
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



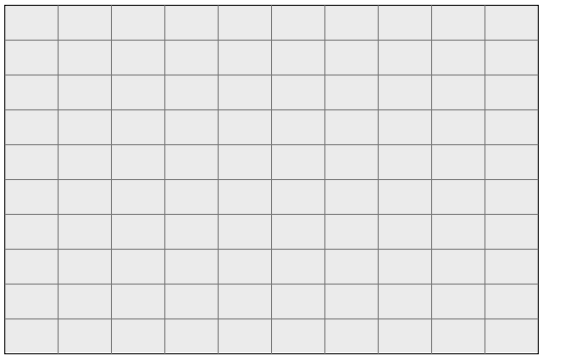
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

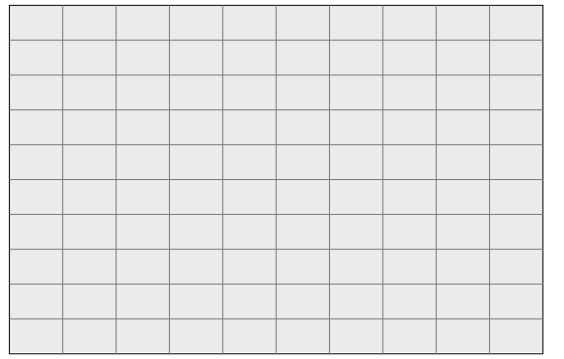


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



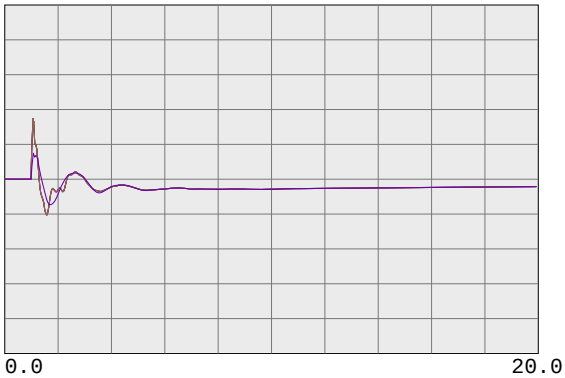
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



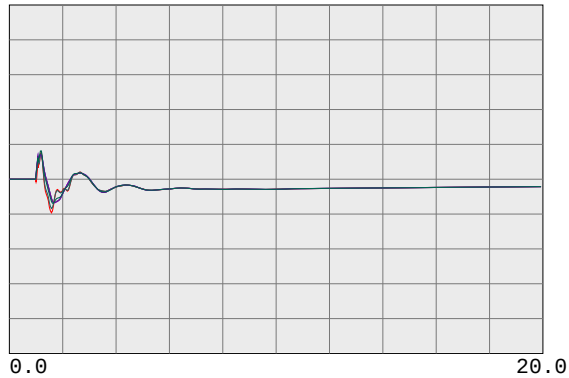


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

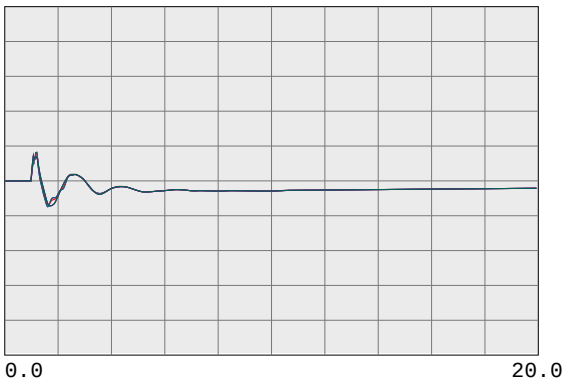
230-KV SYSTEM FREQUENCIES



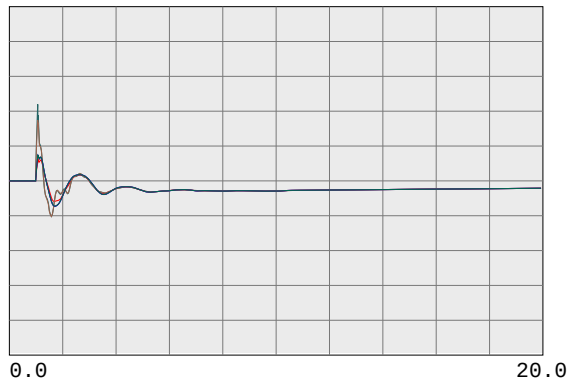
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



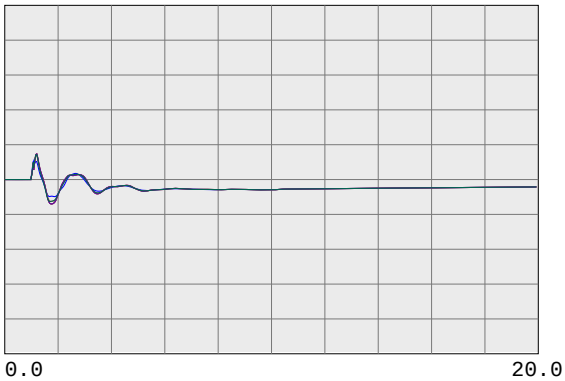
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



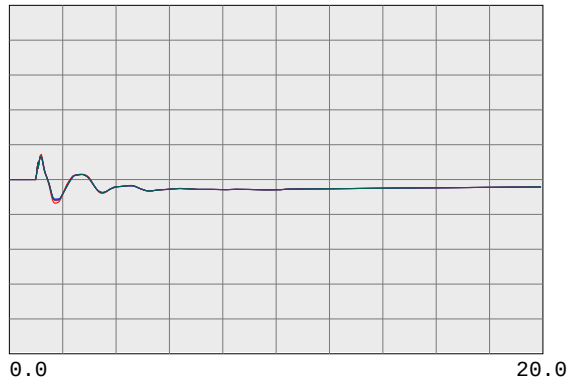
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



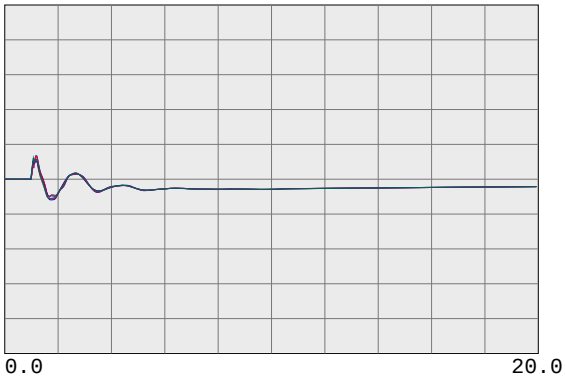
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



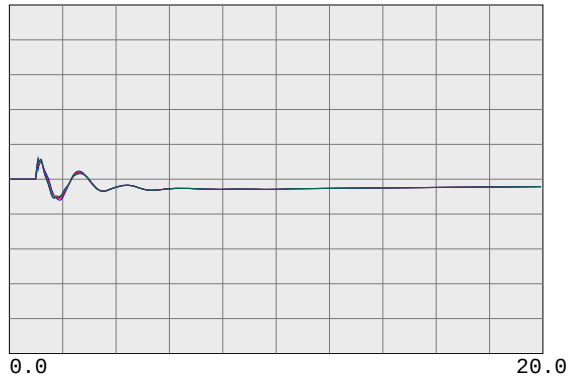
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

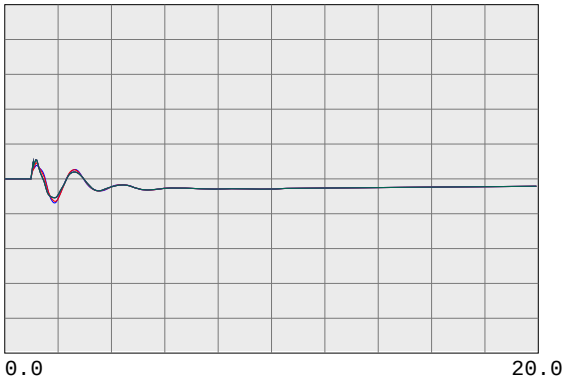
230-KV SYSTEM FREQUENCIES



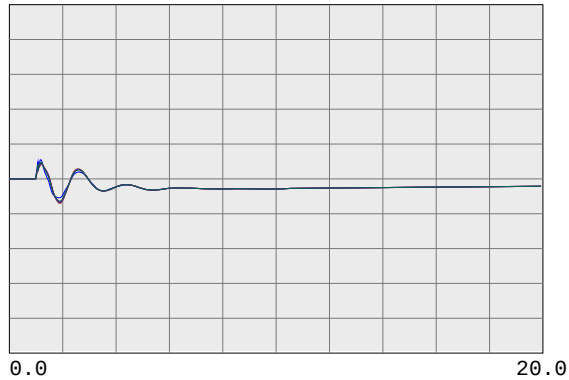
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



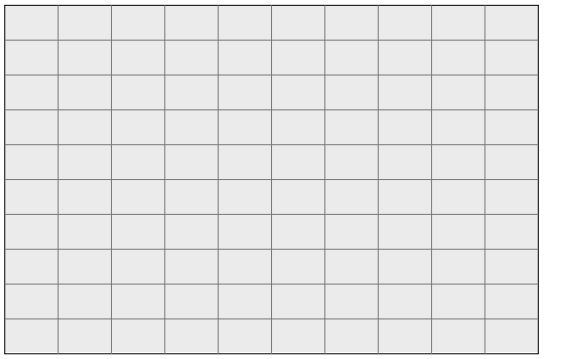
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

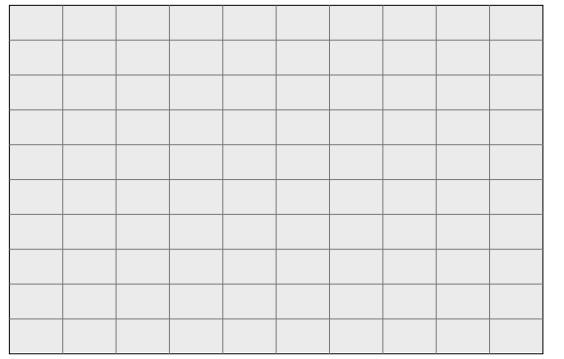


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



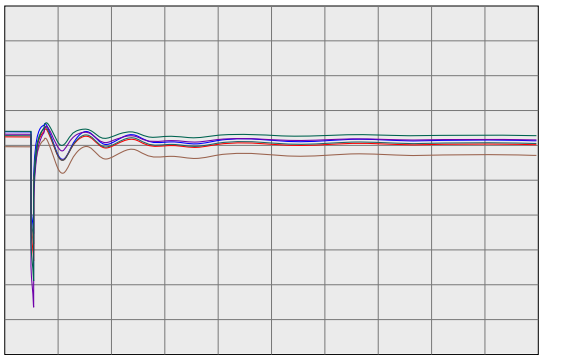
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



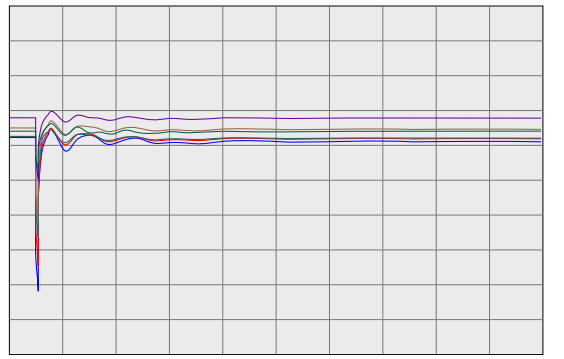


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

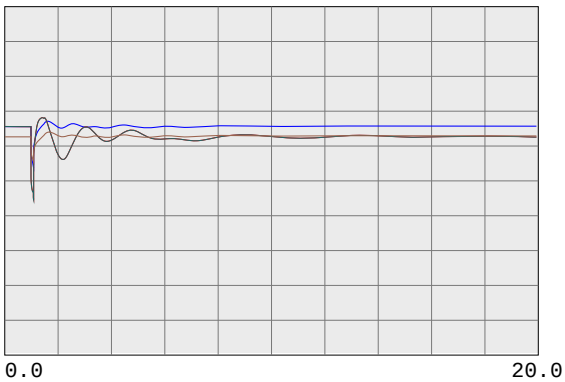
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



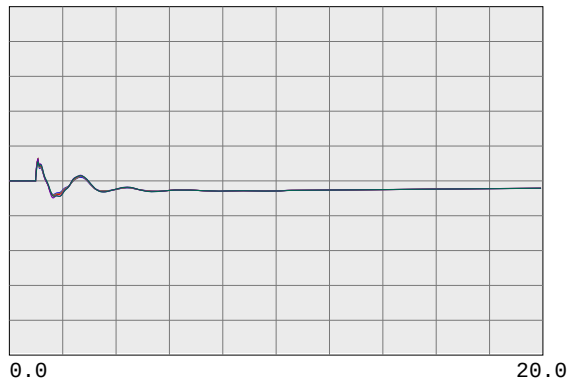
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



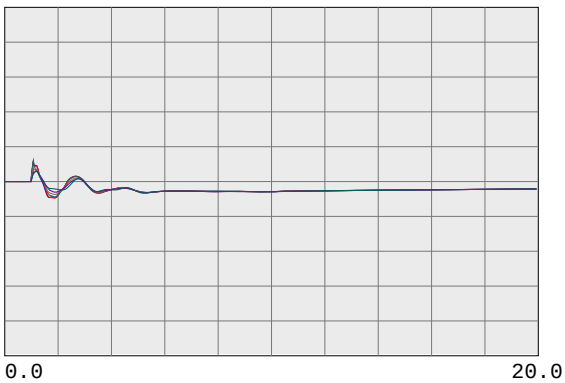
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



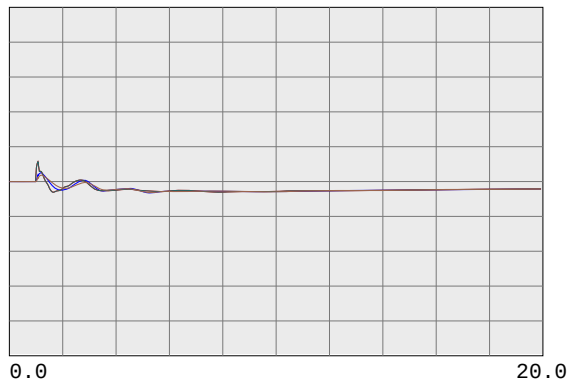
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



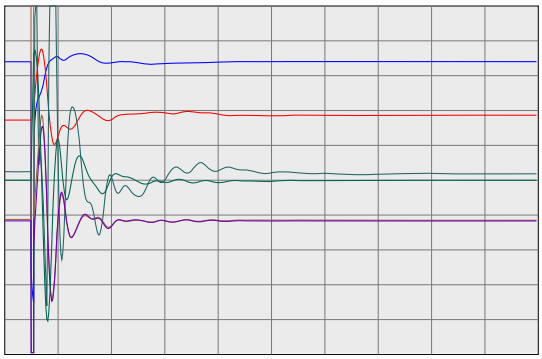
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



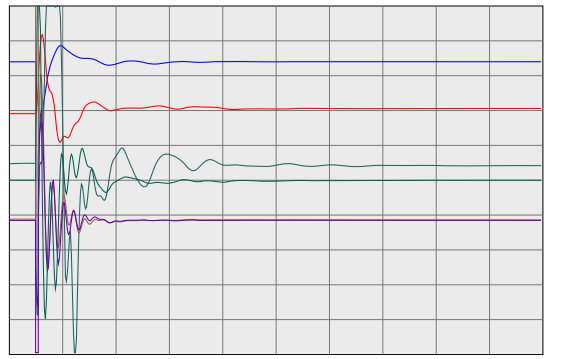
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

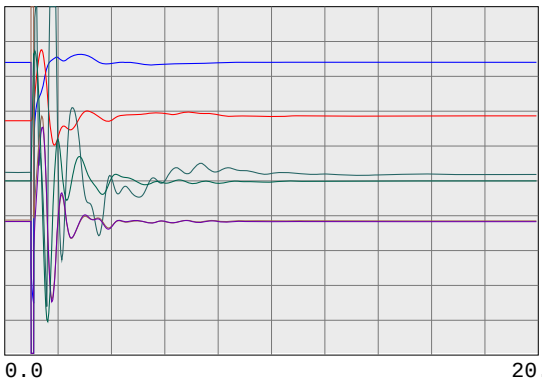
WILLOW PASS GENERATION PLANT



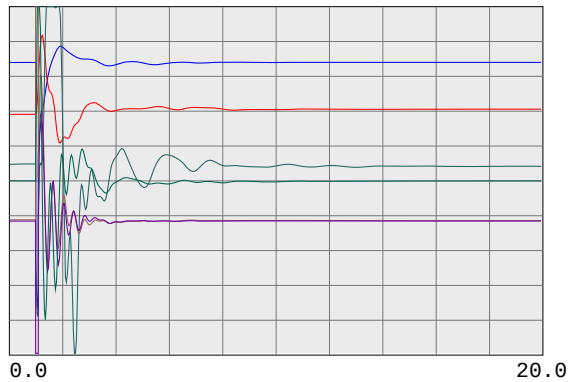
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



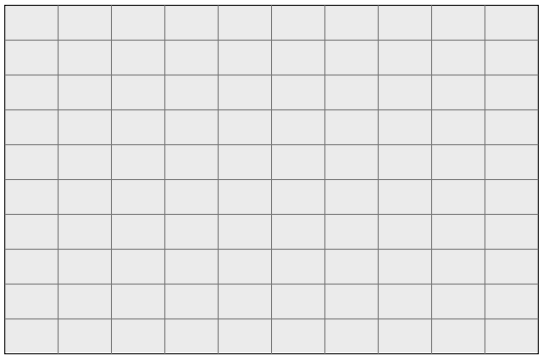
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

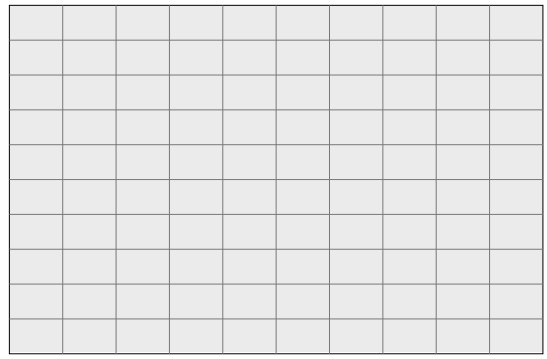


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



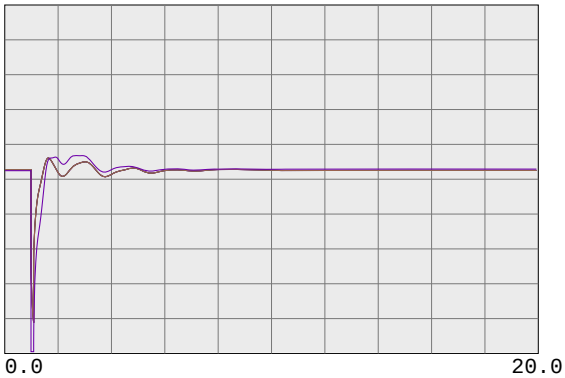
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



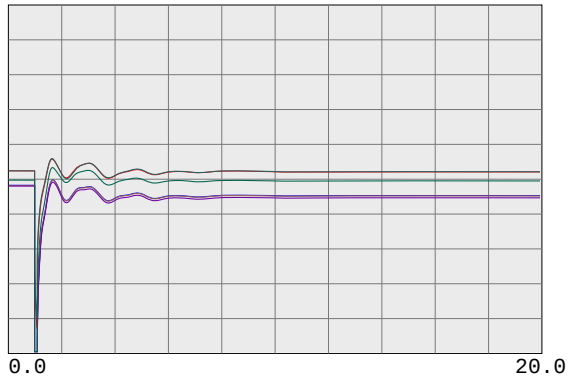


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

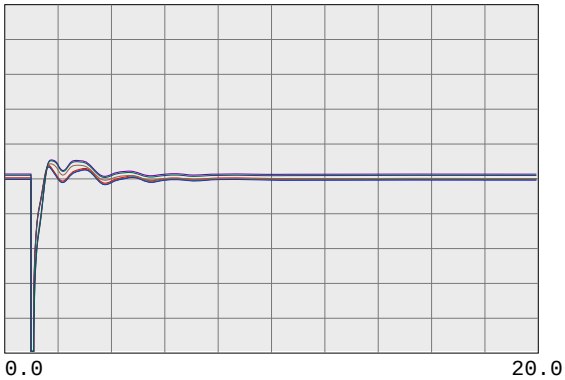
230-KV SYSTEM VOLTAGES



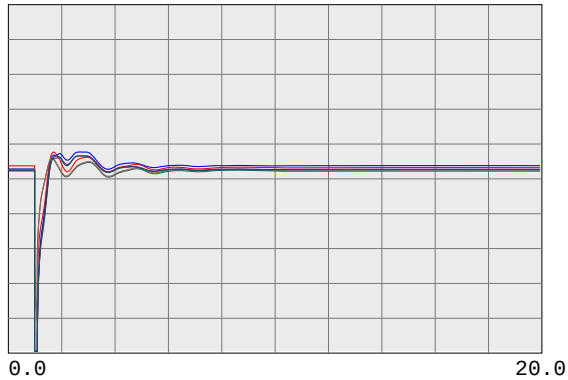
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



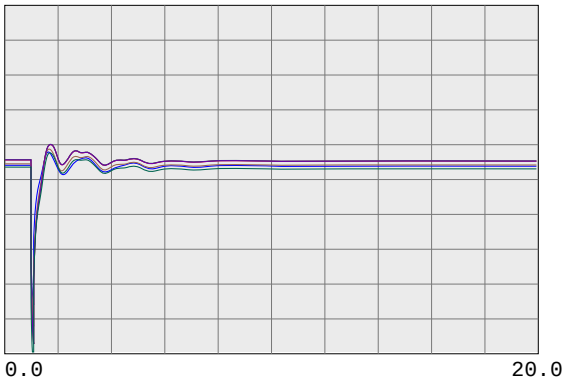
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



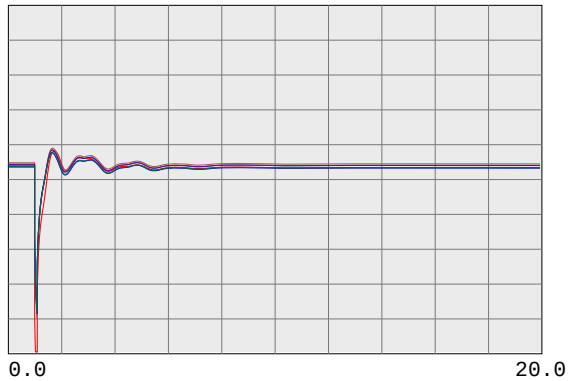
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



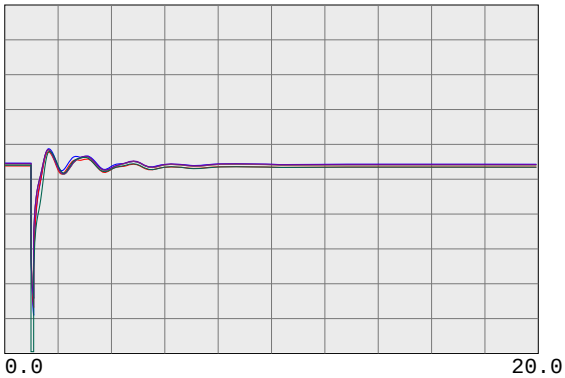
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



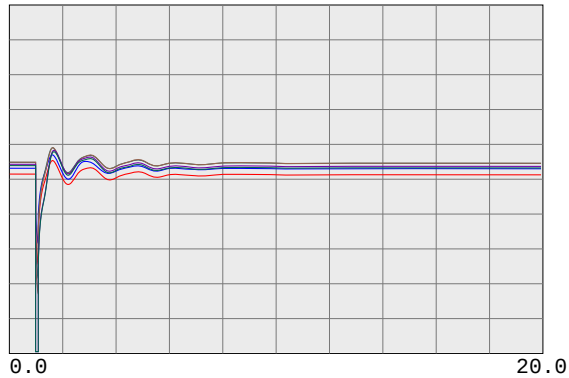
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

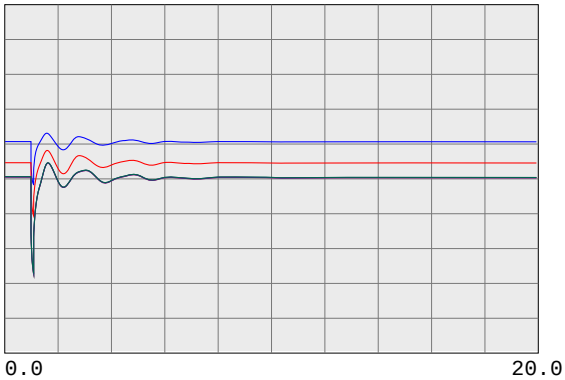
230-KV SYSTEM VOLTAGES



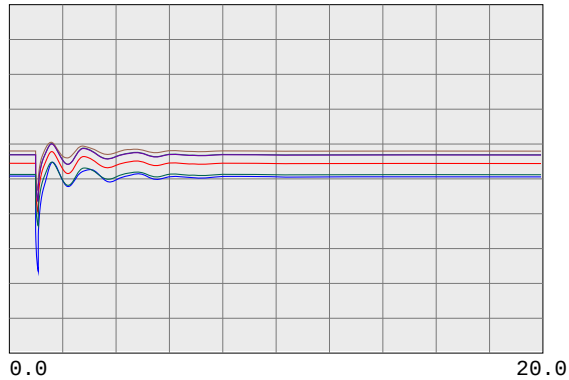
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



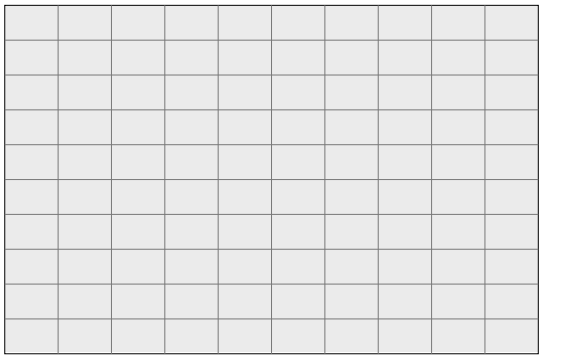
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

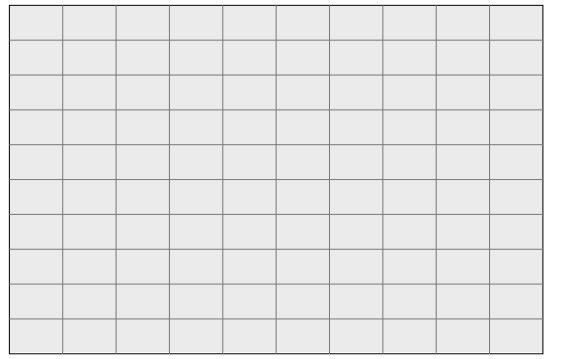


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



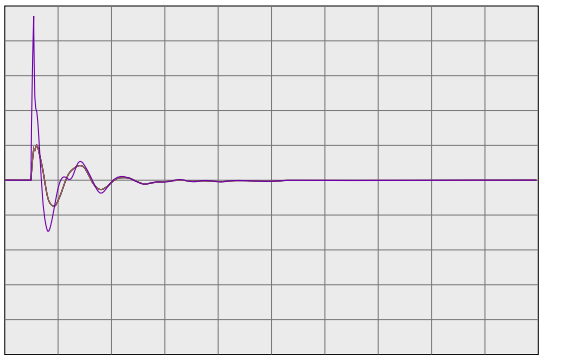
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



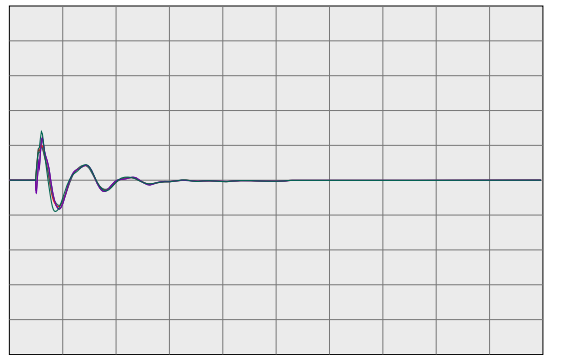


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

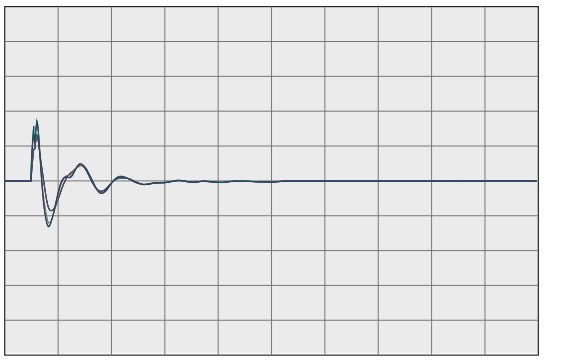
230-KV SYSTEM FREQUENCIES



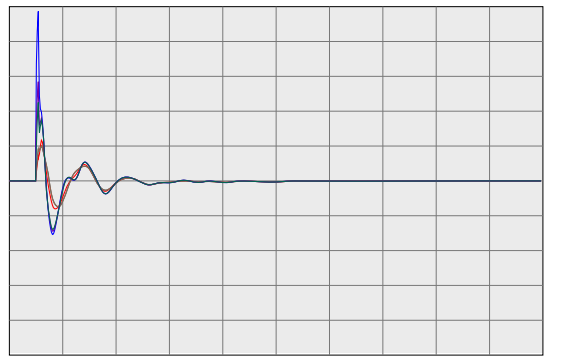
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



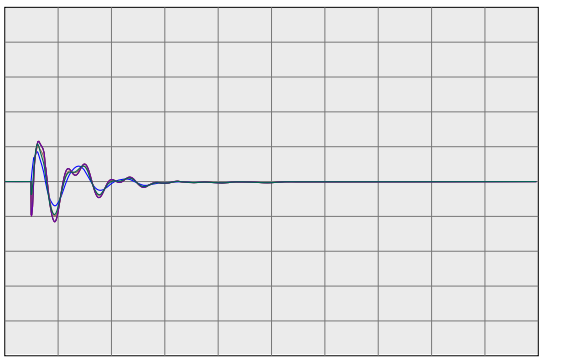
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



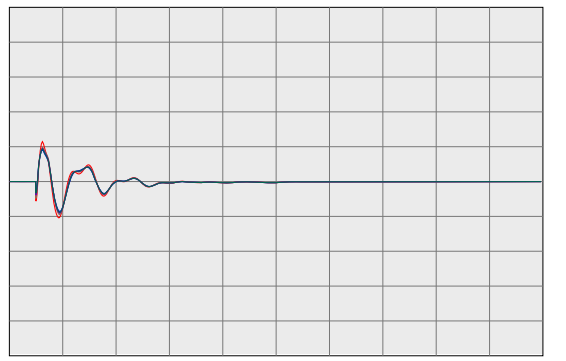
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



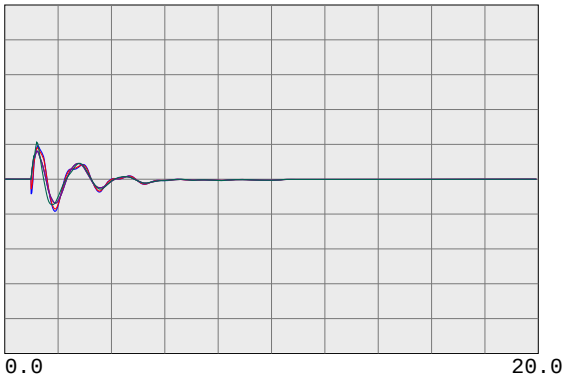
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



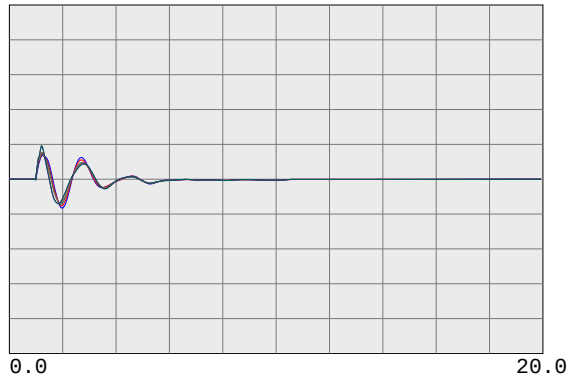
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

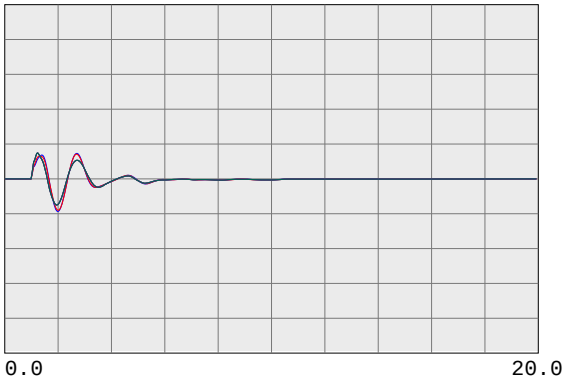
230-KV SYSTEM FREQUENCIES



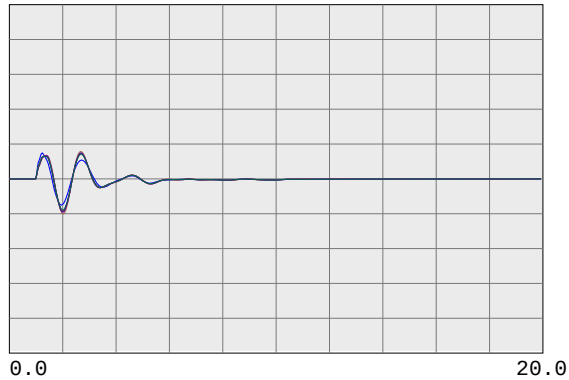
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



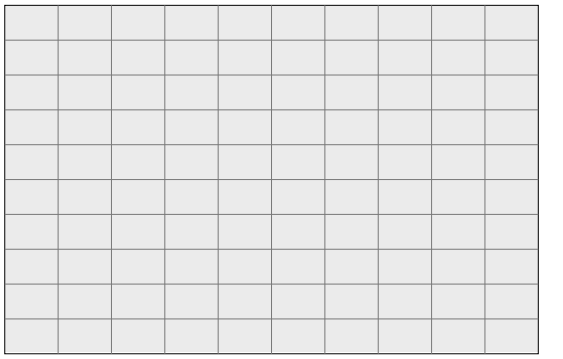
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

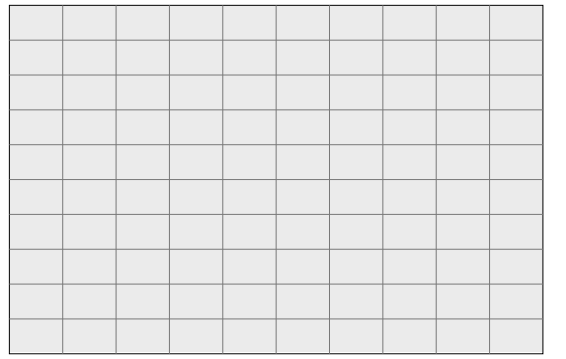


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



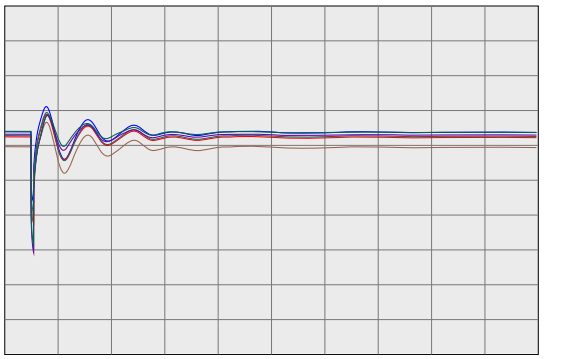
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



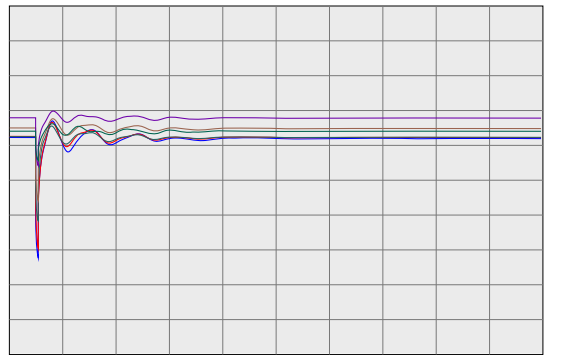


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

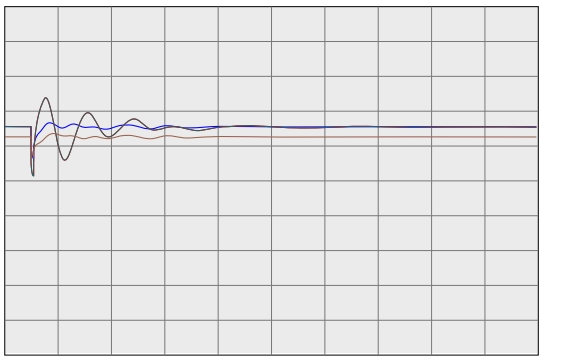
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



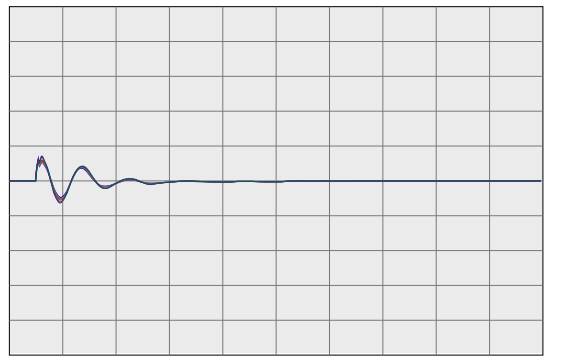
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



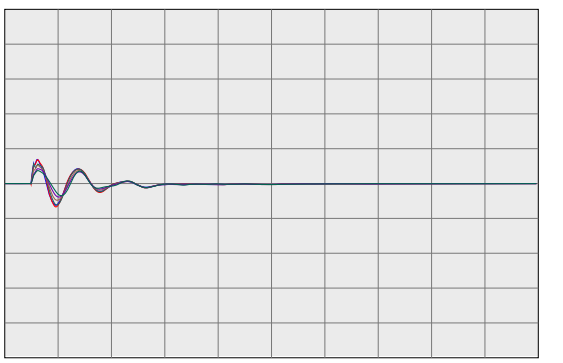
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



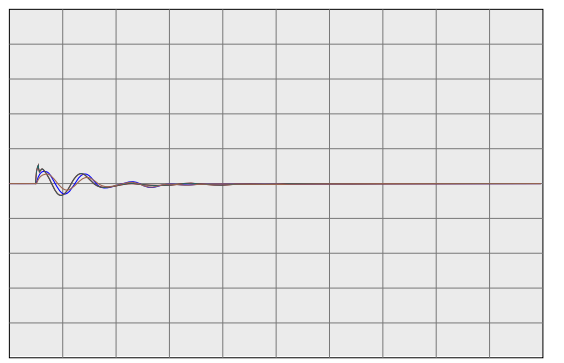
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



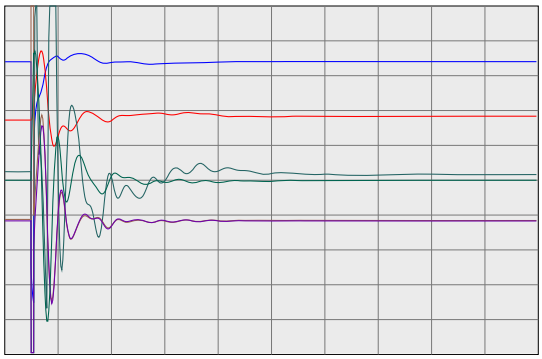
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



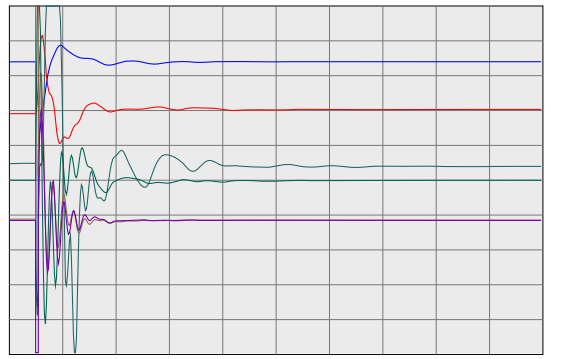
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

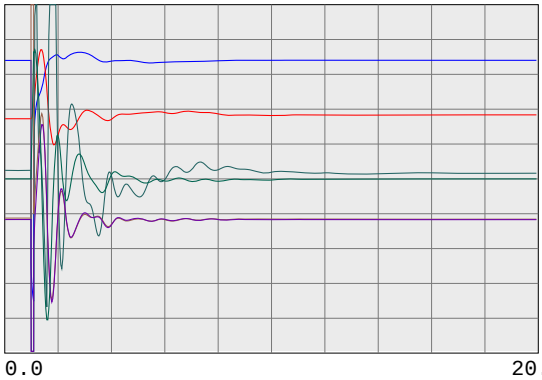
WILLOW PASS GENERATION PLANT



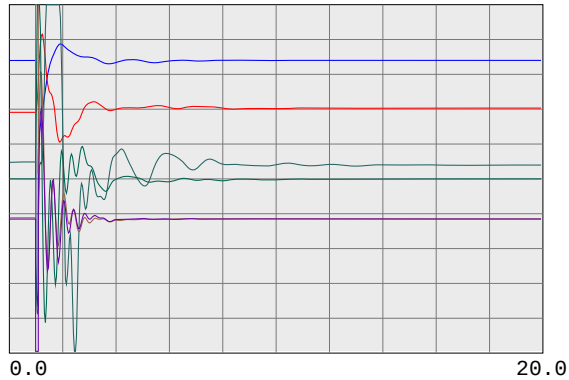
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



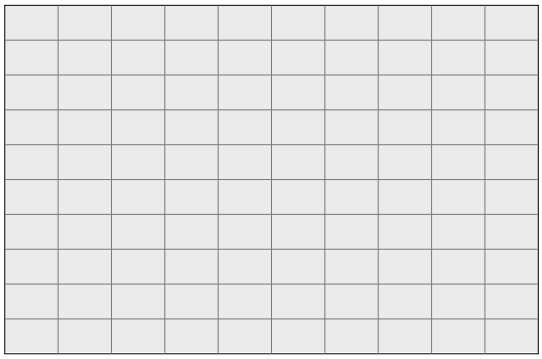
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

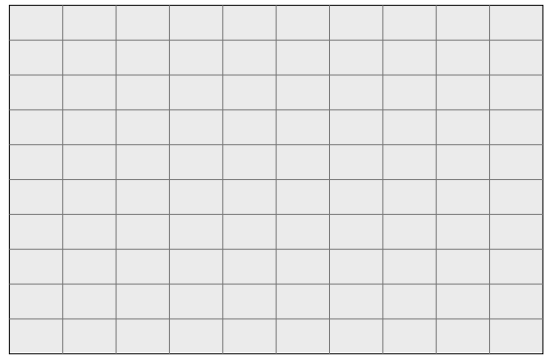


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



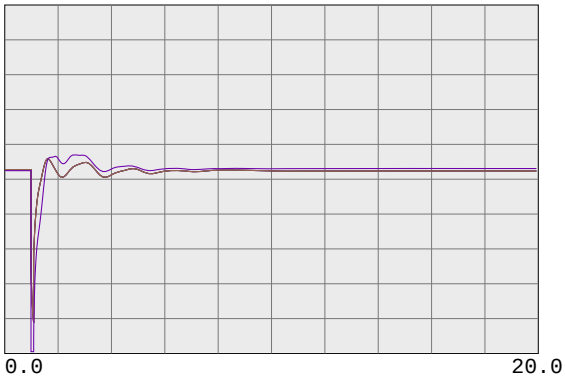
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



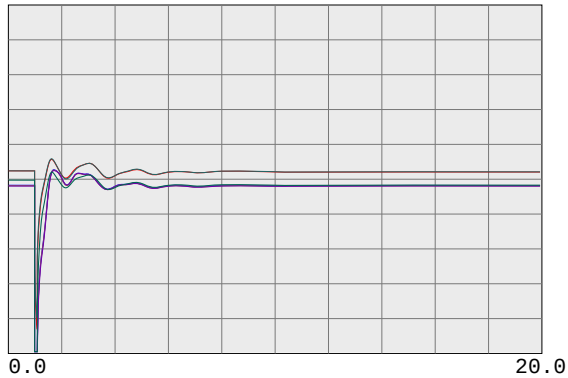


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

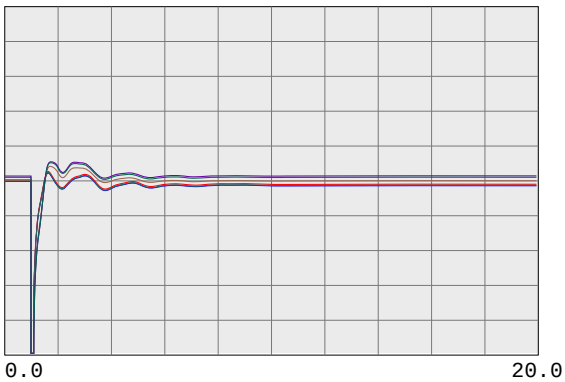
230-KV SYSTEM VOLTAGES



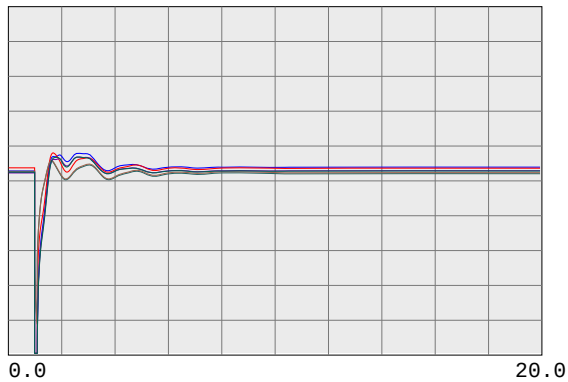
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



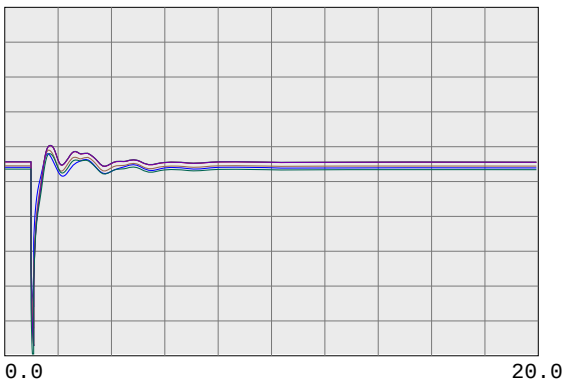
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



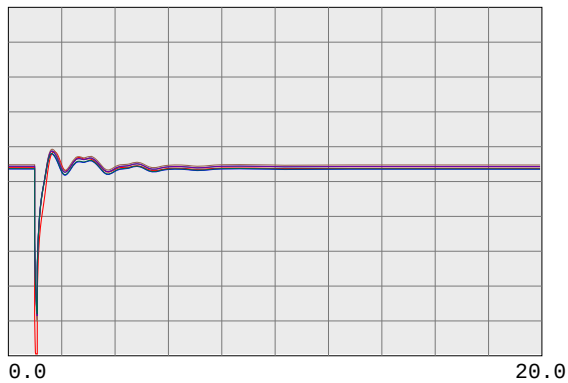
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



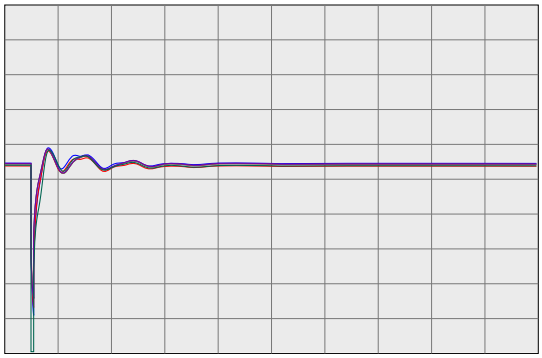
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

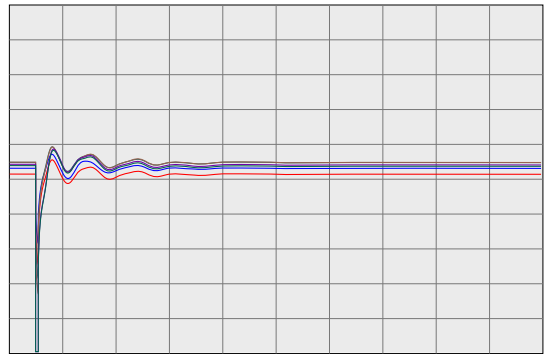
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

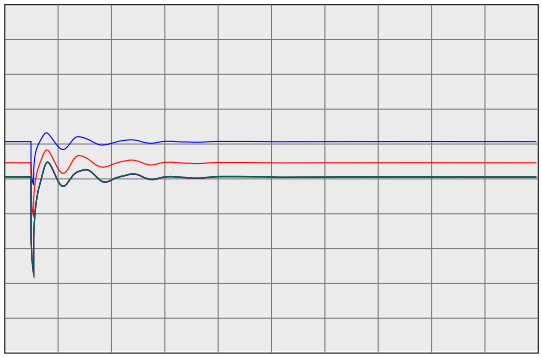
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

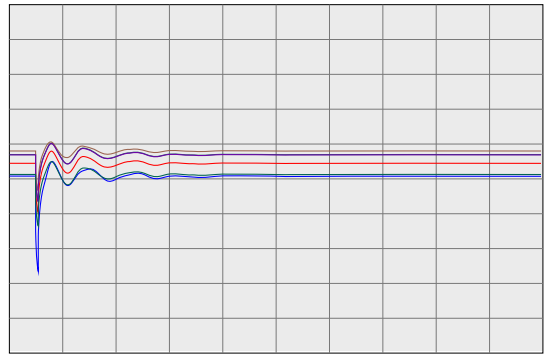
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

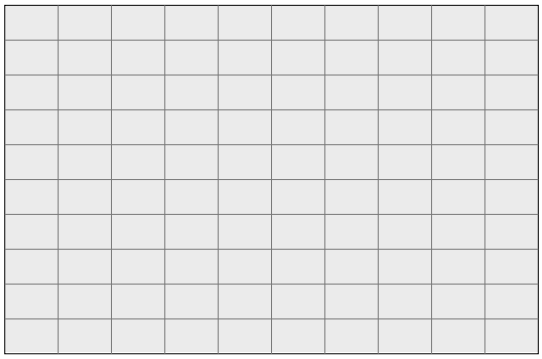
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

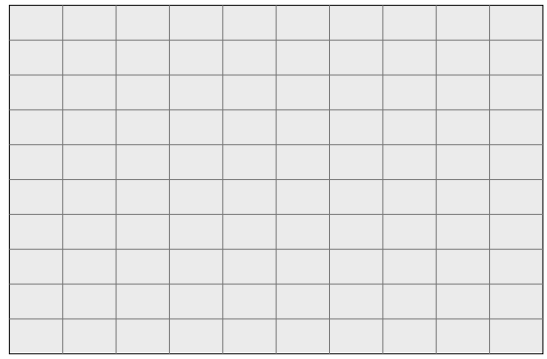


0.0 20.0

Time(sec)

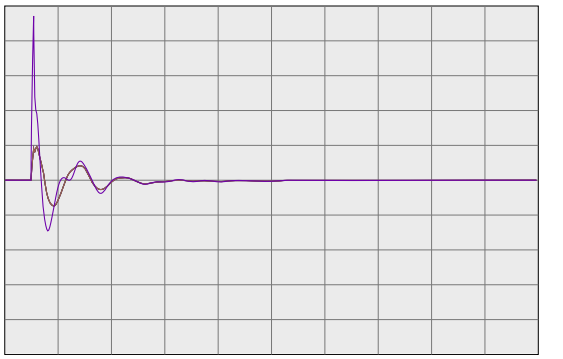
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



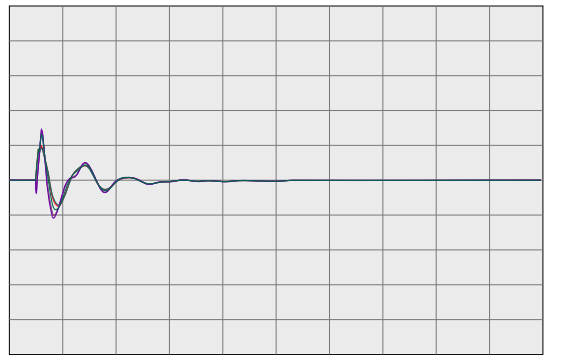


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

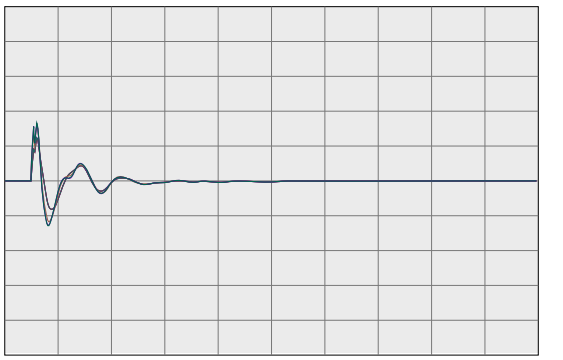
230-KV SYSTEM FREQUENCIES



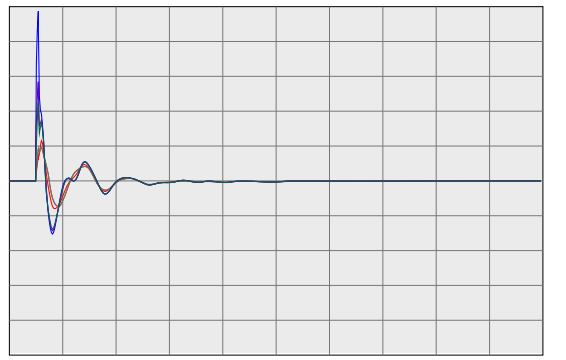
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



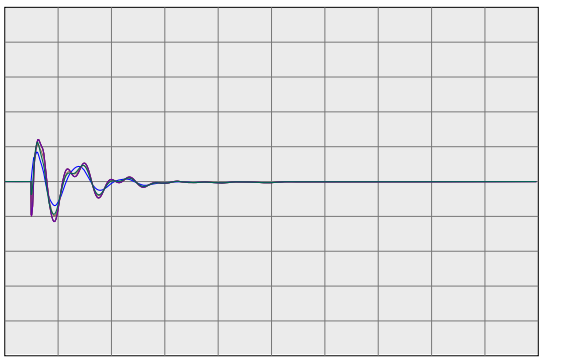
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



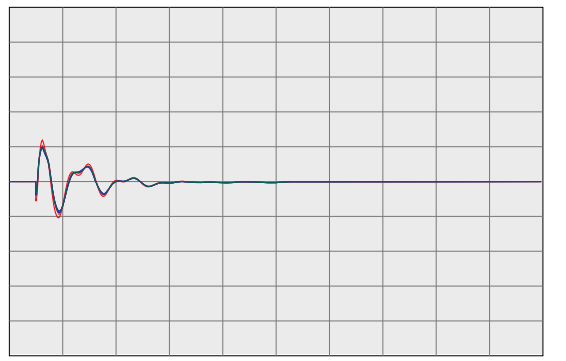
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



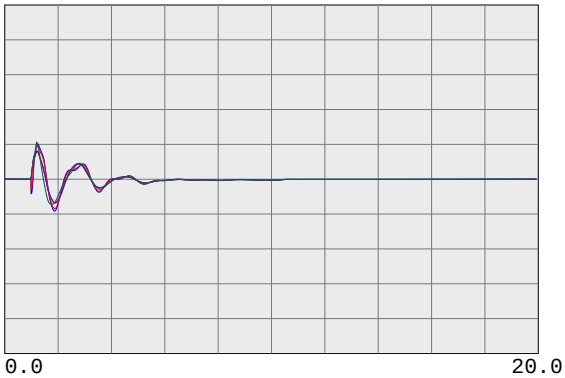
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



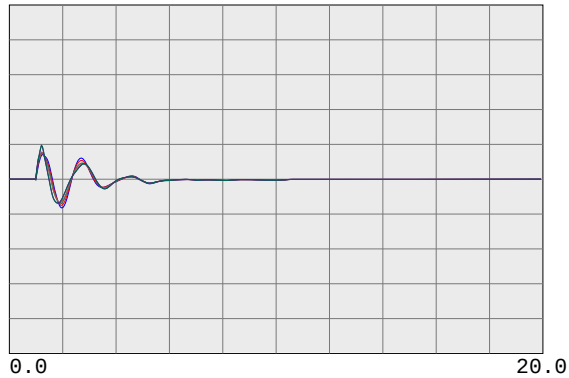
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

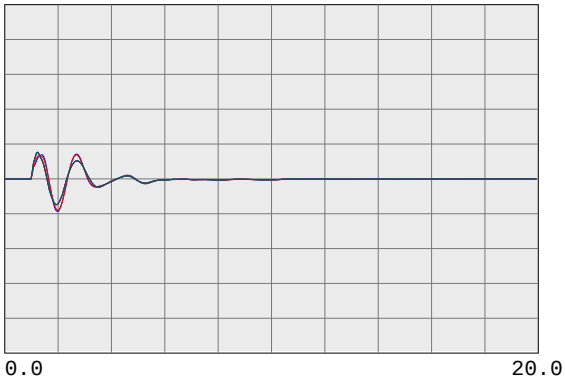
230-KV SYSTEM FREQUENCIES



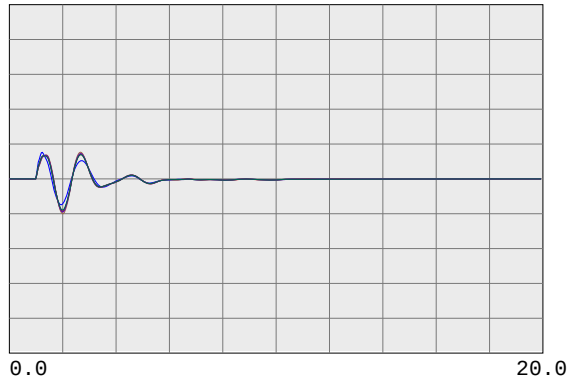
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



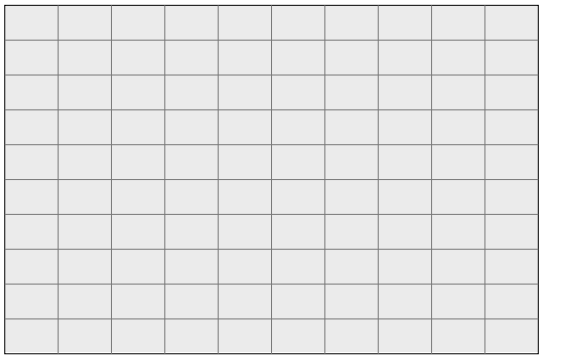
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

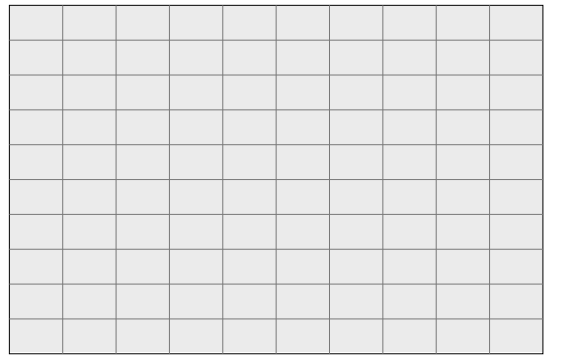


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



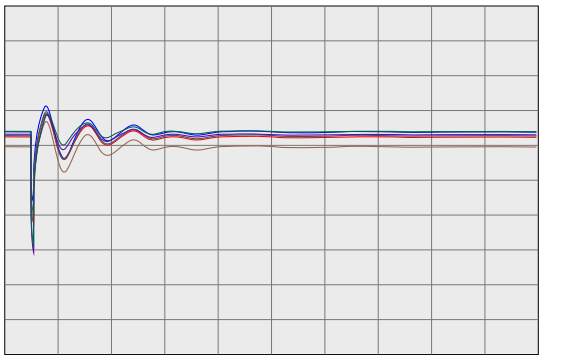
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



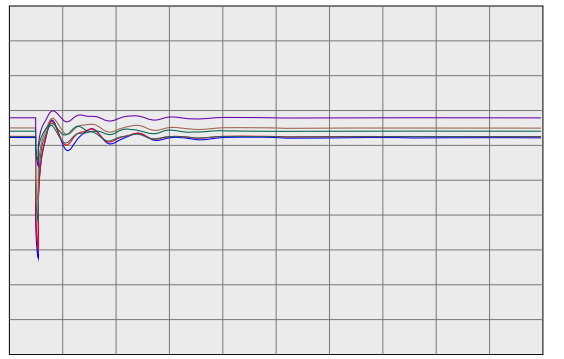


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

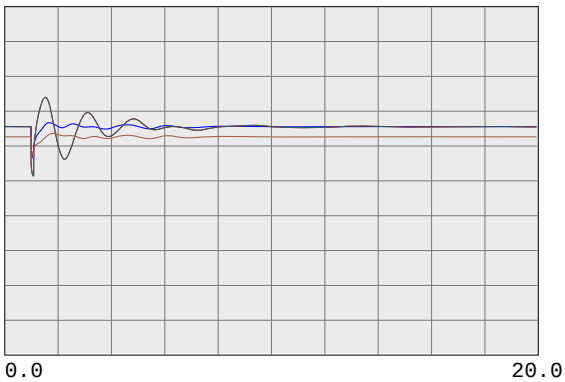
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



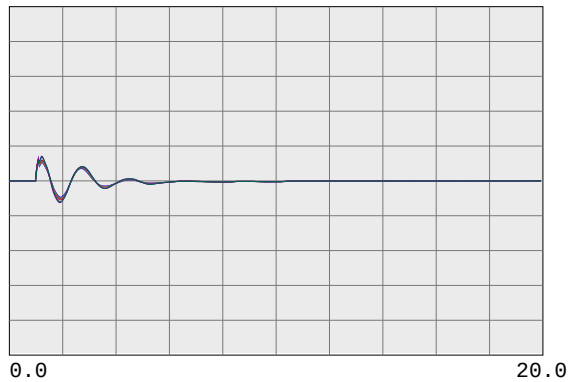
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



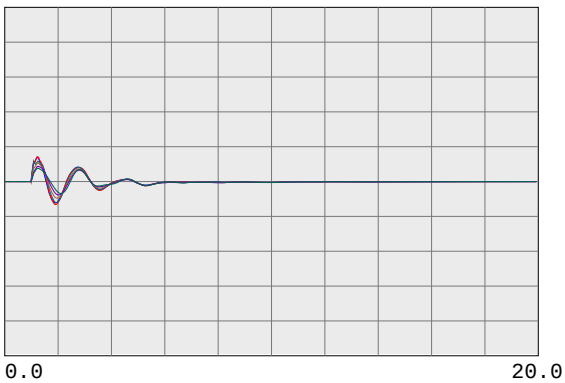
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



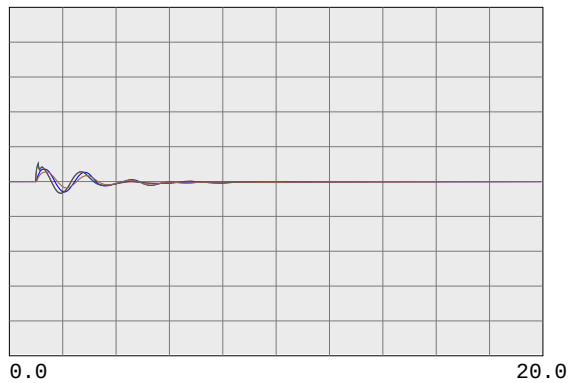
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



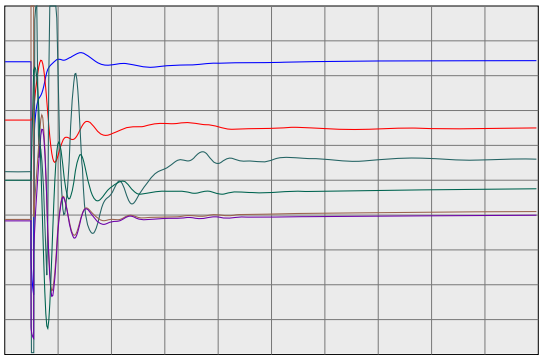
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



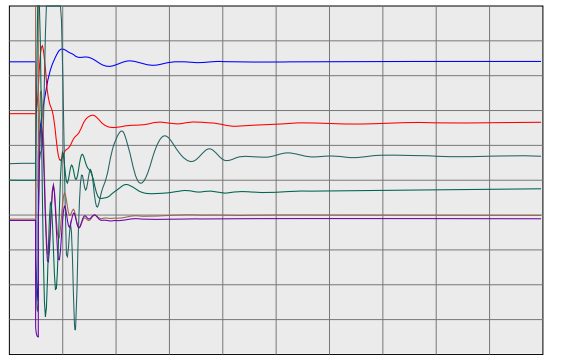
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

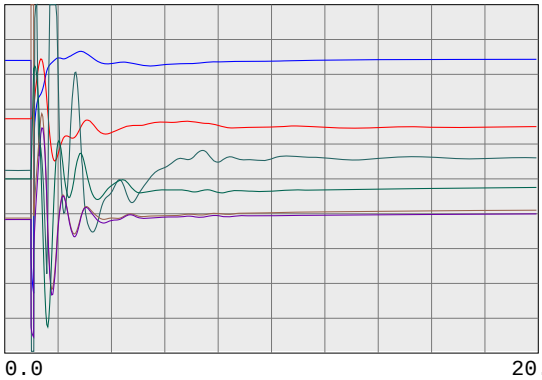
WILLOW PASS GENERATION PLANT



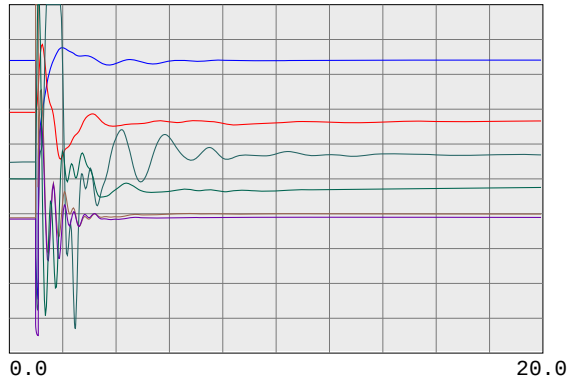
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



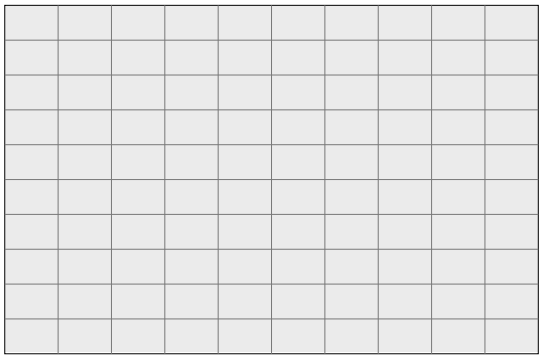
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

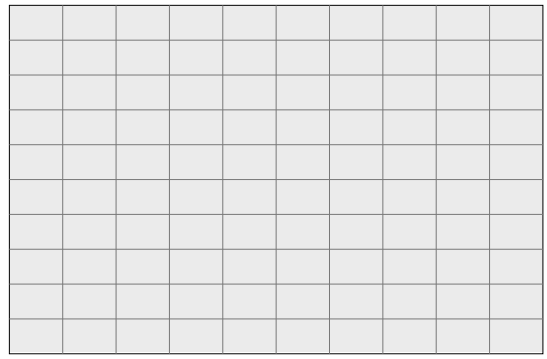


0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



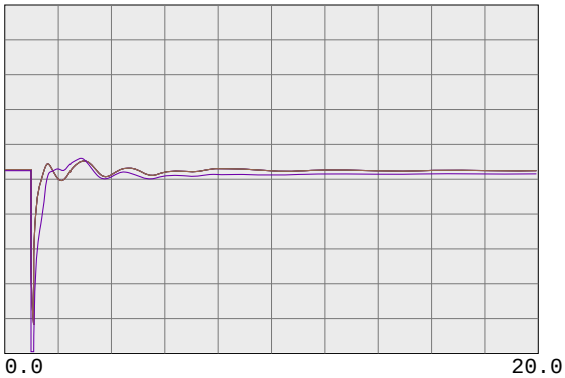
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



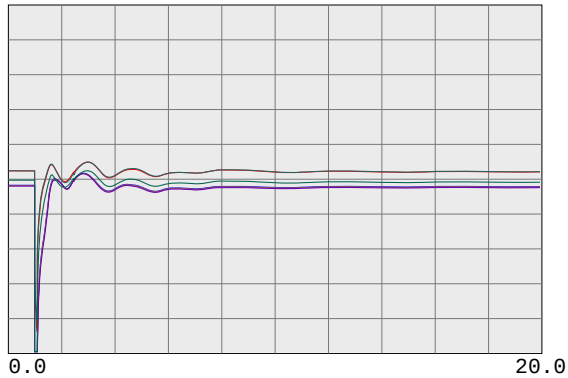


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

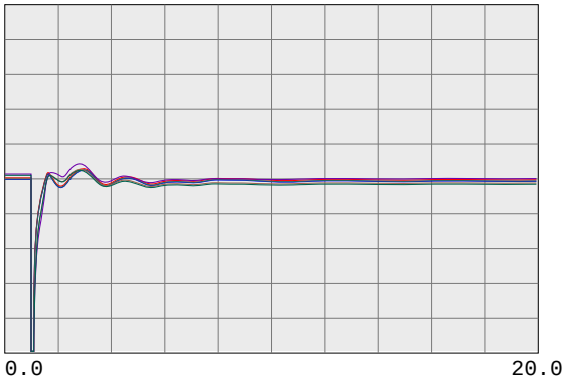
230-KV SYSTEM VOLTAGES



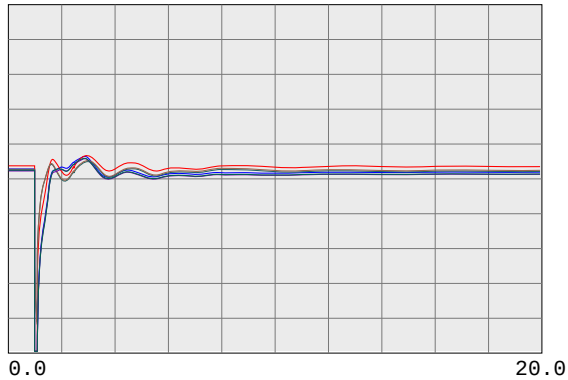
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



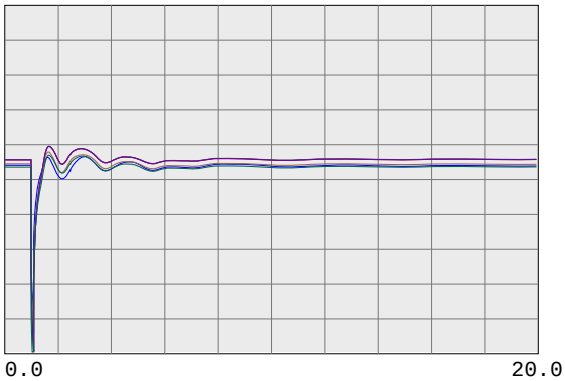
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



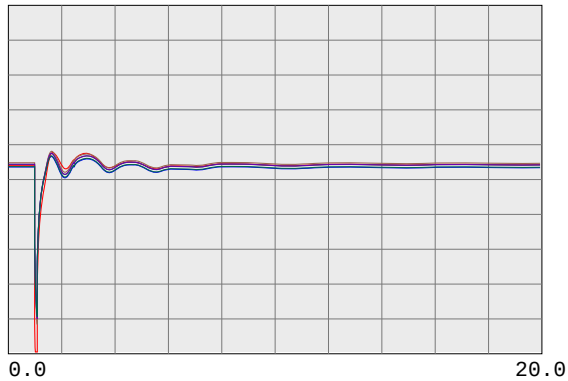
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



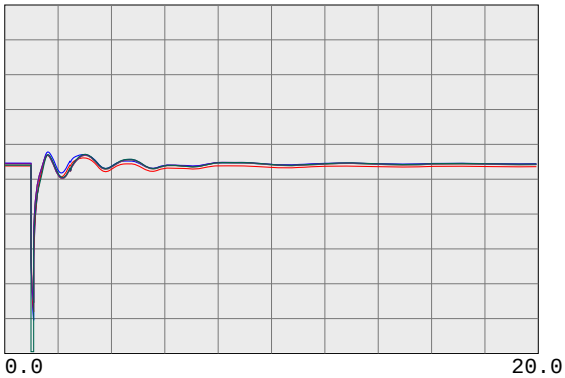
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



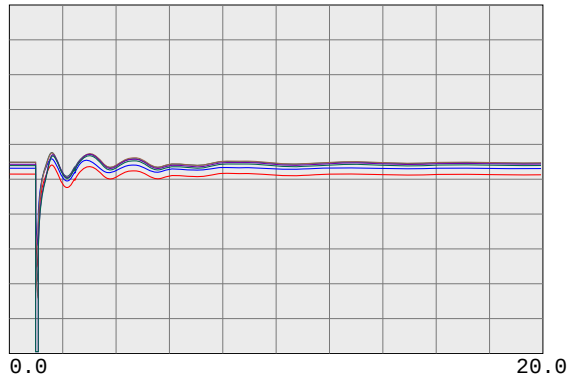
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

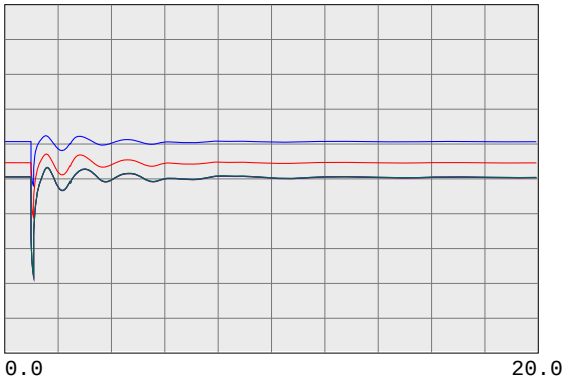
230-KV SYSTEM VOLTAGES



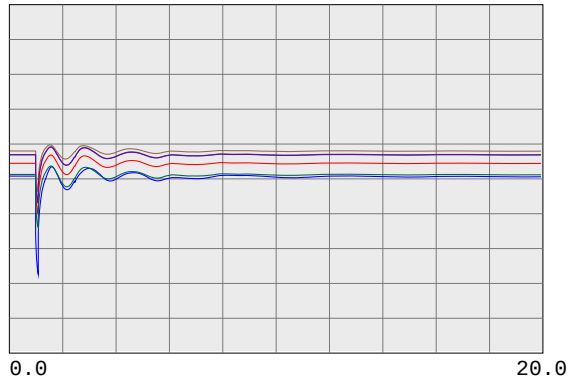
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



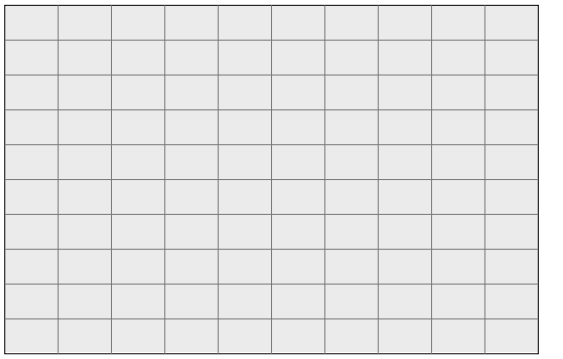
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

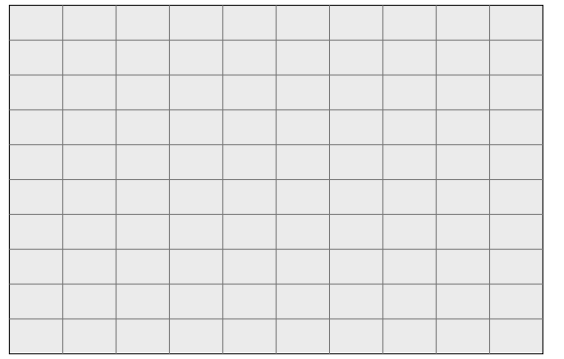


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



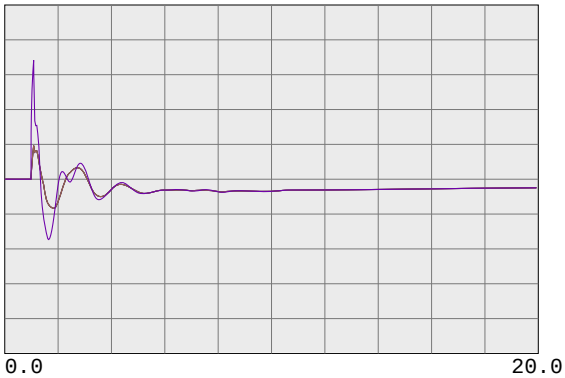
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



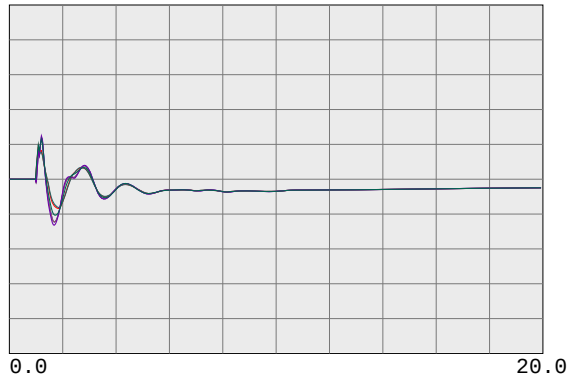


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

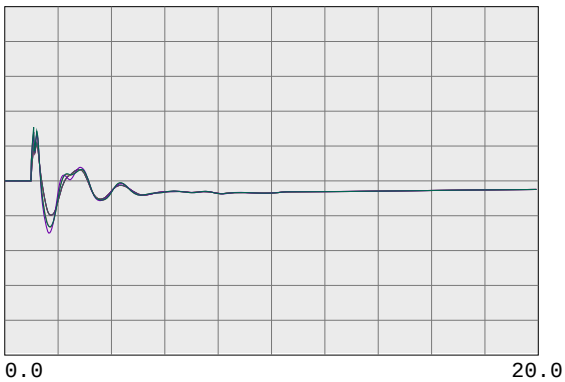
230-KV SYSTEM FREQUENCIES



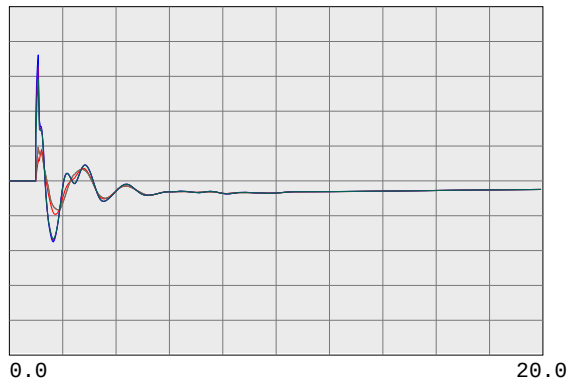
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



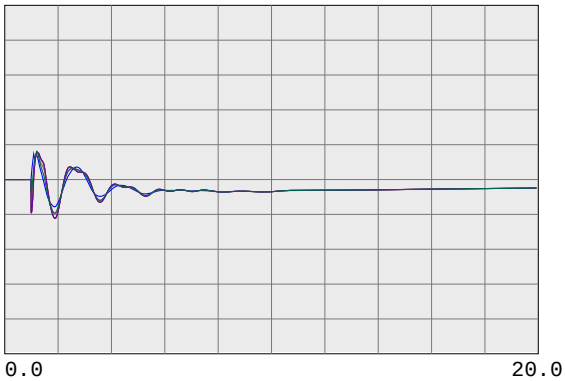
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



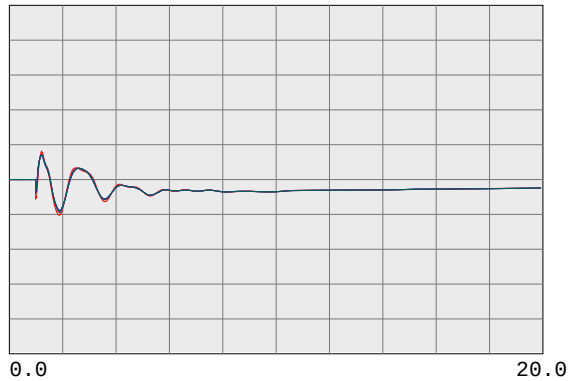
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



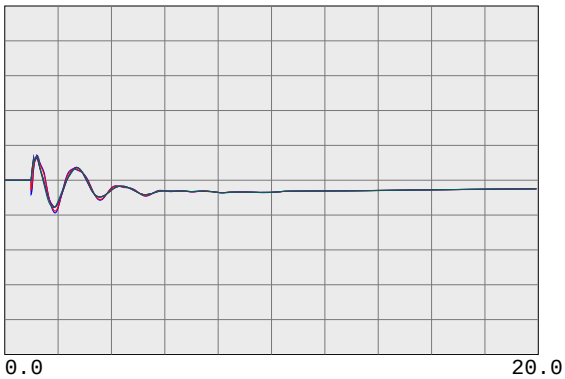
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



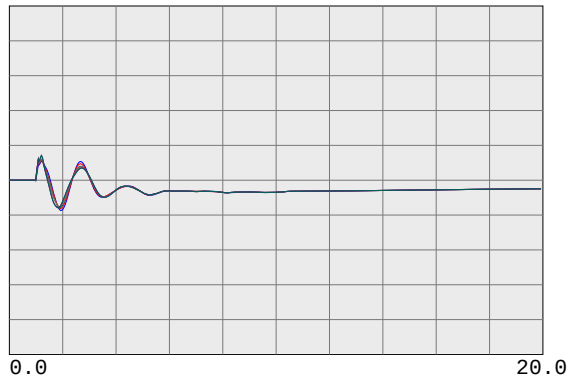
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

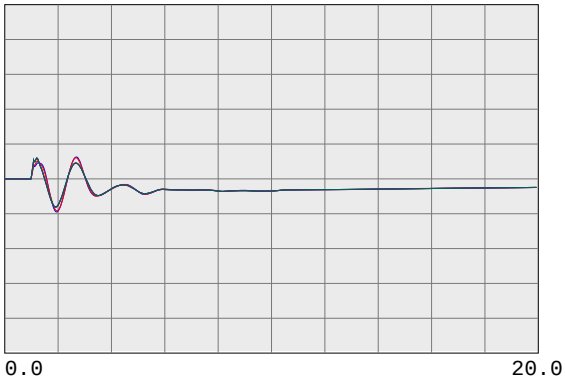
230-KV SYSTEM FREQUENCIES



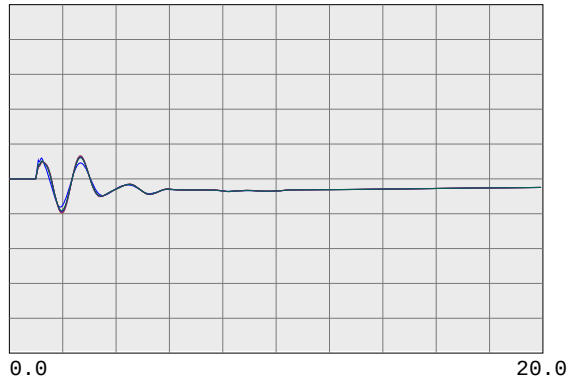
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



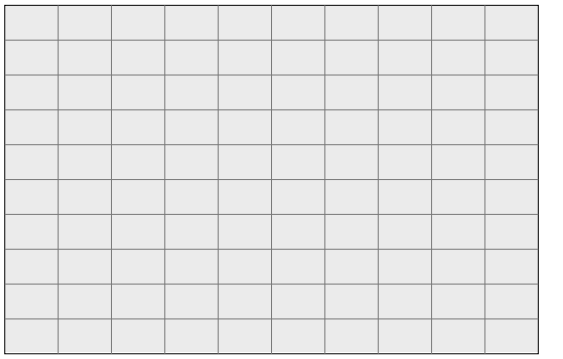
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

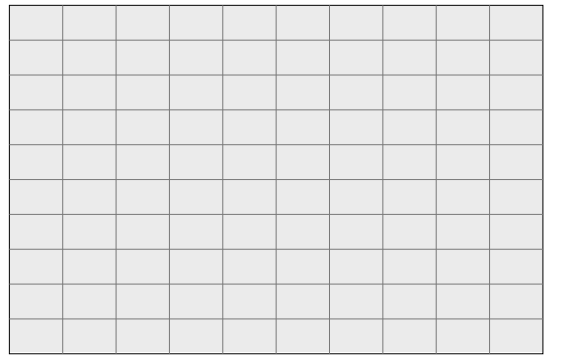


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



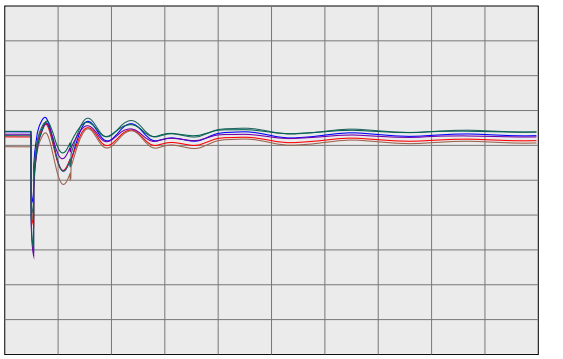
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



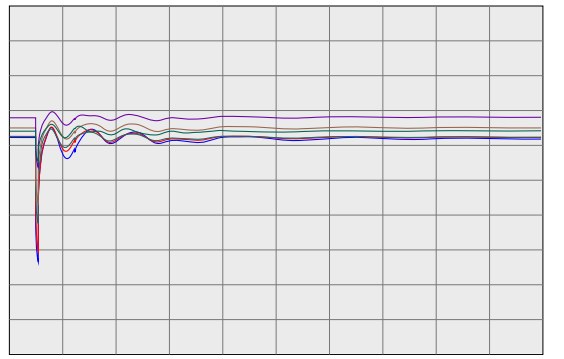


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

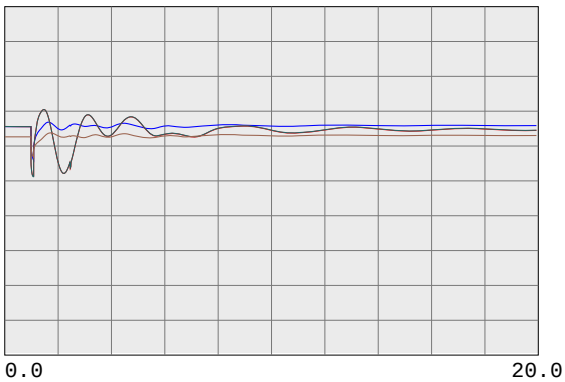
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



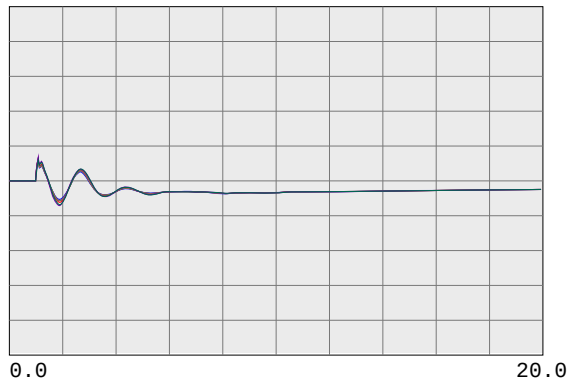
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



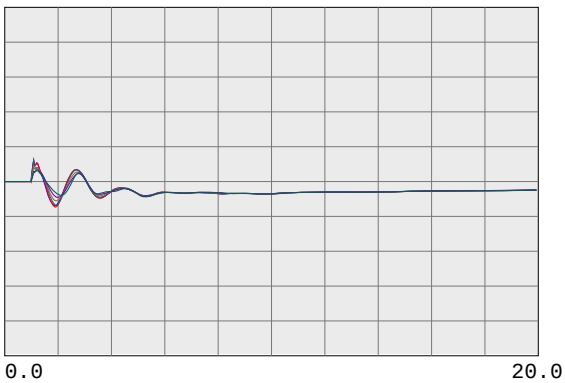
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



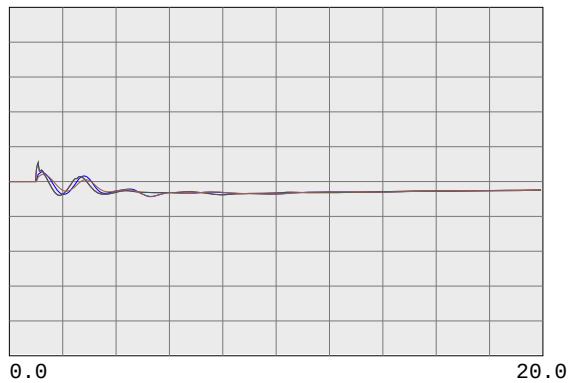
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



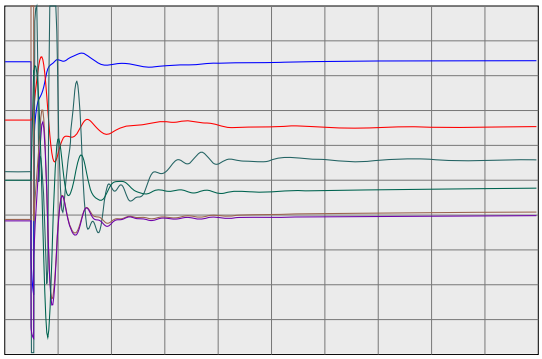
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



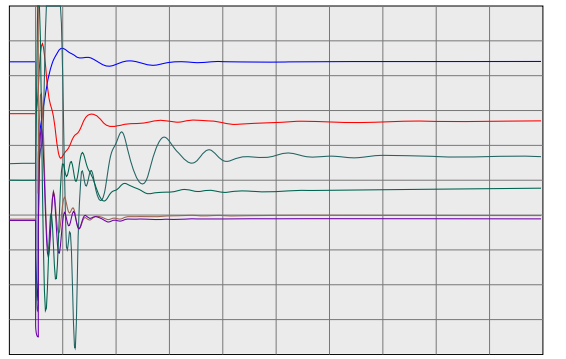
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

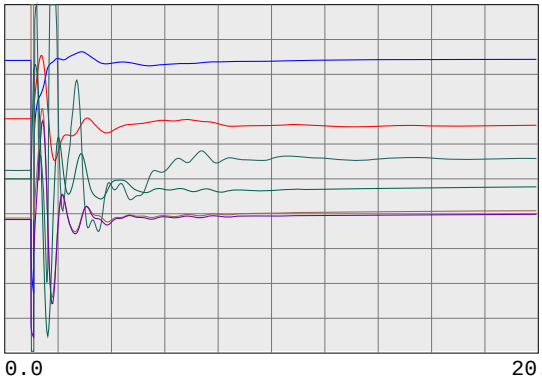
WILLOW PASS GENERATION PLANT



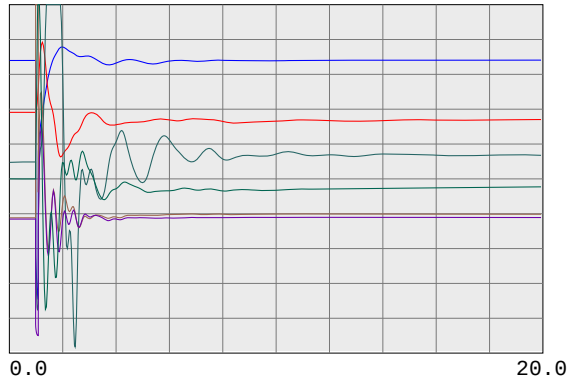
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



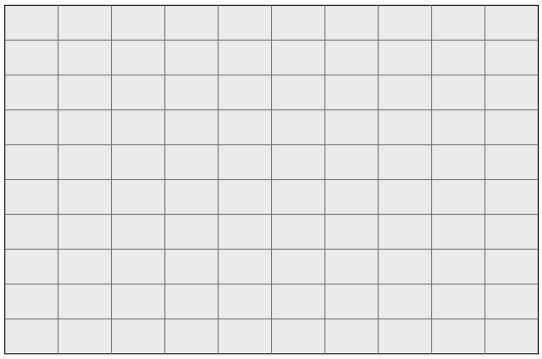
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

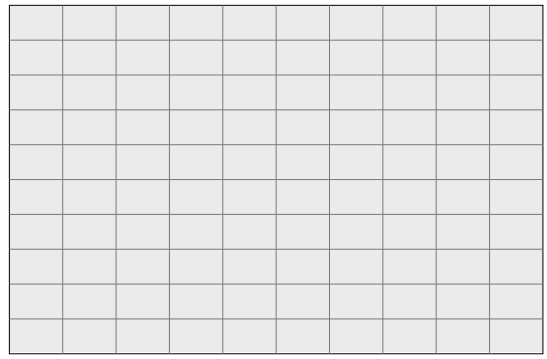


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



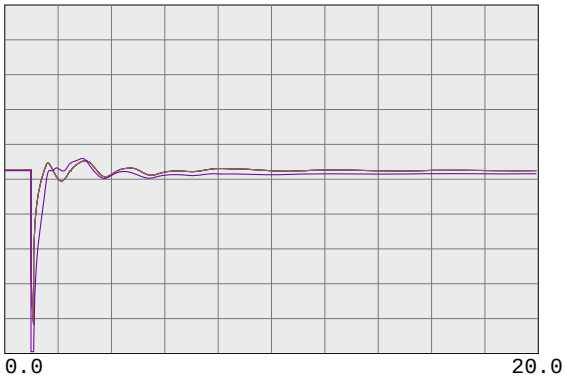
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



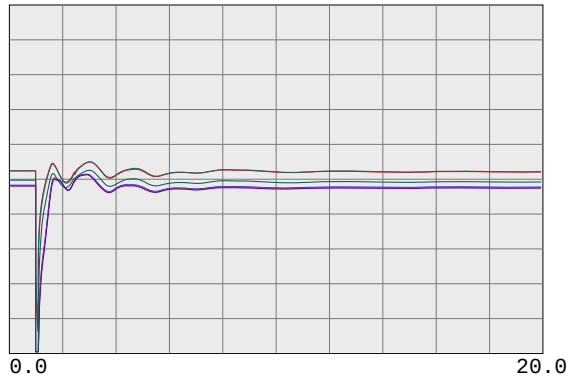


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

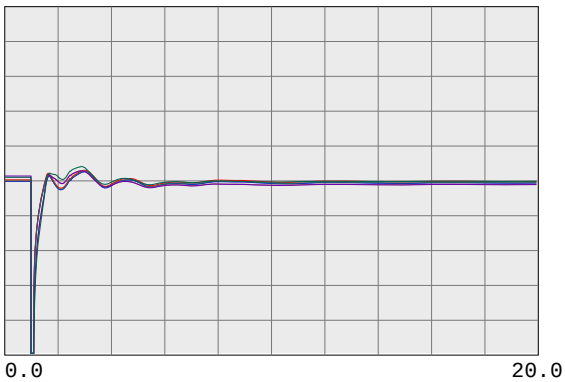
230-KV SYSTEM VOLTAGES



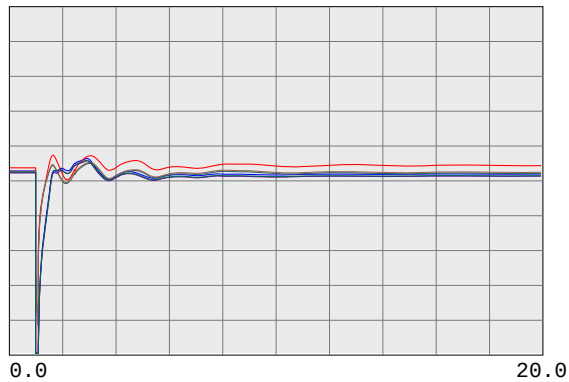
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



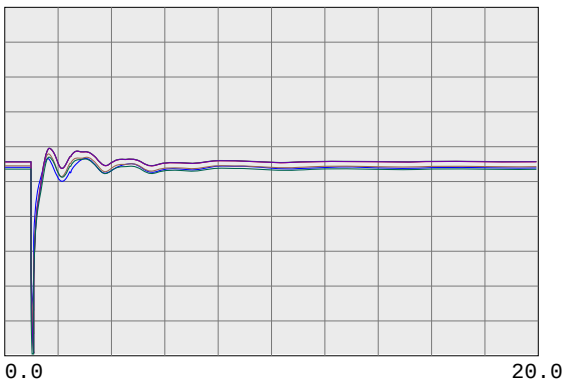
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



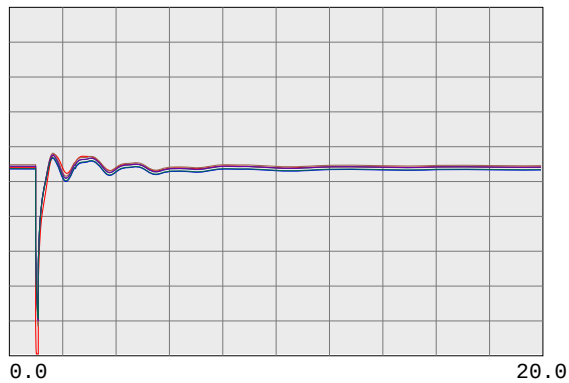
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



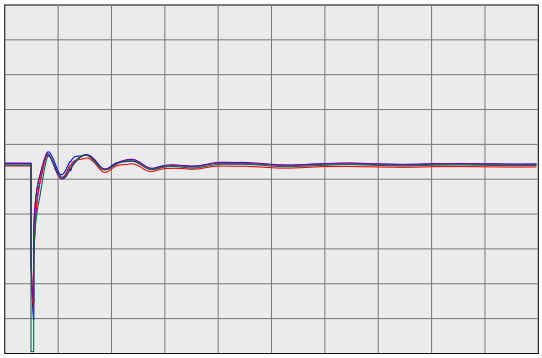
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



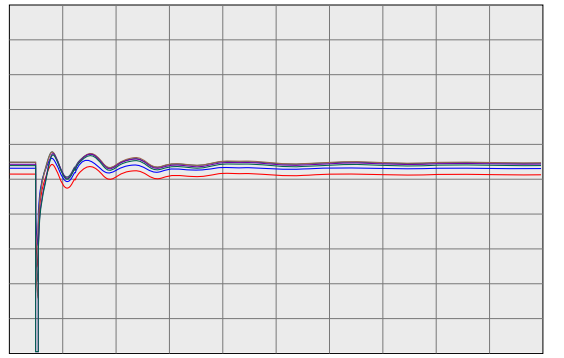
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

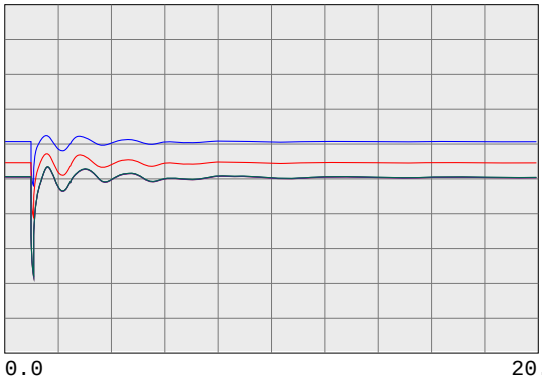
230-KV SYSTEM VOLTAGES



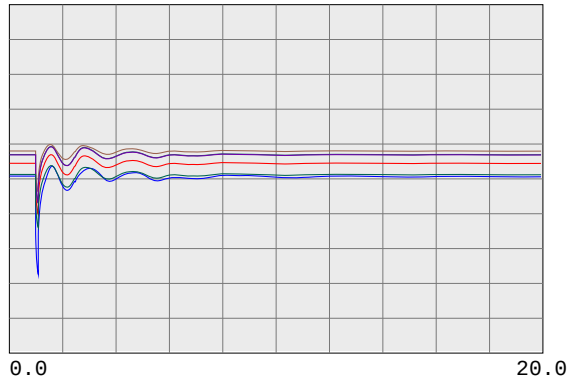
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



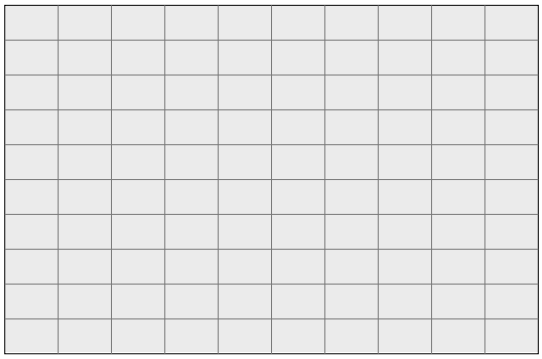
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

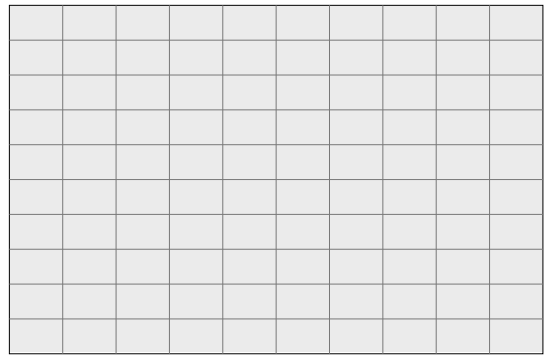


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



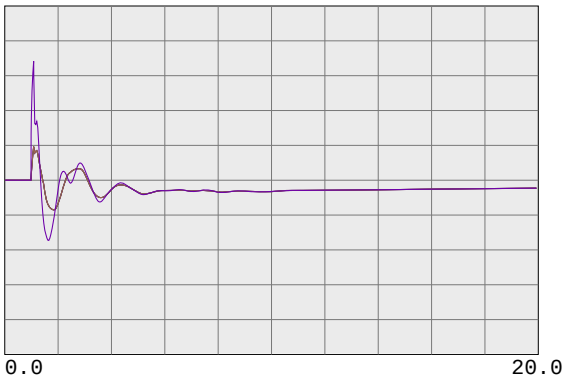
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



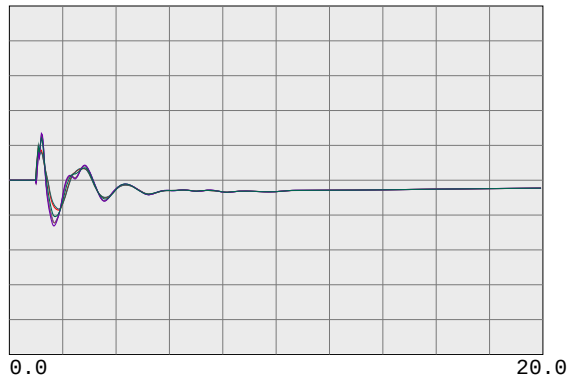


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

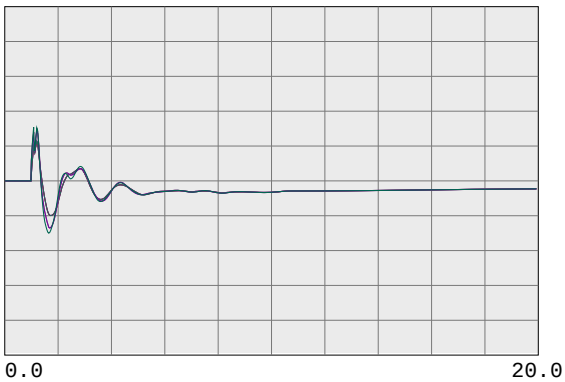
230-KV SYSTEM FREQUENCIES



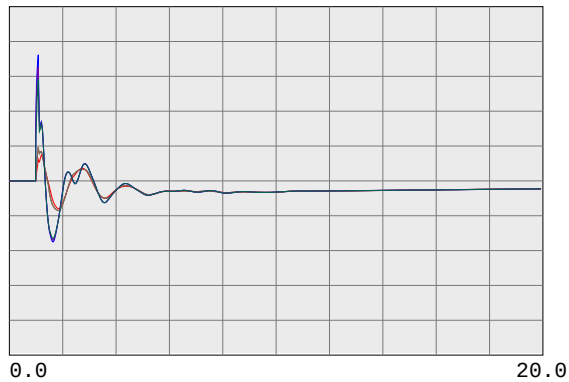
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



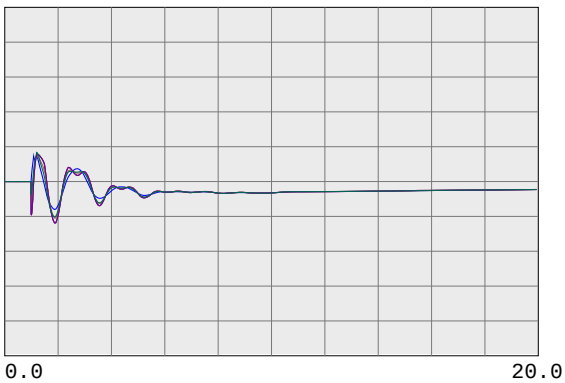
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



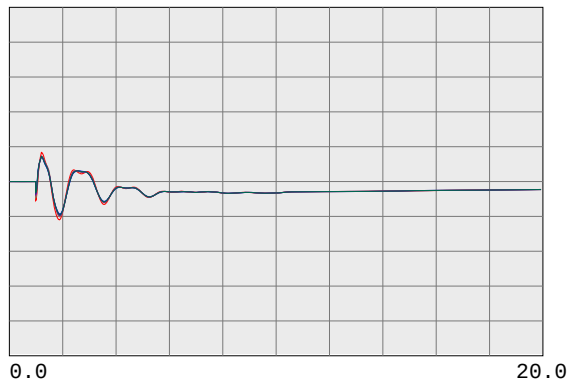
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



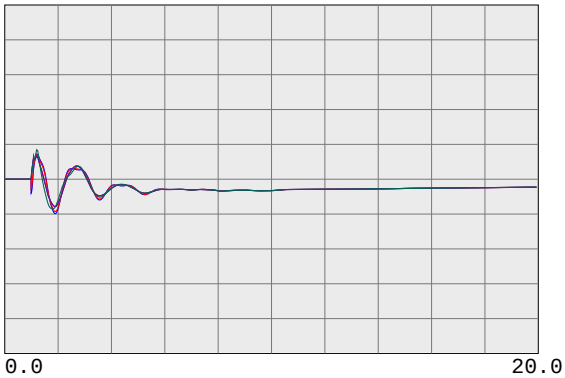
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



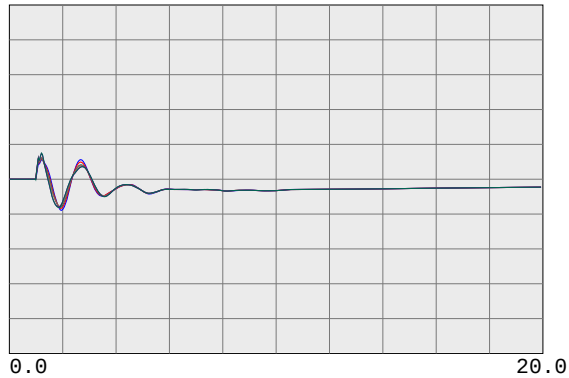
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

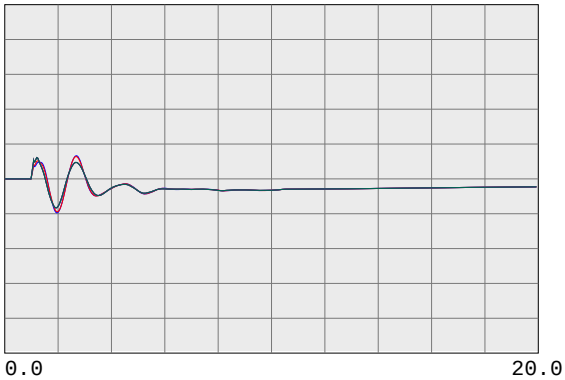
230-KV SYSTEM FREQUENCIES



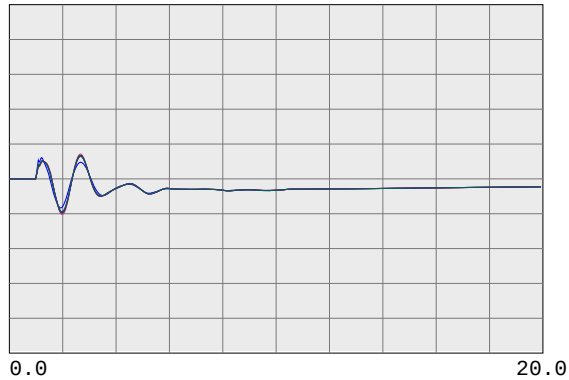
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



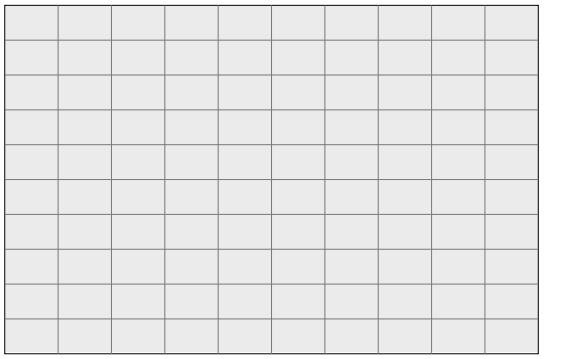
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

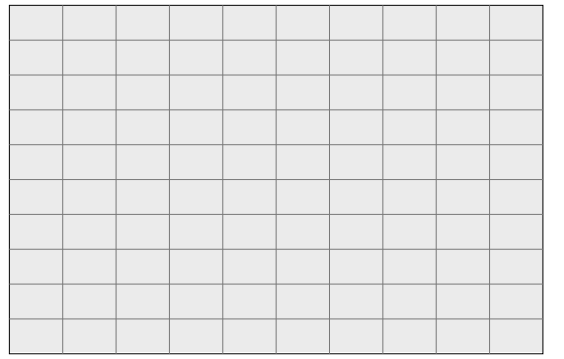


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



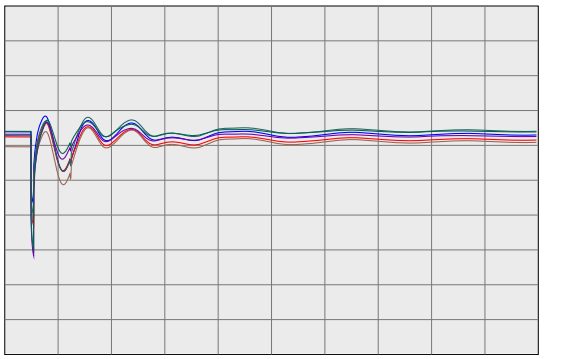
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



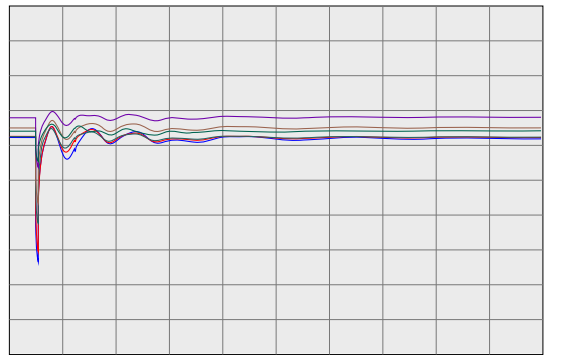


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

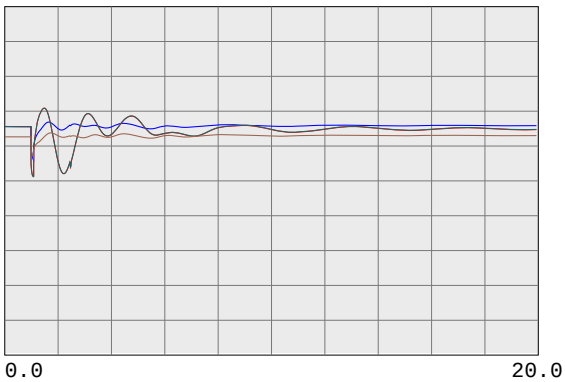
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



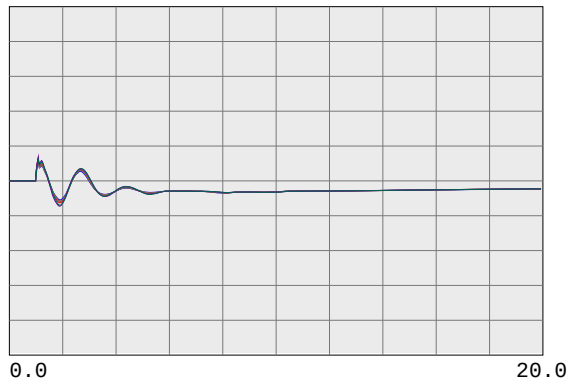
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



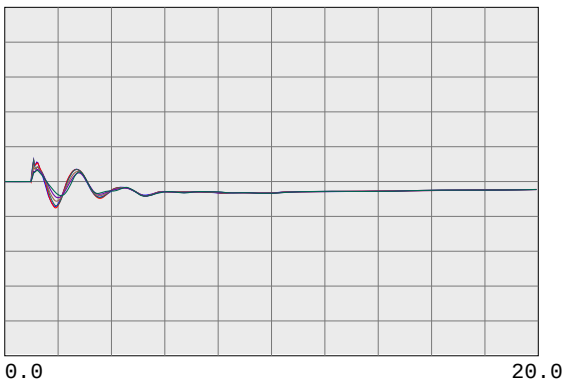
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



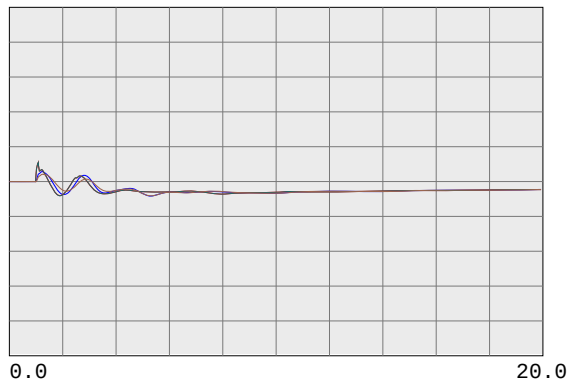
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



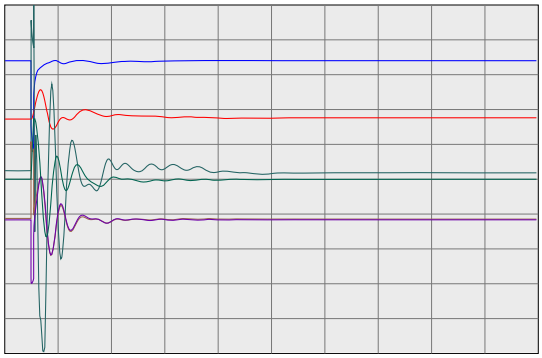
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



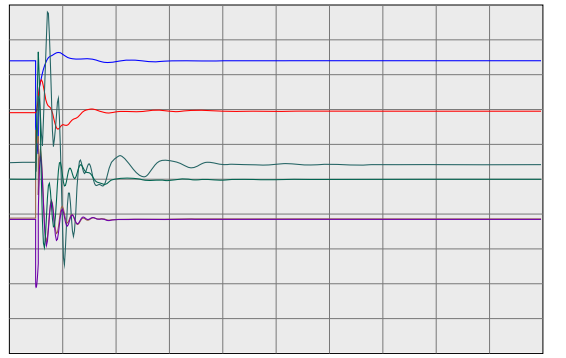
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

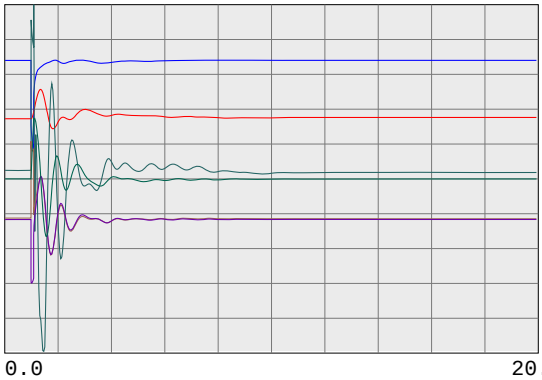
WILLOW PASS GENERATION PLANT



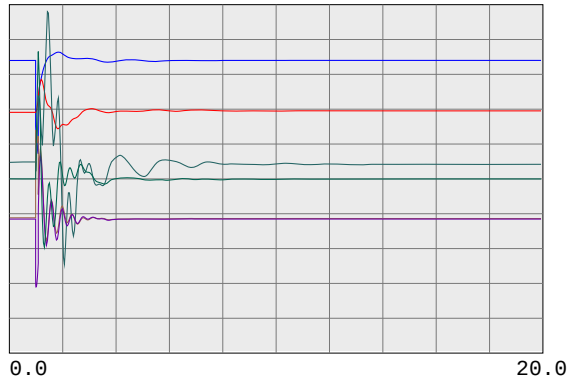
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



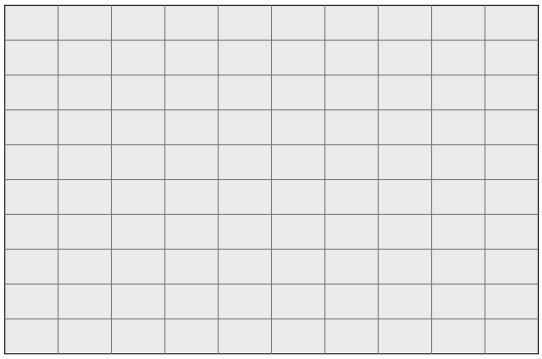
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

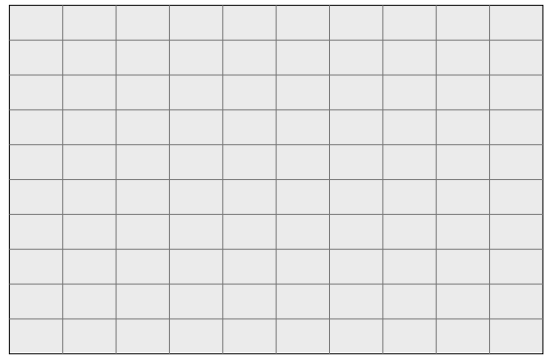


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



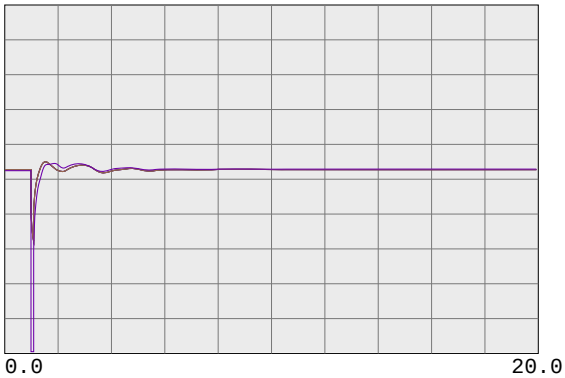
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



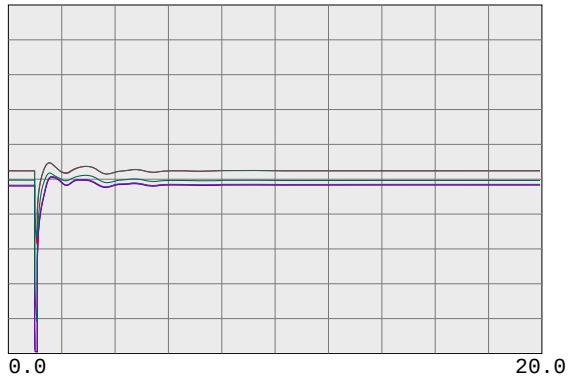


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

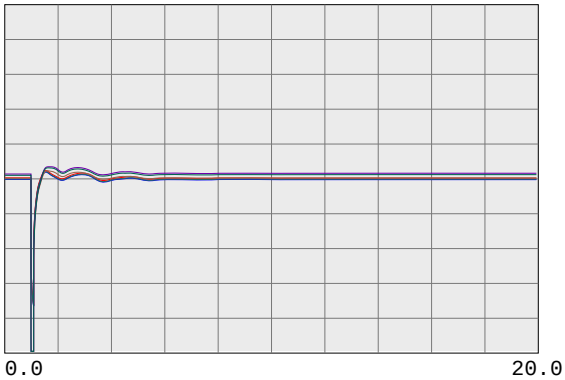
230-KV SYSTEM VOLTAGES



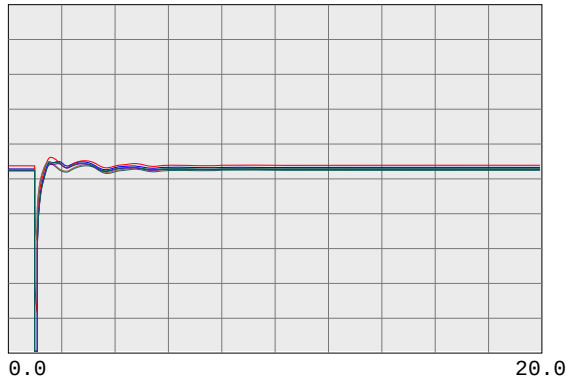
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



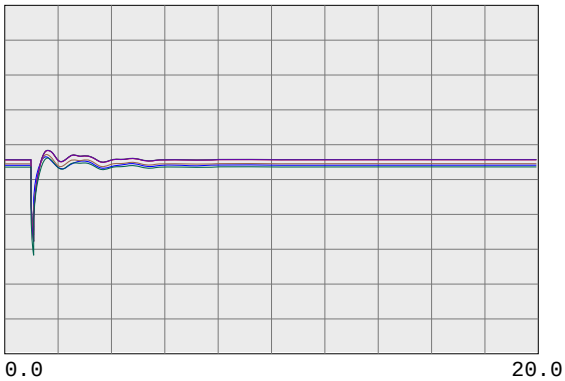
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



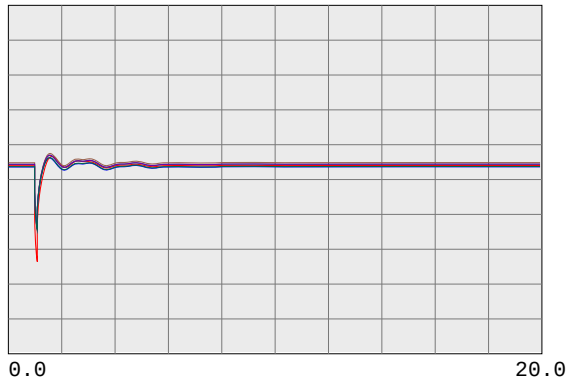
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



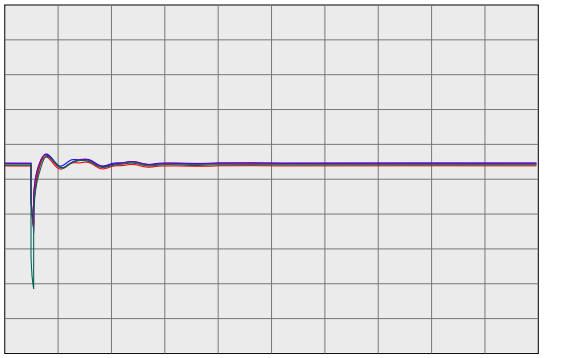
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



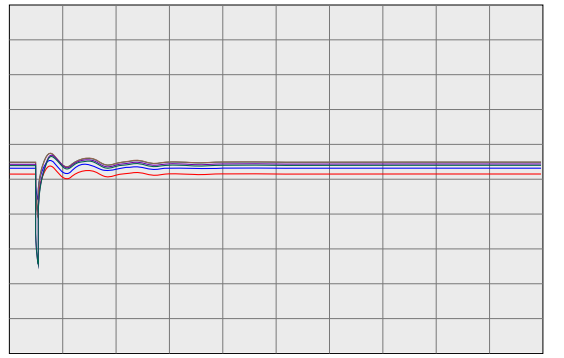
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

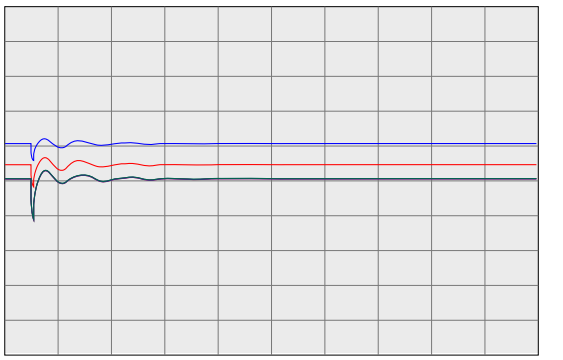
230-KV SYSTEM VOLTAGES



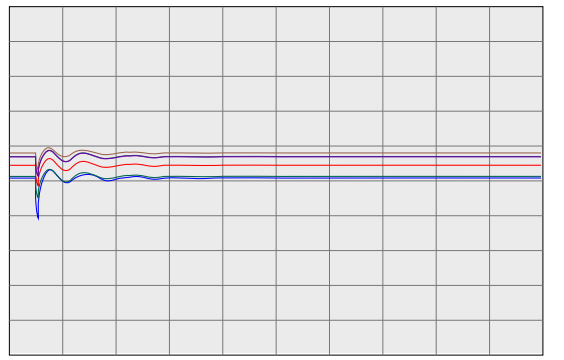
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



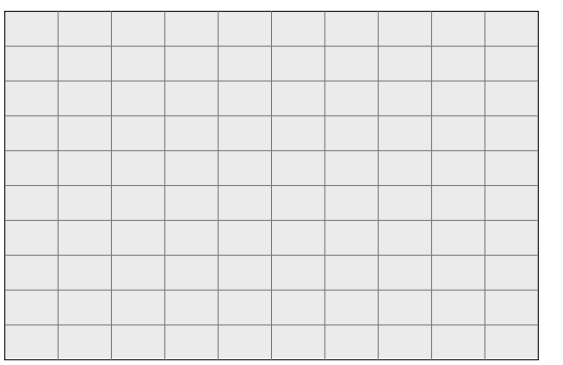
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

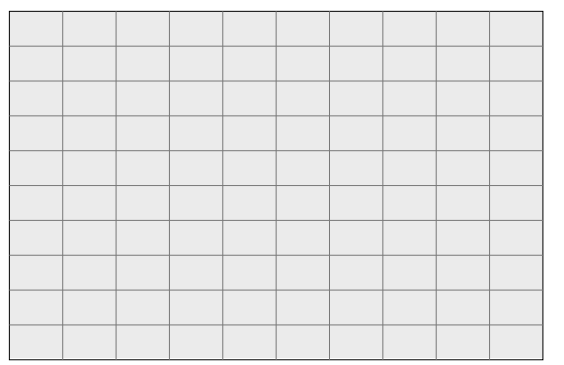


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



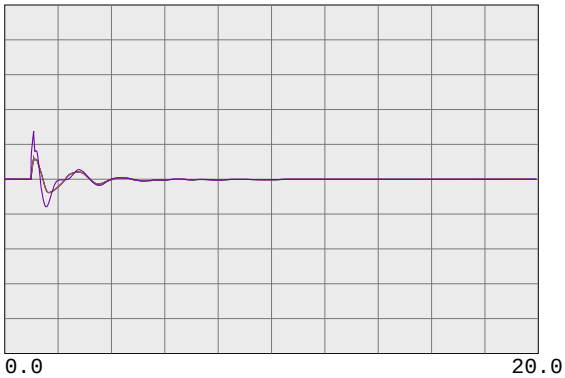
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



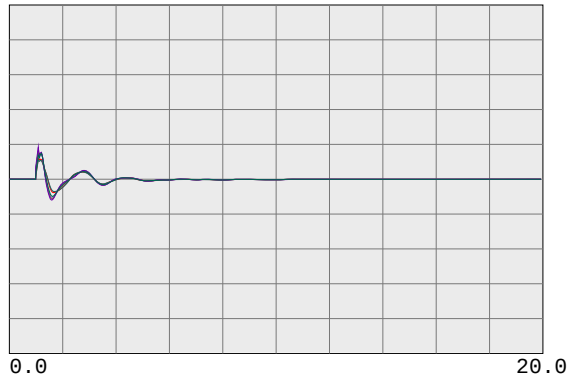


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

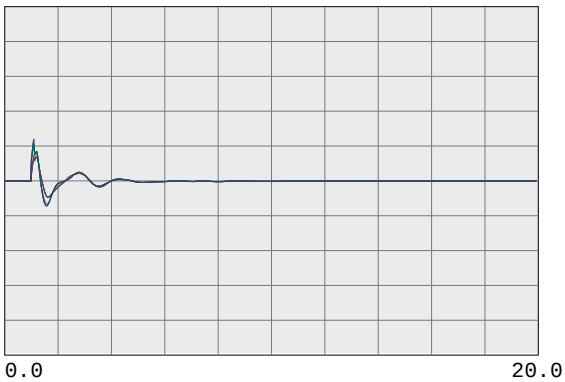
230-KV SYSTEM FREQUENCIES



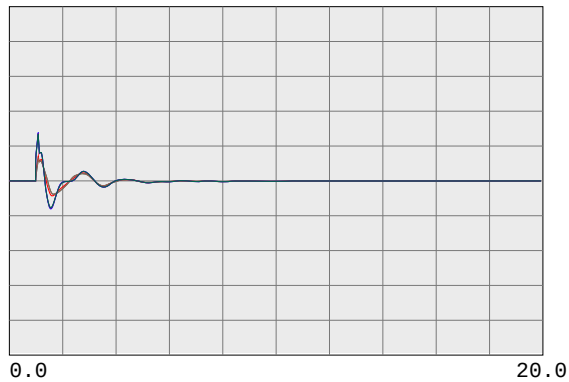
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



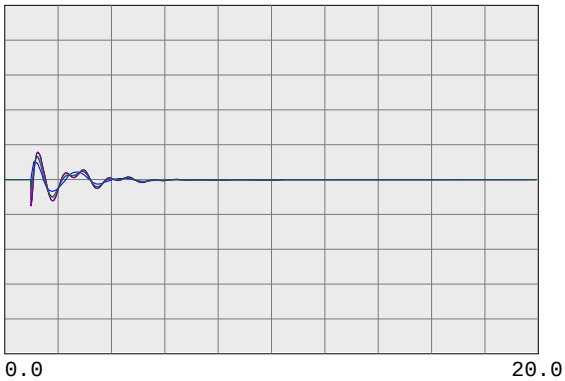
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



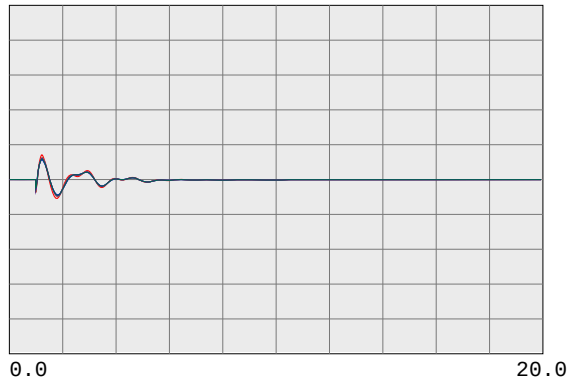
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



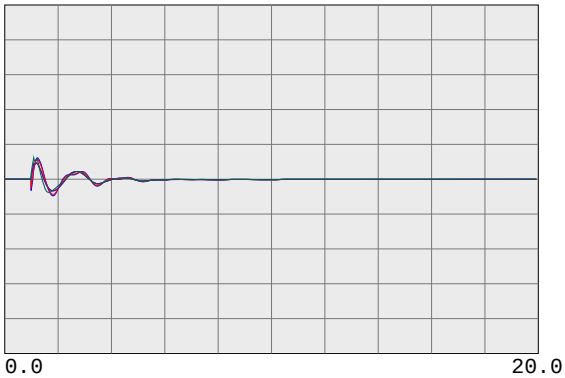
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



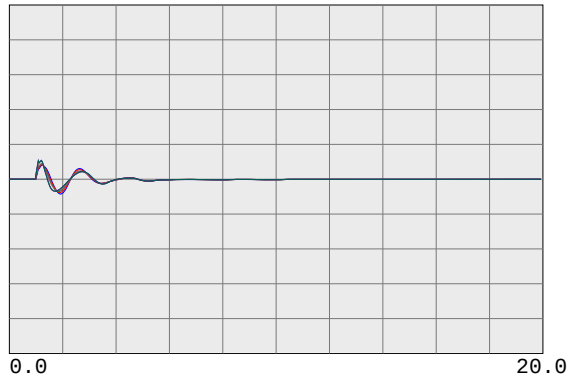
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

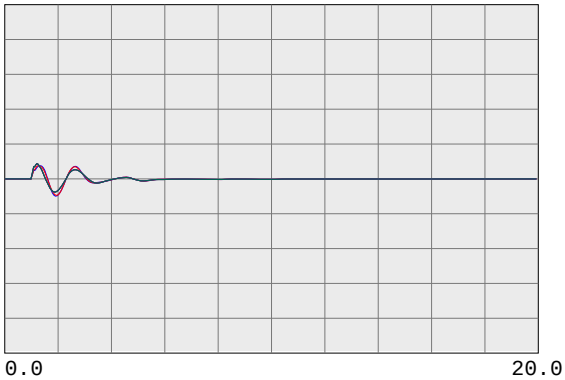
230-KV SYSTEM FREQUENCIES



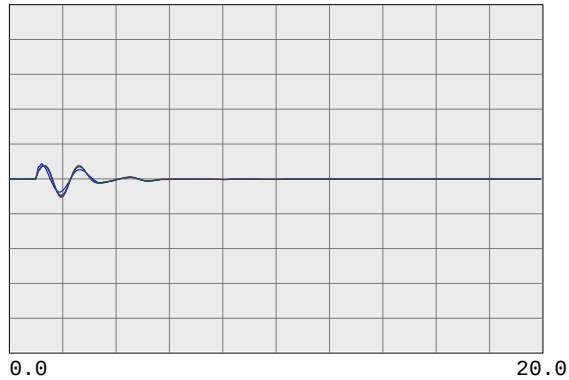
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



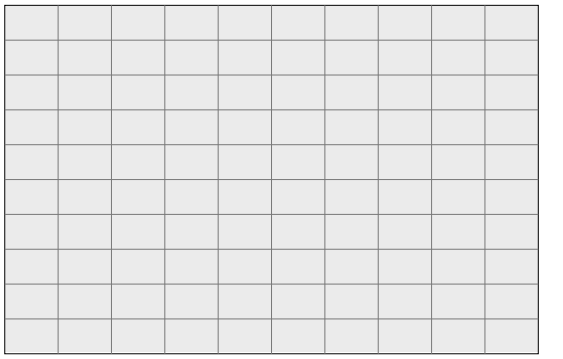
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

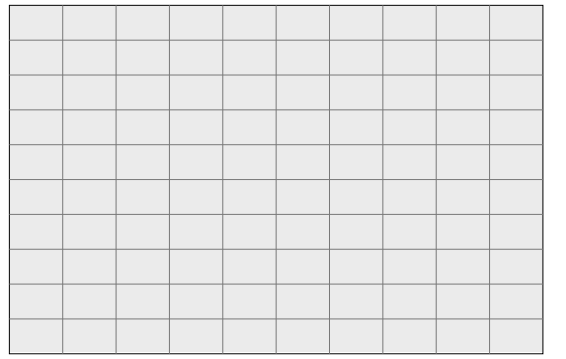


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



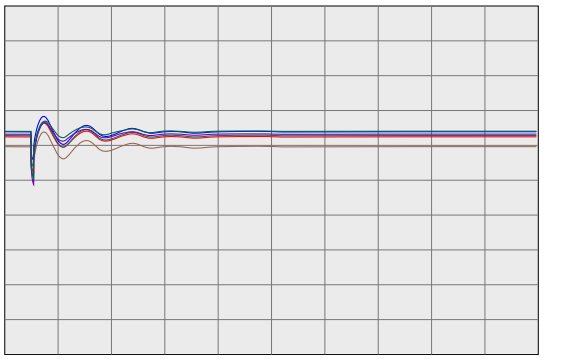
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



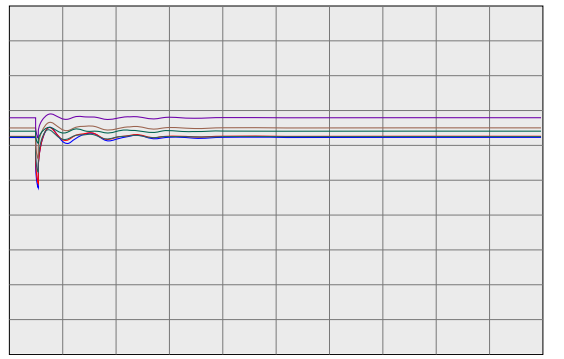


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

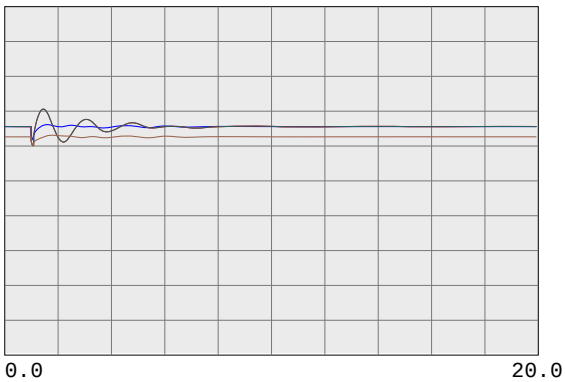
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



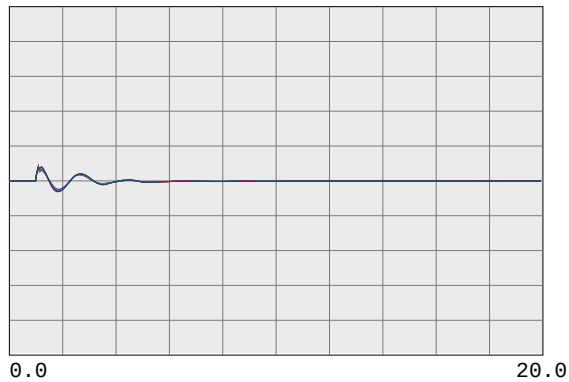
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



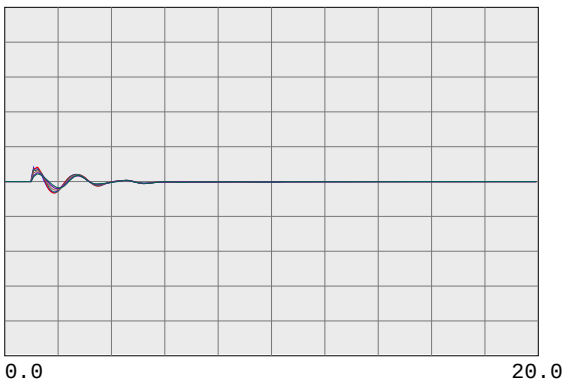
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



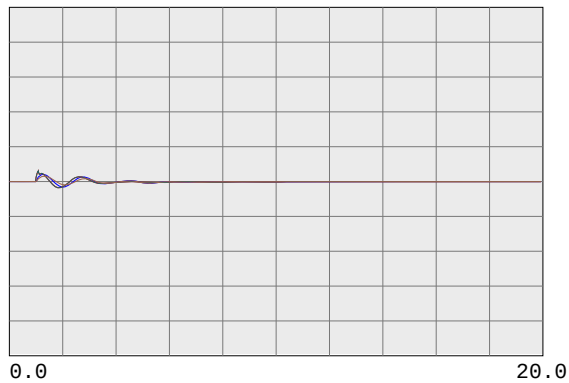
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



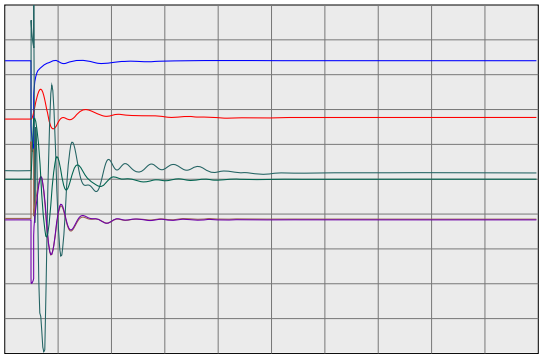
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



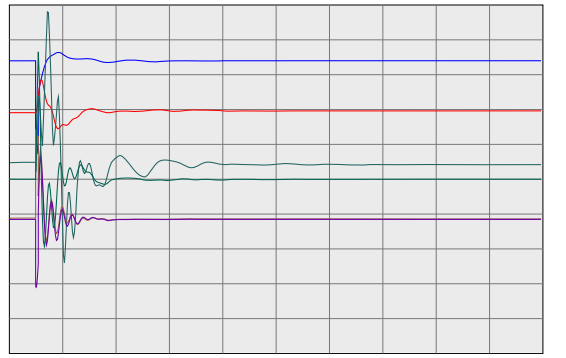
59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

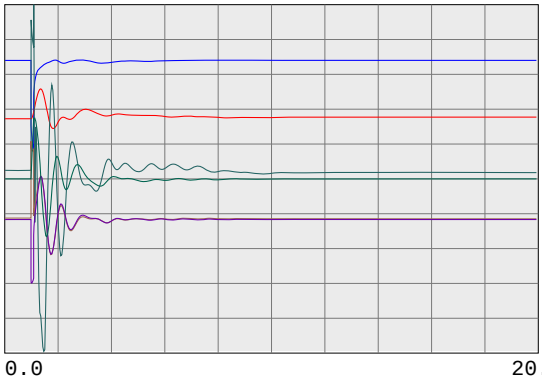
WILLOW PASS GENERATION PLANT



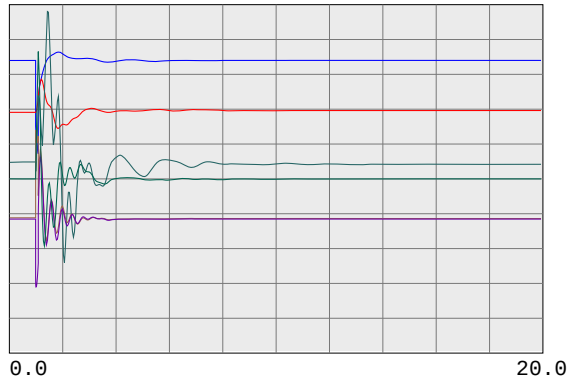
0.2000 vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000 ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000 efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000 it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000 pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900 spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



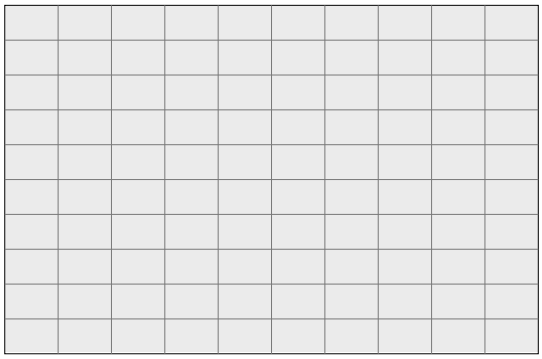
0.2000 vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000 ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000 efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000 it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000 pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900 spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100

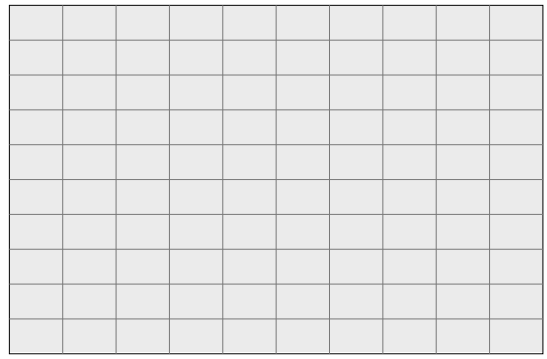


0.2000 vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000 ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000 efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000 it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000 pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900 spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100



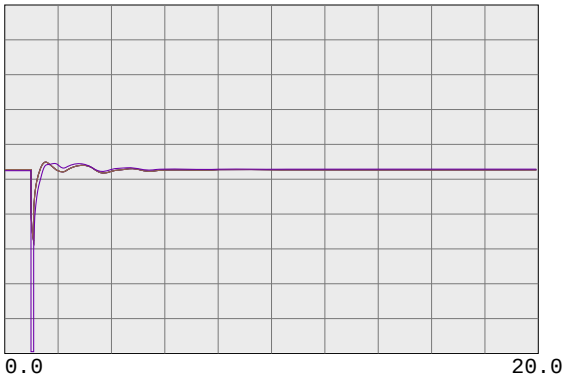
0.2000 vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000 ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000 efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000 it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000 pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900 spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



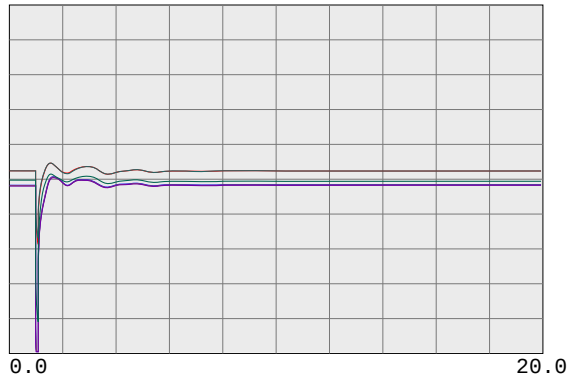


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

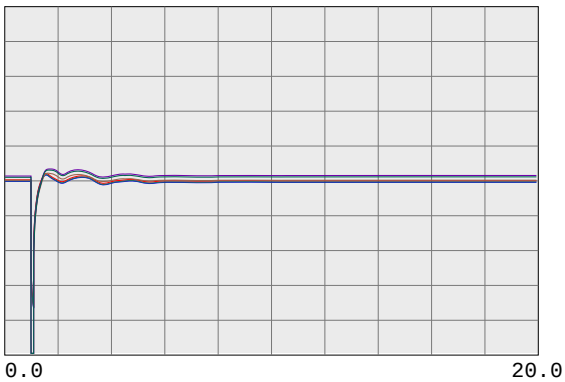
230-KV SYSTEM VOLTAGES



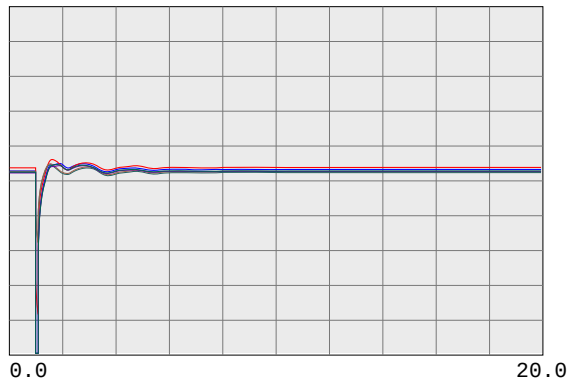
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



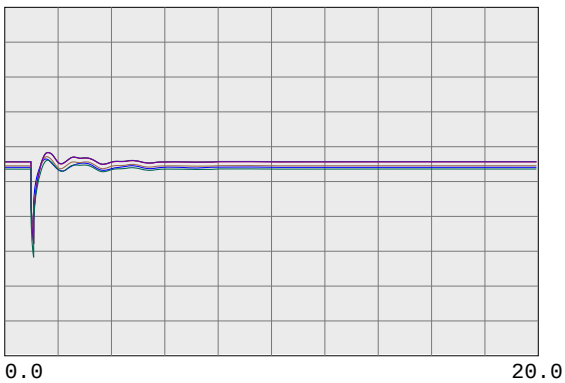
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



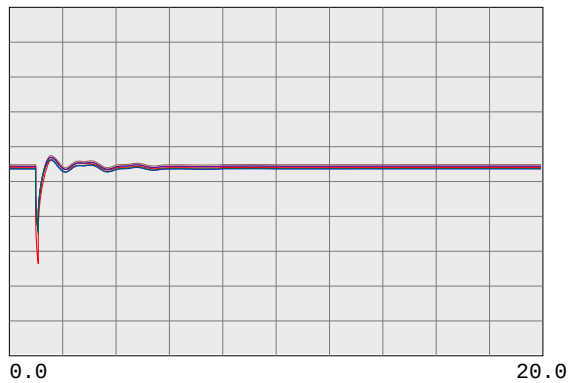
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



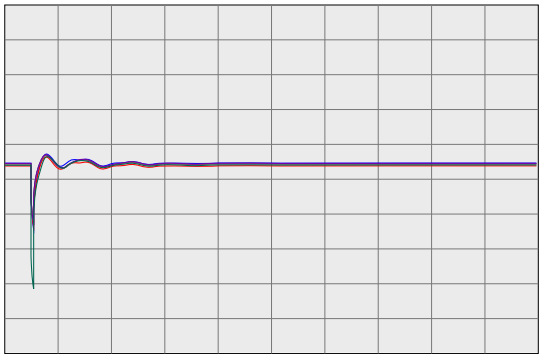
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

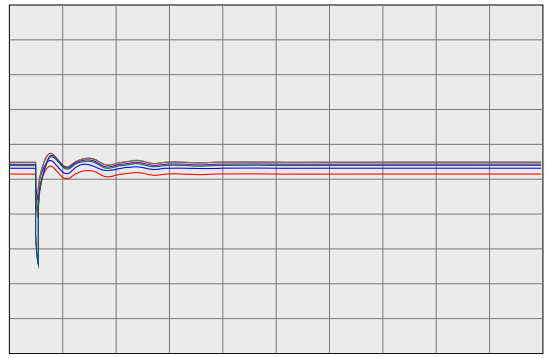
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

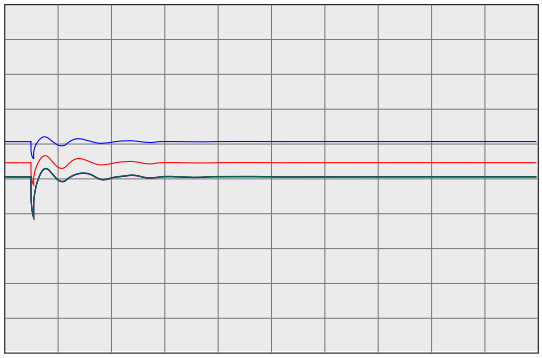
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

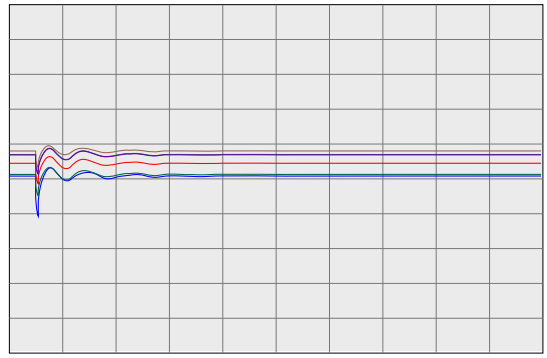
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

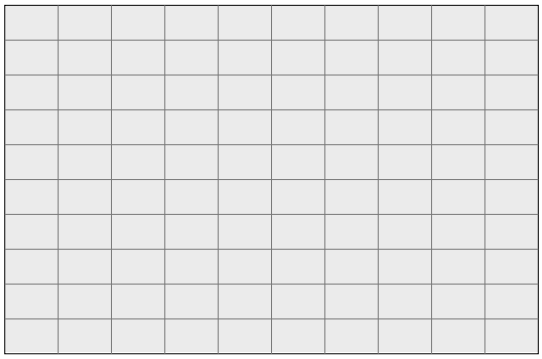
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

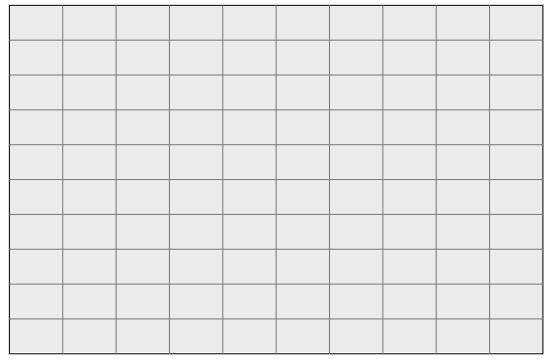


0.0 20.0

Time(sec)

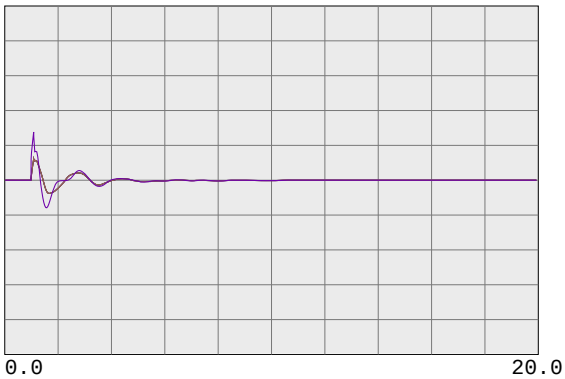
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



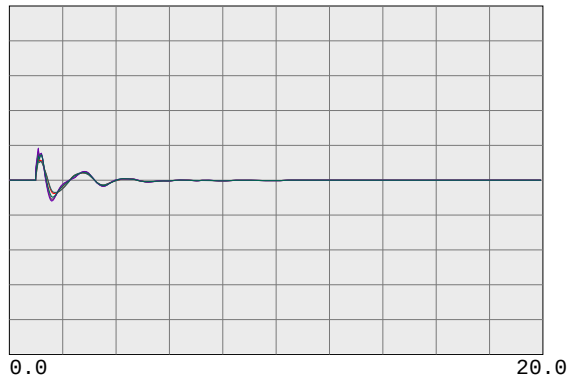


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

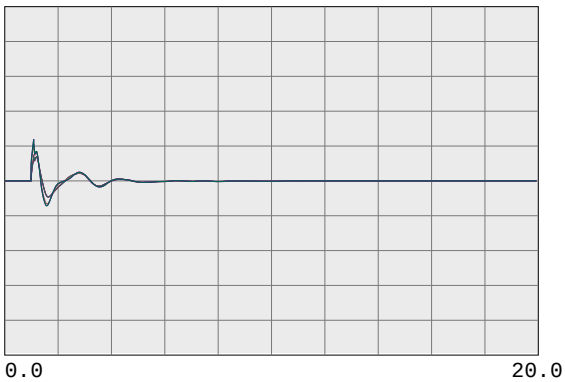
230-KV SYSTEM FREQUENCIES



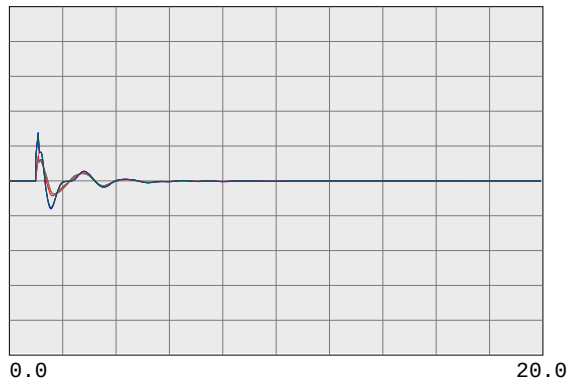
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



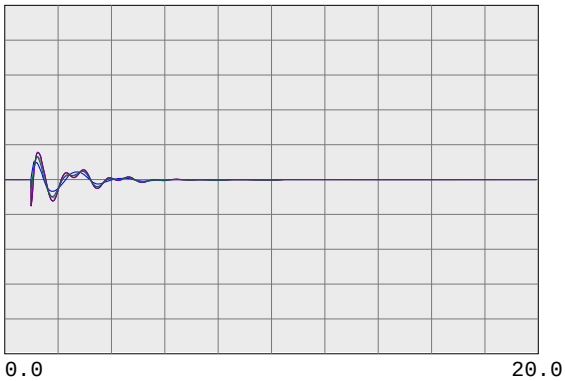
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000



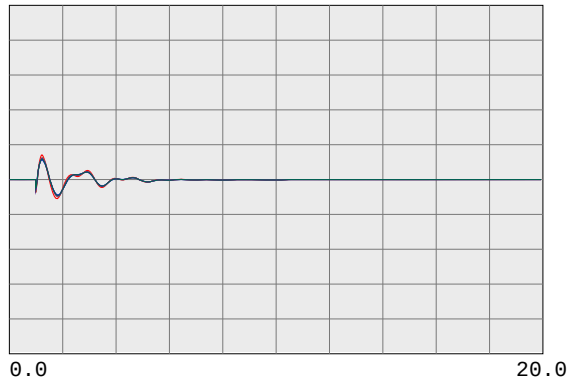
59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000



59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



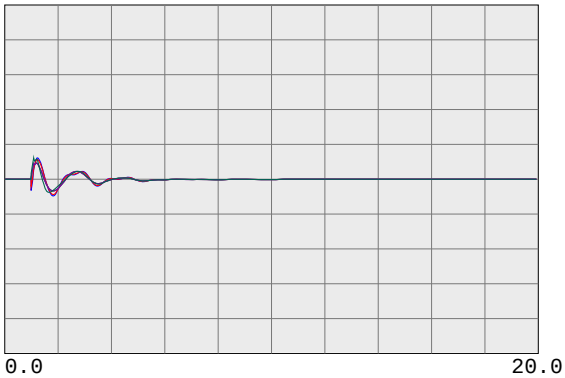
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



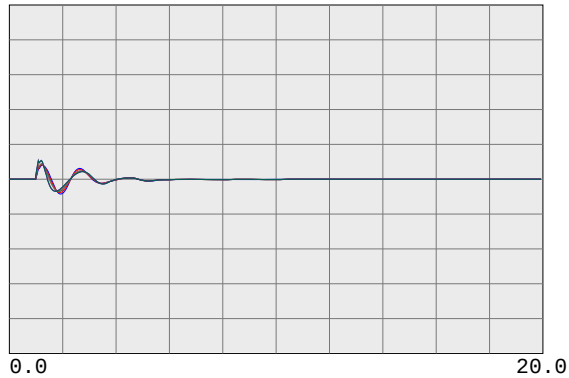
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

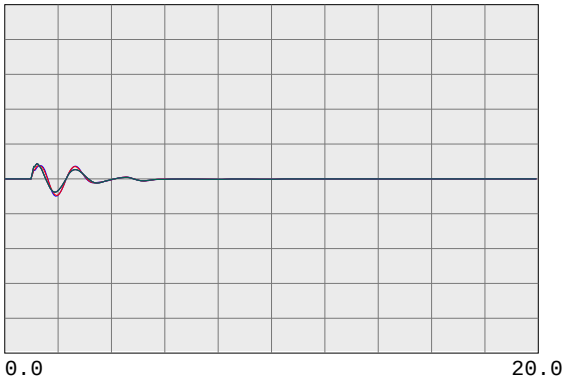
230-KV SYSTEM FREQUENCIES



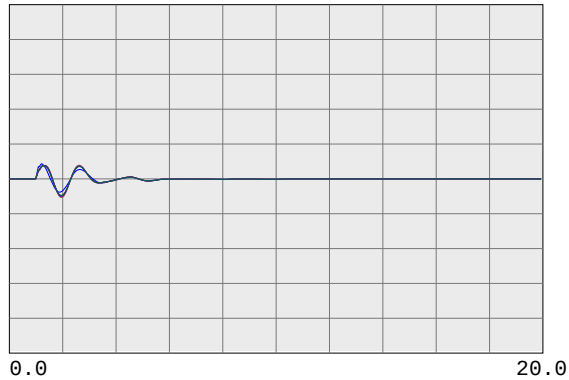
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



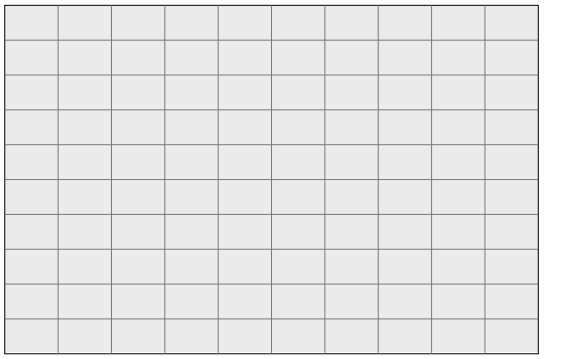
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

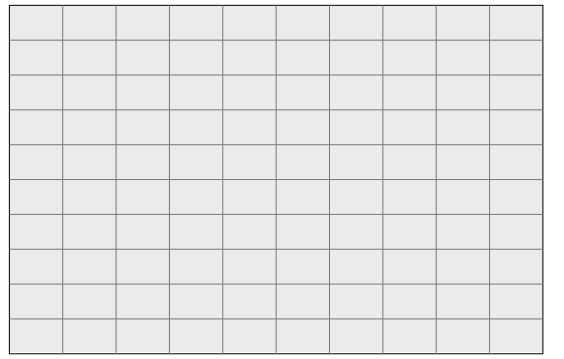


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



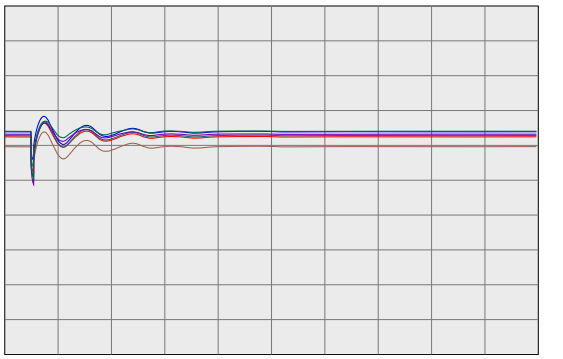
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



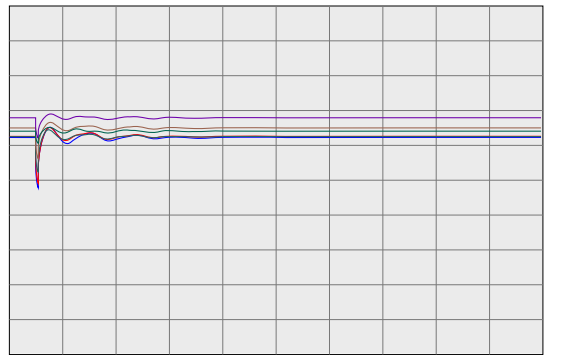


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

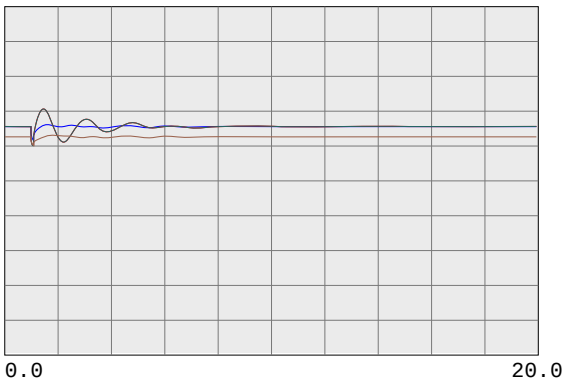
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



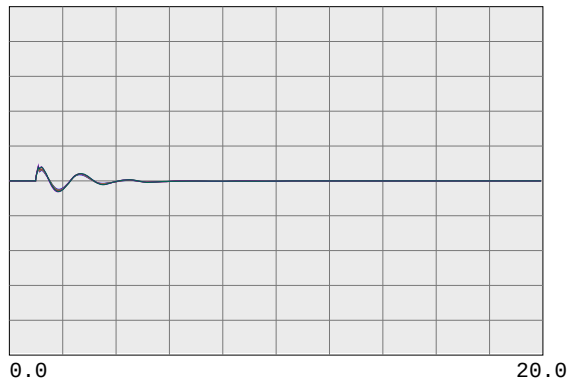
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



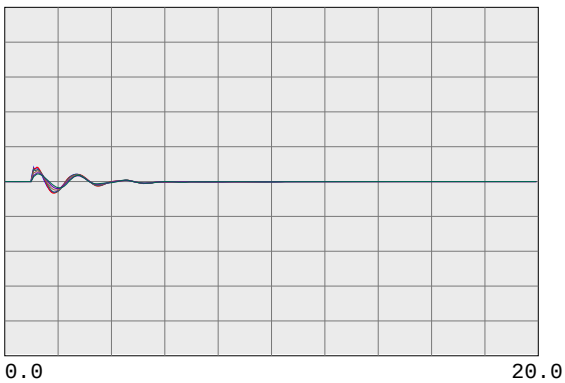
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



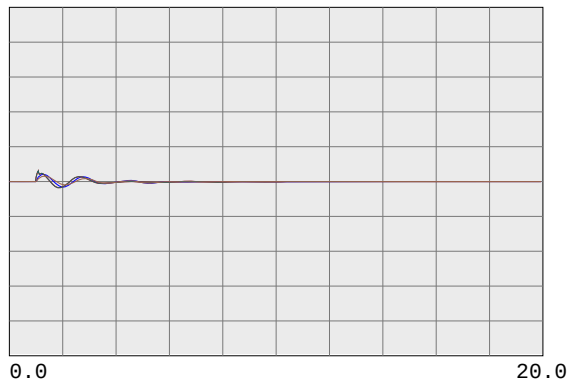
0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



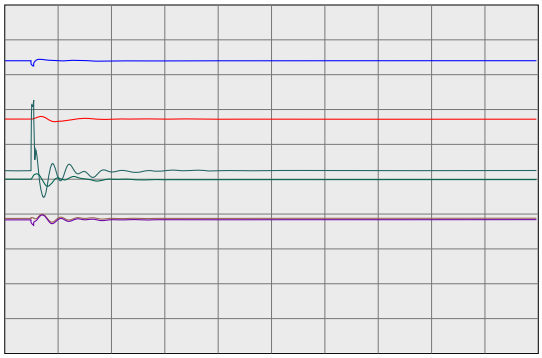
59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

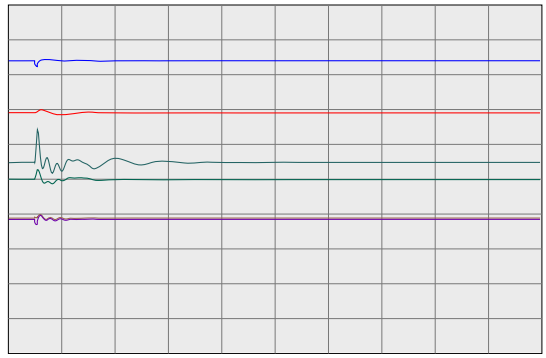
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

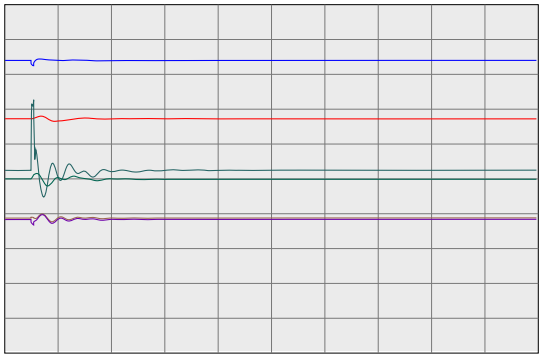
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

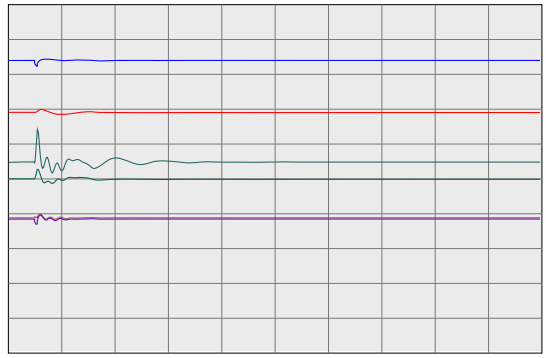
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

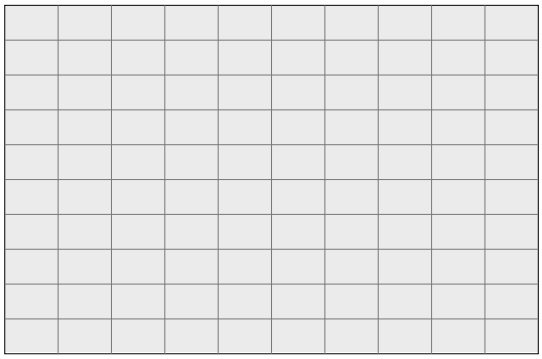
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

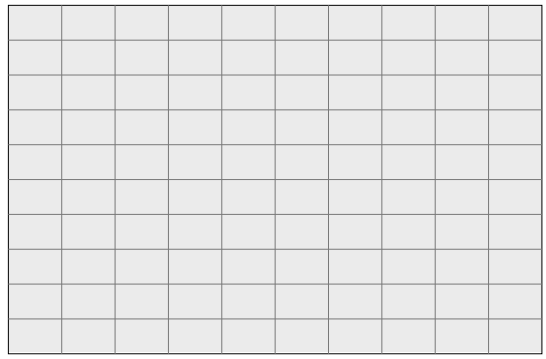


0.0 20.0

Time(sec)

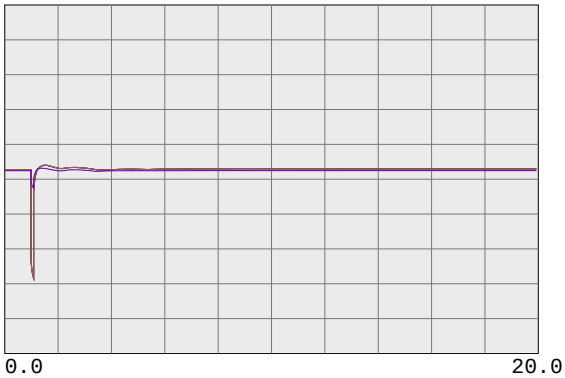
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



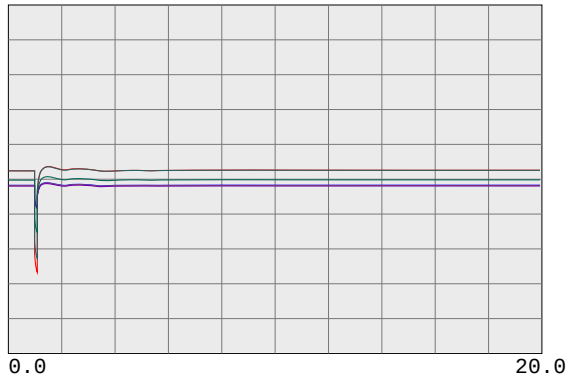


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

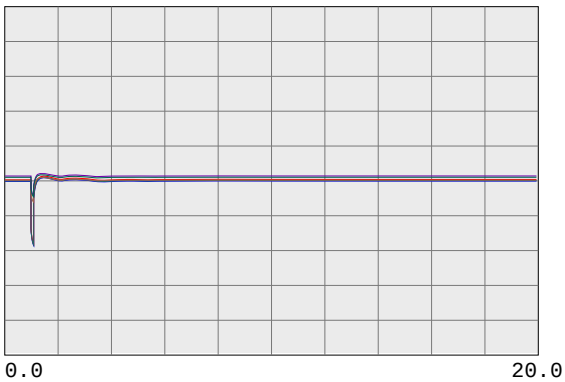
230-KV SYSTEM VOLTAGES



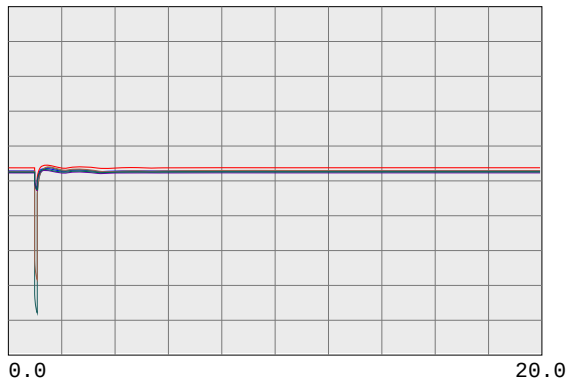
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



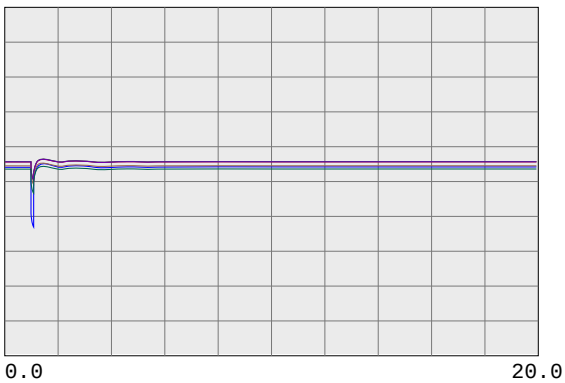
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



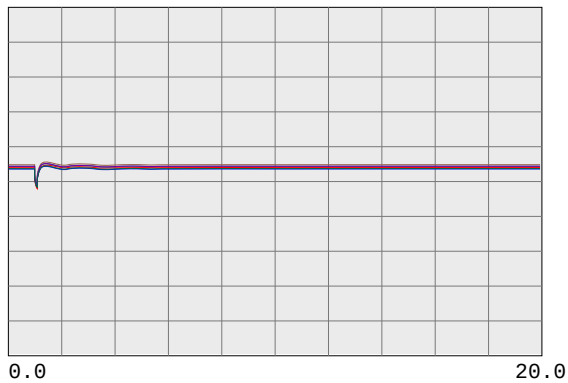
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



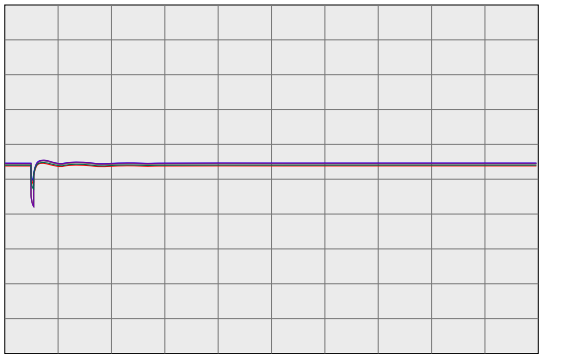
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



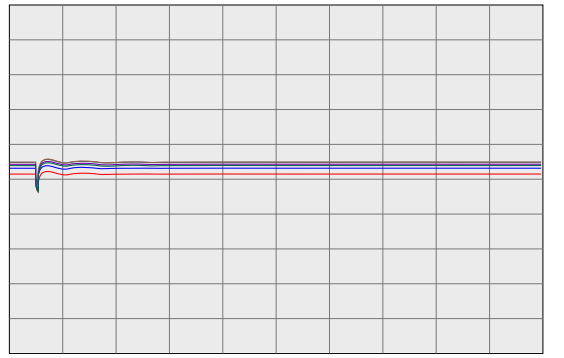
0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

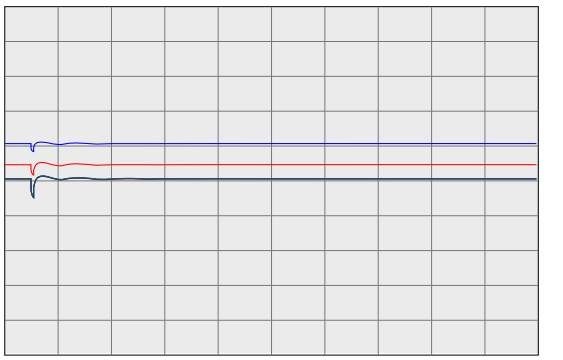
230-KV SYSTEM VOLTAGES



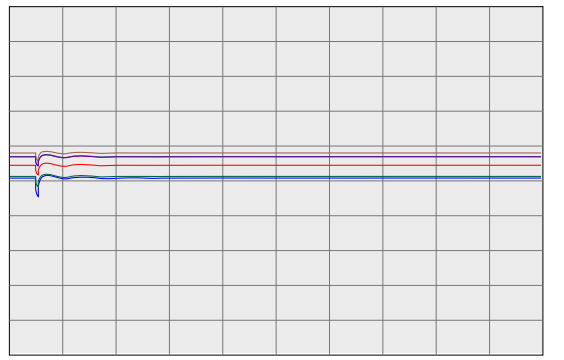
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



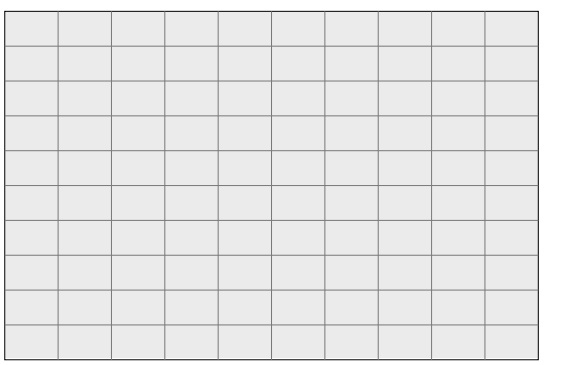
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500

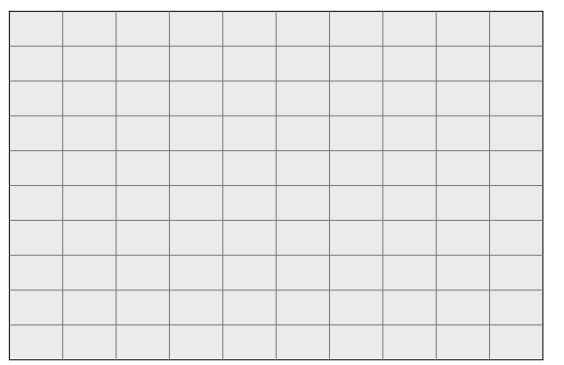


0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500



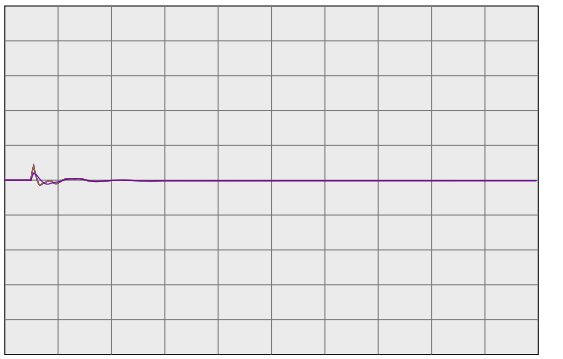
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



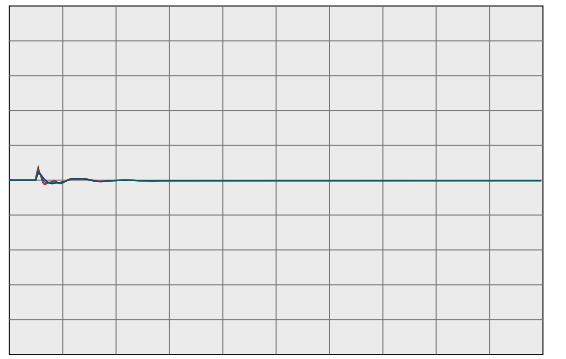


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



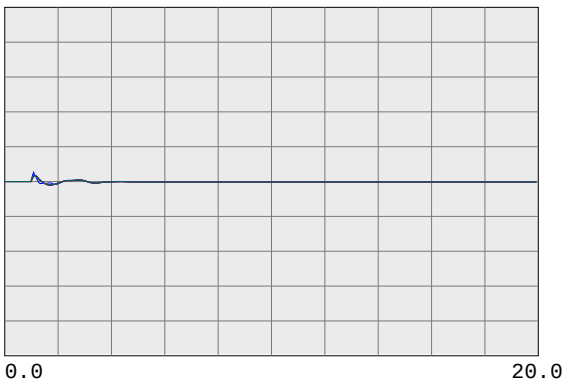
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



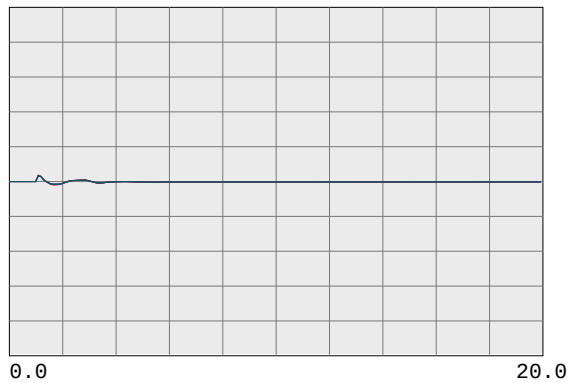
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



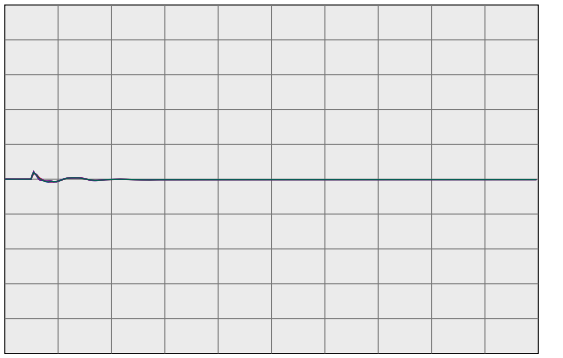
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



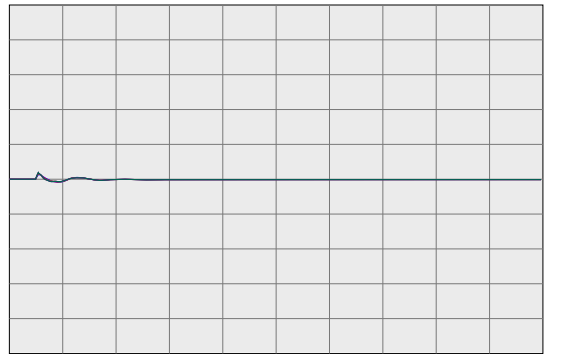
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

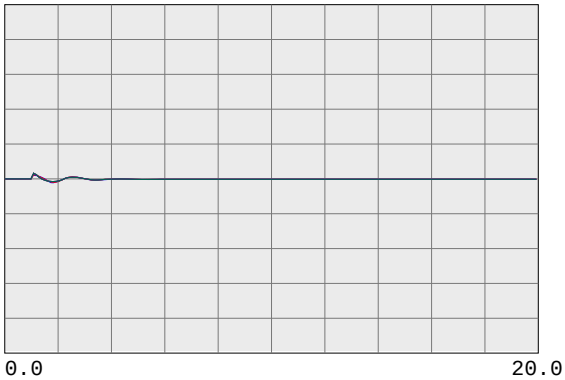
230-KV SYSTEM FREQUENCIES



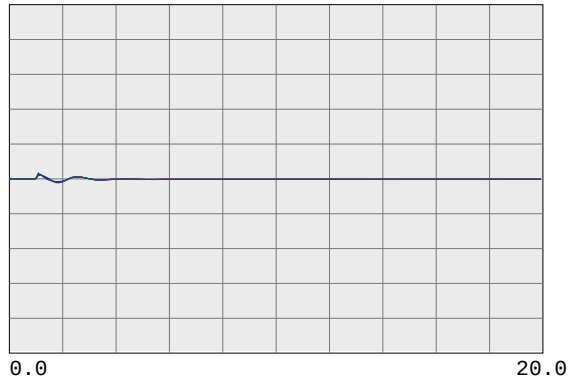
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



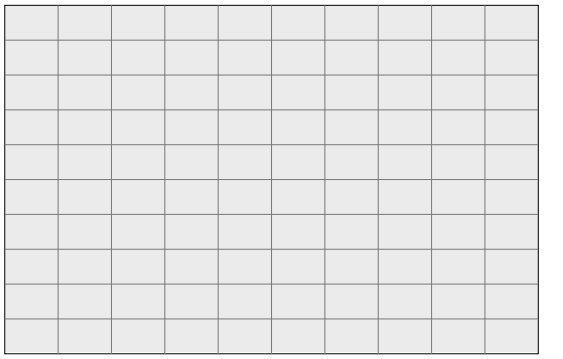
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

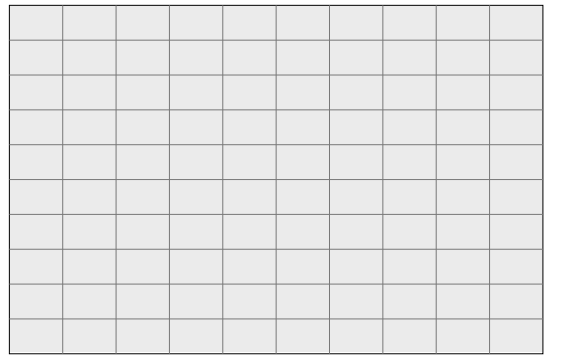


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



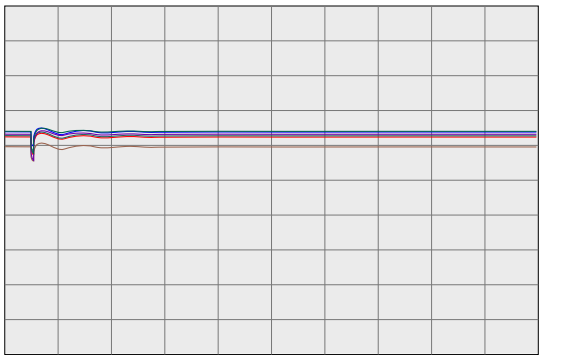
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



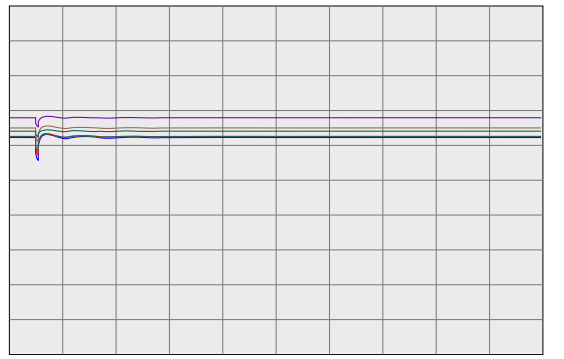


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

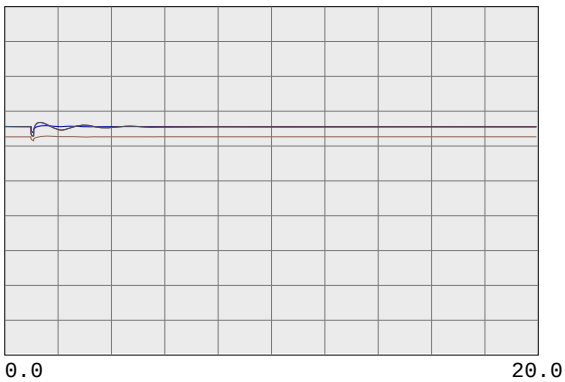
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500

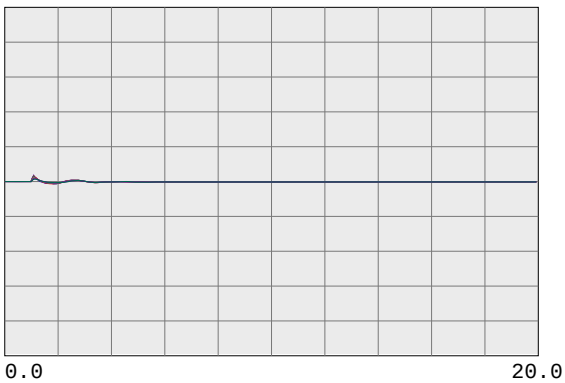


0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500

59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000

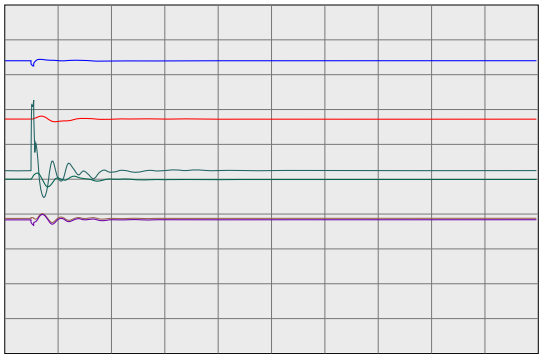


59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

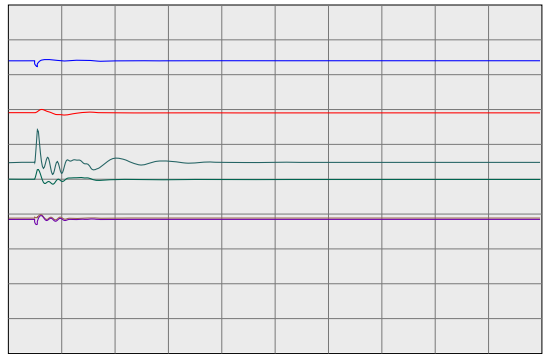
WILLOW PASS GENERATION PLANT



0.0 20.0

Time(sec)

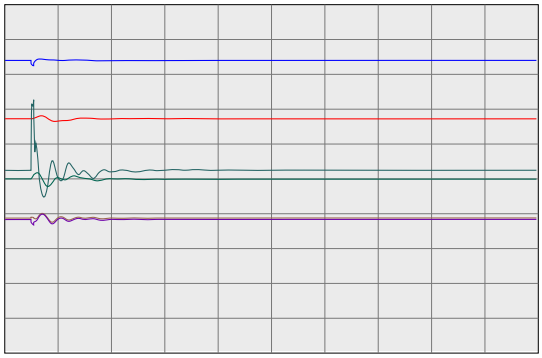
0.2000	vt	99991	MIR_CT1	16.5	0	0.0	1	1	1.2000
-100.0000	ang	99991	MIR_CT1	16.5	0	0.0	1	1	100.0000
0.0000	efd	99991	MIR_CT1	16.5	0	0.0	1	1	5.0000
0.0000	it	99991	MIR_CT1	16.5	0	0.0	1	1	2.0000
0.0000	pg	99991	MIR_CT1	16.5	0	0.0	1	1	570.0000
0.9900	spd	99991	MIR_CT1	16.5	0	0.0	1	1	1.0100



0.0 20.0

Time(sec)

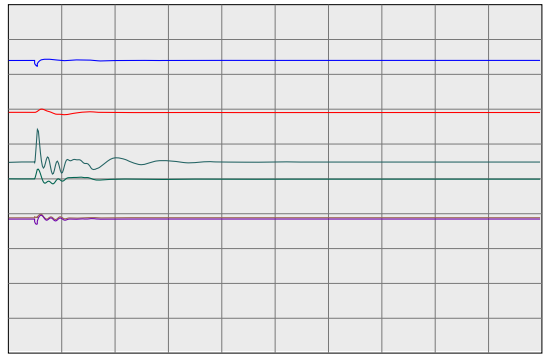
0.2000	vt	99992	MIR_ST1	13.8	0	0.0	2	1	1.2000
-100.0000	ang	99992	MIR_ST1	13.8	0	0.0	2	1	100.0000
0.0000	efd	99992	MIR_ST1	13.8	0	0.0	2	1	5.0000
0.0000	it	99992	MIR_ST1	13.8	0	0.0	2	1	2.0000
0.0000	pg	99992	MIR_ST1	13.8	0	0.0	2	1	166.4000
0.9900	spd	99992	MIR_ST1	13.8	0	0.0	2	1	1.0100



0.0 20.0

Time(sec)

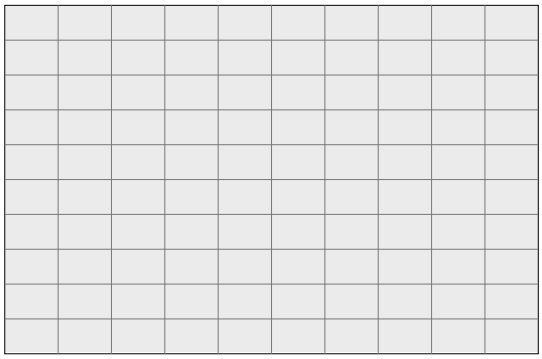
0.2000	vt	99993	MIR_CT2	16.5	0	0.0	3	1	1.2000
-100.0000	ang	99993	MIR_CT2	16.5	0	0.0	3	1	100.0000
0.0000	efd	99993	MIR_CT2	16.5	0	0.0	3	1	5.0000
0.0000	it	99993	MIR_CT2	16.5	0	0.0	3	1	2.0000
0.0000	pg	99993	MIR_CT2	16.5	0	0.0	3	1	570.0000
0.9900	spd	99993	MIR_CT2	16.5	0	0.0	3	1	1.0100

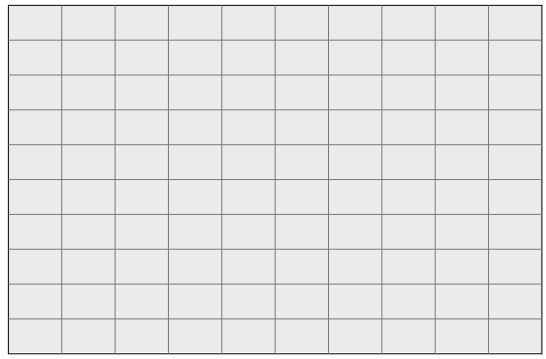


0.0 20.0

Time(sec)

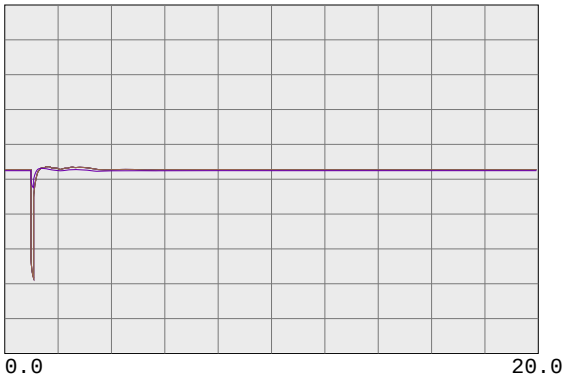
0.2000	vt	99994	MIR_ST2	13.8	0	0.0	4	1	1.2000
-100.0000	ang	99994	MIR_ST2	13.8	0	0.0	4	1	100.0000
0.0000	efd	99994	MIR_ST2	13.8	0	0.0	4	1	5.0000
0.0000	it	99994	MIR_ST2	13.8	0	0.0	4	1	2.0000
0.0000	pg	99994	MIR_ST2	13.8	0	0.0	4	1	166.4000
0.9900	spd	99994	MIR_ST2	13.8	0	0.0	4	1	1.0100



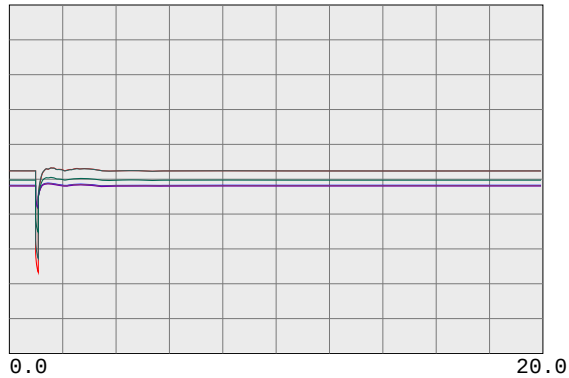


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

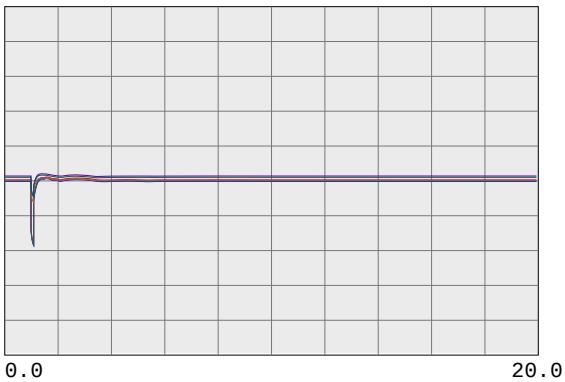
230-KV SYSTEM VOLTAGES



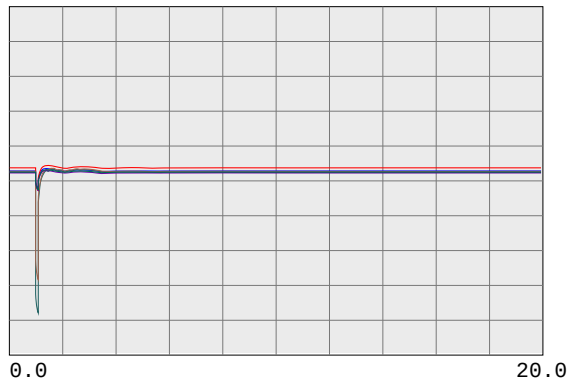
0.7500 vbus	99980	MIRPKCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99981	MIRPKCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99985	MIRCCCC1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99986	MIRCCCC2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	99995	MIRCCPB1 230.0	0	0.0	1	1	1.2500



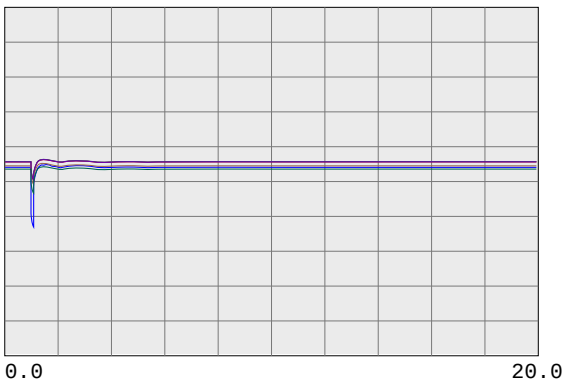
0.7500 vbus	30562	TES JCT 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30567	LONETREE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30565	BRENTWOD 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30563	RESEARCH 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30561	TASSAJAR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30550	MORAGA 230.0	0	0.0	1	1	1.2500



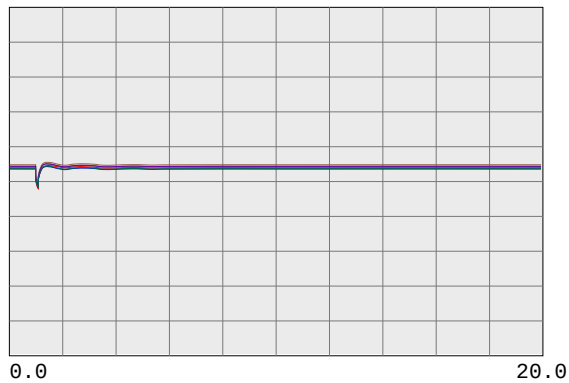
0.7500 vbul	30545	ROSSMOOR 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30544	ROSSTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30543	ROSSTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30540	SOBRANTE 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30536	TESORO 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30535	TIDEWATR 230.0	0	0.0	1	1	1.2500



0.7500 vbul	30528	DEC PTSG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30600	TRES VAQ 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30523	CC SUB 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30525	C.COSTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30526	PITSBG D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30527	PITSBG E 230.0	0	0.0	1	1	1.2500



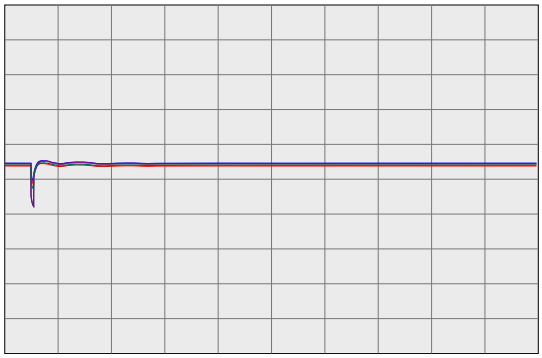
0.7500 vbus	30575	WND MSTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30690	EMBRCDRE 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30695	MARTIN C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30696	MRT RCTR 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30685	EMBRCDRD 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30703	RAVENSWD 230.0	0	0.0	1	1	1.2500



0.7500 vbus	30710	SLACTAP1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30700	SANMATEO 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30713	JMDAMCX1 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30717	TRAN230B 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30714	JMDAMCX2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30715	JEFFERSN 230.0	0	0.0	1	1	1.2500

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

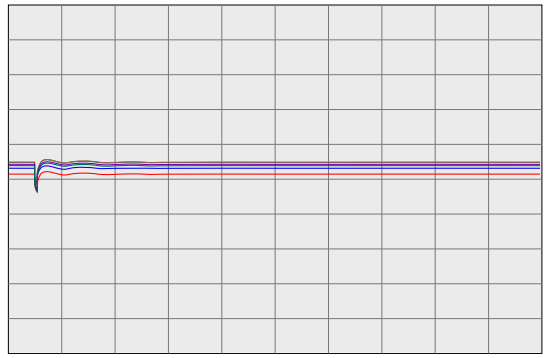
230-KV SYSTEM VOLTAGES



0.0 20.0

Time(sec)

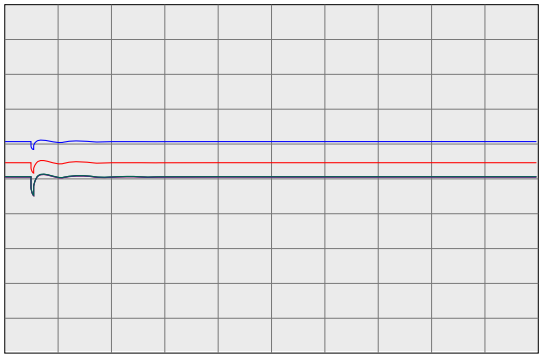
0.7500 vbus	30716	TRAN230A 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30712	SLACTAP2 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30571	ALTALAND 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30570	USWP-RLF 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30580	ALTM MDW 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30595	FLOWIND2 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

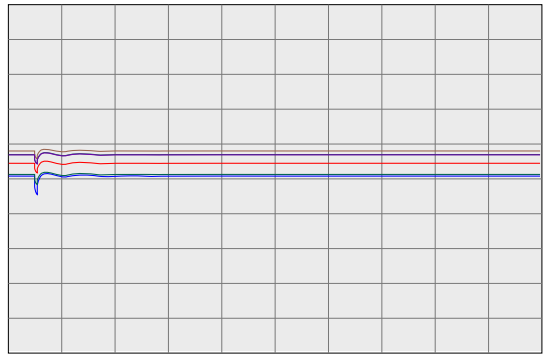
0.7500 vbul	30505	WEBER 230.0	0	0.0	1	1	1.2500
0.7500 vbul	30622	EIGHT MI 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30624	TESLA E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30625	TESLA D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30640	TESLA C 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30655	ADCC 230.0	0	0.0	1	1	1.2500



0.0 20.0

Time(sec)

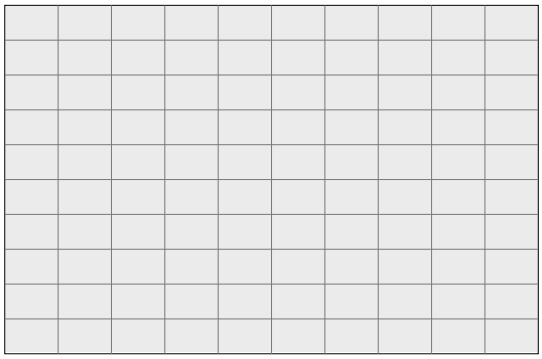
0.7500 vbus	30503	COLLERVL 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30500	BELLOTA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30499	STAGG-E 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30498	STAGG-D 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30497	STAGG-F 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30496	STAGG-H 230.0	0	0.0	1	1	1.2500

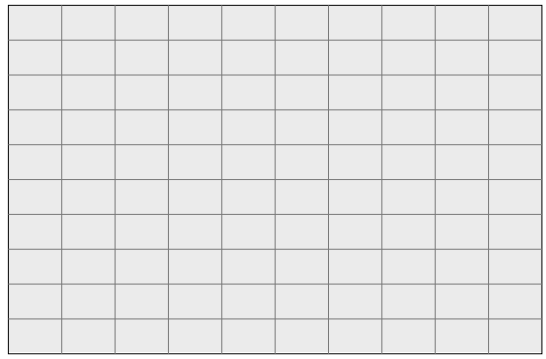


0.0 20.0

Time(sec)

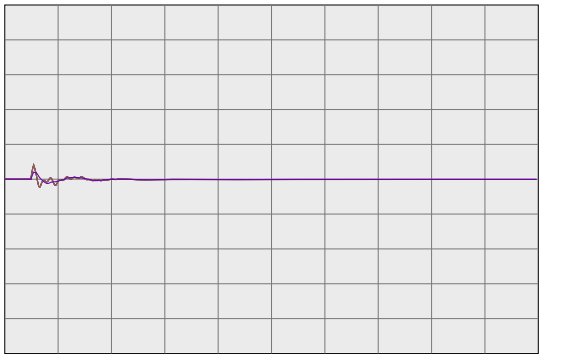
0.7500 vbus	30495	STAGG 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30490	VLLY SPS 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30487	ELECTRA 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30486	TIGR CKM 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30485	TIGR CRK 230.0	0	0.0	1	1	1.2500
0.7500 vbus	30482	LOCKFORD 230.0	0	0.0	1	1	1.2500



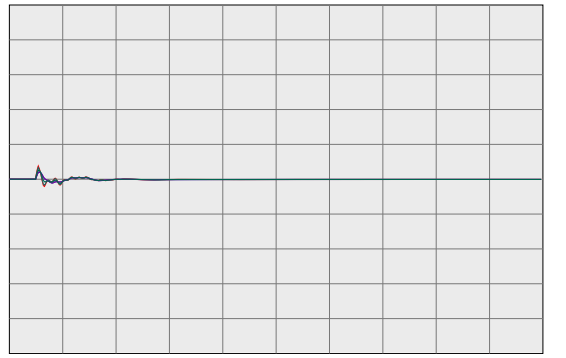


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

230-KV SYSTEM FREQUENCIES



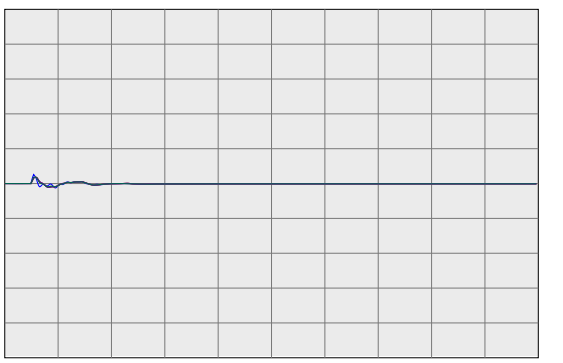
59.4000	fbus	99980	MIRPKCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99981	MIRPKCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99985	MIRCCCC1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99986	MIRCCCC2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	99995	MIRCCPB1 230.0	0	0.0	1	1	60.6000



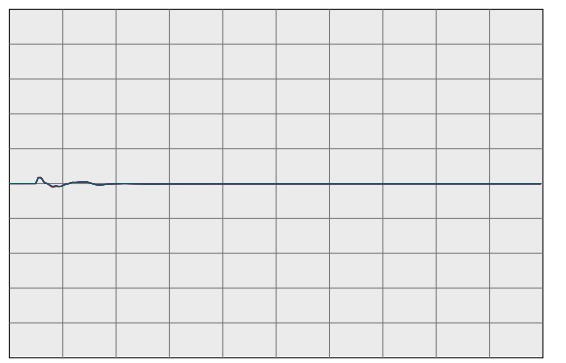
59.4000	fbus	30562	TES JCT 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30567	LONETREE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30565	BRENTWOD 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30563	RESEARCH 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30561	TASSAJAR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30550	MORAGA 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30545	ROSSMOOR 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30544	ROSSTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30543	ROSSTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30540	SOBRANTE 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30536	TESORO 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30535	TIDEWATR 230.0	0	0.0	1	1	60.6000

59.4000	fbul	30528	DEC PTSG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30600	TRES VAQ 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30523	CC SUB 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30525	C.COSTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30526	PITSBG D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30527	PITSBG E 230.0	0	0.0	1	1	60.6000



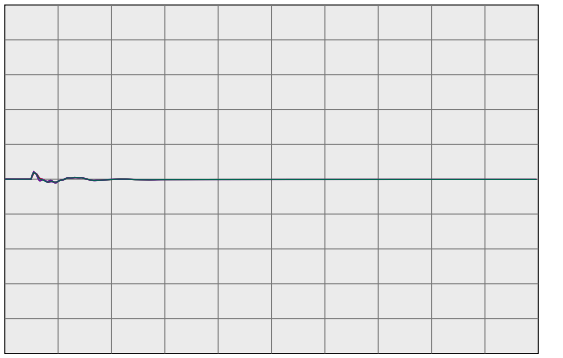
59.4000	fbus	30575	WND MSTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30690	EMBRCDRE 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30695	MARTIN C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30696	MRT RCTR 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30685	EMBRCDRD 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30703	RAVENSWD 230.0	0	0.0	1	1	60.6000



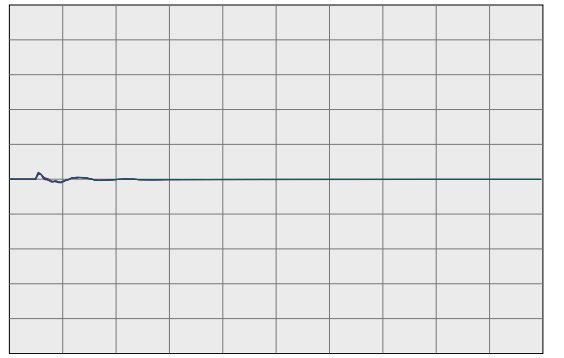
59.4000	fbus	30710	SLACTAP1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30700	SANMATEO 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30713	JMDAMCX1 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30717	TRAN230B 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30714	JMDAMCX2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30715	JEFFERSN 230.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

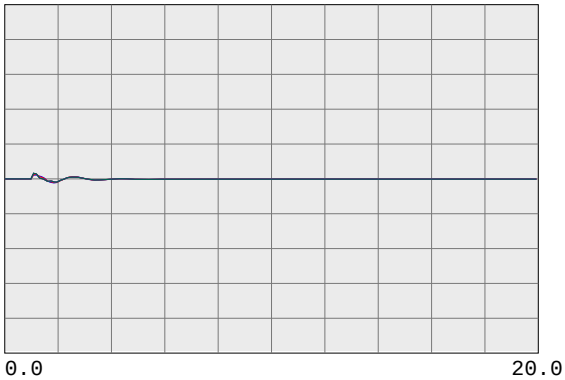
230-KV SYSTEM FREQUENCIES



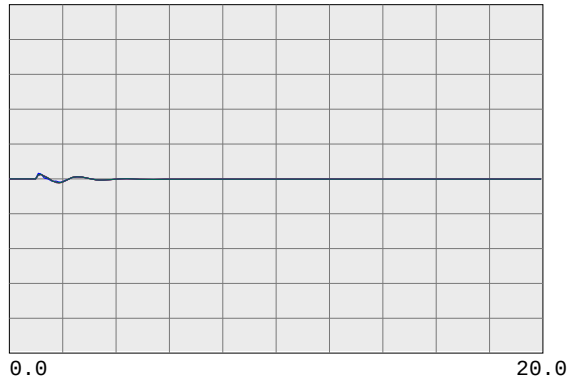
59.4000	fbus	30716	TRAN230A 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30712	SLACTAP2 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30571	ALTALAND 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30570	USWP-RLF 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30580	ALTM MDW 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30595	FLOWIND2 230.0	0	0.0	1	1	60.6000



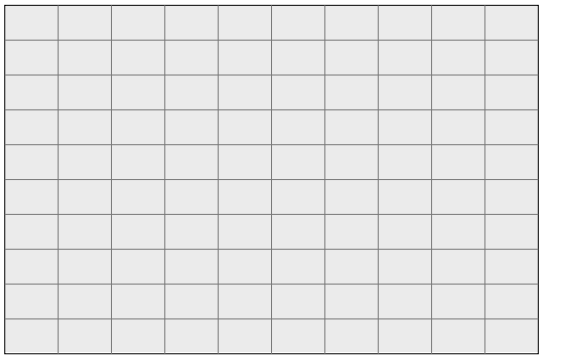
59.4000	fbul	30505	WEBER 230.0	0	0.0	1	1	60.6000
59.4000	fbul	30622	EIGHT MI 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30624	TESLA E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30625	TESLA D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30640	TESLA C 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30655	ADCC 230.0	0	0.0	1	1	60.6000

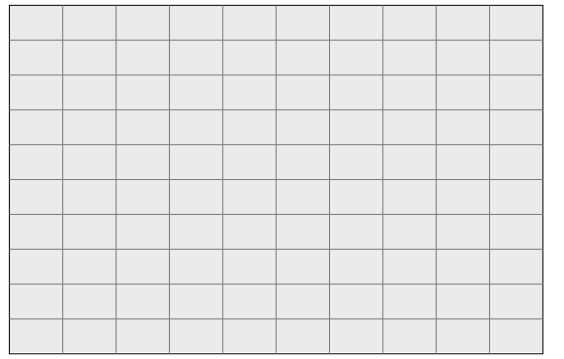


59.4000	fbus	30503	COLLERVL 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30500	BELLOTA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30499	STAGG-E 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30498	STAGG-D 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30497	STAGG-F 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30496	STAGG-H 230.0	0	0.0	1	1	60.6000



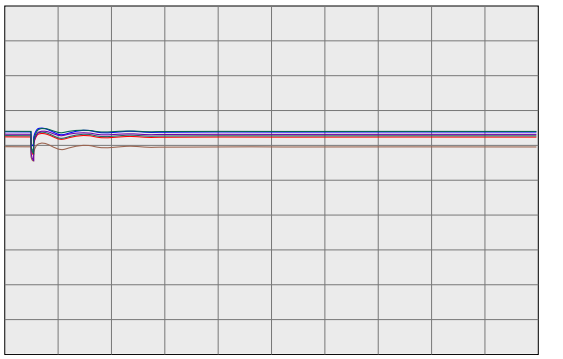
59.4000	fbus	30495	STAGG 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30490	VLLY SPS 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30487	ELECTRA 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30486	TIGR CKM 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30485	TIGR CRK 230.0	0	0.0	1	1	60.6000
59.4000	fbus	30482	LOCKFORD 230.0	0	0.0	1	1	60.6000



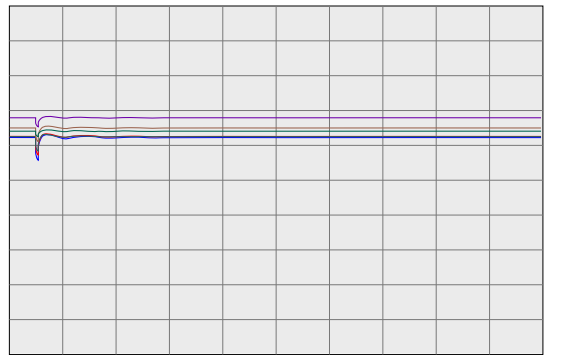


PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07

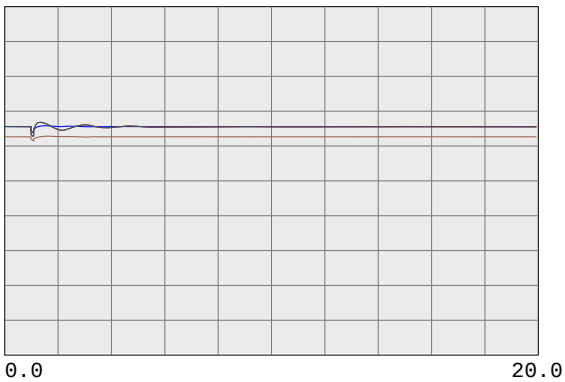
500-KV BULK SYSTEM VOLTAGES & FREQUENCIES



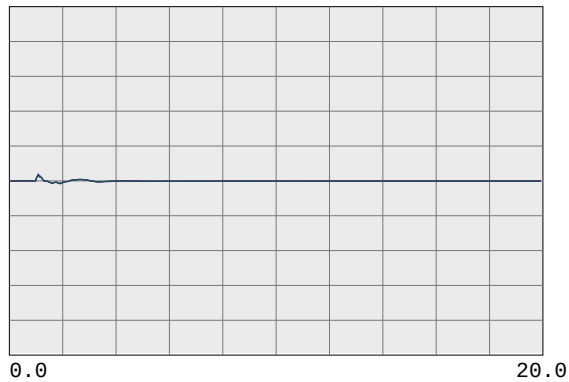
0.7500 vbus	30005	ROUND MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30015	TABLE MT 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30020	OLINDA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30025	MAXWELL 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30030	VACA-DIX 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30035	TRACY 500.0	0	0.0	1	1	1.2500



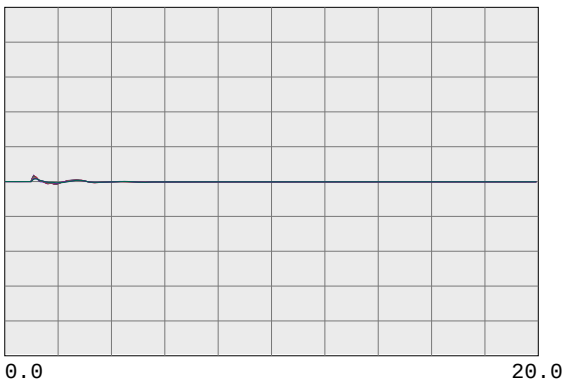
0.7500 vbus	30040	TESLA 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30042	METCALF 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30045	MOSSLAND 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30050	LOSBANOS 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30055	GATES 500.0	0	0.0	1	1	1.2500
0.7500 vbus	30057	DIABLO 500.0	0	0.0	1	1	1.2500



0.7500 vbus	30060	MIDWAY 500.0	0	0.0	1	1	1.2500
0.7500 vbus	45035	CAPTJACK 500.0	0	0.0	1	1	1.2500
0.7500 vbus	40687	MALIN 500.0	0	0.0	1	1	1.2500
0.7500 vbug	24156	VINCENT 500.0	0	0.0	1	1	1.2500



59.4000 fbus	30005	ROUND MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30015	TABLE MT 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30020	OLINDA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30025	MAXWELL 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30030	VACA-DIX 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30035	TRACY 500.0	0	0.0	1	1	60.6000



59.4000 fbus	30040	TESLA 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30042	METCALF 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30045	MOSSLAND 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30050	LOSBANOS 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30055	GATES 500.0	0	0.0	1	1	60.6000
59.4000 fbus	30057	DIABLO 500.0	0	0.0	1	1	60.6000

59.4000 fbus	30060	MIDWAY 500.0	0	0.0	1	1	60.6000
59.4000 fbus	45035	CAPTJACK 500.0	0	0.0	1	1	60.6000
59.4000 fbus	40687	MALIN 500.0	0	0.0	1	1	60.6000
59.4000 fbug	24156	VINCENT 500.0	0	0.0	1	1	60.6000

PG&E 2008 TRANSMISSION EXPANSION PLAN ASSESSMENT
2013 SUMPK: SYSTEM CASE (1-IN-10 LOAD)
COI=4800(n2s); P26=4000(n2s); PDCI=3100(n2s)
6/13/08
Case developed based on WECC 2012 HS2A Case, dated 11/14/07