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July 11, 2011

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BY HAND DELIVERY

Mr. Eric Solorio, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Pio Pico Energy Center Project (11-AFC-1)
California Independent System Operator's Cluster 2 Phase I Interconnection Study Report, Group Report for the San Diego Gas & Electric Area

Dear Mr. Solorio:

On behalf of Applicant Pio Pico Energy Center, LLC, please find enclosed herewith the California Independent System Operator's Cluster 2 Phase 1 Interconnection Study Report, Group Report for the San Diego Gas & Electric Area (the "Study"). Please note that certain portions of the Study were deemed confidential; therefore, those portions deemed as such have been redacted or have been submitted to the Executive Director's office under an Application for Confidential Designation.

Due to the very voluminous nature of the Study, Applicant is providing one (1) paper copy and one (1) electronic copy to the Docket Unit. Parties will be served with an electronic copy provided on a disk.

Should you have any questions regarding this filing, please contact me or Kim Hellwig at (916) 447-0700.

Very truly yours,

Melissa A. Foster

MAF:kjh
Enclosures
cc: See Proof of Service List

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE *PIO PICO ENERGY CENTER, LLC*

Docket No. 11-AFC-1
PROOF OF SERVICE
(Revised 5/12/11)

Pio Pico Energy Center, LLC
Letter to Eric Solorio, California Energy Commission, dated July 11, 2011 re California Independent System Operator's Cluster 2 Phase I Interconnection Study Report, Group Report for the San Diego Gas & Electric Area and CD re Same

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DECLARATION OF SERVICE

I, Judith M. Warmuth, declare that on July 11, 2011, I deposited copies of the aforementioned document in the United States mail at 500 Capitol Mall, Suite 1600, Sacramento, California 95814, with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

AND/OR

Transmission via electronic mail and/or personal delivery were consistent with the requirements of California Code of Regulations, Title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Judith M. Warmuth

California ISO
Your Link to Power

California Independent
System Operator Corporation

Via E-Mail

November 15, 2010

Mr. Gary Chandler
President
Pio Pico Energy Center, LLC
2542 Singletree
South Jordan, UT 84095-2769

Subject: Pio Pico Energy Center Project - Cluster 2 Phase I Interconnection Study

Dear Mr. Chandler:

Attached is the Cluster 2 Phase I Interconnection Study Report for the interconnection of the proposed Pio Pico Energy Center (Project) to the CAISO Controlled Grid. The CAISO and SDG&E performed the Cluster 2 Phase I Interconnection Study in accordance with the CAISO's LGIP tariff.

The study identified the cost of network upgrades assigned to the Project in accordance with the CAISO's LGIP tariff. The cost for network upgrades assigned to the Project is [redacted] on the SDG&E transmission system and [redacted] on the SCE transmission system. In addition, the study report provides a non-binding cost estimate of the interconnection facilities to interconnect the Project to the CAISO Controlled Grid.

Please review the report and prepare comments and questions for the results meeting. The Phase I Interconnection Study results meeting will be coordinated and scheduled within 30 calendar days following receipt of this Phase I Interconnection Study report.

Sincerely,

Robert Sparks, P.E.
Manager
Regional Transmission (South)

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Cluster 2 Phase I Interconnection Study Report

Group Report for SDG&E Area

Report

California ISO
Your Link to Power

November 15, 2010

This study has been completed in coordination with San Diego Gas & Electric Company per CAISO Tariff Appendix Y Large Generator Interconnection Procedures (LGIP) for Interconnection Requests in a Queue Cluster Window

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Appendix A – Cluster 2 Project-Specific Information

1. Executive Summary
2. Project and Interconnection Information
3. Deliverability Assessment
4. Study Assumptions
5. Reliability Study Steady-State Analysis
6. Short Circuit Analysis
7. Transient Stability Analysis
8. Post-Transient Voltage Stability Analysis
9. Reactive Power Deficiency Analysis
10. Environmental Evaluation/Permitting
11. Upgrades, Cost Estimates, and Time to Construct Estimates
12. Local Furnishing Bonds
13. Items Not Covered in this Study

Appendix B – CAISO Controlled Grid Generation Queue

Appendix C – Load, Resource, and Dispatch Summary Tables

Appendix D – Steady-State Power Flow Results: Thermal and Voltage

Appendix E – Power Flow Plots

Appendix F – Power Flow Contingency List

Appendix G – Short Circuit Results

Appendix H – Transient Stability Switching Sequences

Appendix I – Transient Stability Results

Appendix J – Transient Stability Plots

Appendix K – Post-Transient: Voltage and Reactive Power Deficiency Results and Contingency Lists

Definitions

APS	Arizona Public Service
BU Cluster	Group of Cluster 2 projects located at Boulevard 138 kV Substation
CAISO	California Independent System Operator Corporation
CFE	Comision Federal de Electricidad
CPUC	California Public Utilities Commission
COD	Commercial Operation Date
CT	Combustion Turbine
Cut Plane	SDG&E Cut Plane is the aggregate flow of: South of SONGS (5-230 kV lines), 2-500/230 kV transformers at Central Substation, all 500/230 kV transformers at Miguel Substation, 1-230 kV Otay Mesa-Tijuana line, and the flow across the Q72 transmission system
Deliverability Assessment	CAISO's Deliverability Assessment
EO	Energy Only Deliverability Status
ECO	SDG&E's proposed East County Substation located between the Imperial Valley and Miguel substations
FC	Full Capacity Deliverability Status
FERC	Federal Energy Regulatory Commission
IC	Interconnection Customer
IID	Imperial Irrigation District
INT Cluster	Group of Cluster 2 projects located within SDG&E's cut plane
IV	Imperial Valley
IVA Cluster	Group of Cluster 2 projects located at the Imperial Valley 230 kV Substation
LFBs	Local Furnishing Bonds
LGIA	Large Generator Interconnection Agreement
LGIP	Large Generator Interconnection Procedures
Max	Maximum generation output
NERC	North American Electric Reliability Corporation
NG	Natural Gas
PEN	Palomar Energy
Phase I Study	Cluster 2 Phase I Study
PTO	Participating Transmission Owner
RAS	Remedial Action Scheme (also known as SPS)
POI	Point of Interconnection
POS	Plan of Service
PV	Photovoltaic
RASRS	Remedial Action Schemes Reliability Subcommittee
S	Solar
SCE	Southern California Edison Company
SCIT	Southern California Import Transmission
SDG&E	San Diego Gas & Electric Company
SPS	Special Protection System (also known as RAS)
SRPL	Sunrise Powerlink
ST	Steam Turbine
SWPL	Southwest Powerlink
TCA	Transmission Control Agreement
TJI	Tijuana Substation
W	Wind
WECC	Western Electricity Coordinating Council
WT	Wind Turbine

1. Executive Summary

In accordance with the Federal Energy Regulatory Commission (FERC) approved Large Generator Interconnection Procedures (LGIP) for Interconnection Requests in a Queue Cluster Window (CAISO Appendix Y), this Cluster 2 Phase I Study was initiated to determine the combined impact of all the Cluster 2 projects on the CAISO Controlled Grid.

Seven generation projects totaling a maximum net-output-to-grid of 1,257.5 MW are included in SDG&E's Cluster 2 Phase I Study. The Commercial Operation Dates proposed by these projects range from year 2012 to 2014. The study year represents SDG&E's 2014 system load and transmission system topology. This study report provides the following:

A. Transmission system impacts caused by the addition of Cluster 2 projects,

B. System reinforcements necessary to mitigate the adverse impacts of Cluster 2 projects under various system conditions,

C. Preliminary evaluation of the feasibility of Cluster 2 projects on the CAISO Controlled Grid, and

D. A list of required facilities and a non-binding, good faith estimate of cost responsibility and time to construct these facilities.

Project-specific confidential information for each project in Cluster 2 is not included in this Group Report. Each generation project will have its own specific Individual Project Report in Appendix A. Appendix A will include project information, Point of Interconnection (POI), dynamic models, Reliability Study results, and costs to interconnect and mitigate impacts on the transmission system. This Group Report includes only general results based on the cumulative impact of the Cluster 2 projects.

The ***Deliverability Assessment*** was performed by the CAISO pursuant to the On-Peak and Off-Peak Deliverability Assessment Methodologies to ensure the Deliverability Status requested by the Interconnection Customers (ICs). The On-Peak and Off-Peak Deliverability Assessment Methodologies are posted on the CAISO website at http://www.caiso.com/1c44/1c44b5c31cce0.html. Generation projects requesting Energy Only (EO) Deliverability Status were modeled with zero MW output in the Deliverability Assessment. Generation projects requesting Full Capacity (FC) Deliverability Status were modeled consistent with the Deliverability Assessment methodologies.

SDG&E, as the Participating Transmission Owner (PTO) under the direction of the CAISO, performed the ***Reliability Study*** for Cluster 2. Three sub-clusters were evaluated: "Internal (INT) Cluster," "Imperial Valley Area (IVA) Cluster," and "Boulevard (BU) Cluster." The INT Cluster consisted of two gas-fired projects totaling 508 MW. The IVA Cluster consisted of three solar photovoltaic projects totaling 600 MW. The BU Cluster consisted of two wind projects totaling 149.5 MW. The sub-clusters are defined in Table 1.1.

Table 1.1: SDG&E Cluster 2 Phase I

CAISO Queue Position	Point of Interconnection	Max MW	Fuel / Type	Cluster	COD
C555	Boulevard Substation 138 kV	92	W / WT	BU	11/22/2013
C561	Imperial Valley 230 kV Bus	200	S / PV	IVA	2/1/2013
C565	Sycamore-Miguel 230 kV Line	200	NG / CT	INT	5/1/2014
C574	Looping Otay Mesa-Miguel 230 kV Lines into a new Switchyard	308	NG / CT	INT	5/1/2013
C583	Boulevard Substation 138 kV	57.5	W / WT	BU	12/31/2012
C590	Imperial Valley 230 kV Bus	150	S / PV	IVA	12/31/2012
C608	Imperial Valley 230 kV Bus	250	S / PV	IVA	1/1/2013
	Total Generation	**1257.5**			

The Reliability Study included the following analyses:

A. Steady-State Power Flow

B. Short Circuit Duty

C. Transient Stability

D. Post-Transient Voltage Stability

E. Reactive Power Deficiency

The Reliability Study modeled the mitigation measures identified in the Deliverability Assessment. Results of the Reliability Study indicated that some Cluster 2 projects will be subject to dispatch limitations or real-time curtailment of their generation output for select N-1 and N-2 outages in the form of Special Protection Systems (SPSs). General information regarding SDG&E SPSs may be found in Section 4, Section 7, and Section 12 of this report.

To avoid the need for real-time normal condition (N-0) curtailments, the studies were also performed considering pre-contingency generation dispatch limitations. Additionally, it should be noted that real-time market conditions will dictate which projects' energy will be delivered to the CAISO Controlled Grid and be subject to these or other dispatch limitations.

Allocation of costs and generation tripping requirements for each project may be found in the project-specific reports (Appendix A). The proposed mitigation plan for the impacts to SDG&E facilities attributed to Cluster 2 consists of thirty-five (35) Reliability Network Upgrades (30 circuit breaker replacements and 5 Special Protection Systems) and eight (8) Delivery Network Upgrades. Table 1.2 summarizes the proposed mitigation plan for SDG&E facilities attributed to Cluster 2. Some of the projects in the SDG&E area were identified for contributing to overloads in the SCE system. The Delivery Network Upgrades associated with the overloads in the SCE system are presented in Table 1.3. The details are presented in the applicable project's

Appendix A and Attachment 1. (The total cost of the SCE upgrades is shown in Table 1.3. Applicable SDG&E Cluster 2 projects will share this cost with the applicable SCE Cluster 2 projects.) The PTO's Interconnection Facilities and Reliability Network Upgrades required to physically interconnect specific projects are identified (as appropriate) in each project's Appendix A and are not reflected in this Group Report.

Table 1.2: SDG&E Network Upgrades, Estimated Costs, Estimated Time to Construct

Type of Upgrade	Upgrade		Estimated Cost x 1,000 *(Note 1)*	Estimated Time to Construct *(Note 2)*
Reliability Network Upgrades	Participation in existing Imperial Valley SPS for multiple N-1 and N-2 contingencies *(Note 3 & 4)*	SDG&E protection and communication equipment for Imperial Valley Substation *(Note 5)*	[redacted]	12 Months
		Protection and communication equipment to interface between SDG&E and projects *(Note 6)*	[redacted]	12 Months
	Modification of existing Imperial Valley SPS to protect Otay Mesa-TJI 230 kV Line *(Note 3)*	SDG&E protection and communication equipment for Otay Mesa, Miguel, and Central substations *(Note 5)*	[redacted]	12 Months
	Participation in proposed SPS to protect ECO 500/230 kV Transformer *(Note 3)*	SDG&E protection and communication equipment for the ECO 500/230 kV transformer *(Note 6)*	[redacted]	12 Months
	Modification of existing Otay Mesa SPS to protect new Otay Mesa-South Bay *(Note 3)*	SDG&E protection and communication equipment for Otay Mesa, Miguel, Sycamore, South Bay, and Sycamore substations *(Note 5)*	[redacted]	12 Months
		Protection and communication equipment to interface between SDG&E and projects *(Note 6)*	[redacted]	12 Months
	New SPS to protect IV 500/230 kV Transformers *(Note 3)*	SDG&E protection and communication equipment for 3-500/230 kV transformers at Imperial Valley Substation *(Note 5)*	[redacted]	12 Months
	Upgrade 15 Mission 138 kV Circuit Breakers	Replace 15 breakers: MS13822 9N, MS13822 9S, MS13827 3S, MS13840 1N, MS13840 1S, MS50 2N, MS50 2S, MS51 6N, MS51 6S, MS52 8N, MS52 8S, MS60 4N, MS60 4S, MS61 7N, MS61 7S	[redacted]	18 Months
	Upgrade 15 San Luis Rey 230 kV Circuit Breakers	Replace 15 breakers: SA23001 2E, SA23001 2T, SA23002 1W, SA23003 3T, SA23003 3W, SA23004 5E, SA23004 5T, SA23006 1E, SA23006 1T, SA23010 2W, SA23011 4T, SA23011 4W, SA71 5W, SA72 4E, SA73 3E	[redacted]	12 Months

Table 1.2: SDG&E Network Upgrades, Estimated Costs, Estimated Time to Construct - Continued

Type of Upgrade	Upgrade		Estimated Cost x 1,000 *(Note 1)*	Estimated Time to Construct *(Note 2)*
Delivery Network Upgrades	New Otay Mesa-South Bay 230 kV Line *(Note 7)*	• Install 2-230 kV breakers, 2 disconnects, and structures and relaying at Otay Mesa • Install 1-230 kV breaker, 2 disconnects, and relaying at South Bay • Construct 18-mile overhead 230 kV line from Otay Mesa to South Bay	[redacted]	48 Months
	New South Bay-Mission 230 kV Line *(Note 7)*	• Install 1-230 kV breaker, 2 disconnects, and relaying at South Bay • Relocate lines and install 1-230 kV breaker and 2 disconnects and structures and relaying at Mission • Construct 16.6-mile overhead and underground 230 kV line from South Bay to Mission • Relocate 4.2 miles of a 138 kV underground line	[redacted]	66 Months
	New Sycamore-Penasquitos 230 kV Line	• Install 1-230 kV breaker, 2 disconnects, relays and UG structure at Sycamore • Install 2-230 kV breakers, 4 disconnects, relays and structures at Penasquitos • Construct 14-mile overhead and underground 230 kV line from Sycamore to Penasquitos	[redacted]	60 Months
	3rd Encina-San Luis Rey 230 kV Line	• Expand switchyard and add 230 kV bay with 2 breakers, 4 disconnects, structures and relays at San Luis Rey • Install 2-230 kV breakers, 4 disconnects, structures and relays in new proposed switchyard at Encina • Construct 9-mile overhead 230 kV line from Encina to San Luis Rey	[redacted]	54 Months
	Upgrade the Escondido-PEN 230 kV #1 Line Upgrade the Escondido-PEN 230 kV #2 Line	• Reconductor 2-230 kV lines from 605 ACSS/AW to 900 ACSS/AW • Relocate 2 overhead 69 kV circuits and convert to UG • Install 8-230 kV 3000 amp disconnects at Escondido	[redacted]	12 Months
	3rd Miguel 500/230 kV Transformer	• Install 3rd 500/230 kV transformer at Miguel Substation • Install 2-230 kV disconnects, 1-230 kV breaker, and the 230 kV bank leads • Develop 500 kV reactor site, relocate reactors, modify the 500 kV GIS for the reactor position and install the 500 kV bank leads in the old reactor position • Include all required structures and protection	[redacted]	60 Months
	2nd ECO 230/138 kV Transformer	• Intstall 2nd 230/138 kV Transformer at ECO Substation • Install 2-230 kV breakers and 2-230 kV disconnects • Install 2-138 kV breakers and 2-138 kV disconnects • Install all associated structures and relaying	[redacted]	36 Months
Total			[redacted]	Time to construct is not cumulative

Notes continued for Table 1.2:

Note 1: *Estimated costs include land purchases and licensing/permitting costs, when appropriate.*

Note 2: *Time to construct estimates include time for licensing/permitting, when appropriate. The estimated time to construct is for a typical project; construction duration may change due to the number of projects simultaneously in construction. Multiple projects impact resources, system outage availability, and environmental windows of construction. A key assumption is SDG&E will need to obtain CPUC licensing and regulatory approvals prior to design, procurement, and construction of the proposed facilities.*

Note 3: *All Special Protection Systems are classified as Reliability Network Upgrades because their cost is less than $1 million. This is to prevent overburdening of CAISO's congestion management system which can increase processing time to a point that could create reliability concerns.*

Note 4: *The existing Imperial Valley SPS protects SDG&E, CFE, and IID following various N-1 and N-2 contingencies. All new SPSs and modifications to existing SPSs are subject to review by Affected System Operators, members of the Imperial Valley RAS Technical Committee, and review and approval by the WECC RASRS.*

Note 5: *The SPS cost includes the equipment on the PTO's system. This is a one-time setup and equipment cost. The SPS cost does not include any control, protection, and/or fiber-optic communication costs at the projects' facility.*

Note 6: *The SPS cost includes project-specific equipment required on the PTO's system for interface with the projects, as well as equipment provided to the projects for installation at the projects' facility. Additional SPSs would require updated logic, but minimal/no cost.*

Note 7: *South Bay Substation is also known as Bay Boulevard Substation.*

Table 1.3: SCE Network Upgrades, Estimated Costs, Estimated Time to Construct

Type of Upgrade	Upgrade		Estimated Cost x 1,000 *(Note 1)*	Estimated Time to Construct *(Note 2)*
Reliability Network Upgrades	Eastern Area SPS	SPS to bypass Line Series Capacitor Bank on the Colorado River-Palo Verde 500 kV T/L under N-1 of the New Colorado River-Harquahala 500 kV T/L	[redacted]	24 months
Delivery Network Upgrades	2nd Alberhill-Serrano 500 kV Line	Install 26 Miles of new Single Circuit Line equipped with 2-2156 KCMIL ACSR Conductors, one ½-In. Steel OHGW and one OPGW	[redacted]	84 months
	New Colorado River-Harquahala 500 kV Line	Install about 119 miles of new 500 kV Transmission Line using single circuit structures equipped with 2-2156KCMIL ACSR Conductors	[redacted]	96 Months
	Series Capacitors for the New Colorado River-Harquahala 500 kV T/L	Install 500 kV Line Series Capacitor Bank on the New Colorado River- Harquahala 500 kV Transmission Line	[redacted]	96 Months
Total			[redacted]	Time to construct is not cumulative

Note 1: *This is the total cost of the Delivery Network Upgrades attributed to SDG&E and SCE Cluster 2 projects contributing to overloads in SCE's area. This total cost is shared by applicable SCE Cluster 2 and SDG&E Cluster 2 projects.*

Note 2: *The estimated time to construct (ETC) is for a typical project; schedules duration may change due to number of projects approved and release dates. Stacked projects impact resources, system outage availability, and environmental windows of construction. Assumption is SCE will need to obtain CPUC licensing and regulatory approvals prior to design, procurement and construction of the proposed facilities required to serve the interconnection customer and prerequisite facilities are in-service.*

Given the magnitude of the above upgrades in SDG&E and SCE areas, a non-binding, good faith estimate to license/permit, design, procure material, and construct all of these facilities could be 96 months or more from the execution of the Large Generator Interconnection Agreements (LGIAs).

Deliverability Assessment

The Deliverability Assessment studies identified a new Otay Mesa-South Bay 230 kV line, a new South Bay-Mission 230 kV line, a new Sycamore-Penasquitos 230 kV line, a third Encina-San Luis Rey 230 kV line, upgrades to two Escondido-PEN 230 kV lines, a third Miguel 500/230 kV transformer, a second ECO 230/138 kV transformer, and participation in a new Special Protection Systems (SPSs) to protect the Imperial Valley 500/230 kV transformers to mitigate overloads on the SDG&E transmission system. The study results are described in the project-specific Appendix A and Attachment 1 for each project.

Also, some of the projects were identified as contributing to overloads in the SCE transmission system. The studies identified a new Colorado River-Harquahala 500 kV line, a second Alberhill-Serrano 500 kV line, and participation in a new SPS to bypass the series capacitor bank on the Colorado River-Palo Verde 500 kV line under N-1 contingency.

Reliability Study Steady-State Thermal and Voltage Results

The steady-state power flow analysis considered existing system limitations for all sub-clusters under study. These system limitations included observing the combined 1,800 MVA flow limit of the two existing Miguel 500/230 kV transformers and observing the Path 43 rating of 2,440 MW. The dispatch of existing Imperial Valley generation was consequently limited to allow dispatch of various generators in this study.

Under the scenarios studied, the addition of the recommended Delivery Network Upgrades mitigates all overloads caused by the dispatch of the IVA Cluster with the exception of one (1) new Category B overload of the Otay Mesa-Tijuana 230 kV transmission line. This overload can be mitigated by modifying the existing Special Protection System to trip generation at Imperial Valley. The Imperial Valley SPS (IV SPS) trips generation connected to the Imperial Valley and/or Boulevard and/or East County (ECO) substations and/or the C493 switchyard to protect the SDG&E, Comision Federal de Electricidad (CFE), and Imperial Irrigation District (IID) transmission systems for various N-1 and N-2 contingencies.

Under the scenarios studied, the addition of the recommended Delivery Network Upgrades mitigates all overloads caused by the dispatch of the BU Cluster. Generators in the BU Cluster will be required to participate in the proposed ECO/Boulevard SPS which trips all dispatched generation connected at ECO and Boulevard substations following the outage of the 500/230 kV transformer at ECO Substation. Also, generators in the BU Cluster will be required to participate in the existing IV SPS, which trips generation to protect SDG&E, CFE. and IID transmission facilities following various N-1 and N-2 contingencies.

Under the scenarios studied, the addition of the recommended Delivery Network Upgrades mitigate all overloads caused by the dispatch of the INT Cluster with the exception of one (1) new Category C overload of the proposed Otay Mesa-South Bay 230 kV transmission line. This overload can be mitigated by modifying the existing Otay Mesa SPS to add tripping of the INT Cluster generation under these conditions.

No steady-state voltage violations were observed in the SDG&E transmission system due to the addition of the IVA, BU, or INT Cluster generation projects.

Power factor study results indicated that the IVA cluster projects did not satisfy the minimum power factor requirements per the Large Generation Interconnection Agreement (LGIA) Section 9.6. These results may be due to modeling issues and will be further evaluated in the Phase II Study. The ICs must modify the project power flow models (.epc files) such that the project generators are capable of meeting these power factor criteria

Short Circuit Analysis

Short circuit analysis results indicate that thirty (30) SDG&E transmission circuit breakers become overstressed with the addition of all Cluster 2 generator projects plus the associated Delivery Network Upgrades.

Short circuit analysis results also indicate that transmission circuit breakers on the CFE transmission system become overstressed with the addition of all Cluster 2 generator projects plus the associated Delivery Network Upgrades.

Transient Stability Analysis

Using the generator models submitted for Cluster 2 and following selected disturbances, the transient stability analysis concluded that the user written dynamic model for one of the IVA Cluster projects has incorrect parameters which during the disturbance simulations results in division by zero. This model was consequently removed from the case. After a valid dynamic model is re-submitted to CAISO/SDG&E, the project's transient stability performance will be re-evaluated in Phase II.

The BU Cluster and remaining two IVA Cluster projects did not cause voltage or frequency violations, but the addition of the INT Cluster projects caused two (2) new voltage violations. In all sub-cluster studies, there were pre-existing voltage violations in the CFE area. These results are a known problem in CFE and could be attributed to dynamic modeling issues within CFE's transmission system and will be further evaluated in the Phase II studies.

Post-Transient Voltage Stability Analysis

Post-transient voltage stability analysis indicated that, under the studied conditions and system configuration (including all Delivery Network Upgrades), the addition of the IVA, BU, and INT Cluster generation did not result in any post-transient voltage deviations of 5% or more for Category B contingencies and 10% or more for Category C contingencies from the pre-project levels or cause the SDG&E transmission system to fail to meet applicable voltage criteria.

Reactive Power Deficiency Analysis

Reactive power deficiency analysis results indicated that the addition of all Cluster 2 generator projects (including the associated Delivery Network Upgrades) does not adversely impact the reactive power margin of the SDG&E transmission system, as studied.

Local Furnishing Bonds

At this time, it appears that the energy produced by generators in Cluster 2 will not cause an Impairment to the tax-exempt status of the Local Furnishing Bonds (LFBs) involving the Amended Annual Net Importer Test set forth in the IRS supplemental letter ruling dated

July 7, 2009. This situation will continue to be monitored to determine if this conclusion remains the reasonable expectation based on any change in material facts relevant to determining whether an Impairment may arise. However, certain project developers may be required to submit to FERC an application under Section 211 of the Federal Power Act to avoid causing an Impairment involving the Character Test under applicable IRS private letter rulings as supplemented from time to time. The results of the Local Furnishing Bonds analysis for each generator project can be found both in Section 16 and in the project-specific appendix, Appendix A.

Affected Systems

Based on the results of the Deliverability Assessment and the Reliability Study, which also evaluated the addition of Delivery Network Upgrades, the CFE and IID transmission systems may be Affected Systems due to adverse impacts caused by the addition of Cluster 2 projects as identified in the steady-state thermal, transient voltage stability, and short circuit analyses.

2. Cluster Interconnection Information

Seven generation projects totaling a maximum net-output-to-grid of 1257.5 MW are included in SDG&E's Cluster 2 Phase I Study. Table 2.1 lists SDG&E's Cluster 2 projects with essential data obtained from the CAISO Controlled Grid Generation Queue. Five generation projects in SDG&E's Phase I Study utilize renewable resources; two generation projects utilize wind energy and three generation projects utilize solar photovoltaic systems. The two non-renewable projects are combustion turbines fueled by natural gas.

Table 2.1: SDG&E Cluster 2 Phase I

CAISO Queue Position	Point of Interconnection	Max MW	Fuel / Type	Cluster
C555	Boulevard Substation 138 kV	92	W / WT	BU
C561	Imperial Valley 230 kV Bus	200	S / PV	IVA
C565	Sycamore-Miguel 230 kV Line	200	NG / CT	INT
C574	Looping Otay Mesa-Miguel 230 kV Lines into a new Switchyard	308	NG / CT	INT
C583	Boulevard Substation 138 kV	57.5	W / WT	BU
C590	Imperial Valley 230 kV Bus	150	S / PV	IVA
C608	Imperial Valley 230 kV Bus	250	S / PV	IVA
	Total Generation	**1257.5**		

SDG&E performed the Reliability Study under the direction of the CAISO. For the Reliability Study, the generator projects were grouped based on their interconnection points and shared transmission needs. The Reliability Study evaluated three sub-clusters: Boulevard (BU) Cluster, Imperial Valley Area (IVA) Cluster, and Internal (INT) Cluster.

The IVA Cluster is comprised of three Full Capacity generation projects with a combined maximum output totaling 600 MW as listed in Table 2.2 and shown in Figure 2.1. The IVA Cluster study simulated the adverse condition of the SDG&E transmission system with relatively high imports from the East.

Table 2.2: Imperial Valley Area Cluster

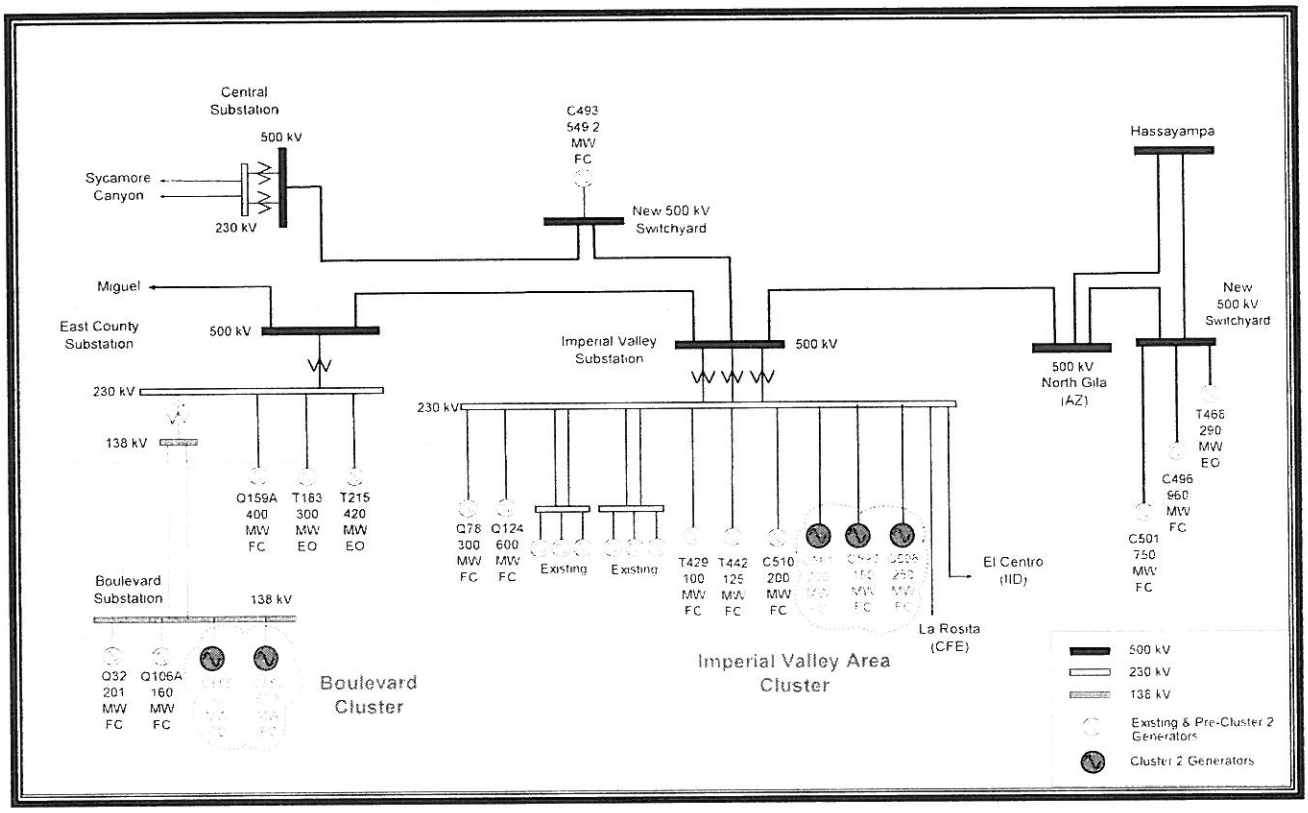
CAISO Queue Position	Point of Interconnection	Max MW	Fuel/Type	Cluster
C561	Imperial Valley 230 kV Bus	200	S / PV	IVA
C590	Imperial Valley 230 kV Bus	150	S / PV	IVA
C608	Imperial Valley 230 kV Bus	250	S / PV	IVA
	Total Generation	**600**		

The Boulevard Cluster is comprised of two Full Capacity generation projects with a combined maximum output totaling 149.5 MW as listed in Table 2.3 and shown in Figure 2.1. The BU Cluster study simulated the adverse condition of the SDG&E transmission system with relatively high imports from the East.

Table 2.3: Boulevard Cluster

CAISO Queue Position	Point of Interconnection	Max MW	Fuel/Type	Cluster
C555	Boulevard Substation 138 kV	92	W / WT	BU
C583	Boulevard Substation 138 kV	57.5	W / WT	BU
	Total Generation	**149.5**		

Figure 2.1: Imperial Valley Area Cluster and Boulevard Cluster Interconnections

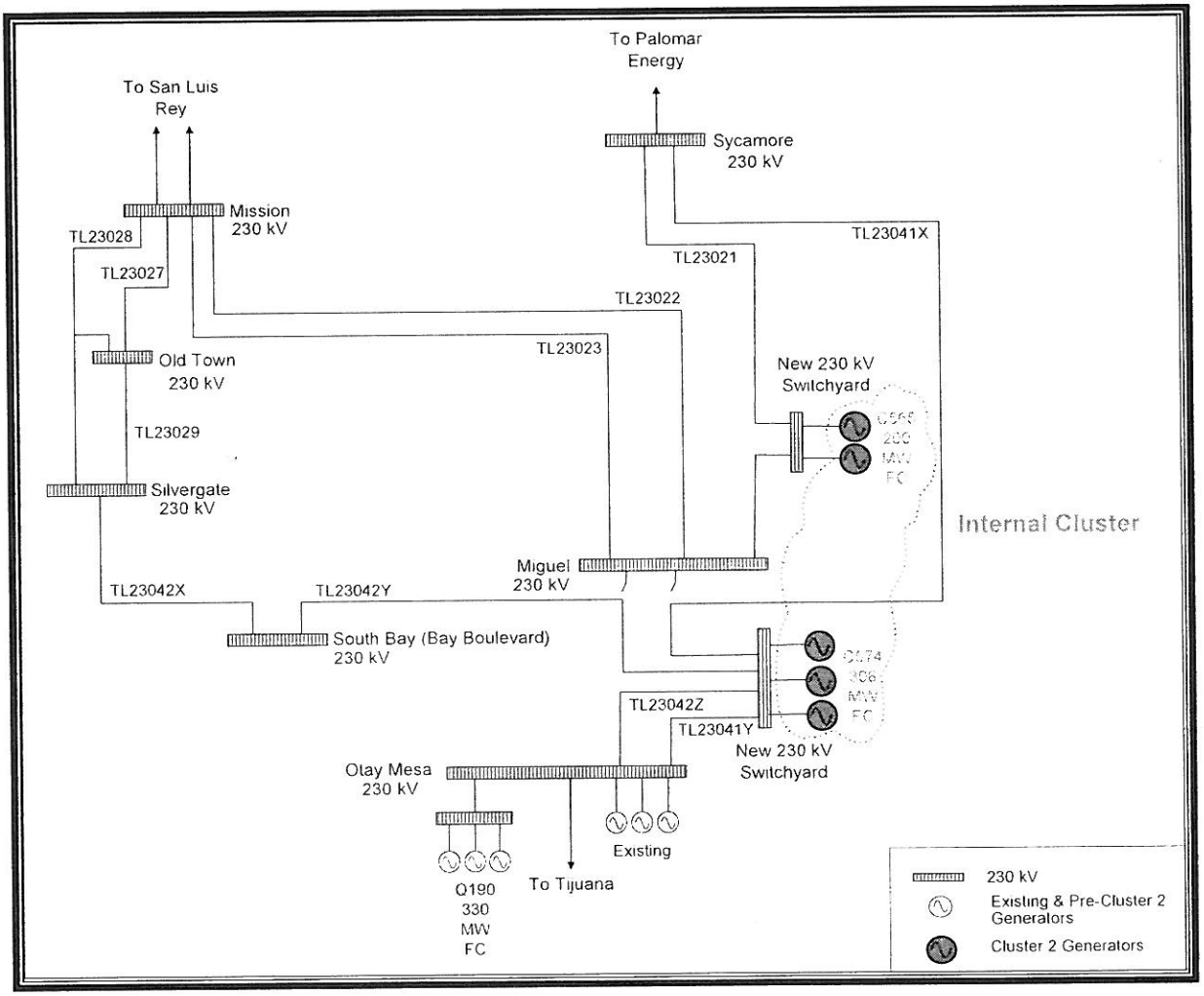


The Internal Cluster is comprised of two Full Capacity generator projects with a combined maximum generation output of 508 MW as listed in Table 2.4 and shown in Figure 2.2. The INT Cluster study simulated the adverse condition of maximum generation in the Otay Mesa Area.

Table 2.4: Internal Cluster

CAISO Queue Position	Point of Interconnection	Max MW	Fuel/Type	Cluster
C565	Sycamore-Miguel 230 kV Line	200	NG / CT	INT
C574	Looping Otay Mesa-Miguel 230 kV Lines into a new Switchyard	308	NG / CT	INT
	Total Generation	**508**		

Figure 2.2: Internal Cluster Interconnections



3. Study Objectives

This Phase I Interconnection study was performed in accordance with Section 6.2 of Appendix Y of the CAISO tariff, which states:

"The Phase I Interconnection Study shall:

(i) evaluate the impact of all Interconnection Requests received during the Queue Cluster Window on the CAISO Controlled Grid,

(ii) preliminarily identify all Network Upgrades needed to address the impacts on the CAISO Controlled Grid of the Interconnection Requests,

(iii) preliminarily identify for each Interconnection Request required Interconnection Facilities,

(iv) assess the Point of Interconnection selected by each Interconnection Customer and potential alternatives to evaluate potential efficiencies in overall transmission upgrades costs,

(v) establish the maximum cost responsibility for Network Upgrades assigned to each Interconnection Request in accordance with LGIP Section 6.3, and

(vi) provide a good faith estimate of the cost of Interconnection Facilities for each Interconnection Request. "

In order to achieve the above objectives, this same section 6.2 explains what specific studies need to be done:

"The Phase I Interconnection Study will consist of a short circuit analysis, a stability analysis to the extent the CAISO and applicable Participating TO(s) reasonably expect transient or voltage stability concerns, a power flow analysis, including off-peak analysis, and an On-Peak and Off-Peak Deliverability Assessment(s), as applicable, in accordance with LGIP Section 6.3.2.

The Phase I Interconnection Study will state for each Group Study or Interconnection Request studied individually (i) the assumptions upon which it is based, (ii) the results of the analyses, and (iii) the requirements or potential impediments to providing the requested Interconnection Service to all Interconnection Requests in a Group Study or to the Interconnection Request studied individually.

The Phase I Interconnection Study will provide, without regard to the requested Commercial Operation Dates of the Interconnection Requests, a list of Network Upgrades to the CAISO Controlled Grid that are preliminarily identified and required as a result of the Interconnection Requests in a Group Study or as a result of any Interconnection Request studied individually and Participating TO's Interconnection Facilities associated with each Interconnection Request, and an estimate of any other financial impacts (i.e., on Local Furnishing Bonds). "

All the required analysis was completed to identify the Interconnection Facilities and Network Upgrades necessary to safely and reliably interconnect the Cluster 2 projects into the CAISO Controlled Grid. An estimated cost and construction schedule for these facilities has also been provided in this report.

4. Study Assumptions

4.1 Power Flow Base Cases

4.1.1 Deliverability Assessment

The Deliverability Assessment was performed by the CAISO pursuant to the On-Peak and Off-Peak Deliverability Assessment Methodologies to ensure the Deliverability Status requested by the IC. Generation projects requesting EO Deliverability Status were modeled with zero MW output in the Deliverability Assessment. Generation projects requesting FC Deliverability Status were modeled consistent with the methodologies to evaluate deliverability. Projects requesting FC were modeled at their Net Qualifying Capacity (NQC) in the On-Peak and Off-Peak Deliverability Assessments.

In the On-Peak scenario, the Summer Peak Qualified Capacity (QC) for proposed FC generation projects is set to 64% of the requested PMax for wind generation and 100% of the requested PMax for solar generation initially. The Summer Peak QC may be adjusted to 40% of the requested PMax for wind generation and 85% for solar generation if a mix of different fuel type generation is identified in the Deliverability Assessent as the 5% DFAX group for a transmission limitation. In the Off-Peak scenario, the proposed FC wind generation is dispatched at its requested PMax and solar generation at 85% of its requested PMax. Gas-fired combustion turbines were assumed to be off-line.

The base cases studied reflect a 2014 SDG&E system configuration with all CAISO-approved transmission projects through 2014. In addition, pre-Cluster 2 generation projects with associated Network Upgrades and Special Protection Systems were modeled. A second Hassayampa-North Gila 500 kV transmission line planned for 2014 in Arizona Public Service's service territory was included in the base cases.

4.1.2 Reliability Study

The Reliability Study evaluated the three sub-clusters under Heavy Summer and Light Load system conditions. The transmission system configuration used for the Reliability Study base cases was the same as for the Deliverability Assessment. The base cases that modeled Cluster 2 projects also modeled the associated Cluster 2 Delivery Network Upgrades identified in the Deliverability Assessment.

The Reliability Study modeled simultaneous maximum dispatch for both pre-Cluster 2 and Cluster 2 generation in Heavy Summer and Light Load cases.

The Heavy Summer and Light Load cases used for the Reliability Study evaluated thermal loading, short circuit, transient stability, post-transient voltage stability, and SDG&E operating voltage and power factor requirements at the POI. The descriptions of each case are listed in Table 4.1.

Definitions for abbreviations used to define cases in Table 4.1:

A. **IVA**: Imperial Valley Area Cluster

B. **BU:** Boulevard Cluster

C. **INT:** Internal Cluster

D. **Pre:** Base case modeling pre-Cluster 2 scenario

E. **Pst:** Base case modeling post-Cluster 2 scenario

F. **Up:** Base case modeling post-Cluster 2 scenario with CAISO Deliverability Assessment upgrades

G. **C2_14:** Cluster 2; Year 2014 Load

H. **Numeric suffixes:** Revision number

Table 4.1: Reliability Study Case Description

Season Heavy Summer or Light Load	Cluster	Pre/Post	Case Name
Heavy Summer	INT	Pre	c2_14hs_pre_int9.sav
	INT	Post	c2_14hs_pst_int6up.sav
	BU/IVA	Pre	c2_14hs_pre_iv4.sav
	BU	Post	c2_14hs_pst_bu5up.sav
	IVA	Post	c2_14hs_pst_iv5up.sav
Light Load	INT	Pre	c2_14ll_pre_int_825ps.sav
	INT	Post	c2_14ll_pstup_int_825ps_rev1.sav
	BU	Pre	c2_14ll_pre_bu_rev2.sav
	BU	Post	c2_14ll_pstup_bu_rev2.sav
	IVA	Pre	c2_14ll_pre_iva_rev2.sav
	IVA	Post	c2_14ll_pstup_iva_rev2.sav

4.2 Load and Import

4.2.1 Deliverability Assessment

The Deliverability Assessment On-Peak case modeled 5,171 MW load + losses (1-in-5 load forecast) in the SDG&E system with an import target as shown in Table 4.2. The Off-Peak case modeled 2,585 MW load + losses in the SDG&E system with path flow target as shown in Table 4.3.

Table 4.2: On-Peak Deliverability Assessment Import Target

Branch Group (BG) Name	BG Import Direction	Net Import MW	Import Unused ETC MW
Lugo_victrville_BG	N-S	1138	171
COI_BG	N-S	3770	548
BLYTHE_BG	E-W	107	0
CASCADE_BG	N-S	1	0
CFE_BG	S-N	-55	0
ELDORADO_BG	E-W	1158	0
IID-SCE_BG	E-W	315	0
IID-SDGE_BG	E-W	-159	0
INYO_BG	E-W	0	0
LAUGHLIN_BG	E-W	0	0
MCCULLGH_BG	E-W	30	316
MEAD_BG	E-W	469	505
MERCHANT_BG	E-W	439	0
N.GILABK4_BG	E-W	-140	168
NOB_BG	N-S	1469	0
PALOVRDE_BG	E-W	3139	175
PARKER_BG	E-W	108	27
SILVERPK_BG	E-W	0	0
SUMMIT_BG	E-W	0	0
SYLMAR-AC_BG	E-W	0	471

Table 4.3: Off-Peak Path Flows

Path	Spring Ave. Flow (MW)	Fall Ave. Flow (MW)	Spring Max Flow (MW)	Fall Max Flow (MW)
Path 66 (N-S)	2957		4382	
Path 49 (E-W)		5734		7015
Path 46 (E-W)		6446		8575
Path 66 Period	May 1 thru June 1		May 1 thru June 1	
Path 46 and 49 Period		Oct 1 thru Nov 1		Oct 1 thru Nov 1

4.2.2 Reliability Study

The Reliability Study evaluated the SDG&E system for two adverse conditions. Power flow base cases representing the 2014 Heavy Summer load conditions and 2014 Light Load conditions were used to evaluate the impact of the proposed generation projects in Cluster 2.

The SDG&E Cut Plane encircles SDG&E's In-Basin transmission system, load, and generation. The SDG&E Cut Plane is the aggregate flow of: South of SONGS (5-230 kV transmission lines), 2-500/230 kV transformers at Central Substation, 2-500/230 kV

transformers at Miguel Substation, 1-230 kV Otay Mesa-Tijuana transmission line, and the flow across the Q72 transmission system.

The Heavy Summer cases represented high load, relatively high Cut Plane imports, and low internal generation. For the BU and IVA Cluster studies, the SDG&E system was modeled with a 5,277 MW (load + losses) target (1-in-10 load forecast) and a 4,000 MW Cut Plane import target. The Light Load cases represented low load, relatively high Cut Plane imports, and low internal generation. The SDG&E area was modeled with a 2,824 MW (load + losses) target and a 2,000 MW Cut Plane import target. For the Heavy Summer Pre-Cluster 2 Internal Cluster study, the SDG&E system was modeled with a 5,277 MW (load + losses) target and a 3,600 MW Cut Plane import target. In the Heavy Summer post-Internal Cluster case, the Cut Plane import target was modeled at 3,092 MW to reflect displacing external generation for internal generation dispatch. In the Light Load Post-Internal Cluster case, the Cut Plane import target was modeled at 971 MW to reflect displacing external generation for internal generation dispatch.

While it is impractical to study all combinations of system load and generation levels during all seasons and at all times of the day, the base cases were developed to represent stressed scenarios of loading and generation conditions for the various clusters. The load, resource, and dispatch summary tables are included in Appendix C.

4.3 Generation Dispatch

The generation dispatch differed for the Deliverability Assessment and the Reliability Study as follows:

4.3.1 Deliverability Assessment

Cluster 2 projects had the option of choosing a Deliverability Status of FC or EO. All generators, regardless of Deliverability Status, are responsible for Interconnection Facilities and Reliability Network Upgrades. The Deliverability Assessment studied only FC generators for their ability to deliver their output to the CAISO Grid. According the posted Deliverability Assessment Methodology, EO resources are dispatched only if it is necessary to balance load and maintain expected import levels, however these units should not contribute to any facility overloads or mitigate any overloads. More details about the dispatch used in the Deliverability Assessment can be found in the Deliverability Assessment Methodologies.

4.3.2 Reliability Study

In the Reliability Study, an attempt was made to dispatch all generation in the study area including SDG&E projects in the CAISO Queue (pre-Cluster 2) at maximum generation output. Curtailment of existing, pre-Cluster 2, and Cluster 2 generation was required for certain scenarios as discussed in Section 7. The base case assumptions are listed in Table 4.4.

SDG&E's Out-of-Basin generation includes existing and proposed generation interconnected at the ECO Substation, Boulevard Substation, Imperial Valley Substation, Imperial Valley-Central 500 kV transmission line (Sunrise Powerlink), and

North Gila-Hassayampa 500 kV transmission line. A detailed list of Out-of-Basin generation may be found in Table 7.1.

Table 4.4: Reliability Study Base Case Assumptions, MW

		Heavy Summer		Light Load	
		IVA/BU Pre-case	INT Pre-case	IVA/BU Pre-case	INT Pre-case
CAISO Load +Losses		61,468	61,508	33,516	33,495
SDG&E					
	Load+Losses	5,345	5,366	2,945	2,923
	Area Generation	4,126	5,135	4,821	4,424
	Imports	1,219	231	-1,876	-1,501
SDG&E Cut Plane		4,000	3,269	2,002	1,473
In-Basin Generation		1,212	3,164	837	1,379
Out-of-Basin Generation		2,914	1,971	3,984	3,045
PG&E					
	Load+Losses	29,451	29,450	15,200	15,217
	Area Generation	26,041	25,546	11,140	10,858
	Imports	3,409	3,904	4,059	4,359
SCE					
	Load+Losses	26,673	26,692	15,371	15,355
	Area Generation	19,868	19,392	9,362	10,021
	Imports	6,804	7,300	6,008	5,334
IID					
	Load+Losses	1,016	1,023	549	542
	Area Generation	1,229	1,236	1,012	1,004
	Imports	-213	-213	-463	-462
CFE					
	Load+Losses	2,862	2,857	1,164	1,157
	Area Generation	3,062	3,057	1,514	1,507
	Imports	-200	-200	-350	-350
Arizona (Area 14)					
	Load+Losses	21,338	21,331	10,696	10,684
	Area Generation	28,064	28,056	17,609	17,596
	Imports	-6,726	-6,726	-6,913	-6,913
Path 43 (North of SONGS)		1,476	2,009	2,440	2,278
Path 44 (South of SONGS)		675	141	-290	-128
Path 45 (CFE-SDG&E)		200	200	350	350
Path 66 (COI)		4,611	4,535	2,489	2,489
SCIT (Southern CA Import Transmission)		14,536	14,050	5,144	4,695

4.4 New Transmission Projects

All CAISO-approved projects with in-service dates before or in 2014 were modeled in the base cases. Table 4.5 lists the planned SDG&E system additions and upgrades modeled in the cases.

Table 4.5: Planned SDG&E System Additions and Upgrades

Project
Proposed East County Substation 500/230/138 kV (also known as ECO) *(Note 1)*
Proposed Boulevard 138/69/12 kV Substation *(Note 1)*
Proposed Boulevard-ECO 138 kV Transmission Line *(Note 1)*
Sunrise Powerlink 500 kV Transmission Project
Bay Boulevard Substation – South Bay Substation Relocation Project *(Note 2)*
Reconductor Los Coches-Alpine 69 kV Transmission Line
Reconfigure Carlton Hills-Sycamore-Santee and Carlton Hills-Mission to Carlton Hills-Sycamore and Sycamore-Santee 138 kV Transmission Lines
Loop TL651 (National City-Wabash) into Silvergate
Reconductor Escondido-Felicita Tap 69 kV Transmission Line
Reconductor Talega-Pico 138 kV Transmission Line
New San Mateo-Laguna Niguel 138 kV Tap
Reconductor Pomerado-Sycamore 69 kV Transmission Line
Second 230/138 kV Transformer at Miguel
Reconductor East Gate-Rose Canyon 69 kV Transmission Line
Calavera Tap Enhancement – Reconductor Shadowridge-Calavera Tap-Cannon and Cannon-Encina Hub. Re-arrange Calavera Tap-Shadowridge and Calavera Tap-Cannon to eliminate tap and form two new lines.
Reconductor Peñasquitos-Del Mar 69 kV Transmission Line
New Escondido- Ash 69 kV Transmission Line # 2
Reconductor San Luis Rey-Melrose tap 69 kV Line Section
Reconductor Peñasquitos-North City West 69 kV Transmission Line
Reconductor Poway-Pomerado 69 kV Transmission Line
Replace Los Coches 138/69 kV Bank 51
Upgrade TL644 South Bay – Sweetwater 69 kV *(Note 3)*
Upgrade terminal line equipment on TL642A South Bay – Montgomery Tap 69 kV *(Note 4)*
Upgrade terminal line equipment on TL603B Sweetwater - Sweetwater Tap 69 kV *(Note 4)*

Note 1: The Permit to Construct for East County Substation and associated Boulevard Substation upgrades are currently under review by the CPUC.

Note 2: The Permit to Construct for the South Bay Relocation Project is currently under review by the CPUC. The relocated substation will be named Bay Boulevard. Bay Boulevard is known as South Bay in this Phase I Study.

Note 3: This project is being evaluated by the CAISO and has not received approval yet. The proposed rating was modeled to ensure that it is adequate for Cluster 2.

Note 4: This project does not require CAISO approval. SDG&E intends to increase the rating of the line. The proposed rating was modeled to ensure that it is adequate for Cluster 2.

4.5 Pre-Cluster 2 Generation Projects

All pre-Cluster 2 generation projects, as listed in Table 4.6, were modeled in the base cases. However, some generation projects were either turned off or modeled with reduced output to create a more stressed case for the Reliability Study and to observe generation dispatch limitations as discussed in Section 7.2.

Table 4.6: Pre-Cluster 2 Generation Projects

Queue Position	Point of Interconnection
13	Olivenhain-Bernardo-Rancho Santa Fe 69 kV Line
32	Boulevard Substation 138 kV
72	Proposed Lee Lake Substation
78	Imperial Valley Substation 230 kV Bus
103	Border Substation 69 kV
106A	Boulevard Substation 138 kV
124	Imperial Valley Substation 230 kV Bus
137	Encina Substation 230kV Bus
150	Border Substation 69 kV
159A	Imperial Valley-Miguel via proposed ECO 500/230 kV Sub 230 kV Bus
183	Imperial Valley-Miguel via proposed ECO 500/230 kV Sub 230 kV Bus
189	Encina 138 kV Substation
190	Otay Mesa 230 kV Substation
201	Pala Substation 69 kV
215	Imperial Valley-Miguel via proposed 230/500 kV Sub 230 kV Bus
337	Borrego Substation 69 kV
429	Imperial Valley Substation 230 kV
442	Imperial Valley Substation 230 kV
468	Hassayampa-North Gila 500 kV Line
480	Borrego Substation 69 kV
493	Sunrise Powerlink 500 kV Line
496	Hassayampa-North Gila 500 kV Line
501	Hassayampa-North Gila 500 kV Line
509	El Cajon Substation 69 kV
510	Imperial Valley Substation 230 kV

Reliability Network Upgrades and Delivery Network Upgrades associated with these generation projects were also modeled in the base cases if there is an executed Large Generator Interconnection Agreement with the Interconnection Customer and the mitigation is listed in the LGIA. These upgrades are listed in Table 4.7.

Table 4.7: Network Upgrades and SPSs for Pre-Cluster 2 Projects

Project
Third Imperial Valley 500/230 kV Transformer
Reconductor Border-Border Tap 69 kV, Otay-Otay Lake Tap 69 kV, and Otay Lake Tap-San Ysidro 69 kV Transmission Lines
Upgrade Pala-Monserate Tap 69 kV Transmission Line
Upgrade Monserate-Monserate Tap 69 kV Transmission Line
Upgrade Pala-Lilac 69 kV Transmission Line
Temporary SPS to Protect Warners-Rincon 69 kV Transmission Line
Dispatch limitation and accompanying SPS to limit ECO and Boulevard 138 kV generation to a maximum of 1,150 MW
Second Poway-Pomerado 69 kV Transmission Line
Reconductor Bernardo-Rancho Carmel 69 kV Line
Reconductor Poway-Rancho Carmel 69 kV Line
New Camp Pendleton 500/230 kV Substation with associated transmission line upgrades *(Note 1)*

Note 1: On November 2, 2009, FERC issued an order accepting CAISO joint compliance filing with SDG&E of revisions to the unexecuted LGIA for the SDG&E portion of the [Q72] project and declared the LGIA effective as of May 11, 2008. The unexecuted LGIA is therefore treated as executed and the upgrades are modeled as described in the "Conceptual One-Line Diagram" and "Description of Transmission Line Upgrades" sections of the unexecuted LGIA.

4.6 Other SPSs and Operator Actions

4.6.1 Imperial Valley SPS

The output from the existing and queued generation connected to the Imperial Valley Substation must comply with the CAISO generation tripping limitation of 1,150 MW for a Category B contingency and 1,400 MW tripping limitation of net generation and load, if required, for a Category C contingency. New generation projects connecting to SDG&E's transmission facilities Out-of-Basin will also be required to participate in the existing Imperial Valley generation SPS, which protects the SDG&E, CFE, and IID transmission systems for various N-1 and N-2 contingencies.

CFE has an internal SPS that monitors the CFE 230kV lines, La Rosita–Rumorosa and La Rosita-Herradura. During non-summer operation, when CFE is likely to be exporting, if loading is above 388 MVA on either line and TL23050 (Imperial Valley–La Rosita 230 kV line) flow is from Imperial Valley to La Rosita, a trip signal will be sent in 2 seconds to open TL23050. During summer operation, when CFE is likely to be importing, TL23040 (Otay Mesa–Tijuana 230kV line) is tripped instead of TL23050.

The following 500 kV contingencies associated with ECO and Imperial Valley substations may require tripping of generation projects connecting to SDG&E's transmission facilities Out-of-Basin (existing, pre-Cluster 2):

A. Category B contingencies with up to 1,150 MW of generation tripping

1. Imperial Valley-ECO 500 kV (segment of Southwest Powerlink (SWPL) after looping into ECO)

2. ECO-Miguel 500 kV (segment of SWPL after looping into ECO)

B. Category C contingencies with up to 1,400 MW of generation tripping

1. Imperial Valley-ECO 500 kV (segment of SWPL after looping into ECO) and Imperial Valley-C493 500 kV (segment of Sunrise Powerlink after looping into C493).

In addition to the contingencies mentioned above, there are additional conditions under which the generators may be tripped. The design and operation of the IV SPS will need to be further evaluated to incorporate contingencies, including Sunrise Powerlink. With Sunrise Powerlink in-service, the IV SPS must be re-evaluated to establish new generation tripping limits (or verify existing limits). All new SPSs and modifications to existing SPSs are subject to review by Affected System Operators, members of the Imperial Valley RAS Technical Committee, and review and approval by WECC RASRS.

4.6.2 Operating Procedures

Operating procedures (which may include curtailing the output of Cluster 2 projects during planned or extended forced outages) may be required for reliable operation of the transmission system. These procedures, if needed, will be developed before the projects' Commercial Operation Date.

5. Study Criteria and Methodology

The CAISO-Controlled Grid Reliability Criteria, which incorporates the Western Electricity Coordinating Council (WECC) and the North American Electric Reliability Corporation (NERC) planning criteria, was used to evaluate the impact of the Cluster 2 projects on the CAISO-Controlled Grid.

5.1 Steady-State Study Criteria

5.1.1 Normal Overloads

Normal overloads are those that exceed 100 percent of continuous facility ratings. The WECC/NERC Criteria requires the loading of all transmission system facilities be within their normal, continuous ratings. Normal overloads (Category A) refer to overloads that occur during normal operating conditions (no contingency, N-0).

5.1.2 Emergency Overloads

Emergency overloads are those that exceed 100 percent of emergency ratings. Emergency overloads refer to overloads that occur during single element contingencies (Category B, N-1) and multiple element contingencies (Category C, N-2).

5.1.3 Voltage Violations

SDG&E's voltage criteria for Category A, B, and C are listed below. Violations will occur if voltage deviations exceed the specified ranges for the following operating conditions:

A. Category A: Steady-state voltage criteria require all bus voltages to be within +/-5% nominal voltage for normal operating conditions.

B. Category B or Category C: Steady-state voltage criteria require 69 kV, 138 kV, and 230 kV bus voltages to be within +5%/-10% nominal voltage following Category B contingencies. Steady-state voltage criteria require 500 kV buses to be within distinct ranges, as listed below, following Category B or Category C contingencies:

   1. Imperial Valley 500 kV Bus: +10%/-5.5% from nominal voltage (500 kV)
   2. Miguel 500 kV Bus: +10%/-5.5% from nominal voltage (500 kV)
   3. North Gila 500 kV Bus: +10%/-0% from nominal voltage (500 kV)

5.1.4 Contingencies

The contingencies used in this analysis are provided in Appendix F. Various categories of three line-to-ground (3LG) and single line-to-ground (SLG) faults were applied for the contingencies used as summarized in Table 5.1.

Table 5.1: Power Flow Contingencies

Contingencies	Description
CAISO Category A (No contingency)	All facilities in service – Normal Conditions
CAISO Category B	• B1 - Any single generator outages. • B2 - Any single transmission circuit outages. • B3 - Any single transformer outages. • Selected overlapping single generator and transmission circuit outages. *(Note 1)*
CAISO Category C	• C1 - SLG Fault, with Normal Clearing: Bus outages (60-230 kV) • C2 - SLG Fault, with Normal Clearing: Breaker failures (excluding bus tie and sectionalizing breakers) at the same bus section above. • C3 - Combination of any two-generator/transmission line/transformer outages

Note 1: The Reliability Study cases modeled relatively high imports *and low internal generation. The low internal generation represents the effect of a single generator outage.*

Although most of the CAISO Category C contingencies are considered during the Phase I Study, it is impractical to study all possible combinations of any two elements being out of service throughout the system. Therefore, as allowed under NERC standard TPL-003-0 R1.3.1, only selected credible and/or critical Category C contingencies (C1 – C3) that were deemed most severe were evaluated in this study.

5.2 Short Circuit Duty Criteria

Short circuit studies are performed to determine the maximum fault duty on all buses in the SDG&E service territory. This study determines the impact of increased fault current resulting from the Cluster 2 projects. Short circuit results will allocate costs for overstressed breakers to each cluster, which are formed from generation projects with a fault contribution above a threshold value. The ASPEN OneLiner Version 11.6 with Breaker Rating Module program was used to conduct the detailed short circuit studies simulating three line-to-ground (3LG) and single line-to-ground (SLG) faults.

The criteria in Table 5.2 are used to determine when SDG&E transmission circuit breakers will become overstressed.

Table 5.2: SDG&E Short Circuit Breaker Duty Criteria Summary

Equipment	Disturbance	Criteria
• Existing Generator Breakers • Non-Generator Breakers ≥ 30 Years Old	SLG and 3LG faults	No fault current exceeds 100% of the nameplate interrupting rating
Existing Non-Generator Breakers < 30 Years Old	SLG and 3LG faults	No fault current exceeds 115% of the nameplate interrupting rating

5.3 Transient Stability Criteria

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 are performed to ensure system stability following critical faults on the system.

The system is considered stable if the following conditions are met:

A. All machines in the WECC interconnected system must remain in synchronism as demonstrated by relative rotor angles (unless modeling problems are identified and concurrence is reached that a problem does not really exist).

B. A stability simulation will be deemed to exhibit positive damping if a line defined by the peaks of the machine relative rotor angle swing curves tends to intersect a second line connecting the valleys of the curves with the passing of time.

C. Corresponding lines on bus voltage swing curves will likewise tend to intersect. A stability simulation, which satisfies these conditions, will be defined as stable.

D. Duration of a stability simulation run will be ten seconds unless a longer time is required to ascertain damping.

E. The transient performance analysis will start immediately after the fault clearing and conclude at the end of the simulation.

F. A case will be defined as marginally stable if it appears to have zero percent damping and the voltage dips are within (or at) the WECC Reliability Criteria limits.

Performance of the transmission system is measured against the WECC Reliability Criteria and the NERC Planning Standards.

Table 5.3 describes and Figure 5.1 illustrates the NERC/WECC Voltage and Frequency Performance Reliability Criteria. The reliability and performance criteria are applied to the entire WECC transmission system.

Table 5.3: WECC Disturbance-Performance Table of Allowable Effects on Other Systems (in addition to NERC requirements)

NERC and WECC Categories	Outage Frequency Associated with the Performance Category (Outage/Year)	Transient Voltage Dip Standard *(Note 1)*	Minimum Transient Frequency Standard	Post-Transient Voltage Deviation Standard
A System normal	Not Applicable	Nothing in Addition to NERC		
B One element out-of-service	≥ 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 **59.6 Hz** for 6 cycles or more at a load bus	Not to exceed **5%** at any bus
C Two or more elements out-of-service	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 **59.0 Hz** for 6 cycles or more at a load bus	Not to exceed **10%** at any bus
D Extreme multiple-element outage	< 0.033	Nothing in addition to NERC		

Note 1: As an example in applying the WECC Disturbance-Performance Table, 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.

Figure 5.1: WECC Voltage Performance Criteria Figure W-1

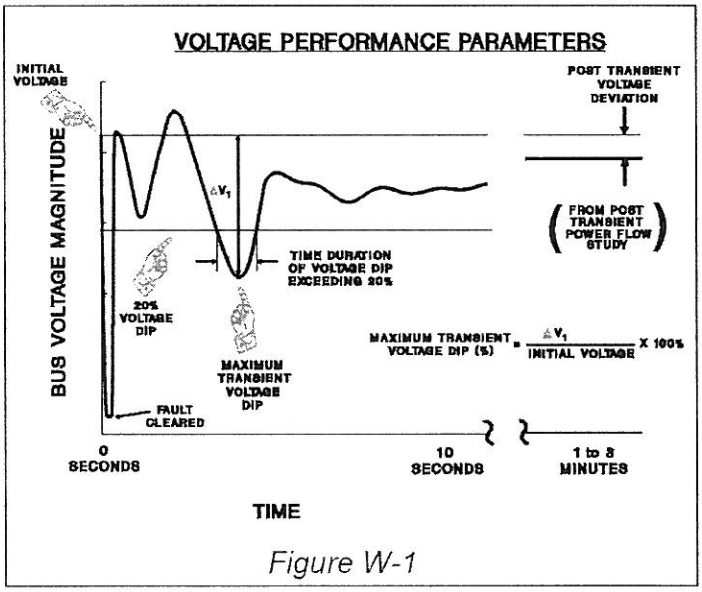


Figure W-1

5.4 Post-Transient Voltage Stability Criteria

The last column of the Table 5.3 above describes the Post-Transient Voltage Stability Criteria, as required by NERC/WECC; Figure 5.1 illustrates the criteria set forth in Table 5.3. It should be noted that the post-transient voltage performance is based on deviations from the initial bus voltage prior to the corresponding contingency. For major SDG&E 500 kV and 230 kV contingencies, the governor power flow is utilized to test for post-transient voltage deviations.

5.5 Reactive Power Deficiency Criteria

Table 5.4 summarizes the voltage support and reactive power criteria in the NERC/WECC Planning Standards.

The system performance will be evaluated according to the NERC/WECC planning criteria.

Table 5.4: Reactive Power Deficiency Criteria Summary

Performance Level/Category	Disturbance	Reactive Power Deficiency Criteria
B	Generator One Circuit One Transformer DC Single Pole Block	Governor power flow to reach convergence at 105% of load level or operational transfer capability
C	Two Generators Two Circuits DC Bipolar Block	Governor power flow to reach convergence at 102.5% of load level or operational transfer capability

5.6 Power Factor Criteria

The Reliability Study considered two tests in the Power Factor study for Cluster 2 generators:

The first test identifies the worst N-1 or N-2 contingency that causes an individual Cluster 2 project's Point of Interconnection to reach the highest and/or lowest voltage to the extent that the base case scenario dictates. At these extreme voltage levels, individual Cluster 2 generators are then adjusted to test if they are able to supply sufficient reactive support to satisfy SDG&E's operating voltage schedule at the Point of Interconnection.

The second test identifies if the range of reactive power that individual Cluster 2 generators can operate on (according to the PSLF model provided by the IC) satisfies power factor criteria as determined by the CAISO's tariff. These criteria require generators to be capable of operating at and between both extremes of 0.95 lag to 0.95 lead power factor for wind generators (measured at the POI) and 0.90 lag to 0.95 lead power factor for all other generator types (measured at the generator terminal bus).

5.7 Affected Systems

If study results identify system impacts to electric systems other than SDG&E's, then the CAISO will coordinate with Affected System Operators in accordance with LGIP Section

3.7. Results are identified in the Group Report and/or the Individual Project Report, as appropriate.

6. Deliverability Assessment

The Deliverability Assessment was performed by the CAISO according to the On-Peak and Off-Peak Deliverability Assessment Methodologies posted on the CAISO website at: http://www.caiso.com/1c44/1c44b5c31cce0.html

Table 6.1 lists the seven Full Capacity projects and their net-output-to-grid capacities.

Table 6.1: Deliverability Assessment - Full Capacity Projects

CAISO Queue	Point of Interconnection	Full Capacity Energy Only	Fuel/Type	Max MW
C555	Boulevard Substation 138 kV	FC	W / WT	92
C561	Imperial Valley 230 kV Bus	FC	S / PV	200
C565	Sycamore-Miguel 230 kV Line	FC	NG / CT	200
C574	Looping Otay Mesa-Miguel 230 kV Lines into a new Switchyard	FC	NG / CT	308
C583	Boulevard Substation 138 kV	FC	W / WT	57.5
C590	Imperial Valley 230 kV Bus	FC	S / PV	150
C608	Imperial Valley 230 kV Bus	FC	S / PV	250
			Total FC Generation Net Capacity	**1257.5**

6.1 Deliverability Assessment Results

The results of the On-Peak and Off-Peak Deliverability Assessment for the Cluster 2 projects in the SDG&E area are summarized in Tables 6.2 and 6.3. Some of the projects in the SDG&E area were also identified as contributing to SCE overloads and upgrades, and those results are summarized in Tables 6.4 and 6.5.

Table 6.2: On-Peak Deliverability Assessment Results for SDG&E Area

Contingency	Overloaded Facilities	Rating (Amps)	MAX Flow (Amps)	Max Flow/Rating
Base Case	Miguel Tap-C574 230kV #2	2950	3012	102%
Base Case	Miguel Tap-Southbay 230kV #1	2289	3012	132%
Base Case	Old Town-Penasquitos 230kV #1	1318	1483	112%
Trip Silvergate-Southbay 230kV #1	Division-Sampson 69kV #1	1439	2223	154%
Trip Old Town-Penasquitos 230kV #1	Doublet Tap-Friars 138kV #1	631	808	128%
Trip Encina-San Luis Rey 230kV #1	Encina Tap-Encina 230kV #1	2289	2872	125%
Trip Encina-San Luis Rey 230kV #1	Encina Tap-San Luis Rey 230kV #1	2289	3039	133%
Trip Encina-San Luis Rey-Pen 230kV #1	Encina-San Luis Rey 230kV #1	2289	2561	112%
Trip Escondido-Pen 230kV #2	Escondido-Pen 230kV #1	2289	2464	108%
Trip Escondido-Pen 230kV #1	Escondido-Pen 230kV #2	2289	2464	108%
Trip Imperial Valley 500/230kV #3	Imperial Valley 500/230kV #1	1344 MVA	1384 MVA	103%
Trip Imperial Valley 500/230kV #3	Imperial Valley 500/230kV #2	732 MVA	754 MVA	103%
Trip Imperial Valley 500/230kV #1	Imperial Valley 500/230kV #2	732 MVA	752 MVA	103%
Trip Imperial Valley 500/230kV #1	Imperial Valley 500/230kV #3	1194 MVA	1385 MVA	116%
Trip ECO-Miguel 500kV #1	Imperial Valley-C493 500kV #1	1000 MW	1630 MW	163%
Trip Imperial Valley-ECO 500kV #1	Imperial Valley-C493 500kV #1	1000 MW	1430 MW	143%
Trip Miguel 500/230kV #2	Miguel 500/230kV #1	1329 MVA	1542 MVA	116%
Trip Miguel 500/230kV #1	Miguel 500/230kV #2	1344 MVA	1519 MVA	113%
Trip ECO-Miguel 500kV #1	Miguel Tap-C574 230kV #2	3150	3733	119%
Trip Imperial Valley-ECO 500kV #1	Miguel Tap-C574 230kV #2	3150	3513	112%
Trip ECO-Miguel 500kV #1	Miguel Tap-C574 230kV #2	3150	3733	119%
Trip ECO-Miguel 500kV #1	Miguel Tap-Southbay 230kV #1	2952	3733	126%
Trip Imperial Valley-ECO 500kV #1	Miguel Tap-Southbay 230kV #1	2952	3541	120%

Contingency	Overloaded Facilities	Rating (Amps)	MAX Flow (Amps)	Max Flow/Rating
Trip Imperial Valley-ECO 500kV #1	Miguel Tap-Southbay 230kV #1	2952	3511	119%
Trip ECO-Miguel 500kV #1	Miguel Tap-Southbay 230kV #1	2952	3733	126%
Trip Silvergate-Southbay 230kV #1	Montgomery Tap-Southbay 69kV #1	1707	2053	120%
Trip Silvergate-Southbay 230kV #1	Montgomery Tap-Sweetwater 69kV #1	2000	2799	140%
Trip Silvergate-Southbay 230kV #1	Montgomery-Southbay 69kV #1	854	1087	127%
Trip Silvergate-Southbay 230kV #1	National City-Sweetwater Tap 69kV #1	854	1122	131%
Trip Division-Sampson 69kV #1	National City-Sweetwater Tap 69kV #1	854	1055	123%
Trip Silvergate-Southbay 230kV #1	Naval Station Metering-Sweetwater Tap 69kV #1	1799	2256	125%
Trip Silvergate-Old Town-Mission 230kV #1	Silvergate-Old Town 230kV #1	1474	1686	114%
Trip Silvergate-Old Town 230kV #1	Silvergate-Old Town Tap 230kV #1	1474	1675	114%
Trip Silvergate-Southbay 230kV #1	Southbay-Sweetwater 69kV #1	1707	1921	113%
Trip Montgomery-Sweetwater-Southbay 69kV #1	Southbay-Sweetwater 69kV #1	1707	1828	107%
Trip Silvergate-Southbay 230kV #1	Sweetwater-Sweetwater Tap 69kV #1	2000	3391	170%
Trip Imperial Valley-ECO 500kV #1 and Imperial Valley-C493 500kV #1	Miguel Tap-C574 230kV #2	3150	3543	112%
Trip Imperial Valley-ECO 500kV #1 and Imperial Valley-C493 500kV #1	Miguel Tap-Southbay 230kV #1	2952	3541	120%

Although the power flow on the C493–Central segment of the Sunrise Powerlink is greater than on the Imperial Valley–C493 segment of the Sunrise Powerlink, the Cluster 2 Phase I Study assumed the Sunrise Powerlink path rating of 1,000 MW is only observed for the Imperial Valley-C493 500 kV segment.

Table 6.3: Off-Peak Deliverability Assessment Results for SDG&E Area

Contingency	Overloaded Facilities	Rating (Amps)	MAX Flow (Amps)	Max Flow/Rating
Base Case	ECO 230/138kV #1	392 MVA	507 MVA	129%

Table 6.4: On-Peak Deliverability Assessment for SCE East Of Pisgah Bulk System

Contingency	Overloaded Facilities	Rating	MAX MVA Flow	
		Amps	Amps	%
Base Case	Colorado River-Palo Verde 500 kV T/L No.1	2700	2910	108%
New Colorado River-Harquahala 500 kV T/L L-1 after it is built	Colorado River-Palo Verde 500 kV T/L No.1	2700	2910	108%

Table 6.5: On-Peak Deliverability Assessment for SCE Eastern System

Contingency	Overloaded Facilities	Rating	MAX MVA Flow	
		Amps	Amps	%
Base Case	Alberhill-Serrano 500 kV #1	3000	3189	106%

The Deliverability Assessment identified IID's transmission system as an Affected System. Those results are summarized in Table 6.6.

Table 6.6: Deliverability Assessment Results for IID Area

Contingency	Overloaded Facilities	Rating (Amps)	MAX Flow (Amps)	Max Flow/Rating
Base Case	Dixilan-Rtap-6 92kV ckt 1	320	400	125%
multiple contingencies (off-peak)	Dixilan-Rtap-6 92kV ckt 1	320	358	112%
multiple contingencies (off-peak)	Pilotknb-Yucca 161kV ckt 1	486	496	102%

6.2 Deliverability Assessment Conclusions

Based on the findings of the Phase I Deliverability Assessment, the following upgrades are required:

A. With all queued Full Capacity generation projects up to and including the SDG&E Cluster 2 projects, the Sunrise Powerlink, monitored at Imperial Valley Substation, is expected to load above WECC path rating of 1,000 MW following the outages. CAISO operators have 30 minutes to bring the Sunrise Powerlink path flow back down below 1,000 MW by re-dispatching generation and/or reducing scheduled imports from Arizona.

B. To mitigate multiple base case and contingency overloads in the Otay Mesa 230 kV area, two new transmission lines are proposed: Otay Mesa-South Bay 230 kV and South Bay-Mission 230 kV.

C. To mitigate base case and contingency overloads in the Old Town area, a new Sycamore-Penasquitos 230kV line is proposed.

D. To mitigate contingency overloads in the Encina area, a third Encina-San Luis Rey 230 kV line is proposed.

E. To mitigate contingency overloads on the two Escondido-Palomar Energy 230 kV lines, it is proposed to upgrade both lines with higher capacity conductors.

F. To mitigate contingency overloads on the 500/230 kV transformers at Miguel, a third 500/230 kV transformer is proposed.

G. To mitigate a base case overload under off-peak conditions on ECO 230/138 kV transformer, a second ECO 230/138 kV transformer is proposed.

H. To mitigate contingency overloads on the Imperial Valley 500/230 kV transformers, an SPS to trip Imperial Valley generation is proposed.

I. To mitigate the base case overload on the Colorado River-Palo Verde 500 kV line, a new 500 kV line from Colorado River-Harquahala is proposed.

J. The existing Colorado River-Palo Verde 500 kV line is limited by its clearance along a significant portion of the line. The normal rating of the line is the same as its emergency rating (2338 MVA). Therefore, the Colorado River-Palo Verde line will be overloaded for the outage of the new Colorado River-Harquahala 500 kV line (Category B). A new SPS to bypass the series capacitors of the Colorado River-Palo Verde 500 kV line is recommended to address this Category B issue as it is too expensive to rebuild the Colorado River-Palo Verde 500 kV line.

K. To mitigate the base case overload on Alberhill-Serrano 500 kV line, a second line is proposed.

7. Reliability Study Steady-State Analysis

7.1 Detailed Base Case Assumptions

The Reliability Study evaluated SDG&E's transmission system under stressed conditions. The steady-state studies identified thermal overloads due to the dispatch of Cluster 2 projects. Cluster 2 projects were dispatched in three sub-clusters: IVA Cluster, BU Cluster, and the INT Cluster.

The steady-state power flow analysis in the Reliability Study was performed to ensure that SDG&E's transmission system remains in full compliance with North American Electric Reliability Corporation (NERC) reliability standards TPL-001, 002, 003 and 004 with the proposed interconnections. The results of this power flow analysis will serve as documentation that the reliability impact of new facilities and their connections on interconnected transmission systems is evaluated. If a NERC reliability problem results from an interconnection, it is SDG&E's responsibility to identify the problem and develop an appropriate corrective action or mitigation plan to comply with the NERC reliability standards.

The CAISO and SDG&E cannot guarantee that Cluster 2 projects can operate at maximum rated output 24 hours a day, year round, without adverse system impacts, nor can the CAISO and SDG&E guarantee that these projects would not have adverse impacts during the times and seasons not studied in the Phase I Study.

The following power flow base cases were used for the analysis in the Phase I Study:

A. WECC 2014 Heavy Summer Base Case:

   The Cluster 2 Phase I Reliability Study modeled a Heavy Summer load target of 5,277 MW (load + losses) with year 2014 topology in the SDG&E area. The loads of other WECC areas replicated the 2014 Heavy Summer 3-Scenario approved base case (14hs3sa.sav). The Heavy Summer cases model high cut-plane imports and low In-Basin generation.

B. WECC 2014 Light Load Base Case:

   The Cluster 2 Phase I Reliability Study modeled a Light Load target of 2,824 MW (load + losses) with year 2014 topology in the SDG&E area. The loads of other WECC areas replicated the 2014 Light Autumn 1-Scenario approved base case (14la1sa.sav). The Light Load cases model relatively high cut-plane imports and low In-Basin generation.

While it is impractical to study all combinations of system load and generation levels during all seasons and at all times of the day, these two seasons represent extreme loading and generation conditions for the study area.

These base cases modeled all CAISO-approved SDG&E transmission projects that would be operational by 2014 and any CAISO-approved projects that will be operational after 2014 provided that CAISO and SDG&E agreed to the reason for including these projects. All approved SDG&E transmission projects were added to the case as described in Section 4. The

base cases also modeled all proposed generation projects in the SDG&E area which are higher than the Cluster 2 projects in the CAISO Controlled Grid Generation Queue. These generation projects were modeled along with their proposed transmission upgrades necessary for their interconnection as noted in Section 4. The base cases that modeled Cluster 2 projects also modeled the associated Cluster 2 Delivery Network Upgrades. However, some generation projects that are electrically remote from the Cluster 2 projects were either turned off or modeled with reduced generation to balance the loads and resources in the power flow model.

Please see Appendix C for additional details regarding generation dispatch.

7.2 Reliability Study Steady-State Results

SDG&E's Reliability Study dispatched all Cluster 2 generation regardless of Deliverability Status. Dispatched generation includes existing and queued generation. The results of the Reliability Study's steady-state power flow analysis and the associated power flow plots for the Cluster 2 Phase I projects are shown in Appendices D and E, respectively. The tables in this section summarize the most severe overload for each overloaded facility. Refer to Appendix D for complete details.

Further limtiations include generation tripping for a double contingency (N-2), which, according to the CAISO Grid Planning Standards, is 1,400 MW. Any generation tripping required above 1,400 MW must be offset with load tripping of the same amount (i.e. if 2,000 MW of generation was required to be tripped, 600 MW of load must also be tripped). For the double contingency of the Imperial Valley-ECO and Imperial Valley-C493 500 kV lines, up to 1,400 MW of generation connected at Imperial Valley Substation may be tripped to protect the neighboring systems in accordance with the existing IV SPS. Study results for Cluster 2 showed that tripping 1,400 MW of generation for this double contingency mitigated any adverse impacts on neighboring systems. No additional generation tripping was required above the 1,400 MW limit and therefore, no load tripping was required.

The steady-state power flow analysis considered dispatch constraints for all sub-clusters under study. These constraints included observing the combined 1,800 MVA flow limit of the two existing Miguel 500/230 kV transformers and observing the Path 43 flow limit of 2,440 MW. Reducing the output of generators connected to Imperial Valley Substation, ECO Substation, and/or Boulevard Substation allows these conditions to be met before and after dispatching Cluster 2 generators.

All existing, pre-Cluster 2, and Cluster 2 generation located geographically Out-of-Basin totals 7,175 MW, as shown below in Table 7.1: Potential Maximum Generation Dispatch Levels.

Table 7.1: Existing and Proposed Out-of-Basin Generation

Out-of-Basin Areas	Rated Net Output
Existing, Imperial Valley	1,070 MW
Serial Queue, Imperial Valley	900 MW
Serial Queue, Boulevard/ECO	761 MW
Transition Cluster, Imperial Valley	225 MW
Transition Cluster, ECO	720 MW
Transition Cluster, Hassayampa-North Gila	290 MW
Cluster 1, North Gila Area	1,710 MW
Cluster 1, Imperial Valley Area	749 MW
Cluster 2, Boulevard Substation	149.5 MW
Cluster 2, Imperial Valley Area	600 MW
Out-of-Basin Generation available for dispatch	**7,175 MW**

Not all generation may be simultaneously dispatched at rated output due to the constraints discussed above and further summarized below:

A. ECO and Boulevard Substation-interconnected generation is limited to 1,150 MW by CAISO N-1 tripping limit (for N-1 of a single ECO 500/230 kV transformer).

B. The combined flow limit of the Miguel 500/230 kV transformers is 1,800 MVA to prevent overload of the Miguel 230 kV South Bus in the event of a stuck or faulted 230 kV circuit breaker at Miguel Substation.

7.2.1 Steady-State Thermal Results for IVA Cluster in SDG&E System

Table 7.2 shows the levels of generation for four scenarios using the Heavy Summer and Light Load cases.

Table 7.2: Dispatch Scenarios for IVA Cluster

Out-of-Basin Generation	Dispatch			
	Heavy Summer		Light Load	
	Pre-C2	Post-C2	Pre-C2	Post-C2
In-Basin Generation	1212 MW	1199 MW	838 MW	825 MW
Existing, Imperial Valley	0 MW *(Note 2)*	0 MW *(Note 2)*	1070 MW	770 MW *(Note 1)*
Serial Queue, Imperial Valley	750 MW	750 MW	750 MW	750 MW
Serial Queue, Boulevard/ECO *(Note 3)*	430 MW	430 MW	761 MW	761 MW
Transition Cluster, Imperial Valley	225 MW	225 MW	225 MW	225 MW
Transition Cluster, ECO *(Note 3)*	720 MW	720 MW	389 MW	389 MW
Transition Cluster, Hassayampa-North Gila	290 MW	290 MW	290 MW	290 MW
Cluster 1, North Gila Area	0 MW	0 MW	0 MW	0 MW
Cluster 1, Imperial Valley Area	499 MW	499 MW	499 MW	499 MW
Cluster 2, Boulevard Substation	0 MW	0 MW	0 MW	0 MW
Cluster 2, Imperial Valley Area	0 MW	600 MW	0 MW	600 MW
Total Generation Dispatch	**4,126 MW**	**4,713 MW**	**4,822 MW**	**5,109 MW**

Note 1: Imperial Valley Substation generation dispatch is limited to prevent exceeding the North of Songs path rating.

Note 2: Imperial Valley Substation generation dispatch is limited to prevent overload of the Miguel 230 kV South Bus in the event of a stuck or faulted 230 kV circuit breaker at Miguel Substation.

Note 3: Total ECO and Boulevard generation dispatch is limited to 1,150 MW for the CAISO N-1 generation tripping limit.

Under the scenarios studied, the addition of the recommended Delivery Network Upgrades mitigates all overloads caused by the dispatch of the IVA Cluster with the exception of one (1) new Category B overload of the Otay Mesa-Tijuana 230 kV transmission line. This overload can be mitigated by modifying the existing Special Protection System to trip generation at Imperial Valley. The Imperial Valley SPS trips generation connected to the Imperial Valley and/or Boulevard and/or East County (ECO) substations and/or the C493 switchyard to protect the SDG&E, Comision Federal de Electricidad (CFE), and Imperial Irrigation District (IID) transmission facilities following various N-1 and N-2 contingencies. This SPS is further described in Section 12: Mitigation.

The Otay Mesa-Tijuana 230 kV transmission line is jointly owned by SDG&E and CFE; the Otay Mesa-US Border portion is owned by SDG&E and the US Border-Tijuana, Mexico portion is owned by CFE.

Table 7.3 summarizes the most severe Category B overloads attributable to the IVA Cluster. Refer to Appendix D for complete details of overloads for specific dispatch scenarios.

Table 7.3: Steady-State Thermal Loading for IVA Cluster in SDG&E System

Overloaded Component	Emergency Rating (MVA)	Heavy Summer		Light Load		Category	Contingency
		Pre-Cluster 2	Post-Cluster 2 (with mitigation)	Pre-Cluster 2	Post-Cluster 2 (with mitigation)		
Otay Mesa–Tijuana 230 kV Line	796.0	0.973	1.067	*(Note 1)*	*(Note 1)*	B	C493-Central 500 kV
		0.914	1.021	*(Note 1)*	*(Note 1)*		IMPRLVLY-C493 500 kV

Note 1: This facility did not overload Pre-Cluster 2 or Post-Cluster 2 under these study conditions.

7.2.2 Steady-State Thermal Results for BU Cluster in SDG&E System

Table 7.4 shows the levels of generation dispatch for four scenarios using the Heavy Summer and Light Load cases.

Table 7.4: Dispatch Scenarios for BU Cluster

Area Generation	Dispatch			
	Heavy Summer		Light Load	
	Pre-C2	Post-C2	Pre-C2	Post-C2
In-Basin Generation	1212 MW	1.193 MW	837 MW	811 MW
Existing, Imperial Valley	0 MW	0 MW	1070 MW	1070 MW
Serial Queue, Imperial Valley	750 MW	750 MW	750 MW	750 MW
Serial Queue, Boulevard/ECO *(Note 1)*	430 MW	430 MW	761 MW	611.5 MW
Transition Cluster, Imperial Valley	225 MW	225 MW	225 MW	225 MW
Transition Cluster, ECO *(Note 1)*	720 MW	570.5 MW	389 MW	389 MW
Transition Cluster, Hassayampa-North Gila	290 MW	290 MW	290 MW	290 MW
Cluster 1, North Gila Area	0 MW	0 MW	0 MW	0 MW
Cluster 1,Imperial Valley Area	499 MW	499 MW	499 MW	499 MW
Cluster 2, Boulevard Substation *(Note 1)*	0 MW	149.5 MW	0 MW	149.5 MW
Cluster 2, Imperial Valley Area	0 MW	0 MW	0 MW	0 MW
Total Generation Dispatch	**4,126 MW**	**4,107 MW**	**4,821 MW**	**4,795 MW**

Note 1: Total generation dispatch at ECO and Boulevard is limited to 1,150 MW for the CAISO N-1 generation tripping limit

As mentioned in Section 7.2, the total generation dispatch at ECO and Boulevard substations, combined, cannot exceed 1,150 MW due to a limitation caused by the N-1 contingency of the ECO 500/230 kV transformer. This limitation is maintained between both the pre-Cluster 2 and post-Cluster 2 cases. Furthermore, in order to dispatch BU Cluster generation, generation connecting to Boulevard or ECO substations was reduced. (Note that Total Generation Dispatch does not change between pre- and post-Cluster 2 cases in Table 7.4)

Under the scenarios studied, the addition of the recommended Delivery Network Upgrades mitigates all overloads caused by the dispatch of the BU Cluster. However,

generators in the BU Cluster will be required to participate in the proposed ECO/Boulevard SPS which trips all dispatched generation connected at ECO and Boulevard substations in the event of an N-1 of the 500/230 kV transformer at ECO Substation. Also, generators in the BU Cluster will be required to participate in the existing IV SPS, which trips generation to protect SDG&E, CFE, and IID transmission facilities following various N-1 and N-2 contingencies. These SPSs are further described in Section 12: Mitigation.

7.2.3 Steady-State Thermal Results for INT Cluster in SDG&E System

Table 7.5 shows the levels of generation for four scenarios using the Heavy Summer and Light Load cases.

Table 7.5: Dispatch Scenarios for INT Cluster

Area Generation	Dispatch			
	Heavy Summer		Light Load	
	Pre-C2	Post-C2	Pre-C2	Post-C2
Out-of-Basin Generation	3,164 MW	3,164 MW	3,045 MW	3,045 MW
Otay Mesa and Q190 Generation	934 MW	934 MW	933 MW	933 MW
Other In-Basin Generation	1,037 MW	1,058 MW	446 MW	469 MW
Cluster 2 Internal Cluster	0 MW	508 MW	0 MW	508 MW
Total Generation Dispatch	**5,135 MW**	**5,664 MW**	**4,424 MW**	**4,955 MW**

Under the scenarios studied, the addition of the recommended Delivery Network Upgrades mitigate all overloads caused by the dispatch of the INT Cluster with the exception of one (1) new Category C overload of the proposed Otay Mesa-South Bay 230 kV transmission line. This overload can be mitigated by modifying an existing SPS to add tripping for the INT Cluster generation under these conditions. This SPS is further described in Section 12: Mitigation.

Table 7.6 summarizes the most severe Category C overloads attributable to the INT Cluster. Refer to Appendix D for complete details of overloads for specific dispatch scenarios.

Table 7.6: Steady-State Thermal Loading for INT Cluster in SDG&E System

Overloaded Component	Emergency Rating (MVA)	Heavy Summer		Light Load		Category	Contingency
		Pre-Cluster 2	Post-Cluster 2 (with mitigation)	Pre-Cluster 2	Post-Cluster 2 (with mitigation)		
Otay Mesa–South Bay 230 kV Line *(Note 1)*	1255.0	N/A	1.201	N/A	1.081	C	C574-Miguel Tap-South Bay 230 kV + C574-Miguel Tap-Sycamore 230 kV

Note 1: South Bay Substation is also known as Bay Boulevard Substation.

7.2.4 Steady-State Voltage Results in SDG&E System

No steady-state voltage violations were observed in the SDG&E transmission system due to the addition of the IVA Cluster, BU Cluster, or INT Cluster generation projects.

7.2.5 Power Factor Results

Per the CAISO tariff, a 0.95 lag to 0.95 lead (using the load convention) power factor is required at the Point of Interconnection for wind projects. A 0.90 lag to 0.95 lead power factor is required at the generator terminal for all other types of generators (solar, gas-fired, etc.). Power factor is evaluated in this study while simultaneously adopting this standard and adhering to SDG&E's standard bus voltage schedule.

Using the Reliability Study Heavy Summer and Light Load cases for Cluster 2 projects, the worst-case post-contingency bus voltages at the generator projects' respective Points of Interconnection were documented for the Cluster 2 projects. A power factor capability test at the generator projects' respective Point of Interconnection or generator terminal (as appropriate) was then performed for each individual generator. Individual studies were completed for each Cluster 2 generator project.

Under the base case conditions studied and the VAr capability models provided by the ICs, all Cluster 2 generator projects were capable of providing sufficient reactive support to meet SDG&E's operating voltage schedule. Per the Steady-State Thermal Results, there were no pre-existing voltage or VAr capability issues at the generator Points of Interconnection or any other SDG&E buses. Furthermore, the Cluster 2 projects did not cause any steady-state voltage violations in the SDG&E transmission system.

However, some projects were not capable of meeting the power factor criteria due to modeling issues. Detailed results can be found in each Interconnection Customer's respective individual report (Appendix A).

7.2.6 Affected Systems

The 230 kV transmission systems of neighboring utilities were monitored in the Reliability Study.

7.2.6.1 CFE Transmission System

The Reliability Study identified CFE's transmission system as an Affected System due to the dispatch of the IVA Cluster. In the Heavy Summer cases, the IVA Cluster caused the Otay Mesa-Tijuana 230 kV transmission line to overload beyond its emergency rating under the N-1 contingencies of the C493-Central 500 kV transmission line or the C493-Imperial Valley 500 kV transmission line. Even with the 230 kV transmission upgrades identified from the Deliverability Assessment, this overload persists and must be mitigated by modifying the existing IV SPS to trip generators interconnecting to the Imperial Valley Area.

Additional details can be found within the Appendix A project-specific reports.

Table 7.7: Steady-State Thermal Loading for IVA Cluster in CFE System

Overloaded Component	Emergency Rating (MVA)	Heavy Summer		Light Load		Category	Contingency
		Pre-Cluster 2	Post-Cluster 2 (with mitigation)	Pre-Cluster 2	Post-Cluster 2 (with mitigation)		
Otay Mesa–Tijuana 230 kV Line	796.0	0.973	1.067	*(Note 1)*	*(Note 1)*	B	C493-Central 500 kV
		0.914	1.021	*(Note 1)*	*(Note 1)*		IMPRLVLY-C493 500 kV

Note 1: This facility did not overload Pre-Cluster 2 or Post-Cluster 2 for this season

7.2.6.2 IID Transmission System

The Reliability Study identified IID's transmission system as an Affected System due to the dispatch of the IVA and BU Clusters. Because the IVA and BU Cluster generators will be required to participate in the IV SPS and ECO/Boulevard SPS, respectively, their flow impacts may affect the IID and CFE transmission systems. No overloads were identified in the IID transmission system as a result of the addition of the IVA or BU Clusters.

8. Short Circuit Duty Analysis

Using SDG&E's short circuit duty criteria as summarized in Section 5.2, Table 5.2, short circuit studies were performed to determine the impact of adding Cluster 2 projects to the SDG&E transmission system. Fault duties were calculated before the addition of Cluster 2 generator projects and after the addition of Cluster 2 generator projects while assuming all Delivery Network Upgrades in-service to identify overstressed conditions on any existing and planned (if planned rating is known) transmission circuit breakers.

Three line-to-ground and single line-to-ground faults were simulated without the Cluster 2 projects and with the Cluster 2 projects plus the Delivery Network Upgrades.

The short circuit analysis results can be found in Appendix G.

8.1 Results

8.1.1 SDG&E Transmission System

Short circuit analysis results indicate that the thirty (30) SDG&E transmission circuit breakers listed in Table 8.1 become overstressed with the addition of all Cluster 2 generator projects plus the associated Delivery Network Upgrades.

Table 8.1: SDG&E Transmission Circuit Breakers Overstressed with the Addition of Cluster 2 Generator Projects

Breaker	Voltage (kV)	Existing Interrupting Capacity (kA)	Percent Duty (%)
MS13822 9N	138	41	104.8
MS13822 9S	138	41	104.8
MS13827 3S	138	42	102.3
MS13840 1N	138	41	104.8
MS13840 1S	138	41	104.8
MS50 2N	138	41	104.8
MS50 2S	138	41	104.8
MS51 6N	138	41	104.8
MS51 6S	138	41	104.8
MS52 8N	138	41	104.8
MS52 8S	138	41	104.8
MS60 4N	138	41	104.8
MS60 4S	138	41	104.8
MS61 7N	138	41	104.8
MS61 7S	138	41	104.8
SA23001 2E	230	40	125.9
SA23001 2T	230	40	125.9
SA23002 1W	230	40	125.9
SA23003 3T	230	40	125.9
SA23003 3W	230	40	125.9
SA23004 5E	230	40	125.9
SA23004 5T	230	40	125.9
SA23006 1E	230	40	125.9
SA23006 1T	230	40	125.9
SA23010 2W	230	40	125.9
SA23011 4T	230	40	125.9
SA23011 4W	230	40	125.9
SA71 5W	230	40	125.9
SA72 4E	230	40	125.9
SA73 3E	230	40	125.9

The ICs are not responsible for mitigating any other pre-existing overstressed circuit breakers.

No other existing or planned (if planned rating is known) SDG&E transmission circuit breakers were identified as overstressed due to the addition of any Cluster 2 generator projects and the associated Delivery Network Upgrades.

8.1.2 Affected Systems

8.1.2.1 CFE Transmission System

CFE is identified as an Affected System in the short circuit analysis due to the addition of Cluster 2 generator projects and their associated Delivery Network Upgrades. The CAISO will coordinate, to the extent possible, further communications and short circuit study efforts between CFE and all Cluster 2 project developers to mitigate the impact.

9. Transient Stability Analysis

The transient stability analysis was conducted to ensure that the transmission system remains stable, as well as operating in a coordinated fashion through abnormal system conditions after Cluster 2 projects are in-service. In performing the analysis, both Heavy Summer and Light Load cases were evaluated. Five (5) 2014 Reliability Study Heavy Summer base cases (as described in Table 9.1A) and five (5) 2014 Reliability Study Light Load base cases (as described in Table 9.1B) were used.

Table 9.1A: Transient Stability Heavy Summer Base Cases

	Base Case	Description
1	c2_14hs_pre_int9.sav	Pre-Cluster 2 base case with high In-Basin generation
2	c2_14hs_pre_iv4.sav	Pre-Cluster 2 base case with high Out-of-Basin generation
3	c2_14hs_pst_bu4up.sav	Post-Cluster 2 base case with BU Cluster dispatched
4	c2_14hs_pst_int5up.sav	Post-Cluster 2 base case with INT Cluster dispatched
5	c2_14hs_pst_iv4up.sav	Post-Cluster 2 base case with IVA Cluster dispatched

Table 9.1B: Transient Stability Light Load Base Cases

	Base Case	Description
1	c2_ll_pre_int.sav	Pre-Cluster 2 base case with high In-Basin generation
2	c2_ll_pre_iva_rev1.sav	Pre-Cluster 2 base case with high Out-of-Basin generation
3	c2_ll_pstup_bu_rev2.sav	Post-Cluster 2 base case with BU Cluster dispatched
4	c2_ll_pstup_int.sav	Post-Cluster 2 base case with INT Cluster dispatched
5	c2_ll_pstup_iva_rev2.sav	Post-Cluster 2 base case with IVA Cluster dispatched

Cluster 2 was analyzed per the requirements set forth in Section 5.3 to identify adverse impacts to the SDG&E system. Each case was subjected to up to 20 disturbances to determine the transient performance on the SDG&E and neighboring transmission systems. If the voltage at any of the monitored buses deviated by more than that allowed by the standard shown in Table 5.3, Cluster 2 projects were deemed to be in violation of NERC criteria. In addition, each project was reviewed to ensure it did not trip out on low voltage (low voltage ride-through) for any of the contingencies analyzed. Details of the general results (not project-specific) are covered in Appendix I (Worst Case Analysis) and Appendix J (Transient Stability Plots). The project-specific results are provided in Appendix A.

9.1 Transient Stability Study Scenarios

Disturbance simulations were performed for a study period of 10 seconds for pre-Cluster 2 and 20 seconds for Cluster 2 to determine whether the Cluster 2 projects would cause any system

instability during a variety of line and generator outages. For each project, selected line and generator outages in the vicinity of that project were evaluated. The outages were consistent with Category B and Category C requirements (single element and multiple element outages).

9.1.1 IVA Cluster

The IVA Cluster, which contained three generation projects C561, C590, and C608, was studied for both Heavy Summer and Light Load scenarios. Each scenario was analyzed at maximum generation output. Due to a modeling issue, the transient stability of project C561 could not be evaluated.

Line and generator outages were evaluated for contingencies simulated by the switch files outlined in Table 9.2.

Table 9.2: IVA Cluster Switch Files

	Switch Files
1	FLAT.swt (No contingency)
2	C493_Centrals_slo.swt
3	Dev-Val_slo.swt
4	HAA_NGila_slo.swt
5	IV_C493_slo.swt
6	IV_ROA_6.swt
7	IV-Wnd1 noRAS_slo.swt
8	IV-Wnd1 noXTrp_slo.swt
9	IV-Wnd1 RAS_slo.swt
10	IV_Wnd_dlo_noXTR1.swt
11	IV_Wnd_dlo_RASxR1.swt
12	ML_Wnd_noRAS_slo.swt
13	ML_Wnd_noXTrp_slo.swt
14	ML_Wnd_RAS_slo.swt
15	Ngila_IV_slo.swt
16	PaloVerde-g1.swt
17	PaloVerde-g2.swt
18	SONGS-g1.swt
19	SONGS-g2.swt
20	T468_HAA_slo.swt
21	T468_NGila_slo.swt

A description of the switching sequences can be found in Appendix H.

As mentioned previously, the user written dynamic model provided by the IC for project C561 did not perform correctly for the disturbances simulated and was removed from the case. The model must be revised, re-submitted, and will be re-evaluated in the Phase II studies.

For the outage of the Imperial Valley-La Rosita 230 kV line, voltage violations were observed in the CFE area prior to the addition of the remaining two IVA Cluster projects. These violations are a known problem in CFE and could be attributed to dynamic modeling issues within CFE's system. This will be further investigated in the Phase II studies.

The associated general results can be found in Appendix I and project-specific results can be found in Appendix A.

9.1.2 BU Cluster

The BU Cluster, which contained two generation projects C555 and C583, was studied for both Heavy Summer and Light Load scenarios. Each scenario was analyzed at maximum generation output.

For the BU Cluster, line and generator outages were evaluated for contingencies simulated by the switch files outlined in Table 9.3: BU Cluster Switch Files. The switch files used for the BU Cluster are identical to those used for the IVA Cluster.

Table 9.3: BU Cluster Switch Files

	Switch Files
1	FLAT.swt (No contingency)
2	C493_Centrals_slo.swt
3	Dev-Val_slo.swt
4	HAA_NGila_slo.swt
5	IV_C493_slo.swt
6	IV_ROA_6.swt
7	IV-Wnd1 noRAS_slo.swt
8	IV-Wnd1 noXTrp_slo.swt
9	IV-Wnd1 RAS_slo.swt
10	IV_Wnd_dlo_noXTrpR1.swt
11	IV_Wnd_dlo_RASxR1.swt
12	ML_Wnd_noRAS_slo.swt
13	ML_Wnd_noXTrp_slo.swt
14	ML_Wnd_RAS_slo.swt
15	Ngila_IV_slo.swt
16	PaloVerde-g1.swt
17	PaloVerde-g2.swt
18	SONGS-g1.swt
19	SONGS-g2.swt
20	T468_HAA_slo.swt
21	T468_NGila_slo.swt

A description of the switching sequences can be found in Appendix H.

For the outage of the Imperial Valley-La Rosita 230 kV line, voltage violations were observed in the CFE area prior to the addition of the BU Cluster. These violations are a known problem in CFE and could be attributed to dynamic modeling issues within CFE's system. This will be further investigated in the Phase II studies.

The associated general results can be found in Appendix I and project-specific results can be found in Appendix A.

9.1.3 INT Cluster

The INT Cluster, which contained two generation projects C565 and C574, was studied for both Heavy Summer and Light Load conditions. Each scenario was analyzed at maximum generation output.

For the INT Cluster, line and generator outages were evaluated for contingencies simulated by the switch files outlined in Table 9.4: INT Cluster Switch Files.

Table 9.4: INT Cluster Switch Files

	Switch Files
1	FLAT.swt (No contingency)
2	C493_Centrals_slo.swt
3	HAA_NGila_slo.swt
4	IV_C493_slo.swt
5	IV_ROA_6.swt
6	IV-Wnd1 noRAS_slo.swt
7	IV-Wnd1 RAS_slo.swt
8	IV_Wnd_dlo_RASxR1.swt
9	ML_Wnd_RAS_slo.swt
10	Ngila_IV_slo.swt
11	PaloVerde-g1.swt
12	PaloVerde-g2.swt
13	SONGS-g1.swt
14	SONGS-g2.swt
15	T468_HAA_slo.swt
16	T468_NGila_slo.swt
17	SY230-SG.swt
18	SX-ML.swt (pre-C2 only)
19	OM-SX.swt (pre-C2 only)
20	OM-SY.swt (pre-C2 only)
21	OM-SX_SYwRAS.swt (pre-C2 only)
22	SX-C565.swt (post-C2 only)
23	C574-SX (post-C2 only)
24	C574-SY (post-C2 only)
25	C574-SX_SYwRAS.swt (post-C2 only)
26	SY-MS (post-C2 only)
27	SX-PQ (post-C2 only)

A description of the switching sequences can be found in Appendix H.

For the outage of the Imperial Valley-La Rosita 230 kV line, two (2) voltage violations were observed due to the addition of the INT Cluster projects. The INT ICs and the CAISO must coordinate, to the extent possible, further study efforts with CFE to investigate these findings.

The two (2) identified violations are in addition to other pre-existing voltage violations that were observed in the CFE area, which are a known problem in CFE and could be attributed to dynamic modeling issues within CFE's system. The pre-existing violations in the CFE system will be further investigated in the Phase II studies.

The associated general results can be found in Appendix I and project-specific results can be found in Appendix A.

9.2 Parameters Monitored to Evaluate System Stability Performance

9.2.1 Rotor Angle

The rotor angle plots shown in Appendix J provide a measure for determining how the proposed generation units would swing with respect to one another. The plots also provide a measure of how the units would swing with respect to other generation units in the area.

9.2.2 Bus Voltage

The bus voltage plots, in conjunction with the relative rotor angle plots, also shown in Appendix J, provide a means of detecting out-of-step conditions. The bus voltage plots are useful in assessing the magnitude and the duration of post-disturbance voltage dips and peak-to-peak voltage oscillations. The bus voltage plots also give an indication of system damping and the level to which voltages are expected to recover in steady-state conditions. In addition to obtaining the bus voltage deviations from plots, Appendix I contains information on the bus voltage deviations from the Worst Condition Analysis.

9.2.3 Bus Frequency

The bus frequency plots, also shown in Appendix J, provide information on the magnitude and the duration of post-fault frequency swings with the Project in service. These plots indicate the extent of possible over-frequency or under-frequency, which can occur because of the imbalance between the generation and load within an area. In addition to obtaining this information from plots, Appendix I contains information on the frequency deviations as shown from the Worst Condition Analysis.

9.2.4 Other Parameters

The following parameters can also be monitored when required:

Generator Terminal Power	Bus Angle
Generator Terminal Voltage	Line Flow
Generator Rotor Speed	Voltage Spread
Generator Field Voltage	Frequency Spread

9.3 Results

9.3.1 SDG&E Transmission System

The study concluded that the addition of the Cluster 2 projects (except the project with the invalid dynamic model) would not cause the SDG&E transmission system to become unstable under Category B and Category C outages studied.

The results of the study are provided in Appendix I. The associated plots are provided in Appendix J.

9.3.2 Affected Systems

The study concluded that the addition of the Cluster 2 projects (except the project with the invalid dynamic model) would not cause the transmission systems of any neighboring utilities to become unstable under Category B and Category C outages studied. The voltage violations identified from the Reliability Study should be further investigated through coordination with CFE as described in Section 15: Coordination with Affected Systems.

10. Post-Transient Voltage Stability Analysis

Using the Heavy Summer and Light Load cases described in Section 7.1, post-transient voltage stability analysis indicated that, under the studied conditions and system configuration (including all Delivery Network Upgrades), the addition of the IVA, BU, and INT Cluster generation did not result in any post-transient voltage deviations of 5% or more for Category B contingencies and 10% or more for Category C contingencies from the pre-project levels or cause the SDG&E transmission system to fail to meet applicable voltage criteria.

Cluster 2 projects will not be responsible for pre-existing post-transient voltage deviations.

The results of this analysis and a list of Category B and C contingencies used to perform these analyses can be found in Appendix K.

11. Reactive Power Deficiency Analysis

Using the Heavy Summer and Light Load cases described in Section 7.1, reactive power deficiency analysis indicated that, under the studied conditions and system configuration (including all Cluster 2 Delivery Network Upgrades), cases including the IVA, BU, and INT Cluster generation converged for a 5% SDG&E area load increase followed by Category B contingencies and a 2.5% SDG&E area load increase followed by Category C contingencies.

This indicates that the addition of all Cluster 2 generator projects plus the Delivery Network Upgrades does not adversely impact the reactive power margin of the SDG&E transmission system.

The results of this analysis and a list of Category B and C contingencies used to perform these analyses can be found in Appendix K.

12. Mitigation

12.1 Mitigation for Steady-State Overloads

Category A (N-0) normal overloads are those that exceed 100% of continuous facility ratings that occur with all facilities in service.

Category B emergency overloads are those that exceed 100% of emergency ratings that occur due to a Category B contingency. A Category B contingency is commonly referred to as an "N-1" event, where there is a loss of a single element. No loss of customer load is allowed for Category B contingencies.

Category C emergency overloads are those that exceed 100% of emergency ratings that occur due to a Category C contingency. A Category C contingency is commonly referred to as an "N-2" event, where there is a loss of two or more elements. Planned (controlled) interruption of customer load and/or generation may occur and contracted firm (non-recalled reserved) transfers may be curtailed.

12.1.1 Deliverability Assessment Mitigation for SDG&E Transmission System

The Deliverability Study identified that the SDG&E Cluster generation causes the following overloads on the SDG&E transmission system.

Table 12.1: Deliverability Assessment Mitigation for SDG&E Transmission System

Overloaded Component	Mitigation
Contingency overloads on Imperial Valley-C493 500 kV	Re-dispatch generation or reduce scheduled imports to bring flow down below 1,000 MW within 30 minutes.
Base case and multiple contingency overloads in Otay Mesa area	Add Otay Mesa-South Bay 230 kV line *(Note 1)*
Base case and multiple contingency overloads in Otay Mesa area	Add South Bay-Mission 230 kV line *(Note 1)*
Base case and contingency overloads in Old Town area	Add Sycamore-Penasquitos 230 kV line
Contingency overloads in Encina area	Add Encina-San Luis Rey 230kV #3 line
Escondido-Pen 230 kV ckt 1	Upgrade line
Escondido-Pen 230 kV ckt 2	Upgrade line
Contingency overloads on Miguel 500/230kV transformers	Add Miguel 500/230 kV #3
Normal overload on ECO230/138 kV transformer (off-peak)	Add ECO 230/138 kV #2
Contingency overloads on IV 500/230kV transformers	Install SPS to trip Imperial Valley generation

Note 1: South Bay Substation is also known as Bay Boulevard Substation.

12.1.2 Deliverability Assessment Mitigation for SCE Transmission System

The first three Network Upgrades listed in Table 12.2 were proposed to mitigate overloaded facilities in SCE's area, which were attributed to SDG&E and SCE's Cluster 2 projects. The fourth overloaded component listed in Table 12.2, the Imperial Valley-North Gila 500 kV line, was attributed to SCE's Cluster 2 generation (no contribution by SDG&E's Cluster 2 projects). The preliminary mitigation was to construct a second Imperial Valley-North Gila 500 kV line. Re-evaluation of this upgrade prior to finalizing the mitigation plan demonstrated that upgrading the Imperial Valley-North Gila 500 kV series capacitor was sufficient. Therefore, the second 500 kV line is not proposed as the final mitigation.

Table 12.2: Preliminary - Deliverability Assessment Mitigation for SCE Transmission System

Overloaded Component	Mitigation
Base case overload on Colorado River-Palo Verde 500 kV line	New Colorado River-Harquahala 500 kV line
Contingency overload on Colorado River-Palo Verde 500 kV line	SPS to bypass series capacitor on Colorado River-Palo Verde 500 kV line
Base case overload on Alberhill-Serrano 500 kV line	Second Alberhill-Serrano 500 kV line
Base case overload on Imperial Valley-North Gila 500 kV line	Preliminary mitigation was to build second Imperial Valley-North Gila 500 kV line, finalized mitigation is to upgrade the series capacitor on the existing line

12.1.3 Reliability Study Mitigation

The Reliability Study modeled all of the mitigation measures identified by the Deliverability Assessment listed in Table 12.1 and two of the upgrades listed in Table 12.2 (New Colorado River-Harquahala 500 kV Line and the second Imperial Valley-North Gila 500 kV Line). The Reliability Study identified the need for four (4) mitigation measures in addition to those identified by the Deliverability Assessment. Special Protection Systems were recommended as mitigation for all four overload conditions.

All SPSs are classified as Reliability Network Upgrades because their cost is [redacted] This is to prevent overburdening of CAISO's congestion management system which can increase processing time to a point that could create reliability concerns.

12.1.3.1 Imperial Valley SPS

Currently, there is an Imperial Valley Special Protection System in place which limits the impact of generation plants connected to the Imperial Valley Substation for various N-1 and N-2 contingencies to protect SDG&E, CFE, and IID's transmission systems from overloads. Any new generation developed in the area must participate in the Imperial Valley SPS.

Participation in this existing IV SPS is proposed as a Reliability Network Upgrade.

The Imperial Valley area generation output is currently limited by the CAISO criteria of 1,150 MW of generation tripping for a Category B contingency and 1,400 MW of net generation and load tripping for a Category C contingency. When the Sunrise Powerlink is placed into service, generation dispatch limits are expected to increase, however, the total output will still be limited. Currently, there is 1,070 MW of generation connected at Imperial Valley Substation which is subject to the Imperial Valley generation tripping SPS. It should be assumed that any generation which would impact the facilities protected by the Imperial Valley SPS would be included in the generation tripping scheme covered by this SPS. Some of the Cluster 2 generation projects will be subject to this SPS. The details are provided in Appendix A.

All new SPSs and modifications to the existing ones are subject to review by Affected System Operators, members of the Imperial Valley RAS Technical Committee, and review and approval by the WECC RASRS.

12.1.3.2 Modification of the existing IV SPS to Protect Otay Mesa-Tijuana 230 kV Line

In the Heavy Summer cases, it was identified that the addition of the generators in the IVA Cluster caused the Otay Mesa-Tijuana 230 kV transmission line to exceed its emergency rating for the N-1 contingencies of C493-Central 500 kV or C493-Imperial Valley 500 kV. To protect this line, the existing SPS will be modified to trip generators until the overload is relieved following the N-1 of the above mentioned transmission lines. Some of the Cluster 2 generation projects will be subject to this SPS. The details are provided in Appendix A.

12.1.3.3 Participation in Proposed ECO/Boulevard SPS

In the event of the N-1 of the 500/230 kV transformer at ECO Substation, all generation interconnected at Boulevard and ECO substations will be left stranded and consequently must be tripped by an SPS. As described in Section 7.2, the combined generation dispatch at these two substations is limited to 1,150 MW. It is assumed that any generation which would impact the facilities impacted by the ECO/Boulevard SPS would be included in the generation tripping scheme covered by this SPS. Some of the Cluster 2 generation projects will be subject to this SPS. The details are provided in Appendix A.

12.1.3.4 Modification of Existing Otay Mesa SPS to Protect Proposed Otay Mesa-South Bay 230 kV Line

Currently, there is an SPS to trip all generation at Otay Mesa Energy Center to protect CFE's transmission system in the event of an N-2 contingency of the Otay Mesa-Miguel/South Bay Tap-South Bay 230 kV and Otay Mesa-Miguel/Sycamore Tap-Sycamore 230 kV transmission lines. With the addition of the C574 project bus, the new N-2 contingency of C574-Miguel/South Bay Tap-South Bay 230 kV and C574-Miguel/Sycamore Tap-

Sycamore transmission lines causes the proposed Otay Mesa–South Bay 230 kV to exceed its emergency rating. The existing SPS will need to be modified to trip generators connected to Otay Mesa Substation and/or INT Cluster generators until the overload is relieved. Some of the Cluster 2 generation projects will be subject to this SPS. The details are provided in Appendix A.

12.2 Mitigation for Power Factor

Power factor study results indicated that the IVA cluster projects did not satisfy the minimum power factor requirements per the Large Generation Interconnection Agreement (LGIA) Section 9.6. These results may be due to modeling issues and will be further evaluated in the Phase II Study. The ICs must modify the project power flow models (.epc files) such that the project generators are capable of meeting these power factor criteria.

12.3 Mitigation for Steady-State Voltage Violation

There were no steady-state voltage violations identified to mitigate.

12.4 Mitigation for Short Circuit Duty

Proposed mitigation for the thirty (30) SDG&E transmission circuit breakers identified as overstressed by the addition of the Cluster 2 generator projects plus the associated Delivery Network Upgrades are the upgrade of the circuit breakers to the requested interrupting capacity, as shown in Table 12.3.

Table 12.3: SDG&E Transmission Circuit Breakers Overstressed with the Addition of Cluster 2 Generator Projects

BREAKER	Voltage (kV)	Existing Interrupting Capacity (kA)	Percent Duty (%)	*Requested Interrupting Capacity (kA)*
MS13822 9N	138	41	104.8	***50***
MS13822 9S	138	41	104.8	***50***
MS13827 3S	138	42	102.3	***50***
MS13840 1N	138	41	104.8	***50***
MS13840 1S	138	41	104.8	***50***
MS50 2N	138	41	104.8	***50***
MS50 2S	138	41	104.8	***50***
MS51 6N	138	41	104.8	***50***
MS51 6S	138	41	104.8	***50***
MS52 8N	138	41	104.8	***50***
MS52 8S	138	41	104.8	***50***
MS60 4N	138	41	104.8	***50***
MS60 4S	138	41	104.8	***50***
MS61 7N	138	41	104.8	***50***
MS61 7S	138	41	104.8	***50***
SA23001 2E	230	40	125.9	***63***
SA23001 2T	230	40	125.9	***63***
SA23002 1W	230	40	125.9	***63***
SA23003 3T	230	40	125.9	***63***
SA23003 3W	230	40	125.9	***63***
SA23004 5E	230	40	125.9	***63***
SA23004 5T	230	40	125.9	***63***
SA23006 1E	230	40	125.9	***63***
SA23006 1T	230	40	125.9	***63***
SA23010 2W	230	40	125.9	***63***
SA23011 4T	230	40	125.9	***63***
SA23011 4W	230	40	125.9	***63***
SA71 5W	230	40	125.9	***63***
SA72 4E	230	40	125.9	***63***
SA73 3E	230	40	125.9	***63***

12.5 Mitigation for Transient Stability

The IVA Cluster project that did not provide a valid dynamic model must revise the model and resubmit to SDG&E in order to re-evaluate transient stability performance in Phase II.

Transient Stability studies for other Cluster 2 projects did not identify the need for any mitigation.

12.6 Mitigation for Post-Transient Voltage Stability

There were no post-transient voltage stability issues identified to mitigate.

12.7 Mitigation for Reactive Power Deficiency

There were no reactive power deficiency issues identified to mitigate.

13. Environmental Evaluation / Permitting

See Individual Project Reports for discussion on potential environmental evaluation and permitting issues associated with specific projects. The intent of the section is not to describe the entire permitting process, but to inform the ICs that a significant amount of time may be needed for the permitting process.

13.1 CPUC General Order 131-D

SDG&E is subject to the jurisdiction of the California Public Utilities Commission (CPUC) and must comply with CPUC General Order 131-D (Order) on the construction, modification, alteration, or addition of all electric transmission facilities (i.e., lines, substations, switchyards, etc.). This includes facilities to be constructed by others and deeded to SDG&E. In most cases where SDG&E's electric facilities are under 200 kV and are part of a larger project (i.e. electric generation plant), the Order exempts SDG&E from obtaining an approval from the CPUC provided its planned facilities have been included in the larger project's California Environmental Quality Act (CEQA) review, the review has included circulation with the State Clearinghouse, and the project's lead agency (i.e., California Energy Commission) finds no significant unavoidable environmental impacts. SDG&E or the project developer may proceed with construction once SDG&E has filed notice with the CPUC and the public on the project's exempt status, and the public has had a chance to protest SDG&E's claim of exemption. If SDG&E facilities are not included in the larger project's CEQA review, or if the project does not qualify for the exemption, SDG&E may need to seek approval from the CPUC (i.e., Permit to Construct) taking as much as 18 months or more since the CPUC would need to conduct its own environmental evaluation (i.e. Negative Declaration or Environmental Impact Report).

When SDG&E's transmission lines are designed for immediate or eventual operation at 200 kV or more, the Order requires SDG&E to obtain a Certificate of Public Convenience and Necessity (CPCN) from the CPUC unless one of the following exemptions applies: the replacement of existing power line facilities or supporting structures with equivalent facilities or structures, the minor relocation of existing facilities, the conversion of existing overhead lines (greater than 200 kV) to underground, or the placing of new or additional conductors, insulators, or their accessories on or replacement of supporting structures already built. Obtaining a CPCN can take as much as 24 months if the CPUC needs to conduct its own CEQA review.

Regardless of the voltage of the PTO's Interconnection Facilities, SDG&E recommends that the project proponent include those facilities in its project description and application to the lead agency performing CEQA review on the project. The lead agency must consider the environmental impacts of the interconnection electric facility, whether built by the developer with the intent to transfer ownership to SDG&E or to be built and owned by SDG&E directly. If the lead agency makes a finding of no significant unavoidable environmental impacts from construction of substation or under 200 kV power line facilities, SDG&E may be able to file an Advice Letter with the CPUC and publish public notice of the proposed construction of the facilities. The noticing process takes about 90 days if no protests are filed, but should be done as early as possible so that a protest does not delay construction. SDG&E has no control over the time it takes the CPUC to respond when

issues arise. If the protest is granted, SDG&E may then need to apply for a formal permit to construct the project (i.e. Permit to Construct).

Please see Section III, in General Order 131-D. This document can be found in the CPUC's web page at:

http://www.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/589.htm

13.2 CPUC Section 851

Because SDG&E is subject to the jurisdiction of the CPUC, it must also comply with Public Utilities Code Section 851. Among other things, this code provision requires SDG&E to obtain CPUC approval of leases and licenses to use SDG&E property, including rights-of-way granted to third parties for Interconnection Facilities. Obtaining CPUC approval for a Section 851 application can take several months or years, and requires compliance with the California Environmental Quality Act (CEQA). SDG&E recommends that Section 851 issues be identified as early as possible so that the necessary application can be prepared and processed. As with GO 131-D compliance, SDG&E recommends that the project proponent include any facilities that may be affected by Section 851 in the lead agency CEQA review so that the CPUC does not need to undertake additional CEQA review in connection with its Section 851 approval.

14. Upgrades, Cost Estimates, and Time to Construct Estimates

The cost estimates are considered to be non-binding, good faith and are based on the published unit costs, when applicable. Customized costs were developed when the unit costs did not reflect the unique circumstances of a project. The customized costs include: anticipated land acquisition costs, environmental mitigation, licensing/permitting, looping lines into substations, new switchyards, substation upgrades not included in unit costs, and PTO's Interconnection Facilities.

The Commercial Operation Dates of the generation projects in Cluster 2 are dependent on the completed construction and energizing of the identified Network Upgrades. Without the Delivery Network Upgrades, the new generators may be subject to CAISO's congestion management, including generation tripping. Based on the needed time to license/permit, design, procure material, and construct, it may not be feasible to complete all the upgrades needed for this cluster before the requested Commercial Operation Dates.

Some of the projects also require Reliability Network Upgrades to accommodate their physical interconnections. Based on the time needed to license/permit, design, procure material, and construct, it may not be feasible to complete all upgrades necessary for all projects in Cluster 2 before the requested In-Service Dates. Specific details are presented in the Individual Project Reports for applicable projects.

Costs for each generation project are confidential and are not published in this Group Report. Each IC is also receiving an Individual Project Report (Appendix A), specific only to their generation project, containing the details of the IC's cost responsibilities.

The estimated cost of **Reliability Network Upgrades** identified in this Group Study is assigned to all Interconnection Requests in that Group Study according to the following rules: (a) short circuit related Reliability Network Upgrades will be assigned pro rata on the basis of the short circuit duty contribution of each Large Generating Facility, (b) for all other Reliability Network Upgrades, the cost will be assigned pro rata on the basis of the maximum megawatt electrical output of each proposed new Large Generating Facility or the amount of megawatt increase in the generating capacity of each existing Generating Facility as listed by the Interconnection Customer in its Interconnection Request. The Reliability Network Upgrades required for a project to "physically" interconnect (i.e. bus extension, new switchyard, etc.) are presented only in the Individual Project Reports. Some mitigation measures are related to the telecommunications needed for each individual SPS. SPS costs may have two components. The cost for the SDG&E protection and communication equipment for the monitored facilities is assigned pro rata on the basis of the maximum megawatt electrical output of each project. The cost for the protection and communication equipment to interface between SDG&E and each project is assigned directly to the participating project.

The estimated cost of all **Delivery Network Upgrades** identified in the Deliverability Assessment are assigned to all Interconnection Requests selecting Full Capacity Deliverability Status based on the flow impact of each such Large Generating Facility on the Delivery Network Upgrades as determined by the generation distribution factor methodology.

The estimated cost of all **PTO's Interconnection Facilities** is assigned to each Interconnection Request individually. The cost estimates for the PTO's Interconnection Facilities are all site specific and details are provided in each Individual Project Report.

The cost of the mitigation plan for overloads of SDG&E facilities attributed to the Cluster 2 projects evaluated as a cluster is [redacted] as shown in Table 14.1. In addition, all of the projects in the SDG&E area were also identified as contributing to SCE overloads. Delivery Network Upgrades associated with the SCE overloads are shown in Table 14.2. The cost of the mitigation plan for overloads on SCE facilities attributed to SDG&E and SCE Cluster 2 projects is [redacted] The cost shown in Table 14.2 is the total cost of the upgrades for SDG&E and SCE Cluster 2 projects. Participating SDG&E Cluster 2 projects will only pay their allocated cost and the SCE Cluster 2 projects will pay their share of this total cost.

PTO's Interconnection Facilities and Reliability Network Upgrades required to physically interconnect specific projects are identified (as appropriate) in each project's Appendix A. The non-binding, good faith estimate of time to construct (license/permit, design, procure material, and construct) the facilities identified in the report will be project-specific and will be based upon the assumption that the environmental permitting obtained by the IC is adequate for permitting all SDG&E activities.

It is assumed that the Interconnection Customers will include the PTO's Interconnection Facilities and Network Upgrades work scope in their environmental impact report to the CPUC. In the time to construct estimates, SDG&E included the time required for a PTC or CPCN, if it was anticipated. If the CPUC requires licensing when it was not anticipated by SDG&E, timing for the upgrade could be extended by two to three years.

Table 14.1: SDG&E Network Upgrades, Estimated Costs, Estimated Time to Construct

Type of Upgrade	Upgrade		Estimated Cost x 1,000 *(Note 1)*	Estimated Time to Construct *(Note 2)*
Reliability Network Upgrades	Participation in existing Imperial Valley SPS for multiple N-1 and N-2 contingencies *(Note 3 & 4)*	SDG&E protection and communication equipment for Imperial Valley Substation *(Note 5)*	[redacted]	12 Months
		Protection and communication equipment to interface between SDG&E and projects *(Note 6)*	[redacted]	12 Months
	Modification of existing Imperial Valley SPS to protect Otay Mesa-TJI 230 kV Line *(Note 3)*	SDG&E protection and communication equipment for Otay Mesa, Miguel, and Central substations *(Note 5)*	[redacted]	12 Months
	Participation in proposed SPS to protect ECO 500/230 kV Transformer *(Note 3)*	SDG&E protection and communication equipment for the ECO 500/230 kV transformer *(Note 6)*	[redacted]	12 Months
	Modification of existing Otay Mesa SPS to protect new Otay Mesa-South Bay *(Note 3)*	SDG&E protection and communication equipment for Otay Mesa, Miguel, Sycamore, South Bay, and Sycamore substations *(Note 5)*	[redacted]	12 Months
		Protection and communication equipment to interface between SDG&E and projects *(Note 6)*	[redacted]	12 Months
	New SPS to protect IV 500/230 kV Transformers *(Note 3)*	SDG&E protection and communication equipment for 3-500/230 kV transformers at Imperial Valley Substation *(Note 5)*	[redacted]	12 Months
	Upgrade 15 Mission 138 kV Circuit Breakers	Replace 15 breakers: MS13822 9N, MS13822 9S, MS13827 3S, MS13840 1N, MS13840 1S, MS50 2N, MS50 2S, MS51 6N, MS51 6S, MS52 8N, MS52 8S, MS60 4N, MS60 4S, MS61 7N, MS61 7S	[redacted]	18 Months
	Upgrade 15 San Luis Rey 230 kV Circuit Breakers	Replace 15 breakers: SA23001 2E, SA23001 2T, SA23002 1W, SA23003 3T, SA23003 3W, SA23004 5E, SA23004 5T, SA23006 1E, SA23006 1T, SA23010 2W, SA23011 4T, SA23011 4W, SA71 5W, SA72 4E, SA73 3E	[redacted]	12 Months

Table 14.1: SDG&E Network Upgrades, Estimated Costs, Estimated Time to Construct - Continued

Type of Upgrade	Upgrade		Estimated Cost x 1,000 *(Note 1)*	Estimated Time to Construct *(Note 2)*
Delivery Network Upgrades	New Otay Mesa-South Bay 230 kV Line *(Note 7)*	• Install 2-230 kV breakers, 2 disconnects, and structures and relaying at Otay Mesa • Install 1-230 kV breaker, 2 disconnects, and relaying at South Bay • Construct 18-mile overhead 230 kV line from Otay Mesa to South Bay	[redacted]	48 Months
	New South Bay-Mission 230 kV Line *(Note 7)*	• Install 1-230 kV breaker, 2 disconnects, and relaying at South Bay • Relocate lines and install 1-230 kV breaker and 2 disconnects and structures and relaying at Mission • Construct 16.6-mile overhead and underground 230 kV line from South Bay to Mission • Relocate 4.2 miles of a 138 kV underground line	[redacted]	66 Months
	New Sycamore-Penasquitos 230 kV Line	• Install 1-230 kV breaker, 2 disconnects, relays and UG structure at Sycamore • Install 2-230 kV breakers, 4 disconnects, relays and structures at Penasquitos • Construct 14-mile overhead and underground 230 kV line from Sycamore to Penasquitos	[redacted]	60 Months
	3rd Encina-San Luis Rey 230 kV Line	• Expand switchyard and add 230 kV bay with 2 breakers, 4 disconnects, structures and relays at San Luis Rey • Install 2-230 kV breakers, 4 disconnects, structures and relays in new proposed switchyard at Encina • Construct 9-mile overhead 230 kV line from Encina to San Luis Rey	[redacted]	54 Months
	Upgrade the Escondido-PEN 230 kV #1 Line Upgrade the Escondido-PEN 230 kV #2 Line	• Reconductor 2-230 kV lines from 605 ACSS/AW to 900 ACSS/AW • Relocate 2 overhead 69 kV circuits and convert to UG • Install 8-230 kV 3000 amp disconnects at Escondido	[redacted]	12 Months
	3rd Miguel 500/230 kV Transformer	• Install 3rd 500/230 kV transformer at Miguel Substation • Install 2-230 kV disconnects, 1-230 kV breaker, and the 230 kV bank leads • Develop 500 kV reactor site, relocate reactors, modify the 500 kV GIS for the reactor position and install the 500 kV bank leads in the old reactor position • Include all required structures and protection	[redacted]	60 Months
	2nd ECO 230/138 kV Transformer	• Intstall 2nd 230/138 kV Transformer at ECO Substation • Install 2-230 kV breakers and 2-230 kV disconnects • Install 2-138 kV breakers and 2-138 kV disconnects • Install all associated structures and relaying	[redacted]	36 Months
Total			[redacted]	Time to construct is not cumulative

Notes continued for Table 14.1:

Note 1: Estimated costs include land purchases and licensing/permitting costs, when appropriate.

Note 2: Time to construct estimates include time for licensing/permitting, when appropriate. The estimated time to construct is for a typical project; construction duration may change due to the number of projects simultaneously in construction. Multiple projects impact resources, system outage availability, and environmental windows of construction. A key assumption is SDG&E will need to obtain CPUC licensing and regulatory approvals prior to design, procurement, and construction of the proposed facilities.

Note 3: All Special Protection Systems are classified as Reliability Network Upgrades because their cost is less than $1 million. This is to prevent overburdening of CAISO's congestion management system which can increase processing time to a point that could create reliability concerns.

Note 4: The existing Imperial Valley SPS protects SDG&E, CFE, and IID following various N-1 and N-2 contingencies. All new SPSs and modifications to existing SPSs are subject to review by Affected System Operators, members of the Imperial Valley RAS Technical Committee, and review and approval by the WECC RASRS.

Note 5: The SPS cost includes the equipment on the PTO's system. This is a one-time setup and equipment cost. The SPS cost does not include any control, protection, and/or fiber-optic communication costs at the projects' facility.

Note 6: The SPS cost includes project-specific equipment required on the PTO's system for interface with the projects, as well as equipment provided to the projects for installation at the projects' facility. Additional SPSs would require updated logic, but minimal/no cost.

Note 7: South Bay Substation is also known as Bay Boulevard Substation.

Table 14.2: SCE Network Upgrades, Estimated Costs, Estimated Time to Construct

Type of Upgrade	Upgrade		Estimated Cost x 1,000 (Note 1)	Estimated Time to Construct (Note 2)
Reliability Network Upgrades	Eastern Area SPS	SPS to bypass Line Series Capacitor Bank on the Colorado River-Palo Verde 500 kV T/L under N-1 of the Colorado River-Harquahala 500 kV T/L	[redacted]	24 months
Delivery Network Upgrades	2nd Alberhill-Serrano 500 kV Line	Install 26 Miles of new Single Circuit Line equipped with 2-2156 KCMIL ACSR Conductors, one ½-In. Steel OHGW and one OPGW	[redacted]	84 months
	New Colorado River-Harquahala 500 kV Line	Install about 119 miles of new 500kV Transmission Line using single circuit structures equipped with 2-2156KCMIL ACSR Conductors.	[redacted]	96 Months
	Series Capacitors for the Colorado River-Harquahala 500 kV T/L	Install 500kV Line Series Capacitor Bank on the new Colorado River-Harquahala 500kV Transmission Line	[redacted]	96 Months
Total			[redacted]	Time to construct is not cumulative

Note 1: This is the total cost of the Delivery Network Upgrades attributed to SDG&E's Cluster 2 projects contributing to overloads in SCE's area. This total cost is shared by applicable SCE Cluster 2 and SDG&E Cluster 2 projects.

Note 2: The estimated time to construct (ETC) is for a typical project; schedules duration may change due to number of projects approved and release dates. Stacked projects impact resources, system outage availability, and environmental windows of construction. Assumption is SCE will need to obtain CPUC licensing and regulatory approvals prior to design, procurement and construction of the proposed facilities required to serve the Interconnection Customer and prerequisite facilities are in-service.

15. Coordination with Affected Systems

CAISO LGIP Tariff, Appendix Y, Section 3.7 requires the CAISO to coordinate, to the extent possible, with any Affected Systems that is identified having potential impacts due to Cluster 2 projects.

The IVA and BU clusters could adversely impact CFE and IID with different base case assumptions, especially with different CFE generation dispatch and Path 45 flow.

CFE is identified as an Affected System in the short circuit analysis due to the addition of Cluster 2 generator projects plus the associated Delivery Network Upgrades. All the Cluster 2 ICs must coordinate with CFE to further investigate these findings and mitigate the impact on the CFE system.

Voltage violations identified in the transient stability analysis are in addition to other pre-existing voltage violations that were observed in the CFE area. These violations are a known problem in CFE and could be attributed to dynamic modeling issues within CFE's system. This will be further evaluated in the Phase II studies.

IID was identified as an Affected System in the Deliverability Assessment. Some of the Cluster 2 Interconnection Customers must coordinate with IID to further investigate these findings. More details are provided in Appendix A.

The CAISO will coordinate, to the extent possible, further communications and study efforts between IID, CFE, and the appropriate project developers.

16. Local Furnishing Bonds

SDG&E has financed or refinanced substantial portions of its wholly-owned transmission and distribution systems with proceeds from [redacted] of outstanding Local Furnishing Bonds issued by the City of San Diego and the City of Chula Vista. This includes the costs of SDG&E's wholly owned electric transmission and distribution facilities located in San Diego and Orange Counties (the "Local Furnishing Transmission System"). Interest on these LFBs is tax-exempt. If the proposed projects comprising Cluster 2 would impair the tax-exempt status of interest on these LFBs under the Internal Revenue Code, Treasury Regulations and applicable IRS private letter rulings (an "Impairment"), the Interconnection Customers will be required to pay any costs SDG&E incurs in mitigating the Impairment.

For the reasons described below, it does not, at this time, appear that energy produced by generators comprising Cluster 2 will cause an Impairment involving the Amended Annual Net Importer Test set forth in the IRS supplemental letter ruling dated July 7, 2009. This situation will continue to be monitored to determine if this conclusion remains the reasonable expectation based on any change in material facts relevant to determining whether an Impairment may arise. Further, under the CAISO Tariff and Transmission Control Agreement ("TCA"), the CAISO is obligated to affect such remedial measures as might be available to avoid an Impairment involving the Amended Annual Net Importer Test set forth in the IRS supplemental letter ruling dated July 7, 2009 that would otherwise trigger a redemption or defeasance of the LFBs.

SDG&E completed a GridView production modeling analysis to determine the post-Cluster 2 cumulative net inbound flow assuming all of the Cluster 2 projects are operational. A chronologic hourly economic simulation of the WECC electric system (generation, loads and transmission network) was performed for a single year to determine whether electric energy from the seven projects, in combination with other local generation and SDG&E's share of electric energy from other non-local generation resources, may cause an actual or deemed cumulative annual net outbound flow of electric energy from SDG&E's Local Furnishing Transmission System in violation of the Encumbrances set forth in SDG&E's Appendix B to the TCA with the CAISO.

For the purposes of this analysis, any generation connected to the Imperial Valley-Miguel 500 kV line west of the Imperial Valley Substation is treated as internal generation. Cluster 2 projects categorized as internal generation included C555, C565, C574, and C583. Any generation connected at the Imperial Valley Substation or east of Imperial Valley Substation, C561, C590, and C608, was treated as external and was not counted towards the net outbound flow. The simulation encompassed all queued generation projects connecting to SDG&E's Local Furnishing Transmission System, including all the Cluster 2 projects. The results of this net inbound flow analysis are summarized in Table 16.1

Table 16.1: Summary of Net Inbound Flow Analysis for Cluster 2

Interfaces	Net Inbound (Outbound) Flows (GW-hr)
Net Import at Miguel	10455
Net Path 44 Import (South of SONGS)	1073
Net Tijuana-Otay Mesa Import	971
Net Import at Central Station	5937
Net Lake Elsinore Import (flow across the Q72 transmission system)	(26)
20% SDG&E San Onofre Generation	(3488)
100% SDG&E outside area Utility Owned Generation (El Dorado & Rim Rock)	(2349)
ECO 500 kV Net Generation	(4974)
Net Inbound (Outbound) Flow	**7598**

As the net flow is 7,598 GW-hr inbound for the simulation year, this is an indication that the actual and reasonably anticipated flows of electricity into and out of the Local Furnishing Transmission System will not become outbound on a net annual basis following the addition of the Cluster 2 generation projects.

SDG&E also completed an assessment to determine whether the generation associated with the projects will cause an Impairment involving the "Character Test" under applicable IRS private letter rulings as supplemented from time to time where SDG&E is required to acquire any facilities sooner, larger, or of a different design than is needed for the purpose of providing electric service to SDG&E's retail bundled service customers. Two chronologic hourly economic simulations of the WECC electric system (generation, loads and transmission network) are performed for a single year to project average line flows on LFB-funded transmission lines before and after the projects comprising Cluster 2 are brought on-line. The purpose of comparing the average line flows before and after Cluster 2 is to determine if the additional generation will interfere with the use of SDG&E's Local Furnishing Transmission System for the purpose of providing electric service to SDG&E's retail bundled service customers.

The results of the average flow analysis described in the immediately preceding paragraph are summarized in Table 16.2.

Table 16.2 – Summary of Average Flow Analysis for Cluster 2

Facility	Rating (MVA)	Average Line Flows (MW)		
		Pre-Cluster 2	Post-Cluster 2	Delta
Imperial Valley-ECO 500 kV #1	2252	644.6	634.3	-10.3
ECO-Miguel 500 kV	2598	1152.6	1193.5	40.9
Otay Mesa-Silvergate 230 kV	912	188.5	194.5	5.9
Otay Mesa-Sycamore Canyon 230 kV	797	13.9	15.3	1.4
Otay Mesa-Tijuana 230 kV	797	-107.0	-110.8	-3.8

For this study year, average line flows on some LFB-funded facilities vary. However, the average flows are below 50% of the ratings for all facilities, indicating that there is adequate capacity on LFB-funded facilities to both serve SDG&E's retail bundled service customers and accommodate Cluster 2.

Based on these analyses, SDG&E's present reasonable expectation in connection with all projects comprising Cluster 2, in aggregate, is that:

A. An Impairment involving the Character Test will not occur from the construction and energization of the PTO's Interconnection Facilities and Network Upgrades within the Local Furnishing Transmission System that are required for the projects if the energy from the projects is sold exclusively to SDG&E. However, in the event energy from the projects is not sold exclusively to SDG&E, then an Impairment involving the Character Test may occur and the means by which such Impairment, if any, is resolved is set forth in the SDG&E Appendix B (SDG&E Encumbrances) to the Transmission Control Agreement.

B. The actual and reasonably anticipated flows of electricity into and out of the Local Furnishing Transmission System will not become outbound on a net annual basis following the addition of the Cluster 2 generating projects.

SDG&E will continue to monitor the projects' generation output and other system conditions to determine if an Impairment may arise as a result of any change in material facts.

Appendix B

CAISO Controlled Grid Generation Queue

The California ISO Controlled Grid Generation Queue
as of May 28, 2010

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection			Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
1	9/30/1998	9/30/1998	Active - A39	WT	W	16.5			Riverside	CA	SCE	Devers-Garnet 115 kV line (Tap)	3/1/1999	12/31/2010	NA	Complete	Complete		IFA
1A	11/1/1999	11/1/1999	Complete	CC	NG	550	550		San Diego	CA	SDGE	Miguel Substation	3/1/2002	10/3/2009	N/A	Complete	Complete		IA Executed
2	8/10/1999	2/3/2000	Complete	CC	NG	590			Contra Costa	CA	PGE	Contra Costa Power Plant 230 kV bus	11/28/2007	1/7/2009	N/A	Complete	Complete		GSFA Executed
3	4/21/2000	6/14/2000	Active	CT	NG	850			Riverside	CA	SCE	Devers Substation 230 kV Bus	1/1/2004	6/1/2010	NA	Complete	Re-study Complete	Complete	Executed
4	8/8/2000	8/8/2000	Complete	CC	NG	521	545		San Diego	CA	SDGE	Palomar 230 kV	6/1/2001	10/15/2005	NA	Complete	Complete		Executed
~~5~~	~~8/9/2000~~	~~8/9/2000~~	~~Withdrawn 9/14/06~~	~~CC~~	~~NG~~	~~900~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Encina Power Plant Switchyard~~	~~6/30/2003~~	~~6/1/2008~~	~~NA~~	~~Complete~~	~~In Progress~~		
6	8/23/2000	8/23/2000	Active - Serial	CC	NG	1156			San Joaquin	CA	PGE	Tesla Substation 230 kV Bus E	6/1/2008	11/30/2014	NA	Re-Study Complete	Complete	Complete	In Progress
7	8/16/2000	10/6/2000	Active - Serial	CC	NG	630			Los Angeles	CA	SCE	El Segundo 220 kV Bus	8/1/2009	6/1/2013	NA	Complete	Complete	Complete	Executed
~~8~~	~~11/28/2000~~	~~11/28/2000~~	~~Withdrawn 1/25/10~~	~~CC~~	~~NG~~	~~750~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Sycamore Canyon Substation~~	~~6/1/2004~~	~~12/31/2010~~	~~NA~~	~~Complete~~	~~Re-Study Complete~~		~~In Progress~~
~~9~~	~~12/1/2000~~	~~12/1/2000~~	~~Withdrawn 9/20/08~~	~~CC~~	~~NG~~	~~1200~~			~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Morro Bay Substation~~	~~1/1/2008~~	~~1/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~GSFA Executed~~
~~10~~	~~5/2/2001~~	~~5/2/2001~~	~~Withdrawn 5/24/07~~	~~CC~~	~~NG~~	~~620~~			~~Kings~~	~~CA~~	~~PGE~~	~~Gates Substation (Arco - Gates 230 kV line)~~	~~1/1/2009~~	~~7/1/2009~~	~~NA~~	~~Complete~~	~~Complete~~		~~GSFA Executed~~
~~11~~	~~10/14/2002~~	~~10/23/2002~~	~~Withdrawn 8/21/09~~	~~WT~~	~~W~~	~~63~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Wheaton Substation~~	~~12/1/2004~~	~~3/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~IFA Executed~~
11A	7/26/2002	7/26/2002	Active	CC	NG	520			Riverside	CA	SCE	Julian Hinds Substation 230kV	6/1/2005	8/1/2010	NA	Complete	Complete		Executed
12	12/16/2002	12/16/2002	Complete	WT	W	150			Solano	CA	PGE	Birds Landing Substation 230kV	10/31/2005	3/30/2006	NA	Complete	Complete		GSFA Executed
13	1/3/2003	1/3/2003	Active	H	WTR	40			San Diego	CA	SDGE	Olivehain-Bernardo-Rancho Santa Fe 69kV line	7/1/2007	7/31/2010	NA	Complete	Complete		Executed
14	1/7/2003	1/7/2003	Complete	CC	NG	65			San Diego	CA	SDGE	Miguel-Tijuana	12/31/2004	10/3/2009	NA	Complete	Complete		IA Tendered
~~15~~	~~12/31/2002~~	~~1/17/2003~~	~~Withdrawn 7/13/07~~	~~WT~~	~~W~~	~~50~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Mountain Pass~~	~~9/1/2004~~	~~1/1/2010~~	~~NA~~	~~Complete~~	~~Complete~~		
16	3/11/2003	3/11/2003	Active	WT	W	120			Santa Barbara	CA	PGE	Cabrillo	6/1/2006	12/31/2011	NA	Complete	Complete		GSFA Executed
17	3/18/2003	3/18/2003	Active - Serial	CC	NG	520			Riverside	CA	SCE	Devers-Palo Verde 500 kV line near Blythe	1/1/2006	8/1/2010	NA	Complete	Complete		In Progress
~~18~~	~~4/15/2003~~	~~4/15/2003~~	~~Withdrawn 6/20/06~~	~~WT~~	~~W~~	~~200~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope~~	~~12/31/2005~~	~~12/12/2007~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
19	6/4/2003	6/18/2003	Complete	WT	W	46			San Diego	CA	SDGE	Crestwood	12/31/2005	10/1/2005	NA	Complete	Complete		Executed
20	8/19/2003	9/4/2003	Active - Serial	WT	W	300			Kern	CA	SCE	Antelope	12/31/2006	10/31/2011	NA	Re-Study Complete	Re-study Complete		In Progress
21	10/3/2003	10/23/2003	Complete	WT	W	37.55			Byron	CA	PGE	Windmaster/Buena Vista Sub	7/1/2004	12/29/2006	NA	NA	NA		Executed
22	11/18/2003	11/18/2003	Active	WT	W	38			Solano	CA	PGE	New Birds Lndng Sw Sta near Contra Costa PP Sub	6/30/2005	12/31/2010	NA	Complete	Complete		GSFA Executed
23	11/17/2003	11/24/2003	Complete	CC	NG	72			San Bernardino	CA	SCE	San Bernadino 220+M127 kV	11/1/2004	10/1/2005	NA	Complete	Complete		IFA Executed
24	1/30/2004	1/30/2004	Complete	WT	W	150			Solano	CA	PGE	High Winds/Contra Costa PP	12/31/2006	1/27/2009	NA	Complete	Complete		GSFA Executed
~~25~~	~~2/5/2004~~	~~2/5/2004~~	~~Withdrawn 6/11/07~~	~~WT~~	~~W~~	~~117~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Crestwood~~	~~6/6/2005~~	~~6/1/2007~~	~~NA~~	~~In Progress~~			
~~26~~	~~2/12/2004~~	~~2/12/2004~~	~~Withdrawn 8/23/07~~	~~WT~~	~~W~~	~~36~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Crestwood~~	~~4/1/2006~~	~~1/1/2008~~	~~NA~~	~~In Progress~~			
~~27~~	~~2/23/2004~~	~~2/23/2004~~	~~Withdrawn 10/19/07~~	~~CC~~	~~NG~~	~~650~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~230/138/69 kV South Bay (650 MW CC)~~	~~1/1/2010~~	~~1/1/2010~~	~~NA~~	~~Complete~~	~~Complete~~		~~In Progress~~
~~28~~	~~2/25/2004~~	~~2/25/2004~~	~~Withdrawn 7/22/08~~	~~CT~~	~~NG~~	~~145.1~~			~~San Francisco~~	~~CA~~	~~PGE~~	~~Potrero 115 kV Sub~~	~~12/1/2006~~	~~6/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~Executed~~
~~29~~	~~3/8/2004~~	~~3/29/2004~~	~~Withdrawn 7/11/08~~	~~WT~~	~~W~~	~~201~~			~~Lake & Sonoma~~	~~CA~~	~~PGE~~	~~Collector Substation at Geysers #17 & Fulton 230 kV line~~	~~12/1/2006~~	~~7/1/2009~~	~~NA~~	~~Complete~~	~~Re-study in Progress~~		~~In Progress~~
~~30~~	~~4/26/2004~~	~~4/26/2004~~	~~Withdrawn 7/22/08~~	~~CT~~	~~NG~~	~~48.7~~			~~San Francisco~~	~~CA~~	~~PGE~~	~~SF Airport Substation~~	~~6/1/2006~~	~~6/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~GSFA Executed~~
~~31~~	~~4/12/2004~~	~~5/11/2004~~	~~Withdrawn 4/18/08~~	~~WT~~	~~W~~	~~201~~			~~Kern~~	~~CA~~	~~SCE~~	~~Monolith Substation~~	~~12/31/2007~~	~~6/1/2010~~	~~NA~~	~~Complete~~	~~In Progress~~		
32	5/12/2004	5/24/2004	Active - Serial	WT	W	201			San Diego	CA	SDGE	Boulevard Substation 138kV	9/1/2007	11/1/2012	NA	Complete	Complete		In Progress
33	7/9/2004	7/12/2004	Complete	ST	G	10			Churchill	NV	SCE	Bishop Control Sub	7/14/1988	5/31/2006	NA	Complete	Complete		LGIA Executed
~~34~~	~~7/19/2004~~	~~7/19/2004~~	~~Withdrawn 4/18/08~~	~~WT~~	~~W~~	~~300~~			~~Kern~~	~~CA~~	~~SCE~~	~~Monolith Substation~~	~~7/1/2007~~	~~7/1/2011~~	~~NA~~	~~Complete~~	~~In Progress~~		
~~35~~	~~10/25/2004~~	~~10/25/2004~~	~~Withdrawn 4/12/07~~	~~CT~~	~~NG~~	~~49.9~~			~~Fresno~~	~~CA~~	~~PGE~~	~~115 KV Panoche Sub~~	~~5/31/2006~~	~~5/31/2006~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
~~36~~	~~11/1/2004~~	~~11/1/2004~~	~~Withdrawn 2/8/07~~	~~CT~~	~~NG~~	~~99.9~~			~~Stanislaus~~	~~CA~~	~~PGE~~	~~115 kV Tesla - Stockton Cogen Trans. Line~~	~~5/31/2006~~	~~5/31/2006~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
37	11/8/2004	11/8/2004	Active	CT	NG	74.9			San Joaquin	CA	PGE	Tesla Substation	1/1/2007	12/31/2011	NA	Complete	Complete		Executed
38	10/19/2004	11/11/2004	Active - Serial	IC	NG	146.4			Humboldt	CA	PGE	Humboldt Power Plant Substation	8/1/2008	7/15/2010	NA	Complete	Complete		LGIA Executed
39	11/11/2004	11/11/2004	Active	WT	W	200			Solano	CA	PGE	New Birds Lndng Sw Sta near Contra Costa PP Sub	12/31/2008	12/22/2009	NA	Complete	Complete		Executed
~~40~~	~~10/19/2004~~	~~11/11/2004~~	~~Withdrawn 4/20/09~~	~~IC~~	~~NG~~	~~118~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Eastshore Substation~~	~~5/1/2007~~	~~10/1/2009~~	~~NA~~	~~Complete~~	~~Complete~~		~~Executed~~
41	11/9/2004	11/18/2004	Active - A39	CT	NG	157			Kern	CA	SCE	Pastoria Substation	7/31/2006	6/1/2011	NA	Complete	Complete		
42	11/24/2004	11/26/2004	Active	CT	NG	300			Fresno	CA	PGE	McCall Substation	5/31/2007	3/31/2013	NA	Complete	Complete		Executed
~~43~~	~~11/29/2004~~	~~11/29/2004~~	~~Withdrawn 6/27/06~~	~~IC~~	~~NG~~	~~168.7~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla-Bellota 230 kV line~~	~~1/1/2008~~	~~10/1/2007~~	~~NA~~	~~Complete~~			~~Tendered~~
~~44~~	~~11/29/2004~~	~~11/29/2004~~	~~Withdrawn 3/30/06~~	~~IC~~	~~NG~~	~~126.5~~			~~Madera~~	~~CA~~	~~PGE~~	~~Borden Substation 230 kV Bus~~	~~1/1/2008~~	~~10/1/2007~~	~~NA~~	~~Complete~~	~~Complete~~		
45	12/1/2004	12/1/2004	Active	CT	NG	361			Alameda	CA	PGE	Eastshore substation	7/31/2006	6/1/2012	NA	Complete	Re-study Complete		Executed
~~46~~	~~12/1/2004~~	~~12/1/2004~~	~~Withdrawn 5/11/07~~	~~CT~~	~~NG~~	~~531~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~Tesla-Tracy #1 230 kV Line - Tracy Sub~~	~~7/31/2006~~	~~7/31/2008~~	~~NA~~	~~Complete~~	~~Complete~~		
~~47~~	~~12/1/2004~~	~~12/1/2004~~	~~Withdrawn 2/26/08~~	~~CT~~	~~NG~~	~~200.6~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Herndon - Kearney 230 kV line~~	~~6/30/2008~~	~~6/30/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~In Progress~~
~~48~~	~~12/1/2004~~	~~12/1/2004~~	~~Withdrawn 4/6/06~~	~~5~~	~~NG~~	~~590~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa Power Plant 230 kV Substation~~	~~1/1/2008~~	~~10/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
49	12/14/2004	12/14/2004	Active - Serial	WT	W	100.5			Riverside	CA	SCE	Devers Substation	12/1/2006	7/31/2011	NA	Re-Study Complete	Re-study Complete		
50	12/21/2004	12/21/2004	Active	CC	NG	810			Riverside	CA	SCE	SCE Valley Substation	5/31/2008	8/4/2008	NA	Complete	Complete		IA Executed
51	12/20/2004	12/21/2004	Complete	IC	NG	0.55			Fresno	CA	PGE	70 kV Kerman-Helm transmission line	4/30/2005	5/31/2006	NA	NA	NA		GSFA Executed
52	12/1/2004	12/21/2004	Complete	CT	NG	401			Fresno	CA	PGE	Panoche Sub Station	6/30/2008	5/28/2009	NA	Re-Study Complete	Re-study Complete		Executed
~~53~~	~~12/1/2004~~	~~12/22/2004~~	~~Withdrawn 7/24/06~~	~~CT~~	~~NG~~	~~116.8~~			~~Placer~~	~~CA~~	~~PGE~~	~~Pleasant Grove Sub Station~~	~~6/1/2008~~	~~6/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
54	11/11/2004	1/12/2005	Complete	CT	NG	119.9			Fresno	CA	PGE	Panoche Substation	6/1/2008	5/4/2009	NA	Complete	Re-study Complete		Executed
~~55~~	~~12/1/2004~~	~~1/13/2005~~	~~Withdrawn 11/13/07~~	~~CC~~	~~NG~~	~~673~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Helm substation~~	~~7/31/2008~~	~~7/31/2008~~	~~NA~~	~~Re-Study Complete~~	~~Tendered~~		
~~56~~	~~12/21/2004~~	~~1/25/2005~~	~~Withdrawn 5/31/07~~	~~CC~~	~~NG~~	~~634~~			~~Clark~~	~~NV~~	~~SCE~~	~~El Dorado 230 kV Substation~~	~~6/1/2007~~	~~8/1/2009~~	~~NA~~	~~Complete~~	~~Complete~~		
57	12/1/2004	2/8/2005	Active	CC	NG	715			Colusa	CA	PGE	Between Cottonwood and Vaca-Dixon	1/1/2010	5/1/2010	NA	Complete	Complete		Executed
58	1/25/2005	2/22/2005	Active - Serial	ST	G	62			Mineral	NV	SCE	Control 115kV Substation	10/7/2007	2/1/2012	NA	Complete	Complete	TAS II Completed	Filed Unexecuted
~~59~~	~~3/25/2005~~	~~3/28/2005~~	~~Withdrawn 8/2/06~~	~~CT~~	~~NG~~	~~97.2~~			~~Kings~~	~~CA~~	~~PGE~~	~~Henrietta Substantion 70 kV~~	~~1/1/2008~~	~~1/1/2008~~	~~NA~~	~~Complete~~	~~Complete~~		~~Tendered~~
60	3/28/2005	3/28/2005	Active	CT	NG	94			Kern	CA	PGE	Kern Oil Substation 115 kV	3/31/2007	3/31/2013	NA	Complete	Complete		Executed
61	3/28/2005	3/30/2005	Complete	ST	NG	73.27			Fresno	CA	PGE	70kV Helm-Kerman	5/31/2006	3/29/2007	NA	Complete	Complete		Executed
~~62~~	~~3/28/2005~~	~~4/13/2005~~	~~Withdrawn 2/21/06~~	~~CC~~	~~NG~~	~~166.5~~			~~Humboldt~~	~~CA~~	~~PGE~~	~~Humboldt Bay-Humboldt #1 115 kV~~	~~5/31/2007~~	~~6/1/2007~~	~~NA~~		~~Tendered~~		
~~63~~	~~3/25/2005~~	~~4/18/2005~~	~~Withdrawn 1/4/07~~	~~CC~~	~~NG~~	~~158~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa (230 kV)~~	~~1/1/2008~~	~~1/1/2008~~	~~NA~~	~~Complete~~	~~Re-study in Progress~~		~~Tendered~~
~~64~~	~~3/30/2005~~	~~4/28/2005~~	~~Withdrawn 1/13/06~~	~~CT~~	~~NG~~	~~147~~			~~Humboldt~~	~~CA~~	~~PGE~~	~~Humboldt Bay Power Plant Sub~~	~~5/1/2008~~	~~3/1/2008~~	~~NA~~	~~Complete~~			
~~65~~	~~5/6/2005~~	~~5/6/2005~~	~~Withdrawn 4/11/07~~	~~CT~~	~~NG~~	~~424.8~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Long Beach Gen Station 220kv switchyard~~	~~1/1/2007~~	~~6/1/2010~~	~~NA~~	~~Complete~~	~~Complete~~		
66	5/6/2005	5/6/2005	Active	CT	NG	500.5			Los Angeles	CA	SCE	Walnut Substation	9/1/2007	1/3/2013	NA	Re-Study Complete	Complete		Executed
67	3/28/2005	5/9/2005	Active	CC	NG	245			Alameda	CA	PGE	Eastshore Substation	7/31/2008	6/1/2012	NA	Complete	Re-study Complete		Executed
68	3/30/2005	5/11/2005	Active - Serial	Other	S	850			San Bernadino	CA	SCE	Pisgah 230 kV Substation	12/31/2009	3/31/2012	Waived	Re-Study Complete	Complete	Complete	LGIA Executed
~~69~~	~~5/6/2005~~	~~6/7/2005~~	~~Withdrawn 5/17/06~~	~~CT~~	~~NG~~	~~527~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Etiwanda 230kV Substation~~	~~8/1/2008~~	~~8/1/2008~~	~~NA~~	~~Complete~~			
70	5/9/2005	6/14/2005	Complete	IC	LFG	12.6			San Mateo	CA	PGE	Hillsdale Junction-Half Moon Bay 60 kV line	12/23/2005	4/1/2009	NA	Complete	Complete		GSFA Executed
~~71~~	~~5/6/2005~~	~~6/15/2005~~	~~Withdrawn 1/11/06~~	~~CC~~	~~NG~~	~~591~~			~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado 500/230kV Substation~~	~~2/28/2007~~	~~1/31/2007~~	~~Complete~~	~~Tendered~~			

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection			Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
72	4/26/2005	6/21/2005	Active - Serial	H	WTR	500			Riverside	CA	SCE/SDGE	Proposed Lee Lake Substation	12/31/2008	5/23/2012	NA	Complete	Complete		In Progress
73	6/6/2005	6/27/2005	Active - Serial	WT	W	250			Kern	CA	SCE	Whirlwind Substation 230kV bus	12/31/2007	10/31/2010	NA	Complete	In Progress		
74	7/12/2005	7/12/2005	Active - Serial	WT	W	102			Shasta	CA	PGE	230kV line btn Pit#3 & Round Mtn	12/15/2007	12/15/2010	Complete	Complete	Re-study Complete		LGIA Executed
75	**4/28/2005**	**7/15/2005**	**Complete**	**ST**	**B**	**10.5**			**Madera**	**CA**	**PGE**	**Le Grand-Chowcilla 115 kV**	**12/31/2005**	**5/20/2009**	**NA**	**Complete**	**Complete**		**GSFA Executed**
76	**4/28/2005**	**7/15/2005**	**Complete**	**ST**	**B**	**10.5**			**Merced**	**CA**	**PGE**	**PG&E Merced #1 70 kV circuit**	**7/1/2006**	**5/19/2009**	**NA**	**Complete**	**Complete**		**GSFA Executed**
~~77~~	~~8/19/2005~~	~~8/22/2005~~	~~Withdrawn 6/26/06~~	~~WT~~	~~W~~	~~300~~			~~Kern~~	~~CA~~	~~SCE/PGE~~	~~TBD Bakersfiled~~	~~11/30/2007~~	~~11/30/2007~~	~~Complete~~	~~Tendered~~			
78	8/31/2005	8/31/2005	Active	Other	S	300			Imperial	CA	SDGE	Imperial Valley Substation 230kV bus	12/31/2009	12/1/2010	Waived	Complete	Complete		Executed
79	5/24/2005	9/7/2005	Active - Serial	WT	W	51			Kern	CA	SCE	Windhub Substation 66kV bus	6/1/2006	3/31/2010	Complete	Complete	Complete		In Progress
~~80~~	~~9/12/2005~~	~~9/12/2005~~	~~Withdrawn 9/28/09~~	~~CC~~	~~NG~~	~~610~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Laguna Bell Substation 230 kV~~	~~7/31/2008~~	~~5/31/2012~~	~~Waived~~	~~Re-Study Complete~~	~~Re-study Complete~~		~~In Progress~~
81	**9/13/2005**	**9/13/2005**	**Complete**	**ST**	**G**	**55**			**Lake**	**CA**	**PGE**	**Geysers #17 - Fulton 230 kV Line**	**9/1/2006**	**11/1/2007**	**Waived**	**Complete**	**Complete**		**Executed**
~~82~~	~~6/10/2005~~	~~9/14/2005~~	~~Withdrawn 8/16/06~~	~~ST~~	~~B~~	~~6.8~~			~~Humboldt~~	~~CA~~	~~PGE~~	~~Rio Dell Substation 60 KV~~	~~1/1/2006~~	~~1/1/2006~~	~~Waived~~	~~Complete~~	~~Waived~~		
~~83~~	~~9/16/2005~~	~~9/16/2005~~	~~Withdrawn 10/8/08~~	~~WT~~	~~W~~	~~60~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Pisgah No. 2 230 kV tran line~~	~~12/31/2008~~	~~6/1/2010~~	~~Complete~~	~~Complete~~	~~Tendered~~	~~Tendered~~	
84	11/22/2005	12/1/2005	Active - Serial	WT	W	340			Kern	CA	SCE	Whirlwind Substation 230kV	12/31/2009	12/31/2011	NA	Complete	In Progress		
~~85~~	~~12/28/2005~~	~~12/28/2005~~	~~Withdrawn 3/26/08~~	~~WT~~	~~W~~	~~120~~			~~Kern~~	~~CA~~	~~SCE~~	~~Segment 3 230 Collector Loop Tehachapi~~	~~12/31/2007~~	~~12/31/2009~~	~~NA~~	~~Complete~~	~~Tendered~~		
~~86~~	~~12/30/2005~~	~~12/30/2005~~	~~Withdrawn 4/7/06~~	~~CT~~	~~NG~~	~~49.9~~			~~Kern~~	~~CA~~	~~PGE~~	~~Kern Oil-Vedder 115 kV Line~~	~~3/1/2008~~	~~3/1/2008~~					
86A	1/20/2006	1/20/2006	Active - Serial	WT	W	33.1			Kern	CA	SCE	Vincent Substation	1/1/2008	10/1/2009	NA	Complete	Complete		In Progress
86B	1/20/2006	1/20/2006	Active - Serial	WT	W	34			Kern	CA	SCE	Canwind Substation	1/1/2008	10/1/2009	NA	Complete	In Progress		
~~87~~	~~2/3/2006~~	~~2/3/2006~~	~~Withdrawn 3/9/06~~	~~ST~~	~~NU~~	~~28~~			~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Diablo Canyon Substation Circuit Breakers 532 and 632~~	~~12/8/2005~~	~~12/8/2005~~					
~~88~~	~~2/10/2006~~	~~2/10/2006~~	~~Withdrawn 2/14/08~~	~~CC~~	~~NG~~	~~613.5~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Hinson Substation 230 kV bus~~	~~7/1/2011~~	~~7/1/2011~~	~~Complete~~	~~Re-Study Complete~~	~~Tendered~~		
89	2/13/2006	2/13/2006	Active - Serial	CC	NG	570			San Bernardino	CA	SCE	Victorville Substation	7/1/2009	7/1/2012	Waived	Complete	Complete		In Progress
~~90~~	~~2/16/2006~~	~~2/16/2006~~	~~Withdrawn - 10/26/09~~	~~CT~~	~~NG~~	~~93~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Existing radial 69kV gen-tie line to TL6929~~	~~6/1/2007~~	~~6/1/2009~~	~~Complete~~	~~Complete~~	~~Complete~~		~~In Progress~~
91	2/22/2006	2/22/2006	Active - Serial	WT	W	51			Kern	CA	SCE	Windhub Substation 66kV bus	3/31/2010	3/31/2010	NA	Complete	Complete		In Progress
92	2/23/2006	2/23/2006	Active - Serial	CC	NG	570			Los Angeles	CA	SCE	Vincent 230 kV	7/1/2009	8/1/2010	NA	Complete	Complete		In Progress
93	2/15/2006	3/1/2006	Active - Serial	WT	W	220			Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2008	12/31/2012	NA	Complete	Complete		
94	3/1/2006	3/1/2006	Active - Serial	WT	W	180			Kern	CA	SCE	Highwind Substation 220kV	12/31/2008	12/31/2011	NA	Complete	Complete		In Progress
95	3/1/2006	3/1/2006	Active - Serial	WT	W	550			Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2011	NA	Complete	Complete		LGIA Executed
96	3/1/2006	3/1/2006	Active - Serial	WT	W	600			Kern	CA	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2010	NA	Complete	Complete		LGIA Executed
97	3/1/2006	3/1/2006	Active - Serial	WT	W	160			Kern	CA	SCE	Whirlwind Substation 220kV bus	12/31/2009	12/31/2013	NA	Complete	Complete		In Progress
98	**3/9/2006**	**3/9/2006**	**Complete**	**ST**	**NU**	**37**			**San Luis Obispo**	**CA**	**PGE**	**Diablo Canyon Substation Circuit Breakers 532 and 632**	**12/8/2005**	**1/1/2006**	**NA**	**Complete**	**NA**		**NA**
99	**3/29/2006**	**3/29/2006**	**Complete**	**ST**	**NU**	**45**			**San Luis Obispo**	**CA**	**PGE**	**Diablo Canyon Substation Circuit Breakers 542 and 642**	**6/8/2006**	**6/8/2006**	**NA**	**Complete**	**NA**		**NA**
100	4/5/2006	4/5/2006	Active - Serial	WT	W	120			Kern	CA	SCE	Vincent Substation through Sagebrush 230 kV line	12/31/2007	12/31/2012	NA	Complete	Complete		LGIA Executed
~~101~~	~~4/7/2006~~	~~4/7/2006~~	~~Withdrawn 10/17/06~~	~~CT~~	~~NG~~	~~100~~			~~Kern~~	~~CA~~	~~PGE~~	~~PG&E Kern Oil-Vedder 115 kV line~~	~~3/1/2008~~	~~3/1/2008~~	~~Complete~~	~~Tendered~~			
~~102~~	~~4/19/2006~~	~~4/19/2006~~	~~Withdrawn 1/17/08~~	~~WT~~	~~W~~	~~210~~			~~Monterey~~	~~CA~~	~~PGE~~	~~PG&E Coburn 230 kV Sub~~	~~11/30/2008~~	~~11/30/2008~~	~~Complete~~	~~Complete~~	~~Complete~~		~~In Progress~~
~~102A~~	~~4/21/2006~~	~~4/21/2006~~	~~Withdrawn 6/26/06~~	~~WT~~	~~W~~	~~100~~			~~Santa Barbara~~	~~CA~~	~~PGE~~	~~PG&E #2 Cabrillo-Divide 115 kV line~~	~~12/31/2009~~	~~12/31/2009~~	~~Tendered~~				
103	5/2/2006	5/2/2006	Active - Serial	ST	B	27			San Diego	CA	SDGE	Border Substation 69 kV	12/1/2008	5/13/2011	Complete	Complete	Complete		LGIA Executed
~~104~~	~~4/14/2006~~	~~5/3/2006~~	~~Withdrawn 9/28/09~~	~~CT~~	~~NG~~	~~304~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Laguna Bell 230 kV Substation~~	~~7/31/2009~~	~~7/31/2009~~	~~Waived~~	~~Re-Study Complete~~	~~Re-study Complete~~		~~In Progress~~
~~105~~	~~5/4/2006~~	~~5/4/2006~~	~~Withdrawn 6/29/06~~	~~WT~~	~~W~~	~~100~~			~~Humboldt~~	~~CA~~	~~PGE~~	~~Between Rio Del Junction and Bridgeville~~	~~10/30/2009~~	~~10/30/2009~~					
~~106~~	~~5/26/2006~~	~~5/26/2006~~	~~Withdrawn 10/13/08~~	~~ST~~	~~S~~	~~635~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Mohave 500 kV Switchyard~~	~~12/31/2009~~	~~12/31/2010~~	~~Complete~~	~~Tendered~~			
106A	5/1/2006	6/6/2006	Active - Serial	WT	W	160			San Diego	CA	SDGE	Boulevard Substation 138kV	6/30/2008	8/15/2012	Complete	Complete	Complete		In Progress
~~107~~	~~6/9/2006~~	~~6/9/2006~~	~~Withdrawn 11/17/06~~	~~WT~~	~~W~~	~~128~~			~~Solano~~	~~CA~~	~~PGE~~	~~Brighton-Contra Costa 115 kV~~	~~3/1/2011~~	~~3/1/2011~~	~~Complete~~				
108	6/9/2006	6/9/2006	Active - Serial	WT	W	128			Solano	CA	PGE	Lambie-Contra Costa 230 kV	3/1/2011	3/5/2012	Complete	Complete	Complete	Complete	LGIA Executed
~~108A~~	~~6/14/2006~~	~~6/14/2006~~	~~Withdrawn 11/16/06~~	~~Other~~	~~S~~	~~300~~			~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Morro Bay-Midway 230 kV circuit~~	~~3/1/2010~~	~~3/1/2010~~	~~Tendered~~				
~~109~~	~~6/14/2006~~	~~6/16/2006~~	~~Withdrawn 12/4/09~~	~~Other~~	~~S~~	~~550~~		~~EO~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation~~	~~3/1/2011~~	~~3/1/2011~~	~~Complete~~	~~Complete~~			
~~110~~	~~6/14/2006~~	~~6/16/2006~~	~~Withdrawn 12/4/09~~	~~Other~~	~~S~~	~~1400~~		~~EO~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation~~	~~3/1/2013~~	~~3/1/2013~~	~~Complete~~	~~Complete~~			
111	6/23/2006	6/26/2006	Active - A39	ST	B	16			Kern	CA	PGE	Tap of Chevron 70kv tran line	8/31/2009	12/15/2012	NA	Complete	Complete		GSFA Executed
~~112~~	~~6/28/2006~~	~~6/28/2006~~	~~Withdrawn 5/1/09~~	~~WT~~	~~W~~	~~300~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~500 kV Imperial Valley-Miguel trans line~~	~~10/31/2008~~	~~10/31/2008~~	~~Complete~~	~~Complete~~	~~In Progress~~		
113	6/29/2006	6/30/2006	Active - Serial	WT	W	30			Solano	CA	PGE	Birds Landing	4/1/2009	4/1/2012	Complete	Complete	Waived		In Progress
~~114~~	~~6/29/2006~~	~~7/12/2006~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~150~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Victor 230 kV~~	~~7/1/2008~~	~~7/1/2008~~	~~Complete~~	~~In Progress~~			
~~115~~	~~6/29/2006~~	~~7/12/2006~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~150~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Pisgah 230kV line~~	~~7/1/2008~~	~~7/1/2008~~	~~Complete~~	~~In Progress~~			
~~116~~	~~6/29/2006~~	~~7/12/2006~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~50~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Pisgah 230kV line~~	~~7/1/2008~~	~~7/1/2008~~	~~Complete~~	~~In Progress~~			
~~117~~	~~7/7/2006~~	~~7/20/2006~~	~~Withdrawn 5/9/07~~	~~WT~~	~~W~~	~~70~~			~~Humboldt~~	~~CA~~	~~PGE~~	~~Bridgeville 115kV Substation~~	~~10/30/2009~~	~~10/30/2009~~	~~Complete~~	~~In Progress~~			
~~118~~	~~8/2/2006~~	~~8/4/2006~~	~~Withdrawn 11/28/07~~	~~CC~~	~~NG~~	~~550~~			~~Mohave~~	~~AZ~~	~~SCE~~	~~SCE Mojave Substation~~	~~1/8/2009~~	~~1/8/2009~~	~~Re-study Complete~~	~~Tendered~~			
119	8/8/2006	8/8/2006	Active - Serial	WT	W	500			Kern	CA	SCE	Windhub Substation 230kV	12/31/2010	12/31/2013	Complete	Complete	In Progress		
~~120~~	~~8/9/2006~~	~~8/9/2006~~	~~Withdrawn 11/26/08~~	~~Other~~	~~S~~	~~1200~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Mojave 500 kV Switchyard~~	~~3/1/2011~~	~~3/1/2011~~	~~In Progress~~				
121	**8/16/2006**	**8/17/2006**	**Complete**	**CT**	**NG**	**49**			**San Diego**	**CA**	**SDGE**	**SDG&E Miramar GT Substation**	**3/31/2009**	**8/8/2009**	**Waived**	**Complete**	**Complete**		**Executed**
~~122~~	~~8/16/2006~~	~~8/17/2006~~	~~Withdrawn 1/16/07~~	~~CT~~	~~NG~~	~~99~~			~~Orange~~	~~CA~~	~~SDGE~~	~~SDG&E Margarita Substation~~	~~3/31/2009~~	~~6/30/2008~~	~~Waived~~	~~In Progress~~			
~~123~~	~~8/16/2006~~	~~8/17/2006~~	~~Withdrawn 1/16/07~~	~~CT~~	~~NG~~	~~99~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~SDG&E Pala Substation~~	~~3/31/2009~~	~~6/30/2008~~	~~Waived~~	~~In Progress~~			
124	8/22/2006	8/22/2006	Active - Serial	Other	S	600			Imperial	CA	SDGE	Imperial Valley Substation 230kV bus	3/1/2011	3/1/2011	Waived	Complete	Complete		Executed
125	8/22/2006	8/22/2006	Active - Serial	ST	S	250			San Bernardino	CA	SCE	Coolwater-Kramer 230kv line	8/1/2010	8/1/2010	Complete	Complete	Complete	In Progress	
126	8/31/2006	8/31/2006	Active - Serial	WT	W	1500			Clark	NV	SCE	Eldorado Substation	12/31/2011	12/31/2011	Complete	Complete	In Progress		
~~127~~	~~8/22/2006~~	~~9/1/2006~~	~~Withdrawn 7/11/07~~	~~Other~~	~~HR~~	~~27.2~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~115kV Oleum Switchyard~~	~~8/1/2008~~	~~8/1/2008~~	~~Waived~~	~~Complete~~	~~Tendered~~		
~~128~~	~~9/1/2006~~	~~9/1/2006~~	~~Withdrawn 8/6/09~~	~~CT~~	~~NG~~	~~565~~	~~600~~		~~Fresno~~	~~CA~~	~~PGE~~	~~McCall Substation~~	~~12/1/2010~~	~~12/1/2012~~	~~Complete~~	~~Re-Study Complete~~	~~Re-Study In Progress~~		
~~129~~	~~9/13/2006~~	~~9/13/2006~~	~~Withdrawn 10/24/06~~	~~WT~~	~~W~~	~~400~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah 230kV Substation~~	~~3/1/2010~~	~~3/1/2010~~					
~~130~~	~~9/13/2006~~	~~9/13/2006~~	~~Withdrawn 4/1/08~~	~~Other~~	~~S~~	~~565~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Mohave Generating Station~~	~~12/31/2010~~	~~12/31/2010~~	~~In Progress~~				
131	9/25/2006	9/25/2006	Active - Serial	ST	S	100			San Bernardino	CA	SCE	Loop new sub connecting to Eldorado-Mtn Pass 115kV line	6/30/2010	6/30/2010	Complete	Complete	Complete		LGIA Executed
132	9/27/2006	9/27/2006	Active - Serial	WT	W	297			Kern	CA	SCE	Highwind Substation 230kV bus	12/31/2009	12/31/2010	Complete	Complete	Complete		In Progress
~~133~~	~~10/3/2006~~	~~10/3/2006~~	~~Withdrawn 12/21/06~~	~~WT~~	~~W~~	~~140~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah-Lugo 230kV~~	~~3/1/2010~~	~~3/1/2010~~	~~Tendered~~				
~~134~~	~~10/9/2006~~	~~10/9/2006~~	~~Withdrawn 1/31/07~~	~~CT~~	~~NG~~	~~200~~			~~Kern~~	~~CA~~	~~SCE~~	~~Pastoria Substation~~	~~5/31/2010~~	~~5/31/2010~~					
135	10/10/2006	10/10/2006	Active - Serial	WT	W	60			San Bernardino	CA	SCE	Lugo-Pisgah 230kV line	9/30/2008	3/31/2011	Complete	Complete	In Progress		
136	10/16/2006	10/16/2006	Active - Serial	CT	NG	300			San Bernardino	CA	SCE	Etiwanda 230kV Substation	1/1/2010	1/1/2010	Waived	Complete	Complete		In Progress
137	10/11/2006	10/17/2006	Active - Serial	CC	NG	300			San Diego	CA	SDGE	Encina Substation 230kV bus	8/1/2008	3/1/2013	Waived	Complete	Complete		LGIA Executed
138	10/23/2006	10/23/2006	Active - Serial	WT	W	150			Riverside	CA	SCE	Devers-Vista 230kV #1	12/31/2008	3/1/2012	Waived	Complete	Complete		In Progress
139	10/24/2006	10/24/2006	Active - Serial	CC	NG	698			San Bernardino	CA	SCE	SCE Rancho Vista 500kV Sub	6/1/2010	6/1/2013	Waived	Complete	Complete		In Progress
~~140~~	~~10/31/2006~~	~~10/31/2006~~	~~Withdrawn 2/26/07~~	~~ST~~	~~G~~	~~75~~			~~Inyo~~	~~CA~~	~~SCE~~	~~Coso-Kramer 230 kV~~	~~8/18/2011~~	~~8/18/2011~~	~~Tendered~~				
~~141~~	~~11/3/2006~~	~~11/3/2006~~	~~Withdrawn 8/24/07~~	~~CT~~	~~NG~~	~~504~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~SCE Rancho Vista 500kV Sub~~	~~6/1/2010~~	~~6/1/2010~~	~~Waived~~	~~Complete~~	~~Tendered~~		
142	11/6/2006	11/6/2006	Active - Serial	ST	S	80			San Bernardino	CA	SCE	Kramer Substation	12/31/2009	12/31/2009	Complete	Complete	In Progress		
~~143~~	~~11/6/2006~~	~~11/6/2006~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~80~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Kramer Substation~~	~~12/31/2009~~	~~12/31/2009~~	~~Complete~~	~~In Progress~~			
~~144~~	~~11/6/2006~~	~~11/6/2006~~	~~Withdrawn 12/7/09~~	~~ST~~	~~S~~	~~320~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Kramer Substation~~	~~12/31/2009~~	~~12/31/2009~~	~~Complete~~	~~Complete~~			
~~145~~	~~11/8/2006~~	~~11/8/2006~~	~~Withdrawn 10/23/08~~	~~CC~~	~~HR~~	~~591~~			~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado 500 kV Substation~~	~~6/1/2010~~	~~6/1/2010~~	~~Complete~~	~~In Progress~~			

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection			Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
146	11/16/2006	11/16/2006	Active - Serial	PV	S	150			Riverside	CA	SCE	Eagle Mountain Substation	12/1/2008	12/31/2009	Complete	Complete	Complete		In Progress
147	11/16/2006	11/16/2006	Active - Serial	PV	S	400			Riverside	CA	SCE	Red Bluff Substation 230kV switchyard	2/1/2010	2/1/2010	Complete	Complete	Complete		In Progress
~~148~~	~~11/16/2006~~	~~11/16/2006~~	~~Withdrawn 2/1/07~~	~~ST~~	~~G~~	~~90~~			~~Churchill~~	~~NV~~	~~SCE~~	~~Oxbow 230kV Substation~~	~~10/1/2011~~	~~10/1/2011~~					
~~149~~	~~11/16/2006~~	~~11/16/2006~~	~~Withdrawn 10/20/08~~	~~WT~~	~~W~~	~~362~~			~~Kern~~	~~CA~~	~~SCE~~	~~SCE Highwind Sub #2 (proposed) 230 kV~~	~~12/31/2009~~	~~12/31/2010~~	~~In Progress~~				
150	11/16/2006	11/16/2006	Active - Serial	CT	NG	43			San Diego	CA	SDGE	Border Substation	5/31/2008	5/15/2011	Complete	Re-Study Complete	In Progress		
~~151~~	~~11/17/2006~~	~~11/17/2006~~	~~Withdrawn 12/11/06~~	~~CT~~	~~NG~~	~~510~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Chino Substation 230kV Line~~	~~5/1/2011~~	~~5/1/2011~~					
~~152~~	~~11/22/2006~~	~~11/22/2006~~	~~Withdrawn 10/29/08~~	~~WT~~	~~W~~	~~105~~			~~Santa Barbara~~	~~CA~~	~~PGE~~	~~Mesa Divide #1 115kV line~~	~~12/31/2009~~	~~12/31/2009~~	~~Complete~~	~~Complete~~	~~Tendered~~		
153	11/22/2006	11/22/2006	Active - Serial	WT	W	100			Kern	CA	SCE	Whirlwind Substation 230kV	5/30/2008	12/31/2012	Waived	Complete	In Progress		
154	**11/28/2006**	**11/30/2006**	**Active - Trans Cluster**	**ST**	**S**	**250**		**FC**	**Kern**	**CA**	**SCE**	**Kramer 230 kV Substion**	**12/31/2009**	**6/1/2015**	Complete	**Complete**	**In Progress**		
~~155~~	~~12/1/2006~~	~~12/1/2006~~	~~Withdrawn 1/2/09~~	~~CT~~	~~NG~~	~~300~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Oakland C 115kV substation~~	~~5/31/2010~~	~~5/31/2012~~	~~Complete~~	~~Re-Study Complete~~	~~Tendered~~		
156	12/5/2006	12/5/2006	Active - Serial	WT	W	201			San Bernardino	CA	SCE	Lugo-Pisgah 230kV line	3/1/2009	3/1/2012	Waived	Complete	In Progress		
~~157~~	~~12/15/2006~~	~~12/15/2006~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~66kV Rosamond-Antelope line~~	~~5/30/2008~~	~~12/31/2014~~	~~In Progress~~				
~~158~~	~~12/15/2006~~	~~12/15/2006~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~66kV Rosamond-Delsur line~~	~~5/30/2008~~	~~12/31/2013~~	~~In Progress~~				
~~159~~	~~12/15/2006~~	~~12/15/2006~~	~~Withdrawn 12/14/09~~	~~WT~~	~~W~~	~~100~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Antelope-Magunden #1 220kV line~~	~~5/30/2008~~	~~12/31/2013~~	~~In Progress~~	~~Complete~~			
159A	12/6/2006	12/22/2006	Active - Serial	WT	W	400			La Rumorosa, Baja CA	Mexico	SDGE	Imperial Valley-Miguel new 230/500kV Sub 230kV bus	6/1/2009	5/31/2013	Complete	Complete	Complete		In Progress
~~160~~	~~12/2/2006~~	~~12/29/2006~~	~~Withdrawn 9/17/07~~	~~ST~~	~~S~~	~~220~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Kramer~~	~~1/1/2009~~	~~1/1/2009~~	~~In Progress~~				
161	12/27/2006	1/4/2007	Active - Serial	CT	NG	202			Los Angeles	CA	SCE	Harborgen Substation	5/1/2009	3/1/2012	Waived	Re-Study Complete	In Progress		
162	1/5/2007	1/5/2007	Active - Serial	ST	S	114			San Bernardino	CA	SCE	Loop new sub connecting Eldorado-Mtn Pass 115kV line	6/30/2010	6/30/2010	Waived	Complete	Complete		In Progress
163	**1/9/2007**	**1/9/2007**	**Active - Trans Cluster**	**PV**	**S**	**300**		**FC**	**San Bernardino**	**CA**	**SCE**	**Mountain Pass Substation 115kV**	**12/31/2010**	**12/31/2015**	In Progress	**Complete**	**In Progress**		
~~164~~	~~1/12/2007~~	~~1/12/2007~~	~~Withdrawn 11/19/08~~	~~WT~~	~~W~~	~~1000~~			~~La Rumorosa, Baja C~~	~~Mexico~~	~~SDGE~~	~~Imperial Valley 230kV switchyard~~	~~10/1/2010~~	~~10/1/2010~~	~~Complete~~	~~In Progress~~			
~~165~~	~~1/16/2007~~	~~1/16/2007~~	~~Withdrawn 5/21/10~~	~~ST~~	~~S~~	~~400~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah 230kV Substation bus~~	~~6/30/2011~~	~~6/30/2011~~	~~Waived~~	~~Complete~~	~~In Progress~~		
166	1/23/2007	1/23/2007	Active - Serial	PV	S	210			San Luis Obispo	CA	PGE	Midway-Morrow Bay 230kV line	12/31/2010	12/31/2013	Complete	Complete	Complete		LGIA Executed
~~167~~	~~1/25/2007~~	~~1/25/2007~~	~~Withdrawn 5/16/07~~	~~CC~~	~~NG~~	~~700~~			~~Riverside~~	~~CA~~	~~SCE~~	~~500kV line to Midpoint Switching Station~~	~~6/1/2012~~	~~6/1/2012~~	~~Tendered~~				
~~168~~	~~2/2/2007~~	~~2/2/2007~~	~~Withdrawn 12/14/09~~	~~WT~~	~~W~~	~~1000~~		~~EO~~	~~a Rumorosa, Baja C~~	~~Mexico~~	~~SDGE~~	~~Imperial Valley 500kV bus~~	~~12/31/2011~~	~~12/31/2011~~	~~Complete~~	~~Complete~~			
~~169~~	~~2/2/2007~~	~~2/2/2007~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~211.6~~			~~Imperial~~	~~CA~~	~~SDGE~~	~~Imperial Valley 230kV bus~~	~~12/31/2011~~	~~12/31/2011~~	~~Complete~~	In Progress			
~~170~~	~~2/2/2007~~	~~2/2/2007~~	~~Withdrawn 12/7/09~~	~~PV~~	~~S~~	~~150~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Substation 5 (aka Whirlwind)~~	~~12/31/2011~~	~~7/31/2013~~	~~In Progress~~	~~Complete~~			
~~171~~	~~2/9/2007~~	~~2/9/2007~~	~~Withdrawn 12/7/09~~	~~WT~~	~~W~~	~~500~~		~~FC~~	~~Solano~~	~~CA~~	~~PGE~~	~~Vaca-Tesla 500kV line~~	~~12/31/2011~~	~~3/31/2011~~	~~In Progress~~	~~Complete~~			
172	2/8/2007	2/15/2007	Active - Serial	CC	NG	508			San Joaquin	CA	PGE	Tesla-Bellota 230kV lines	5/15/2011	5/1/2014	Complete	Complete	Complete		In Progress
~~173~~	~~2/16/2007~~	~~2/16/2007~~	~~Withdrawn 1/27/09~~	~~CT~~	~~NG~~	~~49.9~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Pala 69kV Substation~~	~~5/1/2008~~	~~5/1/2011~~	~~Waived~~	~~Complete~~	~~Complete~~		~~In Progress~~
~~174~~	~~2/16/2007~~	~~2/16/2007~~	~~Withdrawn 6/12/07~~	~~WT~~	~~W~~	~~30~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Devers-Venwind 115kV line~~	~~12/1/2008~~	~~12/1/2008~~	~~Tendered~~				
175	**2/21/2007**	**2/21/2007**	**Active - Trans Cluster**	**WT**	**W**	**650**		**FC**	**Kern**	**CA**	**SCE**	**SCE Proposed Whirlwind 230kV Substation**	**9/30/2008**	**12/31/2014**	In Progress	**Complete**	**In Progress**		
~~176~~	~~2/23/2007~~	~~2/23/2007~~	~~Withdrawn 8/14/09~~	~~CT~~	~~NG~~	~~49.9~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Margarita 138kV Substation~~	~~5/1/2008~~	~~6/15/2010~~	~~Waived~~	~~Complete~~	~~Complete~~		~~Executed~~
~~177~~	~~2/27/2007~~	~~2/28/2007~~	~~Withdrawn 1/21/09~~	~~WT~~	~~W~~	~~100~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~Bahia – Moraga 230 kV Line~~	~~12/31/2011~~	~~12/31/2011~~	~~Complete~~	~~Complete~~	~~In Progress~~		
~~178~~	~~2/27/2007~~	~~2/28/2007~~	~~Withdrawn 11/19/07~~	~~WT~~	~~W~~	~~100~~			~~Merced~~	~~CA~~	~~PGE~~	~~Los Banos 230kV bus near Pacheco Pass~~	~~12/31/2011~~	~~12/31/2011~~	~~Complete~~	~~In Progress~~			
~~178A~~	~~2/27/2007~~	~~2/28/2007~~	~~Withdrawn 11/24/08~~	~~WT~~	~~W~~	~~500~~			~~Mexicali/Ensenada/Tec~~	~~Mexico~~	~~SDGE~~	~~Miguel 230kV Bus~~	~~6/15/2010~~	~~7/1/2011~~	~~Complete~~	~~In Progress~~			
~~178B~~	~~2/27/2007~~	~~2/28/2007~~	~~Withdrawn 12/14/09~~	~~WT~~	~~W~~	~~500~~		~~FC~~	~~xicali/Ensenada/Tec~~	~~Mexico~~	~~SDGE~~	~~Imperial Valley 230kV Substation~~	~~6/15/2010~~	~~6/15/2010~~	~~Complete~~	~~Complete~~			
~~179~~	~~2/15/2007~~	~~3/1/2007~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~300~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Julian Hinds 230kV Substation~~	~~12/31/2010~~	~~12/31/2010~~	~~In Progress~~				
~~180~~	~~3/2/2007~~	~~3/2/2007~~	~~Withdrawn 5/1/08~~	~~CC~~	~~NG~~	~~564~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~New 230kV Switchyard on the Mira Loma-Vista #2 line~~	~~5/1/2011~~	~~5/1/2011~~	~~Complete~~	~~Tendered~~			
~~181~~	~~3/2/2007~~	~~3/2/2007~~	~~Withdrawn 5/1/08~~	~~CT~~	~~NG~~	~~400~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~New 230kV switchyard on the Chino-Serrano line~~	~~3/1/2010~~	~~3/1/2010~~	~~Complete~~	~~Tendered~~			
~~182~~	~~3/5/2007~~	~~3/5/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~500~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation~~	~~12/31/2010~~	~~7/1/2015~~	~~In Progress~~	~~Complete~~			
183	**3/5/2007**	**3/5/2007**	**Active - Trans Cluster**	**WT**	**W**	**300**		**EO**	**a Rumorosa, Baja C**	**Mexico**	**SDGE**	**Imperial Valley-Miguel new 230/500kV Sub 230kV bus**	**11/1/2009**	**7/31/2010**	Complete	**Complete**	**In Progress**		
184	3/5/2007	3/5/2007	Active - Serial	ST	G	35			Sonoma	CA	PGE	Geysers #3 – Cloverdale 115 kV Line	1/1/2010	4/1/2010	Complete	Complete	Complete		LGIA Executed
185	3/6/2007	3/6/2007	Active - Serial	ST	G	150			Mineral	NV	SCE	Control Sub	8/1/2011	1/1/2011	Waived	In Progress			
~~186~~	~~3/7/2007~~	~~3/7/2007~~	~~Withdrawn 11/28/07~~	~~CT~~	~~NG~~	~~211~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Stockton "A" Lockeford-Bellota 115kV #1&#2 lines & Tesla-Tracy 115kV line~~	~~12/31/2009~~	~~12/31/2009~~	~~Complete~~				
~~187~~	~~3/14/2007~~	~~3/14/2007~~	~~Withdrawn 6/6/08~~	~~ST~~	~~G~~	~~50~~			~~Sonoma~~	~~CA~~	~~PGE~~	~~Geysers-Fulton 230kV transmission line~~	~~1/1/2011~~	~~1/1/2011~~	~~Waived~~	~~Complete~~	~~In Progress~~		
188	**3/23/2007**	**3/23/2007**	**Active - Trans Cluster**	**WT**	**W**	**200**		**EO**	**Kern**	**CA**	**SCE**	**Windhub Substation 230kV**	**12/15/2013**	**12/1/2012**	In Progress	**Complete**	**In Progress**		
189	3/30/2007	3/30/2007	Active - Serial	CC	NG	280			San Diego	CA	SDGE	Encina 138kV Substation	5/1/2010	3/1/2013	Waived	Complete	Complete		Executed
190	3/30/2007	3/30/2007	Active - Serial	CT	NG	330			San Diego	CA	SDGE	Proposed Otay Mesa Energy Center 230kV Substation	3/1/2011	5/1/2013	Complete	Complete	Complete		In Progress
~~191~~	~~4/2/2007~~	~~4/2/2007~~	~~Withdrawn 10/1/07~~	~~CT~~	~~NG~~	~~315~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Penasquistos-Old Town 230kV transmission line~~	~~3/1/2010~~	~~3/1/2010~~	~~Complete~~	~~Tendered~~			
~~192~~	~~4/2/2007~~	~~4/2/2007~~	~~Withdrawn 10/1/07~~	~~CT~~	~~NG~~	~~315~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~San Luis Rey-Mission 230kV transmission line~~	~~3/1/2010~~	~~3/1/2010~~	~~Complete~~	~~Tendered~~			
193	**3/19/2007**	**4/4/2007**	**Active - Trans Cluster**	**ST**	**S**	**500**		**FC**	**Riverside**	**CA**	**SCE**	**Colorado River Substation**	**12/31/2010**	**7/1/2013**	In Progress	**Complete**	**In Progress**		
194	4/5/2007	4/5/2007	Active - Serial	ST	S	190			San Luis Obispo	CA	PGE	230kV lines near Carrizo Plain Substation	12/31/2010	9/1/2013	Complete	Complete	Complete		LGIA Executed
~~195~~	~~4/6/2007~~	~~4/6/2007~~	~~Withdrawn 9/21/07~~	~~CC~~	~~NG~~	~~725~~			~~Kern~~	~~CA~~	~~SCE~~	~~Springerville-Magunden 230kV line~~	~~1/1/2013~~	~~1/1/2013~~	~~Waived~~	~~In Progress~~			
~~196~~	~~4/13/2007~~	~~4/13/2007~~	~~Withdrawn 11/30/09~~	~~CT~~	~~NG~~	~~210~~		~~FC~~	~~Madera~~	~~CA~~	~~PGE~~	~~Borden Substation 230kV Bus~~	~~7/1/2011~~	~~6/15/2014~~	~~Complete~~	~~Complete~~			
~~197~~	~~4/16/2007~~	~~4/16/2007~~	~~Withdrawn 12/3/07~~	~~CT~~	~~NG~~	~~315~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Otay Mesa 230kV switchyard~~	~~12/1/2011~~	~~12/1/2011~~	~~Complete~~	~~Tendered~~			
~~198~~	~~4/18/2007~~	~~4/18/2007~~	~~Withdrawn 1/11/08~~	~~CT~~	~~NG~~	~~400~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~OMEC interconnection substation~~	~~2/28/2010~~	~~2/28/2010~~	~~Complete~~	~~Tendered~~			
~~199~~	~~4/19/2007~~	~~4/19/2007~~	~~Withdrawn 3/3/08~~	~~CT~~	~~NG~~	~~50~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~60kV bus at Posdef QF facility~~	~~12/31/2009~~	~~12/31/2009~~	~~Waived~~	~~Complete~~	~~Tendered~~		
~~200~~	~~4/19/2007~~	~~4/19/2007~~	~~Withdrawn 5/14/07~~	~~CT~~	~~NG~~	~~200~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Mira Loma Substation~~	~~5/31/2010~~	~~5/31/2010~~					
201	4/19/2007	4/19/2007	Active - Serial	CT	NG	99			San Diego	CA	SDGE	Pala Substation	5/31/2008	1/20/2010	Waived	Complete	Complete		Executed
~~202~~	~~4/19/2007~~	~~4/19/2007~~	~~Withdrawn 11/12/08~~	~~WT~~	~~W~~	~~198.65~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Cool Water-Kramer #1 230kV line~~	~~11/15/2013~~	~~11/15/2013~~	~~In Progress~~				
~~203~~	~~4/19/2007~~	~~4/19/2007~~	~~Withdrawn 12/14/09~~	~~WT~~	~~W~~	~~198.65~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Cool Water-SEGS2-Tortilla 115kV line~~	~~12/15/2013~~	~~12/15/2013~~	~~In Progress~~	~~Complete~~			
~~204~~	~~4/19/2007~~	~~4/19/2007~~	~~Withdrawn 12/19/08~~	~~WT~~	~~W~~	~~149.4~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Tortilla-Kramer 115 kV line~~	~~11/15/2013~~	~~11/15/2013~~	~~In Progress~~				
205	**4/20/2007**	**4/20/2007**	**Active - Trans Cluster**	**ST**	**S**	**300**		**EO**	**Clark**	**NV**	**SCE**	**El Dorado 220kV Switchyard**	**12/31/2010**	**7/31/2010**	In Progress	**Complete**	**In Progress**		
~~206~~	~~4/23/2007~~	~~4/23/2007~~	~~Withdrawn 6/20/07~~	~~CC~~	~~S~~	~~209~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~El Segundo 230kV Switchyard~~	~~1/30/2013~~	~~1/30/2013~~					
~~207~~	~~4/26/2007~~	~~4/26/2007~~	~~Withdrawn 3/6/08~~	~~CC~~	~~NG~~	~~557~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Long Beach 230kV Switchyard~~	~~2/28/2013~~	~~2/28/2013~~	~~Complete~~	~~Tendered~~			
~~208~~	~~4/20/2007~~	~~5/3/2007~~	~~Withdrawn 4/7/08~~	~~PV~~	~~S~~	~~2~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Tracy-Herdlyn 69kV line~~	~~6/1/2008~~	~~9/1/2008~~	~~NA~~	~~Waived~~	~~In Progress~~		
~~209~~	~~5/2/2007~~	~~5/3/2007~~	~~Wihtdrawn 12/14/09~~	~~WT~~	~~W~~	~~400~~		~~FC~~	~~a Rumorosa, Baja C~~	~~Mexico~~	~~SDGE~~	~~New 230/500kV substation near the 500kV IV-ML line~~	~~12/31/2010~~	~~12/31/2010~~	~~Complete~~	~~Complete~~			
~~210~~	~~5/3/2007~~	~~5/3/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~500~~		~~FC~~	~~Riverside~~	~~CA~~	~~SCE~~	~~Red Bluff Substation 230kV switchyard~~	~~12/31/2012~~	~~12/1/2016~~	~~In Progress~~	~~Complete~~			
~~211~~	~~4/23/2007~~	~~5/4/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~201~~			~~Lassen~~	~~CA~~	~~PGE~~	~~Caribou 230kV Substation~~	~~10/31/2008~~	~~10/31/2008~~	~~Complete~~	~~Tendered~~			
212	5/9/2007	5/9/2007	Active - Serial	WT	W	50			Humboldt	CA	PGE	Rio Dell Substation 60kV	10/30/2010	10/30/2010	Complete	Complete	In Progress		
~~213~~	~~5/9/2007~~	~~5/9/2007~~	~~Withddrawn 11/26/08~~	~~WT~~	~~W~~	~~180~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Coolwater 220kV bus~~	~~11/15/2010~~	~~11/15/2010~~	~~In Progress~~				
~~214~~	~~5/10/2007~~	~~5/10/2007~~	~~Withdrawn 11/12/08~~	~~WT~~	~~W~~	~~49.25~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Coolwater-Kramer 115 kV line~~	~~12/15/2013~~	~~12/15/2013~~	~~In Progress~~				
215	**5/21/2007**	**5/21/2007**	**Active - Trans Cluster**	**WT**	**W**	**420**		**EO**	**a Rumorosa, Baja C**	**Mexico**	**SDGE**	**Imperial Valley-Miguel new 230/500kV Sub 230kV bus**	**5/1/2011**	**12/31/2014**	Complete	**Complete**	**In Progress**		
~~216~~	~~5/22/2007~~	~~5/22/2007~~	~~Withdrawn 7/24/07~~	~~CT~~	~~NG~~	~~98.8~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Otay Mesa Energy Center~~	~~3/31/2010~~	~~3/31/2010~~					
~~217~~	~~5/22/2007~~	~~5/22/2007~~	~~Withdrawn 7/24/07~~	~~CT~~	~~NG~~	~~98.8~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~San Luis Rey-Melrose 69kV~~	~~3/31/2010~~	~~3/31/2010~~					
~~218~~	~~5/22/2007~~	~~5/22/2007~~	~~Withdrawn 7/24/07~~	~~CT~~	~~NG~~	~~98.8~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Loop Talega-Escondido 230kV line~~	~~3/31/2010~~	~~3/31/2010~~					
219	5/7/2007	5/23/2007	Active - Serial	CT	NG	50			Riverside	CA	SCE	Midpoint Substation 500kV	6/1/2012	6/1/2012	Complete	Waived	Waived		Tendered
~~220~~	~~5/23/2007~~	~~5/23/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~450~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~BLM West-Kramer 230kV line~~	~~12/1/2011~~	~~10/1/2016~~	~~In Progress~~	~~Complete~~			
~~221~~	~~5/23/2007~~	~~5/23/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~450~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Cool Water-Kramer #1 230kV line~~	~~12/1/2011~~	~~11/1/2015~~	~~In Progress~~	~~Complete~~			

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection			Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
222	5/23/2007	5/23/2007	Active - Trans Cluster	WT	W	78		FC	Solano	CA	PGE	Birds Landing Substation 230kV	12/31/2010	12/31/2011	Complete	Complete	In Progress		
~~223~~	~~5/29/2007~~	~~5/29/2007~~	~~Withdrawn 5/14/08~~	~~WT~~	~~W~~	~~170~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Cool Water-Kramer #1 230kV line~~	~~12/31/2010~~	~~12/31/2010~~	~~In Progress~~				
~~224~~	~~5/23/2007~~	~~5/30/2007~~	~~Withdrawn 7/23/07~~	~~RE~~	~~NG~~	~~99~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~69kV line next to Calpeak Border site~~	~~5/1/2010~~	~~5/1/2010~~					
~~225~~	~~5/23/2007~~	~~6/4/2007~~	~~Withdrawn 12/10/09~~	~~CC~~	~~NG~~	~~640~~		~~FC~~	~~Riverside~~	~~CA~~	~~SCE~~	~~500kV line to the new Midpoint switching station~~	~~6/1/2012~~	~~5/31/2015~~	~~In Progress~~	~~Complete~~			
~~226~~	~~5/16/2007~~	~~6/5/2007~~	~~Withdrawn 4/3/08~~	~~CC~~	~~NG~~	~~620~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~New double circuit 230kV line into Escondido Substation~~	~~3/30/2012~~	~~3/30/2012~~	~~Complete~~	~~Tendered~~			
~~227~~	~~6/14/2007~~	~~6/14/2007~~	~~Withdrawn 3/10/08~~	~~WT~~	~~W~~	~~175~~			~~Marin~~	~~CA~~	~~PGE~~	~~Fulton-Ignacio 230kV #2 line~~	~~12/31/2010~~	~~12/31/2010~~	~~Complete~~	~~Tendered~~			
~~228~~	~~6/20/2007~~	~~6/20/2007~~	~~Withdrawn 10/22/07~~	~~CT~~	~~NG~~	~~630~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Newark Substation 230kV bus~~	~~6/1/2011~~	~~6/1/2011~~	~~Tendered~~				
~~229~~	~~6/21/2007~~	~~6/21/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~1000~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Devers Substation~~	~~12/31/2013~~	~~12/31/2016~~	~~In Progress~~	~~Complete~~			
~~230~~	~~6/21/2007~~	~~6/21/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~1000~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Devers Substation~~	~~12/31/2013~~	~~12/31/2013~~	~~In Progress~~	~~Complete~~			
~~231~~	~~6/13/2007~~	~~6/25/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~50~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Venwind portion of Devers-Garnett-Venwind line~~	~~12/1/2009~~	~~12/1/2009~~	~~In Progress~~				
~~232~~	~~6/26/2007~~	~~6/26/2007~~	~~Withdrawn 8/6/07~~	~~RE~~	~~NG~~	~~99~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Talega-Escondido 230kV line~~	~~5/15/2010~~	~~5/15/2010~~					
233	6/27/2007	6/27/2007	Active - Serial	ST	S	200			San Bernardino	CA	SCE	Ivanpah Substation 230kV	6/30/2012	6/30/2012	Waived	Complete	Complete		In Progress
~~234~~	~~6/27/2007~~	~~6/27/2007~~	~~Withdrawn 12/14/09~~	~~ST~~	~~S~~	~~400~~		~~FC~~	~~Clark~~	~~NV~~	~~SCE~~	~~Proposed Eldorado-Ivanpah 230kV line~~	~~6/30/2013~~	~~6/30/2013~~	~~In Progress~~	~~Complete~~			
~~235~~	~~6/29/2007~~	~~6/29/2007~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~630~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~Tesla-Tracy #1 230kV line~~	~~6/1/2011~~	~~6/1/2011~~	~~In Progress~~				
~~236~~	~~6/29/2007~~	~~6/29/2007~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~630~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla Substation 230kV bus~~	~~6/1/2011~~	~~6/1/2011~~	~~In Progress~~				
~~237~~	~~6/12/2007~~	~~7/2/2007~~	~~Withdrawn 11/24/08~~	~~CC~~	~~NG~~	~~634~~			~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado 220kV switchyard~~	~~5/1/2011~~	~~5/1/2011~~	~~Waived~~	~~In Progress~~			
~~238~~	~~7/11/2007~~	~~7/11/2007~~	~~Withdrawn 11/26/08~~	~~PV~~	~~S~~	~~45~~			~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Temblor-San Luis Obispo 115kV line~~	~~12/1/2008~~	~~12/1/2008~~	~~In Progress~~				
239	7/11/2007	7/11/2007	Active - Trans Cluster	PV	S	250		FC	San Luis Obispo	CA	PGE	Midway-Morro Bay 230kV line	12/1/2010	12/31/2011	In Progress	Complete	In Progress		
240	7/12/2007	7/12/2007	Active - Serial	ST	S	400			San Bernardino	CA	SCE	Pisgah Sub 230kV	6/30/2014	6/30/2014	Waived	Complete	In Progress		
241	7/12/2007	7/12/2007	Active - Serial	ST	S	400			San Bernardino	CA	SCE	Pisgah Sub 230kV	6/30/2015	6/30/2015	Waived	Complete	In Progress		
242	7/13/2007	7/13/2007	Active - Trans Cluster	PV	S	150		FC	San Luis Obispo	CA	PGE	Morro Bay-Midway 230kV line	9/1/2012	12/31/2013	In Progress	Complete	In Progress		
~~243~~	~~7/16/2007~~	~~7/16/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~429~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah 230kV Substation~~	~~12/30/2010~~	~~12/30/2010~~	~~In Progress~~				
~~244~~	~~7/16/2007~~	~~7/16/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~120~~			~~Kern and Inyo~~	~~CA~~	~~SCE~~	~~Control-Haiwee-Inyokern 115kV line~~	~~12/15/2010~~	~~12/15/2010~~	~~In Progress~~				
~~245~~	~~7/16/2007~~	~~7/16/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~228~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Devers-Mirage-Julian Hinds 230kV line~~	~~12/15/2010~~	~~12/15/2010~~	~~In Progress~~				
~~246~~	~~7/17/2007~~	~~7/17/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~120~~			~~Kern~~	~~CA~~	~~SCE~~	~~Kramer-Inyokern-Randsburg #3 115kV line~~	~~12/15/2010~~	~~12/15/2010~~	~~In Progress~~				
~~247~~	~~7/30/2007~~	~~7/30/2007~~	~~Withdrawn 9/21/09~~	~~CC~~	~~NG~~	~~67~~		~~FC~~	~~Madera~~	~~CA~~	~~PGE~~	~~Borden Substation 230kV Bus~~	~~7/1/2011~~	~~4/15/2012~~	~~Waived~~	~~Complete~~			
248	7/30/2007	7/30/2007	Active - Serial	CC	NG	67			San Joaquin	CA	PGE	Tesla-Bellota 230kV line	5/15/2011	5/1/2014	Waived	Complete	Complete		In Progress
~~249~~	~~7/30/2007~~	~~7/30/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~105~~			~~Monterey~~	~~CA~~	~~PGE~~	~~Moss Linding-Salinas-Soledad 115kV #1 and #2 lines~~	~~2/1/2010~~	~~11/1/2010~~	~~Complete~~	~~In Progress~~			
250	7/30/2007	7/30/2007	Active - Trans Cluster	WT	W	66.2		FC	Lake and Colusa	CA	PGE	Redbud-Cortina 115kV line	8/1/2009	12/31/2012	Complete	Complete	In Progress		
~~251~~	~~8/1/2007~~	~~8/1/2007~~	~~Withdrawn 11/26/08~~	~~PV~~	~~S~~	~~200~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Eagle Mountain-Blythe 161kV line~~	~~12/15/2009~~	~~12/15/2009~~	~~In Progress~~				
252	7/10/2007	8/6/2007	Active - Serial	ST	NG	25.96			Los Angeles	CA	SCE	Redondo Beach Generating Station 220kV switchyard	5/23/2007	5/23/2007	Waived	Complete	Complete		Complete
~~253~~	~~8/13/2007~~	~~8/13/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~40~~			~~Santa Barbara~~	~~CA~~	~~PGE~~	~~Cabrillo Substation 115kV~~	~~12/31/2011~~	~~12/31/2011~~	~~Re-Study In Progress~~				
254	8/21/2007	8/21/2007	Active - Trans Cluster	CC	NG	600		FC	Kings	CA	PGE	Gates Substation 230kV bus	6/1/2012	6/1/2012	Complete	Complete	In Progress		
255	8/23/2007	8/23/2007	Active - Trans Cluster	ST	S	250		FC	Kern	CA	SCE	Inyokern Substation	12/28/2013	7/1/2013	In Progress	Complete	In Progress		
~~256~~	~~8/23/2007~~	~~8/23/2007~~	~~Withdrawn 9/18/07~~	~~PV~~	~~S~~	~~30~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Mendota Biomass Substation~~	~~4/15/2009~~	~~4/15/2009~~					
~~257~~	~~9/10/2007~~	~~9/10/2007~~	~~Withdrawn 9/21/09~~	~~CC~~	~~NG~~	~~575~~		~~FC~~	~~Solano~~	~~CA~~	~~PGE~~	~~New Fairfield Substation 230kV bus~~	~~6/1/2011~~	~~6/1/2011~~	~~Re- Study In Progress~~	~~Complete~~			
258	9/12/2007	9/12/2007	Active - Trans Cluster	CC	NG	651		FC	Contra Costa	CA	PGE	Contra Costa Substation 230kV bus	2/1/2012	12/1/2013	In Progress	Complete	In Progress		
~~259~~	~~9/12/2007~~	~~9/12/2007~~	~~Withdrawn 11/20/09~~	~~CC~~	~~NG~~	~~345~~		~~FC~~	~~Sutter~~	~~CA~~	~~PGE~~	~~Rio Oso Substation 115kV bus~~	~~2/1/2012~~	~~2/1/2012~~	~~In Progress~~	~~Complete~~			
~~260~~	~~9/12/2007~~	~~9/12/2007~~	~~Withdrawn 11/26/08~~	~~CC~~	~~NG~~	~~260~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Loop Gold Hill-Eight Mile Road 230kV line~~	~~2/1/2012~~	~~2/1/2012~~	~~In Progress~~				
~~261~~	~~9/28/2007~~	~~9/28/2007~~	~~Withdrawn 11/26/08~~	~~CC~~	~~NG~~	~~104~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Hinson Substation 220kV~~	~~10/1/2010~~	~~10/1/2010~~	~~In Progress~~				
261A	10/9/2007	10/9/2007	Active - A39	PV	S	5			Fresno	CA	PGE	Mendota-San Joaquin-Helm 70kV line	4/15/2009	4/21/2010	N/A	Complete	Waived		SGIA Executed
~~262~~	~~10/10/2007~~	~~10/10/2007~~	~~Withdrawn 6/3/08~~	~~RE~~	~~NG~~	~~390.6~~			~~Solano~~	~~CA~~	~~PGE~~	~~Birds Landing Substation 230 kV Bus~~	~~4/15/2012~~	~~4/15/2012~~	~~In Progress~~				
~~263~~	~~10/10/2007~~	~~10/10/2007~~	~~Withdrawn 2/13/08~~	~~CC~~	~~NG~~	~~634~~			~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado Switchyard 220kV & NCP Merchant Substation 230kV~~	~~5/1/2011~~	~~5/1/2011~~	~~Waived~~	~~Tendered~~			
~~264~~	~~10/15/2007~~	~~10/15/2007~~	~~Withdrawn 12/11/09~~	~~WT~~	~~W~~	~~300~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Mohave 500kV line~~	~~12/30/2010~~	~~12/30/2010~~	~~In Progress~~	~~Complete~~			
~~265~~	~~10/16/2007~~	~~10/16/2007~~	~~Withdrawn 12/5/07~~	~~PV~~	~~S~~	~~25~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Eagle Mountain-Blythe 161kV line~~	~~12/1/2009~~	~~12/1/2009~~					
~~266~~	~~10/19/2007~~	~~10/19/2007~~	~~Withdrawn 11/26/08~~	~~CC~~	~~NG~~	~~325~~			~~Sutter~~	~~CA~~	~~PGE~~	~~Rio Oso Substation 230kV bus~~	~~2/1/2012~~	~~2/1/2012~~	~~In Progress~~				
267	10/23/2007	10/23/2007	Active - Serial	CC	NG	280			San Joaquin	CA	PGE	Gold Hill-Eight Mile 230kV lines	4/16/2012	4/16/2012	Waived	Waived	Complete		LGIA Executed
268	10/24/2007	10/24/2007	Active - Serial	ST	NG	145			San Joaquin	CA	PGE	Tesla-Manteca 115kV line via Schulte Switchyard	4/1/2013	4/1/2013	Waived	Complete	Complete	Complete	In Progress
~~269~~	~~10/30/2007~~	~~10/31/2007~~	~~Withdrawn 12/1/09~~	~~RE~~	~~NG~~	~~371.3~~		~~FC~~	~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla-Westley 230 KV lines~~	~~4/15/2012~~	~~5/1/2015~~	~~Complete~~	~~Complete~~			
~~270~~	~~11/1/2007~~	~~11/1/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~700~~		~~FC~~	~~Riverside~~	~~CA~~	~~SCE~~	~~Proposed Midpoint Substation 230kV~~	~~12/1/2011~~	~~12/1/2015~~	~~In Progress~~	~~Complete~~			
~~271~~	~~11/1/2007~~	~~11/1/2007~~	~~Withdrawn 12/2/09~~	~~PV~~	~~S~~	~~400~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Pisgah 230kV line~~	~~12/1/2012~~	~~9/1/2016~~	~~In Progress~~	~~Complete~~			
272	11/1/2007	11/1/2007	Active - Trans Cluster	CC/PV	S/NG	150		FC	Kings	CA	PGE	Henrietta Substation 70kV bus	6/1/2012	5/1/2013	In Progress	Complete	In Progress		
~~273~~	~~11/1/2007~~	~~11/1/2007~~	~~Withdrawn 1/31/08~~	~~CC/PV~~	~~NG/S~~	~~99.9~~			~~Kings~~	~~CA~~	~~PGE~~	~~Hanford Switchyard 115kV bus~~	~~5/1/2010~~	~~5/1/2010~~	~~Waived~~	~~Tendered~~			
274	11/5/2007	11/5/2007	Active - Serial	CC	NG	54			San Diego	CA	SDGE	Palomar Substation 230kV	6/1/2008	8/25/2008	Waived	Complete	Complete		Executed
~~275~~	~~11/7/2007~~	~~11/7/2007~~	~~Withdrawn 12/4/09~~	~~CT~~	~~NG~~	~~630~~		~~FC~~	~~Solano~~	~~CA~~	~~PGE~~	~~Loop Vaca Dixon-Peabody & Vaca Dixon-Lambie 230 kV lines~~	~~9/1/2012~~	~~5/1/2013~~	~~In Progress~~	~~Complete~~			
~~276~~	~~11/9/2007~~	~~11/9/2007~~	~~Withdrawn 11/20/08~~	~~CC~~	~~NG~~	~~650~~			~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa Switchyard 230kV bus~~	~~1/15/2012~~	~~1/15/2012~~	~~In Progress~~				
~~277~~	~~11/15/2007~~	~~11/15/2007~~	~~Withdrawn 3/6/08~~	~~WT~~	~~W~~	~~75~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Coolwater-Dunn Siding 115kV line~~	~~11/15/2010~~	~~11/15/2010~~	~~Tendered~~				
~~278~~	~~11/26/2007~~	~~11/26/2007~~	~~Withdrawn 12/14/09~~	~~ST~~	~~S~~	~~565~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation 230kV~~	~~1/1/2011~~	~~1/1/2011~~		~~Complete~~			
~~279~~	~~11/30/2007~~	~~11/30/2007~~	~~Withdrawn 2/29/08~~	~~H~~	~~WTR~~	~~40~~			~~Humboldt~~	~~CA~~	~~PGE~~	~~Fairhaven Substation 60kV bus~~	~~6/1/2012~~	~~6/1/2012~~	~~Tendered~~				
~~280~~	~~11/30/2007~~	~~11/30/2007~~	~~Withdrawn 11/20/08~~	~~H~~	~~WTR~~	~~40~~			~~Mendocino~~	~~CA~~	~~PGE~~	~~Fort Bragg Substation 60kV bus~~	~~6/1/2012~~	~~6/1/2012~~	~~In Progress~~				
~~281~~	~~12/3/2007~~	~~12/3/2007~~	~~Withdrawn 5/28/08~~	~~CC~~	~~NG~~	~~500~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Loop Tesla-Stagg and Tesla-Eight Mile 230kV lines~~	~~12/31/2010~~	~~12/31/2010~~	~~In Progress~~				
282	12/11/2007	12/12/2007	Active - Trans Cluster	ST	B	8		FC	Madera	CA	PGE	Tap Dairyland-Mendota 115 kV line	5/31/2008	12/31/2010	Waived	Complete	In Progress		
~~283~~	~~12/12/2007~~	~~12/12/2007~~	~~Withdrawn 12/11/09~~	~~ST~~	~~S/B~~	~~106.8~~		~~EO~~	~~Fresno~~	~~CA~~	~~PGE~~	~~Gates Substation 230kV bus~~	~~3/1/2010~~	~~9/30/2012~~	~~In Progress~~	~~Complete~~			
~~284~~	~~12/13/2007~~	~~12/13/2007~~	~~Withdrawn 11/26/08~~	~~RE~~	~~NG~~	~~115~~			~~Mendocino~~	~~CA~~	~~PGE~~	~~Ukiah Substation 115kV bus~~	~~4/15/2012~~	~~4/15/2012~~	~~In Progress~~				
~~285~~	~~12/13/2007~~	~~12/13/2007~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~150~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation 230kV~~	~~12/31/2011~~	~~12/31/2011~~	~~In Progress~~				
~~286~~	~~12/20/2007~~	~~12/20/2007~~	~~Withdrawn 5/7/08~~	~~ST~~	~~S~~	~~375~~			~~Imperial~~	~~CA~~	~~SDGE~~	~~Southwest Power Link 500kV line~~	~~7/1/2011~~	~~7/1/2012~~	~~Tendered~~				
~~287~~	~~12/21/2007~~	~~12/21/2007~~	~~Withdrawn 12/14/09~~	~~ST~~	~~S~~	~~231~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Antelope-Magunden 230kV~~	~~4/1/2011~~	~~4/1/2011~~	~~In Progress~~	~~Complete~~			
~~288~~	~~12/20/2007~~	~~12/21/2007~~	~~Withdrawn 5/14/08~~	~~ST~~	~~S~~	~~375~~			~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~Morro Bay-Midway #2 230kV line~~	~~7/1/2011~~	~~7/1/2012~~	~~Tendered~~				
~~289~~	~~12/20/2007~~	~~12/21/2007~~	~~Withdrawn 5/29/08~~	~~ST~~	~~S~~	~~375~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~El Dorado-Ivanpah 115kV line~~	~~7/1/2011~~	~~7/1/2011~~	~~Tendered~~				
~~290~~	~~12/27/2007~~	~~12/27/2007~~	~~Withdrawn 12/3/09~~	~~ST~~	~~S~~	~~750~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation 230kV~~	~~6/1/2015~~	~~12/31/2012~~	~~In Progress~~	~~Complete~~			
~~291~~	~~12/27/2007~~	~~12/27/2007~~	~~Withdrawn 11/20/08~~	~~ST~~	~~S~~	~~250~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Ivanpah Substation 230kV~~	~~6/1/2015~~	~~6/1/2015~~	~~In Progress~~				
~~292~~	~~12/27/2007~~	~~12/27/2007~~	~~Withdrawn 2/6/08~~	~~ST~~	~~S~~	~~250~~			~~Kern~~	~~CA~~	~~SCE~~	~~SCE portion of Kramer-BLM West 230 kV line~~	~~6/1/2014~~	~~6/1/2014~~					
~~293~~	~~1/3/2008~~	~~1/3/2008~~	~~Withdrawn 11/25/08~~	~~RE~~	~~B~~	~~5.2~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Helm-Kerman 70kV line~~	~~6/1/2009~~	~~6/1/2009~~	~~In Progress~~				
294	1/15/2008	1/16/2008	Active - Trans Cluster	ST	S	1000		FC	Riverside	CA	SCE	Midpoint Substation 500kV	6/1/2012	7/1/2013	In Progress	Complete	In Progress		
~~295~~	~~1/17/2008~~	~~1/17/2008~~	~~Withdrawn 12/7/09~~	~~ST~~	~~S~~	~~300~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation 220kV~~	~~12/31/2011~~	~~12/31/2011~~	~~In Progress~~	~~Complete~~			
~~296~~	~~1/18/2008~~	~~1/18/2008~~	~~Withdrawn 5/23/08~~	~~ST~~	~~S~~	~~33~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope-Piute 66kV line~~	~~12/1/2009~~	~~12/1/2009~~	~~Waived~~	~~Tendered~~			
297	1/18/2008	1/18/2008	Active - Trans Cluster	ST	S	66		FC	Los Angeles	CA	SCE	Neenach-Bailey 66kV line	12/1/2009	3/31/2012	Waived	Complete	In Progress		
~~298~~	~~1/23/2008~~	~~1/23/2008~~	~~Withdrawn 11/19/08~~	~~ST~~	~~S~~	~~140~~			~~Clark~~	~~NV~~	~~SCE~~	~~El Dorado 220kV switchyard~~	~~11/1/2011~~	~~11/1/2011~~	~~In Progress~~				
299	1/29/2008	1/29/2008	Active - Trans Cluster	CC	NG	27		FC	Kings	CA	PGE	Hanford Switchyard 115kV bus	5/1/2010	5/1/2013	Waived	Complete	In Progress		

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
300	1/29/2008	2/4/2008	Active - Trans Cluster	CC	NG	400		FC	Kern	CA	PGE	Midway-Wheeler Ridge #1 and #2 230kV line	9/1/2014	9/1/2015	In Progress	Complete	In Progress		
~~301~~	~~2/8/2008~~	~~2/8/2008~~	~~Withdrawn 10/27/08~~	~~PV~~	~~S~~	~~500~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Pisgah 220kV line~~	~~1/1/2016~~	~~1/1/2016~~	~~In Progress~~				
~~302~~	~~2/19/2008~~	~~2/19/2008~~	~~Withdrawn 4/7/08~~	~~PV~~	~~S~~	~~200~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Pisgah 220kV line~~	~~2/1/2010~~	~~2/1/2010~~					
~~303~~	~~2/27/2008~~	~~2/27/2008~~	~~Withdrawn 10/27/08~~	~~WT~~	~~W~~	~~500~~			~~Baja California~~	~~Mexico~~	~~SDGE~~	~~Imperial Valley -Miguel 500kV line~~	~~12/31/2011~~	~~12/31/2011~~	~~In Progress~~				
304	2/28/2008	2/28/2008	Active - Trans Cluster	PV	S	50		FC	Tulare	CA	PGE	Smyrna-Alpaugh 115kV line	5/3/2010	12/31/2012	In Progress	Complete	In Progress		
~~305~~	~~3/10/2008~~	~~3/10/2008~~	~~Withdrawn 11/23/09~~	~~CC~~	~~NG~~	~~611~~		~~FC~~	~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa Substation 230kV switchyard~~	~~7/30/2012~~	~~7/30/2012~~					
~~306~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 11/20/08~~	~~CT~~	~~NG~~	~~200~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla-Belota 230kV and Tesla-Webber 230kV lines~~	~~5/1/2012~~	~~5/1/2012~~					
~~307~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Lancaster-Redman 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~308~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Helijet-Little Rock-Palmdale-Rockair 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
309	3/11/2008	3/11/2008	Active - Trans Cluster	PV	S	100		FC	Los Angeles	CA	SCE	Antelope Substation 66kV	5/1/2009	7/1/2013		Complete	In Progress		
~~310~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Del- Sur-Lancaster-Rite Aid 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~311~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Lancaster-Little Rock-Piute 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~312~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 5/6/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Oasis-Tortoise 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~313~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Piute-Redman 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~314~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Lancaster-Little Rock-Piute 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~315~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Helijet-Little Rock-Palmdale-Rockair 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~316~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope-Rosamond 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
317	3/11/2008	3/11/2008	Active - Trans Cluster	PV	S	100		FC	Los Angeles	CA	SCE	Antelope Substation 66kV	5/1/2009	6/1/2013		Complete	In Progress		
~~318~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Goldtown-Lancaster 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~319~~	~~3/11/2008~~	~~3/11/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Corum-Goldtown 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
320	3/12/2008	3/12/2008	Active - Trans Cluster	CT	NG	100	214	FC	Contra Costa	CA	PGE	Contra Costa Substation 230kV switchyard	4/29/2011	5/1/2013		Complete	In Progress		
~~321~~	~~3/18/2008~~	~~3/18/2008~~	~~Withdrawn 12/11/09~~	~~WT~~	~~W~~	~~100~~		~~FC~~	~~Plumas~~	~~CA~~	~~PGE~~	~~Caribou Substation 230kV switchyard~~	~~12/15/2013~~	~~12/1/2013~~		~~Complete~~			
~~322~~	~~3/17/2008~~	~~3/18/2008~~	~~Withdrawn 11/23/09~~	~~CC~~	~~NG~~	~~611~~	~~554~~	~~FC~~	~~Contra Costa~~	~~CA~~	~~PGE~~	~~Pittsburg 230kV switchyard~~	~~9/30/2012~~	~~9/30/2012~~		~~Complete~~			
~~323~~	~~3/27/2008~~	~~3/27/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~Corum-Rosemond 66kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~324~~	~~3/27/2008~~	~~3/27/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~250~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Eldorado-Baker-Cook-Water-Dunn-Siding-Mountain Pass 115kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~325~~	~~3/27/2008~~	~~3/27/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~Kramer-Cool Water 115kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~326~~	~~3/27/2008~~	~~3/27/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~Kramer-Tortilla 115kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~327~~	~~3/27/2008~~	~~3/27/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~Kramer-Inyokern-Randsberg No. 1 115kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~328~~	~~3/27/2008~~	~~3/27/2008~~	~~Withdrawn 4/24/08~~	~~PV~~	~~S~~	~~100~~			~~Kern~~	~~CA~~	~~SCE~~	~~Kramer-Inyokern-Randsberg No. 3 115kV line~~	~~5/1/2009~~	~~5/1/2009~~					
~~329~~	~~3/31/2008~~	~~3/31/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~264~~			~~Kern~~	~~CA~~	~~SCE~~	~~Whirlwind Substation 230kV~~	~~8/1/2012~~	~~8/1/2012~~					
~~330~~	~~3/31/2008~~	~~3/31/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~33~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope-Calcement 66kV line~~	~~12/1/2009~~	~~12/1/2009~~					
~~331~~	~~3/31/2008~~	~~3/31/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~231~~			~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation~~	~~5/1/2010~~	~~5/1/2010~~					
~~332~~	~~3/31/2008~~	~~3/31/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~264~~			~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation~~	~~9/1/2011~~	~~9/1/2011~~					
~~333~~	~~3/31/2008~~	~~3/31/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~33~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Cool Water-Kramer 115kV line~~	~~7/1/2009~~	~~7/1/2009~~					
334	4/4/2008	4/4/2008	Active - Trans Cluster	CT	NG	195.9		FC	Alameda	CA	PGE	Kelso Substation 230kV bus	6/1/2012	7/1/2012	In Progress	Complete	In Progress		
~~335~~	~~4/4/2008~~	~~4/4/2008~~	~~Withdrawn 5/5/08~~	~~RE~~	~~NG~~	~~99~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Kelso Substation 230kV bus~~	~~6/1/2012~~	~~6/1/2012~~					
~~336~~	~~4/7/2008~~	~~4/7/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~75~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Borrego Substation 69kV~~	~~12/31/2010~~	~~12/31/2010~~					
337	4/2/2008	4/18/2008	Active - Trans Cluster	PV	S	25.75		FC	San Diego	CA	SDGE	Borrego Substation 69kV	4/1/2011	4/1/2012		Complete	In Progress		
~~338~~	~~4/17/2008~~	~~4/17/2008~~	~~Withdrawn 11/26/08~~	~~GC~~	~~NG~~	~~10~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Kerman-Helms 70kV line~~	~~6/1/2010~~	~~6/1/2010~~					
~~339~~	~~4/18/2008~~	~~4/18/2008~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~50~~			~~San Francisco~~	~~CA~~	~~PGE~~	~~Mission Substation~~	~~6/1/2011~~	~~6/1/2011~~					
340	4/2/2008	4/22/2008	Active - SGIP	PV	S	20		EO	Tulare	CA	PGE	Smyrna-Alpaugh 115kV line	5/1/2010	4/1/2011	Waived	Complete	Complete		In Progress
~~341~~	~~4/23/2008~~	~~4/23/2008~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~525~~			~~Merced~~	~~CA~~	~~PGE~~	~~Wilson Substation 230kV bus~~	~~3/1/2012~~	~~3/1/2012~~					
342	4/25/2008	4/25/2008	Active - Trans Cluster	PV	S	50		FC	Los Angeles	CA	SCE	Del Sur Substation 66kV	5/1/2011	7/1/2013		Complete	In Progress		
~~343~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~40~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Piute-Redman 66kV line~~	~~5/1/2011~~	~~5/1/2011~~					
~~344~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 12/7/09~~	~~PV~~	~~S~~	~~40~~		~~FC~~	~~Los Angeles~~	~~CA~~	~~SCE~~	~~Lancaster-Little Rock-Piute 66kV line~~	~~5/1/2011~~	~~5/1/2011~~		~~Complete~~			
~~345~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~40~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Lancaster-Little Rock-Piute 66kV line~~	~~5/1/2011~~	~~5/1/2011~~					
~~346~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~30~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Lancaster-Redman 66kV line~~	~~5/1/2011~~	~~5/1/2011~~					
~~347~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 12/7/09~~	~~PV~~	~~S~~	~~50~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Helijet-Little Rock-Palmdale-Rockair 66kV line~~	~~5/1/2011~~	~~5/1/2011~~		~~Complete~~			
348	4/25/2008	4/25/2008	Active - Trans Cluster	PV	S	40		FC	Kern	CA	SCE	Corum-Goldtown 66kV line	5/1/2011	6/1/2013		Complete	In Progress		
349	4/25/2008	4/25/2008	Active - Trans Cluster	PV	S	100		FC	Kern	CA	SCE	Goldtown Substation 66kV	5/1/2013	6/1/2013		Complete	In Progress		
~~350~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 12/7/09~~	~~PV~~	~~S~~	~~80~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV~~	~~5/1/2013~~	~~5/1/2013~~		~~Complete~~			
~~351~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~Yolo~~	~~CA~~	~~PGE~~	~~Tap Vaca-Rio Oso 115kV line~~	~~7/1/2009~~	~~7/1/2009~~					
~~352~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~Stanislaus~~	~~CA~~	~~PGE~~	~~Salado Substation 115kV~~	~~7/1/2009~~	~~7/1/2009~~					
~~353~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Panoche Substation 115kV bus~~	~~7/1/2009~~	~~7/1/2009~~					
~~354~~	~~4/25/2008~~	~~4/25/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Tap Helm-Valley Nitrogen 70kV line~~	~~7/1/2009~~	~~7/1/2009~~					
~~355~~	~~4/28/2008~~	~~4/28/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~100~~			~~San Luis Obispo~~	~~CA~~	~~PGE~~	~~San Luis Obispo-Temblor 115kV line~~	~~5/1/2011~~	~~5/1/2011~~					
356	4/28/2008	4/28/2008	Active - Trans Cluster	PV	S	40		FC	Santa Barbara	CA	PGE	Taft-Cuyama #1 70kV line	5/1/2011	1/1/2013		Complete	In Progress		
~~357~~	~~4/28/2008~~	~~4/28/2008~~	~~Withdrawn 12/7/09~~	~~PV~~	~~S~~	~~100~~		~~FC~~	~~Kern~~	~~CA~~	~~PGE~~	~~Midway Substation via Midway-Sunset Gen-Tie 230kV line~~	~~5/1/2010~~	~~12/1/2013~~		~~Complete~~			
~~358~~	~~4/30/2008~~	~~4/30/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~100~~			~~Kern~~	~~CA~~	~~PGE~~	~~Midway Substation via Midway-Sunset Gen-Tie 230kV line~~	~~5/1/2011~~	~~5/1/2011~~					
~~359~~	~~5/1/2008~~	~~5/1/2008~~	~~Withdrawn 11/26/08~~	~~PV~~	~~S~~	~~350~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115kV line~~	~~3/1/2011~~	~~3/1/2011~~					
~~360~~	~~5/1/2008~~	~~5/1/2008~~	~~Withdrawn 7/11/08~~	~~CT~~	~~NG~~	~~200~~			~~Colusa~~	~~CA~~	~~PGE~~	~~Cortina Substation 230kV bus~~	~~6/1/2012~~	~~6/1/2012~~					
~~361~~	~~5/2/2008~~	~~5/2/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~200~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Blythe-Eagle Mountain 161kV line~~	~~8/30/2012~~	~~8/30/2012~~					
~~362~~	~~5/2/2008~~	~~5/2/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~300~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation~~	~~8/30/2012~~	~~8/30/2012~~					
~~363~~	~~5/5/2008~~	~~5/6/2008~~	~~Withdrawn 12/7/09~~	~~PV~~	~~S~~	~~700~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation 230kV~~	~~5/1/2013~~	~~5/1/2011~~		~~Complete~~			
~~364~~	~~5/5/2008~~	~~5/6/2008~~	~~Withdrawn 11/21/08~~	~~PV~~	~~S~~	~~700~~			~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation 230kV~~	~~5/1/2014~~	~~5/1/2013~~					
365	5/6/2008	5/12/2008	Active - Trans Cluster	ST	S	500		FC	Riverside	CA	SCE	Midpoint Substation	12/28/2013	7/1/2013		Complete	In Progress		
~~366~~	~~5/7/2008~~	~~5/12/2018~~	~~Withdrawn 10/30/08~~	~~RE~~	~~NG~~	~~115.5~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Kelso Substation~~	~~6/1/2012~~	~~6/1/2012~~					
~~367~~	~~5/12/2008~~	~~5/12/2008~~	~~Withdrawn 11/26/08~~	~~PV~~	~~S~~	~~50~~			~~Santa Barbara~~	~~CA~~	~~PGE~~	~~69kV line proximate to Cuyama Substation~~	~~12/31/2009~~	~~12/31/2009~~					
~~368~~	~~5/9/2008~~	~~5/16/2008~~	~~Withdrawn 11/20/08~~	~~CT~~	~~NG~~	~~150~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Escondido Substation 69 kV~~	~~6/1/2010~~	~~6/1/2010~~					
~~369~~	~~5/16/2008~~	~~5/16/2008~~	~~Withdrawn 10/24/08~~	~~H~~	~~WTR~~	~~1300~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation 500kV~~	~~6/1/2014~~	~~6/1/2014~~					
~~370~~	~~5/1/2008~~	~~5/19/2008~~	~~Withdrawn 11/24/08~~	~~CT~~	~~NG~~	~~390.4~~			~~Solano~~	~~CA~~	~~PGE~~	~~Lambie-Contra Costa Substation 230kV bus~~	~~6/1/2012~~	~~6/1/2012~~					
~~371~~	~~5/9/2008~~	~~5/23/2008~~	~~Withdrawn 11/26/08~~	~~CC~~	~~NG~~	~~337.5~~			~~Fresno~~	~~CA~~	~~PGE~~	~~McCall-Kingsburg #1 & #2 115kV lines~~	~~12/1/2010~~	~~12/1/2010~~					
372	5/21/2008	5/21/2008	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Jacobs Corner Substation 70kV bus	11/1/2010	11/1/2010	Waived	Complete	Complete		In Progress
~~373~~	~~5/27/2008~~	~~5/27/2008~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~315~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Loop Tesla-Stagg and Tesla-Eight Mile 230kV lines~~	~~7/1/2012~~	~~7/1/2012~~					
~~374~~	~~5/27/2008~~	~~5/27/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~Glenn~~	~~CA~~	~~PGE~~	~~Tap Cotonwood-Logan Creek-Vaca Dixon 230kV line~~	~~6/1/2010~~	~~6/1/2010~~					
~~375~~	~~5/28/2008~~	~~5/28/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~NG~~	~~49.9~~			~~Kern~~	~~CA~~	~~PGE~~	~~Famoso Substation~~	~~6/2/2011~~	~~6/2/2011~~					
~~376~~	~~5/28/2008~~	~~5/28/2008~~	~~Withdrawn 12/19/08~~	~~ST~~	~~S~~	~~612~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah-Lugo 230kV line~~	~~12/1/2012~~	~~12/1/2012~~					
~~377~~	~~5/28/2008~~	~~5/28/2008~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~600~~			~~Alameda~~	~~CA~~	~~PGE~~	~~Tracy Substation 230kV~~	~~5/1/2013~~	~~5/1/2013~~					
378	5/28/2008	5/28/2008	Active - Trans Cluster	CC	NG	120		FC	Santa Clara	CA	PGE	Los Esteros Substation 115kV bus	6/1/2011	6/1/2013		Complete	In Progress		

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
~~370~~	~~5/28/2008~~	~~5/28/2008~~	~~Withdrawn 12/11/09~~	~~CC~~	~~NG~~	~~600~~		~~FC~~	~~Sutter~~	~~CA~~	~~PGE~~	~~Table Mountain-Tesla 500kV line~~	~~5/1/2012~~	~~1/1/2014~~		~~Complete~~			
~~380~~	~~5/21/2008~~	~~5/29/2008~~	~~Withdrawn 11/12/08~~	~~ST~~	~~S~~	~~145~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Mohave 500kV line~~	~~5/1/2013~~	~~5/1/2013~~					
~~381~~	~~5/21/2008~~	~~5/29/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~240~~		~~FC~~	~~Clark~~	~~NV~~	~~SCE~~	~~Eldorado Substation 230kV~~	~~5/1/2013~~	~~5/1/2013~~		~~Complete~~			
~~382~~	~~5/21/2008~~	~~5/29/2008~~	~~Withdrawn 11/23/09~~	~~ST~~	~~S~~	~~290~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Eldorado 500kV line~~	~~5/1/2013~~	~~5/1/2013~~		~~Complete~~			
383	5/29/2008	5/29/2008	Active - Trans Cluster	CC	NG	85		FC	Los Angeles	CA	SCE	Arco Gen #1 & #2 230kV lines	5/31/2012	12/1/2012		Complete	In Progress		
~~384~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 10/16/09~~	~~ST~~	~~S~~	~~900~~		~~EO~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Mohave 500kV line~~	~~2/1/2012~~	~~2/1/2015~~		~~Complete~~			
~~385~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 10/16/09~~	~~ST~~	~~S~~	~~600~~		~~EO~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Lugo-Mohave 500kV line~~	~~2/1/2011~~	~~2/1/2014~~		~~Complete~~			
~~386~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~600~~		~~EO~~	~~Imperial~~	~~CA~~	~~SDGE~~	~~New Substation on North Gila-Imperial Valley 500kV line~~	~~1/1/2012~~	~~10/1/2014~~		~~Complete~~			
~~387~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~900~~		~~EO~~	~~La Posa~~	~~AZ~~	~~SCE~~	~~Devers-Palo Verde 500kV line~~	~~2/1/2015~~	~~2/1/2015~~		~~Complete~~			
~~388~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~900~~		~~EO~~	~~La Paz/Maricopa~~	~~AZ~~	~~SCE~~	~~Devers-Palo Verde 500 kV line~~	~~6/1/2014~~	~~6/1/2014~~		~~Complete~~			
~~389~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~900~~		~~EO~~	~~Maricopa~~	~~AZ~~	~~SCE~~	~~Devers-Palo Verde 500 kV line~~	~~5/1/2015~~	~~5/1/2015~~		~~Complete~~			
~~390~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~300~~		~~EO~~	~~Maricopa~~	~~AZ~~	~~SDGE~~	~~North Gila-Hassayampa 500kV line~~	~~5/1/2011~~	~~3/1/2012~~		~~Complete~~			
391	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	15		FC	Inyo	CA	SCE	Kramer Substation 230kV	1/11/2010	1/11/2010		Complete	In Progress		
392	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	15		FC	Inyo	CA	SCE	BLM Substation 230kV	3/13/2019	1/11/2010		Complete	In Progress		
393	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	15		FC	Inyo	CA	SCE	Inyokern Substation 115kV	8/19/2011	1/11/2010		Complete	In Progress		
394	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	60.7		FC	Churchill	NV	SCE	Control Substation 115kV bus	12/1/2012	12/1/2015		Complete	In Progress		
~~395~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~G~~	~~52.5~~			~~Churchill~~	~~NV~~	~~SCE~~	~~Bishop Substation~~	~~12/1/2012~~	~~12/1/2012~~					
396	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	60.7		FC	Churchill	NV	SCE	Control Substation 115kV bus	6/1/2013	6/1/2016		Complete	In Progress		
~~397~~	~~5/29/2008~~	~~5/29/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~G~~	~~52.5~~			~~Churchill~~	~~NV~~	~~SCE~~	~~Bishop Substation~~	~~6/1/2013~~	~~6/1/2013~~					
398	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	60.7		FC	Churchill	NV	SCE	Control Substation 115kV bus	6/1/2012	6/1/2012		Complete	In Progress		
399	5/29/2008	5/29/2008	Active - Trans Cluster	ST	G	60.7		FC	Churchill	NV	SCE	Control Substation 115kV bus	6/1/2012	6/1/2013		Complete	In Progress		
~~400~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 7/22/08~~	~~PV~~	~~S~~	~~700~~			~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation~~	~~5/1/2011~~	~~5/1/2011~~					
~~401~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 7/28/08~~	~~ST~~	~~NG~~	~~49.85~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~ChevGen Substation~~	~~9/1/2010~~	~~9/1/2010~~					
~~402~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 8/19/08~~	~~CC~~	~~NG~~	~~600~~			~~Kern~~	~~CA~~	~~PGE~~	~~Midway Substation 230kV bus~~	~~6/1/2012~~	~~6/1/2012~~					
~~403~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/14/09~~	~~PV~~	~~S~~	~~30~~		~~FC~~	~~Kern~~	~~CA~~	~~PGE~~	~~Midway Substation 230kV bus~~	~~6/1/2012~~	~~12/31/2011~~		~~Complete~~			
~~404~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 8/19/08~~	~~CT~~	~~NG~~	~~450~~			~~Kern~~	~~CA~~	~~PGE~~	~~Midway Substation 230kV bus~~	~~6/1/2011~~	~~6/1/2011~~					
~~405~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~450~~			~~Imperial~~	~~CA~~	~~SDGE~~	~~Imperial Valley Substation~~	~~12/31/2012~~	~~12/31/2012~~					
~~406~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~130~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Boulevard Substation~~	~~6/1/2011~~	~~6/1/2011~~					
407	5/30/2008	5/30/2008	Active - Trans Cluster	PV	S	325		FC	Kern	CA	SCE	Cottonwind-Whirlwind 230kV line	7/1/2012	12/1/2014		Complete	In Progress		
408	5/30/2008	5/30/2008	Active - Trans Cluster	PV	S	325		FC	Kern	CA	SCE	Cottonwind-Whirlwind 230kV line	7/1/2012	12/1/2014		Complete	In Progress		
409	5/30/2008	5/30/2008	Active - Trans Cluster	WT	W	150		EO	Kern	CA	SCE	Highwind Substation 230kV	10/1/2011	12/31/2012		Complete	In Progress		
~~410~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~49.5~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation 500kV~~	~~8/1/2012~~	~~8/1/2012~~					
~~411~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~49.5~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation 500kV~~	~~8/1/2012~~	~~8/1/2012~~					
412	5/30/2008	5/30/2008	Active - Trans Cluster	PV	S	250		FC	Los Angeles	CA	SCE	Whirlwind Substation 230kV	8/1/2012	12/1/2013		Complete	In Progress		
~~413~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/21/08~~	~~ST~~	~~S~~	~~280~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation 230kV~~	~~8/1/2012~~	~~8/1/2012~~					
~~414~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/21/08~~	~~ST~~	~~S~~	~~280~~			~~Imperial~~	~~CA~~	~~SDGE~~	~~Imperial Valley Substation 230kV bus~~	~~7/1/2012~~	~~7/1/2012~~					
~~415~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/21/08~~	~~ST~~	~~S~~	~~280~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Devers-Palo Verde 500kV line~~	~~8/1/2012~~	~~8/1/2012~~					
~~416~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/21/08~~	~~ST~~	~~S~~	~~280~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation 230kV~~	~~8/1/2012~~	~~8/1/2012~~					
417	5/30/2008	5/30/2008	Active - Trans Cluster	WT	W	14		FC	Contra Costa	CA	PGE	Pittsburg-Tesla 230kV line	9/30/2010	9/30/2010		Complete	In Progress		
~~418~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~400~~			~~San Joaquin~~	~~CA~~	~~PGE~~	~~Tesla Substation 230kV bus~~	~~11/1/2012~~	~~11/1/2012~~					
~~419~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~CT~~	~~NG~~	~~188~~			~~Fresno~~	~~CA~~	~~PGE~~	~~Panoche Substation 230kV~~	~~3/1/2011~~	~~3/1/2011~~					
~~420~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/9/09~~	~~ST~~	~~S~~	~~49.5~~		~~FC~~	~~San Diego~~	~~CA~~	~~SDGE~~	~~Borrego Substation 69kV~~	~~2/1/2013~~	~~2/1/2013~~		~~Complete~~			
421	5/30/2008	5/30/2008	Active - Trans Cluster	ST	S	49.5		FC	Riverside	CA	SCE	Eagle Mountain Substation	2/1/2012	2/1/2012		Complete	In Progress		
~~422~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~49.5~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Camino-Iron Mountain 230kV line~~	~~2/1/2012~~	~~2/1/2012~~					
~~423~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~49.5~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Camino-Iron Mountain 230kV line~~	~~2/1/2012~~	~~2/1/2012~~					
~~424~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Mohave Switchyard~~	~~7/1/2014~~	~~7/1/2014~~					
~~425~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Colorado River Substation~~	~~7/1/2014~~	~~7/1/2014~~					
~~426~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~Clark~~	~~NV~~	~~SCE~~	~~Mohave Switchyard~~	~~7/1/2014~~	~~7/1/2014~~					
~~427~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~250~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Antelope Substation~~	~~7/1/2014~~	~~7/1/2014~~		~~Complete~~			
~~428~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Eagle Mountain Substation~~	~~7/1/2014~~	~~7/1/2014~~					
429	5/30/2008	5/30/2008	Active - Trans Cluster	ST	S	100		FC	Imperial	CA	SDGE	Imperial Valley Substation	7/1/2014	7/1/2014		Complete	In Progress		
~~430~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~250~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Kramer Substation~~	~~7/1/2014~~	~~7/1/2014~~		~~Complete~~			
431	5/30/2008	5/30/2008	Active - Trans Cluster	ST	S	150		FC	Riverside	CA	SCE	Midpoint Substation 220kV	7/1/2014	7/1/2014		Complete	In Progress		
~~432~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~250~~		~~FC~~	~~Riverside~~	~~CA~~	~~SCE~~	~~Colorado River Substation 230kV~~	~~7/1/2014~~	~~7/1/2014~~		~~Complete~~			
~~433~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Iron Mountain Substation~~	~~5/29/2015~~	~~5/29/2015~~					
~~434~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~500~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Mohave Switchyard~~	~~5/29/2015~~	~~5/29/2015~~					
~~435~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/4/09~~	~~ST~~	~~S~~	~~250~~		~~FC~~	~~La Paz~~	~~AZ~~	~~SCE~~	~~Palo Verde-Devers #2 line~~	~~7/1/2014~~	~~7/1/2014~~		~~Complete~~			
~~436~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~Maricopa~~	~~AZ~~	~~SCE~~	~~Palo Verde-Devers #2 line~~	~~7/1/2014~~	~~7/1/2014~~					
~~437~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 10/21/08~~	~~WT~~	~~W~~	~~350~~			~~Shasta~~	~~CA~~	~~PGE~~	~~Pit #3-Round Mountain 230kV line~~	~~6/1/2011~~	~~6/1/2011~~					
~~438~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~500~~			~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation~~	~~12/31/2011~~	~~12/31/2011~~					
~~439~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~500~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation~~	~~12/31/2011~~	~~12/31/2011~~					
~~440~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~500~~			~~Kern~~	~~CA~~	~~SCE~~	~~Whirlwind Substation~~	~~12/31/2011~~	~~12/31/2011~~					
~~441~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~G~~	~~50~~			~~Lake~~	~~CA~~	~~PGE~~	~~Geysers 17-Fulton #2 230kV line~~	~~7/31/2012~~	~~7/31/2012~~					
442	5/30/2008	5/30/2008	Active - Trans Cluster	PV	S	125		FC	Imperial	CA	SDGE	Imperial Valley 230kV	5/1/2013	3/1/2013		Complete	In Progress		
~~443~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Talega-Escondido 230kV line~~	~~7/1/2009~~	~~7/1/2009~~					
~~444~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Lilac-Rincon 69kV~~	~~7/1/2009~~	~~7/1/2009~~					
~~445~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Pala-Lilac 69kV line~~	~~7/1/2009~~	~~7/1/2009~~					
~~446~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~Orange~~	~~CA~~	~~SDGE~~	~~Talega-San Mateo 60kV line~~	~~7/1/2009~~	~~7/1/2009~~					
~~447~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Ash-Valley Center 69kV line~~	~~7/1/2009~~	~~7/1/2009~~					
~~448~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/25/08~~	~~CT~~	~~NG~~	~~49~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Border Substation 69kV~~	~~7/1/2009~~	~~7/1/2009~~					
~~449~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 12/19/08~~	~~ST~~	~~S~~	~~250~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Midpoint Substation 500kV~~	~~7/1/2012~~	~~7/1/2012~~					
~~450~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~WT~~	~~W~~	~~1150~~			~~Los Angeles & Kern~~	~~CA~~	~~SCE~~	~~Whirlwind Substation 230kV~~	~~5/30/2013~~	~~5/30/2013~~					
~~451~~	~~5/30/2008~~	~~5/30/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~1150~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Pisgah Substation 230kV~~	~~5/30/2013~~	~~5/30/2013~~					
~~452~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/24/08~~	~~CC~~	~~NG~~	~~730~~			~~Solano~~	~~CA~~	~~PGE~~	~~Loop Lakesville-Sobrante and Lakesville-Ignacio 230kV lines~~	~~6/15/2012~~	~~6/15/2012~~					
~~453~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~250~~			~~La Paz~~	~~AZ~~	~~SCE~~	~~Mohave Switchyard~~	~~7/1/2014~~	~~7/1/2014~~					
~~454~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~84~~			~~Imperial~~	~~CA~~	~~SDGE~~	~~Imperial Valley Substation 230kV~~	~~2/1/2011~~	~~2/1/2011~~					
~~455~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 12/14/09~~	~~ST~~	~~S~~	~~141~~		~~FC~~	~~Los Angeles~~	~~CA~~	~~SCE~~	~~Whirlwind Substation 230kV~~	~~10/1/2013~~	~~10/1/2013~~		~~Complete~~			
~~456~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/26/08~~	~~ST~~	~~S~~	~~840~~			~~Los Angeles~~	~~CA~~	~~SCE~~	~~Vincent Substation~~	~~9/1/2014~~	~~9/1/2014~~					
~~457~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/26/08~~	~~PV~~	~~S~~	~~55~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Victor Substation 115kV~~	~~6/15/2010~~	~~6/15/2010~~					

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection			Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
~~458~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 8/1/08~~	~~PV~~	~~S~~	~~50~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Antelope-Cal Cement 69kV line~~	~~6/15/2010~~	~~6/15/2010~~					
~~459~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/25/08~~	~~PV~~	~~S~~	~~50~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Cameron Substation 69kV~~	~~12/15/2009~~	~~12/15/2009~~					
~~460~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 9/10/08~~	~~PV~~	~~S~~	~~40~~			~~Kern~~	~~CA~~	~~SCE~~	~~Inyokern Substation 115kV bus~~	~~12/1/2010~~	~~12/1/2010~~					
~~461~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 9/10/08~~	~~PV~~	~~S~~	~~40~~			~~San Bernardino~~	~~CA~~	~~SCE~~	~~Dunn Siding-Cool Water 115kV line~~	~~12/1/2010~~	~~12/1/2010~~					
~~462~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/25/08~~	~~PV~~	~~S~~	~~58.8~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Borrego Substation 69kV~~	~~6/15/2010~~	~~6/15/2010~~					
~~463~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/25/08~~	~~PV~~	~~S~~	~~58.8~~			~~San Diego~~	~~CA~~	~~SDGE~~	~~Warner Substation 69kV~~	~~6/30/2010~~	~~6/30/2010~~					
~~464~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/25/08~~	~~PV~~	~~S~~	~~40~~			~~Kern~~	~~CA~~	~~SCE~~	~~Redman Substation 69kV bus~~	~~12/1/2010~~	~~12/1/2010~~					
~~465~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 11/25/08~~	~~PV~~	~~S~~	~~40~~			~~Kern~~	~~CA~~	~~SCE~~	~~Little Rock Substation 69kV bus~~	~~12/1/2010~~	~~12/1/2010~~					
~~466~~	~~6/2/2008~~	~~6/2/2008~~	~~Withdrawn 8/1/08~~	~~PV~~	~~S~~	~~100~~			~~Riverside~~	~~CA~~	~~SCE~~	~~Baker Substation 115kV~~	~~6/15/2010~~	~~6/15/2010~~					
467	**5/30/2008**	**6/2/2008**	**Active - Trans Cluster**	**ST**	**S**	**230**		**FC**	**Clark**	**NV**	**SCE**	**Eldorado-Ivanpah 230kV line**	**8/1/2012**	**10/1/2015**		**Complete**	**In Progress**		
468	**5/30/2008**	**6/2/2008**	**Active - Trans Cluster**	**PV**	**S**	**290**		**EO**	**Yuma**	**AZ**	**SDGE**	**Hassayampa-North Gila 500kV line**	**8/1/2012**	**6/15/2014**		**Complete**	**In Progress**		
~~469~~	~~7/14/2008~~	~~7/14/2008~~	~~Withdrawn 11/18/08~~	~~ST~~	~~B~~	~~16.3~~		~~EO~~	~~Amador~~	~~CA~~	~~PGE~~	~~Valley Springs-Martel #2 60kV line~~	~~12/31/2008~~	~~12/31/2008~~					
470	7/30/2008	7/30/2008	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Jacobs Corner Substation 70kV bus	3/1/2011	3/1/2011	Waived	Complete	Complete		In Progress
471	7/30/2008	7/30/2008	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Jacobs Corner Substation 70kV bus	7/1/2011	7/1/2011	Waived	Complete	Complete		In Progress
472	8/4/2008	8/11/2008	Active - SGIP	ST	B	13.8		EO	Humboldt	CA	PGE	Blue Lake Tap 60kV	12/20/2008	4/1/2010	Waived	Waived	Complete		In Progress
473	9/3/2008	9/12/2008	Active - SGIP	PV	S	20		EO	Tulare	CA	PGE	Smyrna-Alpaugh 115kV line	5/1/2010	5/1/2010	Waived	Complete	Complete		In Progress
474	9/11/2008	9/15/2008	Active - SGIP	PV	S	19.9		EO	San Bernardino	CA	SCE	Dunn Siding Substation	6/1/2011	6/1/2011	Waived	In Progress			
~~475~~	~~9/10/2008~~	~~10/8/2008~~	~~Withdrawn - 10/26/09~~	~~WT~~	~~W~~	~~20~~		~~EO~~	~~Riverside~~	~~CA~~	~~SCE~~	~~Devers-Garnet-Venwind 115kV line~~	~~12/1/2009~~	~~12/1/2010~~	~~Waived~~	~~In Progress~~			
476	10/23/2008	10/23/2008	Active - SGIP	RE	LFG	9.9		EO	Marin	CA	PGE	Lakeville #2 60 kV line	5/29/2010	5/29/2010	Waived	Complete	In Progress		
477	2/2/2009	2/6/2009	Active - SGIP	RE	LFG	4		EO	Butte	CA	PGE	Centerville-Table Mountain 60kV line	3/31/2010	4/17//11	Waived	Waived	Complete		In Progress
478	2/17/2009	2/17/2009	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Corcoran-Kingsburg 115kV #2 line	11/1/2011	11/1/2011	Waived	Complete	In Progress		
479	3/13/2009	3/13/2009	Active - SGIP	PV	S	20		EO	Tulare	CA	PGE	Smyrna-Alpaugh 115kV line	10/1/2011	10/1/2011	Waived	Complete	Tendered		
480	3/16/2009	3/16/2009	Active - SGIP	PV	S	20		EO	San Diego	CA	SDGE	Borrego Substation 69kV switchyard	12/31/2010	12/31/2010	In Progress				
481	4/6/2009	4/20/2009	Active - SGIP	ST	B	18.4		EO	Amador	CA	PGE	Valley Springs-Martel #2 60kV line	4/1/2010	4/1/2010	Waived	Complete	Complete		In Progress
482	4/24/2009	4/24/2009	Active - SGIP	PV	S	20		EO	Tulare	CA	PGE	Smyrna-Alpaugh 115kV line	4/1/2012	4/1/2012	Waived	Complete	Tendered		
483	4/29/2009	4/29/2009	Active - SGIP	PV	S	10		EO	Kern	CA	SCE	Vincent Substation	6/1/2010	6/1/2010	Waived	In Progress			
484	6/11/2009	6/11/2009	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Arco - Carneras 70 kV Line	9/30/2011	9/30/2011	Waived	Complete	In Progress		
485	6/3/2009	6/18/2009	Active - SGIP	WT	W	19.9		EO	Kern	CA	SCE	Highwind Substation 230kV bus	6/30/2012	6/30/2012	In Progress				
486	6/29/2009	6/29/2009	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Antelope-Neenach 66kV line	1/1/2012	1/1/2012	Complete				
487	7/30/2009	7/31/2009	Active - Cluster #1	PV	S	600		FC	Kern	CA	PGE	Midway-Wheeler Ridge 230kV double circuit line	12/1/2015	12/1/2015		In Progress			
488	4/6/2009	7/31/2009	Active - Cluster #1	ST	S	92		FC	Clark	NV	SCE	Eldorado Substation 230kV	9/30/2012	9/30/2012		In Progress			
489	5/26/2009	7/31/2009	Active - Cluster #1	WT	W	98.9		FC	Solano	CA	PGE	Birds Landing Substation 230kV	5/31/2011	5/31/2011		In Progress			
490	6/3/2009	7/31/2009	Active - Cluster #1	ST	NU	48		FC	San Diego	CA	SCE	San Onofre Nuclear Generating Station 230kV switchyard	12/31/2012	12/31/2012		In Progress			
491	6/4/2009	7/31/2009	Active - Cluster #1	PV	S	230		FC	San Bernardino	CA	SCE	Coolwater-Dunn Siding 115kV line	6/1/2014	6/1/2014		In Progress			
~~492~~	~~7/6/2009~~	~~7/31/2009~~	~~Withdrawn 11/2/09~~	~~PV~~	~~S~~	~~350~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Windhub Substation 230kV~~	~~12/1/2015~~	~~12/1/2015~~		In Progress			
493	7/16/2009	7/31/2009	Active - Cluster #1	WT	W	549.2		FC	Imperial	CA	SDGE	Sunrise Powerlink 500kV line	12/31/2013	12/31/2013		In Progress			
494	7/20/2009	7/31/2009	Active - Cluster #1	PV	S	350		FC	Kern	CA	SCE	Windhub Substation 230kV	12/1/2015	12/1/2015		In Progress			
495	7/24/2009	7/31/2009	Active - Cluster #1	H	WTR	7.2		FC	Tuolumne	CA	PGE	Tulloch 115kV tap	10/1/2011	10/1/2011		In Progress			
496	7/27/2009	7/31/2009	Active - Cluster #1	ST	S	960		FC	Yuma	AZ	SDGE	Agua Caliente Substation 500kV	1/1/2014	1/1/2014		In Progress			
497	7/27/2009	7/31/2009	Active - Cluster #1	ST	S	6		FC	San Bernardino	CA	SCE	New Ivanpah Substation 115kV	3/31/2012	3/31/2012		In Progress			
498	7/27/2009	7/31/2009	Active - Cluster #1	ST	S	20		FC	San Bernardino	CA	SCE	New Ivanpah Substation 115kV	9/30/2012	9/30/2012		In Progress			
499	7/27/2009	7/31/2009	Active - Cluster #1	ST	S	40		FC	San Bernardino	CA	SCE	New Ivanpah Substation 115kV	3/31/2013	3/31/2013		In Progress			
500	7/27/2009	7/31/2009	Active - Cluster #1	ST	S	960		FC	Lincoln	NV	SCE	Eldorado Substation 500kV	1/1/2014	1/1/2014		In Progress			
501	7/28/2009	7/31/2009	Active - Cluster #1	PV	S	750		FC	Yuma	AZ	SDGE	Hassayampa-North Gila 500kV switching station	6/30/2015	6/30/2015		In Progress			
502	7/28/2009	7/31/2009	Active - Cluster #1	PV	S	270		FC	Clark	NV	SCE	Eldorado-Ivanpah 230kV line	5/1/2016	5/1/2016		In Progress			
503	7/28/2009	7/31/2009	Active - Cluster #1	PV	S	500		FC	Clark	NV	SCE	Eldorado Substation 230kV bus	1/1/2016	1/1/2016		In Progress			
~~504~~	~~7/30/2009~~	~~7/31/2009~~	~~Withdrawn 10/20/09~~	~~WT~~	~~W~~	~~688~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Highwind Substation 230kV bus~~	~~11/30/2012~~	~~11/30/2012~~					
505	7/30/2009	7/31/2009	Active - Cluster #1	WT/PV	W/S	1100		FC	Kern	CA	SCE	Highwind-Windhub 230kV line	11/30/2012	11/30/2012		In Progress			
506	7/30/2009	7/31/2009	Active - Cluster #1	PV	S	300		EO	Kern	CA	SCE	Whirlwind Substation 230kV	7/31/2015	7/31/2015		In Progress			
~~507~~	~~7/31/2009~~	~~7/31/2009~~	~~Withdrawn 12/4/09~~	~~CC~~	~~NG~~	~~131~~		~~FC~~	~~Contra Costa~~	~~CA~~	~~PGE~~	~~Contra Costa Substation 230kV bus~~	~~12/1/2013~~	~~12/1/2013~~					
508	7/31/2009	7/31/2009	Active - Cluster #1	CC	NG	10		FC	Fresno	CA	PGE	Sanger-Reedley 115kV line	3/15/2011	3/15/2011		In Progress			
509	7/31/2009	7/31/2009	Active - Cluster #1	CT	NG	49.9		FC	San Diego	CA	SDGE	El Cajon-Los Coches 69kV line	6/15/2010	6/15/2010		In Progress			LGIA Executed
510	7/31/2009	7/31/2009	Active - Cluster #1	PV	S	200		FC	Imperial	CA	SDGE	Imperial Valley Substation 230kV bus	1/1/2012	7/1/2012		In Progress			
~~511~~	~~7/31/2009~~	~~7/31/2009~~	~~Withdrawn 11/30/09~~	~~ST~~	~~S~~	~~92.6~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Goldtown-Lancaster 66kV line~~	~~12/31/2012~~	~~12/31/2012~~					
512	7/31/2009	7/31/2009	Active - Cluster #1	PV	S	26		FC	Los Angeles	CA	SCE	Neenach Substation 66kV	2/15/2012	2/15/2012		In Progress			
513	7/31/2009	7/31/2009	Active - Cluster #1	ST	S	141		FC	Los Angeles	CA	SCE	Whirlwind Substation 230kV	8/1/2013	8/1/2013		In Progress			
~~513A~~	~~7/31/2009~~	~~7/31/2009~~	~~Withdrawn 10/8/09~~	~~CT~~	~~NG~~	~~199~~		~~FC~~	~~San Diego~~	~~CA~~	~~SDGE~~	~~Otay Mesa Energy Center Substation 230kV~~	~~5/1/2013~~	~~5/1/2013~~					
514	7/31/2009	7/31/2009	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Arco Substation 69kV bus	12/15/2010	12/15/2010	Waived	In Progress			
515	8/12/2009	8/12/2009	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Kramer-Ransburg 115kV line	4/1/2011	4/1/2011					
516	8/12/2009	8/21/2009	Active - SGIP	PV	S	20		EO	San Diego	CA	SDGE	Borrego Substation 69kV	1/1/2011	1/1/2011	In Progress				
517	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Kern-Old River #1 70kV line	12/31/2012	12/31/2012	Waived	In Progress			
518	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Kern-Old River #2 70kV line	12/31/2012	12/31/2012	Waived	In Progress			
519	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Elk Hills-Taft 70kV line	12/31/2014	12/31/2014	Waived	In Progress			
520	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Blackwell-Carneras 70kV line	12/31/2014	12/31/2014	Waived	In Progress			
521	8/19/2009	8/19/2009	Active - SGIP	PV	S	19.9		EO	Kern	CA	SCE	Goldtown-Corum 66kV line	12/31/2014	12/31/2014					
522	8/19/2009	8/19/2009	Active - SGIP	PV	S	19.9		EO	Kern	CA	SCE	Goldtown-Lancaster 66kV line	12/31/2014	12/31/2014					
522A	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Rosamond Substation 66kV	12/31/2013	12/31/2013					
522B	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Rosamond leg of the Cal Cement-Monolith-Rosamond-Wind Farm 66kV line	12/31/2012	12/31/2012					
522C	8/19/2009	8/19/2009	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Kern River-Cumings 66kV line	12/31/2013	12/31/2013					
523	8/21/2009	8/21/2009	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Arco Substation 70kV bus	10/30/2011	10/30/2011	Waived	In Progress			
523A	8/26/2009	8/26/2009	Active - SGIP	PV	S	19.9		EO	Kern	CA	SCE	Goldtown-Corum 66kV line	12/31/2010	12/31/2010					
524	9/2/2009	9/2/2009	Active - SGIP	PV	S	20		EO	San Bernardino	CA	SCE	Eldorado-Pisgah #2 230kV line	12/1/2011	12/1/2011					
~~525~~	~~9/8/2009~~	~~9/11/2009~~	~~Withdrawn 4/28/10~~	~~PV~~	~~S~~	~~20~~		~~EO~~	~~Kern~~	~~CA~~	~~PGE~~	~~Arco-Caneras 70kV line~~	~~4/30/2011~~	~~12/31/2010~~	~~Waived~~	~~In Progress~~			
526	9/11/2009	9/11/2009	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Schindler-Coalinga #2 70kV line	1/1/2012	1/1/2012	Waived	In Progress			
527	9/23/2009	9/23/2009	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Control-Haiwee-Inyokern #2 115kV line	6/1/2011	6/1/2011					
528	10/5/2009	10/5/2009	Active - SGIP	PV	S	20		EO	Solano	CA	PGE	Birds Landing Substation 230kV bus	6/1/2011	6/1/2011					
529	10/19/2009	10/19/2009	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Corcoran- Kingsburg #1 115kV line	8/1/2013	8/1/2013	Waived	In Progress			
529A	10/23/2009	10/23/2009	Active - SGIP	RE/PV	LFG/S	14.5		EO	Fresno	CA	PGE	Helm-Kerman 70kV line	4/1/2011	4/1/2011	In Progress				
530	10/29/2009	10/29/2009	Active - SGIP	PV	S	20		EO	Tulare	CA	PGE	Corcoran-Smyrna 115kV line	7/1/2011	7/1/2011	Waived	Tendered			

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
~~531~~	~~10/29/2009~~	~~10/29/2009~~	Withdrawn 1/29/10	~~PV~~	~~S~~	~~16~~		~~EO~~	~~Tulare~~	~~CA~~	~~PGE~~	~~Corcoran-Smyrna 115kV line~~	~~7/1/2011~~	~~7/1/2011~~					
531A	10/29/2009	10/29/2009	Active - SGIP	PV	S	20		EO	Los Angeles	CA	SCE	Antelope-Del Sur 69kV line	6/1/2011	6/1/2011	In Progress				
531B	10/29/2009	10/29/2009	Active - SGIP	PV	S	20		EO	Los Angeles	CA	SCE	Neenach Substation 69kV	6/1/2011	6/1/2011	In Progress				
532	11/2/2009	11/2/2009	Active - SGIP	ST	S	20		EO	Fresno	CA	PGE	Schindler-Huron-Gates 70kV line	1/1/2012	1/1/2012	Waived	In Progress			
~~533~~	~~11/11/2009~~	~~11/11/2009~~	Withdrawn 4/19/20	~~PV~~	~~S~~	~~20~~		~~EO~~	~~Kern~~	~~CA~~	~~PGE~~	~~Semitropic-Midway #2 115kV line~~	~~1/1/2012~~	~~1/1/2012~~	~~Waived~~	~~Tendered~~			
534	8/4/2009	11/13/2009	Active - SGIP	PV	S	20		EO	San Benito	CA	PGE	Moss Landing-Panoche #2 230kV line	6/30/2011	6/30/2011	Waived	In Progress			
548	11/19/2009	11/19/2009	Active - SGIP	PV	S	20		EO	Kings	CA	PGE	Mercy Springs Substation 70kV	10/31/2011	10/31/2011	Waived	In Progress			
~~536~~	~~11/19/2009~~	~~11/19/2009~~	Withdrawn 3/4/10	~~PV~~	~~S~~	~~20~~		~~EO~~	~~Merced~~	~~CA~~	~~PGE~~	~~Mercy Springs 70kV line~~	~~12/31/2011~~	~~12/31/2011~~					
~~537~~			Number Not Used																
537A	11/23/2009	11/23/2009	Active - SGIP	WT	W	20		EO	Kern	CA	SCE	Highwind Substation	4/1/2011	4/1/2011	Waived	In Progress			
538	12/16/2009	12/16/2009	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Oro Loma-Mendota 69kV line	1/1/2012	1/1/2012	Waived	Tendered			
539	12/18/2009	12/18/2009	Active - SGIP	PV	S	20		EO	Stanislaus	CA	PGE	Salado-Newman #1 60kV line	1/1/2011	6/1/2011	Waived	In Progress			
540	12/22/2009	12/22/2009	Active - SGIP	PV	S	20		EO	Los Angeles	CA	SCE	Little Rock-Piute 69kV line	5/1/2011	5/1/2011					
541	1/5/2010	1/5/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Panoche-Oro Loma 115kV Line	1/1/2012	1/1/2012	Waived				
541A	1/5/2010	1/5/2010	Active - SGIP	PV	S	20		EO	Los Angeles	CA	SCE	Antelope-Neenach 66kV line	6/1/2011	6/1/2011					
541B	1/5/2010	1/5/2010	Active - SGIP	PV	S	20		EO	Los Angeles	CA	SCE	Antelope-Neenach 66kV line	6/1/2011	6/1/2011					
542	1/6/2010	1/6/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Schindler Substation 115kV bus	1/1/2012	1/1/2012	Waived				
543	1/6/2010	1/6/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Schindler Substation 70kV bus	1/1/2012	1/1/2012	Waived				
~~544~~	~~1/6/2010~~	~~1/6/2010~~	Withdrawn 4/19/10	~~PV~~	~~S~~	~~20~~		~~EO~~	~~Kern~~	~~CA~~	~~PGE~~	~~Lamont Substation 115kV bus~~	~~10/31/2011~~	~~10/31/2011~~					
545	1/6/2010	1/6/2010	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Wheeler Ridge-Lakeview 70kV line	10/31/2011	10/31/2011					
546	1/6/2010	1/6/2010	Active - SGIP	PV	S	15		EO	Los Angeles	CA	SCE	Redman-Piute 66kV line tap	12/1/2012	12/1/2012	Waived				
547	1/6/2010	1/6/2010	Active - SGIP	PV	S	10		EO	Los Angeles	CA	SCE	Loop Redman-Lancaster 66kV line	12/1/2012	12/1/2012	Waived				
			Number Not Used																
549	11/19/2009	1/15/2010	Active - SGIP	PV	S	20		EO	Merced	CA	PGE	Mercy Springs-Oro Loma 70kV line	3/31/2012	3/31/2012	Waived	Tendered			
550	12/4/2009	1/19/2010	Active - SGIP	PV	S	20		EO	Tulare	CA	PGE	Merced #1 70 kV line	12/15/2011	12/15/2011	Waived	In Progress			
551	1/27/2010	1/27/2010	Active - SGIP	PV	S	20		EO	Kern	CA	PGE	Wheeler Ridge Substation 70kV bus	10/31/2011	10/31/2011					
552	10/2/2009	2/1/2010	Active - Cluster #2	PV	S	60		FC	San Bernardino	CA	SCE	Lugo-Pisgah #1 230kV line	3/1/2012	4/30/2012					
553	1/21/2010	2/1/2010	Active - Cluster #2	PV	S	400		FC	San Benito	CA	PGE	Moss Landing-Panoche #2 and Coburn-Panoche #2 230 kV lines	12/15/2013	12/15/2013					
554	1/26/2010	2/1/2010	Active - Cluster #2	WT	W	138		EO	Shasta	CA	PGE	Pit River 1 - Cottonwood 230kV line	10/31/2013	10/31/2013					
555	1/26/2010	2/1/2010	Active - Cluster #2	WT	W	92		FC	San Diego	CA	SDGE	Boulevard Substation 138kV	11/22/2013	11/22/2013					
~~556~~	~~1/27/2010~~	~~2/1/2010~~	Withdrawn 4/9/10	~~WT~~	~~W~~	~~126~~		~~EO~~	~~Mendocino~~	~~CA~~	~~PGE~~	~~Eagle Rock Substation 115kV~~	~~10/31/2013~~	~~10/31/2013~~					
557	1/27/2010	2/1/2010	Active - Cluster #2	PV	S	19.75		FC	Tulare	CA	PGE	Smyrna-Alpaugh 115kV line	4/1/2013	4/1/2013					
558	1/27/2010	2/1/2010	Active - Cluster #2	PV	S	19.75		FC	Kings	CA	PGE	Corcoran-Kingsburg #2 115kV line	6/1/2013	6/1/2013					
559	1/27/2010	2/1/2010	Active - Cluster #2	PV	S	80		FC	Kern	CA	PGE	Wheeler Ridge-Lamont 115kV line	7/1/2012	7/1/2012					
560	1/27/2010	2/1/2010	Active - Cluster #2	PV	S	150		FC	Merced	CA	PGE	Los Banos-Dos Amigos 230kV line	7/1/2012	7/1/2012					
561	1/27/2010	2/1/2010	Active - Cluster #2	PV	S	200		FC	Imperial	CA	SDGE	Imperial Valley 230kV bus	2/1/2013	2/1/2013					
~~562~~	~~1/27/2010~~	~~2/1/2010~~	Withdrawn 5/26/10	~~PV~~	~~S~~	~~420~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Victor Substation 230kV~~	~~10/1/2013~~	~~10/1/2013~~					
~~563~~	~~1/27/2010~~	~~2/1/2010~~	Withdrawn 3/26/10	~~PV~~	~~S~~	~~22~~		~~FC~~	~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope Substation 66kV~~	~~6/1/2013~~	~~6/1/2013~~					
~~564~~	~~1/27/2010~~	~~2/1/2010~~	Withdrawn 3/26/10	~~PV~~	~~S~~	~~23~~		~~FC~~	~~Los Angeles~~	~~CA~~	~~SCE~~	~~Antelope Substation 66kV~~	~~7/1/2013~~	~~7/1/2013~~					
565	1/27/2010	2/1/2010	Active - Cluster #2	CT	NG	200		FC	San Diego	CA	SDGE	Sycamore-Miguel 230kV line	5/1/2014	5/1/2014					
566	1/27/2010	2/1/2010	Active - Cluster #2	PV	S	49.8		FC	Kern	CA	SCE	Rosamond-Corum 66kV line	6/1/2012	6/1/2012					
567	1/28/2010	2/1/2010	Active - Cluster #2	H	WTR	1400		FC	Riverside	CA	SCE	Red Bluff Substation 230kV	6/1/2016	6/1/2016					
568	1/28/2010	2/1/2010	Active - Cluster #2	CC	NG	25		FC	Alameda	CA	PGE	Eastshore Substation 230kV	5/1/2013	5/1/2013					
569	1/28/2010	2/1/2010	Active - Cluster #2	CC	NG	600		FC	Sutter	CA	PGE	Table Mountain-Tesla 500kV line	5/1/2013	5/1/2013					
570	1/28/2010	2/1/2010	Active - Cluster #2	WT	W	102		FC	Shasta & Trinity	CA	PGE	Trinity-Cottonwood 115kV line	11/22/2012	11/22/2012					
571	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	450		FC	Kern	CA	SCE	Windhub Substation 500kV	12/31/2013	12/31/2013					
572	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	110		FC	Riverside	CA	SCE	Valley Substation 500kV bus	12/31/2013	12/31/2013					
573	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	50		FC	Kern	CA	SCE	Antelope-Cal Cement 66kV line	6/1/2013	6/1/2013					
574	1/29/2010	2/1/2010	Active - Cluster #2	CT	NG	308		FC	San Diego	CA	SDGE	Looping substation on Otay Mesa-Miguel 230kV line	5/1/2013	5/1/2013					
~~575~~	~~1/29/2010~~	~~2/1/2010~~	Withdrawn 3/18/10	~~RE~~	~~LFG~~	~~9.6~~		~~FC~~	~~Solano~~	~~CA~~	~~PGE~~	~~Brighton-Davis 115kV line~~	~~6/30/2013~~	~~6/30/2013~~					
576	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	485		FC	Riverside	CA	SCE	Colorado River Substation 230kV bus	12/31/2013	12/31/2013					
577	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	220		FC	Merced	CA	PGE	Los Banos-Westley 230kV line	12/31/2013	12/31/2013					
~~578~~	~~1/29/2010~~	~~2/1/2010~~	Withdrawn 3/31/10	~~PV~~	~~S~~	~~70~~		~~FC~~	~~San Bernardino~~	~~CA~~	~~SCE~~	~~Cottonwood-Savage 115kV line~~	~~12/31/2013~~	~~12/31/2013~~					
579	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	220		FC	Maricopa	CA	PGE	Borden Substation 230kV bus	5/1/2013	5/1/2013					
~~580~~	~~1/29/2010~~	~~2/1/2010~~	Withdrawn 4/16/10	~~PV~~	~~S~~	~~170~~		~~FC~~	~~Riverside~~	~~CA~~	~~SCE~~	~~Blythe-Eagle Mountain 161kV line~~	~~12/31/2012~~	~~12/31/2012~~					
581	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	100		FC	Fresno	CA	PGE	Henrietta Substation 70kV	5/1/2013	5/1/2013					
582	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	1500		FC	Kern	CA	SCE	Midway-Vincent #1 & #2 500 kV lines	5/30/2011	5/30/2011					
583	1/29/2010	2/1/2010	Active - Cluster #2	WT	W	57.5		FC	San Diego	CA	SDGE	Boulevard Substation 138kV	12/31/2012	12/31/2012					
584	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	150		EO	Los Angeles	CA	SCE	Antelope Substation 220kV bus	2/28/2013	2/28/2013					
585	1/29/2010	2/1/2010	Active - Cluster #2	WT	W	150		EO	Los Angeles	CA	SCE	Antelope Substation 220kV bus	2/28/2013	2/28/2013					
586	1/29/2010	2/1/2010	Active - Cluster #2	ST	G	99.8		FC	Sonoma	CA	PGE	Geysers #17-Fulton 230kV line	6/1/2013	6/1/2013					
~~587~~	~~1/29/2010~~	~~2/1/2010~~	Withdrawn 3/22/10	~~ST~~	~~S~~	~~106.8~~		~~EO~~	~~Fresno~~	~~CA~~	~~PGE~~	~~Gates Substation~~	~~9/30/2012~~	~~9/30/2012~~					
588	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	200		FC	Riverside	CA	SCE	Red Bluff Substation 230kV	12/1/2012	12/1/2012					
589	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	60		FC	San Bernardino	CA	SCE	Victor Substation 115kV	12/1/2012	12/1/2012					
590	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	150		FC	Imperial	CA	SDGE	Imperial Valley Substation 230kV bus	12/31/2012	12/31/2012					
~~591~~	~~1/29/2010~~	~~2/1/2010~~	Withdrawn 4/21/10	~~PV~~	~~S~~	~~40~~		~~FC~~	~~San Diego~~	~~CA~~	~~SDGE~~	~~Borrego Substation 69kV~~	~~6/1/2011~~	~~6/1/2011~~					
592	1/29/2010	2/1/2010	Active - Cluster #2	PV	S	500		FC	Kings	CA	PGE	Midway-Gates & Arco-Gates 230kV lines	12/31/2012	12/31/2012					
593	1/30/2010	2/1/2010	Active - Cluster #2	PV	S	310		FC	San Bernardino	CA	SCE	Mohave Generating Station 500kV bus	7/7/2014	7/7/2014					
~~594~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 3/4/10	~~PV~~	~~S~~	~~20~~		~~FC~~	~~Merced~~	~~CA~~	~~PGE~~	~~Merced Substation 70kV~~	~~12/31/2012~~	~~12/31/2012~~					
~~595~~	~~1/30/2010~~	~~2/2/2010~~	Withdrawn 3/4/10	~~PV~~	~~S~~	~~15~~		~~FC~~	~~Kings~~	~~CA~~	~~PGE~~	~~Henrieta-Tulare 70kV line~~	~~12/31/2012~~	~~12/31/2012~~					
~~596~~	~~1/30/2010~~	~~2/3/2010~~	Withdrawn 3/4/10	~~PV~~	~~S~~	~~20~~		~~FC~~	~~Kings~~	~~CA~~	~~PGE~~	~~Henrieta-Tulare 70kV line~~	~~12/31/2012~~	~~12/31/2012~~					
~~597~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 5/17/10	~~PV~~	~~S~~	~~15~~		~~FC~~	~~Madera~~	~~CA~~	~~PGE~~	~~Merced #1 70 kV line (El Nido-Bonita segment)~~	~~12/31/2012~~	~~12/31/2012~~					
~~598~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 3/4/10	~~PV~~	~~S~~	~~17.75~~		~~FC~~	~~Kings~~	~~CA~~	~~PGE~~	~~Henrieta-Tulare 70kV line~~	~~12/31/2012~~	~~12/31/2012~~					
~~599~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 3/4/10	~~PV~~	~~S~~	~~20~~		~~FC~~	~~San Joaquin~~	~~CA~~	~~PGE~~	~~Corral Substation 70kV~~	~~12/31/2012~~	~~12/31/2012~~					
600	1/30/2010	2/1/2010	Active - Cluster #2	PV	S	20		FC	Merced	CA	PGE	Merced #1 70 kV line	12/31/2012	12/31/2012					
~~601~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 3/31/10	~~PV~~	~~S~~	~~10~~		~~FC~~	~~Kings~~	~~CA~~	~~PGE~~	~~Tulare Henrietta 70kV line~~	~~12/31/2012~~	~~12/31/2012~~					
602	1/30/2010	2/1/2010	Active - Cluster #2	PV	S	150		FC	Kern	CA	SCE	Whirlwind Substation 230kV	7/1/2013	7/1/2013					
~~603~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 4/20/10	~~PV~~	~~S~~	~~146~~		~~FC~~	~~Kern~~	~~CA~~	~~SCE~~	~~Whirlwind Substation 230kV~~	~~7/1/2013~~	~~7/1/2013~~					
~~604~~	~~1/30/2010~~	~~2/1/2010~~	Withdrawn 2/12/10	~~CT~~	~~NG~~	~~600~~		~~FC~~	~~Imperial~~	~~CA~~	~~SDGE~~	~~Imperial Valley Substation 230kV~~	~~4/1/2014~~	~~4/1/2014~~					

				Generating Facility		Maximum MWs		Deliverability Status	Location		Point of Interconnection				Study Availability				
Queue Position	Interconnection Request Receive Date	Queue Date	Application Status	Type	Fuel	Summer	Winter	Full Capacity or Energy Only (FC/EO)	County	State	Utility	Station or Transmission Line	Proposed On-line Date (as filed with IR)	Current On-line Date	Feasibility Study (IFS)	System Impact Study *or* Phase I Cluster Study	Facilities Study (FAS) *or* Phase II Cluster Study	Optional Study (OS)	Interconnection Agreement Status
605	1/30/2010	2/1/2010	Active - Cluster #2	CT	NG	600		FC	Clark	NV	SCE	Eldorado Substation 230kV	4/1/2014	4/1/2014					
606	2/1/2010	2/1/2010	Active - Cluster #2	CC	NG	20		FC	San Joaquin	CA	PGE	Schulte Switching Station 115kV bus	6/1/2012	6/1/2012					
607	2/1/2010	2/1/2010	Active - Cluster #2	PV	S	60		FC	Fresno	CA	PGE	Mendota Substation 115 kV bus	10/1/2012	10/1/2012					
608	2/1/2010	2/1/2010	Active - Cluster #2	PV	S	250		FC	Imperial	CA	SDGE	Imperial Valley Substation 230kV bus	5/1/2013	5/1/2013					
609	2/2/2010	2/2/2010	Active - SGIP	PV	S	20		EO	Los Angeles	CA	SCE	Tap line west of Rosamond Substation	6/30/2012	6/30/2012					
610	2/4/2010	2/5/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Stroud SW STA-Schindler 70kV line	12/1/2012	12/1/2012					
611	2/17/2010	2/17/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Oro Loma-El Nido 115kV line	1/1/2012	1/1/2012					
612	2/19/2010	2/19/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Panoche-Schindler 115kV line	1/1/2012	1/1/2012					
613	2/19/2010	2/19/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	San Joaquin-Schindler 69kV line	1/1/2012	1/1/2012					
613A	2/23/2010	2/24/2010	Active - SGIP	WT	W	19.5		EO	Kern	CA	SCE	Monolith Substation	6/1/2011	6/1/2011					
614	3/2/2010	3/2/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Merced-Madera 70kV line	5/1/2011	5/1/2011					
614A	3/4/2010	3/4/2010	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Goldtown-Lancaster 66kV line	12/31/2011	12/31/2011					
615	3/10/2010	3/10/2010	Active - SGIP	PV	S	20		EO	Kern	CA	SCE	Zondwind Substation 66kV bus	12/30/2012	12/30/2012					
616	3/15/2010	3/17/2010	Active - SGIP	PV	S	20		EO	Riverside	CA	SCE	Eagle Mountain-Blythe 161kV line	7/1/2012	7/1/2012					
617	3/22/2010	3/22/2010	Active - SGIP	PV	S	20		EO	San Joaquin	CA	PGE	Tesla-Tracy 115kV line	3/1/2011	3/1/2011					
618	4/1/2010	4/1/2010	Active - SGIP	PV	S	20		EO	Fresno	CA	PGE	Coalinga-Mendota Road 69kV line	8/1/2012	8/1/2012					

Legend:

- **Application Status Key:** A39=Amendment 39 Procedures (Appendix W), Serial=Standard Large Generator Interconnection Procedures (Appendix U), Trans(ition) Cluster=Appendix 2 to Large Generator Interconnection Procedures in a Queue Cluster Window (Appendix Y), Numbered Clusters=Large Generator Interconnection Procedures in a Queue Cluster Window (Appendix Y), SGIP=Small Generator Interconnection Procedure (Appendix S), **Complete**=project is in Commercial Operation
- **Generator Type Key:** IC=Internal Combustion, ST=Steam Turbine, CT=Combustion Turbine, CC=Combined Cycle, H=Hydro, WT=Wind Turbine, PV=Photovoltaic, RE=Reciprocating Engine
- **Fuel Type Key:** W=Wind, NU=Nuclear, NG=Natural Gas, O=Oil, C=Coal, B=Biomass, S=Solar, LFG=Land Fill Gas, WTR=Water, G=Geothermal, HR=Heat Recovery

Appendix C

Load, Resource, and Dispatch Summary Tables

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Imperial Valley Cluster

Case Names	c2_ll_pre_iva_rev1	c2_ll_pstup_iva_rev1	c2_14hs_pre_iv4	c2_14hs_pst_iv4up
CAISO Recommended Plan Of Service	No	Yes	No	Yes
Boulevard - Cluster 2	Off	Off	Off	Off
Internal - Cluster 2	Off	Off	Off	Off
Imperial Valley Area Cluster - Cluster 2	Off	600 MW	Off	600 MW
Season	Light Load	Light Load	Heavy Summer	Heavy Summer
Load	2740	2740	5120	5120
Losses	205	202	225	227
Load + Losses (actual)	**2945**	**2942**	**5345**	**5347**
Path 44 South of SONGS	-290	-286	674	459
Miguel 500/230 kV Flow @ 230 kV	1510	1461	1704	1739
Central 500/230 kV Flow @ 230 kV	929	922	1026	1121
LEAPS 500/230 kV Flow @ 230 kV	-672	-670	1	2
Tijuana-Otay Mesa 230 kV @ OM	523	570	596	683
SDG&E Import Cut Plane (Interface 501)	**2000**	**1997**	**4000**	**4000**
Sunrise (at IV)	641	633	739	837
Sunrise (at CE)	929	922	1026	1121
Imperial Valley - North Gila 500 kV #1 (east)	*** -726	*** -527	*** 822	*** 242
Imperial Valley - North Gila 500 kV #2(east)	Not In Service	*** -527	Not In Service	*** 242
Imperial Valley - ECO 500 kV	410	359	628	663
ECO-Miguel 500 kV	1522	1472	1705	1740
Path 45 SDG&E-CFE (south to north)	350	350	202	202
SDG&E-IID (IV-EC & IV-Dixie 230 kV)	269	237	209	236
Path 43 North of Songs (south to north)	2440	2435	1476	1691
Path 49 East Of River	6208	6628	4039	4404
SCIT	5143	5324	14535	13484

Full Capacity (FC)
Energy Only (EO)

Out of-basin Generation

	ECO Generation					Fuel Type	MAX MW
Q32	Boulevard	201	201	201	201	W	201
Q106A	Boulevard	160	160	160	160	W	160
Q159A	ECO	400	400	** 69	** 69	W	400
Q183	ECO	** 150	** 150	300	300	EO W	300
Q215	ECO	** 239	** 239	420	420	EO W	420
C555- Cluster 2	Boulevard	0	0	0	0	FC W	92
C583- Cluster 2	Boulevard	0	0	0	0	FC W	58
	Sub-total	** **1150**	**1150**	** **1150**	** **1150**		**1631**
	Sub-total Boulevard Cluster 2	**0**	**0**	**0**	**0**		**150**
	Imperial Valley Area Cluster						MAX
N/A	Existing	1070	* 770	^ 0	^ 0	ST	1070
Q78	IV-230	300	300	300	300	S	300
Q124	IV-230	450	450	450	450	S	450
Q429	IV-230	100	100	100	100	FC ST	100
Q442	IV-230	125	125	125	125	FC SPV	125
Q510	IV-230	200	200	200	200	FC SPV	200
Q493	Sunrise Powerlink	299	299	299	299	FC W	549
C561- Cluster 2	IV-230	0	200	0	200	FC SPV	200
C590- Cluster 2	IV-230	0	150	0	150	FC SPV	150
C608- Cluster 2	IV-230	0	250	0	250	FC SPV	250
	Sub-total	**2544**	* **2844**	^ **1474**	^ **2074**		**3394**
	Sub-total Imperial Valley Area Cluster 2	**0**	**600**	**0**	**600**		**600**
	North Gila-Haasayampa Generation						MAX
Q468	AZ NG-HAA 500 kV	290	290	290	290	EO SPV	290
Q496	Agua Caliente 500 kV	0	0	0	0	FC ST	960
Q501	Hassayampa-North Gila 500 kV	0	0	0	0	FC SPV	750
	Sub-total	**290**	**290**	**290**	**290**		**2000**
	Total Out-of-Basin Generation	**3984**	**4284**	**2914**	**3514**		**7025**

In-basin Generation

	Internal Generation						
QF	**Sub-total**	**182**	**182**	**182**	**182**		**192**
	PEN (CT1, CT2 & ST1)	275	262	298	284		565
	OTAYM (CT1, CT2 & ST1)	235	235	248	248		615
	LkHod (G1+G2)	0	0	40	40		40
Priority One	**Sub-total**	**510**	**497**	**586**	**572**		**1220**
	ENCINA 4	50	50	50	50		299
	ES GEN	0	0	35	35		35
	MEF_MR1	46	46	44	44		44
	CALPeak_EC	0	0	0	0		42
	CALPeak_BD	0	0	0	0		42
	CALPeak_ES	0	0	0	0		42
	ELCAJNGT	0	0	0	0		13
	LRKSPBD1	0	0	0	0		46
	LRKSPBD2	0	0	0	0		46
	KUMEYAAY	50	50	50	50	W	50
	OY GEN	0	0	0	0		35
	MIRAMRGT	0	0	0	0		
Priority Two	**Sub-total**	**146**	**146**	**179**	**179**		**1414**
CAISO Internal Queue							
Q72	Proposed Lee Lake Sub	0	0	0	0		500
Q103 (Contract)	Border	0	0	0	0		27
Q121	Miramar (MEF-II)	0	0	48	48		48
Q137	Encina	0	0	0	0		300
Q150	Border	0	0	43	43		43
Q189	Encina	0	0	0	0		280
Q190	Otay Mesa	0	0	0	0		330
Q201	Pala	0	0	99	99		99
Q274	(PEN Expansion)	0	0	0	0		--
Q337	Borrego	0	0	25.8	25.8	FC SPV	25.75
Q509	El Cajon	0	0	50	50	FC NG	49.9
C565- Cluster 2	Sycamore-Miguel 230 kV line	0	0	0	0	FC NG	200
C574- Cluster 2	Otay Mesa-Miguel 230 kV Line	0	0	0	0	FC NG	308
	Sub-total	**0**	**0**	**265**	**266**		**2211**
	Sub-total Internal Cluster 2	**0**	**0**	**0**	**0**		**508**
	Total In Basin Generation	**838**	**825**	**1212**	**1199**		**5037**
	Total	**4822**	**5109**	**4126**	**4713**		**12061**

Adjusting area 24 and area 30 generation to compensate for Cluster 2 generation
* Existing Imperial Valley generation adjusted to maintain flow on NOS WECC Path 43 below the limit of 2440 MW
^ Miguel Bank 80/81 continuous limit is 1800 MW. Generation reduced to maintain Southwest Powerlink flow below 1800 MW.
**N-1 of a single ECO 500/230 kV bank isolates all generation at Boulevard and ECO. The CAISO allows a maximum of 1150 MW of generation tripping for this single contingency. Generation at ECO and Boulevard is limited to a maximum of 1150 MW.
*** Records flow west to east (from Imperial Valley to North Gila)

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Boulevard Cluster

Case Names	c2_ll_pre_bu_rev1	c2_ll_pstup_bu_rev1	c2_14hs_pre_iv4	c2_14hs_pst_bu4up
CAISO Recommended Plan Of Service	No	Yes	No	Yes
Boulevard - Cluster 2	Off	149.5 MW	Off	149.5 MW
Internal - Cluster 2	Off	Off	Off	Off
Imperial Valley Area Cluster - Cluster 2	Off	Off	Off	Off
Season	Light Load	Light Load	Heavy Summer	Heavy Summer
Load	2740	2740	5120	5120
Losses	205	179	225	194
Load + Losses (actual)	**2945**	**2919**	**5345**	**5314**
Path 44 South of SONGS	-290	-178	674	633
Miguel 500/230 kV Flow @ 230 kV	1510	1422	1704	1674
Central 500/230 kV Flow @ 230 kV	930	889	1026	1061
LEAPS 500/230 kV Flow @ 230 kV	-672	-670	1	1
Tijuana-Otay Mesa 230 kV @ OM	523	543	596	633
SDG&E Import Cut Plane (Interface 501)	**2001**	**2006**	**4000**	**4000**
Sunrise (at IV)	641	599	739	776
Sunrise (at CE)	930	889	1026	1062
Imperial Valley - North Gila 500 kV #1 (east)	*** 722	*** 444	*** 822	*** 422
Imperial Valley - North Gila 500 kV #2(east)	Not In Service	*** 444	Not In Service	*** 422
Imperial Valley - ECO 500 kV	410	318	628	597
ECO-Miguel 500 kV	1523	1432	1705	1676
Path 45 SDG&E-CFE (south to north)	350	350	202	202
SDG&E-IID (IV-EC & IV-Dixie 230 kV)	269	216	209	188
Path 43 North of Songs (south to north)	2440	2328	1476	1517
Path 49 East Of River	6208	6465	4039	4129
SCIT	5143	5227	14535	13684

Full Capacity (FC)
Energy Only (EO)

Out-of-basin Generation

	ECO Generation					Fuel Type	MAX MW
Q32	Boulevard	201.0	201.0	201	201	W	201
Q106A	Boulevard	160.0	160.0	160	160	W	160
Q159A	ECO	400.0	** 250.5	** 69	** 69	W	400
Q183	ECO	** 150.0	** 150.0	300	** 150	EO W	300
Q215	ECO	** 239.0	** 239.0	420	420	EO W	420
C555- Cluster 2	Boulevard	0.0	92.0	0	92	FC W	92
C583- Cluster 2	Boulevard	0.0	57.5	0	58	FC W	58
	Sub-total	** **1150.0**	** **1150.0**	** **1150**	** **1150**		**1631**
	Sub-total Boulevard Cluster 2	**0.0**	**149.5**	**0**	**150**		**150**

	Imperial Valley Area Cluster						MAX
N/A	Existing	1070	1070	^ 0	^ 0	ST	1070
Q78	IV-230	300	300	300	300	S	300
Q124	IV-230	450	450	450	450	S	450
Q429	IV-230	100	100	100	100	FC ST	100
Q442	IV-230	125	125	125	125	FC SPV	125
Q510	IV-230	200	200	200	200	FC SPV	200
Q493	Sunrise Powerlink	299	299	299	299	FC W	549
C561- Cluster 2	IV-230	0	0	0	0	FC SPV	200
C590- Cluster 2	IV-230	0	0	0	0	FC SPV	150
C608- Cluster 2	IV-230	0	0	0	0	FC SPV	250
	Sub-total	**2544**	**2544**	^ **1474**	^ **1474**		**3394**
	Sub-total Imperial Valley Area Cluster 2	**0**	**0**	**0**	**0**		**600**

	North Gila-Haasayampa Generation						MAX
Q468	AZ NG-HAA 500 kV	290	290	290	290	EO SPV	290
Q496	Agua Caliente 500 kV	0	0	0	0	FC ST	960
Q501	Hassayampa-North Gila 500 kV	0	0	0	0	FC SPV	750
	Sub-total	**290**	**290**	**290**	**290**		**2000**
	Total Out-of-Basin Generation	**3984**	**3984**	**2914**	**2914**		**7025**

In-basin Generation

Internal Generation

QF	**Sub-total**	**182**	**182**	**182**	**182**		**192**
	PEN (CT1, CT2 & ST1)	274	248	298	278		565
	OTAYM (CT1, CT2 & ST1)	235	235	248	248		615
	LkHod (G1+G2)	0	0	40	40		40
Priority One	**Sub-total**	**509**	**483**	**586**	**566**		**1220**
	ENCINA 4	50	50	50	50		299
	ES GEN	0	0	35	35		35
	MEF_MR1	46	46	44	44		44
	CALPeak_EC	0	0	0	0		42
	CALPeak_BD	0	0	0	0		42
	CALPeak_ES	0	0	0	0		42
	ELCAJNGT	0	0	0	0		13
	LRKSPBD1	0	0	0	0		46
	LRKSPBD2	0	0	0	0		46
	KUMEYAAY	50	50	50	50	W	50
	OY GEN	0	0	0	0		35
	MIRAMRGT	0	0	0	0		
Priority Two	**Sub-total**	**146**	**146**	**179**	**179**		**1414**

CAISO Internal Queue

Q72	Proposed Lee Lake Sub	0	0	0	0			500
Q103 (Contract)	Border	0	0	0	0			27
Q121	Miramar (MEF-II)	0	0	48	48			48
Q137	Encina	0	0	0	0			300
Q150	Border	0	0	43	43			43
Q189	Encina	0	0	0	0			280
Q190	Otay Mesa	0	0	0	0			330
Q201	Pala	0	0	99	99			99
Q274	(PEN Expansion)	0	0	0	0			--
Q337	Borrego	0	0	25.8	25.8	FC	SPV	25.75
Q509	El Cajon	0	0	50	50	FC	NG	49.9
C565- Cluster 2	Sycamore-Miguel 230 kV line	0	0	0	0	FC	NG	200
C574- Cluster 2	Otay Mesa-Miguel 230 kV Line	0	0	0	0	FC	NG	308
	Sub-total	**0**	**0**	**265**	**266**			**2211**
	Sub-total Internal Cluster 2	**0**	**0**	**0**	**0**			**508**
	Total In Basin Generation	**837**	**811**	**1212**	**1193**			**5037**
	Total	**4821**	**4795**	**4126**	**4107**			**12061**

Adjusting area 24 and area 30 generation to compensate for Cluster 2 generation
^ Miguel Bank 80/81 continuous limit is 1800 MW. Generation reduced to maintain Southwest Powerlink flow below 1800 MW.
**N-1 of a single ECO 500/230 kV bank isolates all generation at Boulevard and ECO. The CAISO allows a maximum of 1150 MW of generation tripping for this single contingency. Generation at ECO and Boulevard is limited to a maximum of 1150 MW.
*** Records flow east to west (from N. Gila to Imperial Valley)

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Internal Cluster

Case Names	c2_ll_pre_int_825ps	c2_ll_pstup_int_825ps	c2_14hs_pre_int9	c2_14hs_pst_int5up
CAISO Recommended Plan Of Service	**No**	**Yes**	**No**	**Yes**
Boulevard - Cluster 2	**Off**	**Off**	**Off**	**Off**
Internal - Cluster 2	**Off**	**508 MW**	**Off**	**508 MW**
Imperial Valley Area Cluster - Cluster 2	**Off**	**Off**	**Off**	**Off**
Season	**Light Load**	**Light Load**	**Heavy Summer**	**Heavy Summer**
Load	2740	2740	5120	5120
Losses	182	169	246	224
Load + Losses (actual)	**2922**	**2909**	**5366**	**5344**
Path 44 South of SONGS	-128	-287	141	-161
Miguel 500/230 kV Flow @ 230 kV	1356	1120	1677	1503
Central 500/230 kV Flow @ 230 kV	724	616	982	929
LEAPS 500/230 kV Flow @ 230 kV	-820	-815	-1	0
Tijuana-Otay Mesa 230 kV @ OM	340	337	471	490
SDG&E Import Cut Plane (Interface 501)	**1472**	**971**	**3269**	**2761**
Sunrise (at IV)	729	621	695	641
Sunrise (at CE)	724	616	982	929
Imperial Valley - North Gila 500 kV #1 (east)	*** -663	*** -525	*** 433	*** 102
Imperial Valley - North Gila 500 kV #2(east)	Not In Service	*** -525	Not In Service	*** 102
Imperial Valley - ECO 500 kV	253	12	600	422
ECO-Miguel 500 kV	729	1126	1679	1504
Path 45 SDG&E-CFE (south to north)	350	350	201	201
SDG&E-IID (IV-EC & IV-Dixie 230 kV)	246	211	267	253
Path 43 North of Songs (south to north)	2278	2437	2009	2311
Path 49 East Of River	5716	6122	4314	4582
SCIT	4781	4507	14050	13331

Full Capacity (FC)
Energy Only (EO)

Out of-basin Generation

	ECO Generation					Fuel Type	MAX MW
Q32	Boulevard	201	201	201	201	W	201
Q106A	Boulevard	160	160	160	160	W	160
Q159A	ECO	400	400	** 69	** 69	W	400
Q183	ECO	** 150	** 150	300	300	EO	W	300
Q215	ECO	** 239	** 239	420	420	EO	W	420
C555- Cluster 2	Boulevard	0	0	0	0	FC	W	92
C583- Cluster 2	Boulevard	0	0	0	0	FC	W	58
	Sub-total	** **1150**	** **1150**	** **1150**	** **1150**			**1631**
	Sub-total Boulevard Cluster 2	**0**	**0**	**0**	**0**			**150**
	Imperial Valley Area Cluster							**MAX**
N/A	Existing	* 920	* 920	^ 250	^ 250		ST	1070
Q78	IV-230	300	300	300	300		S	300
Q124	IV-230	450	450	450	450		S	450
Q429	IV-230	100	100	100	100	FC	ST	100
Q442	IV-230	125	125	125	125	FC	SPV	125
Q510	IV-230	0	0	200	200	FC	SPV	200
Q493	Sunrise Powerlink	0	0	299	299	FC	W	549
C561- Cluster 2	IV-230	0	0	0	0	FC	SPV	200
C590- Cluster 2	IV-230	0	0	0	0	FC	SPV	150
C608- Cluster 2	IV-230	0	0	0	0	FC	SPV	250
	Sub-total	* **1895**	* **1895**	^ **1724**	^ **1724**			**3394**
	Sub-total Imperial Valley Area Cluster 2	**0**	**0**	**0**	**0**			**600**
	North Gila-Haasayampa Generation							**MAX**
Q468	AZ NG-HAA 500 kV	0	0	290	290	EO	SPV	290
Q496	Agua Caliente 500 kV	0	0	0	0	FC	ST	960
Q501	Hassayampa-North Gila 500 kV	0	0	0	0	FC	SPV	750
	Sub-total	**0**	**0**	**290**	**290**			**2000**
	Total Out-of-Basin Generation	**3045**	**3045**	**3164**	**3164**			**7025**

In-basin Generation

Internal Generation

QF	**Sub-total**	**182**	**182**	**182**	**182**			**192**
	PEN (CT1, CT2 & ST1)	168	151	345	332			565
	OTAYM (CT1, CT2 & ST1)	603	603	604	604			615
	LkHod (G1+G2)	0	0	40	40			40
Priority One	**Sub-total**	**771**	**754**	**989**	**975**			**1220**
	ENCINA 4	50	50	50	50			299
	ES GEN	0	0	35	35			35
	MEF_MR1	46	46	44	44			44
	CALPeak_EC	0	0	0	0			42
	CALPeak_BD	0	0	0	0			42
	CALPeak_ES	0	0	42	42			42
	ELCAJNGT	0	0	0	0			13
	LRKSPBD1	0	0	0	0			46
	LRKSPBD2	0	0	0	0			46
	KUMEYAAY	0	0	50	50		W	50
	OY GEN	0	0	0	0			35
	MIRAMRGT	0	0	33	33			
Priority Two	**Sub-total**	**96**	**96**	**254**	**254**			**1414**
CAISO Internal Queue								
Q72	Proposed Lee Lake Sub	0	0	0	0			500
Q103 (Contract)	Border	0	0	0	0			27
Q121	Miramar (MEF-II)	0	0	48	48			48
Q137	Encina	0	0	0	0			300
Q150	Border	0	0	43	43			43
Q189	Encina	0	0	0	0			280
Q190	Otay Mesa	330	330	330	330			330
Q201	Pala	0	0	50	50			99
Q274	(PEN Expansion)	0	0	0	0			--
Q337	Borrego	0	0	25.8	25.8	FC	SPV	25.75
Q509	El Cajon	0	0	50	50	FC	NG	49.9
C565- Cluster 2	Sycamore-Miguel 230 kV line	0	200	0	200	FC	NG	200
C574- Cluster 2	Otay Mesa-Miguel 230 kV Line	0	308	0	308	FC	NG	308
	Sub-total	**330**	**838**	**546**	**1055**			**2211**
	Sub-total Internal Cluster 2	**0**	**508**	**0**	**508**			**508**
	Total In Basin Generation	**1379**	**1870**	**1971**	**2466**			**5037**
	Total	**4424**	**4915**	**5135**	**5630**			**12061**

Adjusting SDG&E import to compensate for Cluster 2 generation
^ Miguel Bank 80/81 continuous limit is 1800 MW. Generation reduced to maintain Southwest Powerlink flow below 1800 MW.
* Existing Imperial Valley generation adjusted to maintain flow on NOS WECC Path 43 below the limit of 2440 MW
**N-1 of a single ECO 500/230 kV bank isolates all generation at Boulevard and ECO. The CAISO allows a maximum of 1150 MW of generation tripping for this single contingency. Generation at ECO and Boulevard is limited to a maximum of 1150 MW.
*** Records flow east to west (from North Gila to Imperial Valley)

Appendix D

Steady-State Power Flow Results: Thermal and Voltage

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Imperial Valley Cluster

CAISO Recommended Plan Of Service	**No**	**Yes**	**No**	**Yes**
Boulevard - Cluster 2	**Off**	**Off**	**Off**	**Off**
Internal - Cluster 2	**Off**	**Off**	**Off**	**Off**
Imperial Valley Area Cluster - Cluster 2	**Off**	**600 MW**	**Off**	**600 MW**
Season	**Heavy Summer**		**Light Load**	

AREA	BRANCH DESCRIPTION / CATEGORY		CONTINGENCY DESCRIPTION	MVA1	MVA2	RVU	c2_14hs_pre_iv4	c2_14hs_pst_iv5up	c2_ll_pre_iva_rev1	c2_ll_pstup_iva_rev2
IID	IMPRLVLY 230 ELCENTRO 230 1	B	IMPRLVLY-N.GILA ck 1	239.0	258.0	258.0	0.051	0.553	1.109	0.657
SDG&E	DOUBLTTP 138 FRIARS 138 1	B	TL23013 PENSQTOS - OT ck 1	150.8	150.8	150.8	0.789	0.421	1.180	0.682
		C	OLD TOWN 230 kV 2N CB	150.8	150.8	150.8	0.808	0.436	1.189	0.689
			OLD TOWN 230 kV 2T CB	150.8	150.8	150.8	0.793	0.426	1.178	0.683
	MIGUEL 230 MIGUEL 500 2	B	ML BK 80 230/500 ck 1	1120.0	1344.0	1344.0	1.105	0.620	0.990	0.522
	MIGUEL 230 MIGUELMP 500 1	B	ML BK 81 230/500 ck 2	1120.0	1329.0	1329.0	1.129	0.644	0.999	0.541
		C	MIGUEL 230 kV 2T CB	1120.0	1329.0	1329.0	1.129	0.644	0.999	0.541
	OTAYMESA 230 TJI-230 230 1	B	C493 - CENTRALS ck 1	796.0	796.0	796.0	0.973	1.067	0.847	0.865
			ECO - ML SPS	796.0	796.0	796.0	0.951	1.076	0.729	0.854
			TLSUNRI IMPRLVLY-C493	796.0	796.0	796.0	0.914	1.021	0.790	0.816
		C	IV-ECO + IV-C493 SPS	796.0	796.0	796.0	1.093	1.247	0.864	0.864
	PALA 69 MNSRATTP 69 1	C	ES-TA 230 kV & LI-PA 69 kV	68.0	68.0	68.0	1.154	1.154	0.155	0.155
	POMERADO 69 SYCAMORE 69 1	B	TL06924 POMERADO -SYCAMORE ck 2	174.0	179.0	179.0	1.119	1.032	0.866	0.745
	POMERADO 69 SYCAMORE 69 2	B	TL06915 POMERADO -SYCAMORE ck 1	174.0	179.0	179.0	1.121	1.033	0.868	0.746
	SY230 230 SOUTHBAY 69 2	C	SY230 230 kV 1T CB	224.0	285.0	285.0	1.302	0.837	0.969	0.463
	TA TAP 138 LAGNA NL 138 1	C	PI-CP & TA-TB	136.5	136.5	136.5	1.148	1.149	0.600	0.601
			TALEGA 138 kV 8T CB	136.5	136.5	136.5	1.422	1.422	0.736	0.736
			TA-TB + TA-PI ck 1	136.5	136.5	136.5	1.320	1.320	0.686	0.686
	TALEGA 138 PICO 138 1	C	TA-TB + LNL-TA TAP-SMO 138 kV	204.0	204.0	204.0	1.143	1.144	0.600	0.600

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Imperial Valley Cluster

CAISO Recommended Plan Of Service	**No**	**Yes**	**No**	**Yes**
Boulevard - Cluster 2	**Off**	**Off**	**Off**	**Off**
Internal - Cluster 2	**Off**	**Off**	**Off**	**Off**
Imperial Valley Area Cluster - Cluster 2	**Off**	**600 MW**	**Off**	**600 MW**
Season	**Heavy Summer**		**Light Load**	

KV	FULL NAME	CONTINGENCY DESCRIPTION / CATEGORY		c2_14hs_pre_iv4*	c2_14hs_pst_iv5up*	c2_ll_pre_iva_rev1*	c2_ll_pstup_iva_rev2*
69	CRESTWD 69	ECO BK 80 or 81 230/500 with gen trip	B	1.0353	1.0329	1.0582	1.0443
		IV GENS		1.0233	1.0236	1.0520	1.0316
		IV-ECO SPS+IVGens+OM-TJI		1.0196	1.0191	1.0508	1.0308
		TL06923 BARRETT -CAMERON ck 1		1.0417	1.0418	0.9747	1.0505
		23021 & 23041 + 1400MW	C	1.0310	1.0377	1.0587	1.0424
		23022 & 23023 + 1400MW		1.0313	1.0351	1.0532	1.0403
	NARROWS 69	TL0687 BORREGO-NARROWS ck 1	B	1.0465	1.0466	1.0510	1.0367

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Boulevard Cluster

CAISO Recommended Plan Of Service	**No**	**Yes**	**No**	**Yes**
Boulevard - Cluster 2	**Off**	**149.5 MW**	**Off**	**149.5 MW**
Internal - Cluster 2	**Off**	**Off**	**Off**	**Off**
Imperial Valley Area Cluster - Cluster 2	**Off**	**Off**	**Off**	**Off**
Season	**Heavy Summer**		**Light Load**	

AREA	BRANCH DESCRIPTION / CATEGORY		CONTINGENCY DESCRIPTION	MVA1	MVA2	RVU	c2_14hs_pre_iv4	c2_14hs_pst_bu5up	c2_ll_pre_bu_rev1	c2_ll_pstup_bu_rev2
IID	IMPRLVLY 230 ELCENTRO 230 1	B	IMPRLVLY-N.GILA ck 1	239.0	258.0	258.0	0.051	0.416	1.109	0.596
SDG&E	DOUBLTTP 138 FRIARS 138 1	B	TL23013 PENSQTOS - OT ck 1	150.8	150.8	150.8	0.789	0.360	1.180	0.646
		C	OLD TOWN 230 kV 2N CB	150.8	150.8	150.8	0.808	0.376	1.189	0.654
			OLD TOWN 230 kV 2T CB	150.8	150.8	150.8	0.793	0.365	1.178	0.648
	MIGUEL 230 MIGUELMP 500 1	C	MIGUEL 230 kV 2T CB	1120.0	1329.0	1329.0	1.129	0.618	1.000	0.527
	OTAYMESA 230 TJI-230 230 1	C	IV-ECO + IV-C493 SPS	796.0	796.0	796.0	1.093	1.094	0.806	0.807
	PALA 69 MNSRATTP 69 1	C	ES-TA 230 kV & LI-PA 69 kV	68.0	68.0	68.0	1.154	1.154	0.155	0.155
	POMERADO 69 SYCAMORE 69 1	B	TL06924 POMERADO -SYCAMORE ck 2	174.0	179.0	179.0	1.119	1.009	0.867	0.732
	POMERADO 69 SYCAMORE 69 2	B	TL06915 POMERADO -SYCAMORE ck 1	174.0	179.0	179.0	1.121	1.011	0.868	0.733
	SY230 230 SOUTHBAY 69 2	C	SY230 230 kV 1T CB	224.0	285.0	285.0	1.302	0.832	0.969	0.460
	TA TAP 138 LAGNA NL 138 1	C	PI-CP & TA-TB	136.5	136.5	136.5	1.148	1.148	0.600	0.600
			TALEGA 138 kV 8T CB	136.5	136.5	136.5	1.422	1.422	0.736	0.735
			TA-TB + TA-PI ck 1	136.5	136.5	136.5	1.320	1.320	0.686	0.686
	TALEGA 138 PICO 138 1	C	TA-TB + LNL-TA TAP-SMO 138 kV	204.0	204.0	204.0	1.143	1.143	0.600	0.600

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Boulevard Cluster

CAISO Recommended Plan Of Service	**No**	**Yes**	**No**	**Yes**
Boulevard - Cluster 2	**Off**	**149.5 MW**	**Off**	**149.5 MW**
Internal - Cluster 2	**Off**	**Off**	**Off**	**Off**
Imperial Valley Area Cluster - Cluster 2	**Off**	**Off**	**Off**	**Off**
Season	**Heavy Summer**		**Light Load**	

KV	FULL NAME	CONTINGENCY DESCRIPTION / CATEGORY		c2_14hs_pre_iv4	c2_14hs_pst_bu5up	c2_ll_pre_bu_rev1	c2_ll_pstup_bu_rev2
69	CAMERNTP 69	ECO BK 80 or 81 230/500 with gen trip	B	1.0311	1.0308	1.0545	1.0403
		23021 & 23041 + 1400MW	C	1.0267	1.0262	1.0551	1.0383
	CRESTWD 69	ECO BK 80 or 81 230/500 with gen trip	B	1.0353	1.0350	1.0582	1.0441
		IV GENS		1.0233	1.0218	1.0521	1.0358
		IV-ECO SPS+IVGens+OM-TJI		1.0196	1.0149	1.0510	1.0335
		23021 & 23041 + 1400MW	C	1.0310	1.0305	1.0588	1.0421
		23022 & 23023 + 1400MW		1.0313	1.0272	1.0533	1.0400
138	SHADOWR 138	SH-CC AND SH-BQ 138 kV	C	1.0437	1.0441	1.0492	1.0509

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Internal Cluster

CAISO Recommended Plan Of Service	No	Yes	No	Yes
Boulevard - Cluster 2	Off	Off	Off	Off
Internal - Cluster 2	Off	508 MW	Off	508 MW
Imperial Valley Area Cluster - Cluster 2	Off	Off	Off	Off
Season	Heavy Summer		Light Load	

AREA	BRANCH DESCRIPTION / CATEGORY		CONTINGENCY DESCRIPTION	MVA1	MVA2	RVU	c2_14hs_pre_int9	c2_14hs_pst_int6up	c2_ll_pre_int_825ps	c2_ll_pstup_int_825ps_rev1
IID	IMPRLVLY 230 ELCENTRO 230 1	B	IMPRLVLY-N.GILA ck 1	239.0	258.0	258.0	0.372	0.607	1.005	0.591
SDG&E	DOUBLTTP 138 FRIARS 138 1	B	TL23013 PENSQTOS - OT ck 1	150.8	150.8	150.8	1.064	0.668	1.243	0.829
		C	OLD TOWN 230 kV 2N CB	150.8	150.8	150.8	1.083	0.684	1.252	0.836
			OLD TOWN 230 kV 2T CB	150.8	150.8	150.8	1.062	0.670	1.236	0.827
	OTAYMESA 230 MLMS3TAP 230 1	C	ML-SX 230 kV MLTP-SX Pre C565	1175.0	1255.0	1255.0	1.031	N/A	0.912	N/A
			SYCAMORE 230 kV 23T CB	1175.0	1255.0	1255.0	1.034	N/A	0.914	N/A
	PENSQTOS 230 OLD TOWN 230 1		Base system (n-0)	525.0	912.0	525.0	0.800	0.502	1.024	0.770
	POWAY 69 POMERADO 69 2	B	TL06913 POWAY-POMERADO ck 1	148.0	148.0	148.0	1.032	0.912	0.838	0.726
	SAMPSON 69 DIVISION 69 1	B	TL230XY SILVERGT - SY230	172.0	172.0	172.0	1.154	0.532	1.063	0.454
	SILVERGT 69 URBAN 69 1	C	OLD TOWN 230 kV 1T CB	97.1	100.0	100.0	1.069	0.780	0.863	0.526
			SG-OT 230kV #1+#2	97.1	100.0	100.0	1.069	0.780	0.863	0.526
	SOUTHBAY 69 MONTGMRY 69 1	B	TL230XY SILVERGT - SY230	102.0	102.0	102.0	1.044	0.626	0.822	0.397
	SY230 230 OTAYMESA 230 1	C	C574 - OTAY MESA 230 KV #1+#2	1175.0	1255.0	1255.0		1.000		0.888
			C574-SX + C574-SY 230 KV	1175.0	1255.0	1255.0		1.201		1.081
			OMGP-ML-SY + OMGP-ML-SX 230 kV	1175.0	1255.0	1255.0		1.201		1.080
	SOUTHBAY 69 SWEETWTR 69 1	B	TL230XY SILVERGT - SY230	97.0	143.0	143.0	0.884	0.478	1.040	0.454
	SWEETWTR 69 MONTGYTP 69 1	B	TL230XY SILVERGT - SY230	239.0	239.0	239.0	1.091	0.572	0.911	0.386
	SWEETWTR 69 SWTWTRTP 69 1	B	TL230XY SILVERGT - SY230	215.0	215.0	215.0	1.206	0.567	1.183	0.440
	SY230 230 MLMS3TAP 230 1		Base system (n-0)	912.0	1176.0	912.0	1.095	0.757	0.926	0.658
	SYCAMORE 138 CHCARITA 138 1	B	TL23051 SYCAMORE - PEN ck 1	204.1	204.1	204.1	1.015	0.728	0.907	0.621
		C	OMGP-ML-SY & GRNTHIL-SY	204.1	204.1	204.1	1.010	0.672	0.841	0.543
			SX-PEN + PEN-EA-SA 230 kV	204.1	204.1	204.1	1.015	0.722	0.862	0.592
			SX-PEN 230 kV + AR-SX 69 kV B	204.1	204.1	204.1	1.029	0.734	0.918	0.626
			SX-PEN 230 kV + BE-AR 69 kV	204.1	204.1	204.1	1.023	0.731	0.915	0.624
	SYCAMORE 230 MLSXTAP 230 1	B	TL23042 OTAYMESA - SY230 pre C574 / C574 - SOUTHBAY 230 KV post C574	912.0	912.0	912.0	1.214	0.614	1.111	0.609
		C	MIGUEL 230 kV 7T A CB	912.0	912.0	912.0	1.214	0.614	1.111	0.609
			OMGP-ML-SY & GRNTHIL-SY	912.0	912.0	912.0	1.217	0.610	1.114	0.606
	TALEGA 138 PICO 138 1	C	TA-TB + LNL-TA TAP-SMO 138 kV	204.0	204.0	204.0	1.143	1.142	0.601	0.601
	TALEGA 230 S.ONOFRE 230 1	C	TALEGA 230 kV 1T CB	456.0	557.0	557.0	0.459	0.468	0.965	*1.010
			TALEGA 230 kV 1W CB	456.0	557.0	557.0	0.439	0.451	0.958	1.002
SCE	BARRE 230 ELLIS 230 1	C	SRPL/SWPL SPS 16of16(LL ONLY)	988.0	988.0	988.0	1.018	0.895	0.019	0.079

* A relatively stress case shows this insignificant post INT Cluster category C overload of 1%. No mitigation is planned for this overload.

Load and Resource Summary: Cluster 2 Phase I Study for Stressed Thermal Cases
Internal Cluster

CAISO Recommended Plan Of Service		**No**	**Yes**	**No**	**Yes**
Boulevard - Cluster 2		**Off**	**Off**	**Off**	**Off**
Internal - Cluster 2		**Off**	**508 MW**	**Off**	**508 MW**
Imperial Valley Area Cluster - Cluster 2		**Off**	**Off**	**Off**	**Off**
Season		**Heavy Summer**		**Light Load**	
KV	**FULL NAME**	**CONTINGENCY DESCRIPTION / CATEGORY**	**c2_14hs_pre_int9**	**c2_14hs_pst_int6up**	**c2_ll_pre_int_825ps**	**c2_ll_pstup_int_825ps_rev1**

No Voltage Violations

Appendix E

Power Flow Plots

List of Figures

Figure E1: Cluster 2 Phase I, Pre-Imperial Valley Area Cluster, Heavy Summer

Figure E2: Cluster 2 Phase I, Post-Imperial Valley Area Cluster, Heavy Summer

Figure E3: Cluster 2 Phase I, Pre-Imperial Valley Area Cluster, Light Load

Figure E4: Cluster 2 Phase I, Post-Imperial Valley Area Cluster, Light Load

Figure E5: Cluster 2 Phase I, Pre-Boulevard Cluster, Heavy Summer

Figure E6: Cluster 2 Phase I, Post-Boulevard Cluster, Heavy Summer

Figure E7: Cluster 2 Phase I, Pre-Boulevard Cluster, Light Load

Figure E8: Cluster 2 Phase I, Post-Boulevard Cluster, Light Load

Figure E9: Cluster 2 Phase I, Pre-Internal Cluster, Heavy Summer

Figure E10: Cluster 2 Phase I, Post-Internal Cluster, Heavy Summer

Figure E11: Cluster 2 Phase I, Pre-Internal Cluster, Light Load

Figure E12: Cluster 2 Phase I, Post-Internal Cluster, Light Load

Figure E1: Cluster 2 Phase I, Pre-Imperial Valley Area Cluster, Heavy Summer

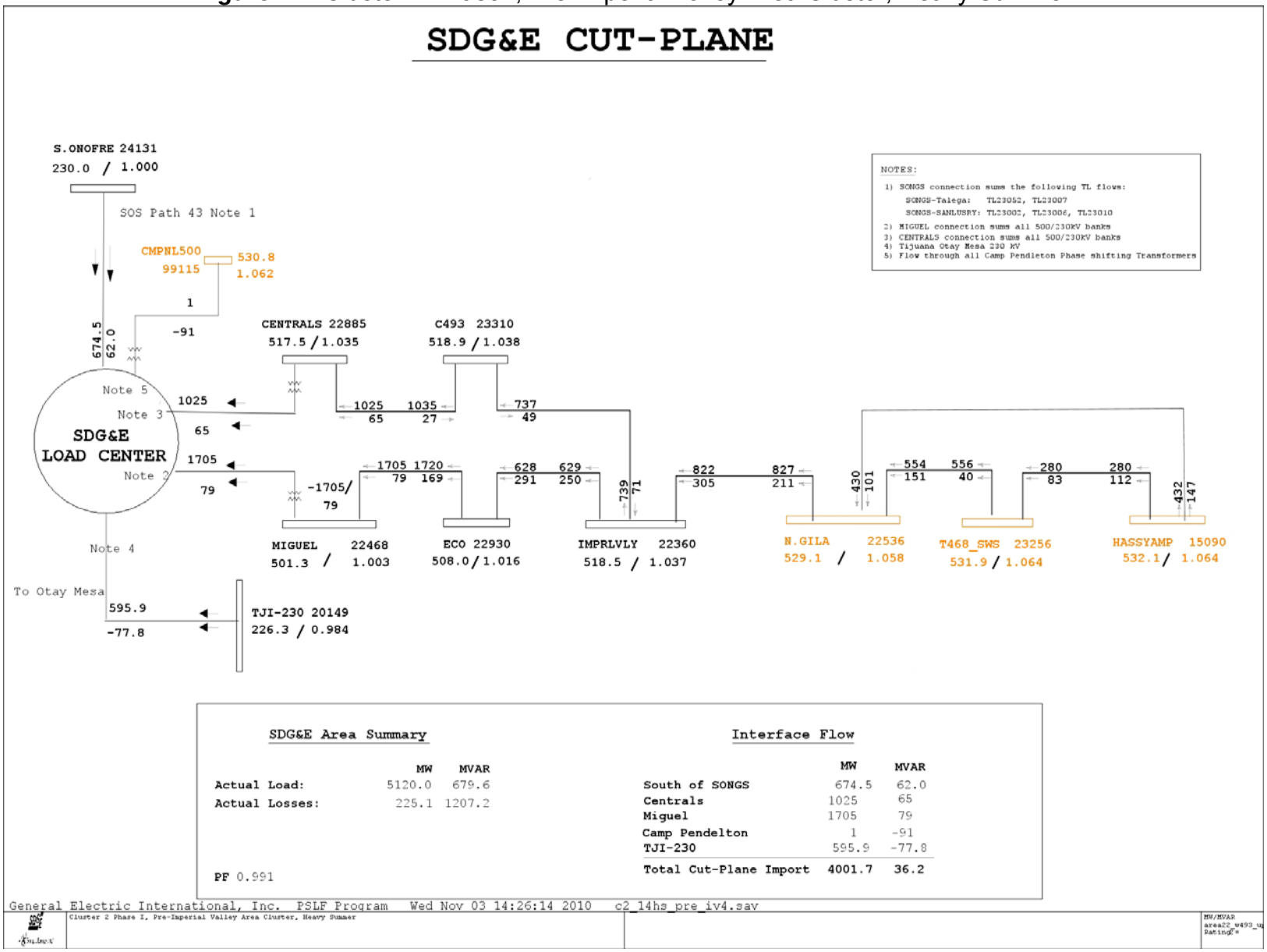


Figure E2: Cluster 2 Phase I, Post-Imperial Valley Area Cluster, Heavy Summer

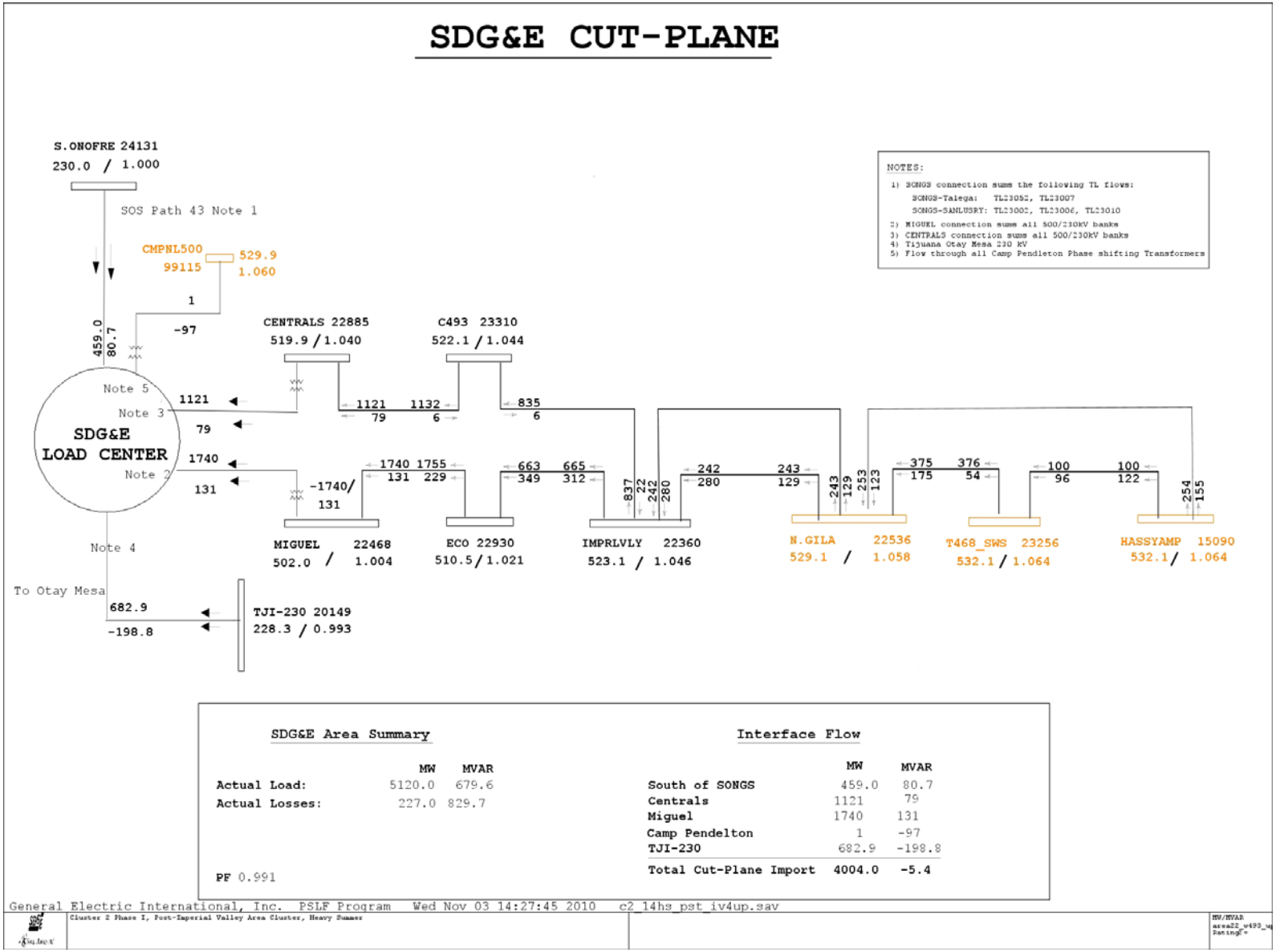


Figure E3: Cluster 2 Phase I, Pre-Imperial Valley Area Cluster, Light Load

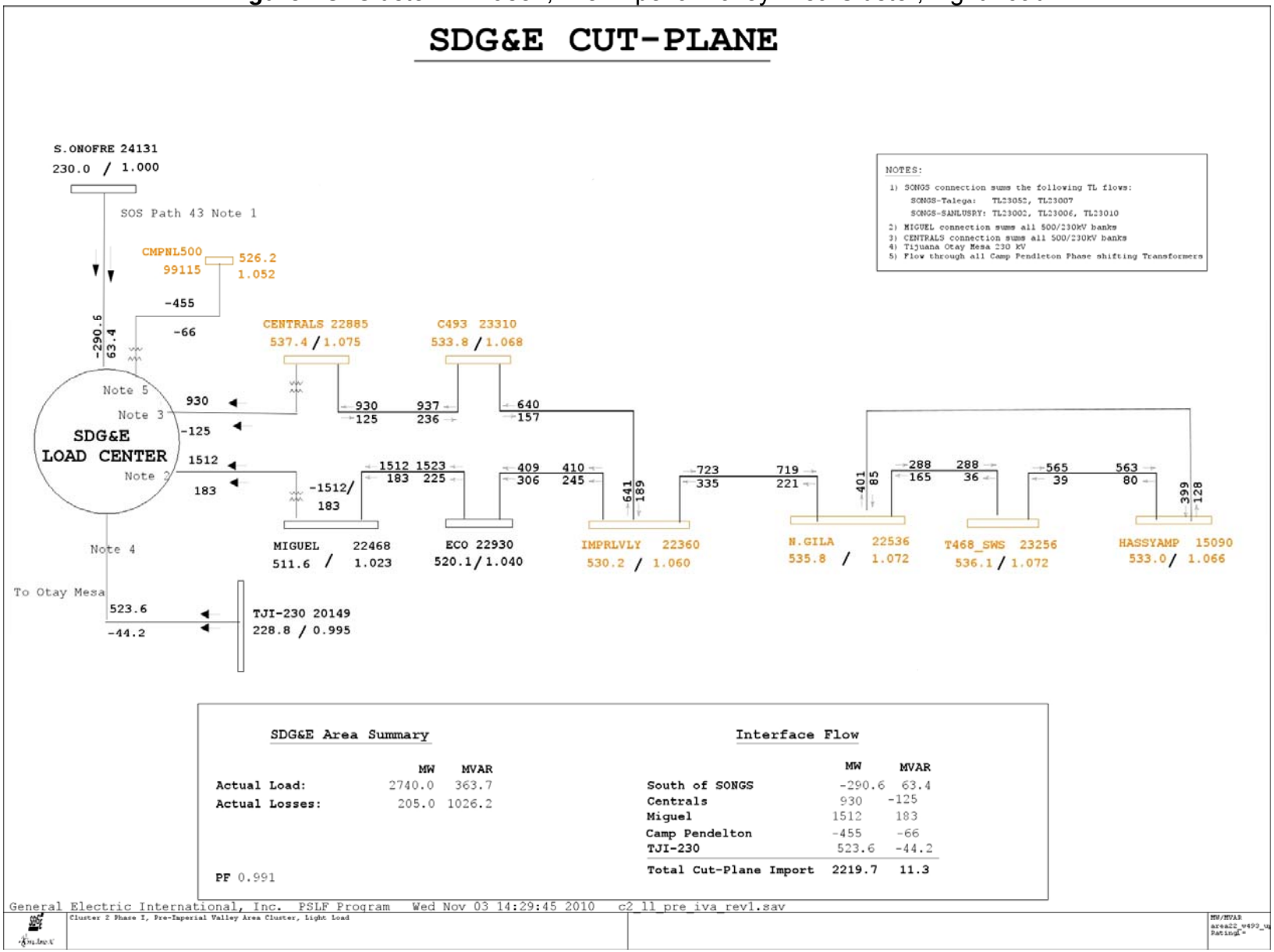


Figure E4: Cluster 2 Phase I, Post-Imperial Valley Area Cluster, Light Load

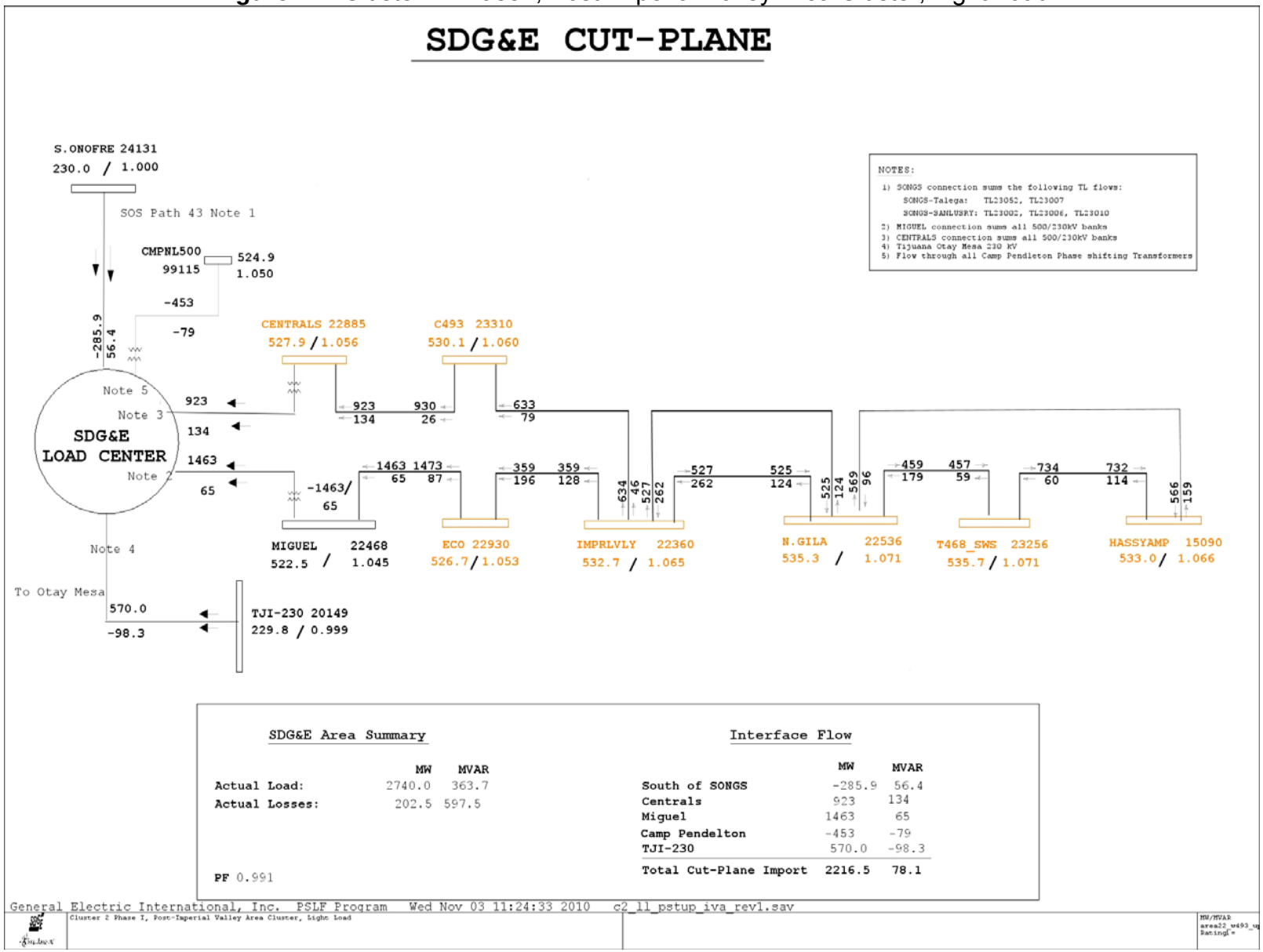


Figure E5: Cluster 2 Phase I, Pre-Boulevard Cluster, Heavy Summer

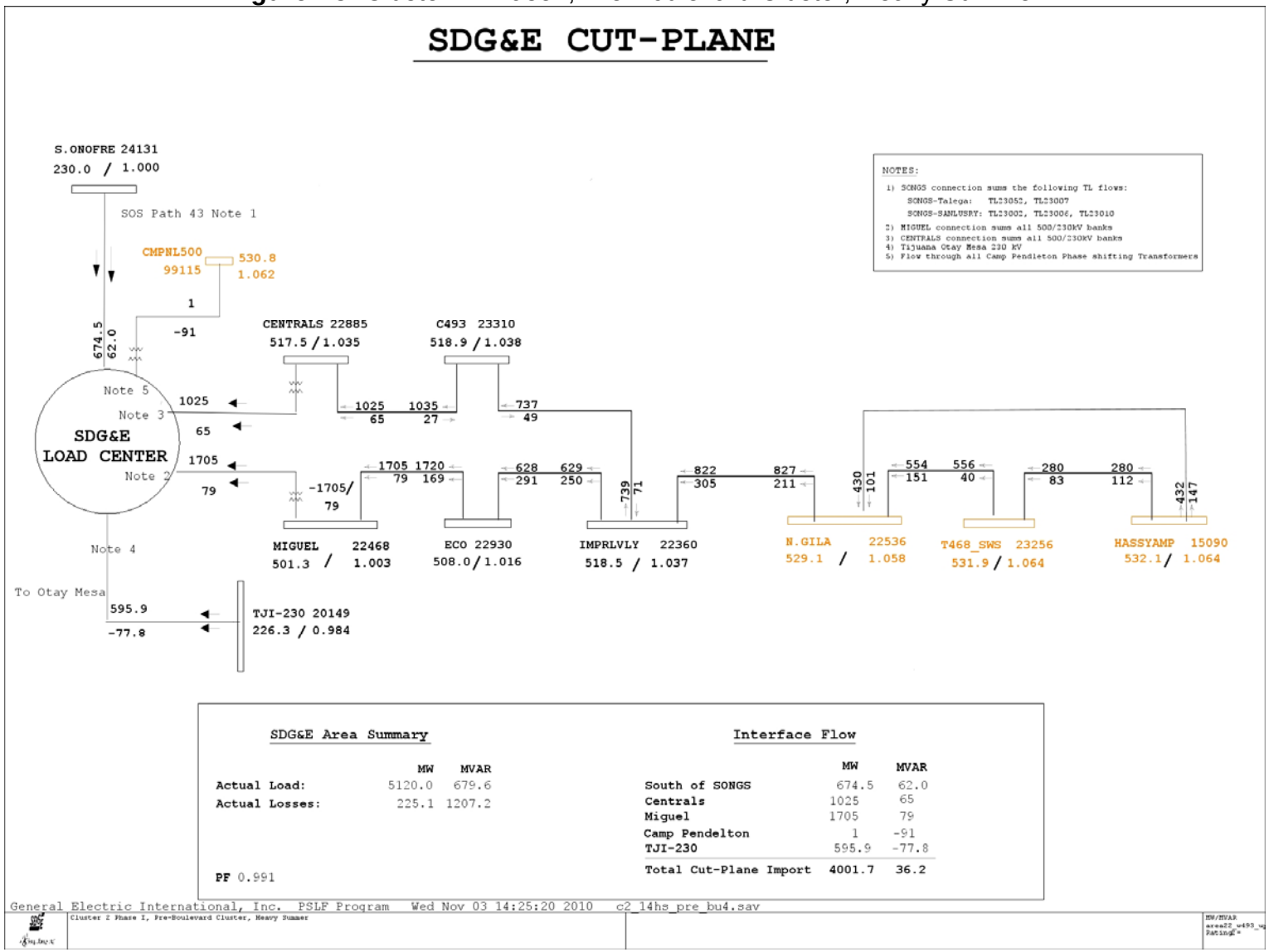


Figure E6: Cluster 2 Phase I, Post-Boulevard Cluster, Heavy Summer

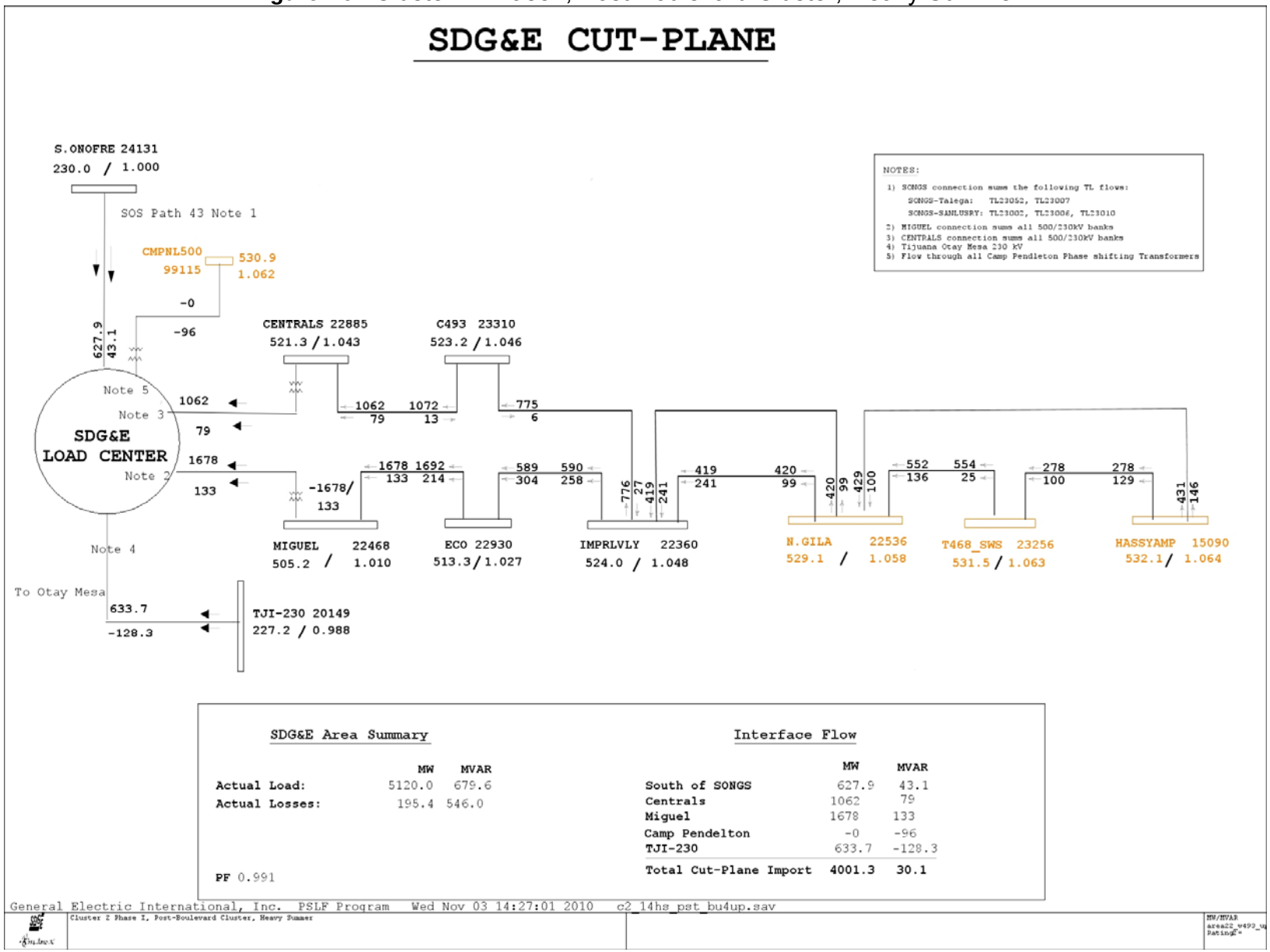


Figure E7: Cluster 2 Phase I, Pre-Boulevard Cluster, Light Load

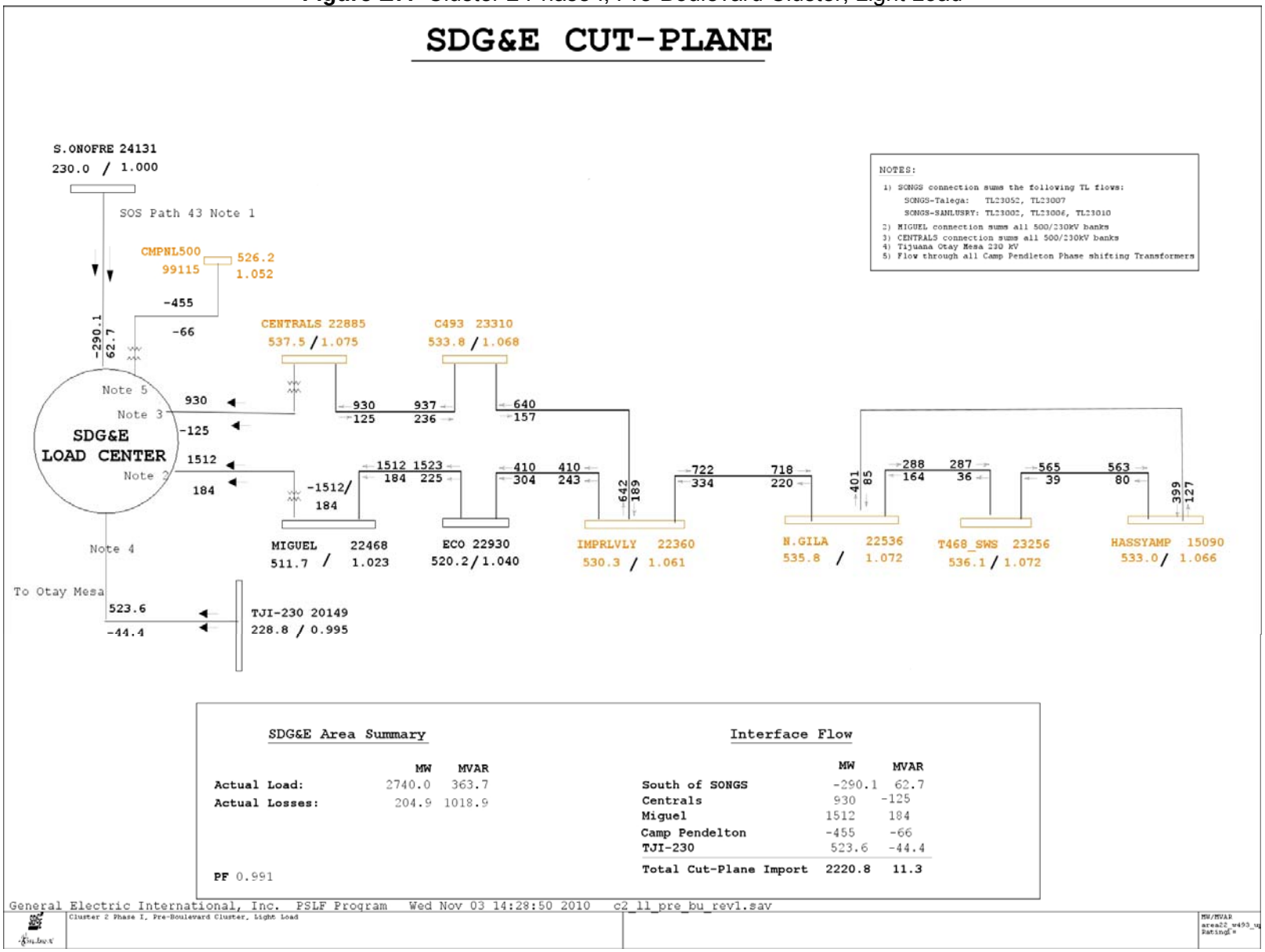


Figure E8: Cluster 2 Phase I, Post-Boulevard Cluster, Light Load

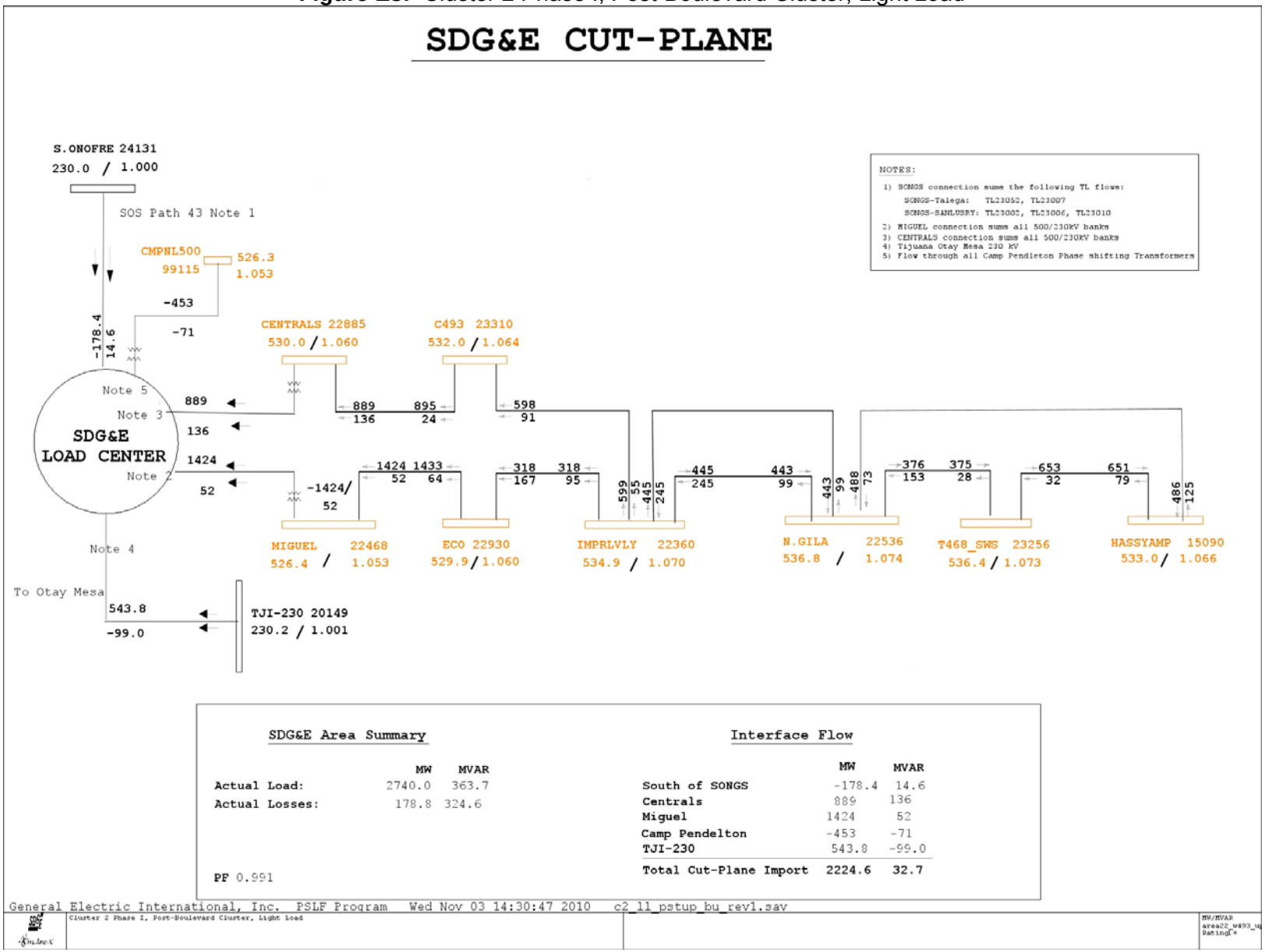


Figure E9: Cluster 2 Phase I, Pre-Internal Cluster, Heavy Summer

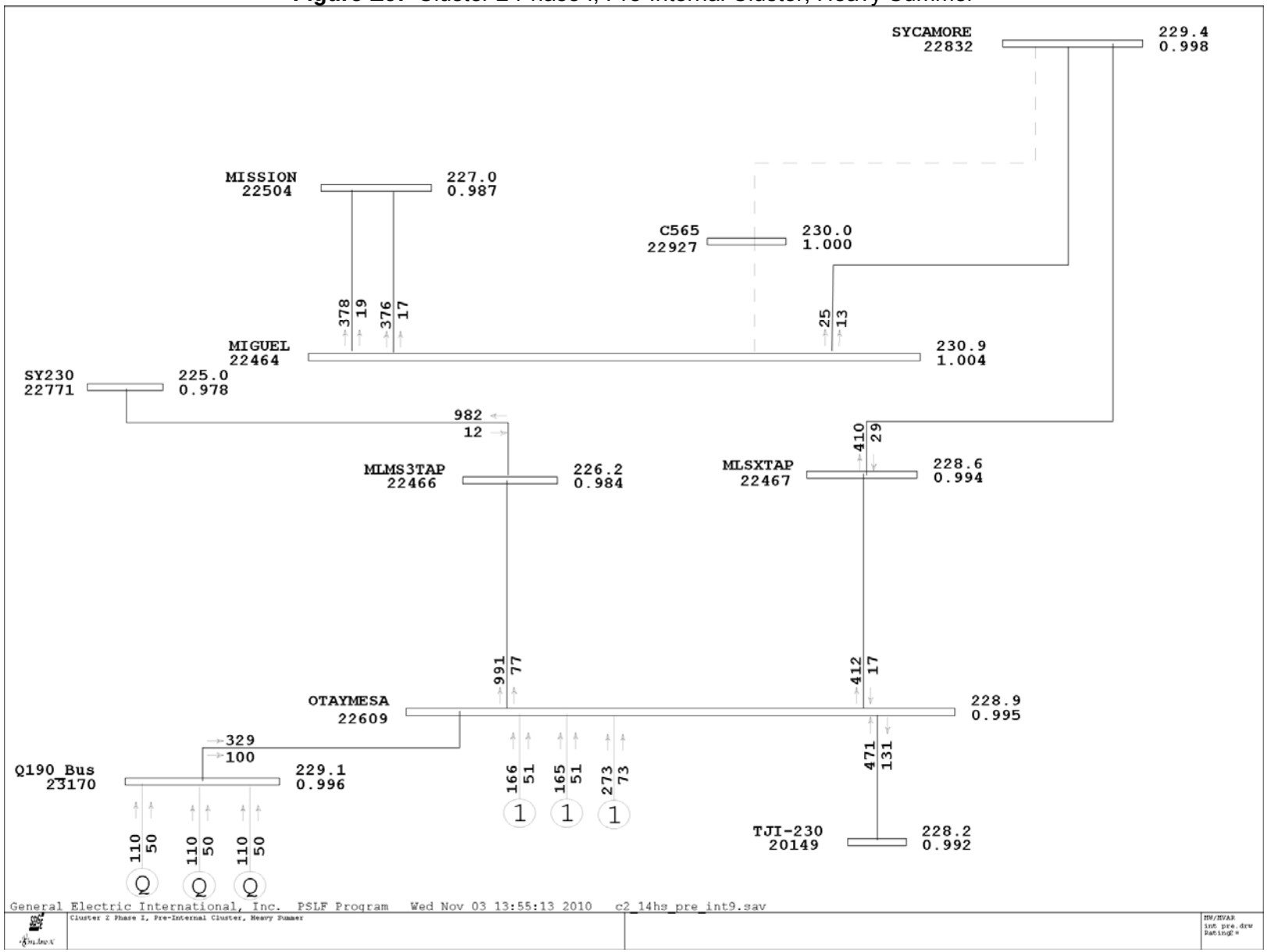


Figure E10: Cluster 2 Phase I, Post-Internal Cluster, Heavy Summer

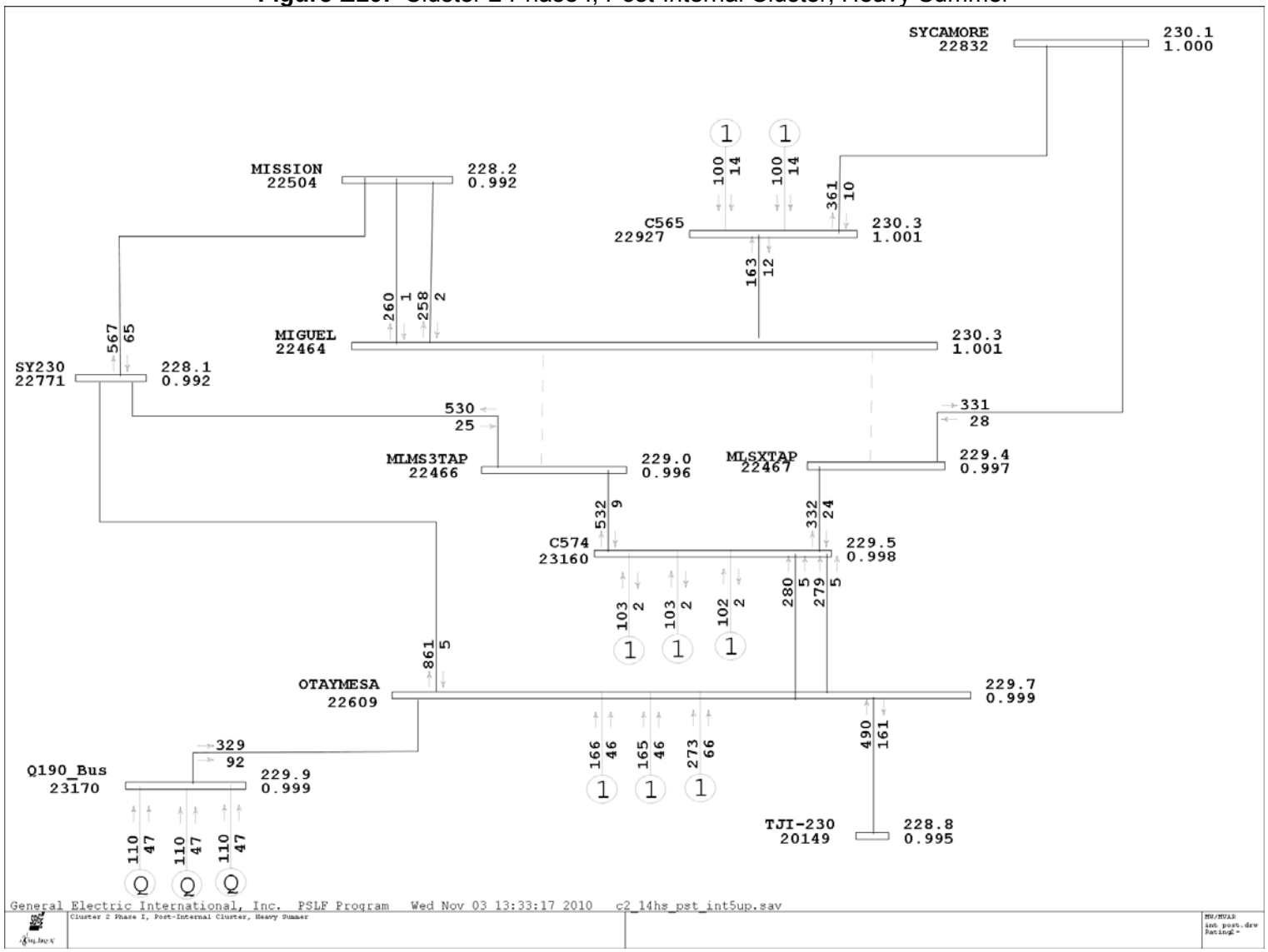


Figure E11: Cluster 2 Phase I, Pre-Internal Cluster, Light Load

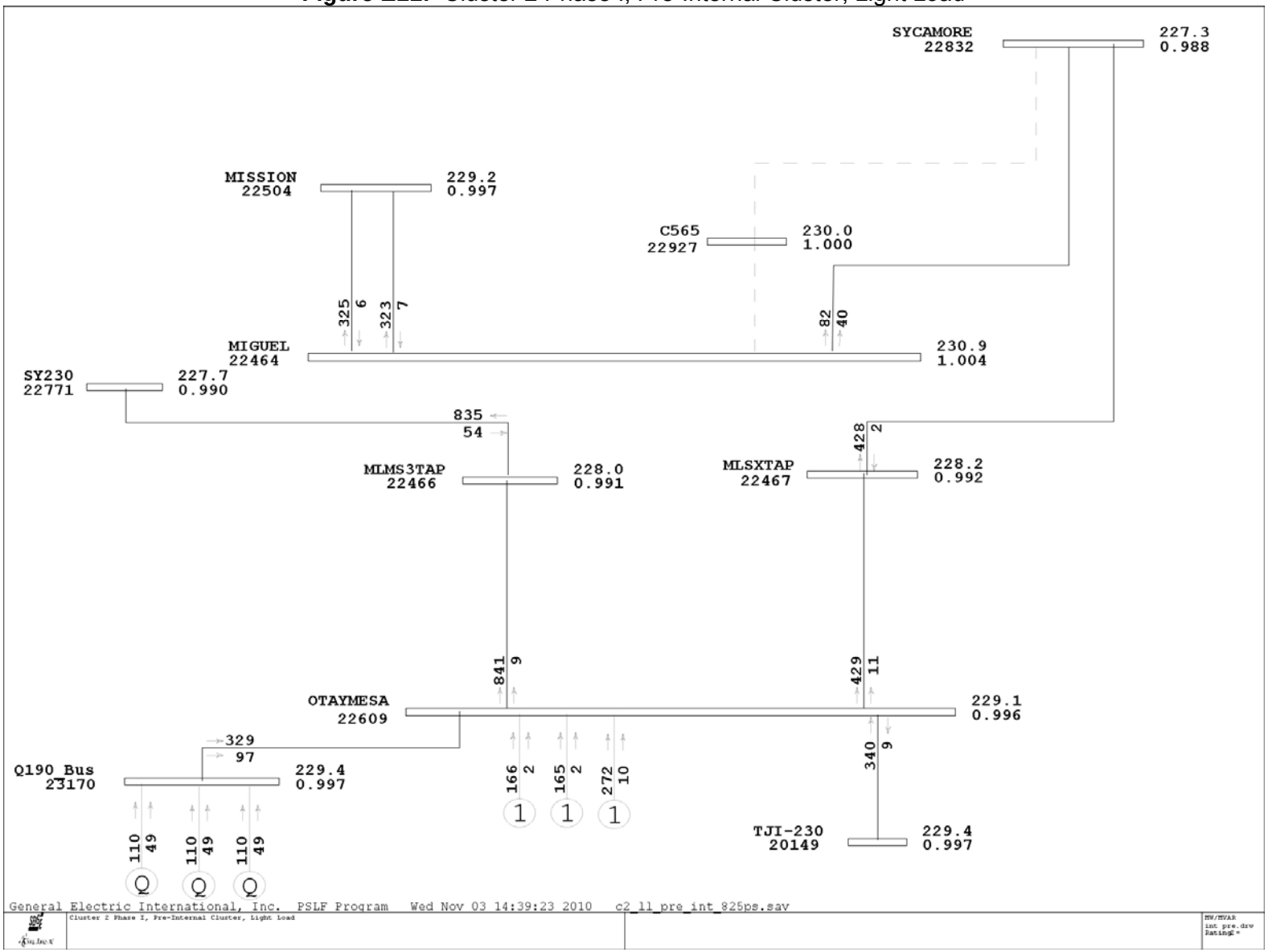
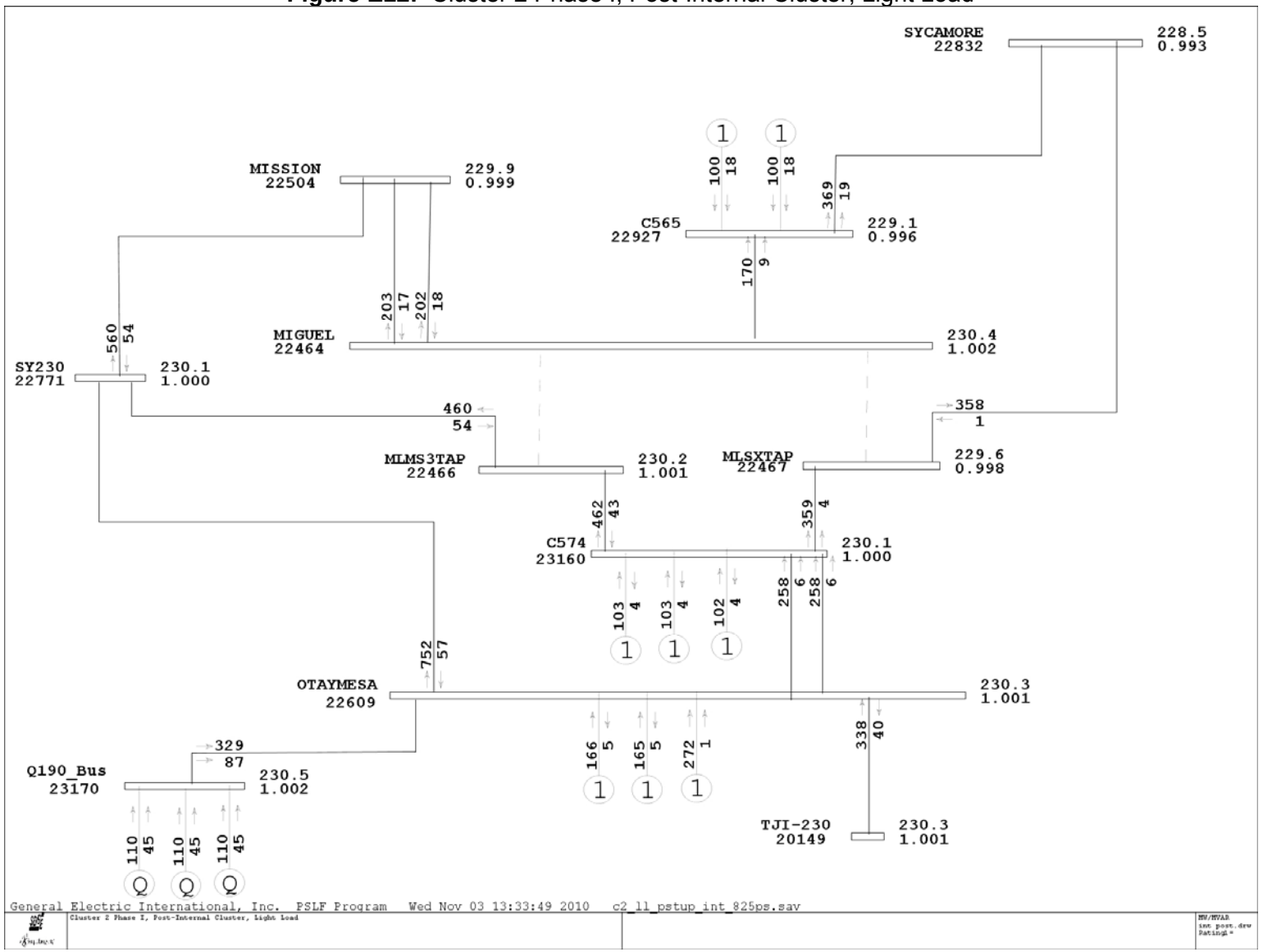


Figure E12: Cluster 2 Phase I, Post-Internal Cluster, Light Load



Appendix F

Power Flow Contingency List

```
# SDG&E CLUSTER 2 PHASE I CONTINGENCY LIST
# USE THESE SEARCH TITLES:
#
#     CLUSTER 2 GEN TIES
#     CLUSTER 1 GEN TIES
#     TRANSITION CLUSTER GEN TIES
#     SERIAL QUEUE GEN TIES
#     SGIP GEN TIES
#     SPS
#     SPECIAL CONTINGENCIES
#
# LOAD EPCLS ES-1N.P AND KUM_SPS INTO WORKING DIRECTORY BEFORE RUNNING CONTINGENCIES
#   ES-1N.P EPCL WILL TRIP 1 63 MVAR SVD AT ES 230 FOR ES-1N STUCK BRKR OUTAGE
#   KUM_SPS.P EPCL WILL CLOSE (+) SHUNTS TO SUPPORT RADIAL AREA VOLTAGE WHEN KUMEYAAY
#     GENERATION IS LOW OR OFF AND TL625 TRIPS
#
#
#
#
####### C2 DA MITIGATION CONTINGENCIES ########
SA-EA3 "SANLUSRY - ENCINA #3 C2 Mitigation" "N-1" "B"
            1 "SANLUSRY 230" "ENCINA 230" "3 " 1  0
            0
IV-NG2 "IMPRLVLY - N.GILA #2 C2 Mitigation" "N-1" "B"
            1 "N.GILA 500" "IMPRLVLY 500" "2 " 1  0
            0
ML82   "MIGUEL BANK 82" "N-1 C2 Mitigation" "B"
            2 "MIGUEL 230" "MIGUEL 500" "3 "  0
            0
PV-CLR "PALO VERDE - COLORADORIV C2 Mitigation" "N-1" "B"
            1 "PALOVRDE 500" "COLRIVER 500" "2 "  1  0
            0
SY-MS  "SOUTHBAY - MISSION 230 KV C2 Mitigation" "N-1" "B"
            1 "SY230 230" "MISSION 230" "1 "  1  0
            0
SY-OM  "SOUTHBAY - OTAY MESA 230 KV C2 Mitigation" "N-1" "B"
            1 "SY230 230" "OTAYMESA 230" "1 "  1  0
            0
SX-PQ  "SYCAMORE - PENSQTOS 230 KV C2 Mitigation" "N-1" "B"
            1 "SYCAMORE 230" "PENSQTOS 230" "1 " 1  0
            0
####### CLUSTER 2 POST-INTERNAL CASE ##########
```

```
C574-OM_1 "C574 - OTAY MESA 230 KV  C2 #1" "N-1" "B"
        1 "OTAYMESA 230" "C574 230" "1 " 1  0
        0
C574-OM_2 "C574 - OTAY MESA 230 KV  C2 #2" "N-1" "B"
        1 "OTAYMESA 230" "C574 230" "2 " 1  0
        0
C574-OM_1+2 "C574 - OTAY MESA 230 KV #1+#2 post C2 no SPS" "N-2" "C"
        1 "OTAYMESA 230" "C574 230" "1 " 1  0
        1 "OTAYMESA 230" "C574 230" "2 " 1  0
        0
C574-OM_1+2sps "C574 - OTAY MESA 230 KV #1+#2 post C2 SPS OMEC" "N-2" "C"
        1 "OTAYMESA 230" "C574 230" "1 " 1  0
        1 "OTAYMESA 230" "C574 230" "2 " 1  0
        3 "OTAYMGT1 18.0"  "1 "   0
        3 "OTAYMGT2 18.0"  "1 "   0
        3 "OTAYMST1 16.0"  "1 "   0
        0
C574-SY "C574 - SOUTHBAY 230 KV" "N-1" "B"
        1 "C574 230" "MLMS3TAP 230" "2 " 1  0
        1 "SY230 230" "MLMS3TAP 230" "1 " 1  0
        1 "MIGUEL 230" "MLMS3TAP 230" "1 " 1  0
        0
C574-SX "C574 - SYCAMORE 230 KV" "N-1" "B"
        1 "C574 230" "MLSXTAP 230" "1 " 1  0
        1 "SYCAMORE 230" "MLSXTAP 230" "1 " 1  0
        1 "MIGUEL 230" "MLSXTAP 230" "1 " 1  0
        0
#C574-SX/SY "C574-SX + C574-SY 230 KV no sps" "N-2" "C"
#       1 "C574 230" "MLMS3TAP 230" "2 " 1  0
#       1 "SY230 230" "MLMS3TAP 230" "1 " 1  0
#       1 "MIGUEL 230" "MLMS3TAP 230" "1 " 1  0
#       1 "C574 230" "MLSXTAP 230" "1 " 1  0
#       1 "SYCAMORE 230" "MLSXTAP 230" "1 " 1  0
#       1 "MIGUEL 230" "MLSXTAP 230" "1 " 1  0
#       0
MLTapssps "ML Taps (OMEC/C574-SY + OMEC/C574-SX) SPS OMEC"  "N-2" "C"
         8 "MLMS3TAP 230"
         8 "MLSXTAP  230"
         3 "OTAYMGT1 18.0"  "1 "   0
         3 "OTAYMGT2 18.0"  "1 "   0
         3 "OTAYMST1 16.0"  "1 "   0
         0
```

```
MLTaps "ML Taps (OMEC/C574-SY + OMEC/C574-SX) no SPS"  "N-2" "C"
             8 "MLMS3TAP 230"
             8 "MLSXTAP  230"
 0
C565-ML "C565 - MIGUEL 230 KV" "N-1" "B"
             1 "C565 230" "MIGUEL 230" "1 " 1  0
             0
C565-SX "C565 - SYCAMORE 230 KV" "N-1" "B"
             1 "SYCAMORE 230" "C565 230" "1 " 1  0
             0
#C574-ML1 "C574 - MIGUEL 230 KV #1" "N-1" "B"
#            1 "C574 230" "MIGUEL 230" "1 " 1  0
#            0
#C574-ML2 "C574 - MIGUEL 230 KV #2" "N-1" "B"
#            1 "C574 230" "MIGUEL 230" "2 " 1  0
#            0
#C574-ML  "C574 - MIGUEL 230 KV #1+#2" "N-1" "B"
#            1 "C574 230" "MIGUEL 230" "1 " 1  0
#            1 "C574 230" "MIGUEL 230" "2 " 1  0
#            0
OM-SY230 "OTAY MESA - SY230 230 KV C2 Mitigation" "N-1" "B"
             1 "SY230 230" "OTAYMESA 230" "1 " 1  0
             0
###### SPECIAL CONTINGENCIES #######
#TL625_SP "KUMEYAAY SPS (+) SHUNTS TL625"  "N-1" "B"
#            1 "BARRETT   69"  "BARRETTP  69"  "1 "   1  0
#            1 "DESCANSO  69"  "BARRETTP  69"  "1 "   1  0
#            1 "LOVELAND  69"  "BARRETTP  69"  "1 "   1  0
#      20 "KUM_SPS.P"
#            0
ES-1N  "ESCNDIDO 230 kV 1N CB" "CB" "C"
             2 "ESCNDIDO  69"  "ESCNDIDO 230"  "1 "  0
             1 "ESCNDIDO 230"  "TALEGA   230"  "1 "  1 0
            20 "ES-1N.p"
             0
ES-1S  "ESCNDIDO 230 kV 1S CB" "CB" "C"
             2 "ESCNDIDO  69"  "ESCNDIDO 230"  "2 "  0
             1 "PEN      230"  "ESCNDIDO 230"  "1 "  1 0
            20 "ES-1N.p"
             0
ES-1T  "ESCNDIDO 230 kV 1T CB" "CB" "C"
             1 "ESCNDIDO 230"  "TALEGA   230"  "1 "  1 0
```

```
            1 "PEN      230"  "ESCNDIDO 230"  "2 "  1 0
           20 "ES-1N.p"
            0
ES-2N  "ESCNDIDO 230 kV 2N CB" "CB" "C"
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "1 "  0
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "3 "  0
            0
ES-2S  "ESCNDIDO 230 kV 2S CB" "CB" "C"
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "2 "  0
            1 "PEN      230"  "ESCNDIDO 230"  "2 "  1 0
           20 "ES-1N.p"
            0
############ CLUSTER 2 GEN TIES ############
C574 "C574 Gen Tie + Gen Trip" "N-1" "B"
  1 "C574IC 230" "C574 230" "1 "  1  0
  3 "C574CT1 13.8" "1 " 0
  3 "C574CT2 13.8" "1 " 0
  3 "C574CT3 13.8" "1 " 0
  0
C555 "C555 Gen Tie + Gen Trip" "N-1" "B"
  1 "C555_HB 138" "BOULEVRD 138" "1 " 1  0
  3 "C555_G1 0.69" "C2" 0
  3 "C555_G2 0.69" "C2" 0
  3 "C555_G3 0.69" "C2" 0
  3 "C555_G4 0.69" "C2" 0
  0
C561 "C561 Gen Tie + Gen Trip" "N-1" "B"
  1 "C561 230" "IMPRLVLY 230" "1 " 1  0
  3 "C561GENA 0.315" "C " 0
  3 "C561GENB 0.315" "C " 0
  0
C574 "C574 Gen Tie + Gen Trip" "N-1" "B"
  1 "C574IC 230" "C574 230" "1 " 1  0
  3 "C574CT1 13.8" "1 " 0
  3 "C574CT2 13.8" "1 " 0
  3 "C574CT3 13.8" "1 " 0
  0
C583 "C583 Gen Tie + Gen Trip" "N-1" "B"
  1 "C583_HB 138" "BOULEVRD 138" "1 " 1  0
  3 "C583_G1 0.69" "C2" 0
  3 "C583_G2 0.69" "C2" 0
  3 "C583_G3 0.69" "C2" 0
```

```
  0
C590 "C590 Gen Tie + Gen Trip" "N-1" "B"
  1 "C590 230.0" "IMPRLVLY 230.0" "1 " 1  0
  3 "C590_G1 0.26" "1 " 0
  0
C608 "C608 Gen Tie + Gen Trip" "N-1" "B"
  1 "C608 230.0" "IMPRLVLY 230" "1 " 1  0
  3 "C608_G1 0.2" "1 " 0
  3 "C608_G2 0.2" "1 " 0
  0
##########################################################
############ CLUSTER 1 GEN TIES ############
C493_1 "C493_1 - C493 1  500kV + Gen Trip"
            1  "C493_1   500"  "C493     500"  "1 "   1  0
            3 "C493_G1 0.69" "C1" 0
            0
C493_4 "C493_4 - C493 1  500kV + Gen Trip"
            1  "C493_4   500"  "C493     500"  "1 "   1  0
            3 "C493_G2 0.69" "C1" 0
            0
C493_SPS "C493 One Gen Tie + Cap By-Pass"
            20 "C493SPS.p"
            0
C496 "C496 - T468_SWS 1  500kV"
            1  "C496     500"  "T468_SWS 500"  "1 "   1  0
            3 "C496_G1 18" "C1" 0
            3 "C496_G2 18" "C1" 0
            3 "C496_G3 18" "C1" 0
            3 "C496_G4 18" "C1" 0
            0
C501 "C501 Gen Tie + Gen Trip" "N-1" "B "
            1 "C501 500" "T468_SWS 500" "1 " 1  0
            3 "C501_G1 0.4" "C1" 0
            3 "C501_CSP 18" "C1" 0
            0
C509 "C509 Gen Tie + Gen Trip"  "N-1" "B "
            1  "C509      69"  "EL CAJON  69"  "1 "   1  0
            3 "C509 13.8" "C1" 0
            0
C510 "C510 Gen Tie + Gen Trip" "N-1" "B "
            1  "IMPRLVLY 230"  "C510     230"  "1 "   1  0
            3 "C510_G1 0.2" "C1" 0
```

```
        3 "C510_G2 0.2" "C1" 0
        0
##################################################
############ TRANSITION CLUSTER GEN TIES ############
T337 "T337 Gen Tie + Gen Trip"  "N-1" "B "
        1  "BORREGO   69"  "T337_HV   69"  "1 "   1  0
        3 "T337_G 0.21" "T " 0
        0
T429 "T429 Gen Tie + Gen Trip" "N-1" "B "
        1  "IMPRLVLY 230"  "T429_HB  230"  "1 "   1  0
        3 "T429_G1 13.8" "T " 0
        0
T442 "T442 Gen Tie + Gen Trip" "N-1" "B "
        1  "IMPRLVLY 230"  "T442_HB  230"  "1 "   1  0
        3 "T442_G1 34.5" "T " 0
        0
T468 "T468 Gen Tie + Gen Trip" "N-1" "B "
        1 "T468 500" "T468_SWS 500" "1 " 1  0
        3 "T468_G1 0.4" "T " 0
        3 "T468_G2 0.4" "T " 0
        0
#
# NOTE: CONTINGENCIES FOR T215/T183 ARE NOT MODELED SINCE
# THEIR POINT OF INTERCONNECTION IS VIA A Q159A RING BUS.
# THE (2) Q159A RING BUS ELEMENTS ARE MODELED IN SEPARATE
# CONTINGENCIES IN THE SERIAL QUEUE CONTINGENCIES BELOW.
#
####### CLUSTER 2 POST-INTERNAL CASE ##########
C574-OM_1 "C574 - OTAY MESA 230 KV #1" "N-1" "B"
        1 "C574 230" "OTAYMESA 230" "1 " 1  0
        0
C574-OM_2 "C574 - OTAY MESA 230 KV #2" "N-1" "B"
        1 "C574 230" "OTAYMESA 230" "2 " 1  0
        0
#on line 51 C574-OM_1+2 "C574 - OTAY MESA 230 KV #1+#2" "N-2" "C"
#       1 "C574 230" "OTAYMESA 230" "1 " 1  0
#       1 "C574 230" "OTAYMESA 230" "2 " 1  0
#       0
C574-SY "C574 - SOUTHBAY 230 KV" "N-1" "B"
        1 "C574 230" "MLMS3TAP 230" "2 " 1  0
        1 "SY230 230" "MLMS3TAP 230" "1 " 1  0
        1 "MIGUEL 230" "MLMS3TAP 230" "1 " 1  0
```

```
            0
C574-SX "C574 - SYCAMORE 230 KV" "N-1" "B"
            1 "C574 230" "MLSXTAP 230" "1 " 1  0
            1 "SYCAMORE 230" "MLSXTAP 230" "1 " 1  0
            1 "MIGUEL 230" "MLSXTAP 230" "1 " 1  0
            0
#line 65 C574-SX/SY "C574-SX + C574-SY 230 KV" "N-2" "C"
#           1 "C574 230" "MLMS3TAP 230" "2 " 1  0
#           1 "SY230 230" "MLMS3TAP 230" "1 " 1  0
#           1 "MIGUEL 230" "MLMS3TAP 230" "1 " 1  0
#           1 "C574 230" "MLSXTAP 230" "1 " 1  0
#           1 "SYCAMORE 230" "MLSXTAP 230" "1 " 1  0
#           1 "MIGUEL 230" "MLSXTAP 230" "1 " 1  0
#           0
C565-ML "C565 - MIGUEL 230 KV" "N-1" "B"
            1 "C565 230" "MIGUEL 230" "1 " 1  0
            0
C565-SX "C565 - SYCAMORE 230 KV" "N-1" "B"
            1 "SYCAMORE 230" "C565 230" "1 " 1  0
            0
C565 "C565 Gen Tie + Gen Trip" "N-1" "B"
  1 "C565_IC 230" "C565 230" "1 " 1  0
  3 "C565_G1 13.8" "1 " 0
  3 "C565_G2 13.8" "1 " 0
  0
############################################################
################ SERIAL QUEUE GEN TIES ################
Q32 "Q32 Gen Tie + Gen Trip" "N-1" "B"
            1 "Q32      138"  "BOULEVRD 138"  "1 "   1  0
            3 "Q32_G1 0.69" "G1" 0
            3 "Q32_G2 0.69" "G2" 0
            0
TA-CMP "CMPNL230 - TALEGA 1  230kV"  "N-1" "B "
            1  "CMPNL230 230"  "TALEGA   230"  "1 "   1  0
            0
ES-CMP "LEAPS-MP - CMPNL500 1  500kV "  "N-1" "B "
            1  "Q72_500 500"  "CMPNL500 500"  "1 "   1  0
            0
Q78 "Q78 Gen Tie + Gen Trip" "N-1" "B"
            1 "IMPRLVLY 230"  "Q78      230"  "1 "   1  0
            3 "Q78_1A1Q 0.48" "Q1" 0
            3 "Q78_1A2Q 0.48" "Q2" 0
```

```
        3 "Q78_1B1Q 0.48" "Q3" 0
        0
Q103 "Q103 Gen Tie + Gen Trip"  "N-1" "B"
        2 "Q103  13.8" "BORDER 69.0" "1 "   0
        3 "Q103 13.8" "Q " 0
        3 "Q103 13.8" "1 " 0
        0
Q106 "Q106A Gen Tie + Gen Trip"
        1  "Q106A    138"  "BOULEVRD 138"  "1 "   1  0
        3 "Q106A_G1 0.69" "Q " 0
        3 "Q106A_G2 0.69" "Q " 0
        3 "Q106A_G3 0.69" "Q " 0
        3 "Q106A_G4 0.69" "Q " 0
        3 "Q106A_G5 0.69" "Q " 0
        3 "Q106A_G6 0.69" "Q " 0
        0
Q124 "Q124 Gen Tie + Gen Trip"  "N-1" "B "
        1  "IMPRLVLY 230"  "Q124     230"  "1 "   1  0
        3 "Q1242A1Q 0.48" "Q1" 0
        3 "Q1242A2Q 0.48" "Q2" 0
        3 "Q1242B1Q 0.48" "Q3" 0
        3 "Q1243A1Q 0.48" "Q4" 0
        3 "Q1243A2Q 0.48" "Q5" 0
        3 "Q1243B1Q 0.48" "Q6" 0
        8 "Q124   230.00"
        0
Q137_CT "Q137CT Gen Tie + Gen Trip"  "N-1" "B "
        2  "Q137CT    16.5" "ENCINA   230"  "1 "   0
        3 "Q137CT 16.5" "Q " 0
        0
Q137_ST "Q137ST Gen Tie + Gen Trip"  "N-1" "B "
        2  "Q137ST    13.8" "ENCINA   230"  "1 "   0
        3 "Q137ST 13.8" "Q " 0
        0
Q150 "Q150CT Gen Tie + Gen Trip"  "N-1" "B "
        2  "LRKSP_BD  69" "Q150CT    13.8"  "1 "   0
        3 "Q150CT 13.8" "Q " 0
        0
Q159A "Q159ARng - ECO  230kV"
        1 "Q159ARng 230" "ECO 230" "1 "  1   0
        0
Q189_1 "Q189U1 Gen Tie + Gen Trip"  "N-1" "B "
```

```
            2  "Q189U1    13.8" "ENCINA   138"  "1 "   0
            3 "Q189U1 13.8" "Q " 0
            0
Q189_2 "Q189U2 Gen Tie + Gen Trip"  "N-1" "B "
            2  "Q189U2    16.5" "ENCINA   138"  "1 "   0
            3 "Q189U2 16.5" "Q " 0
            0
Q190 "Q190 Gen Tie + Gen Trip"
            1  "Q190_Bus 230"  "OTAYMESA 230"  "1 "   1  0
            3 "Q190_U1 13.8" "Q " 0
            3 "Q190_U2 13.8" "Q " 0
            3 "Q190_U3 13.8" "Q " 0
            0
Q201 "Q201 Gen Tie + Gen Trip"  "N-1" "B "
            1 "Q201    69"  "PALA      69"  "1 "  1 0
            3 "Q201_U1 13.8" "Q1" 0
            3 "Q201_U2 13.8" "Q2" 0
            0
#####################################################
############ SGIP Gen Ties ##########################
S480 "S480 Gen Tie + Gen Trip"  "N-1" "B "
            1  "S480 69"  "BORREGO   69"  "1 "   1  0
            3 "S480G1 0.48" "1 " 0
            3 "S480G2 0.48" "1 " 0
            0
W2 "BORREGO - W2 1  12.5kV"  "N-1" "B "
            1  "BORREGO   12.5"  "W2_1   12.5"  "1 "   1  0
            0
W3 "BORREGO 12.5"  "N-1" "B "
            3  "BORREGO   12.5"  "W "   0
            0
# Transmission Single Contingencies
############################################################
# SDG&E 500 kV Transmission Line Outages (Category B: N-1)
############################################################
IV-NG  "IMPRLVLY-N.GILA ck 1       "  "N-1" "B"
             1 "N.GILA   500"  "IMPRLVLY 500"  "1 "   1  0
             0
HAA-NG  "HASSYAMP-N.GILA ck 1       "  "N-1" "B"
             1 "HASSYAMP 500"  "N.GILA   500"  "1 "  1 0
             0
HAA-T468 "HASSAYAMPA-T468 ck 1 "  "N-1" "B"
```

```
            1 "HASSYAMP 500" "T468_SWS 500" "1 "  1  0
            0
NG-T468  "N.GILA - T468 ck 1 " "N-1" "B"
            1 "T468_SWS 500" "N.GILA 500" "1 " 1  0
            0
IV-C493  "IMPRLVLY - C593 ck 1 "  "N-1" "B"
            1 "IMPRLVLY 500" "C493 500" "1 " 1  0
            0
C493-CEN "C493 - CENTRALS ck 1" "N-1" "B"
            1 "C493 500" "CENTRALS 500" "1 " 1  0
            0
############################################################
# IMPERIAL VALLEY SPS - CLUSTER 2 HEAVY SUMMER
############################################################
############################################################
#
#           STEP-BY-STEP SPECIAL PROTECTION SYSTEMS
#
############################################################
############################################################
# SPS 6.1 500kV IV-ML and IV Generator SPS (protects CFE TJI-ROA 230kV)
#
# Note:  Below contingency may or may not solve if running a post contingency
# epcl which redispatches generation
IV-ECO_SPS0 "IV-ECO NO SPS" "N-1" "B"
            1 "IMPRLVLY 500" "ECO 500" "1 " 1  0
            0
ECO-ML_SPS13LL "ECO-ML SPS 13of13(LL ONLY)" "N-1" "B"
            1 "MIGUEL 500" "ECO 500" "1 " 1  0
            3 "C510_G1 0.2" "C1" 0
            3 "C510_G2 0.2" "C1" 0
            3 "Q78_1A1Q 0.48" "Q1" 0
            3 "Q78_1A2Q 0.48" "Q2" 0
            3 "Q78_1B1Q 0.48" "Q3" 0
            3 "T429_G1 13.8" "T " 0
            3 "T442_G1 34.5" "T " 0
            3 "Q1242A1Q 0.48" "Q1" 0
            3 "Q1242A2Q 0.48" "Q2" 0
            3 "Q1242B1Q 0.48" "Q3" 0
            3 "Q1243A1Q 0.48" "Q4" 0
            3 "Q1243A2Q 0.48" "Q5" 0
            3 "Q1243B1Q 0.48" "Q6" 1
```

```
            8 "Q124      230"
            3 "C510_G1 0.2" "C1" 0
            3 "C510_G2 0.2" "C1" 0 PGEN 75
            0
SRPL/SWPL_SPS0LL "SRPL/SWPL NO SPS" "N-2" "C"
            1 "IMPRLVLY 500" "ECO 500" "1 " 1  0
            1 "IMPRLVLY 500" "C493 500" "1 " 1  0
            0
SRPL/SWPL_SPS16LL "SRPL/SWPL SPS 16of16(LL ONLY)" "N-2" "C"
            1 "IMPRLVLY 500" "ECO 500" "1 " 1  0
            1 "IMPRLVLY 500" "C493 500" "1 " 1  0
            3 "C510_G1 0.2" "C1" 0
            3 "C510_G2 0.2" "C1" 0
            3 "Q78_1A1Q 0.48" "Q1" 0
            3 "Q78_1A2Q 0.48" "Q2" 0
            3 "Q78_1B1Q 0.48" "Q3" 0
            8 "Q78   230.00"
            3 "T429_G1 13.8" "T " 0
            3 "T442_G1 34.5" "T " 0
            3 "Q1242A1Q 0.48" "Q1" 0
            3 "Q1242A2Q 0.48" "Q2" 0
            3 "Q1242B1Q 0.48" "Q3" 0
            3 "Q1243A1Q 0.48" "Q4" 0
            3 "Q1243A2Q 0.48" "Q5" 0
            3 "Q1243B1Q 0.48" "Q6" 0
            8 "Q124   230.00"
            3 "T183_G1 0.69" "T " 0
            3 "T183_G2 0.69" "T " 0
            3 "T215_G1 0.69" "T " PGEN 135
            0
############################################################
# Sunrise Powerlink
############################################################
IV-C493 "TLSUNRI IMPRLVLY-C493 "  "N-1" "B"
             1 "IMPRLVLY 500"  "C493     500"  "1"   1  0
             0
C493-SC "C493-CENTRALS "  "N-1" "B"
             1 "C493     500"  "CENTRALS 500"  "1"   1  0
             0
SC80    "CENTRALS BK80 230/500"  "N-1" "B"
             2 "CENTRALS 230"  "CENTRMPS 500"  "1"  0
             2 "CENTRALS  12"  "CENTRMPS 500"  "1"  0
```

```
            2 "CENTRALS 500"  "CENTRMPS 500"  "1"  0
            0
SC81    "CENTRALS BK81 230/500"  "N-1" "B"
            2 "CENTRALS 230"  "CENTRMPS 500"  "2"  0
            2 "CENTRALS  12"  "CENTRMPS 500"  "2"  0
            2 "CENTRALS 500"  "CENTRMPS 500"  "2"  0
            0
TL230SR1 "TL230SR1 CENTRALS-SYCAMORE 230"  "N-1" "B"
            1 "CENTRALS 230"  "SYCAMORE 230"  "1"   1  0
            0
TL230SR2 "TL230SR2 CENTRALS-SYCAMORE 230"  "N-1" "B"
            1 "CENTRALS 230"  "SYCAMORE 230"  "2"   1  0
            0
SA72     "SA BK72 69/230 "  "T-1" "B"
            2 "SANLUSRY  69"  "SANLUSRY 230"  "3"  0
            0
##########################################################################
#    The following is the T-1 outage associated with the new ECO        #
#      substation being built on P07139 ISD September 2011.             #
##########################################################################
ECO80   "ECO BK 80 or 81 230/500 with gen trip"  "T-1" "B"
            2 "ECO 230"  "ECO_MP 500"  "1 "   1  0
            3 "Q32_G1 0.69" "G1" 0
            3 "Q32_G2 0.69" "G2" 0
            3 "Q106A_G1 0.69" "Q" 0
            3 "Q106A_G2 0.69" "Q" 0
            3 "Q106A_G3 0.69" "Q" 0
            3 "Q106A_G4 0.69" "Q" 0
            3 "Q106A_G5 0.69" "Q" 0
            3 "Q106A_G6 0.69" "Q" 0
            3 "Q159A_G1 0.69" "Q1" 0
            3 "Q159A_G2 0.69" "Q1" 0
            3 "T183_G1 0.69" "T " 0
            3 "T183_G2 0.69" "T " 0
            3 "T215_G1 0.69" "T " 0
            3 "T215_G2 0.69" "T " 0
            8 "ECO   230.00"
            0
############################################################
# SDG&E 230 kV Transmission Line Outages (Category B: N-1)
############################################################
TL23001  "TL23001 SANLUSRY - MISSION ck 1"  "N-1" "B"
```

```
            1 "SANLUSRY 230"  "MISSION  230"  "1 "   1  0
            0
TL23002  "TL23002 SANLUSRY-S.ONOFRE  ck 2"  "N-1" "B"
            1 "SANLUSRY 230"  "S.ONOFRE 230"  "2 "   1  0
            0
TL23003  "TL23003 SANLUSRY - ENCINA  ck 1"  "N-1" "B"
            1 "SANLUSRY 230"  "ENCINA   230"  "1 "   1  0
            0
TL23004  "TL23004 SANLUSRY - MISSION ck 2"  "N-1" "B"
            1 "SANLUSRY 230"  "MISSION  230"  "2 "   1  0
            0
TL23006  "TL23006 SANLUSRY - SONGS   ck 1"  "N-1" "B"
            1 "SANLUSRY 230"  "S.ONOFRE 230"  "1 "   1  0
            0
TL23007  "TL23007 TALEGA - SONGS     ck 2"  "N-1" "B"
            1 "TALEGA   230"  "S.ONOFRE 230"  "1 "   1  0
            0
TL23010  "TL23010 SANLUSRY - SONGS   ck 3"  "N-1" "B"
            1 "SANLUSRY 230"  "S.ONOFRE 230"  "3 "   1  0
            0
TL23011  "TL23011 ENCINA-PEN-SANLUSRY    " "N-1" "B"
            1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
            1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
            1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
            0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL23011A "TL23011 ENCINA-PEN-SANLUSRY TAP A" "N-1" "B"
#           1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
            1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
            1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
            0
TL23011B "TL23011 ENCINA-PEN-SANLUSRY TAP B" "N-1" "B"
            1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
#           1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
            1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
            0
TL23011C "TL23011 ENCINA-PEN-SANLUSRY TAP C" "N-1" "B"
            1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
            1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
#           1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
```

```
            0
TL23012  "TL23012 PENSQTOS - ENCINA  ck 1"  "N-1" "B"
            1 "PENSQTOS 230"  "ENCINA   230"  "1 "   1  0
            0
TL23013  "TL23013 PENSQTOS - OT      ck 1"  "N-1" "B"
            1 "PENSQTOS 230"  "OLD TOWN 230"  "1 "   1  0
            0
TL23014  "TL23014 PEN-ESCNDIDO ck 1"  "N-1" "B"
            1 "PEN      230"  "ESCNDIDO 230"  "1 "   1  0
            0
TL23015  "TL23015 PEN-ESCNDIDO ck 2"  "N-1" "B"
            1 "PEN      230"  "ESCNDIDO 230"  "2 "   1  0
            0
TL23021  "TL23021 MIGUEL - SYCAMORE  ck 1"  "N-1" "B"
            1 "MIGUEL   230"  "SYCAMORE 230"  "1 "   1  0
            0
TL23022  "TL23022 MIGUEL - MISSION   ck 1"  "N-1" "B"
            1 "MIGUEL   230"  "MISSION  230"  "1 "   1  0
            0
TL23023  "TL23023 MIGUEL - MISSION   ck 2"  "N-1" "B"
            1 "MIGUEL   230"  "MISSION  230"  "2"    1  0
            0
TL23027  "TL23027 OLD TOWN - MISSION ck 1"  "N-1" "B"
            1 "OLD TOWN 230"  "MISSION  230"  "1 "   1  0
            0
TL23028 "TL23028 SILVERGT - OT - MISSION "  "N-1" "B"
            1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
            1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
            1 "MISSION  230"  "OLDTWNTP 230"  "1 "   1  0
            0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL23028A "TL23028 SILVERGT-OT-MISSION TAP A"  "N-1" "B"
#           1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
            1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
            1 "MISSION  230"  "OLDTWNTP 230"  "1 "   1  0
            0
TL23028B "TL23028 SILVERGT-OT-MISSION TAP B"  "N-1" "B"
            1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
#           1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
            1 "MISSION  230"  "OLDTWNTP 230"  "1 "   1  0
```

```
            0
TL23028C "TL23028 SILVERGT-OT-MISSION TAP C"  "N-1" "B"
            1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
            1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
#           1 "MISSION  230"  "OLDTWNTP 230"  "1 "   1  0
            0
TL23029 "TL23029 SILVERGT-OLD TOWN"  "N-1" "B"
            1 "SILVERGT 230"  "OLD TOWN 230"  "1 "   1  0
            0
#ES-TA changes to ES-CMP-TA for Q78
TL23040 "TL23040 OTAYMESA-TJI "  "N-1" "B"
            1 "OTAYMESA 230"  "TJI-230  230"  "1 "   1  0
            0
############################################################
# Assumes TAP is open at ML
############################################################
TL23041B  "TL23041 OTAYMESA - SYCAMORE pre C574"  "N-1" "B"
            1 "MLSXTAP  230"  "SYCAMORE 230"  "1 "   1  0
            1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "   1  0
#           1 "MLSXTAP  230"  "MIGUEL   230"  "1 "   1  0
            0
TL23042B "TL23042 OTAYMESA - SY230 pre C574"  "N-1" "B"
            1 "MLMS3TAP 230"  "SY230    230"  "1 "   1  0
            1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "   1  0
#           1 "MIGUEL   230"  "MLMS3TAP 230"  "1 "   1  0
            0
TL230XY "TL230XY SILVERGT - SY230        "  "N-1" "B"
            1 "SILVERGT 230"  "SY230    230"  "1 "   1  0
            0
TL23045  "TL23045 INTB - IMPRLVLY    ck 1"  "N-1" "B"
            1 "INTB     230"  "IMPRLVLY 230"  "1 "   1  0
            0
TL23046  "TL23046 INTB - IMPRLVLY    ck 2"  "N-1" "B"
            1 "INTB     230"  "IMPRLVLY 230"  "2 "   1  0
            0
TL23047  "TL23047 IV-GEN - IMPRLVLY  ck 1"  "N-1" "B"
            1 "IV-GEN   230"  "IMPRLVLY 230"  "1 "   1  0
            0
TL23048  "TL23048 IV-GEN - IMPRLVLY  ck 2"  "N-1" "B"
            1 "IV-GEN   230"  "IMPRLVLY 230"  "2 "   1  0
            0
TL23050  "TL23050 IMPRLVLY - ROA-230 ck 1"  "N-1" "B"
```

```
            1 "IMPRLVLY 230"  "ROA-230  230"  "1 "   1  0
            0
TL23051  "TL23051 SYCAMORE - PEN     ck 1"  "N-1" "B"
            1 "PEN      230"  "SYCAMORE 230"  "1 "   1  0
            0
TL23052  "TL23052 TALEGA - S.ONOFRE  ck 1"  "N-1" "B"
            1 "TALEGA   230"  "S.ONOFRE 230"  "2 "   1  0
            0
TL23053  "TL23053 PENSQTOS - ENCINA  ck 2"  "N-1" "B"
            1 "PENSQTOS 230"  "ENCINA   230"  "2 "   1  0
            0
TL23054 "TL23054 CENTRALS-SYCAMORE 230"  "N-1" "B"
            1 "CENTRALS 230"  "SYCAMORE 230"  "1 "   1  0
            0
TL23055 "TL23055 CENTRALS-SYCAMORE 230"  "N-1" "B"
            1 "CENTRALS 230"  "SYCAMORE 230"  "2 "   1  0
            0
TL_230S  "TL230S IMPRLVLY - ELCENTRO ck 1"  "N-1" "B"
            1 "IMPRLVLY 230"  "ELCENTRO 230"  "1 "   1  0
            0
############################################################
# SDG&E 138 kV Transmission Line Outages (Category B: N-1)
############################################################
TL13801  "TL13801 CANNON-ENCINA    ck 1"  "N-1" "B"
            1 "CANNON   138"  "ENCINA 138"  "1 "   1  0
            0
TL13802  "TL13802 CANNON-SANLUSRY    ck 1"  "N-1" "B"
            1 "CANNON   138"  "SANLUSRY 138"  "1 "   1  0
            0
TL13804  "TL13804 BATIQTOS-PENSQTOS-ENCINA"  "N-1" "B"
            1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
            1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
            0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL13804A  "TL13804 BQ-PQ-EN        TAP A"  "N-1" "B"
#           1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
            1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
            0
```

```
TL13804B  "TTL13804 BQ-PQ-EN        TAP A"  "N-1" "B"
          1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
#         1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
          1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
          0
TL13804C  "TL13804 BQ-PQ-EN        TAP A"  "N-1" "B"
          1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
          1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
#         1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
          0
TL13805 "TL13805 PALOMAR-BATIQTOS ck 1"  "N-1" "B"
          1 "PALOMAR  138"  "BATIQTOS 138"  "1 "   1  0
          0
TL13806 "TL13806 ENCINA-PALOMAR ck 1"  "N-1" "B"
          1 "ENCINA   138"  "PALOMAR  138"  "1 "   1  0
          0
TL13809  "TL13809 PRCTRVLY-TELECYN  ck 1 "  "N-1" "B"
          1 "PRCTRVLY 138"  "TELECYN  138"  "1 "   1  0
          0
TL13810  "TL13810 DOUBLET-FRIARS-PENSQTOS"  "N-1" "B"
          1 "DOUBLET  138"  "DOUBLTTP 138"  "1 "   1  0
          1 "FRIARS   138"  "DOUBLTTP 138"  "1 "   1  0
          1 "DOUBLTTP 138"  "PENSQTOS 138"  "1 "   1  0
          0
TL13811  "TL13811 SHADOWR-CHCARITA   CK 1"  "N-1" "B"
          1 "SHADOWR  138"  "CHCARITA 138"  "1 "   1  0
          0
TL13812  "TL13812 TALEGA - SANMATEO  ck 1"  "N-1" "B"
          1 "TALEGA   138"  "SANMATEO 138"  "1 "   1  0
          0
TL13815 "TL13815 GRNT HLL - TELECYN     "  "N-1" "B"
          1 "GRNT HLL 138"   "TELECYN 138"  "1 "   1  0
          0
TL13816  "TL13816 CAPSTRNO - PICO    ck 1"  "N-1" "B"
          1 "CAPSTRNO 138"  "PICO     138"  "1 "   1  0
          0
TL13819 "TL13819 SANTEE - LOSCOCHS   ck 1"  "N-1" "B"
          1 "LOSCOCHS 138"  "SANTEE   138"  "1 "   1  0
          0
TL13820 "TL13820 SYCAMORE-CHCARITA   ck 1"  "N-1" "B"
          1 "SYCAMORE 138"  "CHCARITA 138"  "1 "   1  0
          0
```

```
#
# REVISE TO MODEL LOOP-IN OF TL13821 INTO SYCAMORE 138
#
TL13821 "TL13821 SYCAMORE-SANTEE   ck 1"  "N-1" "B"
            1 "SYCAMORE 138"  "SANTEE   138"  "1 "   1  0
            0
TL13828 "TL13828 SYCAMORE-CARLTNHS ck 1"  "N-1" "B"
            1 "SYCAMORE 138"  "CARLTNHS 138"  "1 "   1  0
            0
TL13822  "TL13822 MISSION - CARLTNHS       ck 1"  "N-1" "B"
            1 "MISSION  138"  "CARLTNHS 138"  "1 "   1  0
            0
TL13824 "TL13824 LOSCOCHS-TELECYN-MLBK60"  "N-1" "B"
            1 "LOSCOCHS 138"  "MIGUEL60 138"  "1 "   1  0
            1 "TELECYN  138"  "MIGUEL60 138"  "1 "   1  0
            2 "MIGUEL   230"  "MIGUEL60 138"  "1 "   1  0
            0
TL13825  "TL13825 SHADOWR-BATIQTOS  CK 1"  "N-1" "B"
            1 "SHADOWR  138"  "BATIQTOS 138"  "1 "   1  0
            0
TL13826  "TL13826 PRCTRVLY-MIGUEL   ck 1"  "N-1" "B"
            1 "PRCTRVLY 138"  "MIGUEL   138"  "1 "   1  0
            0
TL13827  "TL13827 FRIARS-MISSION  ck 1"  "N-1" "B"
            1 "FRIARS   138"  "MISSION  138"  "1 "   1  0
            0
TL13830  "TL13830 MARGARTA-TRABUCO  ck 1"  "N-1" "B"
            1 "MARGARTA 138"  "TRABUCO  138"  "1 "   1  0
            0
#
# RANCHO MISSION VIEJO-NEW SUB IN 2011
#
TL13831A  "TL13831 TALEGA-MARGARTA ck 1"  "N-1" "B"
            1 "TALEGA   138"  "R.MSNVJO 138"  "1 "   1  0
            0
TL13831B  "TL13831 TALEGA-MARGARTA ck 1"  "N-1" "B"
            1 "R.MSNVJO 138"  "MARGARTA 138"  "1 "   1  0
            0
TL13833  "TL13833 TALEGA-TRABUCO  ck 1"  "N-1" "B"
            1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
            0
TL13834  "TL13834 CAPSTRNO-TRABUCO  ck 1"  "N-1" "B"
```

```
        1 "CAPSTRNO 138"  "TRABUCO  138"  "1 "   1  0
        0
TL13835  "TL13835 SANMATEO-LAGNA NL ck 1"  "N-1" "B"
        1 "SANMATEO 138"  "TA TAP    138"  "1 "   1  0
        1 "TA TAP   138"  "LAGNA NL  138"  "1 "   1  0
        1 "TALEGA   138"  "TA TAP    138"  "1 "   1  0
        0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL13835A  "TL13835 SANMATEO-LAGNA NL TAP A"  "N-1" "B"
#       1 "SANMATEO 138"  "TA TAP    138"  "1 "   1  0
        1 "TA TAP   138"  "LAGNA NL  138"  "1 "   1  0
        1 "TALEGA   138"  "TA TAP    138"  "1 "   1  0
        0
TL13835B  "TL13835 SANMATEO-LAGNA NL TAP B"  "N-1" "B"
        1 "SANMATEO 138"  "TA TAP    138"  "1 "   1  0
#       1 "TA TAP   138"  "LAGNA NL  138"  "1 "   1  0
        1 "TALEGA   138"  "TA TAP    138"  "1 "   1  0
        0
TL13835C  "TL13835 SANMATEO-LAGNA NL TAP C"  "N-1" "B"
        1 "SANMATEO 138"  "TA TAP    138"  "1 "   1  0
        1 "TA TAP   138"  "LAGNA NL  138"  "1 "   1  0
#       1 "TALEGA   138"  "TA TAP    138"  "1 "   1  0
        0
TL13836  "TL13836 TALEGA-PICO     ck 1 "  "N-1" "B"
        1 "TALEGA   138"  "PICO     138"  "1 "   1  0
        0
TL13837  "TL13837 CAPSTRNO-LAGNA NL ck 1"  "N-1" "B"
        1 "CAPSTRNO 138"  "LAGNA NL 138"  "1 "   1  0
        0
TL13840  "TL13840 MISSION-GRNT HLL ck 1 "  "N-1" "B"
        1 "MISSION  138"  "GRNT HLL 138"  "1 "   1  0
        0
TL13843  "TL13843 ENCINA-SHADOWR   ck 1 "  "N-1" "B"
        1 "ENCINA  138"  "SHADOWR   138"  "1 "   1  0
        0
############################################################
# SDG&E 69 kV Transmission Line Outages (Category B: N-1)
############################################################
TL0600  "TL0600 CM-KY-RN            ck 1"  "N-1" "B"
        1 "CLAIRMNT  69"  "CLARMTTP  69"  "1 "   1  0
```

```
          1 "KEARNY    69"  "CLARMTTP  69"  "1 "   1  0
          1 "ROSE CYN  69"  "CLARMTTP  69"  "1 "   1  0
          0
##############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
##############################################################
TL0600A  "TL0600 CM-KY-RN          TAP A"  "N-1" "B"
#         1 "CLAIRMNT  69"  "CLARMTTP  69"  "1 "   1  0
          1 "KEARNY    69"  "CLARMTTP  69"  "1 "   1  0
          1 "ROSE CYN  69"  "CLARMTTP  69"  "1 "   1  0
          0
TL0600B  "TL0600 CM-KY-RN          TAP B"  "N-1" "B"
          1 "CLAIRMNT  69"  "CLARMTTP  69"  "1 "   1  0
#         1 "KEARNY    69"  "CLARMTTP  69"  "1 "   1  0
          1 "ROSE CYN  69"  "CLARMTTP  69"  "1 "   1  0
          0
TL0600C  "TL0600 CM-KY-RN          TAP C"  "N-1" "B"
          1 "CLAIRMNT  69"  "CLARMTTP  69"  "1 "   1  0
          1 "KEARNY    69"  "CLARMTTP  69"  "1 "   1  0
#         1 "ROSE CYN  69"  "CLARMTTP  69"  "1 "   1  0
          0
TL0601   "TL0601 B-URBAN     ck 1"  "N-1" "B"
          1 "B        69"  "URBAN     69"  "1 "   1  0
          0
TL0602   "TL0602 B-SILVERGT   ck 1"  "N-1" "B"
          1 "B        69"  "SILVERGT  69"  "1 "   1  0
          0
TL0603   "TL0603 NC-NSM-SW          ck 1"  "N-1" "B"
          1 "NATNLCTY  69"  "SWTWTRTP  69"  "1 "   1  0
          1 "NAVSTMTR  69"  "SWTWTRTP  69"  "1 "   1  0
          1 "SWEETWTR  69"  "SWTWTRTP  69"  "1 "   1  0
          0
##############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
##############################################################
TL0603A  "TL0603 NC-NSM-SW         TAP A"  "N-1" "B"
#         1 "NATNLCTY  69"  "SWTWTRTP  69"  "1 "   1  0
          1 "NAVSTMTR  69"  "SWTWTRTP  69"  "1 "   1  0
          1 "SWEETWTR  69"  "SWTWTRTP  69"  "1 "   1  0
          0
TL0603B  "TL0603 NC-NSM-SW         TAP B"  "N-1" "B"
          1 "NATNLCTY  69"  "SWTWTRTP  69"  "1 "   1  0
```

```
#           1 "NAVSTMTR  69"  "SWTWTRTP  69"  "1 "   1  0
            1 "SWEETWTR  69"  "SWTWTRTP  69"  "1 "   1  0
            0
TL0603C  "TL0603 NC-NSM-SW          TAP C"  "N-1" "B"
            1 "NATNLCTY  69"  "SWTWTRTP  69"  "1 "   1  0
            1 "NAVSTMTR  69"  "SWTWTRTP  69"  "1 "   1  0
#           1 "SWEETWTR  69"  "SWTWTRTP  69"  "1 "   1  0
            0
TL0604  "TL0604 OLD TOWN-KETTNER   ck 1"  "N-1" "B"
            1 "OLD TOWN  69"  "KETTNER   69"  "1 "   1  0
            0
TL0605  "TL0605 SILVERGT-URBAN     ck 1"  "N-1" "B"
            1 "SILVERGT   69"  "URBAN     69"  "1 "   1  0
            0
TL0606  "TL0606 DIVISION-NAVSTMTR  ck 1"  "N-1" "B"
            1 "DIVISION  69"  "NAVSTMTR  69"  "1 "   1  0
            0
TL0607  "TL0607 WABASH-STREAMVW  ck 1"  "N-1" "B"
            1 "WABASH    69"  "STREAMVW  69"  "1 "   1  0
            0
TL0608  "TL0608 STREAMVW-CHOLLAS   ck 1"  "N-1" "B"
            1 "STREAMVW  69"  "CHOLLAS   69"  "1 "   1  0
            0
TL0609  "TL0609 KETTNER-B  ck 1"  "N-1" "B"
            1 "KETTNER   69"  "B         69"  "1 "   1  0
            0
TL0610  "TL0610 DEL MAR-PENSQTOS     ck 1"  "N-1" "B"
            1 "DEL MAR   69"  "PENSQTOS  69"  "1 "   1  0
            0
TL0611  "TL0611 OLD TOWN-POINTLMA  ck 1"  "N-1" "B"
            1 "OLD TOWN  69"  "POINTLMA  69"  "1 "   1  0
            0
TL0612  "TL0612 OLD TOWN-POINTLMA  ck 2"  "N-1" "B"
            1 "OLD TOWN  69"  "POINTLMA  69"  "2 "   1  0
            0
TL0613  "TL0613 PACFCBCH-OLD TOWN  ck 1"  "N-1" "B"
            1 "PACFCBCH  69"  "OLD TOWN  69"  "1 "   1  0
            0
TL0614  "TL0614 CHOLLAS-SWEETWTR  ck 1"  "N-1" "B"
            1 "CHOLLAS   69"  "SWEETWTR  69"  "1 "   1  0
            0
TL0615  "TL0615 CABRILLO-POINTLMA  ck 1"  "N-1" "B"
```

```
          1 "CABRILLO  69"  "POINTLMA  69"  "1 "  1 0
          0
TL0616  "TL0616 Lkhodges-BERNARDO-RSF    "  "N-1" "B"
          1 "Lkhodges  69"  "BERNDOTP  69"  "1 "   1  0
          1 "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
          1 "R.SNTAFE  69"  "BERNDOTP  69"  "1 "   1  0
          0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0616A  "TL0616 Lkhodges-BERNARDO-RSF TAP A"  "N-1" "B"
#         1 "Lkhodges  69"  "BERNDOTP  69"  "1 "   1  0
          1 "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
          1 "R.SNTAFE  69"  "BERNDOTP  69"  "1 "   1  0
          0
TL0616B  "TL0616 Lkhodges-BERNARDO-RSF TAP B"  "N-1" "B"
          1 "Lkhodges  69"  "BERNDOTP  69"  "1 "   1  0
#         1 "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
          1 "R.SNTAFE  69"  "BERNDOTP  69"  "1 "   1  0
          0
TL0616C  "TL0616 Lkhodges-BERNARDO-RSF TAP C"  "N-1" "B"
          1 "Lkhodges  69"  "BERNDOTP  69"  "1 "   1  0
          1 "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
#         1 "R.SNTAFE  69"  "BERNDOTP  69"  "1 "   1  0
          0
TL0617  "TL0617 PB-RN-LJ          ck 1"  "N-1" "B"
          1 "ROSCYNTP  69"  "PACFCBCH  69"  "1 "   1  0
          1 "ROSCYNTP  69"  "ROSE CYN  69"  "1 "   1  0
          1 "ROSCYNTP  69"  "LA JOLLA  69"  "1 "   1  0
     0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0617A  "TL0617 PB-RN-LJ         TAP A"  "N-1" "B"
#         1 "ROSCYNTP  69"  "PACFCBCH  69"  "1 "   1  0
          1 "ROSCYNTP  69"  "ROSE CYN  69"  "1 "   1  0
          1 "ROSCYNTP  69"  "LA JOLLA  69"  "1 "   1  0
     0
TL0617B  "TL0617 PB-RN-LJ         TAP B"  "N-1" "B"
          1 "ROSCYNTP  69"  "PACFCBCH  69"  "1 "   1  0
#         1 "ROSCYNTP  69"  "ROSE CYN  69"  "1 "   1  0
          1 "ROSCYNTP  69"  "LA JOLLA  69"  "1 "   1  0
```

```
      0
TL0617C  "TL0617 PB-RN-LJ          TAP C"  "N-1" "B"
           1 "ROSCYNTP  69"  "PACFCBCH  69"  "1 "   1  0
           1 "ROSCYNTP  69"  "ROSE CYN  69"  "1 "   1  0
#          1 "ROSCYNTP  69"  "LA JOLLA  69"  "1 "   1  0
      0
TL0618  "TL0618 MISSION-MURRAY    ck 1"  "N-1" "B"
           1 "MISSION   69"  "MURRAY    69"  "1 "   1  0
           0
TL0619  "TL0619 MISSION-MURRAY    ck 2"  "N-1" "B"
           1 "MISSION   69"  "MURRAY    69"  "2 "   1  0
           0
TL0620  "TL0620 MURRAY-GARFIELD  ck 1"  "N-1" "B"
           1 "MURRAY    69"  "GARFIELD  69"  "1 "   1  0
           0
TL0621  "TL0621 PARADISE-MIGUEL    ck 1"  "N-1" "B"
           1 "PARADISE  69"  "MIGUEL    69"  "1 "   1  0
           0
TL0622  "TL0622 CHOLLAS-SPRNGVLY  ck 1"  "N-1" "B"
           1 "CHOLLAS   69"  "SPRNGVLY  69"  "1 "   1  0
           0
TL0623  "TL0623 IB-OY-SYO          ck 1"  "N-1" "B"
           1 "IMPRLBCH  69"  "OTAY  TP  69"  "1 "   1  0
           1 "SANYSDRO  69"  "OTAY  TP  69"  "1 "   1  0
           1 "OTAY      69"  "OTAY  TP  69"  "1 "   1  0
           0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0623A  "TL0623 IB-OY-SYO         TAP A"  "N-1" "B"
#          1 "IMPRLBCH  69"  "OTAY  TP  69"  "1 "   1  0
           1 "SANYSDRO  69"  "OTAY  TP  69"  "1 "   1  0
           1 "OTAY      69"  "OTAY  TP  69"  "1 "   1  0
           0
TL0623B  "TL0623 IB-OY-SYO         TAP B"  "N-1" "B"
           1 "IMPRLBCH  69"  "OTAY  TP  69"  "1 "   1  0
#          1 "SANYSDRO  69"  "OTAY  TP  69"  "1 "   1  0
           1 "OTAY      69"  "OTAY  TP  69"  "1 "   1  0
           0
TL0623C  "TL0623 IB-OY-SYO         TAP C"  "N-1" "B"
           1 "IMPRLBCH  69"  "OTAY  TP  69"  "1 "   1  0
           1 "SANYSDRO  69"  "OTAY  TP  69"  "1 "   1  0
```

```
#           1 "OTAY     69"  "OTAY  TP  69"  "1 "   1  0
            0
TL0624  "TL0624 EL CAJON-JAMACHA    ck 1"  "N-1" "B"
            1 "EL CAJON  69"  "JAMACHA   69"  "1 "   1  0
            0
TL0625   "TL0625 BAR - DS - LV KUM SPS  ck 1"  "N-1" "B"
            1 "BARRETT   69"  "BARRETTP  69"  "1 "   1  0
            1 "DESCANSO  69"  "BARRETTP  69"  "1 "   1  0
            1 "LOVELAND  69"  "BARRETTP  69"  "1 "   1  0
            3 "KUMEYAAY   0.69"    "1 "  0
            0
############################################################
# NEXT 2 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0625A   "TL0625 BAR - DS - LV KUM SPS  TAP A"  "N-1" "B"
            1 "BARRETT   69"  "BARRETTP  69"  "1 "   1  0
#           1 "DESCANSO  69"  "BARRETTP  69"  "1 "   1  0
            1 "LOVELAND  69"  "BARRETTP  69"  "1 "   1  0
            3 "KUMEYAAY   0.69"    "1 "  0
            0
TL0625B   "TL0625 BAR - DS - LV KUM SPS  TAP B"  "N-1" "B"
            1 "BARRETT   69"  "BARRETTP  69"  "1 "   1  0
            1 "DESCANSO  69"  "BARRETTP  69"  "1 "   1  0
#           1 "LOVELAND  69"  "BARRETTP  69"  "1 "   1  0
            3 "KUMEYAAY   0.69"    "1 "  0
            0
TL0626  "TL0626 BLDCRKTP - DESCANSO  KUM SPS  ck 1"  "N-1" "B"
            1 "BLDCRKTP  69"  "DESCANSO  69"  "1 "   1  0
            1 "BLDCRKTP  69"  "SANTYSBL  69"  "1 "   1  0
            1 "BLDCRKTP  69"  "BOLDRCRK  69"  "1 "   1  0
            3 "KUMEYAAY   0.69"    "1 "  0
            0
TL0627  "TL0627 MIGUEL -JAMACHA   ck 1"  "N-1" "B"
            1 "MIGUEL    69"  "JAMACHA   69"  "1 "   1  0
            0
TL0628  "TL0628 ML-SW-SU-PD         ck 1"  "N-1" "B"
            4 "SUNYSIDE  69"  "10"   0
            1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
            1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
            1 "SUNYSDTP  69"  "MIGUELTP  69"  "1 "   1  0
            1 "SUNYSIDE  69"  "SUNYSDTP  69"  "1 "   1  0
            1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
```

```
          0
############################################################
# NEXT 4 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0628A  "TL0628 ML-SW-SU-PD       TAP A"  "N-1" "B"
          4 "SUNYSIDE  69"  "10"   0
#         1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
          1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSDTP  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSIDE  69"  "SUNYSDTP  69"  "1 "   1  0
          1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
          0
TL0628B  "TL0628 ML-SW-SU-PD       TAP B"  "N-1" "B"
          4 "SUNYSIDE  69"  "10"   0
          1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
#         1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSDTP  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSIDE  69"  "SUNYSDTP  69"  "1 "   1  0
          1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
          0
TL0628C  "TL0628 ML-SW-SU-PD       TAP C"  "N-1" "B"
          4 "SUNYSIDE  69"  "10"   0
          1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
          1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
#         1 "SUNYSDTP  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSIDE  69"  "SUNYSDTP  69"  "1 "   1  0
          1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
          0
TL0628D  "TL0628 ML-SW-SU-PD       TAP D"  "N-1" "B"
          4 "SUNYSIDE  69"  "10"   0
          1 "MIGUELTP  69"  "MIGUEL    69"  "1 "   1  0
          1 "SWEETWTR  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSDTP  69"  "MIGUELTP  69"  "1 "   1  0
          1 "SUNYSIDE  69"  "SUNYSDTP  69"  "1 "   1  0
#         1 "PARADISE  69"  "SUNYSDTP  69"  "1 "   1  0
          0
TL0629   "TL0629 BU-CW-CN-GC         ck 1"  "N-1" "B"
          4 "GLENCLIF  69"  "10"   0
          4 "BOULEVRD  69"  "10"   0
          4 "CRESTWD   69"  "10"   0
          8 "GLNCLFTP  69"
          8 "CAMERNTP  69"
```

```
          8 "CRESTWD   69"
          8 "BOULEVRD  69"
          8 "GLENCLIF  69"
          1 "CAMERNTP  69"  "CAMERON   69"  "1 "   1  0
          1 "CAMERNTP  69"  "GLNCLFTP  69"  "1 "   1  0
          1 "CAMERNTP  69"  "CRESTWD   69"  "1 "   1  0
          1 "DESCANSO  69"  "GLNCLFTP  69"  "1 "   1  0
          1 "GLENCLIF  69"  "GLNCLFTP  69"  "1 "   1  0
          0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0629A  "TL0629 BU-CW-CN-GC       TAP A"  "N-1" "B"
#         4 "GLENCLIF  69"  "10"   0
#         4 "BOULEVRD  69"  "10"   0
#         4 "CRESTWD   12.50"  "10"   0
#         8 "GLNCLFTP  69"
#         8 "CAMERNTP  69"
#         8 "CRESTWD   69"
#         8 "BOULEVRD  69"
#         8 "GLENCLIF  69"
          1 "CAMERNTP  69"  "CAMERON   69"  "1 "   1  0
#         1 "CAMERNTP  69"  "GLNCLFTP  69"  "1 "   1  0
          1 "CAMERNTP  69"  "CRESTWD   69"  "1 "   1  0
          1 "DESCANSO  69"  "GLNCLFTP  69"  "1 "   1  0
          1 "GLENCLIF  69"  "GLNCLFTP  69"  "1 "   1  0
          0
TL0629B  "TL0629 BU-CW-CN-GC       TAP B"  "N-1" "B"
#         4 "GLENCLIF  69"  "10"   0
          4 "BOULEVRD  69"  "10"   0
          4 "CRESTWD   69"  "10"   0
#         8 "GLNCLFTP  69"
#         8 "CAMERNTP  69"
          8 "CRESTWD   69"
          8 "BOULEVRD  69"
#         8 "GLENCLIF  69"
          1 "CAMERNTP  69"  "CAMERON   69"  "1 "   1  0
          1 "CAMERNTP  69"  "GLNCLFTP  69"  "1 "   1  0
#         1 "CAMERNTP  69"  "CRESTWD   69"  "1 "   1  0
          1 "DESCANSO  69"  "GLNCLFTP  69"  "1 "   1  0
          1 "GLENCLIF  69"  "GLNCLFTP  69"  "1 "   1  0
          0
```

```
TL0629C  "TL0629 BU-CW-CN-GC       TAP C"  "N-1" "B"
#           4 "GLENCLIF  69"  "10"   0
#           4 "BOULEVRD  69"  "10"   0
#           4 "CRESTWD   12.50"  "10"   0
#           8 "GLNCLFTP  69"
#           8 "CAMERNTP  69"
#           8 "CRESTWD   69"
#           8 "BOULEVRD  69"
#           8 "GLENCLIF  69"
            1 "CAMERNTP  69"  "CAMERON   69"  "1 "   1  0
            1 "CAMERNTP  69"  "GLNCLFTP  69"  "1 "   1  0
            1 "CAMERNTP  69"  "CRESTWD   69"  "1 "   1  0
#           1 "DESCANSO  69"  "GLNCLFTP  69"  "1 "   1  0
            1 "GLENCLIF  69"  "GLNCLFTP  69"  "1 "   1  0
            0
TL0630  "TL0630 EL CAJON-GRANITE   ck 1"  "N-1" "B"
            1 "EL CAJON  69"  "GRANITE   69"  "1 "   1  0
            0
TL0631  "TL0631 EL CAJON-LOSCOCHS  ck 1"  "N-1" "B"
            1 "EL CAJON  69"  "LOSCOCHS  69"  "1 "   1  0
            0
TL0632  "TL0632 ML-GR-LC           ck 1"  "N-1" "B"
            1 "GRANITTP  69"  "MIGUEL   69"  "1 "   1  0
            1 "GRANITTP  69"  "GRANITE  69"  "1 "   1  0
            1 "GRANITTP  69"  "LOSCOCHS 69"  "1 "   1  0
            0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0632A "TL0632 ML-GR-LC           TAP A"  "N-1" "B"
#           1 "GRANITTP  69"  "MIGUEL   69"  "1 "   1  0
            1 "GRANITTP  69"  "GRANITE  69"  "1 "   1  0
            1 "GRANITTP  69"  "LOSCOCHS 69"  "1 "   1  0
            0
TL0632B "TL0632 ML-GR-LC           TAP B"  "N-1" "B"
            1 "GRANITTP  69"  "MIGUEL   69"  "1 "   1  0
#           1 "GRANITTP  69"  "GRANITE  69"  "1 "   1  0
            1 "GRANITTP  69"  "LOSCOCHS 69"  "1 "   1  0
            0
TL0632C "TL0632 ML-GR-LC           TAP C"  "N-1" "B"
            1 "GRANITTP  69"  "MIGUEL   69"  "1 "   1  0
            1 "GRANITTP  69"  "GRANITE  69"  "1 "   1  0
```

```
#           1 "GRANITTP  69"  "LOSCOCHS 69"  "1 "   1  0
            0
TL0633  "TL0633 BERNARDO-R.CARMEL  ck 1"  "N-1" "B"
            1 "BERNARDO  69"  "R.CARMEL  69"  "1 "   1  0
            0
TL0634  "TL0634 ESCO-WC-POW         ck 1"  "N-1" "B"
            4 "WARENCYN  69"  "10"   0
            1 "ESCO      69"  "WARCYNTP  69"  "1 "   1  0
            1 "WARENCYN  69"  "WARCYNTP  69"  "1 "   1  0
            1 "POWAY     69"  "WARCYNTP  69"  "1 "   1  0
            0
TL0635  "TL0635 CREELMAN - LOSCOCHS   k 1"  "N-1" "B"
            1 "CREELMAN  69"  "LOSCOCHS  69"  "1 "   1  0
            0
TL0636  "TL0636 LOSCOCHS - ELLIOTT   ck 1"  "N-1" "B"
            1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
            0
TL0637  "TL0637 SANTYSBL - CREELMAN  ck 1"  "N-1" "B"
            1 "SANTYSBL  69"  "CREELMAN  69"  "1 "   1  0
            0
TL0639  "TL0639 SYCAMORE - ELLIOTT   ck 1"  "N-1" "B"
            1 "SYCAMORE  69"  "ELLIOTT   69"  "1 "   1  0
            0
TL0640  "TL0640 PARADISE - CHOLLAS   ck 1"  "N-1" "B"
            1 "PARADISE  69"  "CHOLLAS   69"  "1 "   1  0
            0
TL0641  "TL0641 SOUTHBAY - MONTGMRY  ck 1"  "N-1" "B"
            1 "SOUTHBAY  69"  "MONTGMRY  69"  "1 "   1  0
            0
TL0642  "TL0642 MG - SW - SY        ck 1"  "N-1" "B"
            1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
            1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
            1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
            0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
#TL0642A  "TL0642 MG - SW - SY       TAP A"  "N-1" "B"
#           1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
#           1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
#           1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
#           0
```

```
#TL0642B  "TL0642 MG - SW - SY      TAP B"  "N-1" "B"
#           1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
#           1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
#           1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
#           0
#TL0642C  "TL0642 MG - SW - SY      TAP C"  "N-1" "B"
#           1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
#           1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
#           1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
#           0
TL0643  "TL0643 MIGUEL - JAMACHA     ck 2"  "N-1" "B"
           1 "MIGUEL    69"  "JAMACHA   69"  "2 "   1  0
           0
TL0644  "TL0644 SOUTHBAY - SWEETWTR  ck 1"  "N-1" "B"
           1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
           0
TL0645  "TL0645 SOUTHBAY-OTAY  ck 1"  "N-1" "B"
           1 "SOUTHBAY  69"  "OTAY     69"  "1 "   1  0
           0
TL0646  "TL0646 SOUTHBAY-OTAY  ck 2"  "N-1" "B"
           1 "SOUTHBAY  69"  "OTAY     69"  "2 "   1  0
           0
TL0647  "TL0647 SOUTHBAY-IMPRLBCH  ck 1"  "N-1" "B"
           1 "SOUTHBAY  69"  "IMPRLBCH  69"  "1 "   1  0
           0
TL0648  "TL0648 POWAY-R.CARMEL  ck 1"  "N-1" "B"
           1 "POWAY     69"  "R.CARMEL  69"  "1 "   1  0
           0
TL0649  "TL0649 BD-OY-SYO           ck 1"  "N-1" "B"
           4 "OTAYLAKE  69"  "10"   0
           1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
           1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
           1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
           1 "OTAY      69"  "OTAYLKTP  69"  "1 "   1  0
           1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
           0
############################################################
# NEXT 5 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0649A  "TL0649 BD-OY-SYO         TAP A"  "N-1" "B"
           4 "OTAYLAKE  69"  "10"   0
#          1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
```

```
          1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAY     69"  "OTAYLKTP  69"  "1 "   1  0
          1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
          0
TL0649B  "TL0649 BD-OY-SYO         TAP B"  "N-1" "B"
          4 "OTAYLAKE  69"  "10"   0
          1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
#         1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAY     69"  "OTAYLKTP  69"  "1 "   1  0
          1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
          0
TL0649C  "TL0649 BD-OY-SYO         TAP C"  "N-1" "B"
          4 "OTAYLAKE  69"  "10"   0
          1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
#         1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAY     69"  "OTAYLKTP  69"  "1 "   1  0
          1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
          0
TL0649D  "TL0649 BD-OY-SYO         TAP D"  "N-1" "B"
          4 "OTAYLAKE  69"  "10"   0
          1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
#         1 "OTAY     69"  "OTAYLKTP  69"  "1 "   1  0
          1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
          0
TL0649E  "TL0649 BD-OY-SYO         TAP E"  "N-1" "B"
          4 "OTAYLAKE  69"  "10"   0
          1 "BORDER    69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLAKE  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAYLKTP  69"  "BORDERTP  69"  "1 "   1  0
          1 "OTAY     69"  "OTAYLKTP  69"  "1 "   1  0
#         1 "SANYSDRO  69"  "OTAYLKTP  69"  "1 "   1  0
          0
TL0650   "TL0650 B-BTP-NOIS-CORON TP  ck 1"  "N-1" "B"
          1 "B        69"  "B     TP  69"  "1 "   1  0
          1 "NOISLMTR  69"  "B     TP  69"  "1 "   1  0
          1 "CORONADO  69"  "B     TP  69"  "1 "   1  0
          0
```

```
#
# SG WILL SERVE WA AND NC BY 2011
#
TL0651A  "TL0651 WA-SG              ck 1"  "N-1" "B"
            1 "WABASH    69"  "SILVERGT 69"  "1 "   1  0
            0
TL0651B  "TL0652 WABASH-SILVERGT     ck 1"  "N-1" "B"
            1 "WABASH    69"  "STREAMVW 69"  "1 "   1  0
            0
TL0651A/51B  "SG-WA-SR              ck 1"  "N-1" "B"
            1 "WABASH    69"  "SILVERGT  69"  "1 "   1  0
            1 "WABASH    69"  "STREAMVW  69"  "1 "   1  0
            0
TL0653  "TL0653 MS to F             ck 1"  "N-1" "B"
            1 "MISSION   69"  "F        69"  "1 "   1  0
            0
TL0654  "TL0654 MISSION-F    ck 2"  "N-1" "B"
            1 "MISSION   69"  "F        69"  "2 "   1  0
            0
TL0655  "TL0655 SILVERGT-CORONADO  ck 1"  "N-1" "B"
            1 "SILVERGT   69"  "CORONADO  69"  "1 "   1  0
            0
TL0656  "TL0656 SAMPSON-SILVERGT   ck 1"  "N-1" "B"
            1 "SAMPSON   69"  "SILVERGT   69"  "1 "   1  0
            0
TL0657  "TL0657 SAMPSON-SILVERGT   ck 2"  "N-1" "B"
            1 "SAMPSON   69"  "SILVERGT   69"  "2 "   1  0
            0
TL0658  "TL0658 SAMPSON-DIVISION  ck 1"  "N-1" "B"
            1 "SAMPSON   69"  "DIVISION  69"  "1 "   1  0
            0
TL0659  "TL0659 CABRILLO-POINTLMA  ck 2"  "N-1" "B"
            1 "CABRILLO  69"  "POINTLMA  69"  "2 "   1  0
            0
TL0660  "TL0660 ENCNITAS-DEL MAR   ck 1"  "N-1" "B"
            1 "ENCNITAS  69"  "DEL MAR   69"  "1 "   1  0
            0
TL0661  "TL0661 EASTGATE-PENSQTOS  ck 1"  "N-1" "B"
            1 "EASTGATE  69"  "PENSQTOS  69"  "1 "   1  0
            0
TL0662  "TL0662 PENSQTOS -TOREYPNS  ck 1"  "N-1" "B"
            1 "PENSQTOS  69"  "TOREYPNS  69"  "1 "   1  0
```

```
          0
TL0663  "TL0663 KEARNY -MISSION   ck 1"  "N-1" "B"
          1 "KEARNY    69"  "MISSION   69"  "1 "   1  0
          0
TL0664  "TL0664 PQ-MR1-RN          ck 1"  "N-1" "B"
          1 "ROSE CYN  69"  "MIRAMRTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
          1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
          0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0664A  "TL0664 PQ-MR1-RN         TAP A"  "N-1" "B"
#         1 "ROSE CYN  69"  "MIRAMRTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
          1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
          0
TL0664B  "TL0664 PQ-MR1-RN         TAP B"  "N-1" "B"
          1 "ROSE CYN  69"  "MIRAMRTP  69"  "1 "   1  0
#         1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
          1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
          0
TL0664C  "TL0664 PQ-MR1-RN         TAP C"  "N-1" "B"
          1 "ROSE CYN  69"  "MIRAMRTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
#         1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
          0
TL0665A  "TL0665A MIRASNTO-GENESEE   ck 1"  "N-1" "B"
          1 "MIRASNTO  69"  "GENESEE   69"  "1 "   1  0
          0
TL0665B  "TL0665B MIRASNTO-PENSQTOS  ck 1"  "N-1" "B"
          1 "MIRASNTO  69"  "PENSQTOS  69"  "1 "   1  0
          0
TL0666  "TL0666 PQ-DM-DB-DH-TP       ck 1"  "N-1" "B"
          4 "DUNHILL   69"  "10"   0
          1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
          1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
```

```
          0
############################################################
# NEXT 5 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0666A  "TL0666 PQ-DM-DB-DH-TP     TAP A"  "N-1" "B"
#         4 "DUNHILL   69"  "10"   0
#         1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
          1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
          0
TL0666B  "TL0666 PQ-DM-DB-DH-TP     TAP B"  "N-1" "B"
#         4 "DUNHILL   69"  "10"   0
          1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
#         1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
          1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
          0
TL0666C  "TL0666 PQ-DM-DB-DH-TP     TAP C"  "N-1" "B"
#         4 "DUNHILL   69"  "10"   0
          1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
#         1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
          1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
          0
TL0666D  "TL0666 PQ-DM-DB-DH-TP     TAP D"  "N-1" "B"
#         4 "DUNHILL   69"  "10"   0
          1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
#         1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
          1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
```

```
          1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
          0
TL0666E  "TL0666 PQ-DM-DB-DH-TP     TAP E"  "N-1" "B"
#         4 "DUNHILL   69"  "10"   0
          1 "DEL MAR   69"  "DELMARTP  69"  "1 "   1  0
          1 "PENSQTOS  69"  "DELMARTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DELMARTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DOUBLTTP  69"  "1 "   1  0
          1 "DUNHILTP  69"  "DUNHILL   69"  "1 "   1  0
#         1 "TOREYPNS  69"  "DUNHILTP  69"  "1 "   1  0
          1 "DOUBLTTP  69"  "DOUBLET   69"  "1 "   1  0
          0
TL0667  "TL0667 DEL MAR-PENSQTOS     ck 2"  "N-1" "B"
          1 "DEL MAR   69"  "PENSQTOS  69"  "2 "   1  0
          0
TL0668  "TL0668 FNTNTP-FNTON-MR-MR    ck 1"  "N-1" "B"
          4 "FENTON    69"  "10"   0
          1 "FENTONTP  69"  "FENTON    69"  "1 "   1  0
          1 "MIRAMAR1  69"  "FENTONTP  69"  "1 "   1  0
          1 "MIRAMAR   69"  "FENTONTP  69"  "1 "   1  0
          0
TL0669  "TL0669 MIRAMAR-SCRIPPS   ck 1"  "N-1" "B"
          1 "MIRAMAR   69"  "SCRIPPS   69"  "1 "   1  0
          0
TL0670  "TL0670 CLAIRMNT-MISSION  ck 1"  "N-1" "B"
          1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
          0
TL0671  "TL0671 MISSION-ELLIOTT   ck 1"  "N-1" "B"
          1 "MISSION   69"  "ELLIOTT   69"  "1 "   1  0
          0
TL0672  "TL0672 KY-GD-KA-MSH        ck1"  "N-1" "B"
          8 "KYOCRATP  69"
          8 "KYOCERA   69"
          4 "KYOCERA   69"  "10"   0
          4 "GEN DYNM  69"  "10"   0
          1 "KYOCRATP  69"  "GENDYNTP  69"  "1 "   1  0
          1 "KYOCRATP  69"  "KYOCERA   69"  "1 "   1  0
          1 "MESAHGTS  69"  "KYOCRATP  69"  "1 "   1  0
          1 "KEARNY    69"  "GENDYNTP  69"  "1 "   1  0
          1 "GEN DYNM  69"  "GENDYNTP  69"  "1 "   1  0
     0
TL0673  "TL0673 LA JOLLA to ROSE CYN  ck 1"  "N-1" "B"
```

```
        1 "LA JOLLA  69"  "ROSE CYN  69"  "1 "   1  0
        0
TL0674  "TL0674 NCW-EN-SF          ck 1"  "N-1" "B"
        1 "ENCNITAS  69"  "R.SNTTP1  69"  "1 "   1  0
        1 "NORTHCTY  69"  "R.SNTTP1  69"  "1 "   1  0
        1 "R.SNTAFE  69"  "R.SNTTP1  69"  "1 "   1  0
        0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0674A  "TL0674 NCW-EN-SF         TAP A"  "N-1" "B"
#       1 "ENCNITAS  69"  "R.SNTTP1  69"  "1 "   1  0
        1 "NORTHCTY  69"  "R.SNTTP1  69"  "1 "   1  0
        1 "R.SNTAFE  69"  "R.SNTTP1  69"  "1 "   1  0
        0
TL0674B  "TL0674 NCW-EN-SF         TAP B"  "N-1" "B"
        1 "ENCNITAS  69"  "R.SNTTP1  69"  "1 "   1  0
#       1 "NORTHCTY  69"  "R.SNTTP1  69"  "1 "   1  0
        1 "R.SNTAFE  69"  "R.SNTTP1  69"  "1 "   1  0
        0
TL0674C  "TL0674 NCW-EN-SF         TAP C"  "N-1" "B"
        1 "ENCNITAS  69"  "R.SNTTP1  69"  "1 "   1  0
        1 "NORTHCTY  69"  "R.SNTTP1  69"  "1 "   1  0
#       1 "R.SNTAFE  69"  "R.SNTTP1  69"  "1 "   1  0
        0
TL0675  "TL0675 PENSQTOS-MESA RIM  ck 1"  "N-1" "B"
        1 "PENSQTOS  69"  "MESA RIM  69"  "1 "   1  0
        0
TL0676  "TL0676 MESAHGTS-MISSION   ck 1"  "N-1" "B"
        1 "MESAHGTS  69"  "MISSION   69"  "1 "   1  0
        0
TL0677  "TL0677 MESA RIM-MIRAMAR   ck 1"  "N-1" "B"
        1 "MESA RIM  69"  "MIRAMAR   69"  "1 "   1  0
        0
TL0678  "TL0678 LOSCOCHS-ALPINE    ck 1"  "N-1" "B"
        1 "LOSCOCHS  69"  "ALPINE    69"  "1 "   1  0
        0
TL0679  "TL0679 ESCNDIDO-FELICITA  ck 1"  "N-1" "B"
        1 "ESCNDIDO  69"  "FELICITA  69"  "1 "   1  0
        0
TL0680  "TL0680 SA-ME-SM           ck 1"  "N-1" "B"
        1 "MELROSE   69"  "MELRSETP  69"  "1 "   1  0
```

```
          1 "SANLUSRY  69"  "MELRSETP  69"  "1 "   1  0
          1 "SANMRCOS  69"  "MELRSETP  69"  "1 "   1  0
          0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0680A  "TL0680 SA-ME-SM         TAP A"  "N-1" "B"
#         1 "MELROSE   69"  "MELRSETP  69"  "1 "   1  0
          1 "SANLUSRY  69"  "MELRSETP  69"  "1 "   1  0
          1 "SANMRCOS  69"  "MELRSETP  69"  "1 "   1  0
          0
TL0680B  "TL0680 SA-ME-SM         TAP B"  "N-1" "B"
          1 "MELROSE   69"  "MELRSETP  69"  "1 "   1  0
#         1 "SANLUSRY  69"  "MELRSETP  69"  "1 "   1  0
          1 "SANMRCOS  69"  "MELRSETP  69"  "1 "   1  0
          0
TL0680C  "TL0680 SA-ME-SM         TAP C"  "N-1" "B"
          1 "MELROSE   69"  "MELRSETP  69"  "1 "   1  0
          1 "SANLUSRY  69"  "MELRSETP  69"  "1 "   1  0
#         1 "SANMRCOS  69"  "MELRSETP  69"  "1 "   1  0
          0
TL0681   "TL0681 ASH-FE-VC        ck 1"  "N-1" "B"
          1 "ASH      69"  "ASH   TP  69"  "1 "   1  0
          1 "FELICITA  69"  "ASH   TP  69"  "1 "   1  0
          1 "VALCNTR   69"  "ASH   TP  69"  "1 "   1  0
          0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0681A  "TL0681 ASH-FE-VC        TAP A"  "N-1" "B"
#         1 "ASH      69"  "ASH   TP  69"  "1 "   1  0
          1 "FELICITA  69"  "ASH   TP  69"  "1 "   1  0
          1 "VALCNTR   69"  "ASH   TP  69"  "1 "   1  0
          0
TL0681B  "TL0681 ASH-FE-VC        TAP B"  "N-1" "B"
          1 "ASH      69"  "ASH   TP  69"  "1 "   1  0
#         1 "FELICITA  69"  "ASH   TP  69"  "1 "   1  0
          1 "VALCNTR   69"  "ASH   TP  69"  "1 "   1  0
          0
TL0681C  "TL0681 ASH-FE-VC        TAP C"  "N-1" "B"
          1 "ASH      69"  "ASH   TP  69"  "1 "   1  0
          1 "FELICITA  69"  "ASH   TP  69"  "1 "   1  0
```

```
#           1 "VALCNTR   69"  "ASH   TP  69"  "1 "   1  0
            0
TL0682  "TL0682 WARNERS-RINCON    ck 1"  "N-1" "B"
            1 "WARNERS   69"  "RINCON    69"  "1 "   1  0
            0
TL0683  "TL0683 RINCON-LILAC     ck 1 "  "N-1" "B"
            1 "RINCON    69"  "LILAC     69"  "1 "   1  0
            0
TL0684  "TL0684 ESCNDIDO-SANMRCOS  ck 1"  "N-1" "B"
            1 "ESCNDIDO  69"  "SANMRCOS  69"  "1 "   1  0
            0
TL0685  "TL0685 WARNERS-SANTYSBL  ck 1"  "N-1" "B"
            1 "WARNERS   69"  "SANTYSBL  69"  "1 "   1  0
            0
TL0686  "TL0686 WARNERS-NARROWS  ck 1"  "N-1" "B"
            4 "BORREGO   12.5"  "10"   0
            5 "NARROWS   69"    "b"    0
            6 "BORREGO   12.5"  "sd"   0
            1 "WARNERS   69"  "NARROWS   69"  "1 "   1  0
            0
TL0687  "TL0687 BORREGO-NARROWS   ck 1"  "N-1" "B"
            4 "BORREGO   12.5"  "10"   0
            6 "BORREGO   12.5"  "sd"   0
            1 "BORREGO   69"  "NARROWS   69"  "1 "   1  0
            0
TL0688  "TL0688 ESCNDIDO-LILAC     ck 1"  "N-1" "B"
            1 "ESCNDIDO  69"  "LILAC     69"  "1 "   1  0
            0
TL0689  "TL0689 ES-FE-BR          ck 1"  "N-1" "B"
            1 "BERNARDO  69"  "FELCTATP  69"  "1 "   1  0
            1 "ESCNDIDO  69"  "FELCTATP  69"  "1 "   1  0
            1 "FELICITA  69"  "FELCTATP  69"  "1 "   1  0
            0
############################################################
# NEXT 3 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0689A  "TL0689 ES-FE-BR         TAP A"  "N-1" "B"
#           1 "BERNARDO  69"  "FELCTATP  69"  "1 "   1  0
            1 "ESCNDIDO  69"  "FELCTATP  69"  "1 "   1  0
            1 "FELICITA  69"  "FELCTATP  69"  "1 "   1  0
            0
TL0689B  "TL0689 ES-FE-BR         TAP B"  "N-1" "B"
```

```
          1 "BERNARDO  69"  "FELCTATP  69"  "1 "   1  0
#         1 "ESCNDIDO  69"  "FELCTATP  69"  "1 "   1  0
          1 "FELICITA  69"  "FELCTATP  69"  "1 "   1  0
          0
TL0689C  "TL0689 ES-FE-BR          TAP C"  "N-1" "B"
          1 "BERNARDO  69"  "FELCTATP  69"  "1 "   1  0
          1 "ESCNDIDO  69"  "FELCTATP  69"  "1 "   1  0
#         1 "FELICITA  69"  "FELCTATP  69"  "1 "   1  0
          0
TL0690  "TL0690 SA-OS-STU-LP        ck 1"  "N-1" "B"
          4 "STUART    69"  "10"   0
          1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
          1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
          1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
          1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
          0
############################################################
# NEXT 4 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0690A  "TL0690 SA-OS-STU-LP       TAP A"  "N-1" "B"
          4 "STUART    69"  "10"   0
#         1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
          1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
          1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
          1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
          0
TL0690B  "TL0690 SA-OS-STU-LP       TAP B"  "N-1" "B"
          4 "STUART    69"  "10"   0
          1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
#         1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
          1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
          1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
          0
TL0690C  "TL0690 SA-OS-STU-LP       TAP C"  "N-1" "B"
          4 "STUART    69"  "10"   0
          1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
          1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
#         1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
          1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
          1 "STUARTTP  69"  "STUART    69"  "1 "   1  0
          0
TL0690D  "TL0690 SA-OS-STU-LP       TAP D"  "N-1" "B"
```

```
            4 "STUART    69"  "10"   0
            1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
            1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
            1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
#           1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
            0
TL0691  "TL0691 AVCDTP-AVCAD-PND-MNSRT   ck 1"  "N-1" "B"
            1 "AVOCADO   69"  "AVCADOTP  69"  "1 "   1  0
            1 "PENDLETN  69"  "AVCADOTP  69"  "1 "   1  0
            1 "MONSRATE  69"  "AVCADOTP  69"  "1 "   1  0
            0
TL0692  "TL0692 HORNO-HORNO TP-JPM-LSPL  ck 1"  "N-1" "B"
            4 "HORNO     69"  "10"   0
            1 "HORNO     69"  "HORNO TP  69"  "1 "   1  0
            1 "HORNO TP  69"  "JAP MESA  69"  "1 "   1  0
            1 "LASPULGS  69"  "HORNO TP  69"  "1 "   1  0
            0
TL0693  "TL0693 MELROSE  to SANLUSRY  ck 1"  "N-1" "B"
            1 "MELROSE   69"  "SANLUSRY  69"  "1 "   1  0
            0
TL0694  "TL0694 MONSRT-MRHLTP-MH-SLR  ck 1"  "N-1" "B"
            4 "MOROHILL  69"  "10"   0
            1 "MONSRATE  69"  "MORHILTP  69"  "1 "   1  0
            1 "MORHILTP  69"  "MOROHILL  69"  "1 "   1  0
            1 "MORHILTP  69"  "SANLUSRY  69"  "1 "   1  0
            0
TL0695  "TL0695 CRSTNTS-TALEGATP-JPM-TL  ck 1"  "N-1" "B"
            4 "CRSTNTS   69"  "10"   0
            1 "CRSTNTS   69"  "TALEGATP  69"  "1 "   1  0
            1 "JAP MESA  69"  "TALEGATP  69"  "1 "   1  0
            1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
            0
TL0696  "TL0696 ESCNDIDO-ASH   ck 1"  "N-1" "B"
            1 "ESCNDIDO  69"  "ASH      69"  "1 "   1  0
            0
TL0697  "TL0697 SANLUSRY-OCEANSDE  ck 1"  "N-1" "B"
            1 "SANLUSRY  69"  "OCEANSDE  69"  "1 "   1  0
            0
TL0698  "TL0698 MN-AV-PA           ck 1"  "N-1" "B"
            1 "AVOCADO   69"  "MNSRATTP  69"  "1 "   1  0
            1 "MONSRATE  69"  "MNSRATTP  69"  "1 "   1  0
            1 "PALA      69"  "MNSRATTP  69"  "1 "   1  0
```

```
          0
############################################################
# NEXT 4 OUTAGE DEFINITIONS SIMULATE ONE ELEMENT OF MULTI-TERMINAL LINE OUTAGE
############################################################
TL0698A  "TL0698 MN-AV-PA          TAP A"  "N-1" "B"
#         1 "AVOCADO   69"  "MNSRATTP  69"  "1 "   1  0
          1 "MONSRATE  69"  "MNSRATTP  69"  "1 "   1  0
          1 "PALA      69"  "MNSRATTP  69"  "1 "   1  0
          0
TL0698B  "TL0698 MN-AV-PA          TAP B"  "N-1" "B"
          1 "AVOCADO   69"  "MNSRATTP  69"  "1 "   1  0
#         1 "MONSRATE  69"  "MNSRATTP  69"  "1 "   1  0
          1 "PALA      69"  "MNSRATTP  69"  "1 "   1  0
          0
TL0698C  "TL0698 MN-AV-PA          TAP C"  "N-1" "B"
          1 "AVOCADO   69"  "MNSRATTP  69"  "1 "   1  0
          1 "MONSRATE  69"  "MNSRATTP  69"  "1 "   1  0
#         1 "PALA      69"  "MNSRATTP  69"  "1 "   1  0
          0
TL0699   "TL0699 B -SILVERGT   ck 2"  "N-1" "B"
          1 "B         69"  "SILVERGT   69"  "2 "   1  0
          0
TL06902 "TL06902 NOISLMTR -CORONADO  ck 1"  "N-1" "B"
          1 "NOISLMTR  69"  "CORONADO  69"  "1 "   1  0
          0
TL06904  "TL06904 LOVELAND-ALPINE    ck 1"  "N-1" "B"
          1 "LOVELAND  69"  "ALPINE    69"  "1 "   1  0
          0
TL06905  "TL06905 GENESEE -PENSQTOS  ck 2 "  "N-1" "B"
          1 "GENESEE   69"  "PENSQTOS  69"  "2 "   1  0
          0
TL06906  "TL06906 MIRAMAR-PENSQTOS  ck 1"  "N-1" "B"
          1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
          0
TL06907  "TL06907 GENESEE -UCM       ck 1"  "N-1" "B"
          1 "GENESEE   69"  "UCM       69"  "1 "   1  0
          0
TL06908  "TL06908 ESCNDIDO-ESCO      ck 1"  "N-1" "B"
          1 "ESCNDIDO  69"  "ESCO      69"  "1 "   1  0
          0
TL06910  "TL06910 MIGUEL - BORDER    ck 1"  "N-1" "B"
      1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
```

```
        0
TL06911  "TL06911 JAMACHA-SPRNGVLY  ck 1"  "N-1" "B"
        1 "JAMACHA   69"  "SPRNGVLY  69"  "1 "   1  0
        0
TL06912  "TL06912 PENDLETN-SANLUSRY  ck 1"  "N-1" "B"
        1 "PENDLETN  69"  "SANLUSRY  69"  "1 "   1  0
        0
TL06913  "TL06913 POWAY-POMERADO  ck 1"  "N-1" "B"
        1 "POWAY     69"  "POMERADO  69"  "1 "   1  0
        0
TL06914  "TL06914 LOVELAND-LOSCOCHS  ck 1"  "N-1" "B"
        1 "LOVELAND  69"  "LOSCOCHS  69"  "1 "   1  0
        0
TL06915  "TL06915 POMERADO -SYCAMORE ck 1"  "N-1" "B"
        1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
        0
TL06916  "TL06916 SYCAMORE-SCRIPPS   ck 1"  "N-1" "B"
        1 "SYCAMORE  69"  "SCRIPPS   69"  "1 "   1  0
        0
TL06917  "TL06917 CREELMAN-SYCAMORE  ck 1"  "N-1" "B"
        1 "CREELMAN  69"  "SYCAMORE  69"  "1 "   1  0
        0
TL06918  "TL06918 ESCO-GOALLINE  ck 1 "  "N-1" "B"
        1 "ESCO      69"  "GOALLINE  69"  "1 "   1  0
        3 "GOALLINE  69"  "1 "  0
        0
TL06920  "TL06920 ARTESN-SYCAMORE  ck 1 "  "N-1" "B"
        1 "ARTESN    69"  "SYCAMORE 69"  "1 "   1  0
        0
TL06923  "TL06923 BARRETT -CAMERON  KUM SPS ck 1"  "N-1" "B"
        1 "BARRETT   69"  "CAMERON   69"  "1 "   1  0
        3 "KUMEYAAY   0.69"    "1 "  0
        0
TL06924  "TL06924 POMERADO -SYCAMORE ck 2"  "N-1" "B"
        1 "POMERADO  69"  "SYCAMORE  69"  "2 "   1  0
        0
TL06925 "TL06925 GARFIELD-EL CAJON  ck 1"  "N-1" "B"
        1 "GARFIELD  69"  "EL CAJON  69"  "1 "   1  0
        0
TL06926  "TL06926 RINCON -VALCNTR   ck 1"  "N-1" "B"
        1 "RINCON    69"  "VALCNTR   69"  "1 "   1  0
        0
```

```
TL06927  "TL06927 EASTGATE-ROSE CYN  ck 1"  "N-1" "B"
            1 "EASTGATE  69"  "ROSE CYN  69"  "1 "   1  0
            0
TL6929   "TL06929 OTAY to OY GEN  69 ck 1"  "N-1" "B"
       1 "OTAY      69"  "OY GEN    69"  "1 "  1 0
            3 "OY GEN  13.80"  "1 "   0
       0
TL06930  "TL06930 OMWD-ESCNDIDO      ck 1"  "N-1" "B"
            1 "OMWD      69"  "ESCNDIDO  69"  "1 "   1  0
            0
TL06931  "TL06931 BOULEVRD-CRESTWD   ck 1"  "N-1" "B"
       8 "BOULEVRD 69"
            4 "BOULEVRD  69"  "10"   0
            1 "BOULEVRD  69"  "CRESTWD   69"  "1 "   1  0
            0
TL06933  "TL06933 ESCNDIDO-ES GEN    ck 1"  "N-1" "B"
       1 "ESCNDIDO  69"  "ES GEN    69"  "1 "  1 0
            3 "ES GEN  13.80"  "1 "   0
       0
TLO6934  "TL06934 ESCNDIDO-CALPK ES  ck 1"  "N-1" "B"
       1 "ESCNDIDO  69"  "CALPK_ES  69"  "1 "  1 0
            3 "CALPK_ES  13.80"  "1 "   0
            0
TL06935  "TL06935 BORDER-LRKSP_BD 69 ck 1"  "N-1" "B"
       1 "BORDER    69"  "LRKSP_BD  69"  "1 "  1 0
       3 "LRKSPBD1  13.80"    "1 "  0
       3 "LRKSPBD2  13.80"    "1 "  0
            0
TL06936  "TL69036 BORDER-CALPK_BD 69 ck 1"  "N-1" "B"
       1 "BORDER    69"  "CALPK_BD  69"  "1 "  1 0
       3 "CALPK_BD  13.80"    "1 "  0
            0
TL06938  "TL06938 EL CAJON-CALPK_EC  ck 1"  "N-1" "B"
       1 "EL CAJON  69"  "CALPK_EC  69"  "1 "  1 0
       3 "CALPK_EC  13.80"    "1 "  0
            0
TL06939  "TL06939 BERNARDO-ARTESN    ck 1"  "N-1" "B"
            1 "BERNARDO  69"  "ARTESN    69"  "1 "   1  0
            0
TL06943  "TL069 TOREYPNS  to UCM     ck 1"  "N-1" "B"
            1 "TOREYPNS   69"  "UCM      69"  "1 "   1  0
            0
```

```
TL06945  "TL6945 Lkhodges-OMWD 69     ck1"  "N-1" "B"
            1 "Lkhodges 69"   "OMWD     69"  "1 "   1  0
            0
TL06946   "TL06946 CRESTWD-KUMEYAAY 69 ck1"  "N-1" "B"
       1 "CRESTWD   69"  "KUMEYAAY  69"  "1 "  1 0
       3 "KUMEYAAY   0.69"    "1 "  0
       0
TL06949  "TL06949 SILVERGT-NATNLCTY 69 ck 1"  "N-1" "B"
            1 "SILVERGT  69"  "NATNLCTY  69"  "1 "  1 0
            0
TL06950  "TL6950 DIVISION-NAVSTMTR 69 ck 1"  "N-1" "B"
            1 "DIVISION  69"  "NAVSTMTR  69"  "2 "  1 0
            0
TL06952  "TL06952 NORTHCTY-PENSQTOS  69 ck 1"  "N-1" "B"
            1 "NORTHCTY  69"  "PENSQTOS  69"  "1 "  1 0
            0
TL06956  "TL06596 ESCNDIDO-ASH      ck 1"  "N-1" "B"
            1 "ESCNDIDO  69"  "ASH      69"  "2 "   1  0
            0
############################################################
# SDG&E Bulk Power Transformer Single Outage (80s)
############################################################
EA60  "EA BK 60 230/138  "  "T-1" "B"
            2 "ENCINA   230"  "ENCINA   138"  "1 "  0
            0
#
# RFS post Sunrise
#
#ES50  "ES BK 50 138/69"  "T-1" "B"
#            2 "ESCNDO50 138"  "ESCNDIDO  69"  "2 "  0
#            0
ES70  "ES BK 70 69/230"  "T-1" "B"
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "1 "  0
            6 "ESCNDIDO 230"  "sd"   0
            0
ES71  "ES BK 71 69/230"  "T-1" "B"
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "2 "  0
            6 "ESCNDIDO 230"  "sd"   0
            0
ES72  "ES 72 BK 69/230"  "T-1" "B"
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "3 "  0
            0
```

```
IV80  "IV BK 80 230/500"  "T-1" "B"
            2 "IMPRLVLY 230"  "IMPRLVLY 500"  "2 "  0
            0
IV81  "IV BK 81 230/500"  "T-1" "B"
            2 "IMPRLVLY 230"  "IMPRLVLY 500"  "1 "  0
            0
IV82  "IV BK 82 230/500"  "T-1" "B"
            2 "IMPRLVLY 230"  "IMPRLVLY 500"  "3 "  0
            0
LC50  "LC BK 50 138/69"  "T-1" "B"
            2 "LOSCOCHS 138"  "LOSCOCHS  69"  "1 "  0
            0
LC51  "LC BK 51 69/138"  "T-1" "B"
            2 "LOSCOCHS  69"  "LOSCOCHS 138"  "2 "  0
            0
ML61  "ML BK 61 230/138"  "T-1" "B"
            2 "MIGUEL   230"  "MIGUEL   138"  "2 "  0
            0
ML60  "ML BK 60 230/138"  "T-1" "B"
            2 "MIGUEL   230"  "MIGUEL60   138"  "1 "  0
            0
ML70  "ML BK 70 69/230"  "T-1" "B"
            2 "MIGUEL    69"  "MIGUEL   230"  "1 "  0
            0
ML71  "ML BK 71 69/230"  "T-1" "B"
            2 "MIGUEL    69"  "MIGUEL   230"  "2 "  0
            0
ML80  "ML BK 80 230/500            ck 1"  "T-1" "B"
            2 "MIGUEL   230"  "MIGUELMP 500"  "1 "  0
            2 "MIGUEL    12"  "MIGUELMP 500"  "1 "  0
            2 "MIGUEL   500"  "MIGUELMP 500"  "1 "  0
            0
ML81  "ML BK 81 230/500            ck 2"  "T-1" "B"
            2 "MIGUEL   230"  "MIGUEL   500"  "2 "  0
            0
MS50  "MS BK 50 138/69                "  "T-1" "B"
            2 "MISSION  138"  "MISSION   69"  "1 "  0
            0
MS51  "MS BK 51 138/69                "  "T-1" "B"
            2 "MISSION  138"  "MISSION   69"  "2 "  0
            0
MS52    "MS BK 52 138/69              "  "T-1" "B"
```

```
        2 "MISSION  138"  "MISSION   69"  "3 "  0
        0
MS60  "MS BK 60 230/138"  "T-1" "B"
        2 "MISSION  230"  "MISSION  138"  "1 "  0
        0
MS61  "MS BK 61 230/138"  "T-1" "B"
        2 "MISSION  230"  "MISSION  138"  "2 "  0
        0
MS70  "MS BK 70 230/69"  "T-1" "B"
        2 "MISSION  230"  "MISSION   69"  "1 "  0
        0
NG500/69  "NG 500/69"  "T-1" "B"
        2 "N.GILA   500"  "N.GILA    69"  "1 "  0
        0
OT70  "OT BK 70 69/230"  "T-1" "B"
        2 "OLD TOWN  69"  "OLD TOWN 230"  "1 "  0
        0
OT71  "OT BK 71 69/230"  "T-1" "B"
        2 "OLD TOWN  69"  "OLD TOWN 230"  "2 "  0
        0
PQ50    "PQ BK 50 138/69"  "T-1" "B"
        2 "PENSQTOS 138"  "PENSQTOS  69"  "1 "  0
        0
PQ51    "PQ BK 51 69/138"  "T-1" "B"
        2 "PENSQTOS  69"  "PENSQTOS 138"  "2 "  0
        0
PQ52    "PQ BK 52 69/138"  "T-1" "B"
        2 "PENSQTOS  69"  "PENSQTOS 138"  "3 "  0
        0
PQ60     "PQ60 PENSQTOS-PENSQTOS ck 1"  "T-1" "B"
        2 "PENSQTOS 230"  "PENSQTOS 138"  "1 "  0
        0
PQ70  "PQ BK 70 230/69"  "T-1" "B"
        2 "PENSQTOS 230"  "PENSQTOS  69"  "1 "  0
        0
PQ71  "PQ BK 71 230/69"  "T-1" "B"
        2 "PENSQTOS 230"  "PENSQTOS  69"  "2 "  0
        0
SA51    "SA BK 51 138/69"  "T-1" "B"
        2 "SANLUSRY 138"  "SANLUSRY  69"  "1 "  0
        0
SA70  "SA  BK 70 69/230"  "T-1" "B"
```

```
            2 "SANLUSRY  69"  "SANLUSRY 230"  "1 "  0
            0
SA71  "SA BK 71 69/230"  "T-1" "B"
            2 "SANLUSRY  69"  "SANLUSRY 230"  "2 "  0
            0
SA72  "SA BK 72 69/230"  "T-1" "B"
            2 "SANLUSRY  69"  "SANLUSRY 230"  "3 "  0
            0
SC80   "CENTRALS BK80 230/500"  "N-1" "B"
            2 "CENTRALS 230"  "CENTRMPS 500"  "1 "  0
            2 "CENTRALS  12"  "CENTRMPS 500"  "1 "  0
            2 "CENTRALS 500"  "CENTRMPS 500"  "1 "  0
            0
SC81   "CENTRALS BK81 230/500"  "N-1" "B"
            2 "CENTRALS 230"  "CENTRMPS 500"  "2 "  0
            2 "CENTRALS  12"  "CENTRMPS 500"  "2 "  0
            2 "CENTRALS 500"  "CENTRMPS 500"  "2 "  0
            0
SG70  "SG BK 70 230/69"  "T-1" "B"
            2 "SILVERGT 230"  "SILVERGT 69"  "1 "  0
            0
SG71  "SG BK 71 230/69"  "T-1" "B"
            2 "SILVERGT 230"  "SILVERGT 69"  "2 "  0
            0
SX60  "SX BK 60 230/138"  "T-1" "B"
            2 "SYCAMORE 230"  "SYCAMORE 138"  "1 "  0
            0
SX70  "SX BK 70 230/69"  "T-1" "B"
            2 "SYCAMORE 230"  "SYCAMORE  69"  "1 "  0
            0
SX71  "SX BK 71 230/69"  "T-1" "B"
            2 "SYCAMORE 230"  "SYCAMORE  69"  "3 "  0
            0
SX72  "SX BK 72 230/69"  "T-1" "B"
            2 "SYCAMORE 230"  "SYCAMORE  69"  "2 "  0
            0
SY70    "SY BK 70 230/69"  "T-1" "B"
            2 "SOUTHBAY  69"  "SY230    230"  "1 "  0
            0
SY72    "SY BK 72 230/69"  "T-1" "B"
            2 "SOUTHBAY  69"  "SY230    230"  "2 "  0
            0
```

```
TA50    "TA BK 50 69/138"  "T-1" "B"
          2 "TALEGA    69"  "TALEGA   138"  "1 "  0
          0

TA60  "TA BK 60 230/138"  "T-1" "B"
          2 "TALEGA   230"  "TALEGA   138"  "1 "  0
          0
TA62  "TA BK 62 230/138"  "T-1" "B"
          2 "TALEGA   230"  "TALEGA   138"  "2 "  0
          0
TA61  "TA BK 61 230/138"  "T-1" "B"
          2 "TALEGA   230"  "TALEGA   138"  "3 "  0
          0
TA63  "TA BK 63 230/138"  "T-1" "B"
          2 "TALEGA   230"  "TALEGA   138"  "4 "  0
          0
############################################################
# SDG&E Selected Generator Outage (Category B: G-1)
############################################################
CALPK-BD " CALPK_BD  13.80"  "G-1" "B"
          3 "CALPK_BD  13.80"  "1 "   0
          0
CALPK-EC " CALPK_EC  13.80"  "G-1" "B"
          3 "CALPK_EC  13.80"  "1 "   0
          0
CALPK-ES " CALPK_ES  13.80"  "G-1" "B"
          3 "CALPK_ES  13.80"  "1 "   0
          0
DIVISION " DIV QF  13.80"  "G-1" "B"
          3 "DIVISION  69"  "1 "   0
          0
EA1     "EA1  14.40"  "G-1" "B"
          3 "ENCINA 1  14.40"  "1 "   0
          0
EA2     "EA2  14.40"  "G-1" "B"
          3 "ENCINA 2  14.40"  "1 "   0
          0
EA3     "EA3  14.40"  "G-1" "B"
          3 "ENCINA 3  14.40"  "1 "   0
          0
EA4     "EA4  22"  "G-1" "B"
          3 "ENCINA 4  22"  "1 "   0
```

```
            0
EA5     "EA5  24"  "G-1" "B"
            3 "ENCINA 5  24"  "1 "   0
            0
GOALLINE " GOALLINE    69"  "G-1" "B"
            3 "GOALLINE  69"  "1 "  0
            0
KUM     " KUMEYAAY   0.69"  "G-1" "B"
      3 "KUMEYAAY   0.69"    "1 "  0
            0
LkHod1  " LkHodG1  13.8"  "G-1" "B"
            3 "LkHodG1  13.8"  "1 "   0
            0
LkHod2  " LkHodG2  13.8"  "G-1" "B"
            3 "LkHodG2  13.8"  "1 "   0
            0
LRKSPBD1 "LRKSP_BD 1 13.80"  "G-1" "B"
            3 "LRKSPBD1  13.80"  "1 "   0
            0
LRKSPBD2 "LRKSP_BD 2 13.80"  "G-1" "B"
            3 "LRKSPBD2  13.80"  "1 "   0
            0
ES-GEN " ES_GEN  13.80"  "G-1" "B"
            3 "ES GEN  13.80"  "1 "   0
            0
OY-GEN " OY-GEN  13.80"  "G-1" "B"
            3 "OY GEN  13.80"  "1 "   0
            0
MEF-MR1 " MEF-MR1  13.80"  "G-1" "B"
            3 "MEF MR1   13.80"  "1 "   0
            0
MEF-MR2 " MEF-MR1  13.80"  "G-1" "B"
            3 "MEF MR2   13.80"  "1 "   0
            0
NIM-GT   "NOISLMTR  69"  "G-1" "B"
            3 "NOISLMTR  69"    "1 "  0
            0
OTAYMESA "OTAY MGP 2x1"  "G-1" "B"
            3 "OTAYMGT1 18.0"  "1 "   0
            3 "OTAYMGT2 18.0"  "1 "   0
            3 "OTAYMST1 16.0"  "1 "   0
            0
```

```
PEN      "PEN 2x1 18" "G-1" "B"
            3 "PEN_CT1   18"  "1 "  0
            3 "PEN_CT2   18"  "1 "  0
            3 "PEN_ST    18"  "1 "  0
            0
POINTLMA " PNTLMA QF  69"  "G-1" "B"
            3 "POINTLMA  69"    "1 "  0
            0
##################################################################
# SOUTHBAY UNITS 1/2/3/4 NOT IN RMR post Sunrise 2012
##################################################################
#SY1      "SY1  15"  "G-1" "B"
#            3 "SOUTHBY1  15"    "1 "  0
#            0
#SY2      "SY2  15"  "G-1" "B"
#            3 "SOUTHBY2  15"    "1 "  0
#            0
SONGS2   "SONGS unit2  22"  "G-1" "B"
            3 "S.ONOFR2  22"    "2 "  0
            0
INTRGEN  "INTRGEN "  "G-1" "B"
            3 "INTBCT    16.0"  "1 "  0
            3 "INTBST    18.0"  "1 "  0
            0
IV_GENS "IV GENS "  "G-1" "B"
            3 "IV GEN1   21.0"  "1 "  0
            3 "IV GEN2   18.0"  "1 "  0
            3 "IV GEN3   18.0"  "1 "  0
            0
LRP-U1  "LRP-U1  "  "G-1" "B"
            3 "LRP-U1    16.0"  "1 "  0
            0
PA_PKRS "PA_PKRS "  "G-1" "B"
            3 "Q201_U1  13.8"  "Q1"  0
            3 "Q201_U2  13.8"  "Q2"  0
            0
##################################################################
# Cat C N-2 COMMON STRUCTURE Contingencies
##################################################################
# SDG&E Common Structure Outages (Category C: N-2)
##################################################################
23001/23004 "SA-MS 1 + SA-MS 2 230 kV"  "N-2" "C"
```

```
        1 "SANLUSRY 230"  "MISSION  230"  "1 "   1  0
        1 "SANLUSRY 230"  "MISSION  230"  "2 "   1  0
        0
23002/23010 "SA-SO 2 + SO-SA 3 230 kV"  "N-2" "C"
        1 "SANLUSRY 230"  "S.ONOFRE 230"  "2 "   1  0
        1 "SANLUSRY 230"  "S.ONOFRE 230"  "3 "   1  0
        0
23003/23011 "SA-EA 230 kV + SA-ES-EA 230 kV"  "N-2" "C"
        1 "SANLUSRY 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        0
23007/23052 "TA-SO 1 + 2 230 kV          "  "N-2" "C"
        1 "TALEGA   230"  "S.ONOFRE 230"  "1 "   1  0
        1 "TALEGA   230"  "S.ONOFRE 230"  "2 "   1  0
        0
23011/23012 "23011/12 EA-PEN-SA & EA-PQ  "  "N-2" "C"
        1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        1 "PENSQTOS 230"  "ENCINA   230"  "1 "   1  0
        0
23011/23051 "SX-PEN + PEN-EA-SA 230 kV   "  "N-2" "C"
        1 "SYCAMORE 230"  "PEN      230"  "1 "   1  0
        1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        0
23011/13805 "SA-EA-PEN 230kV + BQ-PA 138kV"  "N-2" "C"
        1 "ENCINA   230"  "ENCINATP 230"  "1 "   1  0
        1 "SANLUSRY 230"  "ENCINATP 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        1 "PALOMAR  138"  "BATIQTOS 138"  "1 "   1  0
        0
23012/23053 "PQ-EA #1 & #2               "  "N-2" "C"
        1 "PENSQTOS 230"  "ENCINA   230"  "1 "   1  0
        1 "PENSQTOS 230"  "ENCINA   230"  "2 "   1  0
        0
23014/23015 "PEN-ES #1 + #2 230 kV       "  "N-2" "C"
        1 "PEN      230"  "ESCNDIDO 230"  "1 "   1  0
        1 "PEN      230"  "ESCNDIDO 230"  "2 "   1  0
```

```
        0
23021/23041 "MML-SX 230 kV  MLTP-SX Pre 565     "  "N-2" "C"
        1 "SYCAMORE 230"  "MIGUEL   230"  "1 "   1  0
        1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "   1  0
        0
23021/23041 "MML-SX 230 kV  MLTP-SX post 565     "  "N-2" "C"
        1 "SYCAMORE 230"  "C565   230"  "1 "   1  0
        1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "   1  0
        0
23022/23023_NOSPS "ML-MS 230 kV #1&#2          "  "N-2" "C"
        1 "MIGUEL   230"  "MISSION  230"  "1 "   1  0
        1 "MIGUEL   230"  "MISSION  230"  "2 "   1  0
        0
23027/23028 "23027/28 OT-MS & OT-SG-MS   "  "N-2" "C"
        1 "OLD TOWN 230"  "MISSION  230"  "1 "   1  0
        1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
        1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
        1 "MISSION  230"  "OLDTWNTP 230"  "1 "   1  0
        0
23028/23029 "SG-OT 230kV #1+#2          "  "N-2" "C"
        1 "SILVERGT 230"  "OLD TOWN 230"  "1 "   1  0
        1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "   1  0
        1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "   1  0
        1 "MISSION  230"  "OLDTWNTP 230"  "1 "   1  0
        0
23030/6932 "ES-TA 230 kV & LI-PA 69 kV     "  "N-2" "C"
        1 "ESCNDIDO 230"  "TALEGA   230"  "1 "   1  0
        1 "LILAC     69"  "PALA      69"  "1 "   1  0
        0
23003/23053 "23003/53 SA-EN & PQ-EA      "  "N-2" "C"
        1 "SANLUSRY 230"  "ENCINA   230"  "1 "   1  0
        1 "PENSQTOS 230"  "ENCINA   230"  "2 "   1  0
        0
23006/13802 "23006/13802 SA-SONGS & SA-CAN"  "N-2" "C"
        1 "SANLUSRY 230"  "S.ONOFRE 230"  "1 "   1  0
        1 "CANNON   138"  "SANLUSRY 138"  "1 "   1  0
        0
23011/13805 "23011/13805 EA-PEN-SA & PA-BQ "  "N-2" "C"
        1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        1 "PALOMAR  138"  "BATIQTOS 138"  "1 "   1  0
```

```
        0
23011/13806 "EA-SA-PEN 230 kV + EA-PA 138 kV "  "N-2" "C"
        1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        1 "ENCINA   138"  "PALOMAR  138"  "1 "   1  0
        0
23011/13825 "EA-SA-PEN 230 kV + BQ-SH 138 kV "  "N-2" "C"
        1 "ENCINATP 230"  "ENCINA   230"  "1 "   1  0
        1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
        1 "PEN      230"  "ENCINATP 230"  "1 "   1  0
        1 "SHADOWR  138"  "BATIQTOS 138"  "1 "   1  0
        0
23051/6920 "SX-PEN 230 kV + BE-AR 69 kV  "  "N-2" "C"
        1 "SYCAMORE 230"  "PEN      230"  "1 "   1  0
        1 "BERNARDO  69"  "ARTESN    69"  "1 "   1  0
        0
23051A/6920B "SX-PEN 230 kV + AR-SX 69 kV   B"  "N-2" "C"
        1 "SYCAMORE 230"  "PEN      230"  "1 "   1  0
        1 "ARTESN    69"  "SYCAMORE  69"  "1 "   1  0
        0
23041/23021 "ML-SX +OMGP-ML TAP-SX 230 kV pre 565"  "N-2" "C"
        1 "SYCAMORE 230"  "MIGUEL   230"  "1 "  1 0
        1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "  1 0
        1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
        0
23041/23021 "ML-SX +OMGP-ML ML TAP-SX 230 kV post 565"  "N-2" "C"
        1 ""SYCAMORE 230"  "C565   230""  "1 "  1 0
        1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "  1 0
        1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
        0
#23041/42A "OMGP-ML TAPS #1+#2  230 kV"  "N-2" "C"
#       1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "  1 0
#       1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
#       0
#23041/42B "OMGP-ML #1+#2          230 kV"  "N-2" "C"
#       1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "  1 0
#       1 "MIGUEL   230"  "MLMS3TAP 230"  "1 "  1 0
#       1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
#       1 "MIGUEL   230"  "MLSXTAP  230"  "1 "  1 0
#       0
#23041/42C "OMGP-ML-SY + OMGP-ML-SX 230 kV no sps"  "N-2" "C"
```

```
#            1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "  1 0
#            1 "MIGUEL   230"  "MLMS3TAP 230"  "1 "  1 0
#            1 "SY230    230"  "MLMS3TAP 230"  "1 "  1 0
#            1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
#            1 "MIGUEL   230"  "MLSXTAP  230"  "1 "  1 0
#            1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "  1 0
#            0
13802/13801 "CAN-SA + EA-CAN 138 kV       "  "N-2" "C"
            1 "ENCINA   138"  "CANNON   138"  "1 "   1  0
            1 "CANNON   138"  "SANLUSRY 138"  "1 "   1  0
            4 "CANNON   138"  "10"   0
            0
13801/13804 "EA-CAN & EA-BQ-PQ           "  "N-2" "C"
            1 "ENCINA   138"  "CANNON   138"  "1 "   1  0
            1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
            1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
            0
13804/13806 "EA-PA + EA-BQ-PQ 138 kV     "  "N-2" "C"
            1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "PENSQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
            1 "ENCINA   138"  "PALOMAR  138"  "1 "   1  0
            0
13809/13824 "13809/13824PV-TC & LC-TC-ML60"  "N-2" "C"
            1 "PRCTRVLY 138"  "TELECYN  138"  "1 "   1  0
            1 "LOSCOCHS 138"  "MIGUEL60 138"  "1 "   1  0
            1 "TELECYN  138"  "MIGUEL60 138"  "1 "   1  0
            2 "MIGUEL   230"  "MIGUEL60 138"  "1 "   1  0
            0
23042/13815 "OMGP-ML-SY  & GRNTHIL-SY     "  "N-2" "C"
            1 "SY230    230"  "MLMS3TAP 230"  "1 "   1  0
            1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "   1  0
            1 "MIGUEL   230"  "MLMS3TAP 230"  "1 "   1  0
            1 "GRNT HLL 138"  "TELECYN  138"  "1 "   1  0
            0
13812/695 "13812/695 TA-SMO & TA-JM-CI   "  "N-2" "C"
            4 "CRSTNTS   69"  "10"   0
            1 "CRSTNTS   69"  "TALEGATP  69"  "1 "   1  0
            1 "JAP MESA  69"  "TALEGATP  69"  "1 "   1  0
            1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
            1 "TALEGA   138"  "SANMATEO 138"  "1 "   1  0
```

```
        0
13816/13833 "PI-CP & TA-TB              "  "N-2" "C"
        1 "PICO     138"  "CAPSTRNO 138"  "1 "   1  0
        1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
        0
13819/636   "LC-SN + LC-EL 138/69  kV    "   "N-2" "C"
        1 "LOSCOCHS 138"  "SANTEE   138"  "1 "   1  0
        1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
        0
13821/636   "SX-SN + LC-EL         ck 1"  "N-2" "C"
        1 "SYCAMORE 138"  "SANTEE   138"  "1 "   1  0
        1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
        0
13828/22  "TL13828 + TL13822          "  "N-2" "C"
        1 "SYCAMORE 138"  "CARLTNHS 138"  "1 "   1  0
        1 "MISSION  138"  "CARLTNHS 138"  "1 "   1  0
        0
13835/13833 "TA-TB + LNL-TA TAP-SMO 138 kV"  "N-2" "C"
        1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
        1 "SANMATEO 138"  "TA TAP    138"  "1 "   1  0
        1 "TA TAP   138"  "LAGNA NL  138"  "1 "   1  0
        1 "TALEGA   138"  "TA TAP    138"  "1 "   1  0
        0
13822/636  "TL13822 + TL636 69kV"  "N-2" "C"
        1 "MISSION  138"  "CARLTNHS  138"  "1 "   1  0
        1 "LOSCOCHS  69"  "ELLIOTT    69"  "1 "   1  0
    0
13822/671  "TL13822 + MS-EL 69kV"  "N-2" "C"
        1 "MISSION  138"  "CARLTNHS  138"  "1 "   1  0
        1 "MISSION   69"  "ELLIOTT    69"  "1 "   1  0
    0
13825/13811 "SH-CC AND SH-BQ    138 kV   "  "N-2" "C"
        1 "SHADOWR  138"  "CHCARITA 138"  "1 "   1  0
        1 "BATIQTOS 138"  "SHADOWR  138"  "1 "   1  0
        0
13836/13833 "TA-TB + TA-PI          ck 1"  "N-2" "C"
        1 "TALEGA   138"  "TRABUCO  138"  "1 "   1  0
        1 "TALEGA   138"  "PICO     138"  "1 "   1  0
        0
TL13822/TL671 "LC-SN + MS-EL        ck 1"  "N-2" "C"
        1 "LOSCOCHS 138"  "SANTEE    138"  "1 "   1  0
        1 "LOSCOCHS  69"  "ELLIOTT    69"  "1 "   1  0
```

```
      0
13824/632  "LC-TC-ML60+ML-GRTap 138/69kV"  "N-2" "C"
            1 "LOSCOCHS 138"  "MIGUEL60 138"  "1 "   1  0
            1 "TELECYN  138"  "MIGUEL60 138"  "1 "   1  0
            2 "MIGUEL   230"  "MIGUEL60 138"  "1 "   1  0
            1 "MIGUEL    69"  "GRANITTP  69"  "1 "   1  0
            0
13804/6906 "EA-BQ-PQ 138 kV + MR-PQ  69 kV"  "N-2" "C"
            1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
            1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
            1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
            0
13810/670 "DB-FR-MIR 138 kV + CM-MS 69 kV"   "N-2" "C"
            1 "DOUBLET  138"  "DOUBLTTP 138"  "1 "   1  0
            1 "FRIARS   138"  "DOUBLTTP 138"  "1 "   1  0
            1 "PENSQTOS 138"  "DOUBLTTP 138"  "1 "   1  0
            1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
            0
13827/670 "FR-MS 138 kV + CM-MS 69 kV    "   "N-2" "C"
            1 "FRIARS   138"  "MISSION  138"  "1 "   1  0
            1 "CLAIRMNT  69"  "MISSION   69"  "1 "   1  0
            0
#13835/695 "LNL-TA TAP-SMO 138 kV + CI-JA-TA 69 kV"  "N-2" "C"
#           1 "CRSTNTS   69"  "TALEGATP  69"  "1 "   1  0
#           1 "JAP MESA  69"  "TALEGATP  69"  "1 "   1  0
#           1 "TALEGA    69"  "TALEGATP  69"  "1 "   1  0
#           1 "SANMATEO 138"  "TA TAP    138"  "1 "   1  0
#           1 "TA TAP   138"  "LAGNA NL  138"  "1 "   1  0
#           1 "TALEGA   138"  "TA TAP    138"  "1 "   1  0
#           4 "CRSTNTS   69"  "10"   0
#           0
TL606/6950  "DI-NSM 69kV #1+#2" "N-2" "C"
            1 "DIVISION   69"  "NAVSTMTR  69"  "1 "   1  0
            1 "DIVISION   69"  "NAVSTMTR  69"  "2 "   1  0
            0
616/6939 "LHM-BE-RSF + BE-AR             "   "N-2" "C"
            1 "Lkhodges 69"   "BERNDOTP  69"  "1 "   1  0
            1 "BERNARDO  69"  "BERNDOTP  69"  "1 "   1  0
            1 "R.SNTAFE  69"  "BERNDOTP  69"  "1 "   1  0
            1 "BERNARDO  69"  "ARTESN    69"  "1 "   1  0
            0
```

```
626/637  "DE-ST-BC + CRE-ST            "  "N-2"  "C"
           1 "BLDCRKTP  69"  "DESCANSO  69"  "1 "   1  0
           1 "BLDCRKTP  69"  "SANTYSBL  69"  "1 "   1  0
           1 "BLDCRKTP  69"  "BOLDRCRK  69"  "1 "   1  0
           1 "SANTYSBL  69"  "CREELMAN  69"  "1 "   1  0
           0
636/639  "LC-EL & SX-EL 69 kV "  "N-2" "C"
           1 "LOSCOCHS  69"  "ELLIOTT   69"  "1 "   1  0
           1 "SYCAMORE  69"  "ELLIOTT   69"  "1 "   1  0
           0
643/627 "ML-JM 1 + 2 69 kV             "  "N-2"  "C"
           1 "MIGUEL    69"  "JAMACHA   69"  "1 "   1  0
           1 "MIGUEL    69"  "JAMACHA   69"  "2 "   1  0
           0
661/664  "PQ-EG + PQ-MR1-RN            "  "N-2"  "C"
           1 "EASTGATE  69"  "PENSQTOS   69"  "1 "   1  0
           1 "PENSQTOS  69"  "MIRAMRTP   69"  "1 "   1  0
           1 "MIRAMAR1  69"  "MIRAMRTP   69"  "1 "   1  0
           1 "ROSE CYN  69"  "MIRAMRTP   69"  "1 "   1  0
      0
664/668  "PQ-MR1-RN + FE-MR1-MR        "  "N-2"  "C"
           1 "ROSE CYN  69"  "MIRAMRTP  69"  "1 "   1  0
           1 "PENSQTOS  69"  "MIRAMRTP  69"  "1 "   1  0
           1 "MIRAMAR1  69"  "MIRAMRTP  69"  "1 "   1  0
           4 "FENTON    69"  "10"   0
           1 "FENTON    69"  "FENTONTP  69"  "1 "   1  0
           1 "MIRAMAR1  69"  "FENTONTP  69"  "1 "   1  0
           1 "MIRAMAR   69"  "FENTONTP  69"  "1 "   1  0
           0
6906/675 "MR-PQ + PQ-MRM               "  "N-2"  "C"
           1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
           1 "PENSQTOS  69"  "MESA RIM  69"  "1 "   1  0
           0
677/6906 "MRM-MR + PQ-MR               "  "N-2"  "C"
           1 "MESA RIM  69"  "MIRAMAR   69"  "1 "   1  0
           1 "MIRAMAR   69"  "PENSQTOS  69"  "1 "   1  0
           0
690/697  "STU-OC-SA-LP + SA-OC         "  "N-2"  "C"
           4 "STUART    69"  "10"   0
           1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
           1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
           1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
```

```
            1 "LASPULGS  69"  "STUARTTP  69"  "1 "   1  0
            1 "SANLUSRY  69"  "OCEANSDE  69"  "1 "   1  0
            0
690/6912 "STU-OC-SA-LP + SA-PE          "  "N-2"  "C"
            4 "STUART    69"  "10"   0
            1 "OCNSDETP  69"  "OCEANSDE  69"  "1 "   1  0
            1 "OCNSDETP  69"  "SANLUSRY  69"  "1 "   1  0
            1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
            1 "STUARTTP  69"  "LASPULGS  69"  "1 "   1  0
            1 "PENDLETN  69"  "SANLUSRY  69"  "1 "   1  0
            0
6924/6915 "POM-SX #1+#2                 "  "N-2"  "C"
            1 "POMERADO  69"  "SYCAMORE  69"  "2 "   1  0
            1 "POMERADO  69"  "SYCAMORE  69"  "1 "   1  0
            0
##################################################################
# Cat C Stuck Breaker Contiongencies
##################################################################
# SDG&E Stuck Breaker Outages (Category C: Stuck Breaker)
# Note: Alphabetical Order
# Note: This section matches the Grid Operations stuck breaker list
#       used in the 2009-10 Contingency Reference Manual
##################################################################
#IV-8022 "IV 8022 50002 & BK81 CB"  "CB"  "C"
#            1 "N.GILA   500"  "IMPRLVLY 500"  "1 "   1  0
#            2 "IMPRLVLY 230"  "IMPRLVLY 500"  "1 "   0
#            0
#IV-8032 "IV 8032 50001 & BK82 CB"  "CB"  "C"
#            1 "IMPRLVLY 500"  "MIGUEL   500"  "1 "   1  0
#            2 "IMPRLVLY 230"  "IMPRLVLY 500"  "3 "   0
#            3 "INTBCT    16.0"  "1 "  0
#            3 "INTBST    18.0"  "1 "  0
#            3 "IV GEN1   21.0"  "1 "  0
#            3 "IV GEN2   18.0"  "1 "  0
#            3 "IV GEN3   18.0"  "1 "  0
#            3 "LRP-U1    16.0"  "1 "  0
#            0
EA-1E  "ENCINA 230 kV 1E CB"  "CB" "C"
            2 "ENCINA   230"  "ENCINA   138"  "1 "  0
            1 "PENSQTOS 230"  "ENCINA   230"  "1 "  1 0
            0
EA-1T  "ENCINA 230 kV 1T CB"  "CB" "C"
```

```
            1 "PENSQTOS 230"  "ENCINA   230"  "1 "  1 0
            1 "ENCINATP 230"  "ENCINA   230"  "1 "  1 0
            0
EA-1W  "ENCINA 230 kV 1W CB"  "CB" "C"
            1 "ENCINATP 230"  "ENCINA   230"  "1 "  1 0
            3 "ENCINA 5  24"   "1 "   0
            0
EA-2E  "ENCINA 230 kV 2E CB"  "CB" "C"
            2 "ENCINA   230"  "ENCINA   138"  "1 "  0
            1 "PENSQTOS 230"  "ENCINA   230"  "2 "  1 0
            0
EA-2T  "ENCINA 230 kV 2T CB"  "CB" "C"
            1 "PENSQTOS 230"   "ENCINA   230"  "2 "  1  0
            3 "ENCINA 5  24"   "1 "   0
            0
EA-2W  "ENCINA 230 kV 2W CB"  "CB" "C"
            1 "ENCINA   230"  "SANLUSRY 230"  "1 "   1  0
            3 "ENCINA 5  24"  "1 "    0
            0
ES-2T  "ESCNDIDO 230 kV 2T CB" "CB" "C"
            2 "ESCNDIDO  69"  "ESCNDIDO 230"  "3 "  0
            1 "PEN      230"  "ESCNDIDO 230"  "2 "  1 0
            0
IV-11T "IMPRLVLY 230 kV 11T CB" "CB" "C"
            2 "IMPRLVLY 230"  "IMPRLVLY 500"  "1 "  0
            1 "IMPRLVLY 230"  "ROA-230  230"  "1 "  1 0
            0
ML-2T  "MIGUEL 230 kV 2T CB" "CB" "C"
            2 "MIGUEL   230"  "MIGUEL   500"  "2 "  0
            1 "MIGUEL   230"  "SYCAMORE 230"  "1 "  1 0
            0
ML-4T  "MIGUEL 230 kV 4T CB" "CB" "C"
            2 "MIGUEL    69"  "MIGUEL   230"  "2 "  0
            1 "MIGUEL   230"  "MLSXTAP 230"  "1 "  1 0
            0
ML-7T-A   "MIGUEL 230 kV 7T A CB" "CB" "C"
            1 "MLMS3TAP 230"  "SY230    230"  "1 "   1  0
            1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "   1  0
            1 "MIGUEL   230"  "MLMS3TAP 230"  "1 "   1  0
            2 "MIGUEL   230"  "MIGUEL   138"  "2 "   1  0
            0
#
```

```
# IF TAP OPEN ON 23042 ONLY BK60 TRIPS
#
ML-7T-B   "MIGUEL 230 kV 7T B CB" "CB" "C"
          2 "MIGUEL   230"  "MIGUEL   138"  "2 "   1  0
          0
MS-1T  "MISSION 230 kV 1T CB" "CB" "C"
          2 "MISSION  230"  "MISSION  138"  "1 "  0
          1 "MISSION  230"  "OLDTWNTP 230"  "1 "  1  0
          0
MS-2T  "MISSION 230 kV 2T CB" "CB" "C"
          2 "MISSION  230"  "MISSION   69"  "1 "  0
          1 "OLD TOWN 230"  "MISSION  230"  "1 "  1 0
          0
MS-3T  "MISSION 230 kV 3T CB" "CB" "C"
          2 "MISSION  230"  "MISSION  138"  "2 "  0
          1 "SANLUSRY 230"  "MISSION  230"  "2 "  1 0
          0
MS-5T  "MISSION 230 kV 5T CB" "CB" "C"
          1 "MIGUEL   230"  "MISSION  230"  "1 "   1  0
          1 "MIGUEL   230"  "MISSION  230"  "2 "   1  0
          0
OT-1N "OLD TOWN 230 kV 1N CB" "CB" "C"
          2 "OLD TOWN  69"  "OLD TOWN 230"  "1 "  1 0
          1 "SILVERGT 230"  "OLD TOWN 230"  "1 "  1 0
          0
OT-1T "OLD TOWN 230 kV 1T CB" "CB" "C"
          1 "SILVERGT 230"  "OLD TOWN 230"  "1 "  1 0
          1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "  1 0
          1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "  1 0
          1 "MISSION  230"  "OLDTWNTP 230"  "1 "  1 0
          0
OT-1S "OLD TOWN 230 kV 1S CB" "CB" "C"
          2 "OLD TOWN  69"  "OLD TOWN 230"  "2 "  1 0
          1 "OLD TOWN 230"  "OLDTWNTP 230"  "1 "  1 0
          1 "SILVERGT 230"  "OLDTWNTP 230"  "1 "  1 0
          1 "OLDTWNTP 230"  "MISSION  230"  "1 "  1 0
          0
OT-2N  "OLD TOWN 230 kV 2N CB" "CB" "C"
          1 "PENSQTOS 230"  "OLD TOWN 230"  "1 "  1 0
          2 "OLD TOWN  69"  "OLD TOWN 230"  "1 "  0
          0
OT-2S  "OLD TOWN 230 kV 2S CB" "CB" "C"
```

```
            2 "OLD TOWN  69"  "OLD TOWN 230"  "2 "  0
            1 "OLD TOWN 230"  "MISSION  230"  "1 "  1 0
            0
OT-2T  "OLD TOWN 230 kV 2T CB" "CB" "C"
            1 "PENSQTOS 230"  "OLD TOWN 230"  "1 "  1 0
            1 "OLD TOWN 230"  "MISSION  230"  "1 "  1 0
            0
SA-1T  "SANLUSRY 230 kV 1T CB" "CB" "C"
            1 "SANLUSRY 230"  "S.ONOFRE 230"  "1 "   1  0
            1 "SANLUSRY 230"  "S.ONOFRE 230"  "2 "   1  0
            0
SA-2T  "SANLUSRY 230 kV 2T CB" "CB" "C"
            2 "SANLUSRY  69"  "SANLUSRY 230"  "1 "  0
            1 "SANLUSRY 230"  "MISSION  230"  "1 "  1 0
            0
SA-3T  "SANLUSRY 230 kV 3T CB" "CB" "C"
            1 "SANLUSRY 230"  "S.ONOFRE 230"  "3 "  1 0
            1 "SANLUSRY 230"  "ENCINA   230"  "1 "   1  0
            0
SA-4T  "SANLUSRY 230 kV 4T CB" "CB" "C"
            2 "SANLUSRY  69"  "SANLUSRY 230"  "3 "  0
            1 "ENCINATP 230"  "SANLUSRY 230"  "1 "   1  0
            0
SA-5T  "SANLUSRY 230 kV 5T CB" "CB" "C"
            2 "SANLUSRY 230"  "SANLUSRY  69"  "2 "  0
            1 "SANLUSRY 230"  "MISSION  230"  "2 "  1 0
            0
SX-21T "SYCAMORE 230 kV 21T CB" "CB" "C"
            1 "PEN      230"  "SYCAMORE 230"  "1 "   1  0
            1 "CENTRALS 230"  "SYCAMORE 230"  "1 "   1  0
            0
SX-22T "SYCAMORE 230 kV 22T CB" "CB" "C"
            1 "CENTRALS 230"  "SYCAMORE 230"  "2 "   1  0
            1 "MIGUEL   230"  "SYCAMORE 230"  "1 "   1  0
            0
SX-23T "SYCAMORE 230 kV 23T CB" "CB" "C"
            2 "SYCAMORE 230"  "SYCAMORE  69"  "1 "  0
            1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "  1 0
            1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
            0
SX-23T "SYCAMORE 230 kV 23T CB" "CB" "C"
            2 "SYCAMORE 230"  "SYCAMORE  69"  "1 "  0
```

```
        1 "SYCAMORE 230"  "C565  230"  "1 "  1 0
        0
SY-1T  "SY230 230 kV 1T CB" "CB" "C"
        1 "SILVERGT 230"  "SY230    230"  "1 "   1  0
        2 "SOUTHBAY  69"  "SY230    230"  "1 "  0
        0
TA-1W "TALEGA 230 kV 1W CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "4 "  0
        1 "TALEGA   230"  "S.ONOFRE 230"  "2 "  1 0
        0
TA-1T "TALEGA 230 kV 1T CB" "CB" "C"
        1 "TALEGA   230"  "S.ONOFRE 230"  "2 "  1 0
        6 "TALEGA   230"  "sd" 0
        0
TA-1E "TALEGA 230 kV 1E CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "1 "  0
        6 "TALEGA   230"  "sd" 0
        0
TA-2E "TALEGA 230 kV 2E CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "1 "  0
        1 "ESCNDIDO 230"  "TALEGA   230"  "1 "  1 0
        0
TA-2T "TALEGA 230 kV 2T CB" "CB" "C"
        1 "TALEGA   230"  "S.ONOFRE 230"  "1 "  1 0
        1 "ESCNDIDO 230"  "TALEGA   230"  "1 "  1 0
        0
TA-2W  "TALEGA 230 kV 2W CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "4 "  0
        1 "TALEGA   230"  "S.ONOFRE 230"  "1 "  1 0
        0
TA-4E  "TALEGA 230 kV 4E CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "1 "  0
        2 "TALEGA   230"  "TALEGA   138"  "3 "  0
        0
TA-4T  "TALEGA 230 kV 4T CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "3 "  0
        2 "TALEGA   230"  "TALEGA   138"  "2 "  0
        0
TA-4W  "TALEGA 230 kV 4W CB" "CB" "C"
        2 "TALEGA   230"  "TALEGA   138"  "3 "  0
        2 "TALEGA   230"  "TALEGA   138"  "4 "  0
        0
```

```
##############################################################################
#    STUCK CIRCUIT BREAKERS (138 kV)                                         #
##############################################################################
#
# POST SUNRISE TL13811 NOT CONNECTED TO ES 138 kV
#
#ES50-1N  "ESCONDIDO 50 138 kV  CB" "CB" "C"
#            2 "ESCNDO50 138"  "ESCNDIDO  69"  "2 "  0
#            1 "SHADOWR  138"  "ESCNDO50 138"  "1 "  1 0
#            0
CC-BT   "CHICARITA 138 kV BT CB"  "CB"  "C"
            1 "SYCAMORE 138"  "CHCARITA 138"  "1 "   1  0
            1 "SHADOWR  138"  "CHCARITA 138"  "1 "   1  0
            0
LC-1N  "LOSCOCHS 138 kV 1N CB" "CB" "C"
            2 "LOSCOCHS 138"  "LOSCOCHS  69"  "1 "  0
            1 "LOSCOCHS 138"  "SANTEE   138"  "1 "  1 0
            0
LC-1S  "LOSCOCHS 138 kV 1S CB" "CB" "C"
            2 "LOSCOCHS  69"  "LOSCOCHS 138"  "2 "  0
            1 "LOSCOCHS 138"  "SANTEE   138"  "1 "  1 0
            0
LC-4N  "LOSCOCHS 138 kV 4N CB" "CB" "C"
            2 "LOSCOCHS 138"  "LOSCOCHS  69"  "1 "  0
            1 "LOSCOCHS 138"  "MIGUEL60 138"  "1 "   1  0
            1 "TELECYN  138"  "MIGUEL60 138"  "1 "   1  0
            2 "MIGUEL   230"  "MIGUEL60 138"  "1 "   1  0
            0
LC-4S  "LOSCOCHS 138 kV 4S CB" "CB" "C"
            2 "LOSCOCHS  69"  "LOSCOCHS 138"  "2 "  0
            1 "LOSCOCHS 138"  "MIGUEL60 138"  "1 "   1  0
            1 "TELECYN  138"  "MIGUEL60 138"  "1 "   1  0
            2 "MIGUEL   230"  "MIGUEL60 138"  "1 "   1  0
            0
PQ-6N  "PENSQTOS 138 kV 6N CB" "CB" "C"
            1 "BATIQTOS 138"  "BATIQTP  138"  "1 "   1  0
            1 "BATIQTP  138"  "PENSQTOS 138"  "1 "   1  0
            1 "ENCINA   138"  "BATIQTP  138"  "1 "   1  0
            1 "DOUBLET  138"  "DOUBLTTP 138"  "1 "   1  0
            1 "FRIARS   138"  "DOUBLTTP 138"  "1 "   1  0
            1 "DOUBLTTP 138"  "PENSQTOS 138"  "1 "   1  0
            0
```

```
#
#PQ-6S  13807 CONSUMMED BY NEW 23053 EA-PQ #2
#
TA-5E  "TALEGA 138 kV 5E CB" "CB" "C"
            2 "TALEGA   230"  "TALEGA   138"  "1 "  0
            2 "TALEGA   230"  "TALEGA   138"  "3 "  0
            0
TA-5T  "TALEGA 138 kV 5T CB" "CB" "C"
            2 "TALEGA   230"  "TALEGA   138"  "3 "  0
            2 "TALEGA   230"  "TALEGA   138"  "2 "  0
            0
TA-5W  "TALEGA 138 kV 5W CB" "CB" "C"
            2 "TALEGA   138"  "TALEGA    69"  "1 "  0
            2 "TALEGA   230"  "TALEGA   138"  "3 "  0
            2 "TALEGA   230"  "TALEGA   138"  "4 "  0
            0
TA-6T  "TALEGA 138 kV 6T CB" "CB" "C"
            2 "TALEGA   230"  "TALEGA   138"  "1 "  0
            1 "TALEGA   138"  "SANMATEO 138"  "1 "  1 0
            0
TA-6W  "TALEGA 138 kV 6W CB" "CB" "C"
            2 "TALEGA    69"  "TALEGA   138"  "1 "  0
            2 "TALEGA   230"  "TALEGA   138"  "4 "  0
            1 "TALEGA   138"  "SANMATEO 138"  "1 "  1 0
            0
TA-7T  "TALEGA 138 kV 7T CB" "CB" "C"
            2 "TALEGA   230"  "TALEGA   138"  "1 "  0
            1 "TALEGA   138"  "TRABUCO  138"  "1 "  1 0
            0
TA-7W  "TALEGA 138 kV 7W CB" "CB" "C"
            2 "TALEGA    69"  "TALEGA   138"  "1 "  0
            2 "TALEGA   230"  "TALEGA   138"  "4 "  0
            1 "TALEGA   138"  "TRABUCO  138"  "1 "  1 0
            0
TA-8E  "TALEGA 138 kV 8E CB" "CB" "C"
            2 "TALEGA   230"  "TALEGA   138"  "1 "  0
            1 "TALEGA   138"  "R.MSNVJO 138"  "1 "  1 0
            0
TA-8T  "TALEGA 138 kV 8T CB" "CB" "C"
            1 "TALEGA   138"  "R.MSNVJO 138"  "1 "  1 0
            1 "TALEGA   138"  "PICO     138"  "1 "  1 0
            0
```

```
TA-8W  "TALEGA 138 kV 8W CB" "CB" "C"
            2 "TALEGA    69"  "TALEGA   138"  "1 "  0
            2 "TALEGA   230"  "TALEGA   138"  "4 "  0
            1 "TALEGA   138"  "PICO     138"  "1 "  1 0
            0
TA-BK50  "TALEGA 138 kV BK50 CB" "CB" "C"
            2 "TALEGA    69"  "TALEGA   138"  "1 "  0
            2 "TALEGA   230"  "TALEGA   138"  "4 "  0
            0
TB-CB    "TRABUCO 138 kV 13830 or13834 CB" "CB" "C"
            1 "MARGARTA 138"  "TRABUCO  138"  "1 "  1 0
            1 "CAPSTRNO 138"  "TRABUCO  138"  "1 "  1 0
            0
##########################################################################
#     STUCK CIRCUIT BREAKERS (69 kV)
##########################################################################
EG-BT  "EASTGATE 69 kV   CB"  "CB" "C"
            1 "EASTGATE  69"  "ROSE CYN  69"  "1 "   1  0
            1 "EASTGATE  69"  "PENSQTOS  69"  "1 "   1  0
            8 "EASTGATE  69"
            0
LKHD69 "LKHODGES 69 kV BT" "BUS" "C"
            1 "Lkhodges  69"  "OMWD      69"  "1 "   1  0
            1 "Lkhodges  69"  "BERNDOTP  69"  "1 "   1  0
            3 "LkHodG1  13.8"  "1 "  0
            3 "LkHodG2  13.8"  "1 "  0
            0
##########################################################
##
## SPS's
##
##########################################################
##VERIFY TRIP OF 685
#6.1. 500kV TL 50001 IV Generator SPS (protects CFE TJI-ROA 230kV)
# Note:  Below contingency may or may not solve if running a post contingency
# epcl which redispatches generation
#50001 SWPL + IV Gens: SPS6.1       "  "N-1" "B"
#################################################################
#SPS6.1 "TL50001 SPS trip IV Gens SPS6.1"  "N-1" "B"
#            1 "IMPRLVLY  500" "MIGUEL   500"  "1 "   1  0
#            3  "LRP-U1    16"    "1 "  0
#            3  "INTBST    18"    "1 "  0
```

```
#           3  "INTBCT    16"    "1 "  0
#           3  "IV GEN1   21"    "1 "  0
#           3  "IV GEN2   18"    "1 "  0
#           3  "IV GEN3   18"    "1 "  0
#           1  "WARNERS   69"     "SANTYSBL  69"  "1 "   1  0
#           0
############################################################
#6.2. CFE SPSto protect lines from La Rosita to Tijuana
# SPS6.2 CFE SPSto protect lines from La Rosita to Tijuana
####################################################################
SPS6.2A "IV-ECO SPS+IVGens+IV-ROA"  "N-1" "B"
            1 "IMPRLVLY 500" "ECO 500" "1 " 1  0
            3 "C510_G1 0.2" "C1" 0
            3 "C510_G2 0.2" "C1" 0
            8 "C510 230"
            3 "Q78_1A1Q 0.48" "Q1" 0
            3 "Q78_1A2Q 0.48" "Q2" 0
            3 "Q78_1B1Q 0.48" "Q3" 0
            8 "Q78 230"
            3 "T429_G1 13.8" "T " 0
            3 "T442_G1 34.5" "T " 0
            3 "INTBCT 16" "1 " 0
            3 "INTBST 18" "1 " 0
            3 "IV GEN1 21" "1 " 0
            3 "IV GEN2 18" "1 " 0
            3 "IV GEN3 18" "1 " 0
            3 "LRP-U1 16" "1 " 1 PGEN 45
            1  "IMPRLVLY 230.00"  "ROA-230  230.00"  "1 "  1 0
            0
## SPS6.2 CFE SPSto protect lines from TJI to OTAYMESA
SPS6.2B "IV-ECO SPS+IVGens+OM-TJI"  "N-1" "B"
            1 "IMPRLVLY 500" "ECO 500" "1 " 1  0
            3 "C510_G1 0.2" "C1" 0
            3 "C510_G2 0.2" "C1" 0
            8 "C510 230"
            3 "Q78_1A1Q 0.48" "Q1" 0
            3 "Q78_1A2Q 0.48" "Q2" 0
            3 "Q78_1B1Q 0.48" "Q3" 0
            8 "Q78 230"
            3 "T429_G1 13.8" "T " 0
            3 "T442_G1 34.5" "T " 0
            3 "INTBCT 16" "1 " 0
```

```
        3 "INTBST 18" "1 " 0
        3 "IV GEN1 21" "1 " 0
        3 "IV GEN2 18" "1 " 0
        3 "IV GEN3 18" "1 " 0
        3 "LRP-U1 16" "1 " 1 PGEN 45
        1 "OTAYMESA 230"  "TJI-230  230"  "1 "   1  0
        0
##############################################################
#6.3. Miguel to South Bay 138kV path N-2 SPS  loading on 13826 >440 MVA
# SPS6.3 TL23022/23 ML-MS:  Note 23021/41 not modeled b/ retermination at OMGP
##############################################################
23022/23023_1400 "23022 & 23023 + 1400MW"  "N-2" "C"
        1  "MIGUEL   230"  "MISSION  230"  "2 "   1  0
        1  "MIGUEL   230"  "MISSION  230"  "1 "   1  0
        3 "C510_G1 0.2" "C1" 0
        3 "C510_G2 0.2" "C1" 0
        3 "Q78_1A1Q 0.48" "Q1" 0
        3 "Q78_1A2Q 0.48" "Q2" 0
        3 "Q78_1B1Q 0.48" "Q3" 0
        3 "T429_G1 13.8" "T " 0
        3 "T442_G1 34.5" "T " 0
        3 "Q1242A1Q 0.48" "Q1" 0
        3 "Q1242A2Q 0.48" "Q2" 0
        3 "Q1242B1Q 0.48" "Q3" 0
        3 "Q1243A1Q 0.48" "Q4" 0
        3 "Q1243A2Q 0.48" "Q5" 0
        3 "Q1243B1Q 0.48" "Q6" 1
        8 "Q124      230"
        8 "Q78      230"
        3 "C510_G1 0.2" "C1" 0
        3 "C510_G2 0.2" "C1" 0 PGEN 75
        0
##############################################################
# SPS6.3 TL23021/41 ml-sx #1 & #2
##############################################################
SPS6.3G "23021 & 23041 + 1050 MW"  "N-2" "C"
        1 "MIGUEL   230"  "SYCAMORE 230"  "1 "   1  0
        1 "MLSXTAP  230"  "SYCAMORE 230"  "1 "   1  0
        1 "MLSXTAP  230"  "OTAYMESA 230"  "1 "   1  0
        1 "MLSXTAP  230"  "MIGUEL   230"  "1 "   1  0
        3 "Q78_1A1Q 0.48" "Q1" 0
        3 "Q78_1A2Q 0.48" "Q2" 0
```

```
            3 "Q78_1B1Q 0.48" "Q3" 0
            3 "T429_G1 13.8" "T " 0
            3 "T442_G1 34.5" "T " 0
            3 "Q1242A1Q 0.48" "Q1" 0
            3 "Q1242A2Q 0.48" "Q2" 0
            3 "Q1242B1Q 0.48" "Q3" 0
            3 "Q1243A1Q 0.48" "Q4" 0
            3 "Q1243A2Q 0.48" "Q5" 0
            3 "Q1243B1Q 0.48" "Q6" 1
            8 "Q124      230"
            8 "Q78       230"
            3 "C510_G1 0.2" "C1" 0
            3 "C510_G2 0.2" "C1" 0 PGEN 75
            0
##############################################################
#6.4. 230kV S-Line Protection for flow from Imperial Valley to El Centro (Temporary relay
# setting until IID completes the rating study for the S-Line)
#
# SPS6.4 not modeled
#
##############################################################
#6.5. 230kV S-Line Protection for flow from El Centro to Imperial Valley
#
# SPS6.5 not modeled
#
##############################################################
#6.6. Miguel BK 80 / BK 81
# SPS6.6 Miguel BK 80/81 protection
#Bank 81 SPSnot repeated because banks are almost identical (Bank 80 has lower impedance)
##############################################################
#SPS6.6A "ML BK80/81 w/IV-NG + 1150 MW"  "T-1" "B"
#           2 "MIGUEL   230"  "MIGUELMP 500"  "1 "  0
#           2 "MIGUEL    12"  "MIGUELMP 500"  "1 "  0
#           2 "MIGUEL   500"  "MIGUELMP 500"  "1 "  0
#           1 "IMPRLVLY 500"  "N.GILA 500" "1 "  0
#           3 "T429_G1 13.8" "T " 0
#           3 "T442_G1 34.5" "T " 0
#           8 "Q124      230"
#           8 "Q78       230"
#           8 "C510      230"
#           0
##############################################################
```

```
# 6.7. 230kV TL 23040  Otay Mesa – Tijuana SPS
# SPS6.7 230 kV TL 23040 Miguel - Tijuana SPS
# Not enabled during summer months May-Sept
# IV-ML open at either end & 23040 loads above 800 MVA
50001/23040a  "SWPL TL23050 SPS6.7"  "N-1" "B"
            1  "IMPRLVLY 500"  "MIGUEL   500"  "1 "  1 0
            1  "IMPRLVLY 230"  "ROA-230  230"  "1 "  1 0
            0
############################################################
# 6.8. 230kV Otay Mesa Energy Center Generator SPS
############################################################
#SPS6.8 "OMGP-ML-SY + OMGP-ML-SX   SPS trip OMEC"  "N-2" "C"
#           1 "OTAYMESA 230"  "MLMS3TAP 230"  "1 "  1 0
#           1 "MIGUEL   230"  "MLMS3TAP 230"  "1 "  1 0
#           1 "SY230    230"  "MLMS3TAP 230"  "1 "  1 0
#           1 "OTAYMESA 230"  "MLSXTAP  230"  "1 "  1 0
#           1 "MIGUEL   230"  "MLSXTAP  230"  "1 "  1 0
#           1 "SYCAMORE 230"  "MLSXTAP  230"  "1 "  1 0
#           3 "OTAYMGT1 18.0"  "1 "   0
#           3 "OTAYMGT2 18.0"  "1 "   0
#           3 "OTAYMST1 16.0"  "1 "   0
#           0
############################################################
# 6.9. 69kV TL 642 SPS
############################################################
SPS6.9A  "TL642 SPS6.9A          ck 1"  "N-1" "B"
            1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
            3 "CALPK_BD  13.80"  "1 "   0
#           3 "LRKSPBD1  13.80"  "1 "   0
#           3 "LRKSPBD2  13.80"  "1 "   0
            0
SPS6.9B  "TL642 SPS6.9B          ck 1"  "N-1" "B"
            1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
            3 "CALPK_BD  13.80"  "1 "   0
            3 "LRKSPBD1  13.80"  "1 "   0
#           3 "LRKSPBD2  13.80"  "1 "   0
            0
SPS6.9C  "TL642 SPS6.9C          ck 1"  "N-1" "B"
            1 "SOUTHBAY  69"  "SWEETWTR  69"  "1 "   1  0
            3 "CALPK_BD  13.80"  "1 "   0
            3 "LRKSPBD1  13.80"  "1 "   0
            3 "LRKSPBD2  13.80"  "1 "   0
```

```
          0
############################################################
# 6.10. 69kV TL 644 SPS
############################################################
SPS6.10A  "TL644 SPS6.10A         ck 1"  "N-1" "B"
          1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
          1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
          1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
          3 "CALPK_BD  13.80"  "1 "   0
#         3 "LRKSPBD1  13.80"  "1 "   0
#         3 "LRKSPBD2  13.80"  "1 "   0
          0
SPS6.10B  "TL644 SPS6.10B         ck 1"  "N-1" "B"
          1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
          1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
          1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
          3 "CALPK_BD  13.80"  "1 "   0
          3 "LRKSPBD1  13.80"  "1 "   0
#         3 "LRKSPBD2  13.80"  "1 "   0
          0
SPS6.10C  "TL644 SPS6.10C         ck 1"  "N-1" "B"
          1 "MONTGMRY  69"  "MONTGYTP  69"  "1 "   1  0
          1 "SWEETWTR  69"  "MONTGYTP  69"  "1 "   1  0
          1 "SOUTHBAY  69"  "MONTGYTP  69"  "1 "   1  0
          3 "CALPK_BD  13.80"  "1 "   0
          3 "LRKSPBD1  13.80"  "1 "   0
          3 "LRKSPBD2  13.80"  "1 "   0
          0
############################################################
# 6.11. 69kV TL 649 SPS
############################################################
SPS6.11AofC  "TL649 SPS6.10A of C         ck 1"  "N-1" "B"
     1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
          3 "CALPK_BD  13.80"  "1 "   0
#         3 "LRKSPBD1  13.80"  "1 "   0
#         3 "LRKSPBD2  13.80"  "1 "   0
          0
SPS6.11BofC  "TL649 SPS6.10B of C         ck 1"  "N-1" "B"
     1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
          3 "CALPK_BD  13.80"  "1 "   0
          3 "LRKSPBD1  13.80"  "1 "   0
#         3 "LRKSPBD2  13.80"  "1 "   0
```

```
            0
SPS6.11CofC  "TL649 SPS6.10C of C         ck 1"  "N-1" "B"
      1 "MIGUEL    69"  "BORDER    69"  "1 "   1  0
            3 "CALPK_BD  13.80"  "1 "   0
            3 "LRKSPBD1  13.80"  "1 "   0
            3 "LRKSPBD2  13.80"  "1 "   0
            0
############################################################
# 6.11. 69kV TL 698 SPS
############################################################
SPS6.11AofB  "TL698 SPS6.11A       ck 1"  "N-1" "B"
            1 "LILAC     69"  "PALA      69"  "1 "   1  0
            3 "Q201_U1  13.8"  "Q1"  0
#           3 "Q201_U2  13.8"  "Q2"  0
            0
SPS6.11BofB  "TL698 SPS6.11B       ck 1"  "N-1" "B"
            1 "LILAC     69"  "PALA      69"  "1 "   1  0
            3 "Q201_U1  13.8"  "Q1"  0
            3 "Q201_U2  13.8"  "Q2"  0
            0
############################################################
#
# SUGGEST WE MODEL THESE BY HAND WITH KU DISPATCHED AT 50 MW OR BUILD SPECIAL EPCLs TO SIMULATE THE
VARIOUS
# CONDITIONS OF THE SPS
#
#7. CRESTWOOD SPS– SPECIAL PROTECTION SYSTEM FOR KUMEYAAY WIND GENERATION
#7.1. Line overload relay with trip setpoint and time delay is present at Descanso and Cameron.
#7.2. Islanding protection schemes are also in place
#7.3. The SPSwill also send a signal without time delay over redundant communication to Kumeyaay as input to the #wind turbine
SCADA system to ramp down the output of the generation to 25 MW when the 69kV voltage at Crestwood #reached 110% or 75.9
kV.
############################################################
# SPS8.1. 69kV TL 633 at RCL - NOT MODELED
############################################################
LD_GRA "LD_GR OPEN 630 PK LC & EL     "  "N-1" "B"
            1 "EL CAJON  69"  "GRANITE   69"  "1 "   1  0
#           4 "LOSCOCHS  69"  "10"   0
#           4 "LOSCOCHS  69"  "PK"   1
#           4 "ELLIOTT   69"  "10"   0
#           4 "ELLIOTT   69"  "PK"   1
            0
############################################################
# GRANITE SUB  OUTAGE OF TL632  PEAK JM  EC  GA
```

```
############################################################
LD_GRB "LD_GR OPEN 632 PK JM/EC/GA     "  "N-1" "B"
            1 "GRANITTP  69"  "MIGUEL   69"  "1 "   1  0
            1 "GRANITTP  69"  "GRANITE  69"  "1 "   1  0
            1 "GRANITTP  69"  "LOSCOCHS 69"  "1 "   1  0
#           4 "EL CAJON  69"  "10"   0
#           4 "EL CAJON  69"  "PK"   1
#           4 "GARFIELD  69"  "10"   0
#           4 "GARFIELD  69"  "PK"   1
#           4 "JAMACHA   69"  "10"   0
#           4 "JAMACHA   69"  "PK"   1
            0
############################################################
# For new NIPR requirements  contingency #332:
#   Outage of two of three 230kV lines feeding OC area  plus outage of
#   TL690C  OC Tap-STU .
# OC area is now connected to rest of the system through TL23030
#   Escondido-Talega.
############################################################
#NIPR3   "23052/07/690C OC Area          "  "COR" "D"
#           1 "TALEGA   230"  "S.ONOFRE 230"  "1 "   1  0
#           1 "TALEGA   230"  "S.ONOFRE 230"  "2 "   1  0
#           1 "ESCNDIDO 230"  "TALEGA   230"  "1 "   1  0
#           1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
#           0
############################################################
# For new NIPR requirements  contingency #333:
#   Outage of all TA 230/69 banks  plus outage of
#   TL690C  OC Tap-STU .
# Outage of these devices dumps the entire OC area load and
#   leaves the 230 kV lines connected with the
#   OC area and rest of the system.
############################################################
#NIPR4   "TA 230/69 banks and TL690C     "  "COR" "D"
#           1 "OCNSDETP  69"  "STUARTTP  69"  "1 "   1  0
#           2 "TALEGA   230"  "TALEGA   138"  "1 "   1  0
#           2 "TALEGA   230"  "TALEGA   138"  "2 "   1  0
#           2 "TALEGA   230"  "TALEGA   138"  "3 "   1  0
#           2 "TALEGA   230"  "TALEGA   138"  "4 "   1  0
#           0
-1
first element type:
```

```
   0 = end of contingency
  -1 = end of all Contingencies
   1 = Change line (secdd) status
   2 = Change tran status (tran)
   3 = Change gen status (if status          1  change generation = P)
   4 = Change load status(if status          1  change load = P  const pf)
   5 = Change shunt status
   6 = Change SVD status
   7 = reorder
   8 = isolate a bus
  11 = change dc converter status
  20 = run an epcl for a complex outage
#############################################################
#
# SPECIAL PROTECTION SYSTEMS (FOR CATEGORY B Contingencies)
#
# The below SPS Contingencies simply trip multiple units all at once to estimate
# a sequential tripping scheme.  This will be good enough in most instances.
# However the most realistic SPS Contingencies would solve the case after each
# step of the SPS has passed for example re-solving after each IV Gen
# unit is tripped for SPS6.1. If you desire to model to this level of detail make
# an epcl file to simply solve the case (the single line of code "@ret= soln()"
# will work).  Then insert like this after every step you want solved:
#                                 1  "IMPRLVLY 500"  "MIGUEL   500"  "1 "  1 0
#                                 20 <filename w/o extension>
#                                 3  "LRP-U1    16"    "1 "  0
```

Appendix G

Short Circuit Results

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
ASH 69.kV	ASH696	26000	Breaker Duty (%)	87.9	88.4
			Available Bus Duty (A)	22,858.1	22,983.2
B 69.kV	B30	40000	Breaker Duty (%)	92.7	96.0
			Available Bus Duty (A)	37,086.4	38,383.7
	B31	40000	Breaker Duty (%)	92.7	96.0
			Available Bus Duty (A)	37,086.4	38,383.7
	B32	40000	Breaker Duty (%)	92.5	95.7
			Available Bus Duty (A)	37,006.7	38,292.4
	B33	40000	Breaker Duty (%)	92.5	95.7
			Available Bus Duty (A)	37,006.7	38,292.5
	B601	40000	Breaker Duty (%)	89.1	92.5
			Available Bus Duty (A)	35,659.7	36,994.7
	B602	40000	Breaker Duty (%)	88.7	92.0
			Available Bus Duty (A)	35,466.0	36,783.4
	B650	40000	Breaker Duty (%)	88.9	92.3
			Available Bus Duty (A)	35,574.2	36,925.8
	B699	40000	Breaker Duty (%)	88.1	91.3
			Available Bus Duty (A)	35,228.5	36,527.7
	BBT	40000	Breaker Duty (%)		85.9
			Available Bus Duty (A)		34,377.2
CAN138 138.kV	CAN13801	40000	Breaker Duty (%)	110.1	112.1
			Available Bus Duty (A)	44,032.1	44,854.8
	CAN13802	40000	Breaker Duty (%)	110.3	112.4
			Available Bus Duty (A)	44,125.6	44,949.5
	CANBT	40000	Breaker Duty (%)	104.8	106.8
			Available Bus Duty (A)	41,900.6	42,701.7
CM 69.kV	CM30	29000	Breaker Duty (%)		85.3
			Available Bus Duty (A)		24,732.3
	CM31	29000	Breaker Duty (%)		85.3
			Available Bus Duty (A)		24,732.3
CR 69.kV	CR650	38000	Breaker Duty (%)	86.5	88.9
			Available Bus Duty (A)	32,860.4	33,770.8
	CR655	38000	Breaker Duty (%)	86.5	88.9
			Available Bus Duty (A)	32,860.4	33,770.8
DI 69.kV	DI BK31	40000	Breaker Duty (%)	108.4	112.0
			Available Bus Duty (A)	43,360.2	44,803.6
	DI BK32	40000	Breaker Duty (%)	109.0	112.6
			Available Bus Duty (A)	43,604.1	45,047.1
	DI606	44000	Breaker Duty (%)	105.2	108.5
			Available Bus Duty (A)	46,292.7	47,743.9
	DI6901	40000	Breaker Duty (%)	105.2	108.8
			Available Bus Duty (A)	42,065.6	43,512.5

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
	DI6950	40000	Breaker Duty (%)	106.2	109.6
			Available Bus Duty (A)	42,486.2	43,820.0
	DIBT	40000	Breaker Duty (%)	88.5	91.6
			Available Bus Duty (A)	35,409.9	36,621.1
EA138 138.kV	EA1 102E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA1 102W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA13801 1W	35000	Breaker Duty (%)	129.9	132.8
			Available Bus Duty (A)	45,467.1	46,481.3
	EA13804 7E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA13804 7W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA13806 5E	40000	Breaker Duty (%)	117.5	120.0
			Available Bus Duty (A)	47,013.4	48,005.1
	EA13843 3E	42000	Breaker Duty (%)	122.2	124.9
			Available Bus Duty (A)	51,335.3	52,444.5
	EA2 206E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA2 206W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA3 309E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA3 309W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA4 411E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA4 411W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA-AUXBK 8E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA-AUXBK 8W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EAGT1 4E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EAGT1 4W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA-GT4 10E	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3
	EA-GT4 10W	40000	Breaker Duty (%)	119.5	122.1
			Available Bus Duty (A)	47,817.0	48,850.3

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
EA230 230.kV	EA23003 1T	63000	Breaker Duty (%)	85.9	95.5
			Available Bus Duty (A)	54,142.5	60,143.8
	EA23011 1E	63000	Breaker Duty (%)	85.9	95.5
			Available Bus Duty (A)	54,142.5	60,143.8
	EA23012 2T	63000	Breaker Duty (%)	85.9	95.5
			Available Bus Duty (A)	54,142.5	60,143.8
	EA23012 2W	63000	Breaker Duty (%)	85.9	95.5
			Available Bus Duty (A)	54,142.5	60,143.8
	EA23053 XX	63000	Breaker Duty (%)	85.9	95.5
			Available Bus Duty (A)	54,142.5	60,143.8
	EABK60	63000	Breaker Duty (%)	85.9	95.5
			Available Bus Duty (A)	54,142.5	60,143.8
EC 69.kV	EC30	29000	Breaker Duty (%)	91.7	92.9
			Available Bus Duty (A)	26,604.0	26,941.8
	EC31	26000	Breaker Duty (%)	102.3	103.6
			Available Bus Duty (A)	26,600.4	26,938.2
	EC32	26000	Breaker Duty (%)	104.0	105.1
			Available Bus Duty (A)	27,028.4	27,316.8
	EC33	26000	Breaker Duty (%)	104.0	105.1
			Available Bus Duty (A)	27,028.4	27,316.8
	EC630	26000	Breaker Duty (%)	94.1	95.0
			Available Bus Duty (A)	24,468.3	24,692.3
	EC631	26000	Breaker Duty (%)	93.1	93.9
			Available Bus Duty (A)	24,201.9	24,419.4
EC3031 12.5kV	EC BK30	20000	Breaker Duty (%)	135.8	136.0
			Available Bus Duty (A)	27,152.9	27,201.6
	EC BK31	23121	Breaker Duty (%)	117.4	117.6
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C547	20000	Breaker Duty (%)	135.8	136.0
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C552	23121	Breaker Duty (%)	117.4	117.6
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C555	25000	Breaker Duty (%)	108.6	108.8
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C71	25000	Breaker Duty (%)	108.6	108.8
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C72	23121	Breaker Duty (%)	117.4	117.6
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C74	23121	Breaker Duty (%)	117.4	117.6
			Available Bus Duty (A)	27,152.9	27,201.6
	EC C77	23121	Breaker Duty (%)	117.4	117.6
			Available Bus Duty (A)	27,152.9	27,201.6

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
EL 69.kV	EL636	21000	Breaker Duty (%)	109.8	111.6
			Available Bus Duty (A)	23,067.6	23,436.6
ES 69.kV	ES30	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES31	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES32 16N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES50 6N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES50 6S	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES679 9S	40000	Breaker Duty (%)	116.9	117.9
			Available Bus Duty (A)	46,754.6	47,143.7
	ES684 5N	40000	Breaker Duty (%)	110.8	111.8
			Available Bus Duty (A)	44,339.6	44,712.8
	ES688 1S	40000	Breaker Duty (%)	114.8	115.8
			Available Bus Duty (A)	45,934.9	46,322.4
	ES689 11N	40000	Breaker Duty (%)	116.5	117.4
			Available Bus Duty (A)	46,586.4	46,970.2
	ES6908 13S	40000	Breaker Duty (%)	110.6	111.4
			Available Bus Duty (A)	44,221.7	44,558.0
	ES6930 7N	40000	Breaker Duty (%)	127.9	128.9
			Available Bus Duty (A)	51,150.7	51,580.0
	ES6930 7S	40000	Breaker Duty (%)	127.9	128.9
			Available Bus Duty (A)	51,150.7	51,580.0
	ES6933 2N	40000	Breaker Duty (%)	112.4	113.4
			Available Bus Duty (A)	44,955.2	45,350.6
	ES6934 12S	40000	Breaker Duty (%)	121.8	122.9
			Available Bus Duty (A)	48,732.9	49,164.4
	ES696 18S	40000	Breaker Duty (%)	117.2	118.1
			Available Bus Duty (A)	46,860.2	47,253.1
	ES696 NEW	40000	Breaker Duty (%)	117.1	118.1
			Available Bus Duty (A)	46,858.3	47,251.2
	ES70 3N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES70 3S	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES71 14N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES71 14S	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
	ES72 8N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ES72 8S	40000	Breaker Duty (%)	127.9	128.9
			Available Bus Duty (A)	51,150.7	51,580.0
	ESGNDBK 19N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ESGNDBK 19S	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ESNBT 10N	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
	ESSBT 10S	40000	Breaker Duty (%)	117.2	118.2
			Available Bus Duty (A)	46,888.2	47,281.7
ES230 230.kV	ES23014 1S	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ES23015 2S	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ES23030 1N	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ES23030 1T	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ES72 2N	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ES72 2T	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ESCAPBK1	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
	ESCAPBK2	40000	Breaker Duty (%)	85.1	86.3
			Available Bus Duty (A)	34,040.5	34,528.6
FE 69.kV	FE681	27000	Breaker Duty (%)	93.0	93.6
			Available Bus Duty (A)	25,105.6	25,270.7
GD 69.kV	GD672	26000	Breaker Duty (%)	96.7	98.2
			Available Bus Duty (A)	25,144.9	25,536.8
GE 69.kV	GE31	26000	Breaker Duty (%)	102.2	105.2
			Available Bus Duty (A)	26,574.8	27,357.6
	GE665	26000	Breaker Duty (%)		86.8
			Available Bus Duty (A)		22,571.4
	GE6905	26000	Breaker Duty (%)	86.4	88.6
			Available Bus Duty (A)	22,471.6	23,038.8
IV230 230.kV	IV23045 12S	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23045 12T	63000	Breaker Duty (%)	89.7	97.7

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23046 13N	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23046 13T	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23047 13S	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23048 14S	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23050 11N	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV23050 11T	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV230S 14N	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV230S 14T	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV80 11S	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV81 15S	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
	IV81 15T	63000	Breaker Duty (%)	89.7	97.7
			Available Bus Duty (A)	56,535.4	61,544.3
KE 69.kV	KE604	40000	Breaker Duty (%)	85.0	88.0
			Available Bus Duty (A)	33,983.1	35,215.7
	KE609	31500	Breaker Duty (%)	107.9	111.8
			Available Bus Duty (A)	33,983.1	35,215.7
KY 69.kV	KY30	29000	Breaker Duty (%)	105.9	107.7
			Available Bus Duty (A)	30,703.4	31,243.2
	KY663	29000	Breaker Duty (%)	87.7	88.8
			Available Bus Duty (A)	25,429.7	25,764.2
	KYGT2	27000	Breaker Duty (%)	93.2	95.2
			Available Bus Duty (A)	25,160.5	25,701.1
	KYGT3	27000	Breaker Duty (%)	93.2	95.2
			Available Bus Duty (A)	25,160.5	25,701.1
LC EAST 69.kV	LCE632	26000	Breaker Duty (%)	111.6	113.9
			Available Bus Duty (A)	29,009.7	29,626.3
	LCE678	26000	Breaker Duty (%)	122.1	124.7
			Available Bus Duty (A)	31,735.4	32,429.8
	LCEBT	24000	Breaker Duty (%)	114.0	116.2
			Available Bus Duty (A)	27,349.9	27,899.0
LC WEST 69.kV	LCW32	21000	Breaker Duty (%)	151.0	154.3

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	31,711.4	32,404.3
	LCW635	31500	Breaker Duty (%)	96.1	98.1
			Available Bus Duty (A)	30,274.0	30,909.7
	LCW6914	26000	Breaker Duty (%)	121.9	124.5
			Available Bus Duty (A)	31,686.8	32,379.0
	LCWBT	24000	Breaker Duty (%)	102.9	104.9
			Available Bus Duty (A)	24,694.1	25,170.3
LC138 138.kV	LC13819 1N	21000	Breaker Duty (%)	108.5	110.9
			Available Bus Duty (A)	22,782.8	23,284.3
	LC13819 1S	21000	Breaker Duty (%)	108.5	110.9
			Available Bus Duty (A)	22,782.8	23,284.3
	LC13824 4N	21000	Breaker Duty (%)	108.5	110.9
			Available Bus Duty (A)	22,782.8	23,284.3
	LC13824 4S	21000	Breaker Duty (%)	108.5	110.9
			Available Bus Duty (A)	22,782.8	23,284.3
ME 69.kV	ME32	12500	Breaker Duty (%)	114.0	114.7
			Available Bus Duty (A)	14,247.1	14,342.1
	ME33	12500	Breaker Duty (%)	114.0	114.7
			Available Bus Duty (A)	14,247.1	14,342.1
	MEBT	8367	Breaker Duty (%)	103.8	104.4
			Available Bus Duty (A)	8,686.3	8,736.7
MG 69.kV	MG30	29000	Breaker Duty (%)	113.5	119.1
			Available Bus Duty (A)	32,911.3	34,530.6
	MG31	29000	Breaker Duty (%)	113.5	119.1
			Available Bus Duty (A)	32,910.6	34,529.9
	MG641	27000	Breaker Duty (%)	114.3	119.5
			Available Bus Duty (A)	30,871.4	32,258.1
	MG642	27000	Breaker Duty (%)	112.8	117.9
			Available Bus Duty (A)	30,446.4	31,833.0
ML 69.kV	ML621 14S	40000	Breaker Duty (%)	86.4	88.4
			Available Bus Duty (A)	34,574.0	35,358.3
	ML627 10S	40000	Breaker Duty (%)	86.4	88.4
			Available Bus Duty (A)	34,576.3	35,375.0
	ML628	40000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		34,054.8
	ML632 12S	40000	Breaker Duty (%)	85.0	87.0
			Available Bus Duty (A)	34,007.7	34,785.7
	ML643 17N	40000	Breaker Duty (%)	87.0	89.0
			Available Bus Duty (A)	34,799.3	35,605.5
	ML70 11N	42000	Breaker Duty (%)	85.2	87.2
			Available Bus Duty (A)	35,797.4	36,637.5
	ML70 11S	42000	Breaker Duty (%)	85.2	87.2

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	35,797.4	36,637.5
	ML71 13N	40000	Breaker Duty (%)	89.5	91.6
			Available Bus Duty (A)	35,797.4	36,637.5
	ML71 13S	40000	Breaker Duty (%)	89.5	91.6
			Available Bus Duty (A)	35,797.4	36,637.5
MS 138.kV	MS13822 9N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS13822 9S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS13827 3N	40000	Breaker Duty (%)	92.1	99.3
			Available Bus Duty (A)	36,856.3	39,704.7
	MS13827 3S	42000	Breaker Duty (%)	94.0	102.3
			Available Bus Duty (A)	39,462.2	42,979.9
	MS13840 1N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS13840 1S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS50 2N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS50 2S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS51 6N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS51 6S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS52 8N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS52 8S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS60 4N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS60 4S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS61 7N	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
	MS61 7S	41000	Breaker Duty (%)	96.2	104.8
			Available Bus Duty (A)	39,462.2	42,979.9
MS 69.kV	MS30 6S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS31 6N	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS32 5N	40000	Breaker Duty (%)	125.8	130.6

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	50,322.1	52,222.3
	MS33 8S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS50 3N	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS50 3S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS51 7S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS52 9N	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS52 9S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS618 11N	40000	Breaker Duty (%)	122.9	127.6
			Available Bus Duty (A)	49,175.3	51,033.8
	MS619 10S	40000	Breaker Duty (%)	123.0	127.7
			Available Bus Duty (A)	49,201.4	51,060.8
	MS653 2S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS654 1N	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS663 10N	40000	Breaker Duty (%)	122.8	127.4
			Available Bus Duty (A)	49,103.0	50,973.1
	MS671 11S	40000	Breaker Duty (%)	114.2	118.6
			Available Bus Duty (A)	45,667.3	47,455.9
	MS676 1S	40000	Breaker Duty (%)	122.6	127.3
			Available Bus Duty (A)	49,043.8	50,914.1
	MS70 4N	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
	MS70 4S	40000	Breaker Duty (%)	125.8	130.6
			Available Bus Duty (A)	50,322.1	52,222.3
MS230 230.kV	MS23001 4N	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23001 4T	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23004 3N	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23004 3T	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23022 5N	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23022 5T	40000	Breaker Duty (%)		99.1

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)		39,639.9
	MS23023 5S	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23027 2N	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS23027 2T	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS60 1S	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS61 3S	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
	MS70 2S	40000	Breaker Duty (%)		99.1
			Available Bus Duty (A)		39,639.9
MY 69.kV	MY30	21000	Breaker Duty (%)	103.1	104.5
			Available Bus Duty (A)	21,658.8	21,946.8
	MY31	21000	Breaker Duty (%)	103.1	104.5
			Available Bus Duty (A)	21,658.8	21,946.8
	MY32	21000	Breaker Duty (%)	103.1	104.5
			Available Bus Duty (A)	21,655.1	21,943.0
	MY620	15000	Breaker Duty (%)	85.5	86.6
			Available Bus Duty (A)	12,825.6	12,986.0
NIM 69.kV	NIM6902	31500	Breaker Duty (%)	92.9	95.1
			Available Bus Duty (A)	29,268.4	29,947.3
	NIM6909	31500	Breaker Duty (%)	94.3	96.8
			Available Bus Duty (A)	29,702.9	30,500.2
	NIMNBT	31500	Breaker Duty (%)	93.3	95.4
			Available Bus Duty (A)	29,375.9	30,060.4
	NIMSBT	31500	Breaker Duty (%)	94.3	96.8
			Available Bus Duty (A)	29,702.9	30,500.2
OMG230 230.kV	OM23040 4E	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OM23040 4T	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OM23041B 5E	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OM23041B 5T	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OM23042B 6E	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OM23042B 6T	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OMCT1 6W	50000	Breaker Duty (%)		89.5

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)		44,750.3
	OMCT2 5W	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
	OMST1 4W	50000	Breaker Duty (%)		89.5
			Available Bus Duty (A)		44,750.3
OT 69.kV	OT30 1W	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT31 1E	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT32 9E	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT604 6E	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT604 6W	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT611 3W	40000	Breaker Duty (%)	89.8	93.4
			Available Bus Duty (A)	35,922.5	37,368.9
	OT612 7E	40000	Breaker Duty (%)	89.8	93.4
			Available Bus Duty (A)	35,927.2	37,373.6
	OT70 2E	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT70 2W	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT71 8E	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OT71 8W	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
	OTWBT	40000	Breaker Duty (%)	89.9	93.5
			Available Bus Duty (A)	35,945.3	37,391.8
OT230 230.kV	OT23013 2N	40000	Breaker Duty (%)		97.5
			Available Bus Duty (A)		39,017.2
	OT23013 2T	40000	Breaker Duty (%)		97.5
			Available Bus Duty (A)		39,017.2
	OT23027 2S	40000	Breaker Duty (%)		97.5
			Available Bus Duty (A)		39,017.2
	OT23028 1S	40000	Breaker Duty (%)		97.5
			Available Bus Duty (A)		39,017.2
PB 69.kV	PBBT	12500	Breaker Duty (%)	89.0	90.4
			Available Bus Duty (A)	11,125.4	11,302.7
PL 69.kV	PL30	21000	Breaker Duty (%)	96.1	98.3
			Available Bus Duty (A)	20,174.7	20,641.2
	PL31	21000	Breaker Duty (%)	96.1	98.3

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	20,174.7	20,641.2
POM69 69.kV	POM6913	31500	Breaker Duty (%)	95.6	98.5
			Available Bus Duty (A)	30,112.3	31,025.8
	POM6915	31500	Breaker Duty (%)	98.1	101.0
			Available Bus Duty (A)	30,904.9	31,829.0
PQ 69.kV	PQ50 5N	42000	Breaker Duty (%)	121.7	130.2
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ50 5S	42000	Breaker Duty (%)	121.7	130.2
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ51 10N	38000	Breaker Duty (%)	134.5	144.0
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ51 10S	42000	Breaker Duty (%)	121.7	130.2
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ52 3N	40000	Breaker Duty (%)	127.7	136.8
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ52 3S	38000	Breaker Duty (%)	134.5	144.0
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ610	40000	Breaker Duty (%)	117.6	125.3
			Available Bus Duty (A)	47,059.3	50,133.7
	PQ661 16S	42000	Breaker Duty (%)	116.9	125.2
			Available Bus Duty (A)	49,092.9	52,580.2
	PQ662 12S	42000	Breaker Duty (%)	121.7	130.2
			Available Bus Duty (A)	51,095.0	54,697.5
	PQ664 13N	40000	Breaker Duty (%)	110.9	119.0
			Available Bus Duty (A)	44,378.7	47,613.1
	PQ665 15N	40000	Breaker Duty (%)	127.7	136.8
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ665 15S	40000	Breaker Duty (%)	127.7	136.8
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ666 2S	40000	Breaker Duty (%)	127.7	136.7
			Available Bus Duty (A)	51,090.1	54,692.6
	PQ667	40000	Breaker Duty (%)	127.7	136.7
			Available Bus Duty (A)	51,085.7	54,688.4
	PQ675 13S	42000	Breaker Duty (%)	119.6	128.2
			Available Bus Duty (A)	50,219.2	53,855.2
	PQ6905 12N	42000	Breaker Duty (%)	121.6	130.2
			Available Bus Duty (A)	51,092.5	54,694.9
	PQ6906 2N	38000	Breaker Duty (%)	132.1	141.7
			Available Bus Duty (A)	50,207.7	53,844.7
	PQ6952 1N	42000	Breaker Duty (%)	121.7	130.2
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ6952 1S	42000	Breaker Duty (%)	121.7	130.2

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ70 7N	40000	Breaker Duty (%)	117.7	125.4
			Available Bus Duty (A)	47,070.1	50,142.8
	PQ70 7S	40000	Breaker Duty (%)	117.7	125.4
			Available Bus Duty (A)	47,070.1	50,142.8
	PQ71 14N	38000	Breaker Duty (%)	134.5	144.0
			Available Bus Duty (A)	51,098.8	54,701.2
	PQ71 14S	40000	Breaker Duty (%)	127.7	136.8
			Available Bus Duty (A)	51,098.8	54,701.2
	PQNBT	38000	Breaker Duty (%)	134.5	144.0
			Available Bus Duty (A)	51,098.8	54,701.2
	PQSBT	42000	Breaker Duty (%)	121.7	130.2
			Available Bus Duty (A)	51,098.8	54,701.2
PQ138 138.kV	PQ13804	37000	Breaker Duty (%)	88.1	96.1
			Available Bus Duty (A)	32,583.4	35,574.3
	PQ13810 6N	21000	Breaker Duty (%)	155.2	169.4
			Available Bus Duty (A)	32,583.4	35,574.3
	PQ13810 6S	21000	Breaker Duty (%)	155.2	169.4
			Available Bus Duty (A)	32,583.4	35,574.3
	PQ50 3N	21000	Breaker Duty (%)	155.2	169.4
			Available Bus Duty (A)	32,583.4	35,574.3
	PQ50 3S	21000	Breaker Duty (%)	155.2	169.4
			Available Bus Duty (A)	32,583.4	35,574.3
	PQ51 4N	40000	Breaker Duty (%)		88.9
			Available Bus Duty (A)		35,574.3
	PQ51 4S	40000	Breaker Duty (%)		88.9
			Available Bus Duty (A)		35,574.3
	PQ52 2S	37000	Breaker Duty (%)	88.1	96.1
			Available Bus Duty (A)	32,583.4	35,574.3
PQ230 230.kV	PQ23012 4N	40000	Breaker Duty (%)		98.5
			Available Bus Duty (A)		39,400.6
	PQ23012 4S	40000	Breaker Duty (%)		98.5
			Available Bus Duty (A)		39,400.6
	PQ23013 9N	40000	Breaker Duty (%)		100.2
			Available Bus Duty (A)		40,077.1
	PQ23013 9S	40000	Breaker Duty (%)		100.2
			Available Bus Duty (A)		40,077.1
	PQ23053 2N	40000	Breaker Duty (%)		100.2
			Available Bus Duty (A)		40,077.1
	PQ23053 2S	40000	Breaker Duty (%)		100.2
			Available Bus Duty (A)		40,077.1
RIN 69.kV	RIN682	8367	Breaker Duty (%)	88.7	88.9

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	7,423.1	7,441.0
	RIN6926	8400	Breaker Duty (%)	88.4	88.6
			Available Bus Duty (A)	7,423.1	7,441.0
RN 69.kV	RN600 5W	12600	Breaker Duty (%)	213.5	218.2
			Available Bus Duty (A)	26,904.9	27,493.0
	RN661 3W	21000	Breaker Duty (%)	128.1	130.9
			Available Bus Duty (A)	26,904.9	27,493.0
	RN673	26000	Breaker Duty (%)	103.5	105.7
			Available Bus Duty (A)	26,904.9	27,493.0
	RN6927	21000	Breaker Duty (%)	107.0	108.8
			Available Bus Duty (A)	22,463.3	22,855.0
S 69.kV	S30	40000	Breaker Duty (%)	99.9	104.2
			Available Bus Duty (A)	39,970.4	41,694.9
	S31	40000	Breaker Duty (%)	99.9	104.2
			Available Bus Duty (A)	39,971.0	41,695.5
	S32	40000	Breaker Duty (%)	100.3	104.6
			Available Bus Duty (A)	40,114.2	41,838.7
	S33	40000	Breaker Duty (%)	100.3	104.6
			Available Bus Duty (A)	40,114.2	41,838.7
	S656	40000	Breaker Duty (%)	98.8	102.9
			Available Bus Duty (A)	39,503.0	41,174.2
	S657	40000	Breaker Duty (%)	98.5	102.7
			Available Bus Duty (A)	39,401.1	41,063.4
	S658	40000	Breaker Duty (%)	89.6	93.1
			Available Bus Duty (A)	35,832.0	37,246.0
	SBT	40000	Breaker Duty (%)	98.8	102.9
			Available Bus Duty (A)	39,503.0	41,174.2
SA 69.kV	SA 9N	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA 9S	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA33	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA34	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA35	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA36 10S	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA51 2N	38000	Breaker Duty (%)	126.3	129.8
			Available Bus Duty (A)	48,006.2	49,332.4
	SA51 2S	38000	Breaker Duty (%)	126.3	129.8

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	48,006.2	49,332.4
	SA680	40000	Breaker Duty (%)	108.0	111.0
			Available Bus Duty (A)	43,180.9	44,381.4
	SA690 1N	40000	Breaker Duty (%)	109.9	113.0
			Available Bus Duty (A)	43,977.5	45,192.4
	SA6912	40000	Breaker Duty (%)	108.9	111.9
			Available Bus Duty (A)	43,567.5	44,776.4
	SA693	40000	Breaker Duty (%)	109.4	112.5
			Available Bus Duty (A)	43,773.3	44,984.8
	SA694	40000	Breaker Duty (%)	108.9	111.9
			Available Bus Duty (A)	43,558.7	44,767.7
	SA697 1S	40000	Breaker Duty (%)	110.0	113.0
			Available Bus Duty (A)	43,993.6	45,209.0
	SA70 5N	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA70 5S	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SA71 6N	38000	Breaker Duty (%)	126.3	129.8
			Available Bus Duty (A)	48,006.2	49,332.4
	SA71 6S	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
	SAGNDBK	40000	Breaker Duty (%)	110.0	113.1
			Available Bus Duty (A)	44,005.7	45,221.4
SA230KV 230.kV	SA23001 2E	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23001 2T	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23002 1W	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23003 3T	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23003 3W	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23004 5E	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23004 5T	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23006 1E	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23006 1T	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23010 2W	40000	Breaker Duty (%)	112.5	125.9

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23011 4T	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA23011 4W	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA71 5W	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA72 4E	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
	SA73 3E	40000	Breaker Duty (%)	112.5	125.9
			Available Bus Duty (A)	45,004.2	50,359.8
SG 69.kV	SG602 2E	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG651	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG652	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG655	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG656	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG657	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG6948 10W	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG6949	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG70 3E	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG70 3W	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SG72 11E	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SGEBT	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
	SGWBT	50000	Breaker Duty (%)		85.1
			Available Bus Duty (A)		42,533.5
SO230 230.kV	SO23002 4162	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23002 6162	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23006 4142	63000	Breaker Duty (%)	100.4	103.1

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23006 6142	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23007 4122	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23007 6122	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23010 4182	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23010 6182	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23052 4132	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
	SO23052 6132	63000	Breaker Duty (%)	100.4	103.1
			Available Bus Duty (A)	63,256.8	64,966.2
SW 69.kV	SW20	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW21	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW30	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW31	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW603	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW614	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW628	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW642	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
	SW644	40000	Breaker Duty (%)	91.3	95.4
			Available Bus Duty (A)	36,539.8	38,157.4
SX 230.kV	SX23051 22N	40000	Breaker Duty (%)		98.9
			Available Bus Duty (A)		39,568.5
	SX23051 22T	40000	Breaker Duty (%)		98.9
			Available Bus Duty (A)		39,568.5
	SX60 24N	40000	Breaker Duty (%)		98.9
			Available Bus Duty (A)		39,568.5
	SX60 24T	40000	Breaker Duty (%)		98.9
			Available Bus Duty (A)		39,568.5
SX 69.kV	SX639	40000	Breaker Duty (%)	96.8	105.3

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	38,727.8	42,133.0
	SX6915	31500	Breaker Duty (%)	134.6	143.7
			Available Bus Duty (A)	42,411.1	45,279.0
	SX6916 5N	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX6916 5S	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX6917 2N	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX6917 2S	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX6920	40000	Breaker Duty (%)	104.7	112.0
			Available Bus Duty (A)	41,899.1	44,817.5
	SX6924 3N	40000	Breaker Duty (%)	106.0	113.2
			Available Bus Duty (A)	42,389.6	45,262.7
	SX70 4N	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX70 4S	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX71 11N	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX71 11S	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX72 XXN	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SX72 XXS	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SXCAPBK1 7N	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
	SXCAPBK2 9S	40000	Breaker Duty (%)	106.9	114.0
			Available Bus Duty (A)	42,769.2	45,584.7
SY69 69.kV	SY641 10N	40000	Breaker Duty (%)	101.6	111.4
			Available Bus Duty (A)	40,644.6	44,567.4
	SY642 3N	40000	Breaker Duty (%)	92.8	102.3
			Available Bus Duty (A)	37,120.7	40,909.5
	SY644 16N	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY644 16S	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY645 14N	40000	Breaker Duty (%)	92.7	102.2
			Available Bus Duty (A)	37,064.3	40,870.8

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
	SY646 8N	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY646 8S	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY647 3S	40000	Breaker Duty (%)	93.3	102.8
			Available Bus Duty (A)	37,312.6	41,115.1
	SY70 2N	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY70 2S	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY72 13N	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SY72 13S	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SYBT 9N	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
	SYBT 9S	40000	Breaker Duty (%)	93.6	103.1
			Available Bus Duty (A)	37,420.1	41,220.4
TA138 138.kV	TA 5T	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA 5W	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13812 6T	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13812 6W	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13831 8E	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13833 7T	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13833 7W	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13836 8T	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA13836 8W	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA50 10W	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA60	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
	TA62	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
	TA63	40000	Breaker Duty (%)	89.9	90.4
			Available Bus Duty (A)	35,970.3	36,172.4
TA230 230.kV	TA23007 2T	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA23007 2W	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA23030 2E	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA23052 1T	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA23052 1W	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA61 4E	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA62 4T	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TA63 4W	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TACAPBK1 01W	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TACAPBK2 01C	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TACAPBK3 01E	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
	TACAPS 1E	40000	Breaker Duty (%)		85.4
			Available Bus Duty (A)		34,151.9
TJCFE 230.kV	98300 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	98340 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	98400 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	98430 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	98500 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	AT 10 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	AT 20 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	MEP 93340	31500	Breaker Duty (%)	95.1	109.0

BUS	BREAKER	Breaker Interrupting Capacity (A)	Data	Pre-Cluster 2	Post-All Cluster 2 w/ Delivery Network Upgrades
			Available Bus Duty (A)	29,960.4	34,334.3
	MEP 93630	31500	Breaker Duty (%)	87.2	100.2
			Available Bus Duty (A)	27,463.7	31,570.3
	PAP 93330	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	PAP 93530	40000	Breaker Duty (%)		85.8
			Available Bus Duty (A)		34,334.3
	PJZ 93440	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	PJZ 93450	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	TL23040	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
	TR 40 230kV	31500	Breaker Duty (%)	95.1	109.0
			Available Bus Duty (A)	29,960.4	34,334.3
TP 69.kV	TP30	31500	Breaker Duty (%)	90.2	93.1
			Available Bus Duty (A)	28,423.2	29,320.0
	TP31	31500	Breaker Duty (%)	90.2	93.1
			Available Bus Duty (A)	28,423.2	29,320.0
	TPBT	27000	Breaker Duty (%)	87.9	90.2
			Available Bus Duty (A)	23,720.5	24,355.4

Appendix H-1

Transient Stability Switching Sequences

Imperial Valley Area Cluster

Heavy Summer & Light Load
Pre & Post-IVA Cluster

*pst_FLAT.swt
TIT
  SDG&E Cluster 2
  Flat

RUN 20

```
* C493_Centrals_slo.swt
TIT
  SDG&E Cluster 2
  C493 - CENTRALS 500kV line


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Central
FB  0.0  "CENTRALS" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Central
*
CFB 4.0  "CENTRALS" 500
*
*   Trip C493 - Centrals 500kV
*
DL  8.0  "C493" 500. "CENTRALS" 500. "1 "
*
*
```

```
* Dev_Val_slo.swt
TIT
  SDG&E Cluster 2
  Valley - Devers 500 kV line


RUN 20
*
*
*   Loss of Valley - Devers Line
*
*  CC cards for post-transient only
*
*
FB 0.0 "DEVERS  " 500
*
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*
*  CLEAR FAULT
*
CFB 4.0 "DEVERS  " 500
*
*  REMOVE DEVERS - VALLEY 500 KV LINE
*
DL 4.0 "DEVERS  " 500. "VALLEYSC" 500. "1 "
*
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*  Add SVC's at Marketplace and Adelanto
*
```

```
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* HAA_NGila_slo.swt
TIT
  SDG&E Cluster 2
  Haasyampa-N.Gila 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Hassyampa - North Gila 500kV line
*
DL  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* IV_C493_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley- C493 500kV line1


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500
*
*   Trip Imperial Valley - C493 line
*
DL  8.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
```

```
*IV-ROA.swt
TIT
  SDG&E Cluster 2
  Fault Imperial Valley 230 kV
  Loss of IV-ROA 230 kV SLO

RUN 20
*
*   Imperial Valley-La Rosita 230 kV SLO
*   3-phase 4 cycle fault at ROA 230 kV bus
*
FB  0.0  "ROA-230 " 230.
*
*   Clear fault bus at Imperial Valley
*
CFB 6.0  "ROA-230 " 230.
*
*   Trip Imperial Valley – La Rosita line
*
DL  6.0  "IMPRLVLY" 230. "ROA-230 " 230. "1"
*
```

```
* IV_Wnd1_noRAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - Windfarms line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
*  TG   8.0 "INTBST  "  18. "**"
*  TG   8.0 "INTBCT  "  18. "**"
*  TG   8.0 "IV GEN1 "  21. "**"
*  TG   8.0 "IV GEN2 "  18. "**"
```

```
*  TG   8.0 "IV GEN3 "  18. "**"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_noXTrp_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   Drop IV Gens
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Inmperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo _noXTR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage


RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY  " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
*
```

```
TG   8.0 "C510_G1  "  0.20 "C1"
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
```

```
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo_RASxR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage
   with Xtrp

RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "IMPRLVLY " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
*
TG   8.0 "C510_G1  "  0.20 "C1"
```

```
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
```

```
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050 winter, Trip 23040 summer
*
DL  120.0  "OTAYMESA" 230. "TJI-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_noRAS_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   Miguel - ECO 500kV Line Out
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel - ECO line
*
DL  4.0  "MIGUEL  " 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
*  TG   8.0 "INTBST  "  18. "**"
*  TG   8.0 "INTBCT  "  18. "**"
*  TG   8.0 "IV GEN1 "  21. "**"
*  TG   8.0 "IV GEN2 "  18. "**"
```

```
*  TG   8.0 "IV GEN3 "  18. "**"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_noXTrp_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   MIguel - ECO 500kV Line Out
*   Drop IV Gens
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel to ECO 500kV
*
DL  4.0  "MIGUEL  " 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   Miguel - ECO 500kV Line Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel - ECO line
*
DL  4.0  "MIGUEL" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* NGila_IV_slo.swt
TIT
  SDG&E Cluster 2
  North Gila - Imperial Valley 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip North Gila - Imperial Valley 500kV line
*
DL  4.0  "N.GILA" 500. "IMPRLVLY  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* PaloVerde-g1.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generator #2


RUN 20
*   Loss of 1 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 1444
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*  Trip Palo Verde unit #2
*
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "1 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt cap at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
```

```
*   Deenergize Malin Shunt reactors as part of FACRI
CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Switch on Olinda Shunt cap
*   CC  MBS   17.5 "OLINDA"   500.    "c "  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*   CC  MBS  90. "TABLE MT" 500. "c1" "R"
*   CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*   CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```

```
* PaloVerde-g2.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generators 1 & 2


RUN 20
*   Loss of 2 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 2946
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip Palo Verde units #1 and #2
*
TG   0.0 "PALOVRD1"  24. "**"
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC 12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC 12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC 12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS 13.4 "MALIN   " 500. "c1" "R"
CC  MBS 13.4 "MALIN   " 500. "c2" "R"
CC  MSV 13.4 "MALIN   " 500. "s " 0.0 0.0
*
```

```
*   Remove reactor at Olinda
*
CC  MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f " -1.9
*
*   Switch on Olinda Shunt cap
*
*   CC  MBS  17.5 "OLINDA  " 500. "c1" "R"
*
*   Drop AZ load (120 MW)
*   120.0 + j7.4
*
*MBL   60.0 "AGUAFAPS"  69.0  "AP" M -15 -2.7
*   MBL   60.0 "AGUAFRIA"  230.0 "AP" M -15 -2.7
*MBL   60.0 "PAPAGOBT"  69.0  "AP" M -30 -3.8
*MBL   60.0 "SANTAN  "  69.0  "SR" M -30  0.0
*MBL   60.0 "CORBELRS"  69.0  "SR" M -15 -0.7
*MBL   60.0 "ORME  RS"  69.0  "**" M -15 -0.2
*MBL   60.0 "THUNDRST"  69.0  "**" M -15  0.0
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*   Switch on Metcalf Shunt cap
*   2 x 175 caps (91 Mvar reactor modeled separately)
*
CC  MBS  92. "METCALF " 500. "c1" "R"
CC  MBS  92. "METCALF " 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto (if voltage deviation is > 5%)
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*   Switch on Kinport Shunt cap
*
CC  MBS 200. "KINPORT" 345. "1 " "R"
*
```

```
* SONGS-g1.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generator #2


RUN 20
*
*  Loss of 1 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 1100
*
*  Trip SONGS units #2
*
TG   0.0 "S.ONOFR2 "  22. "**"
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Switch on Shunt cap at malin by adding new shunt device
*
*  CC  MBS  13.4 "MALIN   " 500. "c1" "R"
*  CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
*  CC  MBS  90. "TABLE MT" 500. "c1" "A" 0.0 2.27
*  CC  MBS  90. "TABLE MT" 500. "c2" "A" 0.0 2.27
*
*
*  CC  MBS  90. "TABLE MT" 500. "c1" "R"
```

```
* CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
* Add SVC's at Marketplace and Adelanto
*
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
* Drop Load at SDGE substations
*
*   SWEETWTR       51.71   6.59
* CC  MBL  300. "SWEETWTR"  69.    "1 "  "D"  000.0 00.
*
*   SANLUSRY       67.12   8.54
* CC   MBL  300. "SANLUSRY"  69.    "1 "  "D"  000.0 00.0
*
*   LOSCOCHS       57.75   7.35
* CC   MBL  300. "LOSCOCHS"  69.    "1 "  "D"  000.0 00.0
*
*   POWAY   53.62   6.82
* CC  MBL  300. "POWAY   "  69.    "1 "  "D"  000.0 00.
*
*   JAMACHA        66.37   8.45
* CC   MBL  300. "JAMACHA "  69.    "1 "  "D"  000.0 00.
*
*   ELCAJNGT       101.84  12.88
* CC   MBL  300. "ELCAJNGT"  12.5   "1 "  "C"  38.5 4.9
*
*   SANMATEO       33.62   4.28
* CC   MBL  300. "SANMATEO" 138.    "1 "  "D"  000.0 00.
*
*   PARADISE       46.75   5.95
* CC   MBL  300. "PARADISE"  69.    "1 "  "D"  000.0 00.
*
*   CHOLLAS        50.75   6.46
* CC   MBL  300. "CHOLLAS "  69.    "1 "  "D"  000.0 00.
*
*   OTAY      39.62   5.04
* CC   MBL  300. "OTAY    "  69.    "1 "  "D"  000.0 00.
*
*   MESAHGTS       47.62   6.06
* CC   MBL  300. "MESAHGTS"  69.    "1 "  "D"  000.0 00.
*
*   ROSE CYN       40.12   5.11
* CC   MBL  300. "ROSE CYN"  69.    "1 "  "D"  000.0 00.
*
```

```
*    ESCNDIDO         78.50   9.99
*  CC   MBL  300. "ESCNDIDO"  69.    "1 "  "D"  000.0 00.
*
```

```
* SONGS-g2.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generators 2 & 3


RUN 20
*  Loss of 2 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 2220
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip SONGS units #2 and #3
*
TG   0.0 "S.ONOFR2 "  22. "**"
TG   0.0 "S.ONOFR3 "  22. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   This will be done at 17.5 cycles
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
```

```
*   Remove shunt reactor from bus
*   CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Remove reactor Table Mtn
*
*   MLS 17.5 "TABLE MT" 500. "TESLA" 500. "1 " 1 "D" "f "
*
*   Remove Malin reactor (12/4/2001, b1 reactor hard tapped to bus, can not remove)
*
*   MBS   17.5 "MALIN"    500.    "b1"  "D"
*
*   Remove reactors at Olinda Substation
*
*   MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f "
*   MLS 17.5 "OLINDA" 500. "CAPTJACK" 500. "1 " 3 "D" "f "
*
*   Insert capacitors at Olinda
*
*   MBS   17.5 "OLINDA"   500.    "c1"  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_HAA_slo.swt
TIT
  SDG&E Cluster 2
  T468-Hassyampa 500 kV line


RUN 20
*   T468 - Hassyampa 500kV Line Out
*   3-phase 4 cycle fault at Hassyampa
*   No SC bypass
*   Fault bus at Hassyampa
*
FB  0.0  "HASSYAMP  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at Hassyampa
*
CFB 4.0  "HASSYAMP  " 500.
*
*   Trip Hassyampa - T468_SWS 500kV line
*
DL  4.0  "HASSYAMP" 500. "T468_SWS" 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_NGila_slo.swt
TIT
  SDG&E Cluster 2
  T468-N.Gila 500 kV line


RUN 20
*   Imperial Valley - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Imperial Valley - North Gila line
*
DL  4.0  "T468_SWS" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

Appendix H-2

Transient Stability Switching Sequences

Boulevard Cluster

Heavy Summer & Light Load
Pre & Post-BU Cluster

*pst_FLAT.swt
TIT
SDG&E Cluster 2
Flat

RUN 20

```
* C493_Centrals_slo.swt
TIT
  SDG&E Cluster 2
  C493 - CENTRALS 500kV line


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Central
FB  0.0  "CENTRALS" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Central
*
CFB 4.0  "CENTRALS" 500
*
*   Trip C493 - Centrals 500kV
*
DL  8.0  "C493" 500. "CENTRALS" 500. "1 "
*
*
```

```
* Dev_Val_slo.swt
TIT
  SDG&E Cluster 2
  Valley - Devers 500 kV line


RUN 20
*
*
*   Loss of Valley - Devers Line
*
*  CC cards for post-transient only
*
*
FB 0.0 "DEVERS  " 500
*
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*
*  CLEAR FAULT
*
CFB 4.0 "DEVERS  " 500
*
*  REMOVE DEVERS - VALLEY 500 KV LINE
*
DL 4.0 "DEVERS  " 500. "VALLEYSC" 500. "1 "
*
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*  Add SVC's at Marketplace and Adelanto
```

```
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* HAA_NGila_slo.swt
TIT
  SDG&E Cluster 2
  Haasyampa-N.Gila 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Hassyampa - North Gila 500kV line
*
DL  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* IV_C493_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley- C493 500kV line1


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500
*
*   Trip Imperial Valley - C493 line
*
DL  8.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
```

```
*IV-ROA.swt
TIT
  SDG&E Cluster 2
  Fault Imperial Valley 230 kV
  Loss of IV-ROA 230 kV SLO

RUN 20
*
*   Imperial Valley-La Rosita 230 kV SLO
*   3-phase 4 cycle fault at ROA 230 kV bus
*
FB  0.0  "ROA-230 " 230.
*
*   Clear fault bus at Imperial Valley
*
CFB 6.0  "ROA-230 " 230.
*
*   Trip Imperial Valley – La Rosita line
*
DL  6.0  "IMPRLVLY" 230. "ROA-230 " 230. "1"
*
```

```
* IV_Wnd1_noRAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - Windfarms line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
*  TG   8.0 "INTBST  "  18. "**"
*  TG   8.0 "INTBCT  "  18. "**"
*  TG   8.0 "IV GEN1 "  21. "**"
```

```
*  TG   8.0 "IV GEN2 "  18. "**"
*  TG   8.0 "IV GEN3 "  18. "**"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_noXTrp_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   Drop IV Gens
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Inmperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo _noXTR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage


RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY  " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
```

```
*
TG   8.0 "C510_G1  "  0.20 "C1"
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
```

```
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo_RASxR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage
   with Xtrp

RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "IMPRLVLY " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
*
```

```
TG   8.0 "C510_G1  "  0.20 "C1"
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
```

```
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050 winter, Trip 23040 summer
*
DL  120.0  "OTAYMESA" 230. "TJI-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_noRAS_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   Miguel - ECO 500kV Line Out
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel - ECO line
*
DL  4.0  "MIGUEL  " 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
*  TG   8.0 "INTBST  "  18. "**"
*  TG   8.0 "INTBCT  "  18. "**"
*  TG   8.0 "IV GEN1 "  21. "**"
```

```
*  TG   8.0 "IV GEN2 "  18. "**"
*  TG   8.0 "IV GEN3 "  18. "**"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_noXTrp_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   MIguel - ECO 500kV Line Out
*   Drop IV Gens
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel to ECO 500kV
*
DL  4.0  "MIGUEL  " 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   Miguel - ECO 500kV Line Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel - ECO line
*
DL  4.0  "MIGUEL" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* NGila_IV_slo.swt
TIT
  SDG&E Cluster 2
  North Gila - Imperial Valley 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip North Gila - Imperial Valley 500kV line
*
DL  4.0  "N.GILA" 500. "IMPRLVLY  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* PaloVerde-g1.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generator #2


RUN 20
*   Loss of 1 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 1444
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*  Trip Palo Verde unit #2
*
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "1 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt cap at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
```

```
*
*   Deenergize Malin Shunt reactors as part of FACRI
CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Switch on Olinda Shunt cap
*   CC  MBS   17.5 "OLINDA"   500.    "c "  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*   CC  MBS  90. "TABLE MT" 500. "c1" "R"
*   CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*   CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```

```
* PaloVerde-g2.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generators 1 & 2


RUN 20
*   Loss of 2 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 2946
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip Palo Verde units #1 and #2
*
TG   0.0 "PALOVRD1"  24. "**"
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC 12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC 12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC 12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS 13.4 "MALIN   " 500. "c1" "R"
CC  MBS 13.4 "MALIN   " 500. "c2" "R"
CC  MSV 13.4 "MALIN   " 500. "s " 0.0 0.0
```

```
*
*   Remove reactor at Olinda
*
CC  MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f " -1.9
*
*   Switch on Olinda Shunt cap
*
*   CC  MBS  17.5 "OLINDA  " 500. "c1" "R"
*
*   Drop AZ load (120 MW)
*   120.0 + j7.4
*
*MBL   60.0 "AGUAFAPS"  69.0  "AP" M -15 -2.7
*   MBL   60.0 "AGUAFRIA"  230.0 "AP" M -15 -2.7
*MBL   60.0 "PAPAGOBT"  69.0  "AP" M -30 -3.8
*MBL   60.0 "SANTAN  "  69.0  "SR" M -30  0.0
*MBL   60.0 "CORBELRS"  69.0  "SR" M -15 -0.7
*MBL   60.0 "ORME  RS"  69.0  "**" M -15 -0.2
*MBL   60.0 "THUNDRST"  69.0  "**" M -15  0.0
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*   Switch on Metcalf Shunt cap
*   2 x 175 caps (91 Mvar reactor modeled separately)
*
CC  MBS  92. "METCALF " 500. "c1" "R"
CC  MBS  92. "METCALF " 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto (if voltage deviation is > 5%)
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*   Switch on Kinport Shunt cap
*
CC  MBS 200. "KINPORT" 345. "1 " "R"
*
```

```
* SONGS-g1.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generator #2


RUN 20
*
*  Loss of 1 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 1100
*
*  Trip SONGS units #2
*
TG   0.0 "S.ONOFR2 "  22. "**"
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Switch on Shunt cap at malin by adding new shunt device
*
*  CC  MBS  13.4 "MALIN   " 500. "c1" "R"
*  CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
*  CC  MBS  90. "TABLE MT" 500. "c1" "A" 0.0 2.27
*  CC  MBS  90. "TABLE MT" 500. "c2" "A" 0.0 2.27
*
*
```

```
* CC  MBS  90. "TABLE MT" 500. "c1" "R"
* CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*  Drop Load at SDGE substations
*
*   SWEETWTR       51.71   6.59
* CC  MBL  300. "SWEETWTR"  69.    "1 "  "D"  000.0 00.
*
*   SANLUSRY       67.12   8.54
* CC   MBL  300. "SANLUSRY"  69.    "1 "  "D"  000.0 00.0
*
*   LOSCOCHS       57.75   7.35
* CC   MBL  300. "LOSCOCHS"  69.    "1 "  "D"  000.0 00.0
*
*   POWAY   53.62   6.82
* CC  MBL  300. "POWAY   "  69.    "1 "  "D"  000.0 00.
*
*   JAMACHA        66.37   8.45
* CC   MBL  300. "JAMACHA "  69.    "1 "  "D"  000.0 00.
*
*   ELCAJNGT       101.84  12.88
* CC   MBL  300. "ELCAJNGT"  12.5   "1 "  "C"  38.5 4.9
*
*   SANMATEO       33.62   4.28
* CC   MBL  300. "SANMATEO" 138.    "1 "  "D"  000.0 00.
*
*   PARADISE       46.75   5.95
* CC   MBL  300. "PARADISE"  69.    "1 "  "D"  000.0 00.
*
*   CHOLLAS        50.75   6.46
* CC   MBL  300. "CHOLLAS "  69.    "1 "  "D"  000.0 00.
*
*   OTAY      39.62   5.04
* CC   MBL  300. "OTAY    "  69.    "1 "  "D"  000.0 00.
*
*   MESAHGTS       47.62   6.06
* CC   MBL  300. "MESAHGTS"  69.    "1 "  "D"  000.0 00.
*
*   ROSE CYN       40.12   5.11
```

```
* CC   MBL  300. "ROSE CYN"  69.    "1 "  "D"  000.0 00.
*
*   ESCNDIDO         78.50   9.99
* CC   MBL  300. "ESCNDIDO"  69.    "1 "  "D"  000.0 00.
*
```

```
* SONGS-g2.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generators 2 & 3


RUN 20
*  Loss of 2 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 2220
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip SONGS units #2 and #3
*
TG   0.0 "S.ONOFR2 "  22. "**"
TG   0.0 "S.ONOFR3 "  22. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   This will be done at 17.5 cycles
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
```

```
*
*   Remove shunt reactor from bus
*   CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Remove reactor Table Mtn
*
*   MLS 17.5 "TABLE MT" 500. "TESLA" 500. "1 " 1 "D" "f "
*
*   Remove Malin reactor (12/4/2001, b1 reactor hard tapped to bus, can not remove)
*
*   MBS   17.5 "MALIN"    500.    "b1"  "D"
*
*   Remove reactors at Olinda Substation
*
*   MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f "
*   MLS 17.5 "OLINDA" 500. "CAPTJACK" 500. "1 " 3 "D" "f "
*
*   Insert capacitors at Olinda
*
*   MBS   17.5 "OLINDA"   500.    "c1"  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_HAA_slo.swt
TIT
  SDG&E Cluster 2
  T468-Hassyampa 500 kV line


RUN 20
*   T468 - Hassyampa 500kV Line Out
*   3-phase 4 cycle fault at Hassyampa
*   No SC bypass
*   Fault bus at Hassyampa
*
FB  0.0  "HASSYAMP  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at Hassyampa
*
CFB 4.0  "HASSYAMP  " 500.
*
*   Trip Hassyampa - T468_SWS 500kV line
*
DL  4.0  "HASSYAMP" 500. "T468_SWS" 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_NGila_slo.swt
TIT
  SDG&E Cluster 2
  T468-N.Gila 500 kV line


RUN 20
*   Imperial Valley - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Imperial Valley - North Gila line
*
DL  4.0  "T468_SWS" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

Appendix H-3

Transient Stability Switching Sequences

Internal Cluster

Heavy Summer & Light Load
Pre-INT Cluster

*pst_FLAT.swt
TIT
SDG&E Cluster 2
Flat

```
RUN 20
* C493_Centrals_slo.swt
TIT
  SDG&E Cluster 2
  C493 - CENTRALS 500kV line


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Central
FB  0.0  "CENTRALS" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Central
*
CFB 4.0  "CENTRALS" 500
*
*   Trip C493 - Centrals 500kV
*
DL  8.0  "C493" 500. "CENTRALS" 500. "1 "
*
*
```

```
* Dev_Val_slo.swt
TIT
  SDG&E Cluster 2
  Valley - Devers 500 kV line


RUN 20
*
*
*   Loss of Valley - Devers Line
*
*  CC cards for post-transient only
*
*
FB 0.0 "DEVERS  " 500
*
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*
*  CLEAR FAULT
*
CFB 4.0 "DEVERS  " 500
*
*  REMOVE DEVERS - VALLEY 500 KV LINE
*
DL 4.0 "DEVERS  " 500. "VALLEYSC" 500. "1 "
*
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*  Add SVC's at Marketplace and Adelanto
*
```

```
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* HAA_NGila_slo.swt
TIT
  SDG&E Cluster 2
  Haasyampa-N.Gila 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Hassyampa - North Gila 500kV line
*
DL  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* IV_C493_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley- C493 500kV line1


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500
*
*   Trip Imperial Valley - C493 line
*
DL  8.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
```

```
*IV-ROA.swt
TIT
  SDG&E Cluster 2
  Fault Imperial Valley 230 kV
  Loss of IV-ROA 230 kV SLO

RUN 20
*
*   Imperial Valley-La Rosita 230 kV SLO
*   3-phase 4 cycle fault at ROA 230 kV bus
*
FB  0.0  "ROA-230 " 230.
*
*   Clear fault bus at Imperial Valley
*
CFB 6.0  "ROA-230 " 230.
*
*   Trip Imperial Valley – La Rosita line
*
DL  6.0  "IMPRLVLY" 230. "ROA-230 " 230. "1"
*
```

```
* IV_Wnd1_noRAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - Windfarms line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
*  TG   8.0 "INTBST  "  18. "**"
*  TG   8.0 "INTBCT  "  18. "**"
*  TG   8.0 "IV GEN1 "  21. "**"
*  TG   8.0 "IV GEN2 "  18. "**"
```

```
*  TG   8.0 "IV GEN3 "  18. "**"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_noXTrp_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   Drop IV Gens
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Inmperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo _noXTR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage


RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY  " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
*
```

```
TG   8.0 "C510_G1  "  0.20 "C1"
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
```

```
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo_RASxR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage
   with Xtrp

RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "IMPRLVLY " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
*
TG   8.0 "C510_G1  "  0.20 "C1"
```

```
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
```

```
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050 winter, Trip 23040 summer
*
DL  120.0  "OTAYMESA" 230. "TJI-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   Miguel - ECO 500kV Line Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel - ECO line
*
DL  4.0  "MIGUEL" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
TG   8.0 "INTBCT  "  16. "1"
```

```
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* NGila_IV_slo.swt
TIT
  SDG&E Cluster 2
  North Gila - Imperial Valley 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip North Gila - Imperial Valley 500kV line
*
DL  4.0  "N.GILA" 500. "IMPRLVLY  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* PaloVerde-g1.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generator #2


RUN 20
*   Loss of 1 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 1444
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*  Trip Palo Verde unit #2
*
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "1 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt cap at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
```

```
*   Deenergize Malin Shunt reactors as part of FACRI
CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Switch on Olinda Shunt cap
*   CC  MBS   17.5 "OLINDA"   500.    "c "  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*   CC  MBS  90. "TABLE MT" 500. "c1" "R"
*   CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*   CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```

```
* PaloVerde-g2.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generators 1 & 2


RUN 20
*   Loss of 2 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 2946
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip Palo Verde units #1 and #2
*
TG   0.0 "PALOVRD1"  24. "**"
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC 12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC 12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC 12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS 13.4 "MALIN   " 500. "c1" "R"
CC  MBS 13.4 "MALIN   " 500. "c2" "R"
CC  MSV 13.4 "MALIN   " 500. "s " 0.0 0.0
*
```

```
*   Remove reactor at Olinda
*
CC  MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f " -1.9
*
*   Switch on Olinda Shunt cap
*
*   CC  MBS  17.5 "OLINDA  " 500. "c1" "R"
*
*   Drop AZ load (120 MW)
*   120.0 + j7.4
*
*MBL   60.0 "AGUAFAPS"  69.0  "AP" M -15 -2.7
*   MBL   60.0 "AGUAFRIA"  230.0 "AP" M -15 -2.7
*MBL   60.0 "PAPAGOBT"  69.0  "AP" M -30 -3.8
*MBL   60.0 "SANTAN  "  69.0  "SR" M -30  0.0
*MBL   60.0 "CORBELRS"  69.0  "SR" M -15 -0.7
*MBL   60.0 "ORME  RS"  69.0  "**" M -15 -0.2
*MBL   60.0 "THUNDRST"  69.0  "**" M -15  0.0
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*   Switch on Metcalf Shunt cap
*   2 x 175 caps (91 Mvar reactor modeled separately)
*
CC  MBS  92. "METCALF " 500. "c1" "R"
CC  MBS  92. "METCALF " 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto (if voltage deviation is > 5%)
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*   Switch on Kinport Shunt cap
*
CC  MBS 200. "KINPORT" 345. "1 " "R"
*
```

```
* SONGS-g1.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generator #2


RUN 20
*
*  Loss of 1 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 1100
*
*  Trip SONGS units #2
*
TG   0.0 "S.ONOFR2 "  22. "**"
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Switch on Shunt cap at malin by adding new shunt device
*
*  CC  MBS  13.4 "MALIN   " 500. "c1" "R"
*  CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
*  CC  MBS  90. "TABLE MT" 500. "c1" "A" 0.0 2.27
*  CC  MBS  90. "TABLE MT" 500. "c2" "A" 0.0 2.27
*
*
*  CC  MBS  90. "TABLE MT" 500. "c1" "R"
```

```
* CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
* Add SVC's at Marketplace and Adelanto
*
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
* Drop Load at SDGE substations
*
*   SWEETWTR       51.71   6.59
* CC  MBL  300. "SWEETWTR"  69.    "1 "  "D"  000.0 00.
*
*   SANLUSRY       67.12   8.54
* CC   MBL  300. "SANLUSRY"  69.    "1 "  "D"  000.0 00.0
*
*   LOSCOCHS       57.75   7.35
* CC   MBL  300. "LOSCOCHS"  69.    "1 "  "D"  000.0 00.0
*
*   POWAY   53.62   6.82
* CC  MBL  300. "POWAY   "  69.    "1 "  "D"  000.0 00.
*
*   JAMACHA        66.37   8.45
* CC   MBL  300. "JAMACHA "  69.    "1 "  "D"  000.0 00.
*
*   ELCAJNGT       101.84  12.88
* CC   MBL  300. "ELCAJNGT"  12.5   "1 "  "C"  38.5 4.9
*
*   SANMATEO       33.62   4.28
* CC   MBL  300. "SANMATEO" 138.    "1 "  "D"  000.0 00.
*
*   PARADISE       46.75   5.95
* CC   MBL  300. "PARADISE"  69.    "1 "  "D"  000.0 00.
*
*   CHOLLAS        50.75   6.46
* CC   MBL  300. "CHOLLAS "  69.    "1 "  "D"  000.0 00.
*
*   OTAY      39.62   5.04
* CC   MBL  300. "OTAY    "  69.    "1 "  "D"  000.0 00.
*
*   MESAHGTS       47.62   6.06
* CC   MBL  300. "MESAHGTS"  69.    "1 "  "D"  000.0 00.
*
*   ROSE CYN       40.12   5.11
* CC   MBL  300. "ROSE CYN"  69.    "1 "  "D"  000.0 00.
*
```

```
*    ESCNDIDO         78.50   9.99
*  CC   MBL  300. "ESCNDIDO"  69.    "1 "  "D"  000.0 00.
*
```

```
* SONGS-g2.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generators 2 & 3


RUN 20
*  Loss of 2 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 2220
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip SONGS units #2 and #3
*
TG   0.0 "S.ONOFR2 "  22. "**"
TG   0.0 "S.ONOFR3 "  22. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   This will be done at 17.5 cycles
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
```

```
*   Remove shunt reactor from bus
*   CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Remove reactor Table Mtn
*
*   MLS 17.5 "TABLE MT" 500. "TESLA" 500. "1 " 1 "D" "f "
*
*   Remove Malin reactor (12/4/2001, b1 reactor hard tapped to bus, can not remove)
*
*   MBS   17.5 "MALIN"    500.    "b1"  "D"
*
*   Remove reactors at Olinda Substation
*
*   MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f "
*   MLS 17.5 "OLINDA" 500. "CAPTJACK" 500. "1 " 3 "D" "f "
*
*   Insert capacitors at Olinda
*
*   MBS   17.5 "OLINDA"   500.    "c1"  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_HAA_slo.swt
TIT
  SDG&E Cluster 2
  T468-Hassyampa 500 kV line


RUN 20
*   T468 - Hassyampa 500kV Line Out
*   3-phase 4 cycle fault at Hassyampa
*   No SC bypass
*   Fault bus at Hassyampa
*
FB  0.0  "HASSYAMP  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at Hassyampa
*
CFB 4.0  "HASSYAMP  " 500.
*
*   Trip Hassyampa - T468_SWS 500kV line
*
DL  4.0  "HASSYAMP" 500. "T468_SWS" 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_NGila_slo.swt
TIT
  SDG&E Cluster 2
  T468-N.Gila 500 kV line


RUN 20
*   Imperial Valley - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Imperial Valley - North Gila line
*
DL  4.0  "T468_SWS" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
```

```
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* pre_int_SY230-SG.swt
TIT
  SDG&E Cluster 2 - pre int
  South Bay - Silvergate 230 kV N-1


RUN 10
*
*   South Bay - Silvergate 230 kV Lines Out
*   3-phase 4 cycle fault at South Bay 230 kV Bus
*
*   Fault bus at South Bay 230 kV Bus
FB  0.0  "SY230   " 230
*
*   Clear fault bus at South Bay 230 kV
*
CFB 6.0  "SY230   " 230
*
*   Trip South Bay - Silvergate 230 kV line
*
DL  6.0  "SILVERGT" 230. "SY230   " 230. "1 "
```

```
* pre_int_SX-ML.swt
TIT
  SDG&E Cluster 2 - pre int
  Sycamore - Miguel 230 kV N-1


RUN 10
*
*   Sycamore - Miguel 230 kV Line Out
*   3-phase 4 cycle fault at Sycamore 230 kV Bus
*
*   Fault bus at Sycamore 230 kV Bus
FB  0.0  "SYCAMORE" 230
*
*   Clear fault bus at Sycamore 230 kV
*
CFB 6.0  "SYCAMORE" 230
*
*   Trip Sycamore - C565 230 kV line
*
DL  6.0  "SYCAMORE" 230. "MIGUEL  " 230. "1 "
```

```
* pre_int_OM-SY.swt
TIT
  SDG&E Cluster 2 - pre int
  Otay Mesa - Southbay 230 kV N-1


RUN 10
*
*   Otay Mesa - Southbay 230 kV Line Out
*   3-phase 4 cycle fault at Otay Mesa 230 kV Bus
*
*   Fault bus at Otay Mesa 230 kV Bus
FB  0.0  "OTAYMESA" 230
*
*   Clear fault bus at C574 230 kV
*
CFB 6.0  "OTAYMESA" 230
*
*   Trip Otay Mesa - Southbay 230 kV line
*
DL  6.0  "OTAYMESA" 230. "MLMS3TAP" 230. "1 "
DL  6.0  "MLMS3TAP" 230. "SY230   " 230. "1 "
```

```
* pre_int_OM-SX_SYwRAS.swt
TIT
  SDG&E Cluster 2 - pre int
  Otay Mesa - SY/SX 230 kV N-2


RUN 10
*
*   Otay Mesa - SY/SX 230 kV Lines Out
*   3-phase 4 cycle fault at Otay Mesa 230 kV Bus
*
*   Fault bus at Otay Mesa 230 kV Bus
FB  0.0  "OTAYMESA" 230
*
*   Clear fault bus at Otay Mesa 230 kV
*
CFB 6.0  "OTAYMESA" 230
*
*   Trip Otay Mesa - SX/SY 230 kV lines
*
DL  6.0  "OTAYMESA" 230. "MLSXTAP " 230. "1 "
DL  6.0  "OTAYMESA" 230. "MLMS3TAP" 230. "1 "
DL  6.0  "MLSXTAP " 230. "SYCAMORE" 230. "1 "
DL  6.0  "MLMS3TAP" 230. "SY230   " 230. "1 "
*
*   Trip Generation at Otay Mesa
*
TG  6.0  "OTAYMGT1" 18. "1 "
TG  6.0  "OTAYMGT2" 18. "1 "
TG  6.0  "OTAYMST1" 18. "1 "
```

Appendix H-4

Transient Stability Switching Sequences

Internal Cluster

Heavy Summer & Light Load
Post-INT Cluster

*pst_FLAT.swt
TIT
SDG&E Cluster 2
Flat

RUN 20

```
* C493_Centrals_slo.swt
TIT
  SDG&E Cluster 2
  C493 - CENTRALS 500kV line


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Central
FB  0.0  "CENTRALS" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Central
*
CFB 4.0  "CENTRALS" 500
*
*   Trip C493 - Centrals 500kV
*
DL  8.0  "C493" 500. "CENTRALS" 500. "1 "
*
*
```

```
* Dev_Val_slo.swt
TIT
  SDG&E Cluster 2
  Valley - Devers 500 kV line


RUN 20
*
*
*   Loss of Valley - Devers Line
*
*  CC cards for post-transient only
*
*
FB 0.0 "DEVERS  " 500
*
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  FC  0.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*
*  CLEAR FAULT
*
CFB 4.0 "DEVERS  " 500
*
*  REMOVE DEVERS - VALLEY 500 KV LINE
*
DL 4.0 "DEVERS  " 500. "VALLEYSC" 500. "1 "
*
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 2
*  RC  4.0 "PALOVRDE" 500. "DEVERS  " 500. "1 " 4
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*  Add SVC's at Marketplace and Adelanto
```

```
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* HAA_NGila_slo.swt
TIT
  SDG&E Cluster 2
  Haasyampa-N.Gila 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Hassyampa - North Gila 500kV line
*
DL  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* IV_C493_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley- C493 500kV line1


RUN 20
*
*   Imperial Valley - C493 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500
*
*   Trip Imperial Valley - C493 line
*
DL  8.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
```

```
*IV-ROA.swt
TIT
  SDG&E Cluster 2
  Fault Imperial Valley 230 kV
  Loss of IV-ROA 230 kV SLO

RUN 20
*
*   Imperial Valley-La Rosita 230 kV SLO
*   3-phase 4 cycle fault at ROA 230 kV bus
*
FB  0.0  "ROA-230 " 230.
*
*   Clear fault bus at Imperial Valley
*
CFB 6.0  "ROA-230 " 230.
*
*   Trip Imperial Valley – La Rosita line
*
DL  6.0  "IMPRLVLY" 230. "ROA-230 " 230. "1"
*
```

```
* IV_Wnd1_noRAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line Out
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
*  CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - Windfarms line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
*  TG   8.0 "INTBST  "  18. "**"
*  TG   8.0 "INTBCT  "  18. "**"
*  TG   8.0 "IV GEN1 "  21. "**"
```

```
*  TG   8.0 "IV GEN2 "  18. "**"
*  TG   8.0 "IV GEN3 "  18. "**"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_noXTrp_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   Drop IV Gens
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Inmperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd1_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-ECO 500 kV line1


RUN 20
*
*   Imperial Valley - ECO 500kV Line1 Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Imperial Valley
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY" 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY" 500.
*
*   Trip Imperial Valley - ECO line1
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo _noXTR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage


RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Imperial Valley
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Imperial Valley
*
CFB 4.0  "IMPRLVLY  " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
```

```
*
TG   8.0 "C510_G1  "  0.20 "C1"
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
```

```
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050
*
*  DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* IV_Wnd_dlo_RASxR1.swt
TIT
  SDG&E Cluster 2
  Imperial Valley-C493-ECO 500 kV Double line outage
    with Xtrp

RUN 20
*
*   Imperial Valley-C493-ECO 500 kV Double line outage
*   Drop IV Gens + additional gens (total 1400MW)
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "IMPRLVLY  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "IMPRLVLY " 500.
*
*   Trip Imperial Valley - C493 line
*   Trip Imperial Valley - ECO line
*
DL  4.0  "IMPRLVLY" 500. "ECO" 500. "1 "
DL  4.0  "IMPRLVLY" 500. "C493" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   Trip TDM and InterGen
*   Please modify these based on generation in .sav case (1400 MW)
*
```

```
TG   8.0 "C510_G1  "  0.20 "C1"
TG   8.0 "C510_G2  "  0.20 "C1"
TG   8.0 "Q159A_G1 "  0.69 "Q1"
TG   8.0 "T183_G2 "   0.69 "T"
TG   8.0 "T429_G1 "  13.80 "T"
TG   8.0 "Q78_1A1Q"  0.48. "Q1"
TG   8.0 "Q78_1A2Q"  0.48. "Q2"
TG   8.0 "Q78_1B1Q"  0.48. "Q3"
TG   8.0 "Q1242A1Q"  0.48. "Q1"
TG   8.0 "Q1242A2Q"  0.48. "Q2"
TG   8.0 "Q1242B1Q"  0.48. "Q3"
TG   8.0 "Q1243A1Q"  0.48. "Q4"
TG   8.0 "Q1243A2Q"  0.48. "Q5"
TG   8.0 "Q1243B1Q"  0.48. "Q6"
*
*   Trip applicable Q78 shunts
MBS  8.0 "Q78_1B1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1B1Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A2Q"  34.5 "b3" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b1" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b2" "D"
MBS  8.0 "Q78_1A1Q"  34.5 "b3" "D"
MBS  8.0 "Q78     "  230. "b1" "D"
MBS  8.0 "Q78     "  230. "b2" "D"
MBS  8.0 "Q78     "  230. "b3" "D"
MBS  8.0 "Q78     "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b7" "D"
MBS  8.0 "Q124    "  230. "b6" "D"
MBS  8.0 "Q124    "  230. "b5" "D"
MBS  8.0 "Q124    "  230. "b4" "D"
MBS  8.0 "Q124    "  230. "b3" "D"
MBS  8.0 "Q124    "  230. "b2" "D"
MBS  8.0 "Q124    "  230. "b1" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1242A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1242B1Q    "  34.5 "b2" "D"
```

```
MBS  8.0 "Q1242B1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A1Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b3" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243A2Q    "  34.5 "b1" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b2" "D"
MBS  8.0 "Q1243B1Q    "  34.5 "b1" "D"
*
*   Trip 23050 winter, Trip 23040 summer
*
DL  120.0  "OTAYMESA" 230. "TJI-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* ML_Wnd_RAS_slo.swt
TIT
  SDG&E Cluster 2
  Miguel-ECO 500 kV line


RUN 20
*
*   Miguel - ECO 500kV Line Out
*   With Cross Trip RAS
*   3-phase 4 cycle fault at Miguel
*   No SC bypass
*
CC  DRP 700
*
*   Fault bus at Miguel
FB  0.0  "MIGUEL  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*
*   Clear fault bus at Miguel
*
CFB 4.0  "MIGUEL  " 500.
*
*   Trip Miguel - ECO line
*
DL  4.0  "MIGUEL" 500. "ECO" 500. "1 "
*
*
*   Readjust SCE's Devers SVCs
*
CC MSV 0.0 "DEVRSVC1" 500.0 "1 "  549. -100.
CC MSV 0.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Trip TDM and InterGen
*
TG   8.0 "LRP-U1  "  16. "1"
TG   8.0 "INTBST  "  18. "1"
```

```
TG   8.0 "INTBCT  "  16. "1"
TG   8.0 "IV GEN1 "  21. "1"
TG   8.0 "IV GEN2 "  18. "1"
TG   8.0 "IV GEN3 "  18. "1"
*
*   Trip 23050
*
DL  120.0  "IMPRLVLY" 230. "ROA-230 " 230. "1 "
*
*   Reinsert remaining SWPL capacitors
*  RC  4.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 3
*
```

```
* NGila_IV_slo.swt
TIT
  SDG&E Cluster 2
  North Gila - Imperial Valley 500 kV line


RUN 20
*   Hassyampa - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip North Gila - Imperial Valley 500kV line
*
DL  4.0  "N.GILA" 500. "IMPRLVLY  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
*MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
*MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* PaloVerde-g1.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generator #2


RUN 20
*   Loss of 1 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 1444
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*  Trip Palo Verde unit #2
*
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "1 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt cap at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
```

```
*
*   Deenergize Malin Shunt reactors as part of FACRI
CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Switch on Olinda Shunt cap
*   CC  MBS   17.5 "OLINDA"   500.    "c "  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*   CC  MBS  90. "TABLE MT" 500. "c1" "R"
*   CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*   CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
```

```
* PaloVerde-g2.swt
TIT
  SDG&E Cluster 2
  Trip PaloVerde Generators 1 & 2


RUN 20
*   Loss of 2 Palo Verde generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
CC  DRP 2946
*
*   Readjust Northwest SVC's
*
CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip Palo Verde units #1 and #2
*
TG   0.0 "PALOVRD1"  24. "**"
TG   0.0 "PALOVRD2"  24. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   Disregard timing
*
*   Insert Fort Rock series caps
CC  RC 12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC 12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC 12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS 13.4 "MALIN   " 500. "c1" "R"
CC  MBS 13.4 "MALIN   " 500. "c2" "R"
CC  MSV 13.4 "MALIN   " 500. "s " 0.0 0.0
```

```
*
*   Remove reactor at Olinda
*
CC  MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f " -1.9
*
*   Switch on Olinda Shunt cap
*
*   CC  MBS  17.5 "OLINDA  " 500. "c1" "R"
*
*   Drop AZ load (120 MW)
*   120.0 + j7.4
*
*MBL   60.0 "AGUAFAPS"  69.0  "AP" M -15 -2.7
*   MBL   60.0 "AGUAFRIA"  230.0 "AP" M -15 -2.7
*MBL   60.0 "PAPAGOBT"  69.0  "AP" M -30 -3.8
*MBL   60.0 "SANTAN  "  69.0  "SR" M -30  0.0
*MBL   60.0 "CORBELRS"  69.0  "SR" M -15 -0.7
*MBL   60.0 "ORME  RS"  69.0  "**" M -15 -0.2
*MBL   60.0 "THUNDRST"  69.0  "**" M -15  0.0
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*   Switch on Metcalf Shunt cap
*   2 x 175 caps (91 Mvar reactor modeled separately)
*
CC  MBS  92. "METCALF " 500. "c1" "R"
CC  MBS  92. "METCALF " 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto (if voltage deviation is > 5%)
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*   Switch on Kinport Shunt cap
*
CC  MBS 200. "KINPORT" 345. "1 " "R"
*
```

```
* SONGS-g1.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generator #2


RUN 20
*
*  Loss of 1 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 1100
*
*  Trip SONGS units #2
*
TG   0.0 "S.ONOFR2 "  22. "**"
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   Switch on Shunt cap at malin by adding new shunt device
*
*  CC  MBS  13.4 "MALIN   " 500. "c1" "R"
*  CC  MBS  13.4 "MALIN   " 500. "c2" "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
*  CC  MBS  90. "TABLE MT" 500. "c1" "A" 0.0 2.27
*  CC  MBS  90. "TABLE MT" 500. "c2" "A" 0.0 2.27
*
*
```

```
* CC  MBS  90. "TABLE MT" 500. "c1" "R"
* CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
* CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
*  Drop Load at SDGE substations
*
*   SWEETWTR       51.71   6.59
* CC  MBL  300. "SWEETWTR"  69.    "1 "  "D"  000.0 00.
*
*   SANLUSRY       67.12   8.54
* CC   MBL  300. "SANLUSRY"  69.    "1 "  "D"  000.0 00.0
*
*   LOSCOCHS       57.75   7.35
* CC   MBL  300. "LOSCOCHS"  69.    "1 "  "D"  000.0 00.0
*
*   POWAY   53.62   6.82
* CC  MBL  300. "POWAY   "  69.    "1 "  "D"  000.0 00.
*
*   JAMACHA        66.37   8.45
* CC   MBL  300. "JAMACHA "  69.    "1 "  "D"  000.0 00.
*
*   ELCAJNGT       101.84  12.88
* CC   MBL  300. "ELCAJNGT"  12.5   "1 "  "C"  38.5 4.9
*
*   SANMATEO       33.62   4.28
* CC   MBL  300. "SANMATEO" 138.    "1 "  "D"  000.0 00.
*
*   PARADISE       46.75   5.95
* CC   MBL  300. "PARADISE"  69.    "1 "  "D"  000.0 00.
*
*   CHOLLAS        50.75   6.46
* CC   MBL  300. "CHOLLAS "  69.    "1 "  "D"  000.0 00.
*
*   OTAY      39.62   5.04
* CC   MBL  300. "OTAY    "  69.    "1 "  "D"  000.0 00.
*
*   MESAHGTS       47.62   6.06
* CC   MBL  300. "MESAHGTS"  69.    "1 "  "D"  000.0 00.
*
*   ROSE CYN       40.12   5.11
```

```
* CC   MBL  300. "ROSE CYN"  69.    "1 "  "D"  000.0 00.
*
*   ESCNDIDO         78.50   9.99
* CC   MBL  300. "ESCNDIDO"  69.    "1 "  "D"  000.0 00.
*
```

```
* SONGS-g2.swt
TIT
  SDG&E Cluster 2
  Trip San Onofre Generators 2 & 3


RUN 20
*  Loss of 2 SONGS generators
*
*  CC cards for post-transient only
*
*  Set Generator MW Dropping
*
CC  DRP 2220
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*  Trip SONGS units #2 and #3
*
TG   0.0 "S.ONOFR2 "  22. "**"
TG   0.0 "S.ONOFR3 "  22. "**"
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
*
*
*   This routine will call the FACRI (Fort Rock and Malin MSC)
*      in In-Run EPCL (facri.p)
*   This will be done at 17.5 cycles
*
*   Insert Fort Rock series caps
CC  RC  12.6 "CAPTJACK" 500. "GRIZZLY " 500. "1 " 4
CC  RC  12.6 "GRIZZLY " 500. "MALIN   " 500. "2 " 4
CC  RC  12.6 "PONDROSA" 500. "SUMMER L" 500. "1 " 4
*
*   Switch on Shunt caps at malin as part of FACRI
CC  MBS  13.4 "MALIN   " 500. "c1" "R"
CC  MBS  13.4 "MALIN   " 500. "c2" "R"
```

```
*
*   Remove shunt reactor from bus
*   CC  MSV  13.4 "MALIN   " 500. "s " 0.0 0.0
*
*   Remove reactor Table Mtn
*
*   MLS 17.5 "TABLE MT" 500. "TESLA" 500. "1 " 1 "D" "f "
*
*   Remove Malin reactor (12/4/2001, b1 reactor hard tapped to bus, can not remove)
*
*   MBS   17.5 "MALIN"    500.    "b1"  "D"
*
*   Remove reactors at Olinda Substation
*
*   MLS 17.5 "OLINDA" 500. "MAXWELL" 500. "1 " 1 "D" "f "
*   MLS 17.5 "OLINDA" 500. "CAPTJACK" 500. "1 " 3 "D" "f "
*
*   Insert capacitors at Olinda
*
*   MBS   17.5 "OLINDA"   500.    "c1"  "R"
*
*   Switch on Table Mountain Shunt cap
*   2 x 217 caps (91 Mvar reactor modeled separately)
*
CC  MBS  90. "TABLE MT" 500. "c1" "R"
CC  MBS  90. "TABLE MT" 500. "c2" "R"
*
*  Add SVC's at Marketplace and Adelanto
*
CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
* CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_HAA_slo.swt
TIT
  SDG&E Cluster 2
  T468-Hassyampa 500 kV line


RUN 20
*   T468 - Hassyampa 500kV Line Out
*   3-phase 4 cycle fault at Hassyampa
*   No SC bypass
*   Fault bus at Hassyampa
*
FB  0.0  "HASSYAMP  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at Hassyampa
*
CFB 4.0  "HASSYAMP  " 500.
*
*   Trip Hassyampa - T468_SWS 500kV line
*
DL  4.0  "HASSYAMP" 500. "T468_SWS" 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* T468_NGila_slo.swt
TIT
  SDG&E Cluster 2
  T468-N.Gila 500 kV line


RUN 20
*   Imperial Valley - North Gila 500kV Line Out
*   3-phase 4 cycle fault at North Gila
*   No SC bypass
*   Fault bus at North Gila
*
FB  0.0  "N.GILA  " 500.
*
*   Flash SWPL capacitors
*
*  FC  0.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*  FC  0.0  "N.GILA  " 500. "IMPRLVLY" 500. "1 " 2
*  FC  0.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 1
*
*   Readjust Northwest SVC's
*  CC  MSV 0.0 "KEEL-SVC" 19.60 "1 "  350. -300.
*  CC  MSV 0.0 "MV-SVC  " 19.60 "1 "  350. -300.
*  CC  RG  0.0 "DALLES 3"  13.8 "1 "  180. -270.
*
*
*   Clear fault bus at North Gila
*
CFB 4.0  "N.GILA  " 500.
*
*   Trip Imperial Valley - North Gila line
*
DL  4.0  "T468_SWS" 500. "N.GILA  " 500. "1 "
*
*   Reinsert remaining SWPL capacitors
*
*  RC  4.0  "IMPRLVLY" 500. "MIGUEL  " 500. "1 " 2
*  RC  4.0  "HASSYAMP" 500. "N.GILA  " 500. "1 " 2
*
*
*   Readjust SCE's Devers SVCs
*
MSV 6.0 "DEVRSVC1" 500.0 "1 "  549. -100.
MSV 6.0 "DEVRSVC1" 500.0 "2 "  549. -100.
```

```
*
*
*  Add SVC's at Marketplace and Adelanto
*
*  CC  MBS  120.0 "ADELSVC " 500. "sv" "A" 0.0 1.320
*  CC  MBS  120.0 "MKTPSVC " 500. "sv" "A" 0.0 1.320
*
```

```
* pre_int_SY230-SG.swt
TIT
  SDG&E Cluster 2 - post int
  South Bay - Silvergate 230 kV N-1


RUN 10
*
*   South Bay - Silvergate 230 kV Lines Out
*   3-phase 4 cycle fault at South Bay 230 kV Bus
*
*   Fault bus at South Bay 230 kV Bus
FB  0.0  "SY230   " 230
*
*   Clear fault bus at South Bay 230 kV
*
CFB 6.0  "SY230   " 230
*
*   Trip South Bay - Silvergate 230 kV line
*
DL  6.0  "SILVERGT" 230. "SY230   " 230. "1 "
```

```
* pst_int_SX-C565.swt
TIT
  SDG&E Cluster 2 - pst int
  Sycamore - C565 230 kV N-1


RUN 20
*
*   Sycamore - C565 230 kV Line Out
*   3-phase 4 cycle fault at Sycamore 230 kV Bus
*
*   Fault bus at Sycamore 230 kV Bus
FB  0.0  "SYCAMORE" 230
*
*   Clear fault bus at Sycamore 230 kV
*
CFB 6.0  "SYCAMORE" 230
*
*   Trip Sycamore - C565 230 kV line
*
DL  6.0  "SYCAMORE" 230. "C565    " 230. "1 "
```

```
* pst_int_C574-SX.swt
TIT
  SDG&E Cluster 2 - pst int
  C574 - SX 230 kV N-1


RUN 20
*
*   C574 - SX 230 kV Line Out
*   3-phase 4 cycle fault at C574 230 kV Bus
*
*   Fault bus at C574 230 kV Bus
FB  0.0  "C574    " 230
*
*   Clear fault bus at C574 230 kV
*
CFB 6.0  "C574    " 230
*
*   Trip C574 - SX 230 kV line
*
DL  6.0  "C574    " 230. "MLSXTAP " 230. "1 "
DL  6.0  "MLSXTAP " 230. "SYCAMORE" 230. "1 "
*
*   Trip Generation at C574
*
*TG  6.0  "C574CT1 " 13.8. "1 "
*TG  6.0  "C574CT2 " 13.8. "1 "
*TG  6.0  "C574CT3 " 13.8. "1 "
```

```
* pst_int_C574-SY.swt
c2_14hs_pst.dyd
TIT
  SDG&E Cluster 2 - pst int
  2014 Heavy Summer
  C574 - SY 230 kV N-1


RUN 20
*
*   C574 - SY 230 kV Line Out
*   3-phase 4 cycle fault at C574 230 kV Bus
*
*   Fault bus at C574 230 kV Bus
FB  0.0  "C574    " 230
*
*   Clear fault bus at C574 230 kV
*
CFB 6.0  "C574    " 230
*
*   Trip C574 - SY 230 kV line
*
DL  6.0  "C574    " 230. "MLMS3TAP" 230. "1 "
DL  6.0  "MLMS3TAP" 230. "SY230   " 230. "1 "
*
*   Trip Generation at C574
*
*TG  6.0  "C574CT1 " 13.8. "1 "
*TG  6.0  "C574CT2 " 13.8. "1 "
*TG  6.0  "C574CT3 " 13.8. "1 "
```

```
* pst_int_C574-SX_SYwRAS.swt
TIT
  SDG&E Cluster 2 - pst int
  C574 - SY/SX 230 kV N-2


RUN 20
*
*   C574 - SY/SX 230 kV Lines Out
*   3-phase 4 cycle fault at C574 230 kV Bus
*
*   Fault bus at C574 230 kV Bus
FB  0.0  "C574    " 230
*
*   Clear fault bus at C574 230 kV
*
CFB 6.0  "C574    " 230
*
*   Trip C574 - SX/SY 230 kV lines
*
DL  6.0  "C574    " 230. "MLSXTAP " 230. "1 "
DL  6.0  "C574    " 230. "MLMS3TAP" 230. "1 "
DL  6.0  "MLSXTAP " 230. "SYCAMORE" 230. "1 "
DL  6.0  "MLMS3TAP" 230. "SY230   " 230. "1 "
*
*   Trip Generation at C574
*
TG  6.0  "C574CT1 " 13.8. "1 "
TG  6.0  "C574CT2 " 13.8. "1 "
TG  6.0  "C574CT3 " 13.8. "1 "
```

```
* pst_int_SY-MS.swt
TIT
  SDG&E Cluster 2 - pst int
  Southbay - Mission 230 kV N-1


RUN 20
*
*   Southbay - Mission 230 kV Line Out
*   3-phase 4 cycle fault at Mission 230 kV Bus
*
*   Fault bus at Mission 230 kV Bus
FB  0.0  "MISSION" 230
*
*   Clear fault bus at MISSION 230 kV
*
CFB 6.0  "MISSION" 230
*
*   Trip Southbay - Mission 230 kV line
*
DL  6.0  "SY230   " 230. "MISSION " 230. "1 "
```

```
* pst_int_SX-PQ.swt
TIT
  SDG&E Cluster 2 - pst int
  Sycamore - Penasquitos 230 kV N-1


RUN 20
*
*   Sycamore - Penasquitos 230 kV Line Out
*   3-phase 4 cycle fault at Penasquitos 230 kV Bus
*
*   Fault bus at Penasquitos 230 kV Bus
FB  0.0  "PENSQTOS" 230
*
*   Clear fault bus at Penasquitos 230 kV
*
CFB 6.0  "PENSQTOS" 230
*
*   Trip Sycamore - Penasquitos 230 kV line
*
DL  6.0  "SYCAMORE" 230. "PENSQTOS" 230. "1 "
```

Appendix I-1

Transient Stability Analysis Results

Imperial Valley Area Cluster & Boulevard Cluster

Heavy Summer Pre

Worst Condition Analysis Report Case flat_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pre_iv4_hs.chf	No dips violating criteria.			
flat_pre_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_iv4_hs.chf	No dips violating criteria.			
flat_pre_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pre_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pre_iv4	No dips violating criteria.			
C493_Cen_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pre_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pre_iv4	No dips violating criteria.			
C493_Cen_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pre_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pre_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pre_iv4_hs.c	No dips violating criteria.			
Dev_Val_pre_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pre_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pre_iv4_hs.c	No dips violating criteria.			
Dev_Val_pre_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pre_iv	No dips violating criteria.			
HAA_NGila_slo_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_iv	No dips violating criteria.			
HAA_NGila_slo_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pre_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_iv4_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pre_iv4_	No dips violating criteria.			
IV_C493_slo_pre_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_iv4_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pre_iv4_	No dips violating criteria.			
IV_C493_slo_pre_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9857	25.093	1.1583	0.108
20103 WIS-230	230.0	0.9896	23.995	1.1583	0.108
20110 APD-230	230.0	0.9837	24.753	1.1583	0.108
20111 TEK-230	230.0	0.9842	24.696	1.1583	0.108
20112 STB-230	230.0	0.9879	24.251	1.1583	0.108
20113 OZA-230	230.0	0.9894	24.016	1.1583	0.108
20114 CSC-230	230.0	0.9890	24.273	1.1583	0.108
20115 MXI-230	230.0	0.9877	24.252	1.1583	0.108
20116 CTY-230	230.0	0.9827	24.826	1.1583	0.108
20136 CPU-161	161.0	0.9923	23.716	1.1583	0.108
20147 CTY-161	161.0	0.9842	25.222	1.1583	0.108
20148 NZI-161	161.0	0.9842	25.263	1.1583	0.108
20150 CRO-161	161.0	0.9862	25.017	1.1583	0.108
20151 PKD-161	161.0	0.9858	25.112	1.1583	0.108
20152 MOE-161	161.0	0.9833	25.230	1.1583	0.108
20153 GOR-161	161.0	0.9824	25.247	1.1583	0.108
20154 STA-161	161.0	0.9897	24.790	1.1583	0.108
20155 LCA-161	161.0	0.9870	25.004	1.1583	0.108
20158 MXI-345	34.5	0.9912	27.357	1.1583	0.108
20177 PID-230	230.0	0.9813	24.660	1.1583	0.108
20178 PID-161	161.0	0.9917	25.278	1.1583	0.108
20179 RZC-161	161.0	0.9831	25.598	1.1583	0.108
20180 HGO-161	161.0	0.9830	25.687	1.1583	0.108
20181 CHQ-161	161.0	0.0000	24.906	1.1583	0.108
20191 DAE-230	230.0	0.9879	24.251	1.1583	0.108
20226 XCO-230	230.0	0.9871	24.276	1.1583	0.108
20303 THO-230	230.0	0.9871	24.294	1.1583	0.108
20391 CHQ-230	230.0	0.9896	24.068	1.1583	0.108
20453 CNT-230	230.0	0.9900	23.964	1.1583	0.108
20454 SLR-161	161.0	0.9878	25.514	1.1583	0.108
20460 VPU-230	230.0	0.9867	24.483	1.1583	0.108
20461 CZA-161	161.0	0.9823	25.324	1.1583	0.108

Worst dip was 27.36 at 20158 MXI-345 34.5

Worst Condition Analysis Report Case iv_roa_6_pre_iv4_hs

Frequency at All Buses

	Name	Initial Frequency	Percent Dip	Time	Duration
20016	RIN-161	161.0	60.0000	0.689	1.7542	0.108
20103	WIS-230	230.0	60.0000	0.681	1.7542	0.108
20104	CPD-230	230.0	60.0000	0.723	1.7542	0.163
20105	CPD-U1	13.8	60.0000	0.783	1.7000	0.271
20106	CPD-U2	13.8	60.0000	0.783	1.7000	0.271
20107	CPT-230	230.0	60.0000	0.721	1.7542	0.163
20108	CPT-U1	13.8	60.0000	0.782	1.7000	0.271
20109	CPT-U2	13.8	60.0000	0.782	1.7000	0.271
20110	APD-230	230.0	60.0000	0.708	1.7542	0.163
20111	TEK-230	230.0	60.0000	0.702	1.7542	0.163
20112	STB-230	230.0	60.0000	0.685	1.7542	0.108
20113	OZA-230	230.0	60.0000	0.680	1.7542	0.108
20114	CSC-230	230.0	60.0000	0.712	1.7542	0.163
20115	MXI-230	230.0	60.0000	0.689	1.7542	0.163
20116	CTY-230	230.0	60.0000	0.706	1.7542	0.163
20117	CRO-230	230.0	60.0000	0.678	1.7542	0.108
20134	ROA-161	161.0	60.0000	0.677	1.7542	0.108
20135	MXI-161	161.0	60.0000	0.696	1.7542	0.163
20136	CPU-161	161.0	60.0000	0.720	1.7000	0.217
20137	CPU-U1	13.8	60.0000	0.720	1.7000	0.217
20138	CPU-U2	13.8	60.0000	0.720	1.7000	0.217
20139	CPU-U3	13.8	60.0000	0.761	1.7000	0.217
20140	CPU-U4	13.8	60.0000	0.761	1.7000	0.217
20141	CPU-U5	13.8	60.0000	0.798	1.6458	0.271
20142	CPC-161	161.0	60.0000	0.721	1.7000	0.217
20143	CPC-U1	13.8	60.0000	0.753	1.7000	0.217
20144	CPC-U2	13.8	60.0000	0.754	1.7000	0.217
20145	CPC-U3	13.8	60.0000	0.753	1.7000	0.217
20146	CPC-U4	13.8	60.0000	0.754	1.7000	0.217
20147	CTY-161	161.0	60.0000	0.700	1.7542	0.163
20148	NZI-161	161.0	60.0000	0.695	1.7542	0.163
20150	CRO-161	161.0	60.0000	0.690	1.7542	0.163
20151	PKD-161	161.0	60.0000	0.698	1.7542	0.163
20152	MOE-161	161.0	60.0000	0.703	1.7542	0.163
20153	GOR-161	161.0	60.0000	0.710	1.7000	0.217
20154	STA-161	161.0	60.0000	0.684	1.7542	0.108
20155	LCA-161	161.0	60.0000	0.687	1.7542	0.108
20156	MXI-U1	13.8	60.0000	0.696	1.7542	0.163
20157	MXI-U23	13.8	60.0000	0.696	1.7542	0.163
20158	MXI-345	34.5	60.0000	0.696	1.7542	0.163

20177	PID-230	230.0	60.0000	0.721	1.7542	0.163
20178	PID-161	161.0	60.0000	0.720	1.7542	0.163
20179	RZC-161	161.0	60.0000	0.718	1.7000	0.217
20180	HGO-161	161.0	60.0000	0.718	1.7000	0.217
20181	CHQ-161	161.0	60.0000	0.719	1.7000	0.217
20188	LRP-U2	16.0	60.0000	0.741	1.7000	0.217
20190	LRP-U4	16.0	60.0000	0.723	1.7000	0.217
20191	DAE-230	230.0	60.0000	0.685	1.7542	0.108
20226	XCO-230	230.0	60.0000	0.685	1.7542	0.108
20231	MXI-U2	13.8	60.0000	0.696	1.7542	0.163
20232	MXI-U3	13.8	60.0000	0.696	1.7542	0.163
20303	THO-230	230.0	60.0000	0.685	1.7542	0.108
20328	LRP-230	230.0	60.0000	0.666	1.7542	0.108
20390	ESL-230	230.0	60.0000	0.722	1.7542	0.163
20391	CHQ-230	230.0	60.0000	0.722	1.7542	0.163
20410	ESL-TG1	13.8	60.0000	0.722	1.7542	0.163
20411	ESL-TG2	13.8	60.0000	0.722	1.7542	0.163
20412	ESL-TG3	13.8	60.0000	0.722	1.7542	0.163
20428	CPV-161	161.0	60.0000	0.723	1.7000	0.217
20429	CPV-U1	13.8	60.0000	0.753	1.7000	0.217
20430	CPV-U2	13.8	60.0000	0.753	1.7000	0.217
20431	CPV-U3	13.8	60.0000	0.753	1.7000	0.217
20453	CNT-230	230.0	60.0000	0.680	1.7542	0.108
20454	SLR-161	161.0	60.0000	0.719	1.7542	0.163
20460	VPU-230	230.0	60.0000	0.708	1.7542	0.163
20461	CZA-161	161.0	60.0000	0.705	1.7542	0.163
20488	CUH-230	230.0	60.0000	0.701	1.7542	0.163

Worst dip was 0.80 at 20141 CPU-U5 13.8

Worst dip was 0.80 at 20141 CPU-U5 13.8
Worst Condition Analysis Report Case iv_roa_6_pre_iv4_hs

Voltage at All Buses

	Name	Initial Voltage	Percent Dip	Time	Duration
20016	RIN-161	161.0	0.9857	25.093	1.1583	0.054
20147	CTY-161	161.0	0.9842	25.222	1.1583	0.054
20148	NZI-161	161.0	0.9842	25.263	1.1583	0.054
20150	CRO-161	161.0	0.9862	25.017	1.1583	0.054
20151	PKD-161	161.0	0.9858	25.112	1.1583	0.054
20152	MOE-161	161.0	0.9833	25.230	1.1583	0.054

20153	GOR-161	161.0	0.9824	25.247	1.1583	0.054
20155	LCA-161	161.0	0.9870	25.004	1.1583	0.054
20156	MXI-U1	13.8	0.9912	27.357	1.1583	0.054
20157	MXI-U23	13.8	0.9912	27.357	1.1583	0.054
20158	MXI-345	34.5	0.9912	27.357	1.1583	0.054
20178	PID-161	161.0	0.9917	25.278	1.1583	0.054
20179	RZC-161	161.0	0.9831	25.598	1.1583	0.054
20180	HGO-161	161.0	0.9830	25.687	1.1583	0.054
20231	MXI-U2	13.8	0.9912	27.357	1.1583	0.054
20232	MXI-U3	13.8	0.9912	27.357	1.1583	0.054
20454	SLR-161	161.0	0.9878	25.514	1.1583	0.054
20461	CZA-161	161.0	0.9823	25.324	1.1583	0.054

Worst dip was 27.36 at 20156 MXI-U1 13.8

Worst dip was 27.36 at 20156 MXI-U1 13.8

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_iv	No dips violating criteria.			
IV_Wnd1_noRAS_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_iv	No dips violating criteria.			
IV_Wnd1_noRAS_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pre_i	No dips violating criteria			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_iv4_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_iv4_	No dips violating criteria.			
IV_Wnd1_RAS_pre_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_iv4_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_iv4_	No dips violating criteria.			
IV_Wnd1_RAS_pre_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pre_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pre_iv4	No dips violating criteria.			
ML_Wnd_noRAS_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pre_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pre_iv4	No dips violating criteria.			
ML_Wnd_noRAS_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pre_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pre_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_iv4_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_iv4_h	No dips violating criteria.			
ML_Wnd_RAS_pre_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_iv4_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_iv4_h	No dips violating criteria.			
ML_Wnd_RAS_pre_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pre_iv4	No dips violating criteria.			
NGila_IV_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pre_iv4	No dips violating criteria.			
NGila_IV_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pre_iv4	No dips violating criteria.			
PaloVerde-g1_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_iv4	No dips violating criteria.			
PaloVerde-g1_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN	69.0	1.0037	27.538	2.6833	0.650
41145 WESTON	69.0	1.0179	22.434	2.7375	0.271
41223 LAGOON T	69.0	1.0154	23.591	2.7375	0.271
41319 ALKALI C	115.0	1.0533	37.451	3.7667	0.379

Worst dip was 37.45 at 41319 ALKALI C 115.0

Worst Condition Analysis Report Case PaloVerde-g2_pre_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
47944 VANSY W1	0.7	60.0000	1.415	3.0083	0.108
47991 WLWCK C1	34.5	60.0000	1.466	4.1458	0.108
47992 WLWCK W1	0.6	60.0000	2.094	4.1458	0.108
47994 WLWCK C2	34.5	60.0000	1.467	4.1458	0.108
47995 WLWCK W2	0.6	60.0000	2.094	4.1458	0.108
47997 WLWCK C3	34.5	60.0000	1.467	4.1458	0.108
47998 WLWCK W3	0.6	60.0000	2.094	4.1458	0.108

Worst dip was 2.09 at 47995 WLWCK W2 0.6

Worst dip was 2.09 at 47995 WLWCK W2 0.6

Worst Condition Analysis Report Case PaloVerde-g2_pre_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN	69.0	1.0037	27.538	2.7917	0.217
41258 STATLN T	69.0	1.0046	27.520	2.7917	0.217
41319 ALKALI C	115.0	1.0533	37.451	3.9292	0.217
41404 WLW C TP	115.0	1.0549	37.422	3.9292	0.217
47550 VANSY 1	34.5	0.9715	28.696	2.7917	0.217
47551 VANSYCLE	69.0	1.0050	27.760	2.7917	0.217

47803 CMBHL 2 34.5 0.9372 44.151 2.6292 0.758
47804 CMBHL C2 34.5 0.9509 47.538 2.6292 0.758
47805 CMBHL W2 0.6 0.9374 53.815 2.5750 0.867
47847 WILOWCRK 115.0 1.0741 46.093 3.8208 0.325
47943 VANSY C1 34.5 0.9831 28.110 2.7917 0.217
47944 VANSY W1 0.7 0.9722 28.869 2.7917 0.217
47990 WLWCK 1 34.5 1.0805 48.783 3.8208 0.325
47991 WLWCK C1 34.5 1.0993 51.255 3.8208 0.325
47992 WLWCK W1 0.6 1.1061 63.393 3.7125 0.433
47993 WLWCK 2 34.5 1.0806 48.776 3.8208 0.325
47994 WLWCK C2 34.5 1.0993 51.233 3.8208 0.325
47995 WLWCK W2 0.6 1.1061 63.323 3.7125 0.433
47996 WLWCK 3 34.5 1.0806 48.776 3.8208 0.325
47997 WLWCK C3 34.5 1.0993 51.233 3.8208 0.325
47998 WLWCK W3 0.6 1.1061 63.323 3.7125 0.433

Worst dip was 63.39 at 47992 WLWCK W1 0.6

Worst dip was 63.39 at 47992 WLWCK W1 0.6

Worst Condition Analysis Report Case SONGS-g1_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pre_iv4_hs.	No dips violating criteria.			
SONGS-g1_pre_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_iv4_hs.	No dips violating criteria.			
SONGS-g1_pre_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pre_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pre_iv4_hs.	No dips violating criteria.			
SONGS-g2_pre_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pre_iv4_hs.	No dips violating criteria.			
SONGS-g2_pre_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23258 T468_LB1	34.5	60.0000	6.759	1.1792	0.163
23259 T468_LB2	34.5	60.0000	6.759	1.1792	0.163
23260 T468_T1	34.5	60.0000	6.617	1.1792	0.163
23261 T468_T2	34.5	60.0000	6.617	1.1792	0.163
23262 T468_G1	0.4	60.0000	6.522	1.1792	0.163
23263 T468_G2	0.4	60.0000	6.522	1.1792	0.163

Worst dip was 6.76 at 23258 T468_LB1 34.5

Worst dip was 6.76 at 23258 T468_LB1 34.5

Worst Condition Analysis Report Case T468_HAA_slo_pre_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_iv4	No dips violating criteria.			
T468_HAA_slo_pre_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pre_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pre_i	No dips violating criteria.			
T468_NGila_slo_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pre_i	No dips violating criteria.			
T468_NGila_slo_pre_i	No dips violating criteria.			

Appendix I-10

Transient Stability Analysis Results

Internal Cluster

Light Load Post

Worst Condition Analysis Report Case flat_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_int_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_int_ll.chf	No dips violating criteria.			
flat_pst_int_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_int_ll.chf	No dips violating criteria.			
flat_pst_int_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pst_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pst_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Centrals_pst_in	No dips violating criteria.			
C493_Centrals_pst_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pst_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pst_in	No dips violating criteria.			
C493_Centrals_pst_in	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SX_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_pst_int_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23171 Q190_U1	13.8 60.0000	1.141	1.2667	0.163
23172 Q190_U2	13.8 60.0000	1.141	1.2667	0.163
23173 Q190_U3	13.8 60.0000	1.141	1.2667	0.163

Worst dip was 1.14 at 23171 Q190_U1 13.8

Worst dip was 1.14 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_C574-SX_pst_int_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23171 Q190_U1	13.8 1.0512	28.561	1.3750	0.108
23172 Q190_U2	13.8 1.0512	28.561	1.3750	0.108
23173 Q190_U3	13.8 1.0512	28.561	1.3750	0.108

Worst dip was 28.56 at 23171 Q190_U1 13.8

Worst dip was 28.56 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_C574-SX_SYwRAS_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SX_SYwRAS_i	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_SYwRAS_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_C574-SX_SYwRAS_i	No dips violating criteria.			
int_C574-SX_SYwRAS_i	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_SYwRAS_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SX_SYwRAS_i	No dips violating criteria.			
int_C574-SX_SYwRAS_i	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SY_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SY_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SY_pst_int_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_C574-SY_pst_int_	No dips violating criteria.			
int_C574-SY_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SY_pst_int_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SY_pst_int_	No dips violating criteria.			
int_C574-SY_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-C565_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-C565_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-C565_pst_int_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SX-C565_pst_int_	No dips violating criteria.			
int_SX-C565_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-C565_pst_int_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-C565_pst_int_	No dips violating criteria.			
int_SX-C565_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-PQ_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-PQ_pst_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-PQ_pst_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SX-PQ_pst_int_ll	No dips violating criteria.			
int_SX-PQ_pst_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-PQ_pst_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-PQ_pst_int_ll	No dips violating criteria.			
int_SX-PQ_pst_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY230-SG_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY230-SG_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY230-SG_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SY230-SG_pst_int	No dips violating criteria.			
int_SY230-SG_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY230-SG_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY230-SG_pst_int	No dips violating criteria.			
int_SY230-SG_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY-MS_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY-MS_pst_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY-MS_pst_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SY-MS_pst_int_ll	No dips violating criteria.			
int_SY-MS_pst_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY-MS_pst_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY-MS_pst_int_ll	No dips violating criteria.			
int_SY-MS_pst_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_int_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pst_int_	No dips violating criteria.			
IV_C493_slo_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_int_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9560	27.450	1.1917	0.054
23011 Q1241B1T 13.8	0.9575	27.126	1.1917	0.054
23012 Q1241B1i 13.8	0.9575	27.126	1.1917	0.054
23019 Q1242A1Q 0.5	0.9991	26.103	1.1917	0.054
23018 Q1242A1Q 34.5	0.9734	25.553	1.1917	0.054
23016 Q1242A1T 13.8	0.9575	27.126	1.1917	0.054
23017 Q1242A1i 13.8	0.9575	27.126	1.1917	0.054
23020 Q1242A2 34.5	0.9703	26.256	1.1917	0.054
23023 Q1242A2Q 34.5	0.9734	25.553	1.1917	0.054
23024 Q1242A2Q 0.5	0.9991	26.103	1.1917	0.054
23021 Q1242A2T 13.8	0.9709	25.978	1.1917	0.054
23022 Q1242A2i 13.8	0.9709	25.978	1.1917	0.054
23028 Q1242B1Q 34.5	0.9734	25.553	1.1917	0.054
23029 Q1242B1Q 0.5	0.9991	26.103	1.1917	0.054
23026 Q1242B1T 13.8	0.9709	25.978	1.1917	0.054
23027 Q1242B1i 13.8	0.9709	25.978	1.1917	0.054
23034 Q1243A1Q 0.5	0.9836	27.333	1.1917	0.054
23033 Q1243A1Q 34.5	0.9591	26.699	1.1917	0.054
23039 Q1243A2Q 0.5	0.9836	27.333	1.1917	0.054
23038 Q1243A2Q 34.5	0.9591	26.699	1.1917	0.054

23043 Q1243B1Q 34.5 0.9585 26.699 1.1917 0.054
23044 Q1243B1Q 0.5 0.9830 27.347 1.1917 0.054

Worst dip was 27.45 at 23010 Q1241B1 34.5

Worst dip was 27.45 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_ROA_6_slo_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_ROA_6_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case IV_ROA_6_slo_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_ROA_6_slo_pst_int	No dips violating criteria.			
IV_ROA_6_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case IV_ROA_6_slo_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_ROA_6_slo_pst_int	No dips violating criteria.			
IV_ROA_6_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_int_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_int_	No dips violating criteria.			
IV_Wnd1_RAS_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_int_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_int_	No dips violating criteria.			
IV_Wnd1_RAS_pst_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_int_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_int_l	No dips violating criteria.			
ML_Wnd_RAS_pst_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_int_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_int_l	No dips violating criteria.			
ML_Wnd_RAS_pst_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_int	No dips violating criteria.			
NGila_IV_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_int	No dips violating criteria.			
NGila_IV_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_int	No dips violating criteria.			
PaloVerde-g1_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_int	No dips violating criteria.			
PaloVerde-g1_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.867	8.9124	0.162
54425 NOSE CR9 138.0	1.0225	30.403	8.8582	0.271
58177 AIRDRIE9 25.0	1.0485	23.040	8.9666	0.108
58178 AIRDRIE8 25.0	1.0432	23.196	8.9666	0.108

Worst dip was 30.40 at 54425 NOSE CR9 138.0

Worst Condition Analysis Report Case PaloVerde-g2_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
54318 WEST CRO 138.0	60.0000	0.748	10.1041	0.108
54425 NOSE CR9 138.0	60.0000	0.808	9.0207	0.108
54503 SUMMIT_7 138.0	60.0000	0.811	9.0207	0.108
54729 SUMMITTP 138.0	60.0000	0.808	9.0207	0.108
54810 AMOCOTAP 138.0	60.0000	0.786	9.0207	0.108
54933 AIRD TAP 138.0	60.0000	0.748	10.1041	0.108
56503 SUMMITG3 13.8	60.0000	12.303	9.5082	0.271
57503 SUMMITG2 13.8	60.0000	12.303	9.5082	0.271
58503 SUMMITG1 13.8	60.0000	0.811	9.0207	0.108

Worst dip was 12.30 at 56503 SUMMITG3 13.8

Worst dip was 12.30 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case PaloVerde-g2_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	27.054	9.1832	0.054
54425 NOSE CR9 138.0	1.0225	30.698	9.1832	0.054
54503 SUMMIT_7 138.0	1.0229	30.879	9.1832	0.054
54729 SUMMITTP 138.0	1.0229	30.694	9.1832	0.054

54810 AMOCOTAP 138.0 1.0228 29.448 9.1832 0.054
54933 AIRD TAP 138.0 1.0215 27.051 9.1832 0.054
56503 SUMMITG3 13.8 1.0000 76.174 8.4249 2.167
57503 SUMMITG2 13.8 1.0000 76.174 8.4249 2.167
58503 SUMMITG1 13.8 1.0229 30.879 9.1832 0.054

Worst dip was 76.17 at 56503 SUMMITG3 13.8

Worst dip was 76.17 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case SONGS-g1_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_int_ll.	No dips violating criteria.			
SONGS-g1_pst_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_int_ll.	No dips violating criteria.			
SONGS-g1_pst_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_int_ll.	No dips violating criteria.			
SONGS-g2_pst_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_int_ll.	No dips violating criteria.			
SONGS-g2_pst_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_HAA_slo_pst_int	No dips violating criteria.			
T468_HAA_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_int	No dips violating criteria.			
T468_HAA_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pst_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pst_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pst_int_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_pst_int_l	No dips violating criteria.			
T468_NGila_pst_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pst_int_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pst_int_l	No dips violating criteria.			
T468_NGila_pst_int_l	No dips violating criteria.			

Appendix I-2

Transient Stability Analysis Results

Imperial Valley Area Cluster & Boulevard Cluster

Light Load Pre

Worst Condition Analysis Report Case flat_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_iva_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pre_iva_ll.chf	No dips violating criteria.			
flat_pre_iva_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_iva_ll.chf	No dips violating criteria.			
flat_pre_iva_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pre_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pre_iva	No dips violating criteria.			
C493_Cen_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pre_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pre_iva	No dips violating criteria.			
C493_Cen_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pre_iva_ll.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pre_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pre_iva_ll.c	No dips violating criteria.			
Dev_Val_pre_iva_ll.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pre_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pre_iva_ll.c	No dips violating criteria.			
Dev_Val_pre_iva_ll.c	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pre_iv	No dips violating criteria.			
HAA_NGila_slo_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9479	25.298	1.1792	0.054
23011 Q1241B1T 13.8	0.9495	25.114	1.1792	0.054
23012 Q1241B1i 13.8	0.9495	25.114	1.1792	0.054
23016 Q1242A1T 13.8	0.9495	25.114	1.1792	0.054
23017 Q1242A1i 13.8	0.9495	25.114	1.1792	0.054

Worst dip was 25.30 at 23010 Q1241B1 34.5

Worst dip was 25.30 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_C493_slo_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pre_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_iva_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pre_iva_	No dips violating criteria.			
IV_C493_slo_pre_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_iva_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5 0.9479	30.685	1.1917	0.054
23011 Q1241B1T	13.8 0.9495	30.440	1.1917	0.054
23012 Q1241B1i	13.8 0.9495	30.440	1.1917	0.054
23019 Q1242A1Q	0.5 0.9903	28.954	1.1917	0.054
23018 Q1242A1Q	34.5 0.9653	28.763	1.1917	0.054
23016 Q1242A1T	13.8 0.9495	30.440	1.1917	0.054
23017 Q1242A1i	13.8 0.9495	30.440	1.1917	0.054
23020 Q1242A2	34.5 0.9622	29.546	1.1917	0.054
23023 Q1242A2Q	34.5 0.9653	28.763	1.1917	0.054
23024 Q1242A2Q	0.5 0.9903	28.954	1.1917	0.054
23021 Q1242A2T	13.8 0.9629	29.344	1.1917	0.054
23022 Q1242A2i	13.8 0.9629	29.344	1.1917	0.054
23028 Q1242B1Q	34.5 0.9653	28.763	1.1917	0.054
23029 Q1242B1Q	0.5 0.9903	28.954	1.1917	0.054
23026 Q1242B1T	13.8 0.9629	29.344	1.1917	0.054
23027 Q1242B1i	13.8 0.9629	29.344	1.1917	0.054
23034 Q1243A1Q	0.5 0.9749	30.120	1.1917	0.054
23033 Q1243A1Q	34.5 0.9510	29.859	1.1917	0.054
23039 Q1243A2Q	0.5 0.9749	30.120	1.1917	0.054
23038 Q1243A2Q	34.5 0.9510	29.859	1.1917	0.054

23043 Q1243B1Q 34.5 0.9505 29.859 1.1917 0.054
23044 Q1243B1Q 0.5 0.9743 30.135 1.1917 0.054

Worst dip was 30.68 at 23010 Q1241B1 34.5

Worst dip was 30.68 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case iv_roa_6_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration

iv_roa_6_pre_iva_ll. No dips violating criteria.

Worst Condition Analysis Report Case iv_roa_6_pre_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20141 CPU-U5 13.8	60.0000	0.675	1.6458	0.108

Worst dip was 0.67 at 20141 CPU-U5 13.8

Worst dip was 0.67 at 20141 CPU-U5 13.8

Worst Condition Analysis Report Case iv_roa_6_pre_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23003 Q78_1A1Q 34.5	0.9893	26.725	1.1583	0.054
23004 Q78_1A1Q 0.5	1.0161	27.390	1.1583	0.054
23001 Q78_1A1T 13.8	0.9857	27.229	1.1583	0.054
23002 Q78_1A1i 13.8	0.9857	27.229	1.1583	0.054
23005 Q78_1A2 34.5	0.9852	27.635	1.1583	0.054
23009 Q78_1A2Q 0.5	1.0161	27.390	1.1583	0.054
23008 Q78_1A2Q 34.5	0.9893	26.725	1.1583	0.054
23006 Q78_1A2T 13.8	0.9857	27.229	1.1583	0.054
23007 Q78_1A2i 13.8	0.9857	27.229	1.1583	0.054
23013 Q78_1B1Q 34.5	0.9893	26.725	1.1583	0.054
23014 Q78_1B1Q 0.5	1.0161	27.390	1.1583	0.054
23010 Q1241B1 34.5	0.9479	25.928	1.3208	0.054
23011 Q1241B1T 13.8	0.9495	25.675	1.3208	0.054
23012 Q1241B1i 13.8	0.9495	25.675	1.3208	0.054
23016 Q1242A1T 13.8	0.9495	25.675	1.3208	0.054
23017 Q1242A1i 13.8	0.9495	25.675	1.3208	0.054
23020 Q1242A2 34.5	0.9622	25.396	1.3208	0.054

23021	Q1242A2T	13.8	0.9629	25.167	1.3208	0.054
23022	Q1242A2i	13.8	0.9629	25.167	1.3208	0.054
23026	Q1242B1T	13.8	0.9629	25.167	1.3208	0.054
23027	Q1242B1i	13.8	0.9629	25.167	1.3208	0.054
23034	Q1243A1Q	0.5	0.9749	25.438	1.3208	0.054
23033	Q1243A1Q	34.5	0.9510	25.110	1.3208	0.054
23039	Q1243A2Q	0.5	0.9749	25.438	1.3208	0.054
23038	Q1243A2Q	34.5	0.9510	25.110	1.3208	0.054
23043	Q1243B1Q	34.5	0.9505	25.110	1.3208	0.054
23044	Q1243B1Q	0.5	0.9743	25.451	1.3208	0.054

Worst dip was 27.64 at 23005 Q78_1A2 34.5

Worst dip was 27.64 at 23005 Q78_1A2 34.5

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2	60.0000	3.678	1.1792	0.108
23299 C510_G2	0.2	60.0000	3.678	1.1792	0.108

Worst dip was 3.68 at 23298 C510_G1 0.2

Worst dip was 3.68 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23004 Q78_1A1Q	0.5	1.0161	25.411	1.1792	0.054
23001 Q78_1A1T	13.8	0.9857	25.254	1.1792	0.054
23002 Q78_1A1i	13.8	0.9857	25.254	1.1792	0.054
23005 Q78_1A2	34.5	0.9852	25.546	1.1792	0.054
23009 Q78_1A2Q	0.5	1.0161	25.411	1.1792	0.054
23006 Q78_1A2T	13.8	0.9857	25.254	1.1792	0.054
23007 Q78_1A2i	13.8	0.9857	25.254	1.1792	0.054
23014 Q78_1B1Q	0.5	1.0161	25.411	1.1792	0.054
23010 Q1241B1	34.5	0.9479	26.748	1.1792	0.054
23011 Q1241B1T	13.8	0.9495	26.593	1.1792	0.054
23012 Q1241B1i	13.8	0.9495	26.593	1.1792	0.054
23019 Q1242A1Q	0.5	0.9903	25.652	1.1792	0.054
23018 Q1242A1Q	34.5	0.9653	25.682	1.1792	0.054
23016 Q1242A1T	13.8	0.9495	26.593	1.1792	0.054
23017 Q1242A1i	13.8	0.9495	26.593	1.1792	0.054
23020 Q1242A2	34.5	0.9622	26.489	1.1792	0.054

23023	Q1242A2Q	34.5	0.9653	25.682	1.1792	0.054
23024	Q1242A2Q	0.5	0.9903	25.652	1.1792	0.054
23021	Q1242A2T	13.8	0.9629	26.349	1.1792	0.054
23022	Q1242A2i	13.8	0.9629	26.349	1.1792	0.054
23028	Q1242B1Q	34.5	0.9653	25.682	1.1792	0.054
23029	Q1242B1Q	0.5	0.9903	25.652	1.1792	0.054
23026	Q1242B1T	13.8	0.9629	26.349	1.1792	0.054
23027	Q1242B1i	13.8	0.9629	26.349	1.1792	0.054
23034	Q1243A1Q	0.5	0.9749	25.923	1.1792	0.054
23033	Q1243A1Q	34.5	0.9510	25.931	1.1792	0.054
23039	Q1243A2Q	0.5	0.9749	25.923	1.1792	0.054
23038	Q1243A2Q	34.5	0.9510	25.931	1.1792	0.054
23043	Q1243B1Q	34.5	0.9505	25.931	1.1792	0.054
23044	Q1243B1Q	0.5	0.9743	25.934	1.1792	0.054

Worst dip was 26.75 at 23010 Q1241B1 34.5

Worst dip was 26.75 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_iva_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_iva_	No dips violating criteria.			
IV_Wnd1_RAS_pre_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_iva_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_iva_	No dips violating criteria.			
IV_Wnd1_RAS_pre_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1 0.2	60.0000	2.365	1.1917	0.108
23299 C510_G2 0.2	60.0000	2.365	1.1917	0.108

Worst dip was 2.37 at 23298 C510_G1 0.2

Worst dip was 2.37 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2 60.0000	2.365	1.1917	0.108
23299 C510_G2	0.2 60.0000	2.365	1.1917	0.108

Worst dip was 2.37 at 23298 C510_G1 0.2

Worst dip was 2.37 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			
IV_Wnd_dlo_RxR_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pre_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pre_iva	No dips violating criteria.			
ML_Wnd_noRAS_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pre_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pre_iva	No dips violating criteria.			
ML_Wnd_noRAS_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pre_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pre_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pre_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_iva_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_iva_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_iva_l	No dips violating criteria.			
ML_Wnd_RAS_pre_iva_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_iva_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_iva_l	No dips violating criteria.			
ML_Wnd_RAS_pre_iva_l	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pre_iva	No dips violating criteria.			
NGila_IV_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9479	26.739	1.1792	0.054
23011 Q1241B1T 13.8	0.9495	26.678	1.1792	0.054
23012 Q1241B1i 13.8	0.9495	26.678	1.1792	0.054
23016 Q1242A1T 13.8	0.9495	26.678	1.1792	0.054
23017 Q1242A1i 13.8	0.9495	26.678	1.1792	0.054
23020 Q1242A2 34.5	0.9622	25.807	1.1792	0.054
23021 Q1242A2T 13.8	0.9629	25.777	1.1792	0.054
23022 Q1242A2i 13.8	0.9629	25.777	1.1792	0.054
23026 Q1242B1T 13.8	0.9629	25.777	1.1792	0.054
23027 Q1242B1i 13.8	0.9629	25.777	1.1792	0.054
23034 Q1243A1Q 0.5	0.9749	25.423	1.1792	0.054
23033 Q1243A1Q 34.5	0.9510	25.838	1.1792	0.054
23039 Q1243A2Q 0.5	0.9749	25.423	1.1792	0.054
23038 Q1243A2Q 34.5	0.9510	25.838	1.1792	0.054
23043 Q1243B1Q 34.5	0.9505	25.838	1.1792	0.054
23044 Q1243B1Q 0.5	0.9743	25.435	1.1792	0.054

Worst dip was 26.74 at 23010 Q1241B1 34.5

Worst dip was 26.74 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case PaloVerde-g1_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pre_iva	No dips violating criteria.			
PaloVerde-g1_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_iva	No dips violating criteria.			
PaloVerde-g1_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.870	9.0207	0.217
54425 NOSE CR9 138.0	1.0225	30.371	9.0207	0.217
58177 AIRDRIE9 25.0	1.0485	23.021	9.0749	0.108
58178 AIRDRIE8 25.0	1.0432	23.162	9.0749	0.108

Worst dip was 30.37 at 54425 NOSE CR9 138.0

Worst Condition Analysis Report Case PaloVerde-g2_pre_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
54318 WEST CRO 138.0	60.0000	0.742	10.2124	0.108
54425 NOSE CR9 138.0	60.0000	0.791	10.2124	0.108
54503 SUMMIT_7 138.0	60.0000	0.793	10.2124	0.108
54729 SUMMITTP 138.0	60.0000	0.791	10.2124	0.108
54810 AMOCOTAP 138.0	60.0000	0.774	10.2124	0.108
54933 AIRD TAP 138.0	60.0000	0.742	10.2124	0.108
56503 SUMMITG3 13.8	60.0000	19.624	9.6707	0.217
57503 SUMMITG2 13.8	60.0000	19.624	9.6707	0.217
58503 SUMMITG1 13.8	60.0000	0.793	10.2124	0.108

Worst dip was 19.62 at 56503 SUMMITG3 13.8

Worst dip was 19.62 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case PaloVerde-g2_pre_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	27.435	9.2916	0.054
54425 NOSE CR9 138.0	1.0225	31.036	9.2916	0.054
54503 SUMMIT_7 138.0	1.0229	31.218	9.2916	0.054
54729 SUMMITTP 138.0	1.0228	31.033	9.2916	0.054

54810 AMOCOTAP 138.0 1.0228 29.788 9.2916 0.054
54933 AIRD TAP 138.0 1.0215 27.432 9.2916 0.054
56503 SUMMITG3 13.8 1.0000 78.236 8.5332 2.112
57503 SUMMITG2 13.8 1.0000 78.236 8.5332 2.112
58503 SUMMITG1 13.8 1.0229 31.218 9.2916 0.054

Worst dip was 78.24 at 56503 SUMMITG3 13.8

Worst dip was 78.24 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case SONGS-g1_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pre_iva_ll.	No dips violating criteria.			
SONGS-g1_pre_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_iva_ll.	No dips violating criteria.			
SONGS-g1_pre_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration

SONGS-g2_pre_iva_ll. No dips violating criteria.

Worst Condition Analysis Report Case SONGS-g2_pre_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration

SONGS-g2_pre_iva_ll. No dips violating criteria.
SONGS-g2_pre_iva_ll. No dips violating criteria.

Worst Condition Analysis Report Case SONGS-g2_pre_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
56503 SUMMITG3	13.8	1.0000	25.262	10.9999	0.000
57503 SUMMITG2	13.8	1.0000	25.262	10.9999	0.000

Worst dip was 25.26 at 56503 SUMMITG3 13.8

Worst dip was 25.26 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case T468_HAA_slo_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_HAA_slo_pre_iva	No dips violating criteria.			
T468_HAA_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_iva	No dips violating criteria.			
T468_HAA_slo_pre_iva	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pre_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pre_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pre_i	No dips violating criteria.			
T468_NGila_slo_pre_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pre_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5	0.9479	25.630	1.1792	0.054
23011 Q1241B1T	13.8	0.9495	25.456	1.1792	0.054
23012 Q1241B1i	13.8	0.9495	25.456	1.1792	0.054
23016 Q1242A1T	13.8	0.9495	25.456	1.1792	0.054
23017 Q1242A1i	13.8	0.9495	25.456	1.1792	0.054

Worst dip was 25.63 at 23010 Q1241B1 34.5

Worst dip was 25.63 at 23010 Q1241B1 34.5

Appendix I-3

Transient Stability Analysis Results

Imperial Valley Area Cluster

Heavy Summer Post

Worst Condition Analysis Report Case flat_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_iv4_hs.chf	No dips violating criteria.			
flat_pst_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_iv4_hs.chf	No dips violating criteria.			
flat_pst_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pst_iv4	No dips violating criteria.			
C493_Cen_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_iv4	No dips violating criteria.			
C493_Cen_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9578	26.972	1.1792	0.054
23011 Q1241B1T 13.8	0.9593	26.705	1.1792	0.054
23012 Q1241B1i 13.8	0.9593	26.705	1.1792	0.054
23019 Q1242A1Q 0.5	1.0011	25.322	1.1792	0.054
23018 Q1242A1Q 34.5	0.9753	25.192	1.1792	0.054
23016 Q1242A1T 13.8	0.9593	26.705	1.1792	0.054
23017 Q1242A1i 13.8	0.9593	26.705	1.1792	0.054
23020 Q1242A2 34.5	0.9721	26.140	1.1792	0.054
23023 Q1242A2Q 34.5	0.9753	25.192	1.1792	0.054
23024 Q1242A2Q 0.5	1.0011	25.322	1.1792	0.054
23021 Q1242A2T 13.8	0.9727	25.907	1.1792	0.054
23022 Q1242A2i 13.8	0.9727	25.907	1.1792	0.054
23028 Q1242B1Q 34.5	0.9753	25.192	1.1792	0.054
23029 Q1242B1Q 0.5	1.0011	25.322	1.1792	0.054
23026 Q1242B1T 13.8	0.9727	25.907	1.1792	0.054
23027 Q1242B1i 13.8	0.9727	25.907	1.1792	0.054
23034 Q1243A1Q 0.5	0.9856	26.173	1.1792	0.054
23033 Q1243A1Q 34.5	0.9609	25.992	1.1792	0.054
23039 Q1243A2Q 0.5	0.9856	26.173	1.1792	0.054
23038 Q1243A2Q 34.5	0.9609	25.992	1.1792	0.054
23043 Q1243B1Q 34.5	0.9603	25.993	1.1792	0.054

23044 Q1243B1Q 0.5 0.9849 26.189 1.1792 0.054

Worst dip was 26.97 at 23010 Q1241B1 34.5

Worst dip was 26.97 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_C493_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_iv4_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pst_iv4_	No dips violating criteria.			
IV_C493_slo_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_iv4_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_iv4_	No dips violating criteria.			
IV_C493_slo_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9864	25.744	1.1583	0.108
20103 WIS-230	230.0	0.9904	24.656	1.1583	0.108
20110 APD-230	230.0	0.9842	25.372	1.1583	0.108
20111 TEK-230	230.0	0.9848	25.325	1.1583	0.108
20112 STB-230	230.0	0.9886	24.906	1.1583	0.108
20113 OZA-230	230.0	0.9902	24.678	1.1583	0.108
20114 CSC-230	230.0	0.9895	24.887	1.1583	0.108
20115 MXI-230	230.0	0.9884	24.901	1.1583	0.108
20116 CTY-230	230.0	0.9833	25.448	1.1583	0.108
20136 CPU-161	161.0	0.9927	24.308	1.1583	0.108
20147 CTY-161	161.0	0.9848	25.853	1.1583	0.108
20148 NZI-161	161.0	0.9848	25.902	1.1583	0.108
20150 CRO-161	161.0	0.9869	25.668	1.1583	0.108
20151 PKD-161	161.0	0.9864	25.748	1.1583	0.108
20152 MOE-161	161.0	0.9839	25.857	1.1583	0.108
20153 GOR-161	161.0	0.9829	25.859	1.1583	0.108
20154 STA-161	161.0	0.9904	25.448	1.1583	0.108
20155 LCA-161	161.0	0.9877	25.658	1.1583	0.108
20158 MXI-345	34.5	0.9918	27.980	1.1583	0.108
20177 PID-230	230.0	0.9817	25.249	1.1583	0.108
20178 PID-161	161.0	0.9922	25.868	1.1583	0.108
20179 RZC-161	161.0	0.9836	26.190	1.1583	0.108
20180 HGO-161	161.0	0.9835	26.278	1.1583	0.108
20181 CHQ-161	161.0	0.0000	25.498	1.1583	0.108
20191 DAE-230	230.0	0.9887	24.906	1.1583	0.108
20226 XCO-230	230.0	0.9879	24.931	1.1583	0.108
20251 QCELL-23	230.0	0.9980	23.695	1.1583	0.108
20303 THO-230	230.0	0.9879	24.949	1.1583	0.108
20391 CHQ-230	230.0	0.9900	24.659	1.1583	0.108
20453 CNT-230	230.0	0.9908	24.628	1.1583	0.108
20454 SLR-161	161.0	0.9882	26.104	1.1583	0.108
20460 VPU-230	230.0	0.9872	25.103	1.1583	0.108
20461 CZA-161	161.0	0.9828	25.945	1.1583	0.108

Worst dip was 27.98 at 20158 MXI-345 34.5

Worst Condition Analysis Report Case iv_roa_6_pst_iv4_hs

Frequency at All Buses

	Name	Initial Frequency	Percent Dip	Time	Duration
20016	RIN-161	161.0	60.0000	0.708	1.7000	0.163
20103	WIS-230	230.0	60.0000	0.697	1.7000	0.163
20104	CPD-230	230.0	60.0000	0.738	1.7000	0.217
20105	CPD-U1	13.8	60.0000	0.795	1.7000	0.217
20106	CPD-U2	13.8	60.0000	0.795	1.7000	0.217
20107	CPT-230	230.0	60.0000	0.736	1.7000	0.217
20108	CPT-U1	13.8	60.0000	0.793	1.7000	0.217
20109	CPT-U2	13.8	60.0000	0.793	1.7000	0.217
20110	APD-230	230.0	60.0000	0.724	1.7000	0.163
20111	TEK-230	230.0	60.0000	0.718	1.7000	0.163
20112	STB-230	230.0	60.0000	0.702	1.7000	0.163
20113	OZA-230	230.0	60.0000	0.696	1.7000	0.163
20114	CSC-230	230.0	60.0000	0.727	1.7000	0.217
20115	MXI-230	230.0	60.0000	0.705	1.7000	0.163
20116	CTY-230	230.0	60.0000	0.722	1.7000	0.163
20117	CRO-230	230.0	60.0000	0.694	1.7000	0.163
20118	ROA-230	230.0	60.0000	0.678	1.7542	0.108
20134	ROA-161	161.0	60.0000	0.694	1.7000	0.163
20135	MXI-161	161.0	60.0000	0.717	1.7000	0.163
20136	CPU-161	161.0	60.0000	0.750	1.7000	0.217
20137	CPU-U1	13.8	60.0000	0.750	1.7000	0.217
20138	CPU-U2	13.8	60.0000	0.750	1.7000	0.217
20139	CPU-U3	13.8	60.0000	0.794	1.6458	0.271
20140	CPU-U4	13.8	60.0000	0.794	1.6458	0.271
20141	CPU-U5	13.8	60.0000	0.833	1.6458	0.271
20142	CPC-161	161.0	60.0000	0.751	1.7000	0.217
20143	CPC-U1	13.8	60.0000	0.788	1.6458	0.271
20144	CPC-U2	13.8	60.0000	0.789	1.6458	0.271
20145	CPC-U3	13.8	60.0000	0.788	1.6458	0.271
20146	CPC-U4	13.8	60.0000	0.789	1.6458	0.271
20147	CTY-161	161.0	60.0000	0.721	1.7000	0.163
20148	NZI-161	161.0	60.0000	0.716	1.7000	0.163
20150	CRO-161	161.0	60.0000	0.709	1.7000	0.163
20151	PKD-161	161.0	60.0000	0.719	1.7000	0.163
20152	MOE-161	161.0	60.0000	0.726	1.7000	0.163
20153	GOR-161	161.0	60.0000	0.735	1.7000	0.163
20154	STA-161	161.0	60.0000	0.703	1.7000	0.163
20155	LCA-161	161.0	60.0000	0.705	1.7000	0.163
20156	MXI-U1	13.8	60.0000	0.717	1.7000	0.163
20157	MXI-U23	13.8	60.0000	0.717	1.7000	0.163
20158	MXI-345	34.5	60.0000	0.717	1.7000	0.163

20177	PID-230	230.0	60.0000	0.739	1.7000	0.217
20178	PID-161	161.0	60.0000	0.740	1.7000	0.217
20179	RZC-161	161.0	60.0000	0.740	1.7000	0.217
20180	HGO-161	161.0	60.0000	0.740	1.7000	0.217
20181	CHQ-161	161.0	60.0000	0.743	1.7000	0.217
20188	LRP-U2	16.0	60.0000	0.766	1.7000	0.217
20189	LRP-U3	21.0	60.0000	0.692	1.6458	0.163
20190	LRP-U4	16.0	60.0000	0.746	1.7000	0.217
20191	DAE-230	230.0	60.0000	0.702	1.7000	0.163
20226	XCO-230	230.0	60.0000	0.701	1.7000	0.163
20231	MXI-U2	13.8	60.0000	0.717	1.7000	0.163
20232	MXI-U3	13.8	60.0000	0.717	1.7000	0.163
20251	QCELL-23	230.0	60.0000	0.678	1.7542	0.108
20303	THO-230	230.0	60.0000	0.702	1.7000	0.163
20328	LRP-230	230.0	60.0000	0.683	1.7542	0.108
20390	ESL-230	230.0	60.0000	0.739	1.7000	0.217
20391	CHQ-230	230.0	60.0000	0.738	1.7000	0.217
20410	ESL-TG1	13.8	60.0000	0.739	1.7000	0.217
20411	ESL-TG2	13.8	60.0000	0.739	1.7000	0.217
20412	ESL-TG3	13.8	60.0000	0.739	1.7000	0.217
20428	CPV-161	161.0	60.0000	0.752	1.7000	0.217
20429	CPV-U1	13.8	60.0000	0.787	1.6458	0.271
20430	CPV-U2	13.8	60.0000	0.787	1.6458	0.271
20431	CPV-U3	13.8	60.0000	0.787	1.6458	0.271
20453	CNT-230	230.0	60.0000	0.695	1.7000	0.163
20454	SLR-161	161.0	60.0000	0.740	1.7000	0.217
20460	VPU-230	230.0	60.0000	0.724	1.7000	0.163
20461	CZA-161	161.0	60.0000	0.729	1.7000	0.163
20488	CUH-230	230.0	60.0000	0.717	1.7000	0.163

Worst dip was 0.83 at 20141 CPU-U5 13.8

Worst dip was 0.83 at 20141 CPU-U5 13.8
Worst Condition Analysis Report Case iv_roa_6_pst_iv4_hs

Voltage at All Buses

	Name	Initial Voltage	Percent Dip	Time	Duration
20016	RIN-161	161.0	0.9864	25.744	1.1583	0.054
20110	APD-230	230.0	0.9842	25.372	1.1583	0.054
20111	TEK-230	230.0	0.9848	25.325	1.1583	0.054
20116	CTY-230	230.0	0.9833	25.448	1.1583	0.054
20135	MXI-161	161.0	0.9889	25.541	1.1583	0.054

20147	CTY-161	161.0	0.9848	25.853	1.1583	0.054
20148	NZI-161	161.0	0.9848	25.902	1.1583	0.054
20150	CRO-161	161.0	0.9869	25.668	1.1583	0.054
20151	PKD-161	161.0	0.9864	25.748	1.1583	0.054
20152	MOE-161	161.0	0.9839	25.857	1.1583	0.054
20153	GOR-161	161.0	0.9829	25.859	1.1583	0.054
20154	STA-161	161.0	0.9904	25.448	1.1583	0.054
20155	LCA-161	161.0	0.9877	25.658	1.1583	0.054
20156	MXI-U1	13.8	0.9918	27.980	1.1583	0.054
20157	MXI-U23	13.8	0.9918	27.980	1.1583	0.054
20158	MXI-345	34.5	0.9918	27.980	1.1583	0.054
20177	PID-230	230.0	0.9817	25.249	1.1583	0.054
20178	PID-161	161.0	0.9922	25.868	1.1583	0.054
20179	RZC-161	161.0	0.9836	26.190	1.1583	0.054
20180	HGO-161	161.0	0.9835	26.278	1.1583	0.054
20181	CHQ-161	161.0	0.0000	25.498	1.1583	0.054
20231	MXI-U2	13.8	0.9918	27.980	1.1583	0.054
20232	MXI-U3	13.8	0.9918	27.980	1.1583	0.054
20454	SLR-161	161.0	0.9882	26.104	1.1583	0.054
20460	VPU-230	230.0	0.9872	25.103	1.1583	0.054
20461	CZA-161	161.0	0.9828	25.945	1.1583	0.054

Worst dip was 27.98 at 20157 MXI-U23 13.8

Worst dip was 27.98 at 20157 MXI-U23 13.8

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iv4_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iv4_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration

IV_Wnd_dlo_RxR_pst_i No dips violating criteria.

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20006 PJZ-U5	15.0	60.0000	0.709	3.2208	0.162
20007 PJZ-U6	15.0	60.0000	0.709	3.2208	0.162
20008 PJZ-U8	21.0	60.0000	0.683	3.2208	0.108
20009 PJZ-U9	21.0	60.0000	0.682	3.2208	0.108
20010 CCBC-U1	16.5	60.0000	0.723	3.2208	0.162
20011 CCBC-U2	13.8	60.0000	0.737	3.2208	0.162
20014 PJZ-U7	18.0	60.0000	0.721	3.2208	0.162
20021 JAT-115	115.0	60.0000	0.692	3.2208	0.108
20023 MSN-115	115.0	60.0000	0.679	3.2208	0.108
20063 CIP-230	230.0	60.0000	0.709	3.2208	0.162
20065 CIP-115	115.0	60.0000	0.705	3.2208	0.162
20066 EPCH-115	115.0	60.0000	0.705	3.2208	0.162
20067 PCH-115	115.0	60.0000	0.705	3.2208	0.162
20068 SVE-115	115.0	60.0000	0.706	3.2208	0.162
20069 CEC-115	115.0	60.0000	0.705	3.2208	0.162
20070 GLL-115	115.0	60.0000	0.704	3.2208	0.162
20071 EDA-115	115.0	60.0000	0.704	3.2208	0.162
20072 FAM-115	115.0	60.0000	0.704	3.2208	0.162
20073 EMND-115	115.0	60.0000	0.705	3.2208	0.162
20074 MND-115	115.0	60.0000	0.705	3.2208	0.162
20075 KON-115	115.0	60.0000	0.706	3.2208	0.162
20076 SQN-115	115.0	60.0000	0.707	3.2208	0.162
20077 SMN-115	115.0	60.0000	0.707	3.2208	0.162
20078 TRI-115	115.0	60.0000	0.707	3.2208	0.162
20079 MIN-115	115.0	60.0000	0.708	3.2208	0.162
20080 ENT-115	115.0	60.0000	0.708	3.2208	0.162
20081 SAF-115	115.0	60.0000	0.709	3.2208	0.162
20082 LOS-115	115.0	60.0000	0.704	3.2208	0.162
20085 ONG-69	69.0	60.0000	0.685	3.2208	0.108
20086 BAO-69	69.0	60.0000	0.684	3.2208	0.108

20099	CIP-U1	13.8	60.0000	0.705	3.2208	0.162
20100	CIP-U2	13.8	60.0000	0.705	3.2208	0.162
20198	CIP-69	69.0	60.0000	0.706	3.2208	0.162
20202	GLL-69	69.0	60.0000	0.706	3.2208	0.162
20203	MND-69	69.0	60.0000	0.706	3.2208	0.162
20204	CEC-69	69.0	60.0000	0.706	3.2208	0.162
20222	LOS-230	230.0	60.0000	0.709	3.2208	0.162
20223	LOS-69	69.0	60.0000	0.684	3.2208	0.108
20416	JOV-CC1	21.0	60.0000	0.757	3.2208	0.162
20417	JOV-CC2	21.0	60.0000	0.715	3.2208	0.162
20418	PJZ-VAP	15.0	60.0000	0.702	3.2208	0.162
20443	JOV-CC3	21.0	60.0000	0.738	3.2208	0.162
20444	JOV-CC4	21.0	60.0000	0.712	3.2208	0.162
20450	JOV-230	230.0	60.0000	0.713	3.2208	0.162
20455	DOR-115	115.0	60.0000	0.710	3.2208	0.162
20490	VDO-115	115.0	60.0000	0.705	3.2208	0.162

Worst dip was 0.76 at 20416 JOV-CC1 21.0

Worst dip was 0.76 at 20416 JOV-CC1 21.0
Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iv4_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iv4_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_iv4	No dips violating criteria.			
NGila_IV_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9578	27.222	1.1792	0.054
23011 Q1241B1T 13.8	0.9593	26.966	1.1792	0.054
23012 Q1241B1i 13.8	0.9593	26.966	1.1792	0.054
23019 Q1242A1Q 0.5	1.0011	25.546	1.1792	0.054
23018 Q1242A1Q 34.5	0.9753	25.454	1.1792	0.054
23016 Q1242A1T 13.8	0.9593	26.966	1.1792	0.054
23017 Q1242A1i 13.8	0.9593	26.966	1.1792	0.054
23020 Q1242A2 34.5	0.9721	26.405	1.1792	0.054
23023 Q1242A2Q 34.5	0.9753	25.454	1.1792	0.054
23024 Q1242A2Q 0.5	1.0011	25.546	1.1792	0.054
23021 Q1242A2T 13.8	0.9727	26.182	1.1792	0.054
23022 Q1242A2i 13.8	0.9727	26.182	1.1792	0.054
23028 Q1242B1Q 34.5	0.9753	25.454	1.1792	0.054
23029 Q1242B1Q 0.5	1.0011	25.546	1.1792	0.054
23026 Q1242B1T 13.8	0.9727	26.182	1.1792	0.054
23027 Q1242B1i 13.8	0.9727	26.182	1.1792	0.054
23034 Q1243A1Q 0.5	0.9856	26.382	1.1792	0.054
23033 Q1243A1Q 34.5	0.9609	26.240	1.1792	0.054
23039 Q1243A2Q 0.5	0.9856	26.382	1.1792	0.054
23038 Q1243A2Q 34.5	0.9609	26.240	1.1792	0.054
23043 Q1243B1Q 34.5	0.9603	26.241	1.1792	0.054

23044 Q1243B1Q 0.5 0.9849 26.398 1.1792 0.054

Worst dip was 27.22 at 23010 Q1241B1 34.5

Worst dip was 27.22 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case PaloVerde-g1_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_iv4	No dips violating criteria.			
PaloVerde-g1_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_iv4	No dips violating criteria.			
PaloVerde-g1_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0036	26.751	2.7375	0.650
41145 WESTON 69.0	1.0179	21.671	2.7917	0.271
41223 LAGOON T 69.0	1.0154	22.830	2.7917	0.271

Worst dip was 26.75 at 41029 STATELIN 69.0

Worst Condition Analysis Report Case PaloVerde-g2_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g2_pst_iv4	No dips violating criteria.			
PaloVerde-g2_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0036	26.751	2.8458	0.217
41258 STATLN T 69.0	1.0046	26.734	2.8458	0.217
47550 VANSY 1 34.5	0.9715	27.853	2.8458	0.217
47551 VANSYCLE 69.0	1.0049	26.869	2.8458	0.217
47803 CMBHL 2 34.5	0.9371	43.692	2.6833	0.758
47804 CMBHL C2 34.5	0.9508	46.923	2.6833	0.758
47805 CMBHL W2 0.6	0.9374	53.047	2.6292	0.812
47943 VANSY C1 34.5	0.9830	27.357	2.8458	0.217
47944 VANSY W1 0.7	0.9721	28.097	2.8458	0.217

Worst dip was 53.05 at 47805 CMBHL W2 0.6

Worst dip was 53.05 at 47805 CMBHL W2 0.6

Worst Condition Analysis Report Case SONGS-g1_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23258 T468_LB1	34.5	60.0000	5.843	1.1792	0.163
23259 T468_LB2	34.5	60.0000	5.843	1.1792	0.163
23260 T468_T1	34.5	60.0000	5.864	1.1792	0.163
23261 T468_T2	34.5	60.0000	5.864	1.1792	0.163
23262 T468_G1	0.4	60.0000	6.005	1.1792	0.163
23263 T468_G2	0.4	60.0000	6.005	1.1792	0.163

Worst dip was 6.00 at 23262 T468_G1 0.4

Worst dip was 6.00 at 23262 T468_G1 0.4

Worst Condition Analysis Report Case T468_HAA_slo_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_iv4	No dips violating criteria.			
T468_HAA_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			
T468_NGila_slo_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9578	27.223	1.1792	0.054
23011 Q1241B1T 13.8	0.9593	26.963	1.1792	0.054
23012 Q1241B1i 13.8	0.9593	26.963	1.1792	0.054
23019 Q1242A1Q 0.5	1.0011	25.547	1.1792	0.054
23018 Q1242A1Q 34.5	0.9753	25.446	1.1792	0.054
23016 Q1242A1T 13.8	0.9593	26.963	1.1792	0.054
23017 Q1242A1i 13.8	0.9593	26.963	1.1792	0.054
23020 Q1242A2 34.5	0.9721	26.400	1.1792	0.054
23023 Q1242A2Q 34.5	0.9753	25.446	1.1792	0.054
23024 Q1242A2Q 0.5	1.0011	25.547	1.1792	0.054
23021 Q1242A2T 13.8	0.9727	26.173	1.1792	0.054
23022 Q1242A2i 13.8	0.9727	26.173	1.1792	0.054
23028 Q1242B1Q 34.5	0.9753	25.446	1.1792	0.054
23029 Q1242B1Q 0.5	1.0011	25.547	1.1792	0.054
23026 Q1242B1T 13.8	0.9727	26.173	1.1792	0.054
23027 Q1242B1i 13.8	0.9727	26.173	1.1792	0.054
23034 Q1243A1Q 0.5	0.9856	26.388	1.1792	0.054
23033 Q1243A1Q 34.5	0.9609	26.238	1.1792	0.054
23039 Q1243A2Q 0.5	0.9856	26.388	1.1792	0.054
23038 Q1243A2Q 34.5	0.9609	26.238	1.1792	0.054
23043 Q1243B1Q 34.5	0.9603	26.239	1.1792	0.054

23044 Q1243B1Q 0.5 0.9849 26.404 1.1792 0.054

Worst dip was 27.22 at 23010 Q1241B1 34.5

Worst dip was 27.22 at 23010 Q1241B1 34.5

Appendix I-3

Transient Stability Analysis Results

Imperial Valley Area Cluster

Heavy Summer Post

Worst Condition Analysis Report Case flat_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_iv4_hs.chf	No dips violating criteria.			
flat_pst_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_iv4_hs.chf	No dips violating criteria.			
flat_pst_iv4_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pst_iv4	No dips violating criteria.			
C493_Cen_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_iv4	No dips violating criteria.			
C493_Cen_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			
Dev_Val_pst_iv4_hs.c	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9578	26.972	1.1792	0.054
23011 Q1241B1T 13.8	0.9593	26.705	1.1792	0.054
23012 Q1241B1i 13.8	0.9593	26.705	1.1792	0.054
23019 Q1242A1Q 0.5	1.0011	25.322	1.1792	0.054
23018 Q1242A1Q 34.5	0.9753	25.192	1.1792	0.054
23016 Q1242A1T 13.8	0.9593	26.705	1.1792	0.054
23017 Q1242A1i 13.8	0.9593	26.705	1.1792	0.054
23020 Q1242A2 34.5	0.9721	26.140	1.1792	0.054
23023 Q1242A2Q 34.5	0.9753	25.192	1.1792	0.054
23024 Q1242A2Q 0.5	1.0011	25.322	1.1792	0.054
23021 Q1242A2T 13.8	0.9727	25.907	1.1792	0.054
23022 Q1242A2i 13.8	0.9727	25.907	1.1792	0.054
23028 Q1242B1Q 34.5	0.9753	25.192	1.1792	0.054
23029 Q1242B1Q 0.5	1.0011	25.322	1.1792	0.054
23026 Q1242B1T 13.8	0.9727	25.907	1.1792	0.054
23027 Q1242B1i 13.8	0.9727	25.907	1.1792	0.054
23034 Q1243A1Q 0.5	0.9856	26.173	1.1792	0.054
23033 Q1243A1Q 34.5	0.9609	25.992	1.1792	0.054
23039 Q1243A2Q 0.5	0.9856	26.173	1.1792	0.054
23038 Q1243A2Q 34.5	0.9609	25.992	1.1792	0.054

23043 Q1243B1Q 34.5 0.9603 25.993 1.1792 0.054
23044 Q1243B1Q 0.5 0.9849 26.189 1.1792 0.054

Worst dip was 26.97 at 23010 Q1241B1 34.5

Worst dip was 26.97 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_C493_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_iv4_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pst_iv4_	No dips violating criteria.			
IV_C493_slo_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_iv4_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_iv4_	No dips violating criteria.			
IV_C493_slo_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9864	25.744	1.1583	0.108
20103 WIS-230	230.0	0.9904	24.656	1.1583	0.108
20110 APD-230	230.0	0.9842	25.372	1.1583	0.108
20111 TEK-230	230.0	0.9848	25.325	1.1583	0.108
20112 STB-230	230.0	0.9886	24.906	1.1583	0.108
20113 OZA-230	230.0	0.9902	24.678	1.1583	0.108
20114 CSC-230	230.0	0.9895	24.887	1.1583	0.108
20115 MXI-230	230.0	0.9884	24.901	1.1583	0.108
20116 CTY-230	230.0	0.9833	25.448	1.1583	0.108
20136 CPU-161	161.0	0.9927	24.308	1.1583	0.108
20147 CTY-161	161.0	0.9848	25.853	1.1583	0.108
20148 NZI-161	161.0	0.9848	25.902	1.1583	0.108
20150 CRO-161	161.0	0.9869	25.668	1.1583	0.108
20151 PKD-161	161.0	0.9864	25.748	1.1583	0.108
20152 MOE-161	161.0	0.9839	25.857	1.1583	0.108
20153 GOR-161	161.0	0.9829	25.859	1.1583	0.108
20154 STA-161	161.0	0.9904	25.448	1.1583	0.108
20155 LCA-161	161.0	0.9877	25.658	1.1583	0.108
20158 MXI-345	34.5	0.9918	27.980	1.1583	0.108
20177 PID-230	230.0	0.9817	25.249	1.1583	0.108
20178 PID-161	161.0	0.9922	25.868	1.1583	0.108
20179 RZC-161	161.0	0.9836	26.190	1.1583	0.108
20180 HGO-161	161.0	0.9835	26.278	1.1583	0.108
20181 CHQ-161	161.0	0.0000	25.498	1.1583	0.108
20191 DAE-230	230.0	0.9887	24.906	1.1583	0.108
20226 XCO-230	230.0	0.9879	24.931	1.1583	0.108
20251 QCELL-23	230.0	0.9980	23.695	1.1583	0.108
20303 THO-230	230.0	0.9879	24.949	1.1583	0.108
20391 CHQ-230	230.0	0.9900	24.659	1.1583	0.108
20453 CNT-230	230.0	0.9908	24.628	1.1583	0.108
20454 SLR-161	161.0	0.9882	26.104	1.1583	0.108
20460 VPU-230	230.0	0.9872	25.103	1.1583	0.108
20461 CZA-161	161.0	0.9828	25.945	1.1583	0.108

Worst dip was 27.98 at 20158 MXI-345 34.5

Worst Condition Analysis Report Case iv_roa_6_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20016 RIN-161	161.0	60.0000	0.708	1.7000	0.163
20103 WIS-230	230.0	60.0000	0.697	1.7000	0.163
20104 CPD-230	230.0	60.0000	0.738	1.7000	0.217
20105 CPD-U1	13.8	60.0000	0.795	1.7000	0.217
20106 CPD-U2	13.8	60.0000	0.795	1.7000	0.217
20107 CPT-230	230.0	60.0000	0.736	1.7000	0.217
20108 CPT-U1	13.8	60.0000	0.793	1.7000	0.217
20109 CPT-U2	13.8	60.0000	0.793	1.7000	0.217
20110 APD-230	230.0	60.0000	0.724	1.7000	0.163
20111 TEK-230	230.0	60.0000	0.718	1.7000	0.163
20112 STB-230	230.0	60.0000	0.702	1.7000	0.163
20113 OZA-230	230.0	60.0000	0.696	1.7000	0.163
20114 CSC-230	230.0	60.0000	0.727	1.7000	0.217
20115 MXI-230	230.0	60.0000	0.705	1.7000	0.163
20116 CTY-230	230.0	60.0000	0.722	1.7000	0.163
20117 CRO-230	230.0	60.0000	0.694	1.7000	0.163
20118 ROA-230	230.0	60.0000	0.678	1.7542	0.108
20134 ROA-161	161.0	60.0000	0.694	1.7000	0.163
20135 MXI-161	161.0	60.0000	0.717	1.7000	0.163
20136 CPU-161	161.0	60.0000	0.750	1.7000	0.217
20137 CPU-U1	13.8	60.0000	0.750	1.7000	0.217
20138 CPU-U2	13.8	60.0000	0.750	1.7000	0.217
20139 CPU-U3	13.8	60.0000	0.794	1.6458	0.271
20140 CPU-U4	13.8	60.0000	0.794	1.6458	0.271
20141 CPU-U5	13.8	60.0000	0.833	1.6458	0.271
20142 CPC-161	161.0	60.0000	0.751	1.7000	0.217
20143 CPC-U1	13.8	60.0000	0.788	1.6458	0.271
20144 CPC-U2	13.8	60.0000	0.789	1.6458	0.271
20145 CPC-U3	13.8	60.0000	0.788	1.6458	0.271
20146 CPC-U4	13.8	60.0000	0.789	1.6458	0.271
20147 CTY-161	161.0	60.0000	0.721	1.7000	0.163
20148 NZI-161	161.0	60.0000	0.716	1.7000	0.163
20150 CRO-161	161.0	60.0000	0.709	1.7000	0.163
20151 PKD-161	161.0	60.0000	0.719	1.7000	0.163
20152 MOE-161	161.0	60.0000	0.726	1.7000	0.163
20153 GOR-161	161.0	60.0000	0.735	1.7000	0.163
20154 STA-161	161.0	60.0000	0.703	1.7000	0.163
20155 LCA-161	161.0	60.0000	0.705	1.7000	0.163
20156 MXI-U1	13.8	60.0000	0.717	1.7000	0.163

20157	MXI-U23	13.8	60.0000	0.717	1.7000	0.163
20158	MXI-345	34.5	60.0000	0.717	1.7000	0.163
20177	PID-230	230.0	60.0000	0.739	1.7000	0.217
20178	PID-161	161.0	60.0000	0.740	1.7000	0.217
20179	RZC-161	161.0	60.0000	0.740	1.7000	0.217
20180	HGO-161	161.0	60.0000	0.740	1.7000	0.217
20181	CHQ-161	161.0	60.0000	0.743	1.7000	0.217
20188	LRP-U2	16.0	60.0000	0.766	1.7000	0.217
20189	LRP-U3	21.0	60.0000	0.692	1.6458	0.163
20190	LRP-U4	16.0	60.0000	0.746	1.7000	0.217
20191	DAE-230	230.0	60.0000	0.702	1.7000	0.163
20226	XCO-230	230.0	60.0000	0.701	1.7000	0.163
20231	MXI-U2	13.8	60.0000	0.717	1.7000	0.163
20232	MXI-U3	13.8	60.0000	0.717	1.7000	0.163
20251	QCELL-23	230.0	60.0000	0.678	1.7542	0.108
20303	THO-230	230.0	60.0000	0.702	1.7000	0.163
20328	LRP-230	230.0	60.0000	0.683	1.7542	0.108
20390	ESL-230	230.0	60.0000	0.739	1.7000	0.217
20391	CHQ-230	230.0	60.0000	0.738	1.7000	0.217
20410	ESL-TG1	13.8	60.0000	0.739	1.7000	0.217
20411	ESL-TG2	13.8	60.0000	0.739	1.7000	0.217
20412	ESL-TG3	13.8	60.0000	0.739	1.7000	0.217
20428	CPV-161	161.0	60.0000	0.752	1.7000	0.217
20429	CPV-U1	13.8	60.0000	0.787	1.6458	0.271
20430	CPV-U2	13.8	60.0000	0.787	1.6458	0.271
20431	CPV-U3	13.8	60.0000	0.787	1.6458	0.271
20453	CNT-230	230.0	60.0000	0.695	1.7000	0.163
20454	SLR-161	161.0	60.0000	0.740	1.7000	0.217
20460	VPU-230	230.0	60.0000	0.724	1.7000	0.163
20461	CZA-161	161.0	60.0000	0.729	1.7000	0.163
20488	CUH-230	230.0	60.0000	0.717	1.7000	0.163

Worst dip was 0.83 at 20141 CPU-U5 13.8

Worst dip was 0.83 at 20141 CPU-U5 13.8
Worst Condition Analysis Report Case iv_roa_6_pst_iv4_hs

Voltage at All Buses

	Name	Initial Voltage	Percent Dip	Time	Duration
20016	RIN-161	161.0	0.9864	25.744	1.1583	0.054
20110	APD-230	230.0	0.9842	25.372	1.1583	0.054

20111	TEK-230	230.0	0.9848	25.325	1.1583	0.054
20116	CTY-230	230.0	0.9833	25.448	1.1583	0.054
20135	MXI-161	161.0	0.9889	25.541	1.1583	0.054
20147	CTY-161	161.0	0.9848	25.853	1.1583	0.054
20148	NZI-161	161.0	0.9848	25.902	1.1583	0.054
20150	CRO-161	161.0	0.9869	25.668	1.1583	0.054
20151	PKD-161	161.0	0.9864	25.748	1.1583	0.054
20152	MOE-161	161.0	0.9839	25.857	1.1583	0.054
20153	GOR-161	161.0	0.9829	25.859	1.1583	0.054
20154	STA-161	161.0	0.9904	25.448	1.1583	0.054
20155	LCA-161	161.0	0.9877	25.658	1.1583	0.054
20156	MXI-U1	13.8	0.9918	27.980	1.1583	0.054
20157	MXI-U23	13.8	0.9918	27.980	1.1583	0.054
20158	MXI-345	34.5	0.9918	27.980	1.1583	0.054
20177	PID-230	230.0	0.9817	25.249	1.1583	0.054
20178	PID-161	161.0	0.9922	25.868	1.1583	0.054
20179	RZC-161	161.0	0.9836	26.190	1.1583	0.054
20180	HGO-161	161.0	0.9835	26.278	1.1583	0.054
20181	CHQ-161	161.0	0.0000	25.498	1.1583	0.054
20231	MXI-U2	13.8	0.9918	27.980	1.1583	0.054
20232	MXI-U3	13.8	0.9918	27.980	1.1583	0.054
20454	SLR-161	161.0	0.9882	26.104	1.1583	0.054
20460	VPU-230	230.0	0.9872	25.103	1.1583	0.054
20461	CZA-161	161.0	0.9828	25.945	1.1583	0.054

Worst dip was 27.98 at 20157 MXI-U23 13.8

Worst dip was 27.98 at 20157 MXI-U23 13.8

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iv4_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iv4_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			
IV_Wnd1_RAS_pst_iv4_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20006 PJZ-U5	15.0 60.0000	0.709	3.2208	0.162
20007 PJZ-U6	15.0 60.0000	0.709	3.2208	0.162
20008 PJZ-U8	21.0 60.0000	0.683	3.2208	0.108
20009 PJZ-U9	21.0 60.0000	0.682	3.2208	0.108
20010 CCBC-U1	16.5 60.0000	0.723	3.2208	0.162
20011 CCBC-U2	13.8 60.0000	0.737	3.2208	0.162
20014 PJZ-U7	18.0 60.0000	0.721	3.2208	0.162
20021 JAT-115	115.0 60.0000	0.692	3.2208	0.108
20023 MSN-115	115.0 60.0000	0.679	3.2208	0.108
20063 CIP-230	230.0 60.0000	0.709	3.2208	0.162
20065 CIP-115	115.0 60.0000	0.705	3.2208	0.162
20066 EPCH-115	115.0 60.0000	0.705	3.2208	0.162
20067 PCH-115	115.0 60.0000	0.705	3.2208	0.162
20068 SVE-115	115.0 60.0000	0.706	3.2208	0.162
20069 CEC-115	115.0 60.0000	0.705	3.2208	0.162
20070 GLL-115	115.0 60.0000	0.704	3.2208	0.162
20071 EDA-115	115.0 60.0000	0.704	3.2208	0.162
20072 FAM-115	115.0 60.0000	0.704	3.2208	0.162
20073 EMND-115	115.0 60.0000	0.705	3.2208	0.162
20074 MND-115	115.0 60.0000	0.705	3.2208	0.162
20075 KON-115	115.0 60.0000	0.706	3.2208	0.162
20076 SQN-115	115.0 60.0000	0.707	3.2208	0.162
20077 SMN-115	115.0 60.0000	0.707	3.2208	0.162
20078 TRI-115	115.0 60.0000	0.707	3.2208	0.162
20079 MIN-115	115.0 60.0000	0.708	3.2208	0.162
20080 ENT-115	115.0 60.0000	0.708	3.2208	0.162
20081 SAF-115	115.0 60.0000	0.709	3.2208	0.162
20082 LOS-115	115.0 60.0000	0.704	3.2208	0.162
20085 ONG-69	69.0 60.0000	0.685	3.2208	0.108

20086 BAO-69 69.0 60.0000 0.684 3.2208 0.108
20099 CIP-U1 13.8 60.0000 0.705 3.2208 0.162
20100 CIP-U2 13.8 60.0000 0.705 3.2208 0.162
20198 CIP-69 69.0 60.0000 0.706 3.2208 0.162
20202 GLL-69 69.0 60.0000 0.706 3.2208 0.162
20203 MND-69 69.0 60.0000 0.706 3.2208 0.162
20204 CEC-69 69.0 60.0000 0.706 3.2208 0.162
20222 LOS-230 230.0 60.0000 0.709 3.2208 0.162
20223 LOS-69 69.0 60.0000 0.684 3.2208 0.108
20416 JOV-CC1 21.0 60.0000 0.757 3.2208 0.162
20417 JOV-CC2 21.0 60.0000 0.715 3.2208 0.162
20418 PJZ-VAP 15.0 60.0000 0.702 3.2208 0.162
20443 JOV-CC3 21.0 60.0000 0.738 3.2208 0.162
20444 JOV-CC4 21.0 60.0000 0.712 3.2208 0.162
20450 JOV-230 230.0 60.0000 0.713 3.2208 0.162
20455 DOR-115 115.0 60.0000 0.710 3.2208 0.162
20490 VDO-115 115.0 60.0000 0.705 3.2208 0.162

Worst dip was 0.76 at 20416 JOV-CC1 21.0

Worst dip was 0.76 at 20416 JOV-CC1 21.0
Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			
ML_Wnd_noRAS_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iv4_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iv4_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			
ML_Wnd_RAS_pst_iv4_h	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_iv4	No dips violating criteria.			
NGila_IV_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5 0.9578	27.222	1.1792	0.054
23011 Q1241B1T	13.8 0.9593	26.966	1.1792	0.054
23012 Q1241B1i	13.8 0.9593	26.966	1.1792	0.054
23019 Q1242A1Q	0.5 1.0011	25.546	1.1792	0.054
23018 Q1242A1Q	34.5 0.9753	25.454	1.1792	0.054
23016 Q1242A1T	13.8 0.9593	26.966	1.1792	0.054
23017 Q1242A1i	13.8 0.9593	26.966	1.1792	0.054
23020 Q1242A2	34.5 0.9721	26.405	1.1792	0.054
23023 Q1242A2Q	34.5 0.9753	25.454	1.1792	0.054
23024 Q1242A2Q	0.5 1.0011	25.546	1.1792	0.054
23021 Q1242A2T	13.8 0.9727	26.182	1.1792	0.054
23022 Q1242A2i	13.8 0.9727	26.182	1.1792	0.054
23028 Q1242B1Q	34.5 0.9753	25.454	1.1792	0.054
23029 Q1242B1Q	0.5 1.0011	25.546	1.1792	0.054
23026 Q1242B1T	13.8 0.9727	26.182	1.1792	0.054
23027 Q1242B1i	13.8 0.9727	26.182	1.1792	0.054
23034 Q1243A1Q	0.5 0.9856	26.382	1.1792	0.054
23033 Q1243A1Q	34.5 0.9609	26.240	1.1792	0.054
23039 Q1243A2Q	0.5 0.9856	26.382	1.1792	0.054
23038 Q1243A2Q	34.5 0.9609	26.240	1.1792	0.054

23043 Q1243B1Q 34.5 0.9603 26.241 1.1792 0.054
23044 Q1243B1Q 0.5 0.9849 26.398 1.1792 0.054

Worst dip was 27.22 at 23010 Q1241B1 34.5

Worst dip was 27.22 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case PaloVerde-g1_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_iv4	No dips violating criteria.			
PaloVerde-g1_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_iv4	No dips violating criteria.			
PaloVerde-g1_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0036	26.751	2.7375	0.650
41145 WESTON 69.0	1.0179	21.671	2.7917	0.271
41223 LAGOON T 69.0	1.0154	22.830	2.7917	0.271

Worst dip was 26.75 at 41029 STATELIN 69.0

Worst Condition Analysis Report Case PaloVerde-g2_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g2_pst_iv4	No dips violating criteria.			
PaloVerde-g2_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0036	26.751	2.8458	0.217
41258 STATLN T 69.0	1.0046	26.734	2.8458	0.217
47550 VANSY 1 34.5	0.9715	27.853	2.8458	0.217
47551 VANSYCLE 69.0	1.0049	26.869	2.8458	0.217
47803 CMBHL 2 34.5	0.9371	43.692	2.6833	0.758
47804 CMBHL C2 34.5	0.9508	46.923	2.6833	0.758
47805 CMBHL W2 0.6	0.9374	53.047	2.6292	0.812
47943 VANSY C1 34.5	0.9830	27.357	2.8458	0.217
47944 VANSY W1 0.7	0.9721	28.097	2.8458	0.217

Worst dip was 53.05 at 47805 CMBHL W2 0.6

Worst dip was 53.05 at 47805 CMBHL W2 0.6

Worst Condition Analysis Report Case SONGS-g1_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			
SONGS-g1_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iv4_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iv4_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			
SONGS-g2_pst_iv4_hs.	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iv4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23258 T468_LB1	34.5	60.0000	5.843	1.1792 0.163
23259 T468_LB2	34.5	60.0000	5.843	1.1792 0.163
23260 T468_T1	34.5	60.0000	5.864	1.1792 0.163
23261 T468_T2	34.5	60.0000	5.864	1.1792 0.163
23262 T468_G1	0.4	60.0000	6.005	1.1792 0.163
23263 T468_G2	0.4	60.0000	6.005	1.1792 0.163

Worst dip was 6.00 at 23262 T468_G1 0.4

Worst dip was 6.00 at 23262 T468_G1 0.4

Worst Condition Analysis Report Case T468_HAA_slo_pst_iv4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_iv4	No dips violating criteria.			
T468_HAA_slo_pst_iv4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_iv4_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			
T468_NGila_slo_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9578	27.223	1.1792	0.054
23011 Q1241B1T 13.8	0.9593	26.963	1.1792	0.054
23012 Q1241B1i 13.8	0.9593	26.963	1.1792	0.054
23019 Q1242A1Q 0.5	1.0011	25.547	1.1792	0.054
23018 Q1242A1Q 34.5	0.9753	25.446	1.1792	0.054
23016 Q1242A1T 13.8	0.9593	26.963	1.1792	0.054
23017 Q1242A1i 13.8	0.9593	26.963	1.1792	0.054
23020 Q1242A2 34.5	0.9721	26.400	1.1792	0.054
23023 Q1242A2Q 34.5	0.9753	25.446	1.1792	0.054
23024 Q1242A2Q 0.5	1.0011	25.547	1.1792	0.054
23021 Q1242A2T 13.8	0.9727	26.173	1.1792	0.054
23022 Q1242A2i 13.8	0.9727	26.173	1.1792	0.054
23028 Q1242B1Q 34.5	0.9753	25.446	1.1792	0.054
23029 Q1242B1Q 0.5	1.0011	25.547	1.1792	0.054
23026 Q1242B1T 13.8	0.9727	26.173	1.1792	0.054
23027 Q1242B1i 13.8	0.9727	26.173	1.1792	0.054
23034 Q1243A1Q 0.5	0.9856	26.388	1.1792	0.054
23033 Q1243A1Q 34.5	0.9609	26.238	1.1792	0.054
23039 Q1243A2Q 0.5	0.9856	26.388	1.1792	0.054
23038 Q1243A2Q 34.5	0.9609	26.238	1.1792	0.054

23043 Q1243B1Q 34.5 0.9603 26.239 1.1792 0.054
23044 Q1243B1Q 0.5 0.9849 26.404 1.1792 0.054

Worst dip was 27.22 at 23010 Q1241B1 34.5

Worst dip was 27.22 at 23010 Q1241B1 34.5

Appendix I-4

Transient Stability Analysis Results

Imperial Valley Area Cluster

Light Load Post

Worst Condition Analysis Report Case flat_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_iva_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_iva_ll.chf	No dips violating criteria.			
flat_pst_iva_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_iva_ll.chf	No dips violating criteria.			
flat_pst_iva_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pst_iva	No dips violating criteria.			
C493_Cen_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_iva	No dips violating criteria.			
C493_Cen_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_iva_ll.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pst_iva_ll.c	No dips violating criteria.			
Dev_Val_pst_iva_ll.c	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_iva_ll.c	No dips violating criteria.			
Dev_Val_pst_iva_ll.c	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_iv	No dips violating criteria.			
HAA_NGila_slo_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_iva_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2	60.0000	3.581	1.1917	0.108
23299 C510_G2	0.2	60.0000	3.581	1.1917	0.108

Worst dip was 3.58 at 23298 C510_G1 0.2

Worst dip was 3.58 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_C493_slo_pst_iva_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5	0.9522	28.624	1.1917	0.054
23011 Q1241B1T	13.8	0.9537	28.316	1.1917	0.054
23012 Q1241B1i	13.8	0.9537	28.316	1.1917	0.054
23019 Q1242A1Q	0.5	0.9950	27.177	1.1917	0.054
23018 Q1242A1Q	34.5	0.9696	26.715	1.1917	0.054
23016 Q1242A1T	13.8	0.9537	28.316	1.1917	0.054
23017 Q1242A1i	13.8	0.9537	28.316	1.1917	0.054
23020 Q1242A2	34.5	0.9665	27.449	1.1917	0.054
23023 Q1242A2Q	34.5	0.9696	26.715	1.1917	0.054
23024 Q1242A2Q	0.5	0.9950	27.177	1.1917	0.054
23021 Q1242A2T	13.8	0.9671	27.185	1.1917	0.054
23022 Q1242A2i	13.8	0.9671	27.185	1.1917	0.054
23028 Q1242B1Q	34.5	0.9696	26.715	1.1917	0.054
23029 Q1242B1Q	0.5	0.9950	27.177	1.1917	0.054
23026 Q1242B1T	13.8	0.9671	27.185	1.1917	0.054
23027 Q1242B1i	13.8	0.9671	27.185	1.1917	0.054

23034	Q1243A1Q	0.5	0.9795	28.386	1.1917	0.054
23033	Q1243A1Q	34.5	0.9553	27.844	1.1917	0.054
23039	Q1243A2Q	0.5	0.9795	28.386	1.1917	0.054
23038	Q1243A2Q	34.5	0.9553	27.844	1.1917	0.054
23043	Q1243B1Q	34.5	0.9547	27.845	1.1917	0.054
23044	Q1243B1Q	0.5	0.9789	28.400	1.1917	0.054

Worst dip was 28.62 at 23010 Q1241B1 34.5

Worst dip was 28.62 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case iv_roa_6_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration

iv_roa_6_pst_iva_ll. No dips violating criteria.

Worst Condition Analysis Report Case iv_roa_6_pst_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20141 CPU-U5	13.8	60.0000	0.706	1.6458	0.108

Worst dip was 0.71 at 20141 CPU-U5 13.8

Worst dip was 0.71 at 20141 CPU-U5 13.8

Worst Condition Analysis Report Case iv_roa_6_pst_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration

iv_roa_6_pst_iva_ll. No dips violating criteria.
iv_roa_6_pst_iva_ll. No dips violating criteria.

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2	60.0000	4.698	1.1792	0.108
23299 C510_G2	0.2	60.0000	4.698	1.1792	0.108

Worst dip was 4.70 at 23298 C510_G1 0.2

Worst dip was 4.70 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23004 Q78_1A1Q	0.5	1.0205	25.315	1.1792	0.054
23001 Q78_1A1T	13.8	0.9897	25.040	1.1792	0.054
23002 Q78_1A1i	13.8	0.9897	25.040	1.1792	0.054
23005 Q78_1A2	34.5	0.9893	25.356	1.1792	0.054
23009 Q78_1A2Q	0.5	1.0205	25.315	1.1792	0.054
23006 Q78_1A2T	13.8	0.9897	25.040	1.1792	0.054
23007 Q78_1A2i	13.8	0.9897	25.040	1.1792	0.054
23014 Q78_1B1Q	0.5	1.0205	25.315	1.1792	0.054
23010 Q1241B1	34.5	0.9522	26.609	1.1792	0.054
23011 Q1241B1T	13.8	0.9537	26.430	1.1792	0.054
23012 Q1241B1i	13.8	0.9537	26.430	1.1792	0.054
23019 Q1242A1Q	0.5	0.9950	25.590	1.1792	0.054
23018 Q1242A1Q	34.5	0.9696	25.537	1.1792	0.054
23016 Q1242A1T	13.8	0.9537	26.430	1.1792	0.054
23017 Q1242A1i	13.8	0.9537	26.430	1.1792	0.054
23020 Q1242A2	34.5	0.9665	26.342	1.1792	0.054

23023	Q1242A2Q	34.5	0.9696	25.537	1.1792	0.054
23024	Q1242A2Q	0.5	0.9950	25.590	1.1792	0.054
23021	Q1242A2T	13.8	0.9671	26.179	1.1792	0.054
23022	Q1242A2i	13.8	0.9671	26.179	1.1792	0.054
23028	Q1242B1Q	34.5	0.9696	25.537	1.1792	0.054
23029	Q1242B1Q	0.5	0.9950	25.590	1.1792	0.054
23026	Q1242B1T	13.8	0.9671	26.179	1.1792	0.054
23027	Q1242B1i	13.8	0.9671	26.179	1.1792	0.054
23034	Q1243A1Q	0.5	0.9795	25.870	1.1792	0.054
23033	Q1243A1Q	34.5	0.9553	25.793	1.1792	0.054
23039	Q1243A2Q	0.5	0.9795	25.870	1.1792	0.054
23038	Q1243A2Q	34.5	0.9553	25.793	1.1792	0.054
23043	Q1243B1Q	34.5	0.9547	25.793	1.1792	0.054
23044	Q1243B1Q	0.5	0.9789	25.882	1.1792	0.054

Worst dip was 26.61 at 23010 Q1241B1 34.5

Worst dip was 26.61 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iva_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iva_	No dips violating criteria.			
IV_Wnd1_RAS_pst_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_iva_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_iva_	No dips violating criteria.			
IV_Wnd1_RAS_pst_iva_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2	60.0000	3.195	1.1917	0.108
23299 C510_G2	0.2	60.0000	3.195	1.1917	0.108

Worst dip was 3.19 at 23298 C510_G1 0.2

Worst dip was 3.19 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2	60.0000	3.195	1.1917	0.108
23299 C510_G2	0.2	60.0000	3.195	1.1917	0.108

Worst dip was 3.19 at 23298 C510_G1 0.2

Worst dip was 3.19 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			
IV_Wnd_dlo_RxR_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iva	No dips violating criteria.			
ML_Wnd_noRAS_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_iva	No dips violating criteria.			
ML_Wnd_noRAS_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_iv

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			
ML_Wnd_noXTrp_pst_iv	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iva_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iva_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iva_l	No dips violating criteria.			
ML_Wnd_RAS_pst_iva_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_iva_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_iva_l	No dips violating criteria.			
ML_Wnd_RAS_pst_iva_l	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_iva	No dips violating criteria.			
NGila_IV_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_iva	No dips violating criteria.			
NGila_IV_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_iva	No dips violating criteria.			
PaloVerde-g1_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_iva	No dips violating criteria.			
PaloVerde-g1_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.221	9.1291	0.162
54425 NOSE CR9 138.0	1.0225	30.174	9.5082	0.271
58177 AIRDRIE9 25.0	1.0485	22.447	9.1832	0.108
58178 AIRDRIE8 25.0	1.0432	22.548	9.1832	0.108

Worst dip was 30.17 at 54425 NOSE CR9 138.0

Worst Condition Analysis Report Case PaloVerde-g2_pst_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
54318 WEST CRO 138.0	60.0000	0.739	10.3207	0.108
54425 NOSE CR9 138.0	60.0000	0.792	10.3207	0.108
54503 SUMMIT_7 138.0	60.0000	0.795	10.3207	0.108
54729 SUMMITTP 138.0	60.0000	0.792	10.3207	0.108
54810 AMOCOTAP 138.0	60.0000	0.774	10.3207	0.108
54933 AIRD TAP 138.0	60.0000	0.739	10.3207	0.108
56503 SUMMITG3 13.8	60.0000	34.432	9.6707	0.325
57503 SUMMITG2 13.8	60.0000	34.432	9.6707	0.325
58503 SUMMITG1 13.8	60.0000	0.795	10.3207	0.108

Worst dip was 34.43 at 56503 SUMMITG3 13.8

Worst dip was 34.43 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case PaloVerde-g2_pst_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.688	9.5082	0.054
54425 NOSE CR9 138.0	1.0225	30.174	9.5082	0.054
54503 SUMMIT_7 138.0	1.0229	30.350	9.5082	0.054
54729 SUMMITTP 138.0	1.0228	30.170	9.5082	0.054

54810 AMOCOTAP 138.0 1.0228 28.961 9.5082 0.054
54933 AIRD TAP 138.0 1.0215 26.684 9.5082 0.054
56503 SUMMITG3 13.8 1.0000 76.259 8.6416 2.112
57503 SUMMITG2 13.8 1.0000 76.259 8.6416 2.112
58503 SUMMITG1 13.8 1.0229 30.350 9.5082 0.054

Worst dip was 76.26 at 56503 SUMMITG3 13.8

Worst dip was 76.26 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case SONGS-g1_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_iva_ll.	No dips violating criteria.			
SONGS-g1_pst_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_iva_ll.	No dips violating criteria.			
SONGS-g1_pst_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iva_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_iva_ll.	No dips violating criteria.			
SONGS-g2_pst_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_iva_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_iva_ll.	No dips violating criteria.			
SONGS-g2_pst_iva_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iva

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_HAA_slo_pst_iva	No dips violating criteria.			
T468_HAA_slo_pst_iva	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_iva

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9522	25.179	1.1792	0.054
23011 Q1241B1T 13.8	0.9537	25.035	1.1792	0.054
23012 Q1241B1i 13.8	0.9537	25.035	1.1792	0.054
23016 Q1242A1T 13.8	0.9537	25.035	1.1792	0.054
23017 Q1242A1i 13.8	0.9537	25.035	1.1792	0.054

Worst dip was 25.18 at 23010 Q1241B1 34.5

Worst dip was 25.18 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case T468_NGila_slo_pst_iva_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			
T468_NGila_slo_pst_i	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_i	No dips violating criteria.			
T468_NGila_slo_pst_i	No dips violating criteria.			

Appendix I-5

Transient Stability Analysis Results

Boulevard Cluster

Heavy Summer Post

Worst Condition Analysis Report Case flat_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_hs_eco4.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_hs_eco4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_hs_eco4.chf	No dips violating criteria.			
flat_pst_hs_eco4.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_hs_eco4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_hs_eco4.chf	No dips violating criteria.			
flat_pst_hs_eco4.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_hs_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pst_hs_	No dips violating criteria.			
C493_Cen_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_hs_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_hs_	No dips violating criteria.			
C493_Cen_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_hs_eco4.	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_hs_eco4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pst_hs_eco4.	No dips violating criteria.			
Dev_Val_pst_hs_eco4.	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_hs_eco4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_hs_eco4.	No dips violating criteria.			
Dev_Val_pst_hs_eco4.	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pst_hs	No dips violating criteria.			
HAA_NGila_slo_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_hs	No dips violating criteria.			
HAA_NGila_slo_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_hs_e	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_hs_e

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pst_hs_e	No dips violating criteria.			
IV_C493_slo_pst_hs_e	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_hs_e

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_hs_e	No dips violating criteria.			
IV_C493_slo_pst_hs_e	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9869	25.680	1.1583	0.108
20103 WIS-230	230.0	0.9909	24.598	1.1583	0.108
20110 APD-230	230.0	0.9845	25.306	1.1583	0.108
20111 TEK-230	230.0	0.9851	25.260	1.1583	0.108
20112 STB-230	230.0	0.9891	24.846	1.1583	0.108
20113 OZA-230	230.0	0.9908	24.621	1.1583	0.108
20114 CSC-230	230.0	0.9897	24.820	1.1583	0.108
20115 MXI-230	230.0	0.9888	24.840	1.1583	0.108
20116 CTY-230	230.0	0.9836	25.382	1.1583	0.108
20136 CPU-161	161.0	0.9929	24.240	1.1583	0.108
20147 CTY-161	161.0	0.9852	25.787	1.1583	0.108
20148 NZI-161	161.0	0.9853	25.837	1.1583	0.108
20150 CRO-161	161.0	0.9874	25.603	1.1583	0.108
20151 PKD-161	161.0	0.9869	25.682	1.1583	0.108
20152 MOE-161	161.0	0.9842	25.790	1.1583	0.108
20153 GOR-161	161.0	0.9832	25.791	1.1583	0.108
20154 STA-161	161.0	0.9910	25.386	1.1583	0.108
20155 LCA-161	161.0	0.9883	25.595	1.1583	0.108
20158 MXI-345	34.5	0.9923	27.918	1.1583	0.108
20177 PID-230	230.0	0.9818	25.184	1.1583	0.108
20178 PID-161	161.0	0.9923	25.803	1.1583	0.108
20179 RZC-161	161.0	0.9838	26.125	1.1583	0.108
20180 HGO-161	161.0	0.9837	26.213	1.1583	0.108
20181 CHQ-161	161.0	0.0000	25.431	1.1583	0.108
20191 DAE-230	230.0	0.9891	24.846	1.1583	0.108
20226 XCO-230	230.0	0.9883	24.872	1.1583	0.108
20251 QCELL-23	230.0	0.9989	23.641	1.1583	0.108
20303 THO-230	230.0	0.9883	24.889	1.1583	0.108
20391 CHQ-230	230.0	0.9901	24.592	1.1583	0.108
20453 CNT-230	230.0	0.9913	24.570	1.1583	0.108
20454 SLR-161	161.0	0.9884	26.039	1.1583	0.108
20460 VPU-230	230.0	0.9875	25.037	1.1583	0.108
20461 CZA-161	161.0	0.9831	25.878	1.1583	0.108

Worst dip was 27.92 at 20158 MXI-345 34.5

Worst Condition Analysis Report Case iv_roa_6_pst_hs_eco4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20016 RIN-161	161.0	60.0000	0.694	1.7542	0.108
20103 WIS-230	230.0	60.0000	0.684	1.7542	0.108
20104 CPD-230	230.0	60.0000	0.725	1.7000	0.217
20105 CPD-U1	13.8	60.0000	0.789	1.7000	0.217
20106 CPD-U2	13.8	60.0000	0.789	1.7000	0.217
20107 CPT-230	230.0	60.0000	0.723	1.7000	0.217
20108 CPT-U1	13.8	60.0000	0.788	1.7000	0.217
20109 CPT-U2	13.8	60.0000	0.788	1.7000	0.217
20110 APD-230	230.0	60.0000	0.710	1.7000	0.217
20111 TEK-230	230.0	60.0000	0.704	1.7542	0.163
20112 STB-230	230.0	60.0000	0.688	1.7542	0.108
20113 OZA-230	230.0	60.0000	0.682	1.7542	0.108
20114 CSC-230	230.0	60.0000	0.714	1.7000	0.217
20115 MXI-230	230.0	60.0000	0.692	1.7542	0.108
20116 CTY-230	230.0	60.0000	0.708	1.7000	0.217
20117 CRO-230	230.0	60.0000	0.680	1.7542	0.108
20118 ROA-230	230.0	60.0000	0.665	1.7542	0.108
20134 ROA-161	161.0	60.0000	0.680	1.7542	0.108
20135 MXI-161	161.0	60.0000	0.703	1.7000	0.163
20136 CPU-161	161.0	60.0000	0.735	1.7000	0.217
20137 CPU-U1	13.8	60.0000	0.735	1.7000	0.217
20138 CPU-U2	13.8	60.0000	0.735	1.7000	0.217
20139 CPU-U3	13.8	60.0000	0.779	1.7000	0.217
20140 CPU-U4	13.8	60.0000	0.778	1.7000	0.217
20141 CPU-U5	13.8	60.0000	0.817	1.6458	0.271
20142 CPC-161	161.0	60.0000	0.736	1.7000	0.217
20143 CPC-U1	13.8	60.0000	0.772	1.6458	0.271
20144 CPC-U2	13.8	60.0000	0.773	1.6458	0.271
20145 CPC-U3	13.8	60.0000	0.772	1.6458	0.271
20146 CPC-U4	13.8	60.0000	0.773	1.6458	0.271
20147 CTY-161	161.0	60.0000	0.707	1.7000	0.163
20148 NZI-161	161.0	60.0000	0.702	1.7000	0.163
20150 CRO-161	161.0	60.0000	0.695	1.7542	0.108
20151 PKD-161	161.0	60.0000	0.705	1.7000	0.163
20152 MOE-161	161.0	60.0000	0.711	1.7000	0.163
20153 GOR-161	161.0	60.0000	0.721	1.7000	0.217
20154 STA-161	161.0	60.0000	0.689	1.7542	0.108
20155 LCA-161	161.0	60.0000	0.691	1.7542	0.108
20156 MXI-U1	13.8	60.0000	0.702	1.7000	0.163

20157 MXI-U23 13.8 60.0000 0.702 1.7000 0.163
20158 MXI-345 34.5 60.0000 0.702 1.7000 0.163
20177 PID-230 230.0 60.0000 0.724 1.7000 0.217
20178 PID-161 161.0 60.0000 0.725 1.7000 0.217
20179 RZC-161 161.0 60.0000 0.726 1.7000 0.217
20180 HGO-161 161.0 60.0000 0.726 1.7000 0.217
20181 CHQ-161 161.0 60.0000 0.728 1.7000 0.217
20188 LRP-U2 16.0 60.0000 0.751 1.7000 0.217
20189 LRP-U3 21.0 60.0000 0.674 1.7000 0.108
20190 LRP-U4 16.0 60.0000 0.734 1.7000 0.217
20191 DAE-230 230.0 60.0000 0.688 1.7542 0.108
20226 XCO-230 230.0 60.0000 0.687 1.7542 0.108
20231 MXI-U2 13.8 60.0000 0.702 1.7000 0.163
20232 MXI-U3 13.8 60.0000 0.702 1.7000 0.163
20251 QCELL-23 230.0 60.0000 0.665 1.7542 0.108
20303 THO-230 230.0 60.0000 0.688 1.7542 0.108
20328 LRP-230 230.0 60.0000 0.670 1.7542 0.108
20390 ESL-230 230.0 60.0000 0.725 1.7000 0.217
20391 CHQ-230 230.0 60.0000 0.725 1.7000 0.217
20410 ESL-TG1 13.8 60.0000 0.725 1.7000 0.217
20411 ESL-TG2 13.8 60.0000 0.725 1.7000 0.217
20412 ESL-TG3 13.8 60.0000 0.725 1.7000 0.217
20428 CPV-161 161.0 60.0000 0.738 1.7000 0.217
20429 CPV-U1 13.8 60.0000 0.771 1.6458 0.271
20430 CPV-U2 13.8 60.0000 0.771 1.6458 0.271
20431 CPV-U3 13.8 60.0000 0.771 1.6458 0.271
20453 CNT-230 230.0 60.0000 0.682 1.7542 0.108
20454 SLR-161 161.0 60.0000 0.725 1.7000 0.217
20460 VPU-230 230.0 60.0000 0.710 1.7000 0.217
20461 CZA-161 161.0 60.0000 0.714 1.7000 0.217
20488 CUH-230 230.0 60.0000 0.703 1.7542 0.108

Worst dip was 0.82 at 20141 CPU-U5 13.8

Worst dip was 0.82 at 20141 CPU-U5 13.8
Worst Condition Analysis Report Case iv_roa_6_pst_hs_eco4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9869	25.680	1.1583	0.054
20110 APD-230	230.0	0.9845	25.306	1.1583	0.054

20111	TEK-230	230.0	0.9851	25.260	1.1583	0.054
20116	CTY-230	230.0	0.9836	25.382	1.1583	0.054
20135	MXI-161	161.0	0.9894	25.474	1.1583	0.054
20147	CTY-161	161.0	0.9852	25.787	1.1583	0.054
20148	NZI-161	161.0	0.9853	25.837	1.1583	0.054
20150	CRO-161	161.0	0.9874	25.603	1.1583	0.054
20151	PKD-161	161.0	0.9869	25.682	1.1583	0.054
20152	MOE-161	161.0	0.9842	25.790	1.1583	0.054
20153	GOR-161	161.0	0.9832	25.791	1.1583	0.054
20154	STA-161	161.0	0.9910	25.386	1.1583	0.054
20155	LCA-161	161.0	0.9883	25.595	1.1583	0.054
20156	MXI-U1	13.8	0.9923	27.918	1.1583	0.054
20157	MXI-U23	13.8	0.9923	27.918	1.1583	0.054
20158	MXI-345	34.5	0.9923	27.918	1.1583	0.054
20177	PID-230	230.0	0.9818	25.184	1.1583	0.054
20178	PID-161	161.0	0.9923	25.803	1.1583	0.054
20179	RZC-161	161.0	0.9838	26.125	1.1583	0.054
20180	HGO-161	161.0	0.9837	26.213	1.1583	0.054
20181	CHQ-161	161.0	0.0000	25.431	1.1583	0.054
20231	MXI-U2	13.8	0.9923	27.918	1.1583	0.054
20232	MXI-U3	13.8	0.9923	27.918	1.1583	0.054
20454	SLR-161	161.0	0.9884	26.039	1.1583	0.054
20460	VPU-230	230.0	0.9875	25.037	1.1583	0.054
20461	CZA-161	161.0	0.9831	25.878	1.1583	0.054

Worst dip was 27.92 at 20157 MXI-U23 13.8

Worst dip was 27.92 at 20157 MXI-U23 13.8

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_hs	No dips violating criteria.			
IV_Wnd1_noRAS_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_hs	No dips violating criteria.			
IV_Wnd1_noRAS_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_h	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_h	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_hs_e	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_hs_e

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_hs_e	No dips violating criteria.			
IV_Wnd1_RAS_pst_hs_e	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_hs_e

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_hs_e	No dips violating criteria.			
IV_Wnd1_RAS_pst_hs_e	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_h	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_h	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_h	No dips violating criteria.			
IV_Wnd_dlo_RxR_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_h	No dips violating criteria.			
IV_Wnd_dlo_RxR_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_hs_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_hs_	No dips violating criteria.			
ML_Wnd_noRAS_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_hs_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_hs_	No dips violating criteria.			
ML_Wnd_noRAS_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_hs	No dips violating criteria.			
ML_Wnd_noXTrp_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_hs	No dips violating criteria.			
ML_Wnd_noXTrp_pst_hs	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_hs_ec	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_hs_ec

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_hs_ec	No dips violating criteria.			
ML_Wnd_RAS_pst_hs_ec	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_hs_ec

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_hs_ec	No dips violating criteria.			
ML_Wnd_RAS_pst_hs_ec	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_hs_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_hs_	No dips violating criteria.			
NGila_IV_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_hs_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_hs_	No dips violating criteria.			
NGila_IV_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_hs_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_hs_	No dips violating criteria.			
PaloVerde-g1_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_hs_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_hs_	No dips violating criteria.			
PaloVerde-g1_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0037	27.060	2.7375	0.650
41145 WESTON 69.0	1.0180	21.936	2.7917	0.271
41223 LAGOON T 69.0	1.0154	23.103	2.7917	0.271
41319 ALKALI C 115.0	1.0534	33.629	4.7416	0.325

Worst dip was 33.63 at 41319 ALKALI C 115.0
Worst Condition Analysis Report Case PaloVerde-g2_pst_hs_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
41319 ALKALI C 115.0	60.0000	0.838	5.0125	0.108
41404 WLW C TP 115.0	60.0000	0.843	5.0125	0.108
47847 WILOWCRK 115.0	60.0000	1.094	5.0125	0.108
47990 WLWCK 1 34.5	60.0000	1.208	5.0125	0.108
47991 WLWCK C1 34.5	60.0000	1.405	5.0125	0.108
47992 WLWCK W1 0.6	60.0000	2.268	5.0125	0.162
47993 WLWCK 2 34.5	60.0000	1.208	5.0125	0.108
47994 WLWCK C2 34.5	60.0000	1.405	5.0125	0.108
47995 WLWCK W2 0.6	60.0000	2.265	5.0125	0.162
47996 WLWCK 3 34.5	60.0000	1.208	5.0125	0.108
47997 WLWCK C3 34.5	60.0000	1.405	5.0125	0.108
47998 WLWCK W3 0.6	60.0000	2.265	5.0125	0.162

Worst dip was 2.27 at 47992 WLWCK W1 0.6

Worst dip was 2.27 at 47992 WLWCK W1 0.6
Worst Condition Analysis Report Case PaloVerde-g2_pst_hs_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0037	27.060	2.7917	0.271

41258 STATLN T 69.0 1.0046 27.043 2.7917 0.271
41319 ALKALI C 115.0 1.0534 33.629 4.8500 0.217
41404 WLW C TP 115.0 1.0550 33.602 4.8500 0.217
47550 VANSY 1 34.5 0.9715 27.936 2.7917 0.271
47551 VANSYCLE 69.0 1.0050 27.135 2.7917 0.271
47803 CMBHL 2 34.5 0.9372 44.003 2.6833 0.758
47804 CMBHL C2 34.5 0.9509 47.391 2.6292 0.812
47805 CMBHL W2 0.6 0.9374 53.629 2.6292 0.812
47847 WILOWCRK 115.0 1.0741 40.844 4.7416 0.325
47943 VANSY C1 34.5 0.9831 27.506 2.8458 0.217
47944 VANSY W1 0.7 0.9722 28.339 2.8458 0.217
47990 WLWCK 1 34.5 1.0806 43.033 4.7416 0.325
47991 WLWCK C1 34.5 1.0993 44.580 4.7416 0.325
47992 WLWCK W1 0.6 1.1061 53.702 4.6333 0.433
47993 WLWCK 2 34.5 1.0806 43.023 4.7416 0.325
47994 WLWCK C2 34.5 1.0993 44.555 4.7416 0.325
47995 WLWCK W2 0.6 1.1061 53.627 4.6333 0.433
47996 WLWCK 3 34.5 1.0806 43.023 4.7416 0.325
47997 WLWCK C3 34.5 1.0993 44.555 4.7416 0.325
47998 WLWCK W3 0.6 1.1061 53.627 4.6333 0.433

Worst dip was 53.70 at 47992 WLWCK W1 0.6

Worst dip was 53.70 at 47992 WLWCK W1 0.6

Worst Condition Analysis Report Case SONGS-g1_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_hs_eco4	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_hs_eco4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_hs_eco4	No dips violating criteria.			
SONGS-g1_pst_hs_eco4	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_hs_eco4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_hs_eco4	No dips violating criteria.			
SONGS-g1_pst_hs_eco4	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_hs_eco4	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_hs_eco4

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_hs_eco4	No dips violating criteria.			
SONGS-g2_pst_hs_eco4	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_hs_eco4

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_hs_eco4	No dips violating criteria.			
SONGS-g2_pst_hs_eco4	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_hs_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23258 T468_LB1	34.5	60.0000	4.816	1.1792	0.163
23259 T468_LB2	34.5	60.0000	4.816	1.1792	0.163
23260 T468_T1	34.5	60.0000	5.799	1.1792	0.163
23261 T468_T2	34.5	60.0000	5.799	1.1792	0.163
23262 T468_G1	0.4	60.0000	5.944	1.1792	0.163
23263 T468_G2	0.4	60.0000	5.944	1.1792	0.163

Worst dip was 5.94 at 23262 T468_G1 0.4

Worst dip was 5.94 at 23262 T468_G1 0.4

Worst Condition Analysis Report Case T468_HAA_slo_pst_hs_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_hs_	No dips violating criteria.			
T468_HAA_slo_pst_hs_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_hs_eco4

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pst_h	No dips violating criteria.			
T468_NGila_slo_pst_h	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_h	No dips violating criteria.			
T468_NGila_slo_pst_h	No dips violating criteria.			

Appendix I-6

Transient Stability Analysis Results

Boulevard Cluster

Light Load Post

Worst Condition Analysis Report Case flat_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_ll_bu.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_ll_bu

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_ll_bu.chf	No dips violating criteria.			
flat_pst_ll_bu.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_ll_bu

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_ll_bu.chf	No dips violating criteria.			
flat_pst_ll_bu.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_ll_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Cen_slo_pst_ll_	No dips violating criteria.			
C493_Cen_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Cen_slo_pst_ll_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Cen_slo_pst_ll_	No dips violating criteria.			
C493_Cen_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_ll_bu.ch	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_ll_bu

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
Dev_Val_pst_ll_bu.ch	No dips violating criteria.			
Dev_Val_pst_ll_bu.ch	No dips violating criteria.			

Worst Condition Analysis Report Case Dev_Val_pst_ll_bu

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
Dev_Val_pst_ll_bu.ch	No dips violating criteria.			
Dev_Val_pst_ll_bu.ch	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pst_ll	No dips violating criteria.			
HAA_NGila_slo_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pst_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pst_ll	No dips violating criteria.			
HAA_NGila_slo_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_ll_b	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_ll_b

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pst_ll_b	No dips violating criteria.			
IV_C493_slo_pst_ll_b	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_ll_b

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5 0.9564	28.737	1.1917	0.054
23011 Q1241B1T	13.8 0.9579	28.440	1.1917	0.054
23012 Q1241B1i	13.8 0.9579	28.440	1.1917	0.054
23019 Q1242A1Q	0.5 0.9996	27.248	1.1917	0.054
23018 Q1242A1Q	34.5 0.9739	26.821	1.1917	0.054
23016 Q1242A1T	13.8 0.9579	28.440	1.1917	0.054
23017 Q1242A1i	13.8 0.9579	28.440	1.1917	0.054
23020 Q1242A2	34.5 0.9707	27.555	1.1917	0.054
23023 Q1242A2Q	34.5 0.9739	26.821	1.1917	0.054
23024 Q1242A2Q	0.5 0.9996	27.248	1.1917	0.054
23021 Q1242A2T	13.8 0.9713	27.302	1.1917	0.054
23022 Q1242A2i	13.8 0.9713	27.302	1.1917	0.054
23028 Q1242B1Q	34.5 0.9739	26.821	1.1917	0.054
23029 Q1242B1Q	0.5 0.9996	27.248	1.1917	0.054
23026 Q1242B1T	13.8 0.9713	27.302	1.1917	0.054
23027 Q1242B1i	13.8 0.9713	27.302	1.1917	0.054
23034 Q1243A1Q	0.5 0.9841	28.464	1.1917	0.054
23033 Q1243A1Q	34.5 0.9595	27.957	1.1917	0.054
23039 Q1243A2Q	0.5 0.9841	28.464	1.1917	0.054
23038 Q1243A2Q	34.5 0.9595	27.957	1.1917	0.054

23043 Q1243B1Q 34.5 0.9590 27.958 1.1917 0.054
23044 Q1243B1Q 0.5 0.9835 28.478 1.1917 0.054

Worst dip was 28.74 at 23010 Q1241B1 34.5

Worst dip was 28.74 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case iv_roa_6_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
iv_roa_6_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_pst_ll_bu

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20141 CPU-U5	13.8	60.0000	0.687	1.6458	0.108

Worst dip was 0.69 at 20141 CPU-U5 13.8

Worst dip was 0.69 at 20141 CPU-U5 13.8

Worst Condition Analysis Report Case iv_roa_6_pst_ll_bu

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
iv_roa_6_pst_ll_bu.c	No dips violating criteria.			
iv_roa_6_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2	60.0000	3.720	1.1792	0.108
23299 C510_G2	0.2	60.0000	3.720	1.1792	0.108

Worst dip was 3.72 at 23298 C510_G1 0.2

Worst dip was 3.72 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pst_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23003 Q78_1A1Q	34.5	0.9975	25.088	1.1792	0.054
23004 Q78_1A1Q	0.5	1.0249	25.676	1.1792	0.054
23001 Q78_1A1T	13.8	0.9938	25.480	1.1792	0.054
23002 Q78_1A1i	13.8	0.9938	25.480	1.1792	0.054
23005 Q78_1A2	34.5	0.9933	25.782	1.1792	0.054
23009 Q78_1A2Q	0.5	1.0249	25.676	1.1792	0.054
23008 Q78_1A2Q	34.5	0.9975	25.088	1.1792	0.054
23006 Q78_1A2T	13.8	0.9938	25.480	1.1792	0.054
23007 Q78_1A2i	13.8	0.9938	25.480	1.1792	0.054
23013 Q78_1B1Q	34.5	0.9975	25.088	1.1792	0.054
23014 Q78_1B1Q	0.5	1.0249	25.676	1.1792	0.054
23010 Q1241B1	34.5	0.9564	27.057	1.1792	0.054
23011 Q1241B1T	13.8	0.9579	26.894	1.1792	0.054
23012 Q1241B1i	13.8	0.9579	26.894	1.1792	0.054
23019 Q1242A1Q	0.5	0.9996	25.965	1.1792	0.054
23018 Q1242A1Q	34.5	0.9739	25.972	1.1792	0.054

23016	Q1242A1T	13.8	0.9579	26.894	1.1792	0.054
23017	Q1242A1i	13.8	0.9579	26.894	1.1792	0.054
23020	Q1242A2	34.5	0.9707	26.784	1.1792	0.054
23023	Q1242A2Q	34.5	0.9739	25.972	1.1792	0.054
23024	Q1242A2Q	0.5	0.9996	25.965	1.1792	0.054
23021	Q1242A2T	13.8	0.9713	26.637	1.1792	0.054
23022	Q1242A2i	13.8	0.9713	26.637	1.1792	0.054
23028	Q1242B1Q	34.5	0.9739	25.972	1.1792	0.054
23029	Q1242B1Q	0.5	0.9996	25.965	1.1792	0.054
23026	Q1242B1T	13.8	0.9713	26.637	1.1792	0.054
23027	Q1242B1i	13.8	0.9713	26.637	1.1792	0.054
23034	Q1243A1Q	0.5	0.9841	26.251	1.1792	0.054
23033	Q1243A1Q	34.5	0.9595	26.233	1.1792	0.054
23039	Q1243A2Q	0.5	0.9841	26.251	1.1792	0.054
23038	Q1243A2Q	34.5	0.9595	26.233	1.1792	0.054
23043	Q1243B1Q	34.5	0.9590	26.233	1.1792	0.054
23044	Q1243B1Q	0.5	0.9835	26.263	1.1792	0.054

Worst dip was 27.06 at 23010 Q1241B1 34.5

Worst dip was 27.06 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_l	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noXTrp_pst_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noXTrp_pst_l	No dips violating criteria.			
IV_Wnd1_noXTrp_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_ll_b	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_ll_b

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_ll_b	No dips violating criteria.			
IV_Wnd1_RAS_pst_ll_b	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_ll_b

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_ll_b	No dips violating criteria.			
IV_Wnd1_RAS_pst_ll_b	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2 60.0000	2.431	1.1917	0.108
23299 C510_G2	0.2 60.0000	2.431	1.1917	0.108

Worst dip was 2.43 at 23298 C510_G1 0.2

Worst dip was 2.43 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd_dlo_noX_pst_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_noX_pst_l	No dips violating criteria.			
IV_Wnd_dlo_noX_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23298 C510_G1	0.2 60.0000	2.431	1.1917	0.108
23299 C510_G2	0.2 60.0000	2.431	1.1917	0.108

Worst dip was 2.43 at 23298 C510_G1 0.2

Worst dip was 2.43 at 23298 C510_G1 0.2

Worst Condition Analysis Report Case IV_Wnd_dlo_RxR_pst_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RxR_pst_l	No dips violating criteria.			
IV_Wnd_dlo_RxR_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_ll_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_ll_	No dips violating criteria.			
ML_Wnd_noRAS_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noRAS_pst_ll_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noRAS_pst_ll_	No dips violating criteria.			
ML_Wnd_noRAS_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_ll	No dips violating criteria.			
ML_Wnd_noXTrp_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_noXTrp_pst_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_noXTrp_pst_ll	No dips violating criteria.			
ML_Wnd_noXTrp_pst_ll	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_ll_bu	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_ll_bu

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_ll_bu	No dips violating criteria.			
ML_Wnd_RAS_pst_ll_bu	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_ll_bu

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_ll_bu	No dips violating criteria.			
ML_Wnd_RAS_pst_ll_bu	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_ll_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_ll_	No dips violating criteria.			
NGila_IV_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_ll_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_ll_	No dips violating criteria.			
NGila_IV_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_ll_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_ll_	No dips violating criteria.			
PaloVerde-g1_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_ll_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_ll_	No dips violating criteria.			
PaloVerde-g1_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.121	9.0207	0.162
54425 NOSE CR9 138.0	1.0225	29.630	8.9666	0.379
58177 AIRDRIE9 25.0	1.0485	22.418	9.0749	0.108
58178 AIRDRIE8 25.0	1.0432	22.605	9.0749	0.108

Worst dip was 29.63 at 54425 NOSE CR9 138.0

Worst Condition Analysis Report Case PaloVerde-g2_pst_ll_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
54177 AIRDRIE 138.0	60.0000	0.673	10.2124	0.108
54318 WEST CRO 138.0	60.0000	0.726	10.2124	0.108
54425 NOSE CR9 138.0	60.0000	0.779	10.2124	0.108
54503 SUMMIT_7 138.0	60.0000	0.782	10.2124	0.108
54729 SUMMITTP 138.0	60.0000	0.779	10.2124	0.108
54810 AMOCOTAP 138.0	60.0000	0.761	10.2124	0.108
54933 AIRD TAP 138.0	60.0000	0.726	10.2124	0.108
56503 SUMMITG3 13.8	60.0000	13.354	9.5624	0.325
57503 SUMMITG2 13.8	60.0000	13.354	9.5624	0.325
58177 AIRDRIE9 25.0	60.0000	0.671	10.2124	0.108
58178 AIRDRIE8 25.0	60.0000	0.671	10.2124	0.108
58503 SUMMITG1 13.8	60.0000	0.782	10.2124	0.108

Worst dip was 13.35 at 56503 SUMMITG3 13.8

Worst dip was 13.35 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case PaloVerde-g2_pst_ll_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.168	9.3999	0.054

54425 NOSE CR9 138.0 1.0225 29.630 9.0749 0.108
54503 SUMMIT_7 138.0 1.0229 29.798 9.0749 0.108
54729 SUMMITTP 138.0 1.0229 29.622 9.0749 0.108
54810 AMOCOTAP 138.0 1.0228 28.431 9.0749 0.108
54933 AIRD TAP 138.0 1.0215 26.164 9.3999 0.054
56503 SUMMITG3 13.8 1.0000 74.445 8.5332 2.112
57503 SUMMITG2 13.8 1.0000 74.445 8.5332 2.112
58503 SUMMITG1 13.8 1.0229 29.798 9.0749 0.108

Worst dip was 74.45 at 56503 SUMMITG3 13.8

Worst dip was 74.45 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case SONGS-g1_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_ll_bu

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_ll_bu.c	No dips violating criteria.			
SONGS-g1_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_ll_bu

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_ll_bu.c	No dips violating criteria.			
SONGS-g1_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_ll_bu

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_ll_bu.c	No dips violating criteria.			
SONGS-g2_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_ll_bu

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_ll_bu.c	No dips violating criteria.			
SONGS-g2_pst_ll_bu.c	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_ll_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_HAA_slo_pst_ll_	No dips violating criteria.			
T468_HAA_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_ll_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_ll_	No dips violating criteria.			
T468_HAA_slo_pst_ll_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_ll_bu

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_slo_pst_l	No dips violating criteria.			
T468_NGila_slo_pst_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_slo_pst_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_slo_pst_l	No dips violating criteria.			
T468_NGila_slo_pst_l	No dips violating criteria.			

Appendix I-7

Transient Stability Analysis Results

Internal Cluster

Heavy Summer Pre

Worst Condition Analysis Report Case flat_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_int9_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_int9_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pre_int9_hs.chf	No dips violating criteria.			
flat_pre_int9_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_int9_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_int9_hs.chf	No dips violating criteria.			
flat_pre_int9_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pre_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Centrals_pre_in	No dips violating criteria.			
C493_Centrals_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pre_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pre_in	No dips violating criteria.			
C493_Centrals_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pre_in	No dips violating criteria.			
HAA_NGila_slo_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_in	No dips violating criteria.			
HAA_NGila_slo_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SX_pre_int9_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_pre_int9_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23171 Q190_U1	13.8	60.0000	1.469	1.2667	0.217
23172 Q190_U2	13.8	60.0000	1.469	1.2667	0.217
23173 Q190_U3	13.8	60.0000	1.469	1.2667	0.217

Worst dip was 1.47 at 23171 Q190_U1 13.8

Worst dip was 1.47 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_OM-SX_pre_int9_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
22467 MLSXTAP	230.0	0.9950	100.000	1.1583	9.842
23171 Q190_U1	13.8	1.0512	39.298	1.3750	0.163
23172 Q190_U2	13.8	1.0512	39.298	1.3750	0.163
23173 Q190_U3	13.8	1.0512	39.298	1.3750	0.163
23160 C574	230.0	0.0000	36.188	1.1583	0.542
23161 C574IC	230.0	0.0000	36.188	1.1583	0.542
23162 C574CT1	13.8	0.0000	36.188	1.1583	0.542
23163 C574CT2	13.8	0.0000	36.188	1.1583	0.542
23164 C574CT3	13.8	0.0000	36.188	1.1583	0.542

Worst dip was100.00 at 22467 MLSXTAP 230.0

Worst dip was100.00 at 22467 MLSXTAP 230.0

Worst Condition Analysis Report Case int_OM-SX_SYwRAS_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SX_SYwRAS_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_SYwRAS_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_OM-SX_SYwRAS_int	No dips violating criteria.			
int_OM-SX_SYwRAS_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_SYwRAS_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SX_SYwRAS_int	No dips violating criteria.			
int_OM-SX_SYwRAS_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SY_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration

int_OM-SY_pre_int9_h No dips violating criteria.

Worst Condition Analysis Report Case int_OM-SY_pre_int9_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23171 Q190_U1	13.8	60.0000	1.662	1.2667	0.217
23172 Q190_U2	13.8	60.0000	1.662	1.2667	0.217
23173 Q190_U3	13.8	60.0000	1.662	1.2667	0.217

Worst dip was 1.66 at 23171 Q190_U1 13.8

Worst dip was 1.66 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_OM-SY_pre_int9_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
22466 MLMS3TAP	230.0	0.9852	100.000	1.1583	9.842
23171 Q190_U1	13.8	1.0512	40.851	1.3750	0.163
23172 Q190_U2	13.8	1.0512	40.851	1.3750	0.163
23173 Q190_U3	13.8	1.0512	40.851	1.3750	0.163
23160 C574	230.0	0.0000	36.953	1.1583	0.867
23161 C574IC	230.0	0.0000	36.953	1.1583	0.867
23162 C574CT1	13.8	0.0000	36.953	1.1583	0.867
23163 C574CT2	13.8	0.0000	36.953	1.1583	0.867
23164 C574CT3	13.8	0.0000	36.953	1.1583	0.867

Worst dip was100.00 at 22466 MLMS3TAP 230.0

Worst dip was100.00 at 22466 MLMS3TAP 230.0

Worst Condition Analysis Report Case int_SX-ML_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-ML_pre_int9_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-ML_pre_int9_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SX-ML_pre_int9_h	No dips violating criteria.			
int_SX-ML_pre_int9_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-ML_pre_int9_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-ML_pre_int9_h	No dips violating criteria.			
int_SX-ML_pre_int9_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pre_int9	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_int9

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pre_int9	No dips violating criteria.			
IV_C493_slo_pre_int9	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_int9

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pre_int9	No dips violating criteria.			
IV_C493_slo_pre_int9	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_slo_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9874	24.763	1.1583	0.108
20103 WIS-230	230.0	0.9914	23.657	1.1583	0.108
20110 APD-230	230.0	0.9847	24.446	1.1583	0.108
20111 TEK-230	230.0	0.9853	24.382	1.1583	0.108
20112 STB-230	230.0	0.9896	23.919	1.1583	0.108
20113 OZA-230	230.0	0.9914	23.678	1.1583	0.108
20114 CSC-230	230.0	0.9898	23.970	1.1583	0.108
20115 MXI-230	230.0	0.9892	23.923	1.1583	0.108
20116 CTY-230	230.0	0.9838	24.517	1.1583	0.108
20147 CTY-161	161.0	0.9855	24.910	1.1583	0.108
20148 NZI-161	161.0	0.9857	24.944	1.1583	0.108
20150 CRO-161	161.0	0.9878	24.688	1.1583	0.108
20151 PKD-161	161.0	0.9872	24.794	1.1583	0.108
20152 MOE-161	161.0	0.9846	24.922	1.1583	0.108
20153 GOR-161	161.0	0.9834	24.953	1.1583	0.108
20154 STA-161	161.0	0.9915	24.455	1.1583	0.108
20155 LCA-161	161.0	0.9888	24.672	1.1583	0.108
20158 MXI-345	34.5	0.9927	27.048	1.1583	0.108
20177 PID-230	230.0	0.9819	24.379	1.1583	0.108
20178 PID-161	161.0	0.9925	25.000	1.1583	0.108
20179 RZC-161	161.0	0.9840	25.320	1.1583	0.108
20180 HGO-161	161.0	0.9838	25.409	1.1583	0.108
20181 CHQ-161	161.0	0.0000	24.628	1.1583	0.108
20191 DAE-230	230.0	0.9896	23.919	1.1583	0.108
20226 XCO-230	230.0	0.9888	23.943	1.1583	0.108
20303 THO-230	230.0	0.9888	23.962	1.1583	0.108
20391 CHQ-230	230.0	0.9902	23.785	1.1583	0.108
20453 CNT-230	230.0	0.9919	23.624	1.1583	0.108
20454 SLR-161	161.0	0.9886	25.237	1.1583	0.108
20460 VPU-230	230.0	0.9877	24.175	1.1583	0.108
20461 CZA-161	161.0	0.9835	25.022	1.1583	0.108

Worst dip was 27.05 at 20158 MXI-345 34.5

Worst Condition Analysis Report Case iv_roa_6_slo_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
20104 CPD-230	230.0	60.0000	0.674	1.8083	0.108
20105 CPD-U1	13.8	60.0000	0.732	1.7542	0.217
20106 CPD-U2	13.8	60.0000	0.732	1.7542	0.217
20107 CPT-230	230.0	60.0000	0.672	1.8083	0.108
20108 CPT-U1	13.8	60.0000	0.731	1.7542	0.217
20109 CPT-U2	13.8	60.0000	0.731	1.7542	0.217
20139 CPU-U3	13.8	60.0000	0.709	1.7542	0.163
20140 CPU-U4	13.8	60.0000	0.709	1.7542	0.163
20141 CPU-U5	13.8	60.0000	0.726	1.7000	0.217
20143 CPC-U1	13.8	60.0000	0.687	1.7542	0.163
20144 CPC-U2	13.8	60.0000	0.687	1.7542	0.163
20145 CPC-U3	13.8	60.0000	0.687	1.7542	0.163
20146 CPC-U4	13.8	60.0000	0.687	1.7542	0.163
20177 PID-230	230.0	60.0000	0.672	1.8083	0.108
20178 PID-161	161.0	60.0000	0.670	1.8083	0.108
20188 LRP-U2	16.0	60.0000	0.689	1.8083	0.108
20190 LRP-U4	16.0	60.0000	0.679	1.8083	0.108
20390 ESL-230	230.0	60.0000	0.673	1.8083	0.108
20391 CHQ-230	230.0	60.0000	0.673	1.8083	0.108
20410 ESL-TG1	13.8	60.0000	0.673	1.8083	0.108
20411 ESL-TG2	13.8	60.0000	0.673	1.8083	0.108
20412 ESL-TG3	13.8	60.0000	0.673	1.8083	0.108
20429 CPV-U1	13.8	60.0000	0.689	1.7542	0.163
20430 CPV-U2	13.8	60.0000	0.689	1.7542	0.163
20431 CPV-U3	13.8	60.0000	0.689	1.7542	0.163
20454 SLR-161	161.0	60.0000	0.670	1.8083	0.108

Worst dip was 0.73 at 20105 CPD-U1 13.8

Worst dip was 0.73 at 20105 CPD-U1 13.8
Worst Condition Analysis Report Case iv_roa_6_slo_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20156 MXI-U1	13.8	0.9927	27.048	1.1583	0.054
20157 MXI-U23	13.8	0.9927	27.048	1.1583	0.054
20158 MXI-345	34.5	0.9927	27.048	1.1583	0.054
20179 RZC-161	161.0	0.9840	25.320	1.1583	0.054

20180	HGO-161	161.0	0.9838	25.409	1.1583	0.054
20231	MXI-U2	13.8	0.9927	27.048	1.1583	0.054
20232	MXI-U3	13.8	0.9927	27.048	1.1583	0.054
20454	SLR-161	161.0	0.9886	25.237	1.1583	0.054
20461	CZA-161	161.0	0.9835	25.022	1.1583	0.054

Worst dip was 27.05 at 20157 MXI-U23 13.8

Worst dip was 27.05 at 20157 MXI-U23 13.8

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_int9	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_int9

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_int9	No dips violating criteria.			
IV_Wnd1_RAS_pre_int9	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pre_int9

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pre_int9	No dips violating criteria.			
IV_Wnd1_RAS_pre_int9	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_int9_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_int9_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_int9_	No dips violating criteria.			
ML_Wnd_RAS_pre_int9_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_int9_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_int9_	No dips violating criteria.			
ML_Wnd_RAS_pre_int9_	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pre_int	No dips violating criteria.			
NGila_IV_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pre_int	No dips violating criteria.			
NGila_IV_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pre_int	No dips violating criteria.			
PaloVerde-g1_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_int	No dips violating criteria.			
PaloVerde-g1_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0032	27.480	2.7375	0.596
41145 WESTON 69.0	1.0175	22.353	2.7917	0.271
41223 LAGOON T 69.0	1.0149	23.516	2.7375	0.325
41319 ALKALI C 115.0	1.0533	34.175	3.9292	0.379

Worst dip was 34.17 at 41319 ALKALI C 115.0
Worst Condition Analysis Report Case PaloVerde-g2_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
41319 ALKALI C 115.0	60.0000	0.821	4.2541	0.108
41404 WLW C TP 115.0	60.0000	0.826	4.2541	0.108
47847 WILOWCRK 115.0	60.0000	1.094	4.2541	0.108
47990 WLWCK 1 34.5	60.0000	1.210	4.2541	0.108
47991 WLWCK C1 34.5	60.0000	1.412	4.2541	0.108
47992 WLWCK W1 0.6	60.0000	2.299	4.2541	0.162
47993 WLWCK 2 34.5	60.0000	1.210	4.2541	0.108
47994 WLWCK C2 34.5	60.0000	1.412	4.2541	0.108
47995 WLWCK W2 0.6	60.0000	2.297	4.2541	0.162
47996 WLWCK 3 34.5	60.0000	1.210	4.2541	0.108
47997 WLWCK C3 34.5	60.0000	1.412	4.2541	0.108
47998 WLWCK W3 0.6	60.0000	2.297	4.2541	0.162

Worst dip was 2.30 at 47992 WLWCK W1 0.6

Worst dip was 2.30 at 47992 WLWCK W1 0.6
Worst Condition Analysis Report Case PaloVerde-g2_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN 69.0	1.0032	27.480	2.7917	0.271

41258 STATLN T 69.0 1.0041 27.462 2.7917 0.271
41319 ALKALI C 115.0 1.0533 34.175 4.0916 0.217
41404 WLW C TP 115.0 1.0549 34.148 4.0916 0.217
47550 VANSY 1 34.5 0.9710 28.497 2.7917 0.271
47551 VANSYCLE 69.0 1.0045 27.652 2.7917 0.271
47803 CMBHL 2 34.5 0.9366 44.075 2.6292 0.758
47804 CMBHL C2 34.5 0.9503 47.689 2.6292 0.812
47805 CMBHL W2 0.6 0.9368 53.997 2.5750 0.867
47847 WILOWCRK 115.0 1.0741 41.545 3.9833 0.325
47943 VANSY C1 34.5 0.9826 27.839 2.7917 0.271
47944 VANSY W1 0.7 0.9716 28.743 2.7917 0.271
47990 WLWCK 1 34.5 1.0805 43.785 3.9833 0.325
47991 WLWCK C1 34.5 1.0993 45.411 3.9833 0.325
47992 WLWCK W1 0.6 1.1061 54.803 3.8208 0.487
47993 WLWCK 2 34.5 1.0806 43.776 3.9833 0.325
47994 WLWCK C2 34.5 1.0993 45.387 3.9833 0.325
47995 WLWCK W2 0.6 1.1061 54.727 3.8208 0.487
47996 WLWCK 3 34.5 1.0806 43.776 3.9833 0.325
47997 WLWCK C3 34.5 1.0993 45.387 3.9833 0.325
47998 WLWCK W3 0.6 1.1061 54.727 3.8208 0.487

Worst dip was 54.80 at 47992 WLWCK W1 0.6

Worst dip was 54.80 at 47992 WLWCK W1 0.6

Worst Condition Analysis Report Case SONGS-g1_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_int9_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pre_int9_hs	No dips violating criteria.			
SONGS-g1_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_int9_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_int9_hs	No dips violating criteria.			
SONGS-g1_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_int9_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pre_int9_hs	No dips violating criteria.			
SONGS-g2_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_int9_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pre_int9_hs	No dips violating criteria.			
SONGS-g2_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SY230-SG_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SY230-SG_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SY230-SG_pre_int9_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SY230-SG_pre_int9_hs	No dips violating criteria.			
SY230-SG_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SY230-SG_pre_int9_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SY230-SG_pre_int9_hs	No dips violating criteria.			
SY230-SG_pre_int9_hs	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_HAA_slo_pre_int	No dips violating criteria.			
T468_HAA_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_int	No dips violating criteria.			
T468_HAA_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int9_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pre_int9_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int9_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_pre_int9_	No dips violating criteria.			
T468_NGila_pre_int9_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int9_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pre_int9_	No dips violating criteria.			
T468_NGila_pre_int9_	No dips violating criteria.			

Appendix I-8

Transient Stability Analysis Results

Internal Cluster

Light Load Pre

Worst Condition Analysis Report Case flat_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_int_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pre_int_ll.chf	No dips violating criteria.			
flat_pre_int_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pre_int_ll.chf	No dips violating criteria.			
flat_pre_int_ll.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pre_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Centrals_pre_in	No dips violating criteria.			
C493_Centrals_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pre_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pre_in	No dips violating criteria.			
C493_Centrals_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
HAA_NGila_slo_pre_in	No dips violating criteria.			
HAA_NGila_slo_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case HAA_NGila_slo_pre_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
HAA_NGila_slo_pre_in	No dips violating criteria.			
HAA_NGila_slo_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SX_pre_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23171 Q190_U1	13.8	60.0000	1.445	1.2667	0.163
23172 Q190_U2	13.8	60.0000	1.445	1.2667	0.163
23173 Q190_U3	13.8	60.0000	1.445	1.2667	0.163

Worst dip was 1.44 at 23171 Q190_U1 13.8

Worst dip was 1.44 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_OM-SX_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
22467 MLSXTAP	230.0	0.9921	100.000	1.1583	9.842
23171 Q190_U1	13.8	1.0512	36.104	1.3750	0.108
23172 Q190_U2	13.8	1.0512	36.104	1.3750	0.108
23173 Q190_U3	13.8	1.0512	36.104	1.3750	0.108
23160 C574	230.0	0.0000	36.038	1.1583	0.433
23161 C574IC	230.0	0.0000	36.038	1.1583	0.433
23162 C574CT1	13.8	0.0000	36.038	1.1583	0.433
23163 C574CT2	13.8	0.0000	36.038	1.1583	0.433
23164 C574CT3	13.8	0.0000	36.038	1.1583	0.433

Worst dip was100.00 at 22467 MLSXTAP 230.0

Worst dip was100.00 at 22467 MLSXTAP 230.0

Worst Condition Analysis Report Case int_OM-SX_SYwRAS_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SX_SYwRAS_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_SYwRAS_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_OM-SX_SYwRAS_int	No dips violating criteria.			
int_OM-SX_SYwRAS_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SX_SYwRAS_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SX_SYwRAS_int	No dips violating criteria.			
int_OM-SX_SYwRAS_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SY_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_OM-SY_pre_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_OM-SY_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23171 Q190_U1	13.8 60.0000	1.622	1.2667	0.217
23172 Q190_U2	13.8 60.0000	1.622	1.2667	0.217
23173 Q190_U3	13.8 60.0000	1.622	1.2667	0.217

Worst dip was 1.62 at 23171 Q190_U1 13.8

Worst dip was 1.62 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_OM-SY_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
22466 MLMS3TAP	230.0 0.9911	100.000	1.1583	9.842
23171 Q190_U1	13.8 1.0512	38.534	1.3750	0.163
23172 Q190_U2	13.8 1.0512	38.534	1.3750	0.163
23173 Q190_U3	13.8 1.0512	38.534	1.3750	0.163
23160 C574	230.0 0.0000	38.283	1.1583	0.867
23161 C574IC	230.0 0.0000	38.283	1.1583	0.867
23162 C574CT1	13.8 0.0000	38.283	1.1583	0.867
23163 C574CT2	13.8 0.0000	38.283	1.1583	0.867
23164 C574CT3	13.8 0.0000	38.283	1.1583	0.867

Worst dip was100.00 at 22466 MLMS3TAP 230.0

Worst dip was100.00 at 22466 MLMS3TAP 230.0

Worst Condition Analysis Report Case int_SX-ML_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-ML_pre_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-ML_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SX-ML_pre_int_ll	No dips violating criteria.			
int_SX-ML_pre_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-ML_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-ML_pre_int_ll	No dips violating criteria.			
int_SX-ML_pre_int_ll	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pre_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_int_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pre_int_	No dips violating criteria.			
IV_C493_slo_pre_int_	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pre_int_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9529	28.460	1.1917	0.054
23011 Q1241B1T 13.8	0.9545	28.170	1.1917	0.054
23012 Q1241B1i 13.8	0.9545	28.170	1.1917	0.054
23019 Q1242A1Q 0.5	0.9958	26.951	1.1917	0.054
23018 Q1242A1Q 34.5	0.9704	26.544	1.1917	0.054
23016 Q1242A1T 13.8	0.9545	28.170	1.1917	0.054
23017 Q1242A1i 13.8	0.9545	28.170	1.1917	0.054
23020 Q1242A2 34.5	0.9672	27.275	1.1917	0.054
23023 Q1242A2Q 34.5	0.9704	26.544	1.1917	0.054
23024 Q1242A2Q 0.5	0.9958	26.951	1.1917	0.054
23021 Q1242A2T 13.8	0.9679	27.029	1.1917	0.054
23022 Q1242A2i 13.8	0.9679	27.029	1.1917	0.054
23028 Q1242B1Q 34.5	0.9704	26.544	1.1917	0.054
23029 Q1242B1Q 0.5	0.9958	26.951	1.1917	0.054
23026 Q1242B1T 13.8	0.9679	27.029	1.1917	0.054
23027 Q1242B1i 13.8	0.9679	27.029	1.1917	0.054
23034 Q1243A1Q 0.5	0.9803	28.169	1.1917	0.054
23033 Q1243A1Q 34.5	0.9561	27.683	1.1917	0.054
23039 Q1243A2Q 0.5	0.9803	28.169	1.1917	0.054
23038 Q1243A2Q 34.5	0.9561	27.683	1.1917	0.054

23043 Q1243B1Q 34.5 0.9555 27.683 1.1917 0.054
23044 Q1243B1Q 0.5 0.9797 28.183 1.1917 0.054

Worst dip was 28.46 at 23010 Q1241B1 34.5

Worst dip was 28.46 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case iv_roa_6_slo_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
iv_roa_6_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_slo_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
iv_roa_6_slo_pre_int	No dips violating criteria.			
iv_roa_6_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case iv_roa_6_slo_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
iv_roa_6_slo_pre_int	No dips violating criteria.			
iv_roa_6_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_noRAS_pre_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			
IV_Wnd1_noRAS_pre_in	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_pre_int_l	No dips violating criteria.			
T468_NGila_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5	0.9529	25.123	1.1792	0.054

Worst dip was 25.12 at 23010 Q1241B1 34.5

Worst dip was 25.12 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_int_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_int_l	No dips violating criteria.			
ML_Wnd_RAS_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pre_int_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pre_int_l	No dips violating criteria.			
ML_Wnd_RAS_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pre_int	No dips violating criteria.			
NGila_IV_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1 34.5	0.9529	26.526	1.1792	0.054
23011 Q1241B1T 13.8	0.9545	26.448	1.1792	0.054
23012 Q1241B1i 13.8	0.9545	26.448	1.1792	0.054
23016 Q1242A1T 13.8	0.9545	26.448	1.1792	0.054
23017 Q1242A1i 13.8	0.9545	26.448	1.1792	0.054
23020 Q1242A2 34.5	0.9672	25.558	1.1792	0.054
23021 Q1242A2T 13.8	0.9679	25.513	1.1792	0.054
23022 Q1242A2i 13.8	0.9679	25.513	1.1792	0.054
23026 Q1242B1T 13.8	0.9679	25.513	1.1792	0.054
23027 Q1242B1i 13.8	0.9679	25.513	1.1792	0.054
23034 Q1243A1Q 0.5	0.9803	25.281	1.1792	0.054
23033 Q1243A1Q 34.5	0.9561	25.630	1.1792	0.054
23039 Q1243A2Q 0.5	0.9803	25.281	1.1792	0.054
23038 Q1243A2Q 34.5	0.9561	25.630	1.1792	0.054
23043 Q1243B1Q 34.5	0.9555	25.630	1.1792	0.054
23044 Q1243B1Q 0.5	0.9797	25.293	1.1792	0.054

Worst dip was 26.53 at 23010 Q1241B1 34.5

Worst dip was 26.53 at 23010 Q1241B1 34.5

Worst Condition Analysis Report Case PaloVerde-g1_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pre_int	No dips violating criteria.			
PaloVerde-g1_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pre_int	No dips violating criteria.			
PaloVerde-g1_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54312 E CROSS9 138.0	1.0209	20.255	8.9666	0.108
54318 WEST CRO 138.0	1.0211	26.539	8.9124	0.162
54425 NOSE CR9 138.0	1.0225	30.074	8.8582	0.379
58177 AIRDRIE9 25.0	1.0485	22.781	8.9666	0.108
58178 AIRDRIE8 25.0	1.0432	22.958	8.9666	0.108

Worst dip was 30.07 at 54425 NOSE CR9 138.0

Worst Condition Analysis Report Case PaloVerde-g2_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
54318 WEST CRO 138.0	60.0000	0.743	10.1041	0.108
54425 NOSE CR9 138.0	60.0000	0.791	10.1041	0.108
54503 SUMMIT_7 138.0	60.0000	0.793	10.1041	0.108
54729 SUMMITTP 138.0	60.0000	0.790	10.1041	0.108
54810 AMOCOTAP 138.0	60.0000	0.774	10.1041	0.108
54933 AIRD TAP 138.0	60.0000	0.743	10.1041	0.108
56503 SUMMITG3 13.8	60.0000	11.036	9.4541	0.325
57503 SUMMITG2 13.8	60.0000	11.036	9.4541	0.325
58503 SUMMITG1 13.8	60.0000	0.793	10.1041	0.108

Worst dip was 11.04 at 56503 SUMMITG3 13.8

Worst dip was 11.04 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case PaloVerde-g2_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
54318 WEST CRO 138.0	1.0211	26.539	8.9666	0.108
54425 NOSE CR9 138.0	1.0225	30.074	8.9666	0.108
54503 SUMMIT_7 138.0	1.0229	30.244	8.9666	0.108

54729 SUMMITTP 138.0 1.0228 30.066 8.9666 0.108
54810 AMOCOTAP 138.0 1.0228 28.864 8.9666 0.108
54933 AIRD TAP 138.0 1.0215 26.530 8.9666 0.108
56503 SUMMITG3 13.8 1.0000 75.029 8.4249 2.167
57503 SUMMITG2 13.8 1.0000 75.029 8.4249 2.167
58503 SUMMITG1 13.8 1.0229 30.244 8.9666 0.108

Worst dip was 75.03 at 56503 SUMMITG3 13.8

Worst dip was 75.03 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case SONGS-g1_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pre_int_ll.	No dips violating criteria.			
SONGS-g1_pre_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pre_int_ll.	No dips violating criteria.			
SONGS-g1_pre_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration

SONGS-g2_pre_int_ll. No dips violating criteria.

Worst Condition Analysis Report Case SONGS-g2_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration

SONGS-g2_pre_int_ll. No dips violating criteria.
SONGS-g2_pre_int_ll. No dips violating criteria.

Worst Condition Analysis Report Case SONGS-g2_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration	
56503 SUMMITG3	13.8	1.0000	30.359	10.7540	0.246
57503 SUMMITG2	13.8	1.0000	30.359	10.7540	0.246

Worst dip was 30.36 at 56503 SUMMITG3 13.8

Worst dip was 30.36 at 56503 SUMMITG3 13.8

Worst Condition Analysis Report Case SY230-SG_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SY230-SG_pre_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SY230-SG_pre_int_ll

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SY230-SG_pre_int_ll.	No dips violating criteria.			
SY230-SG_pre_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case SY230-SG_pre_int_ll

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SY230-SG_pre_int_ll.	No dips violating criteria.			
SY230-SG_pre_int_ll.	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_HAA_slo_pre_int	No dips violating criteria.			
T468_HAA_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pre_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pre_int	No dips violating criteria.			
T468_HAA_slo_pre_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int_ll

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int_l

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_pre_int_l	No dips violating criteria.			
T468_NGila_pre_int_l	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pre_int_l

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
23010 Q1241B1	34.5	0.9529	25.123	1.1792	0.054

Worst dip was 25.12 at 23010 Q1241B1 34.5

Worst dip was 25.12 at 23010 Q1241B1 34.5

Appendix I-9

Transient Stability Analysis Results

Internal Cluster

Heavy Summer Post

Worst Condition Analysis Report Case flat_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_int5_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_int5_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
flat_pst_int5_hs.chf	No dips violating criteria.			
flat_pst_int5_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case flat_pst_int5_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
flat_pst_int5_hs.chf	No dips violating criteria.			
flat_pst_int5_hs.chf	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pst_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pst_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
C493_Centrals_pst_in	No dips violating criteria.			
C493_Centrals_pst_in	No dips violating criteria.			

Worst Condition Analysis Report Case C493_Centrals_pst_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
C493_Centrals_pst_in	No dips violating criteria.			
C493_Centrals_pst_in	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SX_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_pst_int5

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration	
23171 Q190_U1	13.8	60.0000	1.139	1.2667	0.163
23172 Q190_U2	13.8	60.0000	1.139	1.2667	0.163
23173 Q190_U3	13.8	60.0000	1.139	1.2667	0.163
23162 C574CT1	13.8	60.0000	0.965	1.5917	0.108
23163 C574CT2	13.8	60.0000	0.965	1.5917	0.108
23164 C574CT3	13.8	60.0000	0.957	1.5917	0.108

Worst dip was 1.14 at 23171 Q190_U1 13.8

Worst dip was 1.14 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_C574-SX_pst_int5

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration	
23171 Q190_U1	13.8	1.0512	28.019	1.3750	0.054
23172 Q190_U2	13.8	1.0512	28.019	1.3750	0.054
23173 Q190_U3	13.8	1.0512	28.019	1.3750	0.054

Worst dip was 28.02 at 23171 Q190_U1 13.8

Worst dip was 28.02 at 23171 Q190_U1 13.8

Worst Condition Analysis Report Case int_C574-SX_SYwRAS_int_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SX_SYwRAS_i	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_SYwRAS_i

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_C574-SX_SYwRAS_i	No dips violating criteria.			
int_C574-SX_SYwRAS_i	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SX_SYwRAS_i

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SX_SYwRAS_i	No dips violating criteria.			
int_C574-SX_SYwRAS_i	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SY_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SY_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SY_pst_int5

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_C574-SY_pst_int5	No dips violating criteria.			
int_C574-SY_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_C574-SY_pst_int5

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_C574-SY_pst_int5	No dips violating criteria.			
int_C574-SY_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-C565_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-C565_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-C565_pst_int5

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SX-C565_pst_int5	No dips violating criteria.			
int_SX-C565_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-C565_pst_int5

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-C565_pst_int5	No dips violating criteria.			
int_SX-C565_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-PQ_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-PQ_pst_int5_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-PQ_pst_int5_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SX-PQ_pst_int5_h	No dips violating criteria.			
int_SX-PQ_pst_int5_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SX-PQ_pst_int5_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SX-PQ_pst_int5_h	No dips violating criteria.			
int_SX-PQ_pst_int5_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY230-SG_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY230-SG_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY230-SG_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SY230-SG_pst_int	No dips violating criteria.			
int_SY230-SG_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY230-SG_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY230-SG_pst_int	No dips violating criteria.			
int_SY230-SG_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY-MS_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY-MS_pst_int5_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY-MS_pst_int5_h

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
int_SY-MS_pst_int5_h	No dips violating criteria.			
int_SY-MS_pst_int5_h	No dips violating criteria.			

Worst Condition Analysis Report Case int_SY-MS_pst_int5_h

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
int_SY-MS_pst_int5_h	No dips violating criteria.			
int_SY-MS_pst_int5_h	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_int5

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_C493_slo_pst_int5	No dips violating criteria.			
IV_C493_slo_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case IV_C493_slo_pst_int5

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_C493_slo_pst_int5	No dips violating criteria.			
IV_C493_slo_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case IV_ROA_6_slo_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20016 RIN-161	161.0	0.9879	24.972	1.1583	0.108
20103 WIS-230	230.0	0.9920	23.870	1.1583	0.108
20110 APD-230	230.0	0.9849	24.641	1.1583	0.108
20111 TEK-230	230.0	0.9856	24.581	1.1583	0.108
20112 STB-230	230.0	0.9900	24.129	1.1583	0.108
20113 OZA-230	230.0	0.9919	23.892	1.1583	0.108
20114 CSC-230	230.0	0.9900	24.162	1.1583	0.108
20115 MXI-230	230.0	0.9896	24.131	1.1583	0.108
20116 CTY-230	230.0	0.9840	24.713	1.1583	0.108
20136 CPU-161	161.0	0.9934	23.632	1.1583	0.108
20147 CTY-161	161.0	0.9859	25.113	1.1583	0.108
20148 NZI-161	161.0	0.9861	25.150	1.1583	0.108
20150 CRO-161	161.0	0.9883	24.897	1.1583	0.108
20151 PKD-161	161.0	0.9876	24.999	1.1583	0.108
20152 MOE-161	161.0	0.9849	25.124	1.1583	0.108
20153 GOR-161	161.0	0.9837	25.150	1.1583	0.108
20154 STA-161	161.0	0.9921	24.667	1.1583	0.108
20155 LCA-161	161.0	0.9893	24.882	1.1583	0.108
20158 MXI-345	34.5	0.9931	27.247	1.1583	0.108
20177 PID-230	230.0	0.9820	24.563	1.1583	0.108
20178 PID-161	161.0	0.9926	25.185	1.1583	0.108
20179 RZC-161	161.0	0.9842	25.508	1.1583	0.108
20180 HGO-161	161.0	0.9840	25.596	1.1583	0.108
20181 CHQ-161	161.0	0.0000	24.816	1.1583	0.108
20191 DAE-230	230.0	0.9900	24.129	1.1583	0.108
20226 XCO-230	230.0	0.9893	24.153	1.1583	0.108
20303 THO-230	230.0	0.9892	24.172	1.1583	0.108
20391 CHQ-230	230.0	0.9902	23.968	1.1583	0.108
20453 CNT-230	230.0	0.9924	23.838	1.1583	0.108
20454 SLR-161	161.0	0.9887	25.422	1.1583	0.108
20460 VPU-230	230.0	0.9879	24.370	1.1583	0.108
20461 CZA-161	161.0	0.9838	25.222	1.1583	0.108

Worst dip was 27.25 at 20158 MXI-345 34.5
Worst Condition Analysis Report Case IV_ROA_6_slo_pst_int

Frequency at All Buses

	Name	Initial Frequency	Percent Dip	Time	Duration
20104	CPD-230	230.0	60.0000	0.685	1.7542	0.163
20105	CPD-U1	13.8	60.0000	0.748	1.7542	0.163
20106	CPD-U2	13.8	60.0000	0.748	1.7542	0.163
20107	CPT-230	230.0	60.0000	0.683	1.7542	0.163
20108	CPT-U1	13.8	60.0000	0.746	1.7542	0.163
20109	CPT-U2	13.8	60.0000	0.747	1.7542	0.163
20136	CPU-161	161.0	60.0000	0.683	1.7542	0.108
20137	CPU-U1	13.8	60.0000	0.683	1.7542	0.108
20138	CPU-U2	13.8	60.0000	0.683	1.7542	0.108
20139	CPU-U3	13.8	60.0000	0.726	1.7542	0.163
20140	CPU-U4	13.8	60.0000	0.726	1.7542	0.163
20141	CPU-U5	13.8	60.0000	0.751	1.7000	0.217
20142	CPC-161	161.0	60.0000	0.682	1.7542	0.108
20143	CPC-U1	13.8	60.0000	0.706	1.7000	0.217
20144	CPC-U2	13.8	60.0000	0.707	1.7000	0.217
20145	CPC-U3	13.8	60.0000	0.706	1.7000	0.217
20146	CPC-U4	13.8	60.0000	0.707	1.7000	0.217
20177	PID-230	230.0	60.0000	0.683	1.7542	0.163
20178	PID-161	161.0	60.0000	0.682	1.7542	0.108
20179	RZC-161	161.0	60.0000	0.680	1.7542	0.108
20180	HGO-161	161.0	60.0000	0.680	1.7542	0.108
20181	CHQ-161	161.0	60.0000	0.682	1.7542	0.108
20188	LRP-U2	16.0	60.0000	0.703	1.7542	0.163
20190	LRP-U4	16.0	60.0000	0.688	1.7542	0.163
20390	ESL-230	230.0	60.0000	0.684	1.7542	0.163
20391	CHQ-230	230.0	60.0000	0.685	1.7542	0.163
20410	ESL-TG1	13.8	60.0000	0.684	1.7542	0.163
20411	ESL-TG2	13.8	60.0000	0.684	1.7542	0.163
20412	ESL-TG3	13.8	60.0000	0.684	1.7542	0.163
20428	CPV-161	161.0	60.0000	0.684	1.7542	0.108
20429	CPV-U1	13.8	60.0000	0.706	1.7000	0.217
20430	CPV-U2	13.8	60.0000	0.706	1.7000	0.217
20431	CPV-U3	13.8	60.0000	0.706	1.7000	0.217
20454	SLR-161	161.0	60.0000	0.681	1.7542	0.108

Worst dip was 0.75 at 20141 CPU-U5 13.8

Worst dip was 0.75 at 20141 CPU-U5 13.8
Worst Condition Analysis Report Case IV_ROA_6_slo_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
20147 CTY-161	161.0	0.9859	25.113	1.1583	0.054
20148 NZI-161	161.0	0.9861	25.150	1.1583	0.054
20152 MOE-161	161.0	0.9849	25.124	1.1583	0.054
20153 GOR-161	161.0	0.9837	25.150	1.1583	0.054
20156 MXI-U1	13.8	0.9931	27.247	1.1583	0.054
20157 MXI-U23	13.8	0.9931	27.247	1.1583	0.054
20158 MXI-345	34.5	0.9931	27.247	1.1583	0.054
20178 PID-161	161.0	0.9926	25.185	1.1583	0.054
20179 RZC-161	161.0	0.9842	25.508	1.1583	0.054
20180 HGO-161	161.0	0.9840	25.596	1.1583	0.054
20231 MXI-U2	13.8	0.9931	27.247	1.1583	0.054
20232 MXI-U3	13.8	0.9931	27.247	1.1583	0.054
20454 SLR-161	161.0	0.9887	25.422	1.1583	0.054
20461 CZA-161	161.0	0.9838	25.222	1.1583	0.054

Worst dip was 27.25 at 20156 MXI-U1 13.8

Worst dip was 27.25 at 20156 MXI-U1 13.8

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_int5

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_int5	No dips violating criteria.			
IV_Wnd1_RAS_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd1_RAS_pst_int5

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd1_RAS_pst_int5	No dips violating criteria.			
IV_Wnd1_RAS_pst_int5	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case IV_Wnd_dlo_RASxR1_in

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			
IV_Wnd_dlo_RASxR1_in	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_int5_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_int5_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_int5_	No dips violating criteria.			
ML_Wnd_RAS_pst_int5_	No dips violating criteria.			

Worst Condition Analysis Report Case ML_Wnd_RAS_pst_int5_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
ML_Wnd_RAS_pst_int5_	No dips violating criteria.			
ML_Wnd_RAS_pst_int5_	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
NGila_IV_slo_pst_int	No dips violating criteria.			
NGila_IV_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case NGila_IV_slo_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
NGila_IV_slo_pst_int	No dips violating criteria.			
NGila_IV_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
PaloVerde-g1_pst_int	No dips violating criteria.			
PaloVerde-g1_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g1_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
PaloVerde-g1_pst_int	No dips violating criteria.			
PaloVerde-g1_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case PaloVerde-g2_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
41029 STATELIN	69.0	1.0035	27.180	2.7375	0.596
41145 WESTON	69.0	1.0178	22.084	2.7917	0.271
41223 LAGOON T	69.0	1.0152	23.240	2.7375	0.325
41319 ALKALI C	115.0	1.0534	33.780	4.3083	0.325

Worst dip was 33.78 at 41319 ALKALI C 115.0

Worst Condition Analysis Report Case PaloVerde-g2_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
41319 ALKALI C	115.0	60.0000	0.848	4.5791	0.108
41404 WLW C TP	115.0	60.0000	0.852	4.5791	0.108
47847 WILOWCRK	115.0	60.0000	1.186	4.5791	0.108
47944 VANSY W1	0.7	60.0000	0.890	3.0083	0.108
47990 WLWCK 1	34.5	60.0000	1.328	4.5791	0.108
47991 WLWCK C1	34.5	60.0000	1.605	4.5791	0.108
47992 WLWCK W1	0.6	60.0000	2.661	4.5791	0.162
47993 WLWCK 2	34.5	60.0000	1.306	4.5791	0.108
47994 WLWCK C2	34.5	60.0000	1.513	4.5791	0.108
47995 WLWCK W2	0.6	60.0000	2.419	4.5791	0.162
47996 WLWCK 3	34.5	60.0000	1.306	4.5791	0.108
47997 WLWCK C3	34.5	60.0000	1.513	4.5791	0.108
47998 WLWCK W3	0.6	60.0000	2.419	4.5791	0.162

Worst dip was 2.66 at 47992 WLWCK W1 0.6

Worst dip was 2.66 at 47992 WLWCK W1 0.6

Worst Condition Analysis Report Case PaloVerde-g2_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration

41029 STATELIN 69.0 1.0035 27.180 2.7917 0.217
41258 STATLN T 69.0 1.0044 27.163 2.7917 0.217
41319 ALKALI C 115.0 1.0534 33.780 4.4166 0.162
41404 WLW C TP 115.0 1.0550 33.754 4.4166 0.162
47550 VANSY 1 34.5 0.9713 28.278 2.7917 0.217
47551 VANSYCLE 69.0 1.0048 27.383 2.7917 0.217
47803 CMBHL 2 34.5 0.9370 43.566 2.6292 0.758
47804 CMBHL C2 34.5 0.9507 47.189 2.6292 0.812
47805 CMBHL W2 0.6 0.9372 53.451 2.5750 0.867
47847 WILOWCRK 115.0 1.0741 41.040 4.3083 0.325
47943 VANSY C1 34.5 0.9829 27.678 2.7917 0.217
47944 VANSY W1 0.7 0.9720 28.479 2.7917 0.217
47990 WLWCK 1 34.5 1.0806 43.243 4.3083 0.325
47991 WLWCK C1 34.5 1.0993 44.813 4.3083 0.325
47992 WLWCK W1 0.6 1.1061 54.012 4.1458 0.487
47993 WLWCK 2 34.5 1.0806 43.233 4.3083 0.325
47994 WLWCK C2 34.5 1.0993 44.788 4.3083 0.325
47995 WLWCK W2 0.6 1.1061 53.936 4.1458 0.487
47996 WLWCK 3 34.5 1.0806 43.233 4.3083 0.325
47997 WLWCK C3 34.5 1.0993 44.788 4.3083 0.325
47998 WLWCK W3 0.6 1.1061 53.936 4.1458 0.487

Worst dip was 54.01 at 47992 WLWCK W1 0.6

Worst dip was 54.01 at 47992 WLWCK W1 0.6

Worst Condition Analysis Report Case SONGS-g1_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_int5_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_int5_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g1_pst_int5_hs	No dips violating criteria.			
SONGS-g1_pst_int5_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g1_pst_int5_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g1_pst_int5_hs	No dips violating criteria.			
SONGS-g1_pst_int5_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_int5_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_int5_hs

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
SONGS-g2_pst_int5_hs	No dips violating criteria.			
SONGS-g2_pst_int5_hs	No dips violating criteria.			

Worst Condition Analysis Report Case SONGS-g2_pst_int5_hs

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
SONGS-g2_pst_int5_hs	No dips violating criteria.			
SONGS-g2_pst_int5_hs	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_HAA_slo_pst_int

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
23258 T468_LB1	34.5 60.0000	5.691	1.1792	0.163
23259 T468_LB2	34.5 60.0000	5.691	1.1792	0.163
23260 T468_T1	34.5 60.0000	5.758	1.1792	0.163
23261 T468_T2	34.5 60.0000	5.758	1.1792	0.163
23262 T468_G1	0.4 60.0000	5.862	1.1792	0.163
23263 T468_G2	0.4 60.0000	5.862	1.1792	0.163

Worst dip was 5.86 at 23262 T468_G1 0.4

Worst dip was 5.86 at 23262 T468_G1 0.4

Worst Condition Analysis Report Case T468_HAA_slo_pst_int

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_HAA_slo_pst_int	No dips violating criteria.			
T468_HAA_slo_pst_int	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pst_int5_hs

Voltage at Load Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pst_int5_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pst_int5_

Frequency at All Buses

Name	Initial Frequency	Percent Dip	Time	Duration
T468_NGila_pst_int5_	No dips violating criteria.			
T468_NGila_pst_int5_	No dips violating criteria.			

Worst Condition Analysis Report Case T468_NGila_pst_int5_

Voltage at All Buses

Name	Initial Voltage	Percent Dip	Time	Duration
T468_NGila_pst_int5_	No dips violating criteria.			
T468_NGila_pst_int5_	No dips violating criteria.			

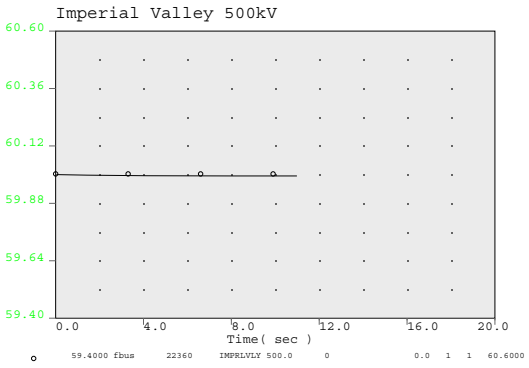
Appendix J-1

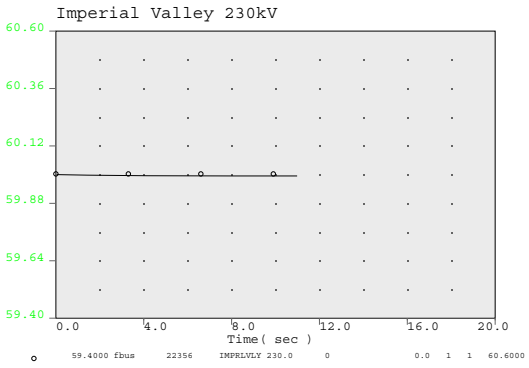
Transient Stability Analysis Plots

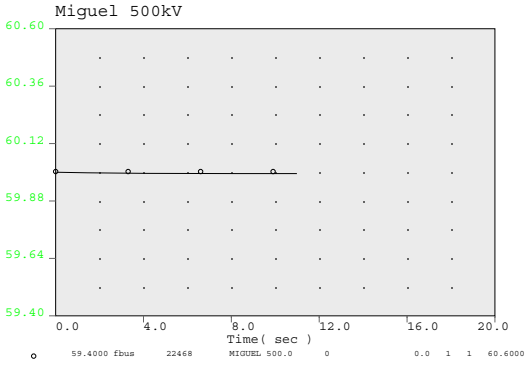
Imperial Valley Area Cluster & Boulevard Cluster

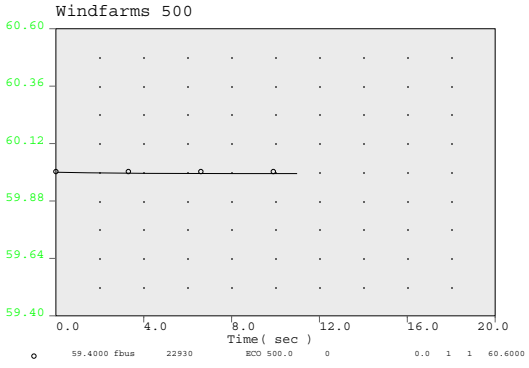
Heavy Summer Pre

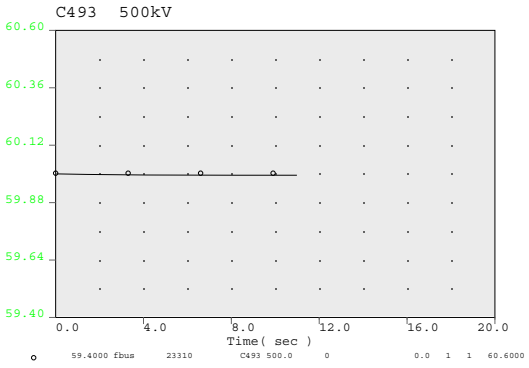
Imperial Valley Area - Frequency

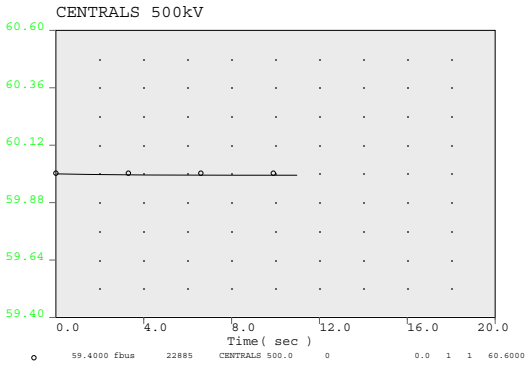






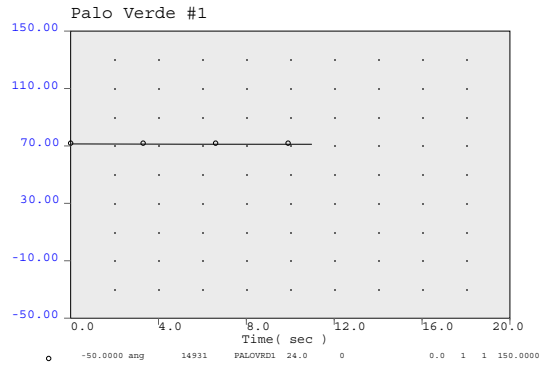


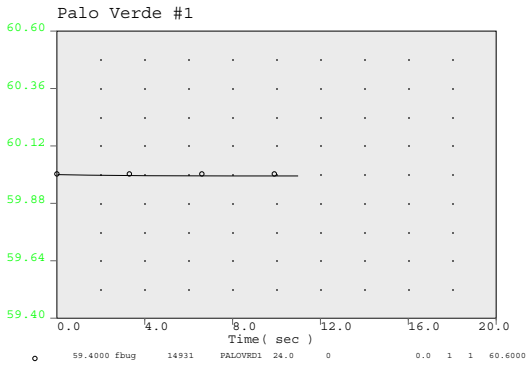


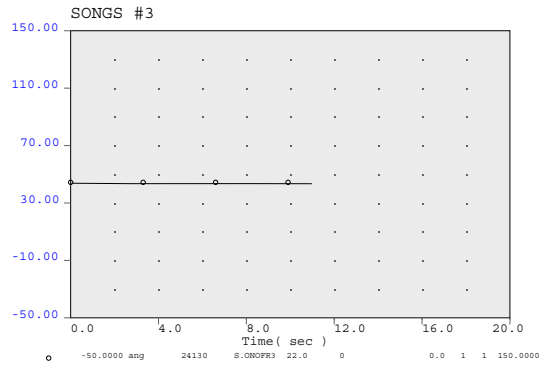


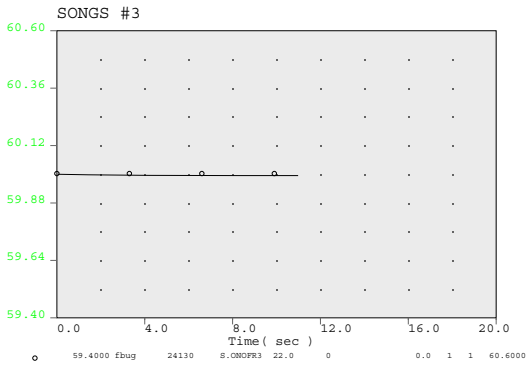
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

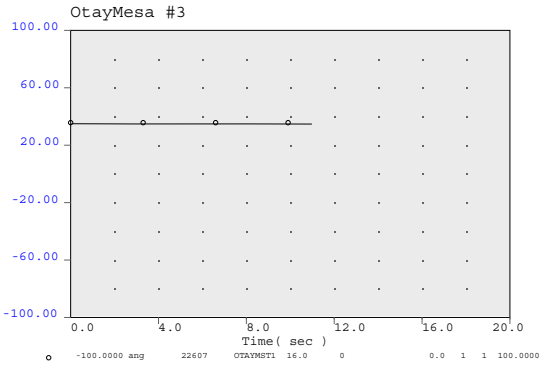
RELATIVE ROTOR ANGLE & FREQUENCY

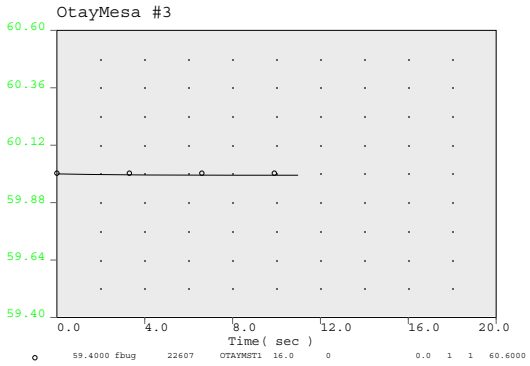










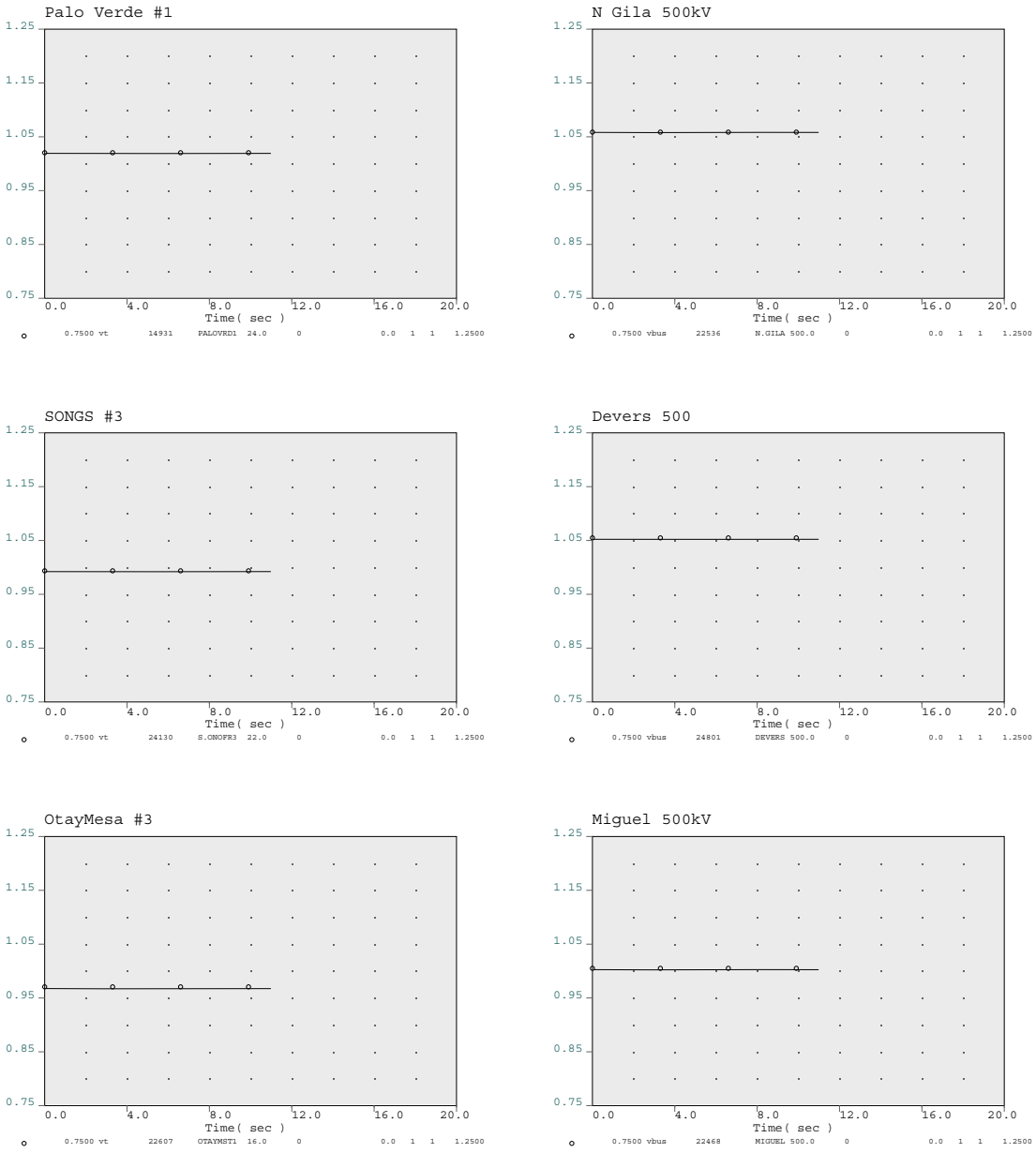


SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

Page 1

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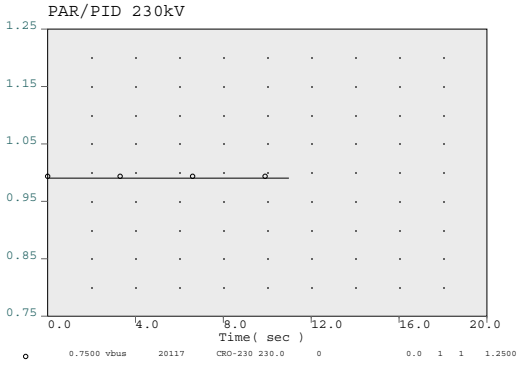
RELATIVE VOLTAGE



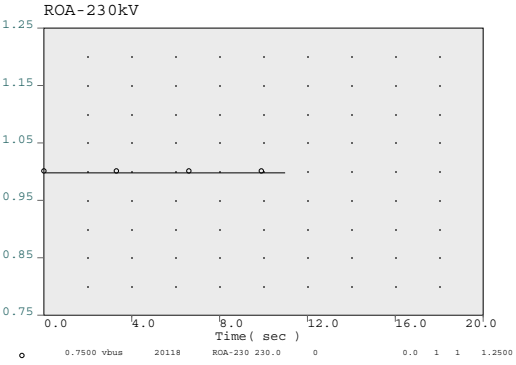
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

Affected System Voltage Check and Comparison

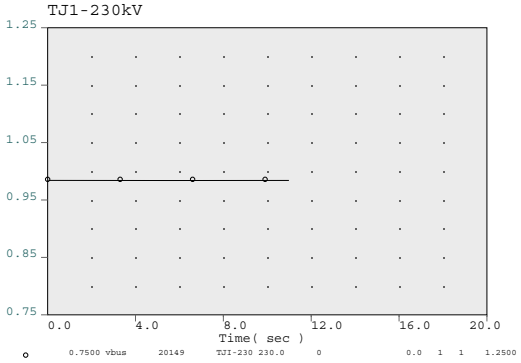
PAR/PID 230kV



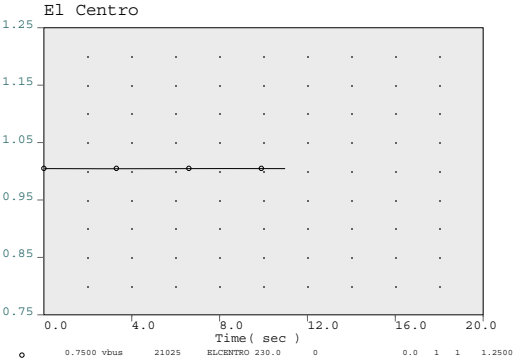
ROA-230kV



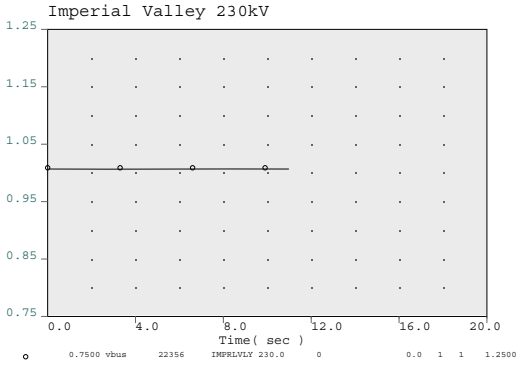
TJ1-230kV



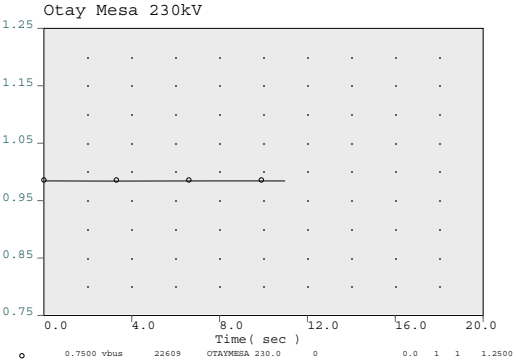
El Centro



Imperial Valley 230kV

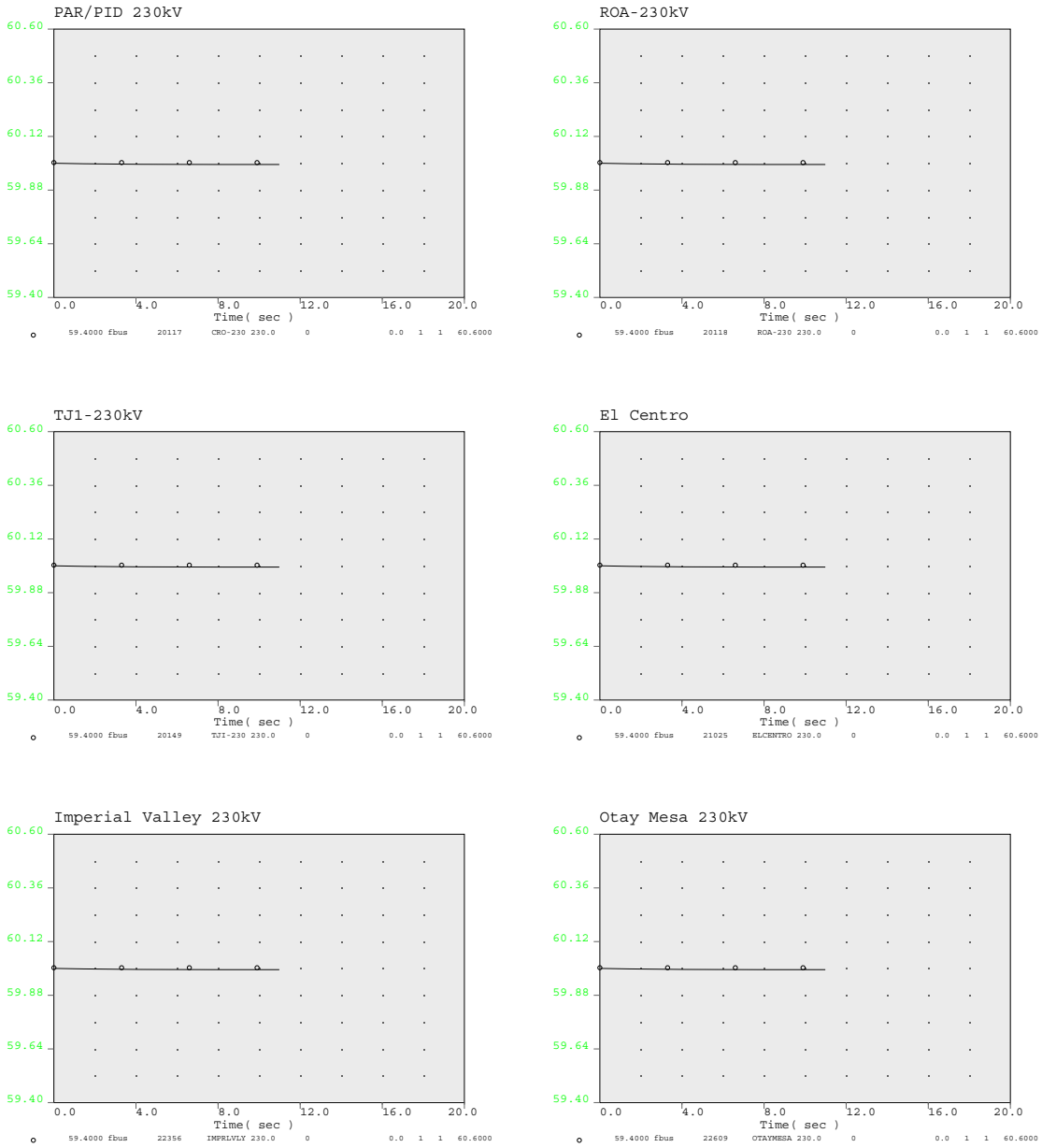


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

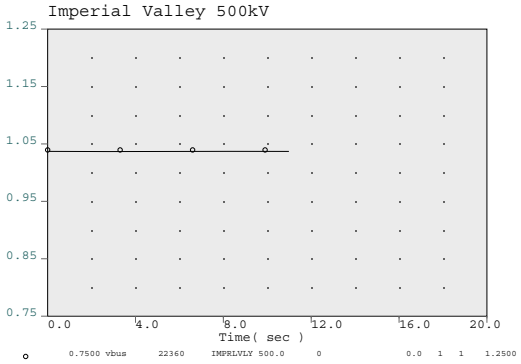
Affected System Frequency Check and Comparison



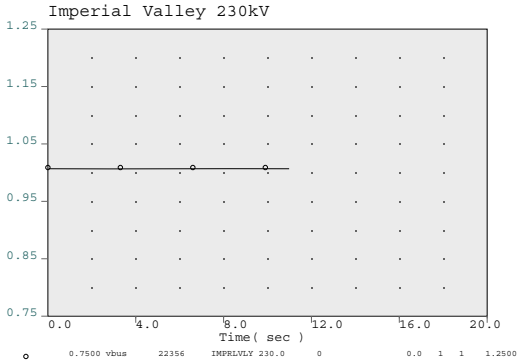
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

Imperial Valley Area - VOLTAGE

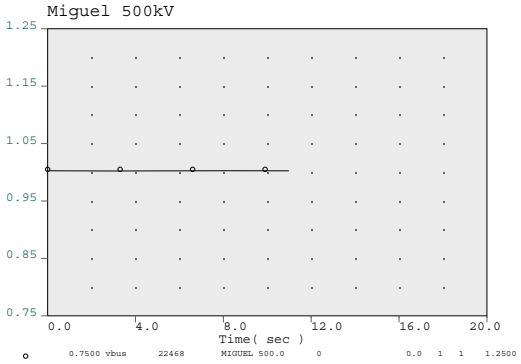
Imperial Valley 500kV



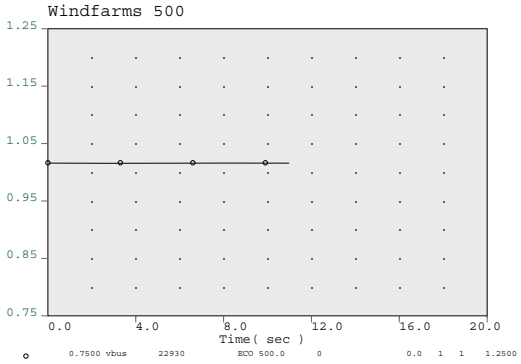
Imperial Valley 230kV



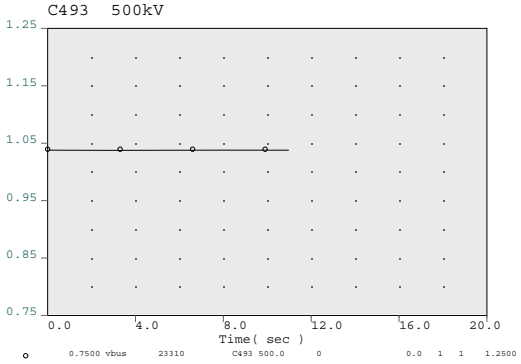
Miguel 500kV



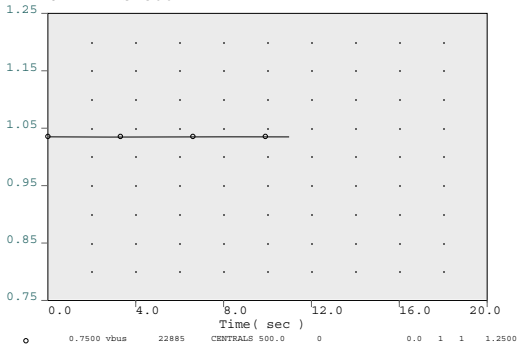
Windfarms 500



C493 500kV

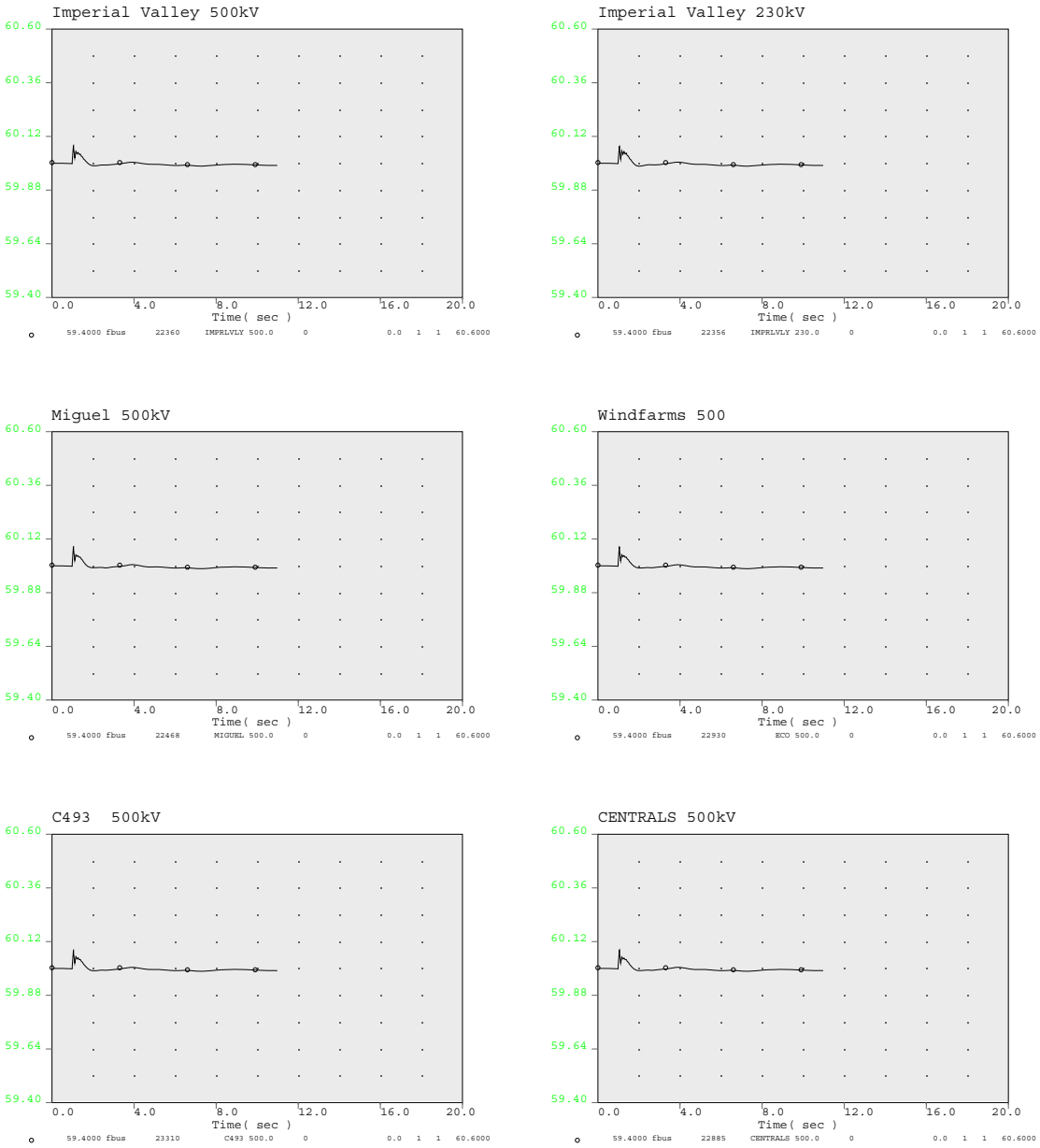


CENTRALS 500kV



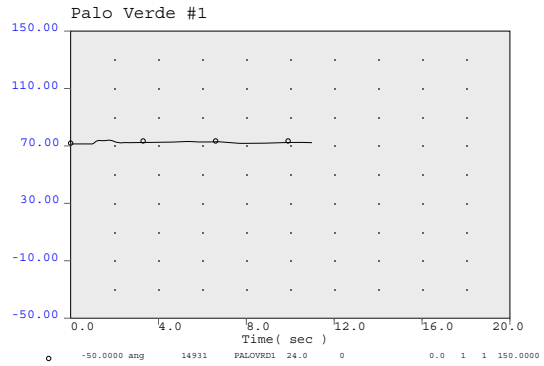
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

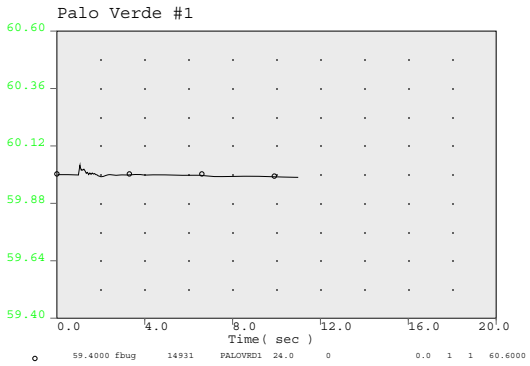
Imperial Valley Area - Frequency

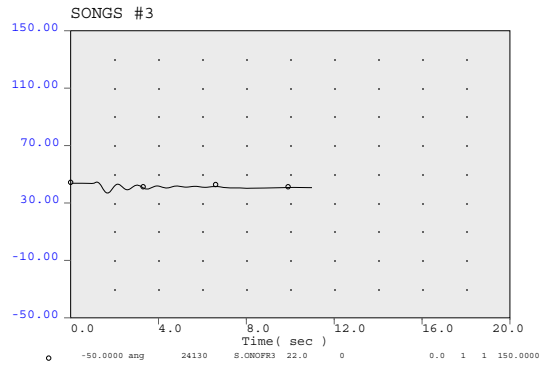


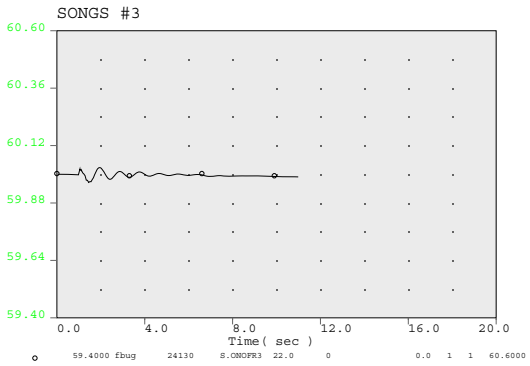
SDG&E Cluster 2 - pre
2014 Heavy Summer
Valley - Devers 500 kV line

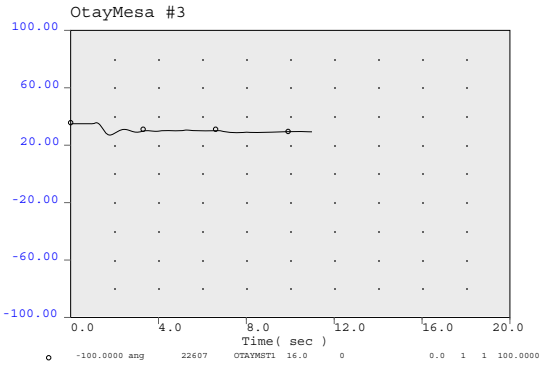
RELATIVE ROTOR ANGLE & FREQUENCY

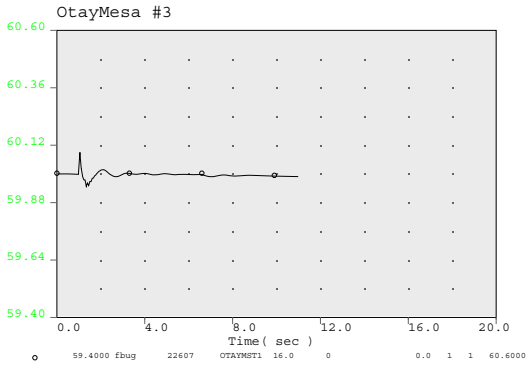












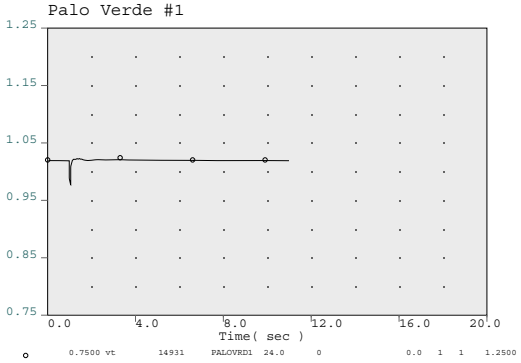
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Page 1

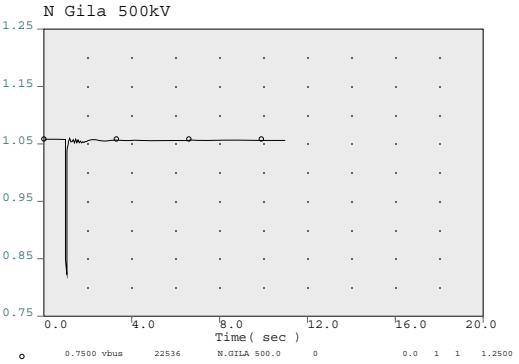
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RELATIVE VOLTAGE

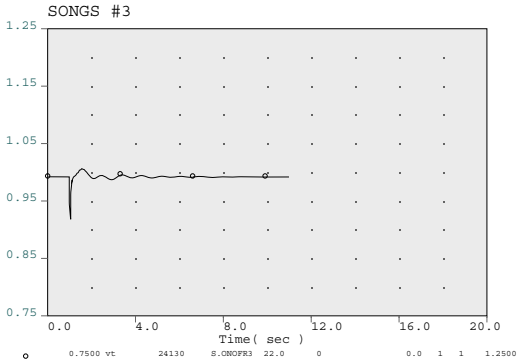
Palo Verde #1



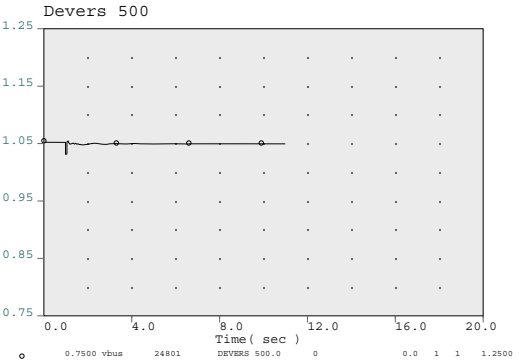
N Gila 500kV



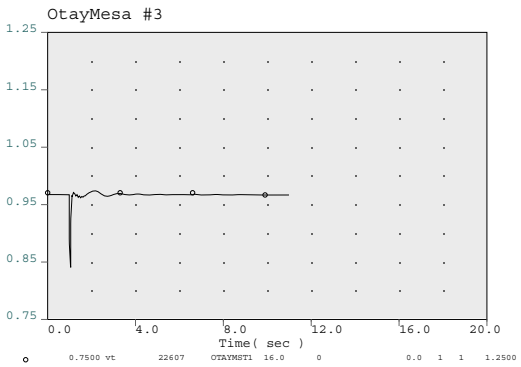
SONGS #3



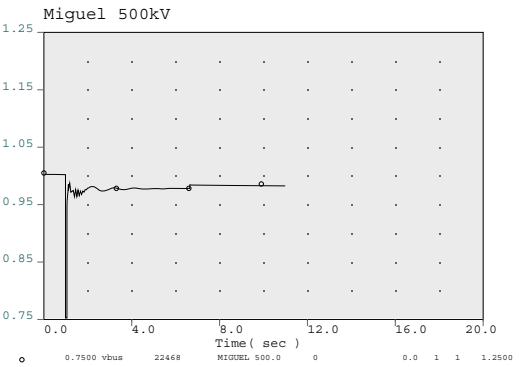
Devers 500



OtayMesa #3



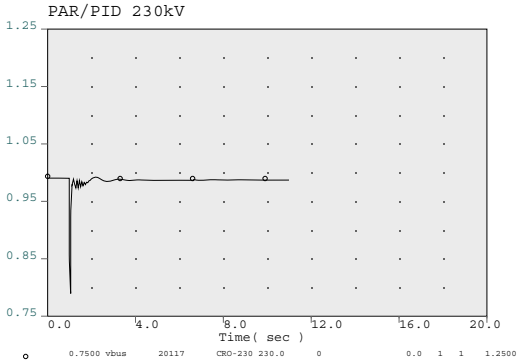
Miguel 500kV



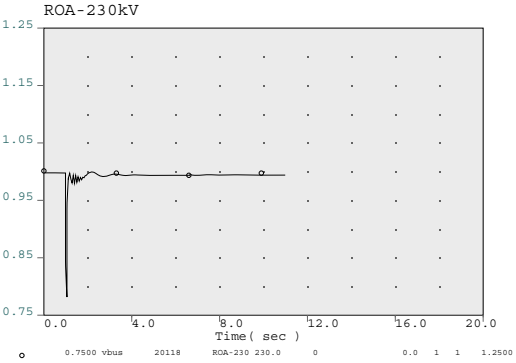
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

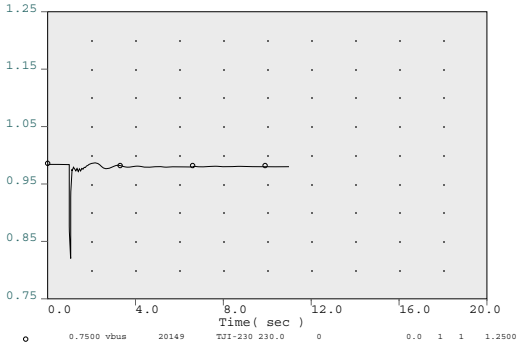
PAR/PID 230kV



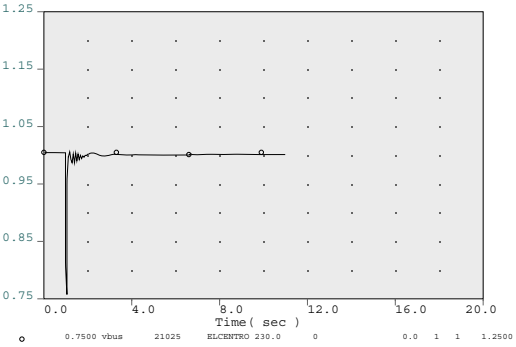
ROA-230kV



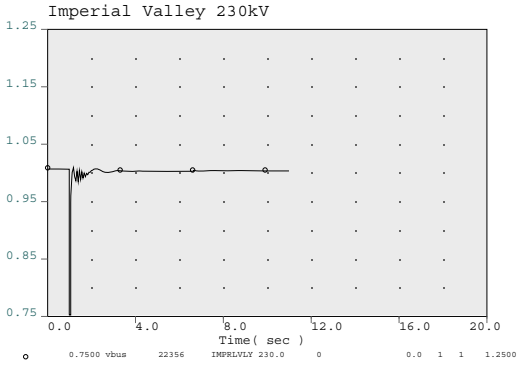
TJ1-230kV



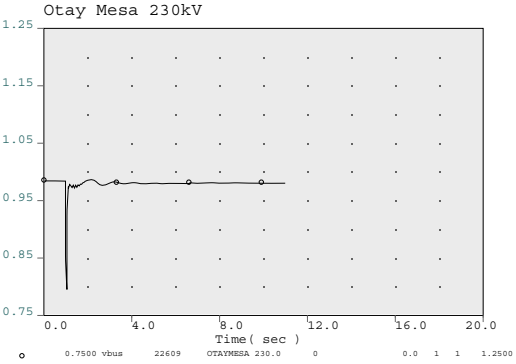
El Centro



Imperial Valley 230kV



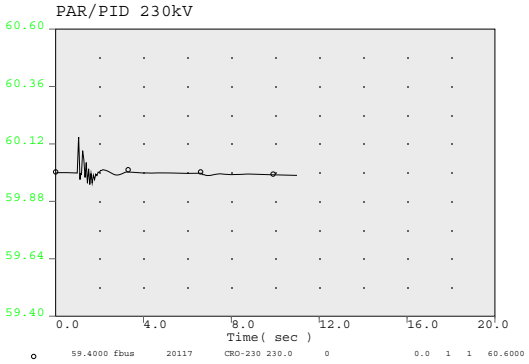
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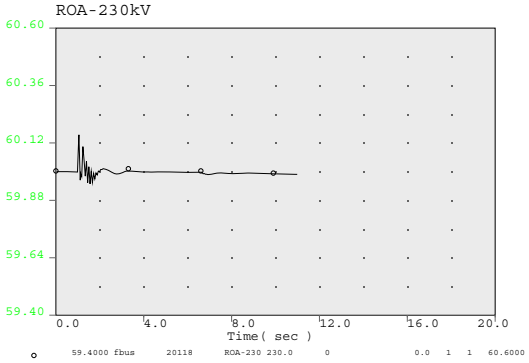
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Frequency Check and Comparison

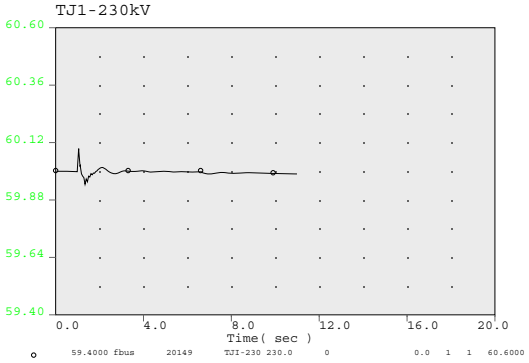
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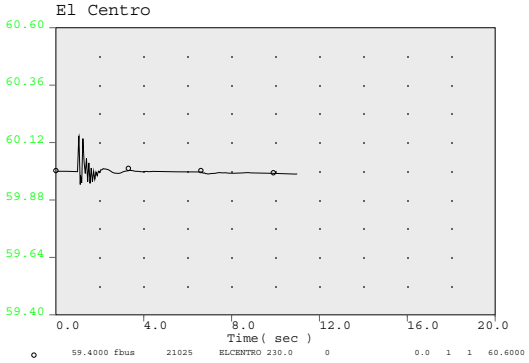
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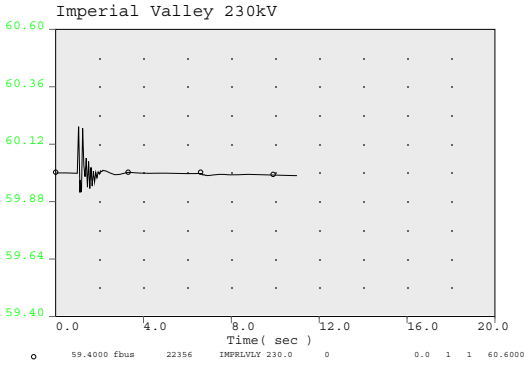
TJ1-230kV



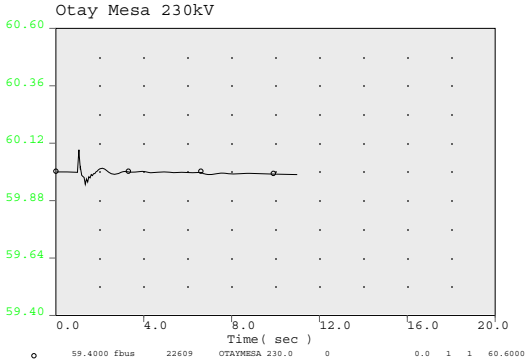
El Centro



Imperial Valley 230kV



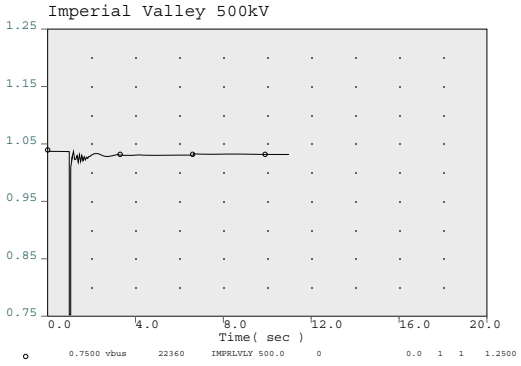
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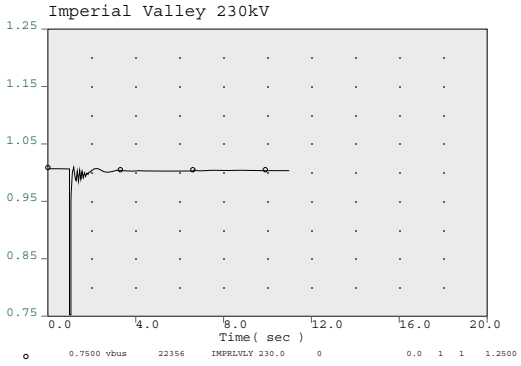
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Imperial Valley Area - VOLTAGE

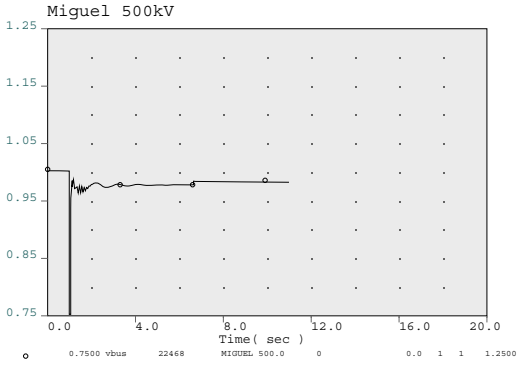
Imperial Valley 500kV



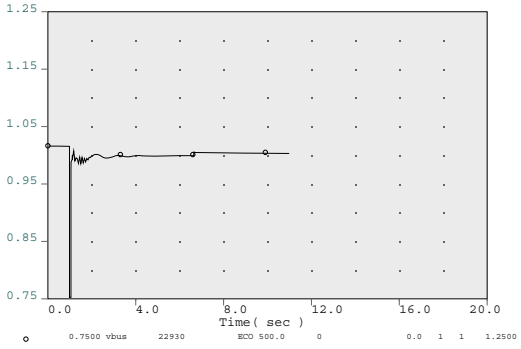
Imperial Valley 230kV



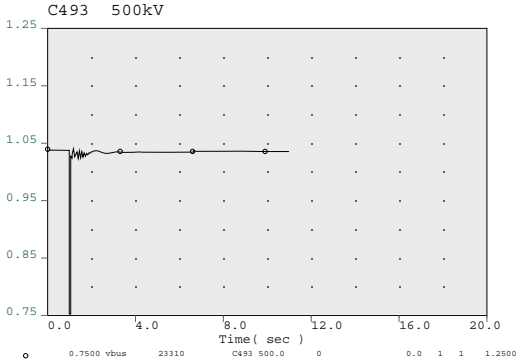
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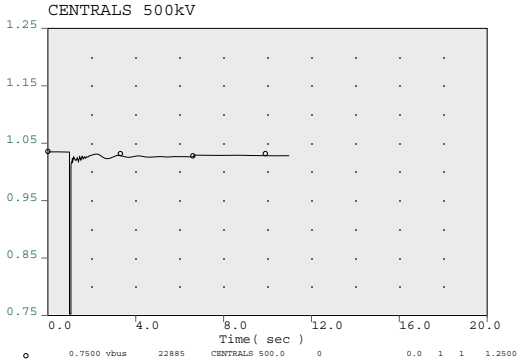
Windfarms 500



C493 500kV

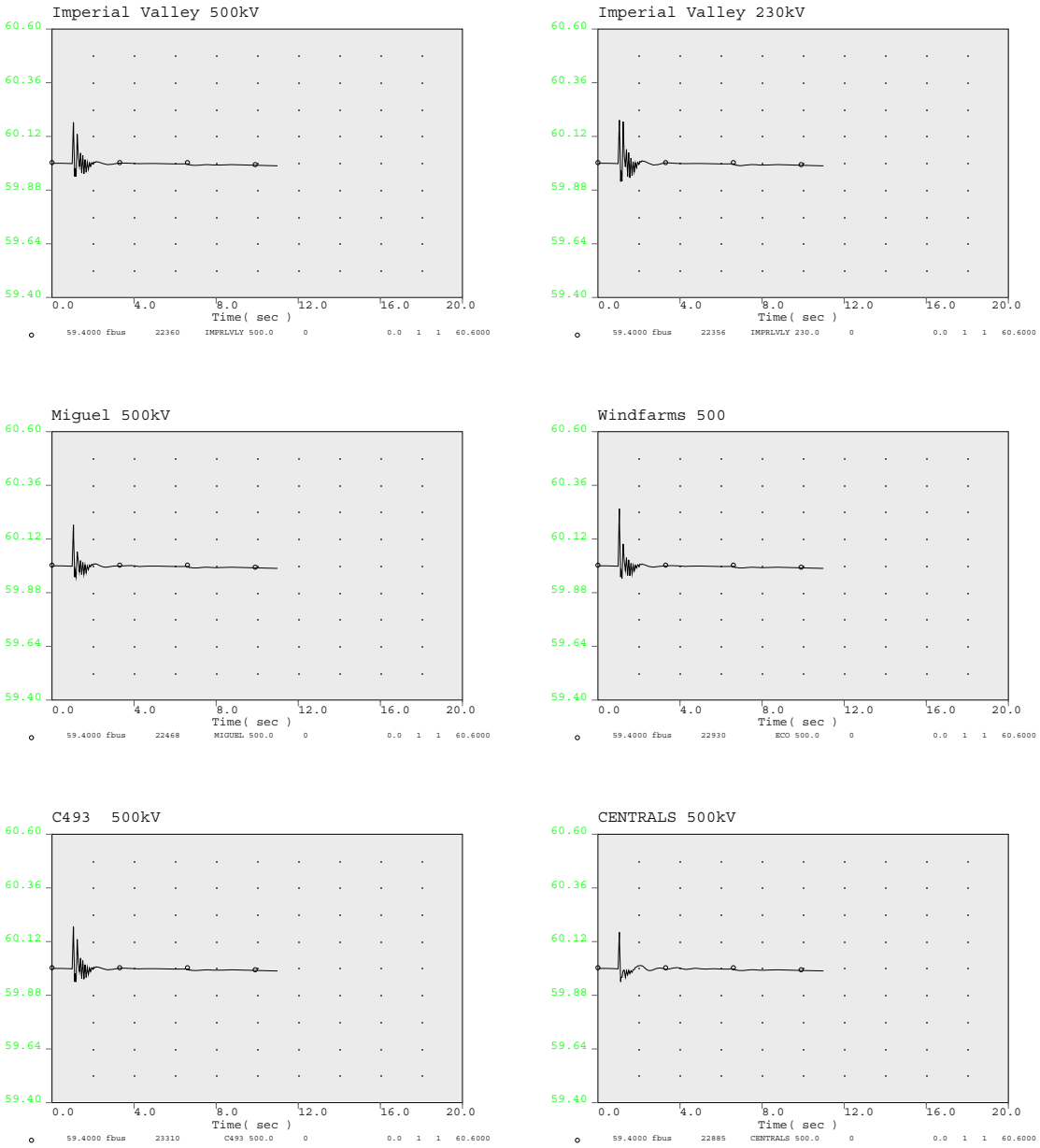


CENTRALS 500kV



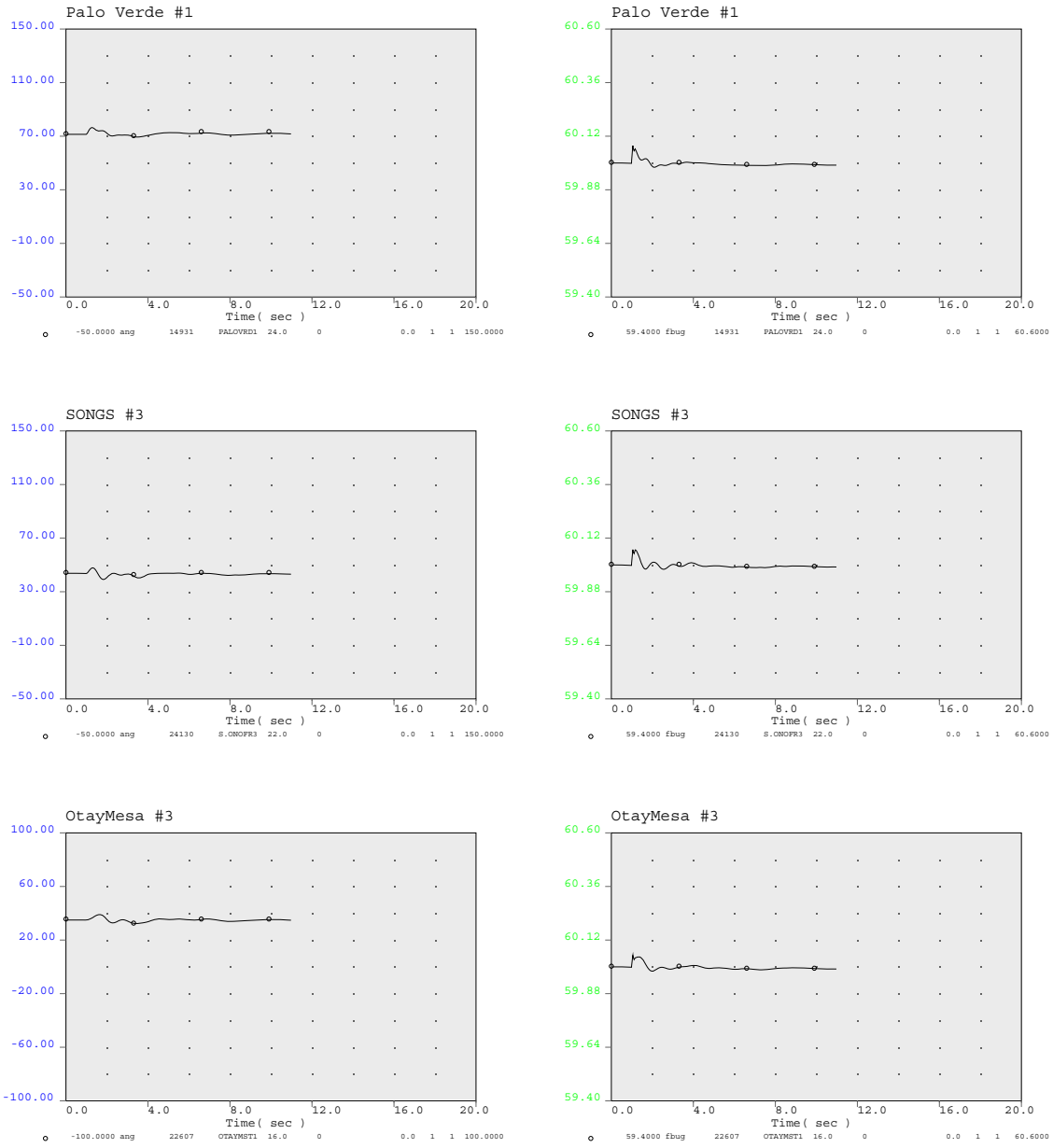
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Imperial Valley Area - Frequency



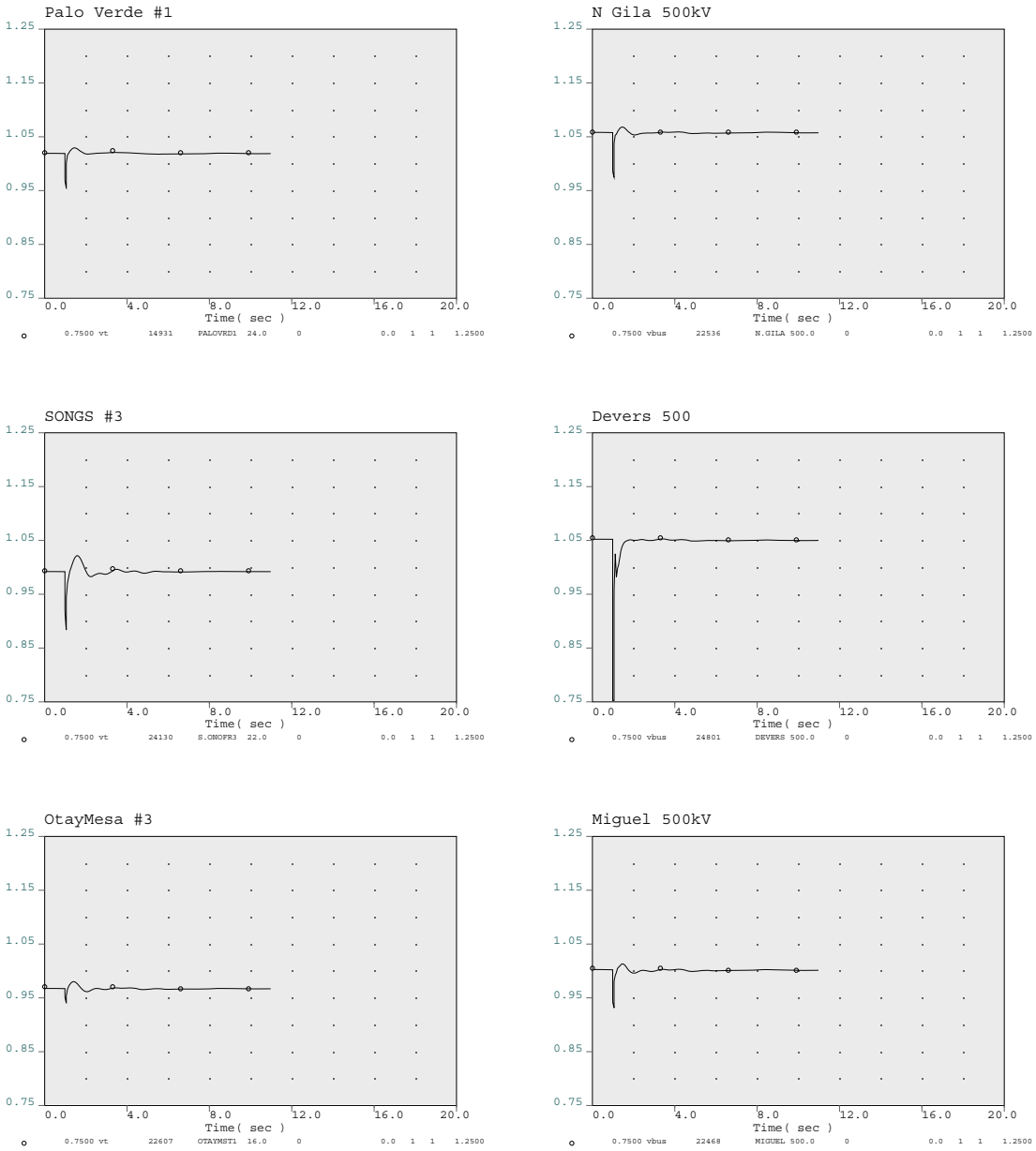
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

RELATIVE ROTOR ANGLE & FREQUENCY



SDG&E Cluster 2 - pre
2014 Heavy Summer
Valley - Devers 500 kV line

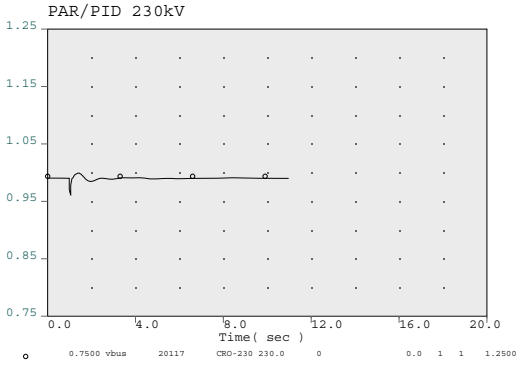
RELATIVE VOLTAGE



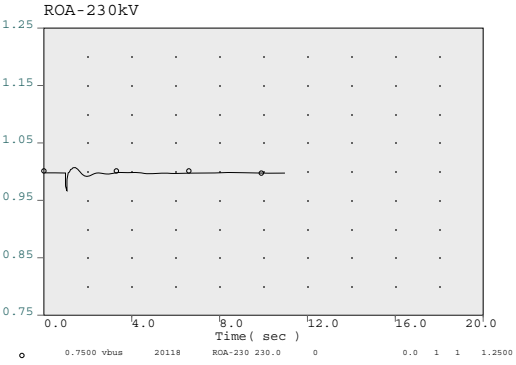
SDG&E Cluster 2 - pre
2014 Heavy Summer
Valley - Devers 500 kV line

Affected System Voltage Check and Comparison

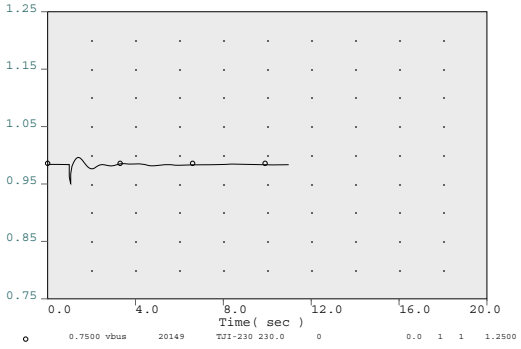
PAR/PID 230kV



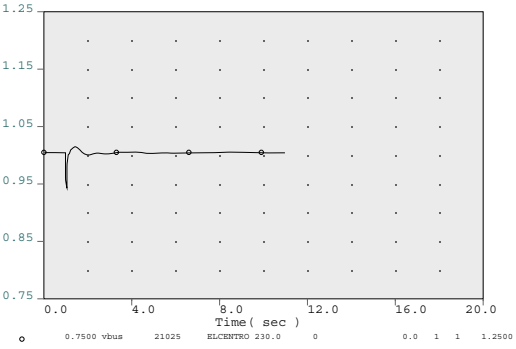
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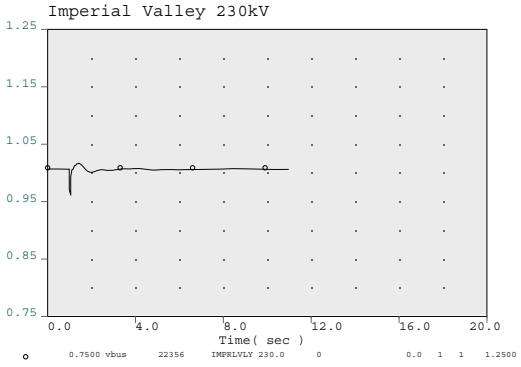
TJ1-230kV



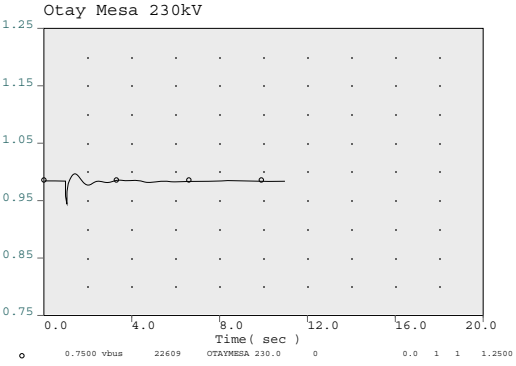
El Centro



Imperial Valley 230kV



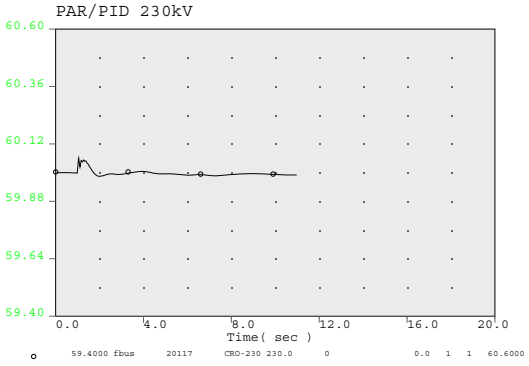
Otay Mesa 230kV



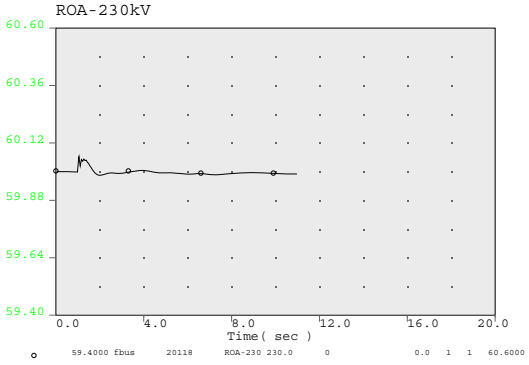
SDG&E Cluster 2 - pre
2014 Heavy Summer
Valley - Devers 500 kV line

Affected System Frequency Check and Comparison

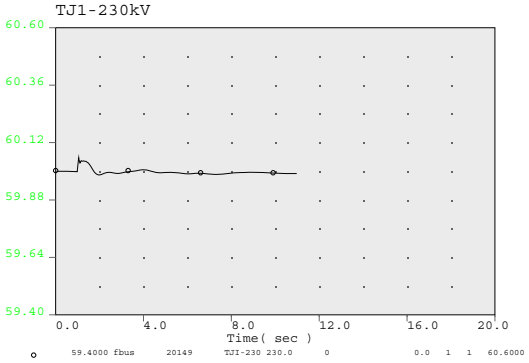
PAR/PID 230kV



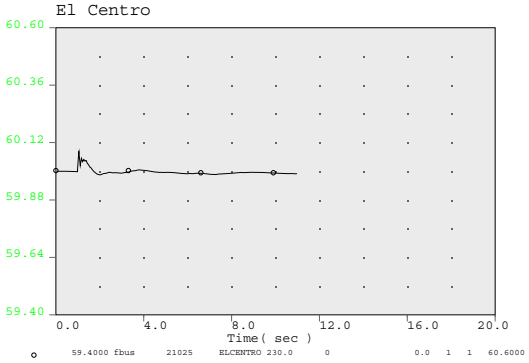
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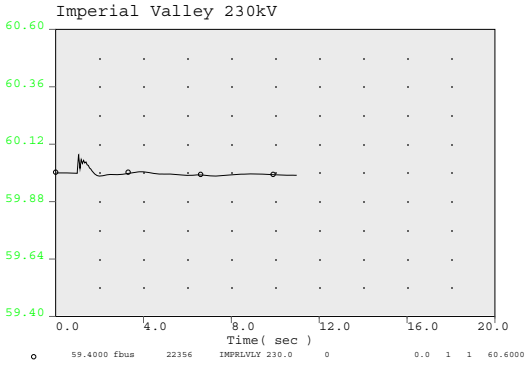
TJ1-230kV



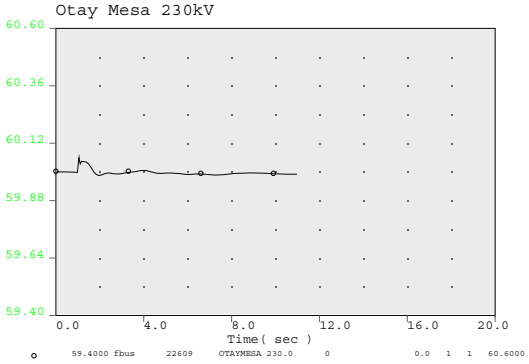
El Centro



Imperial Valley 230kV



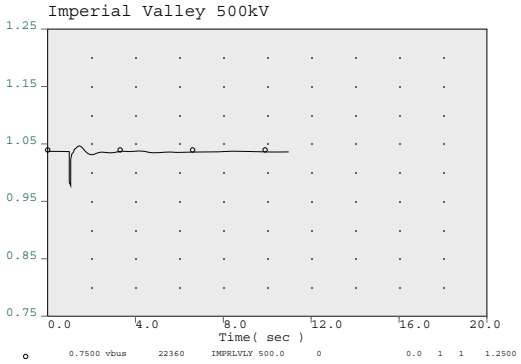
Otay Mesa 230kV



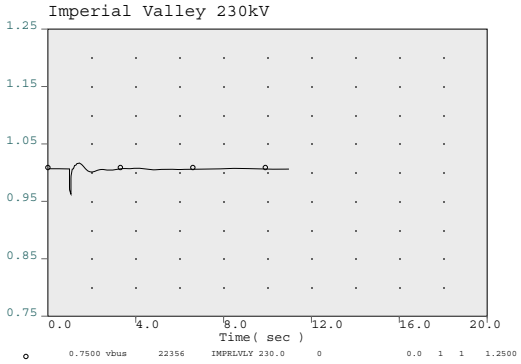
SDG&E Cluster 2 - pre
2014 Heavy Summer
Valley - Devers 500 kV line

Imperial Valley Area - VOLTAGE

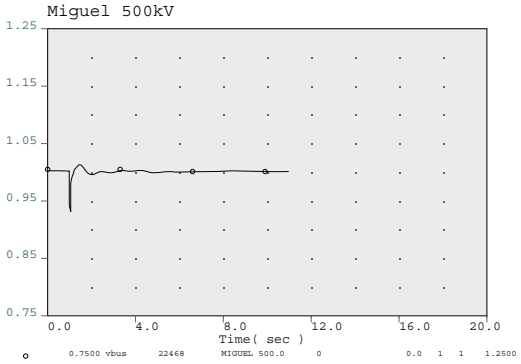
Imperial Valley 500kV



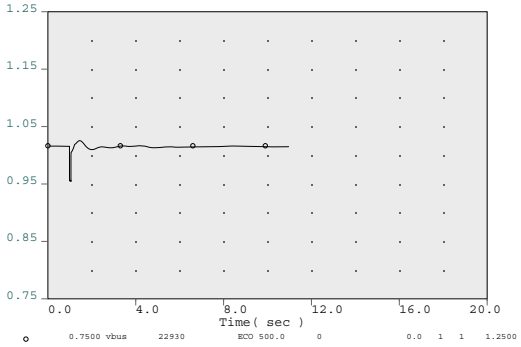
Imperial Valley 230kV



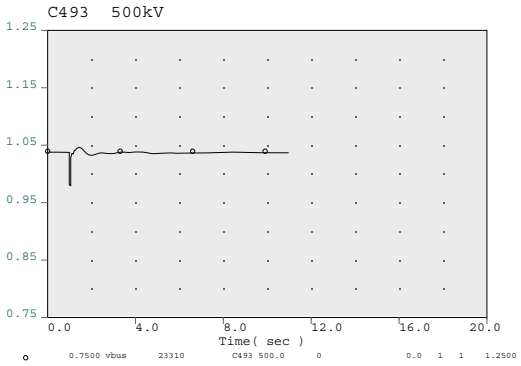
Miguel 500kV



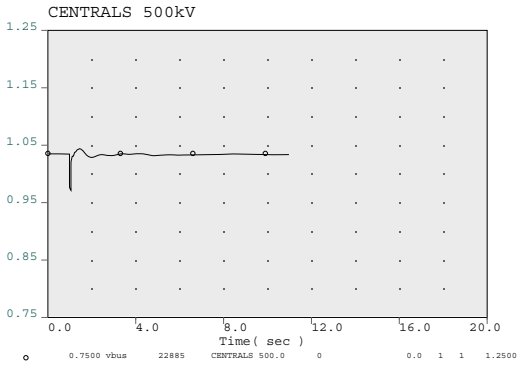
Windfarms 500



C493 500kV

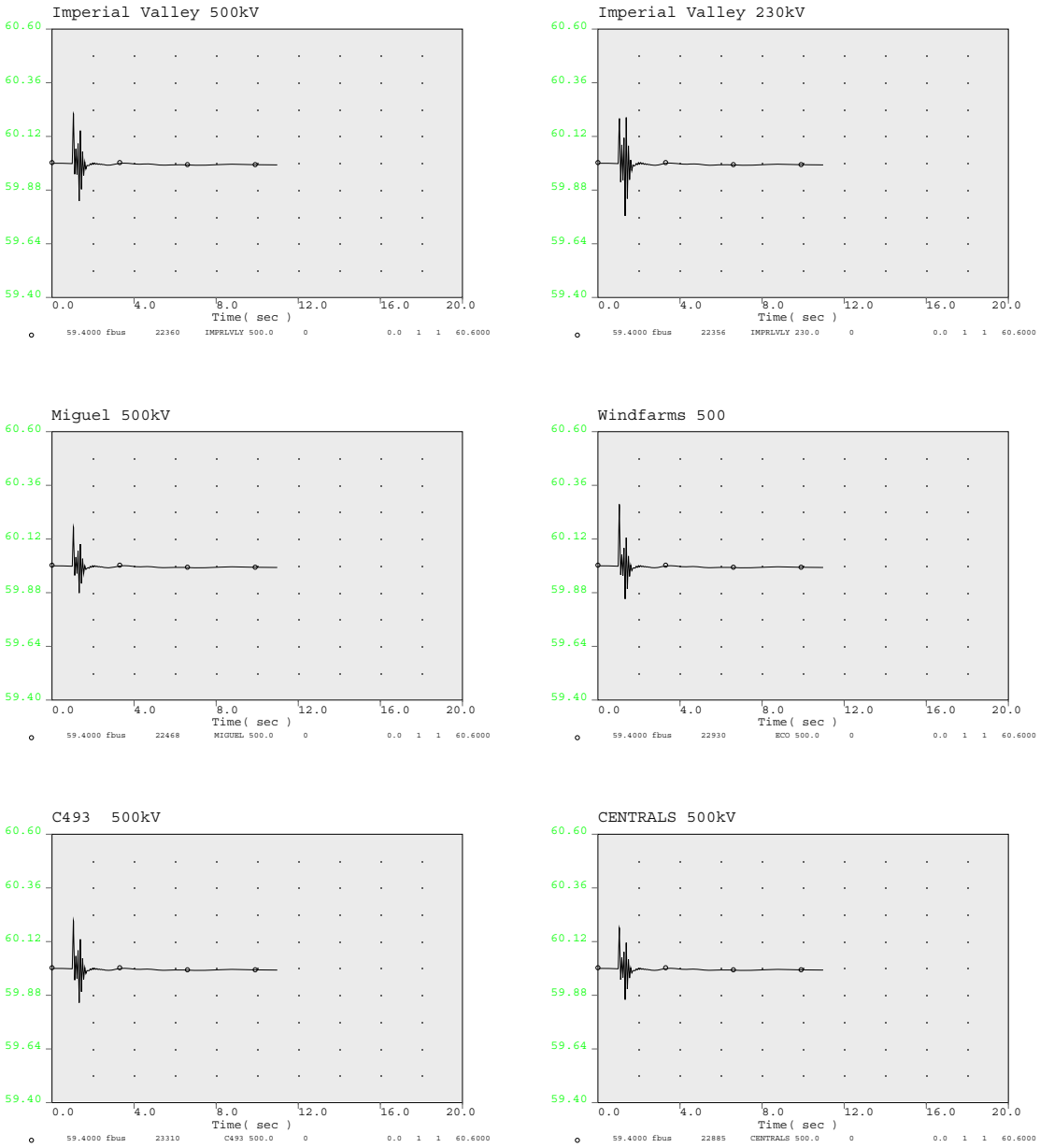


CENTRALS 500kV



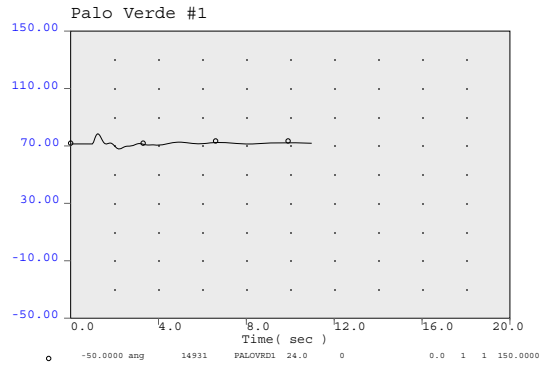
SDG&E Cluster 2 - pre
2014 Heavy Summer
Valley - Devers 500 kV line

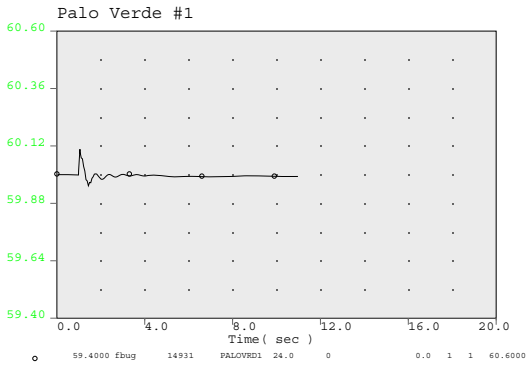
Imperial Valley Area - Frequency

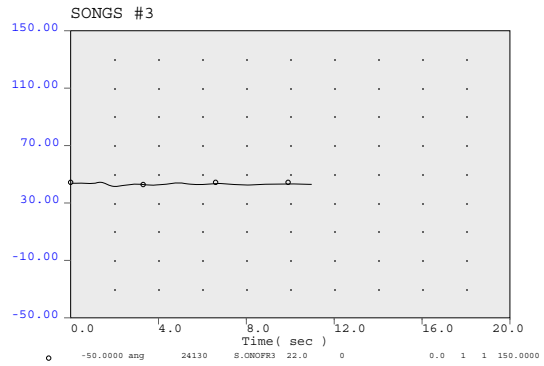


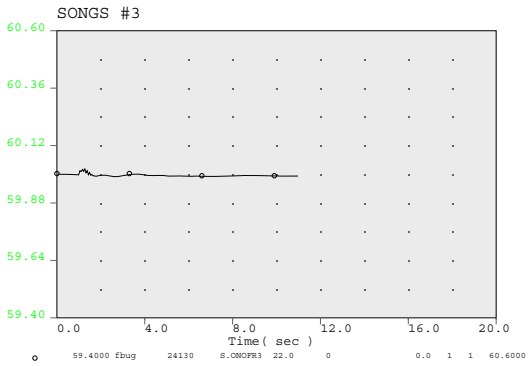
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

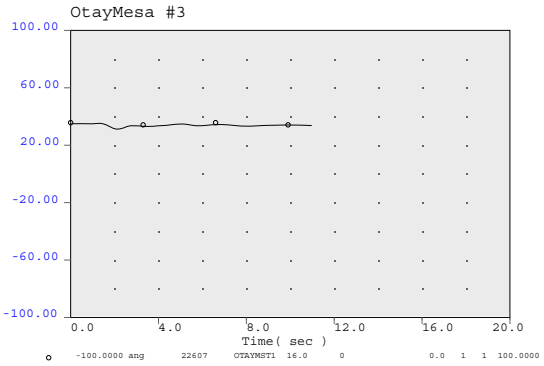
RELATIVE ROTOR ANGLE & FREQUENCY

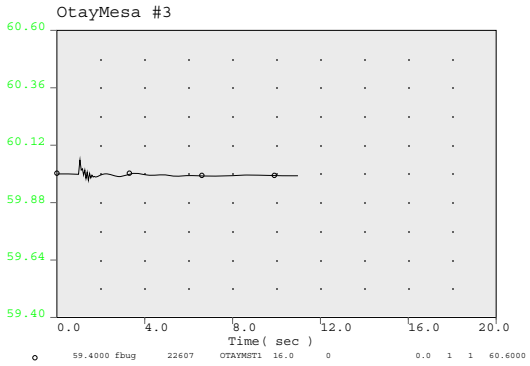










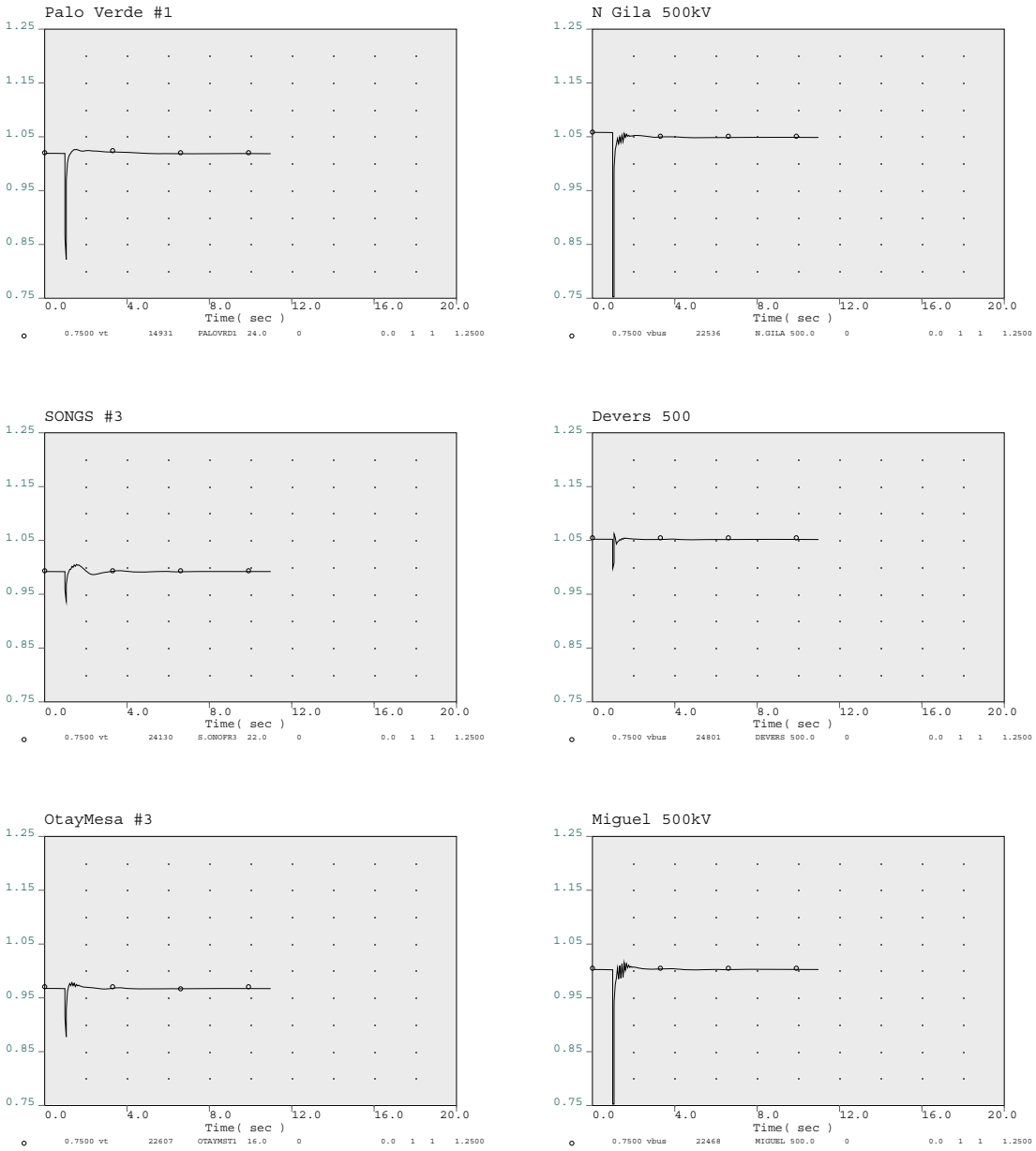


SDG&E Cluster 2 - pre
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Page 1

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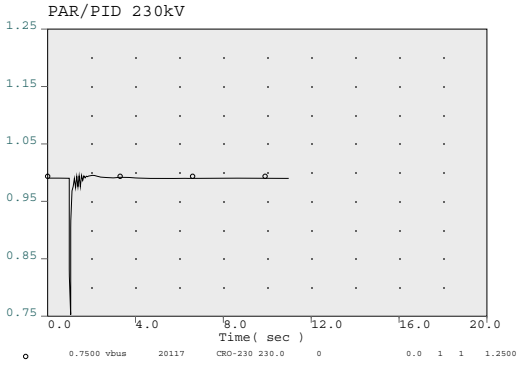
RELATIVE VOLTAGE



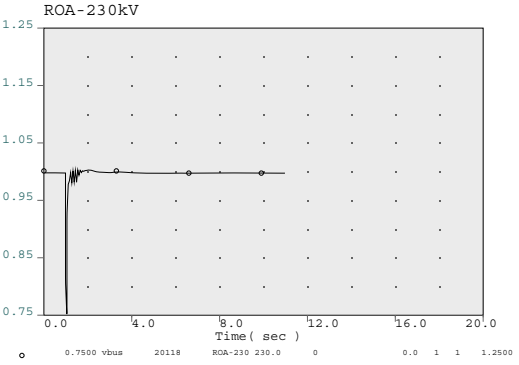
SDG&E Cluster 2 - pre
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

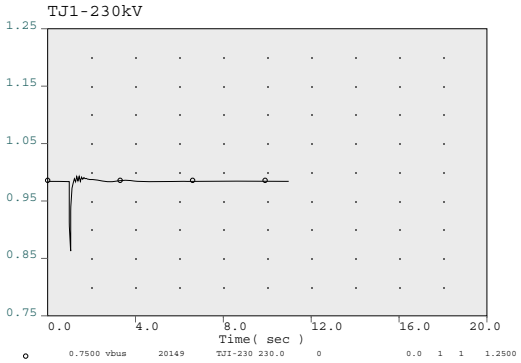
PAR/PID 230kV



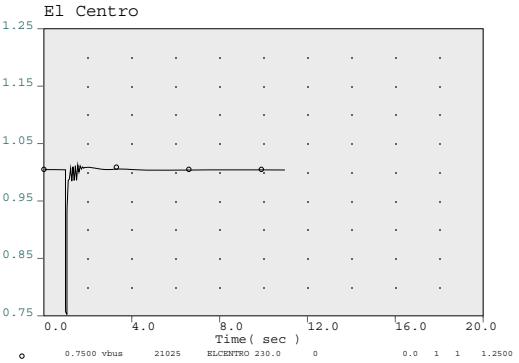
ROA-230kV



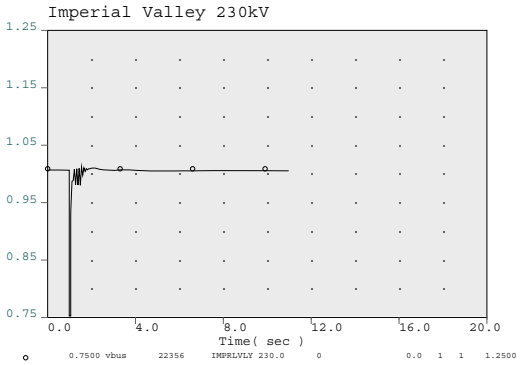
TJ1-230kV



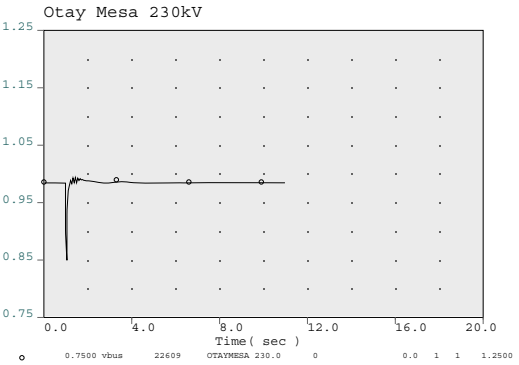
El Centro



Imperial Valley 230kV



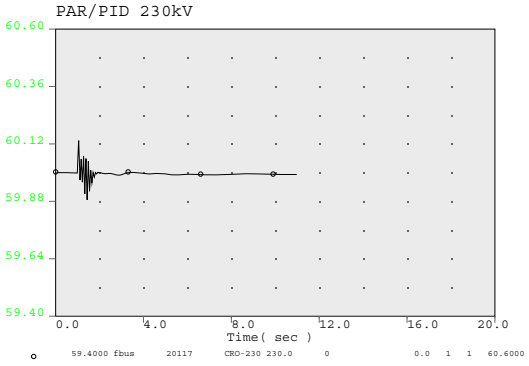
Otay Mesa 230kV



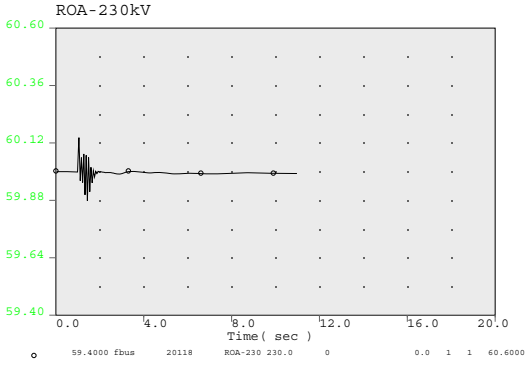
SDG&E Cluster 2 - pre
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Affected System Frequency Check and Comparison

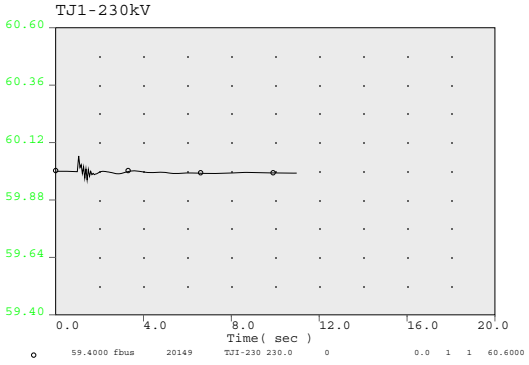
PAR/PID 230kV



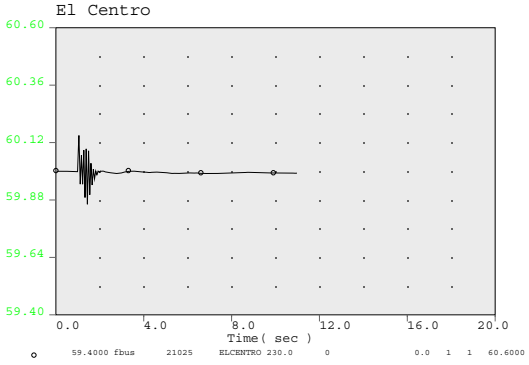
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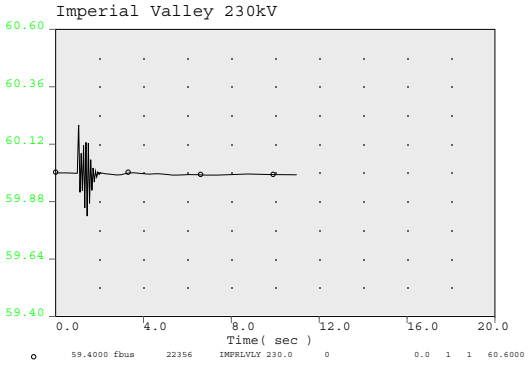
TJ1-230kV



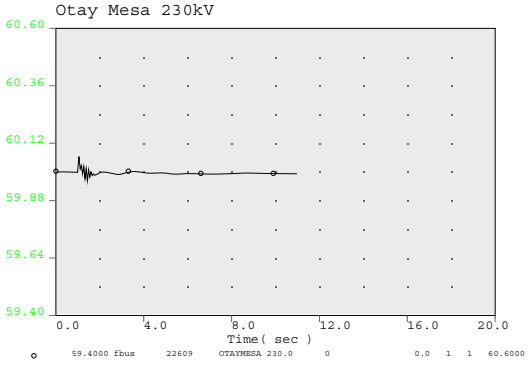
El Centro



Imperial Valley 230kV



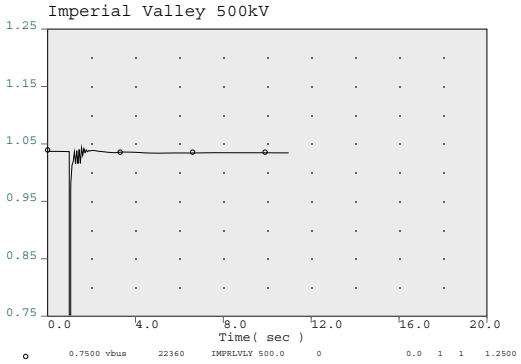
Otay Mesa 230kV



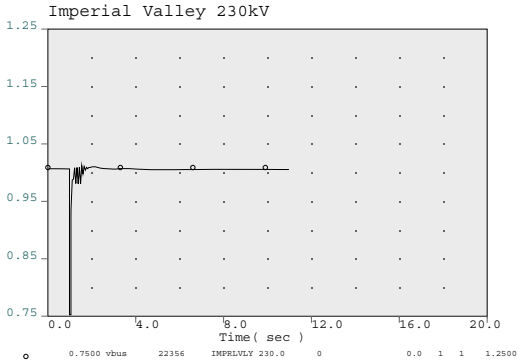
SDG&E Cluster 2 - pre
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

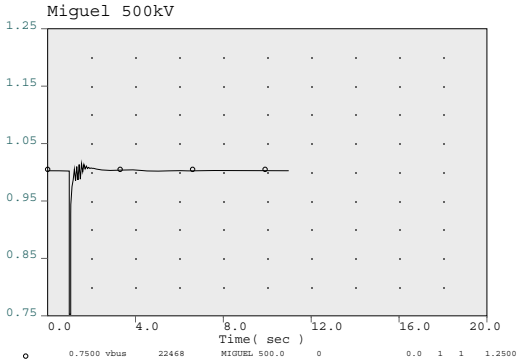
Imperial Valley 500kV



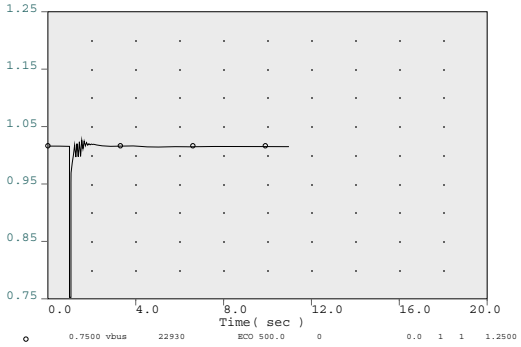
Imperial Valley 230kV



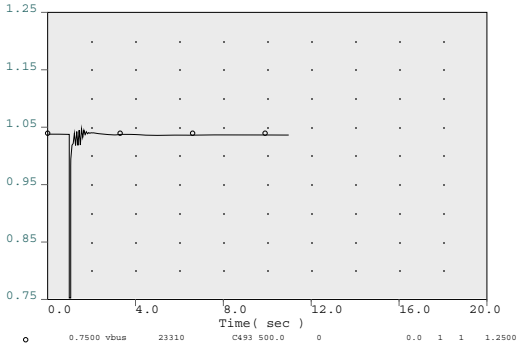
Miguel 500kV



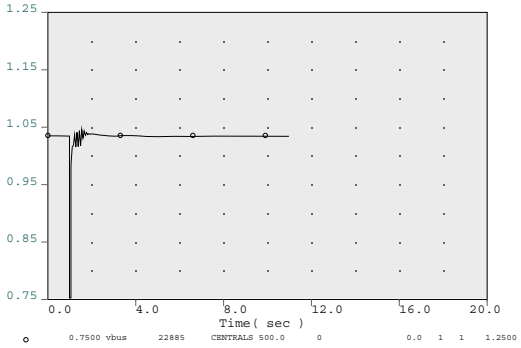
Windfarms 500



C493 500kV



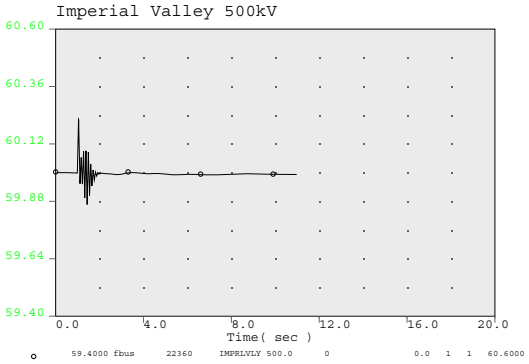
CENTRALS 500kV



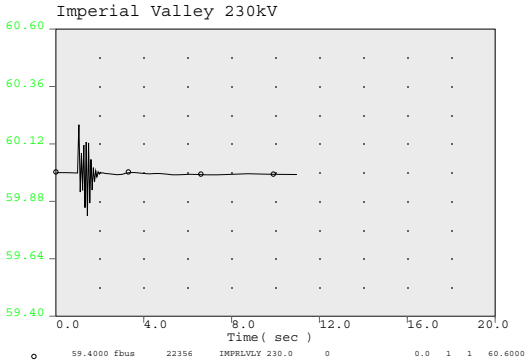
SDG&E Cluster 2 - pre
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - Frequency

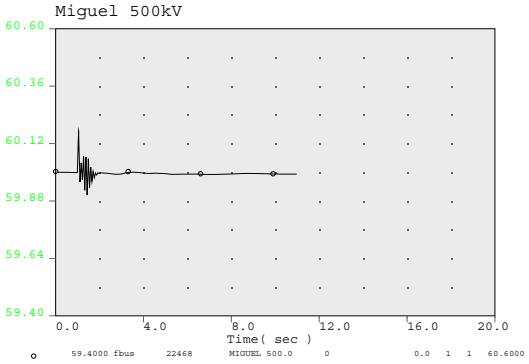
Imperial Valley 500kV



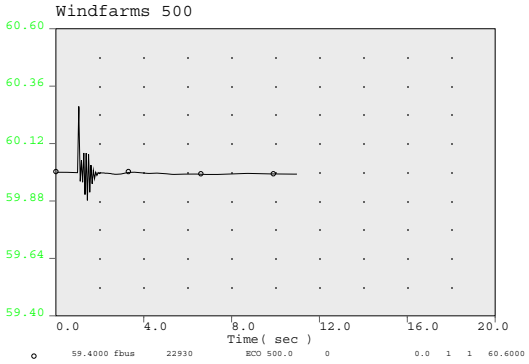
Imperial Valley 230kV



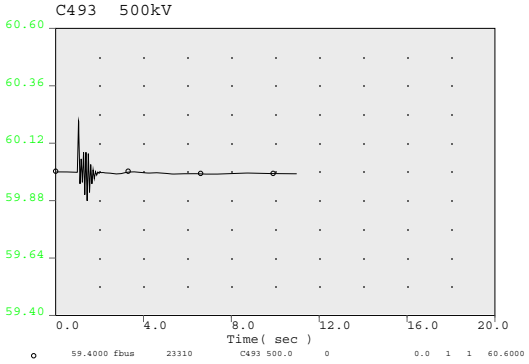
Miguel 500kV



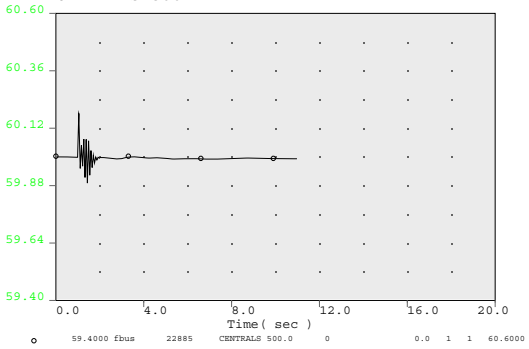
Windfarms 500



C493 500kV

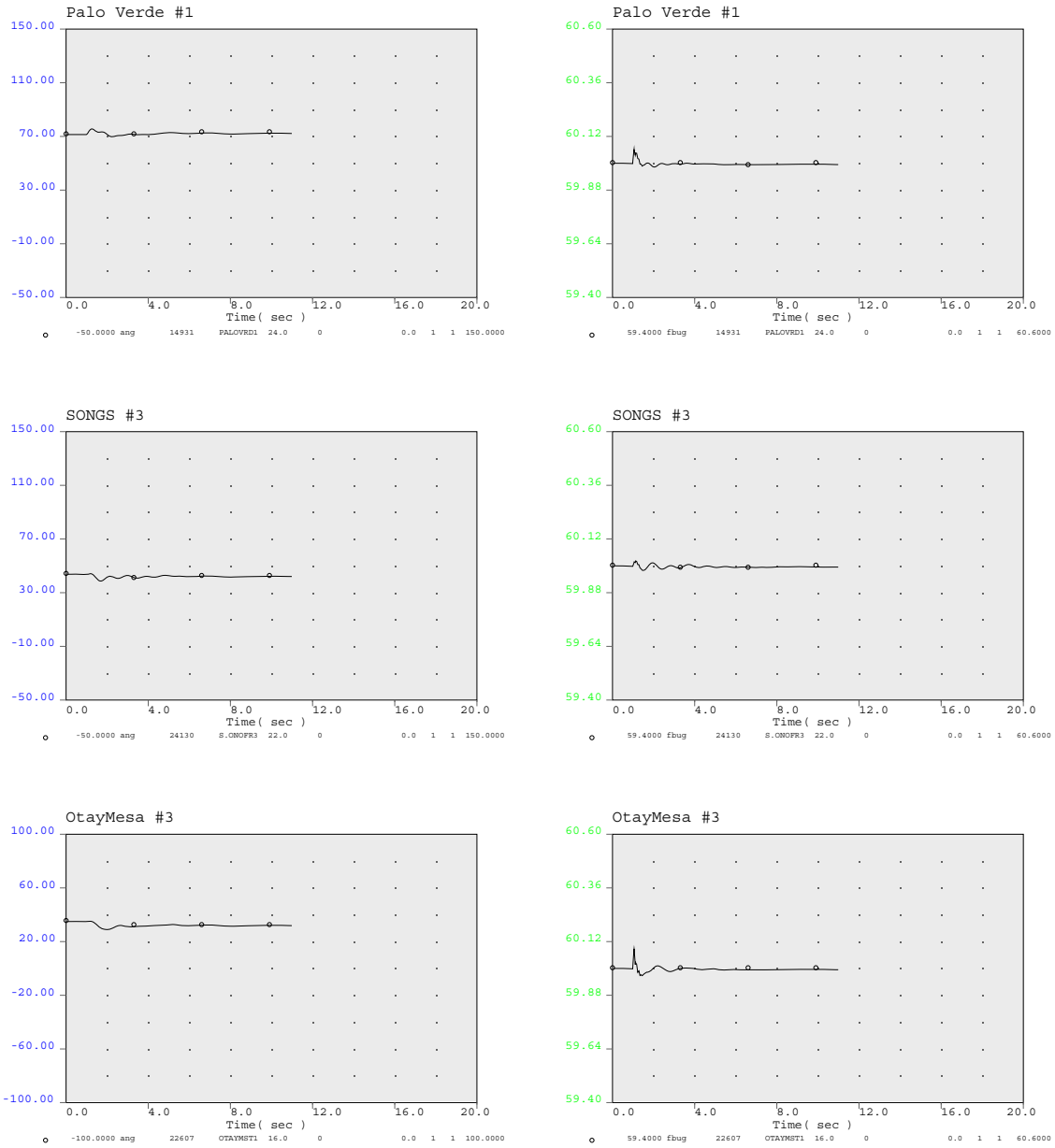


CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

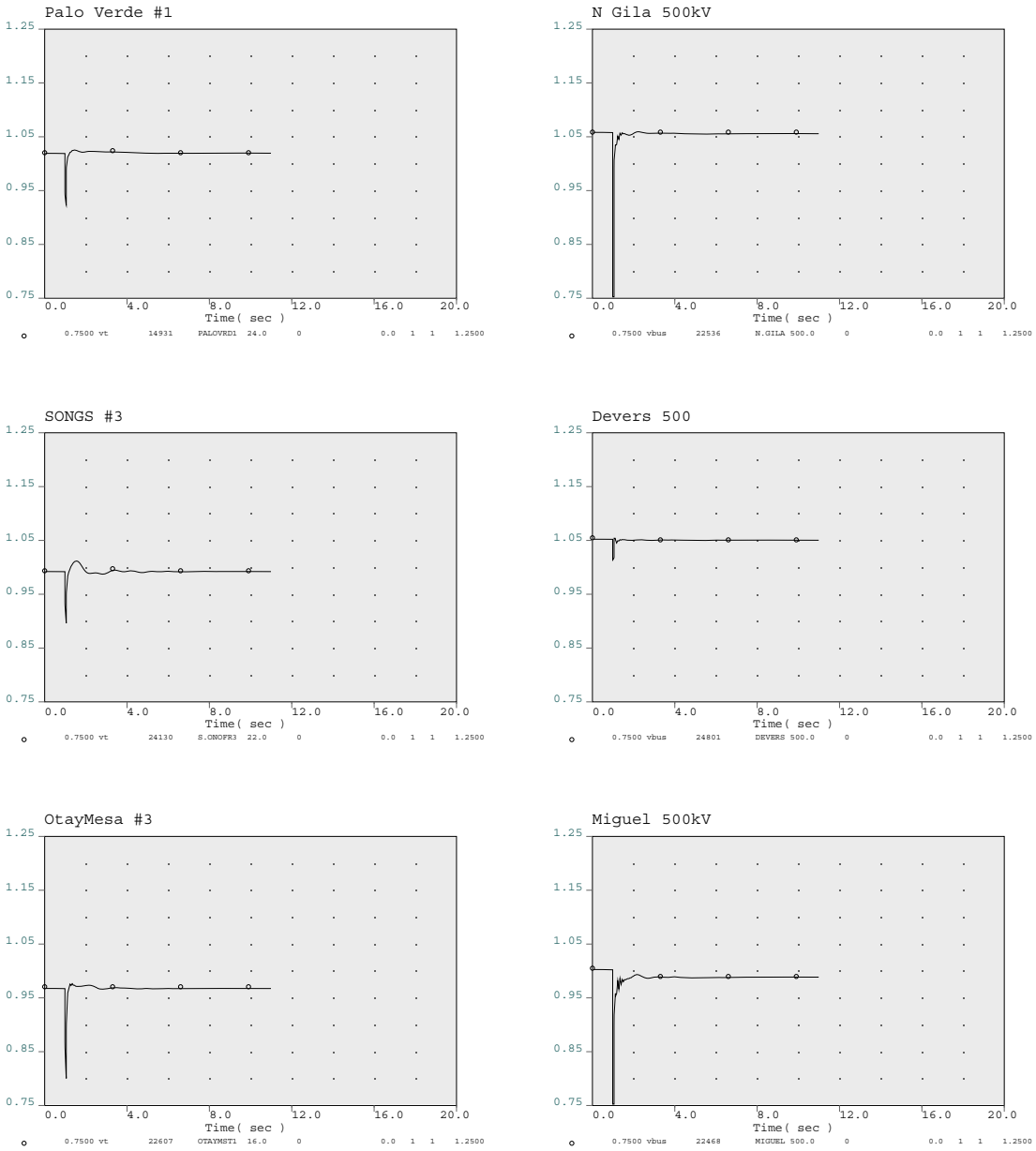


SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Page 1

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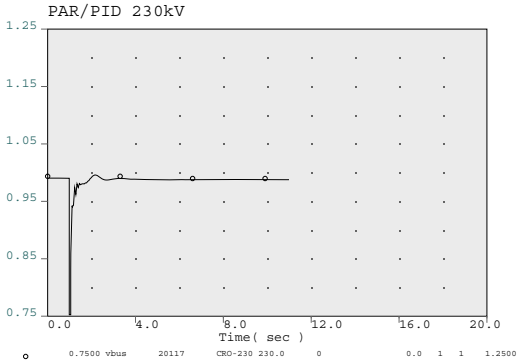
RELATIVE VOLTAGE



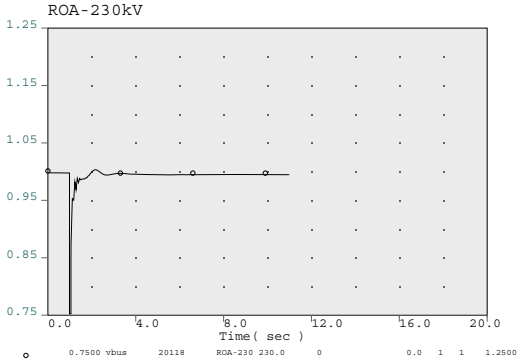
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

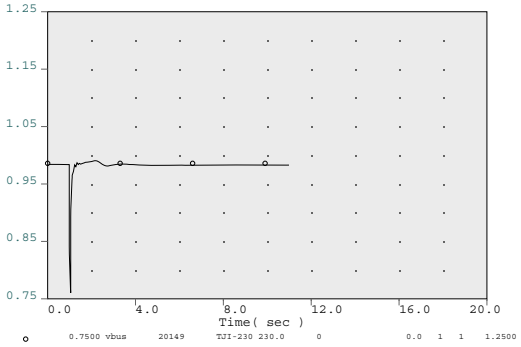
PAR/PID 230kV



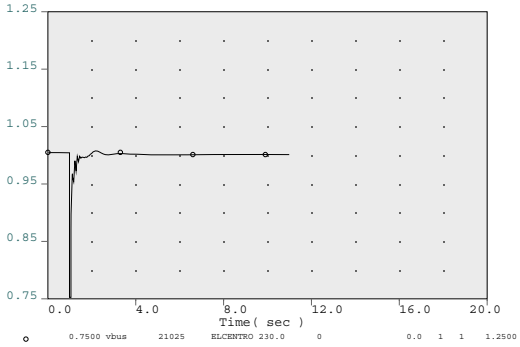
ROA-230kV



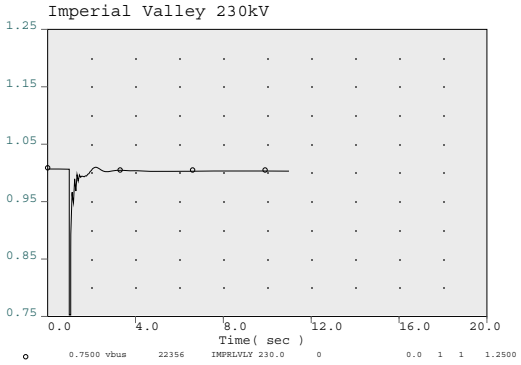
TJ1-230kV



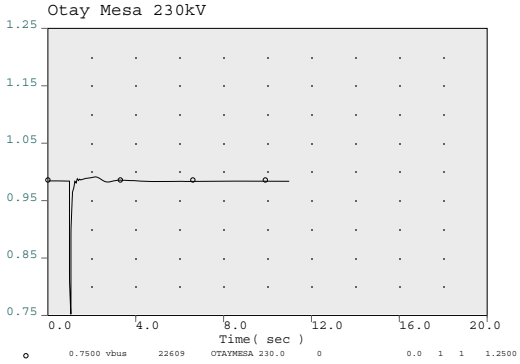
El Centro



Imperial Valley 230kV



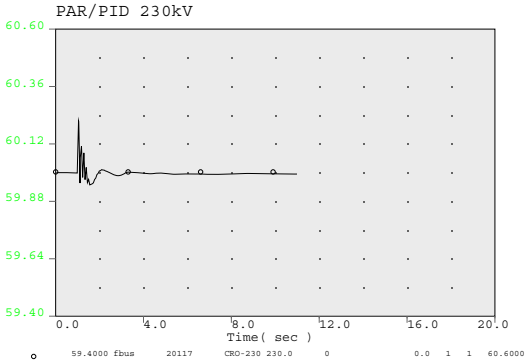
Otay Mesa 230kV



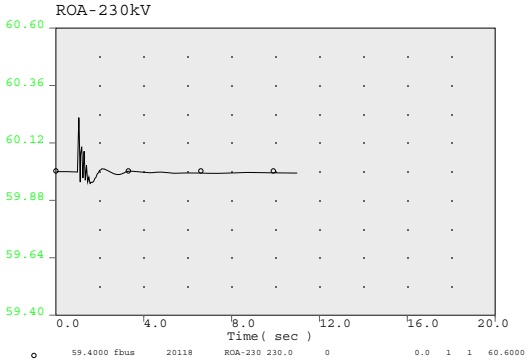
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

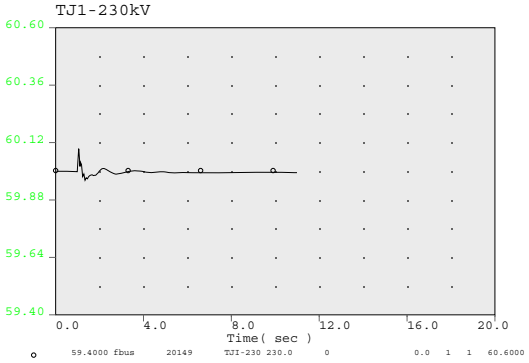
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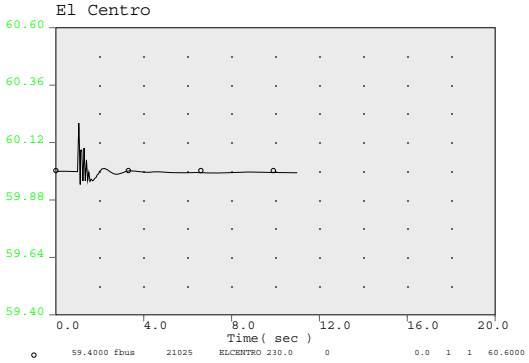
ROA-230kV



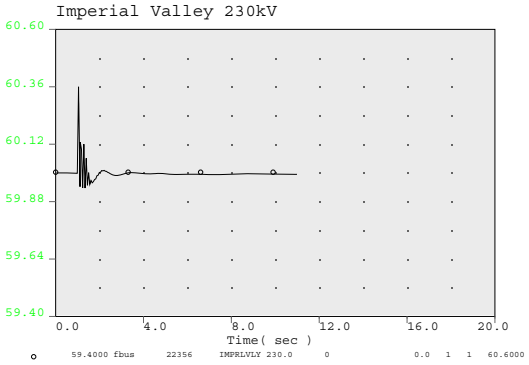
TJ1-230kV



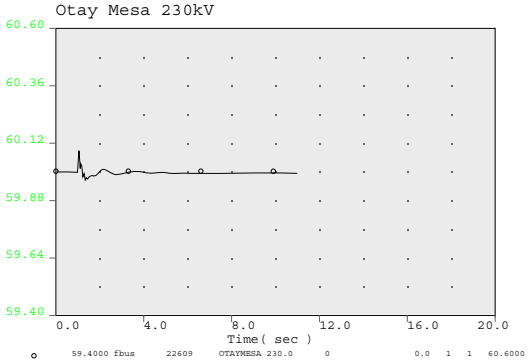
El Centro



Imperial Valley 230kV

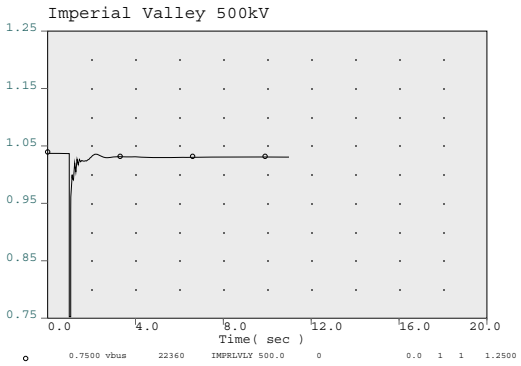


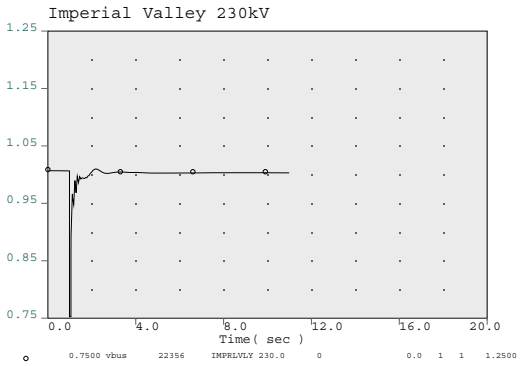
Otay Mesa 230kV

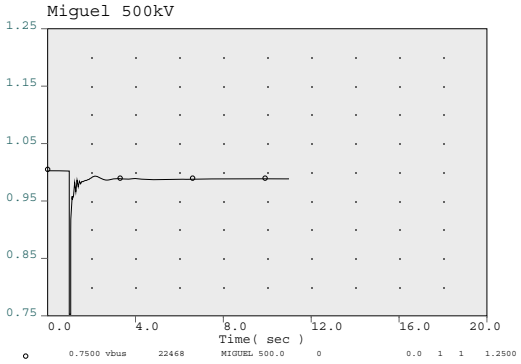


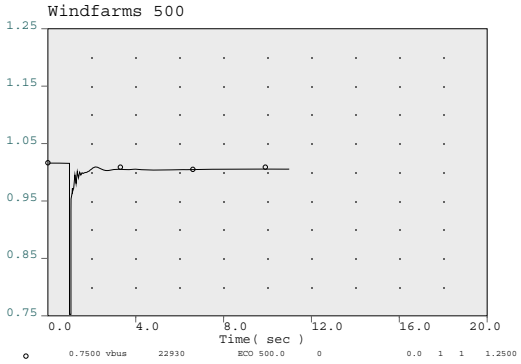
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

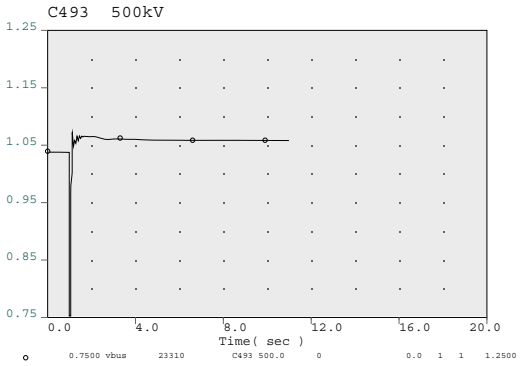
Imperial Valley Area - VOLTAGE

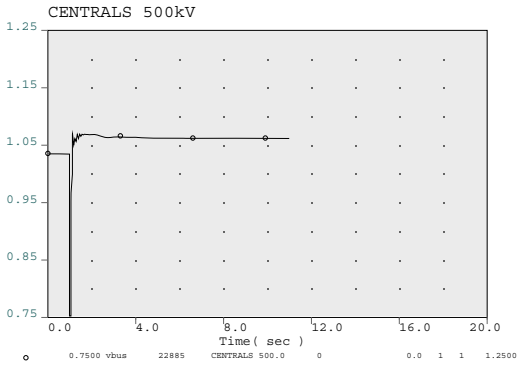






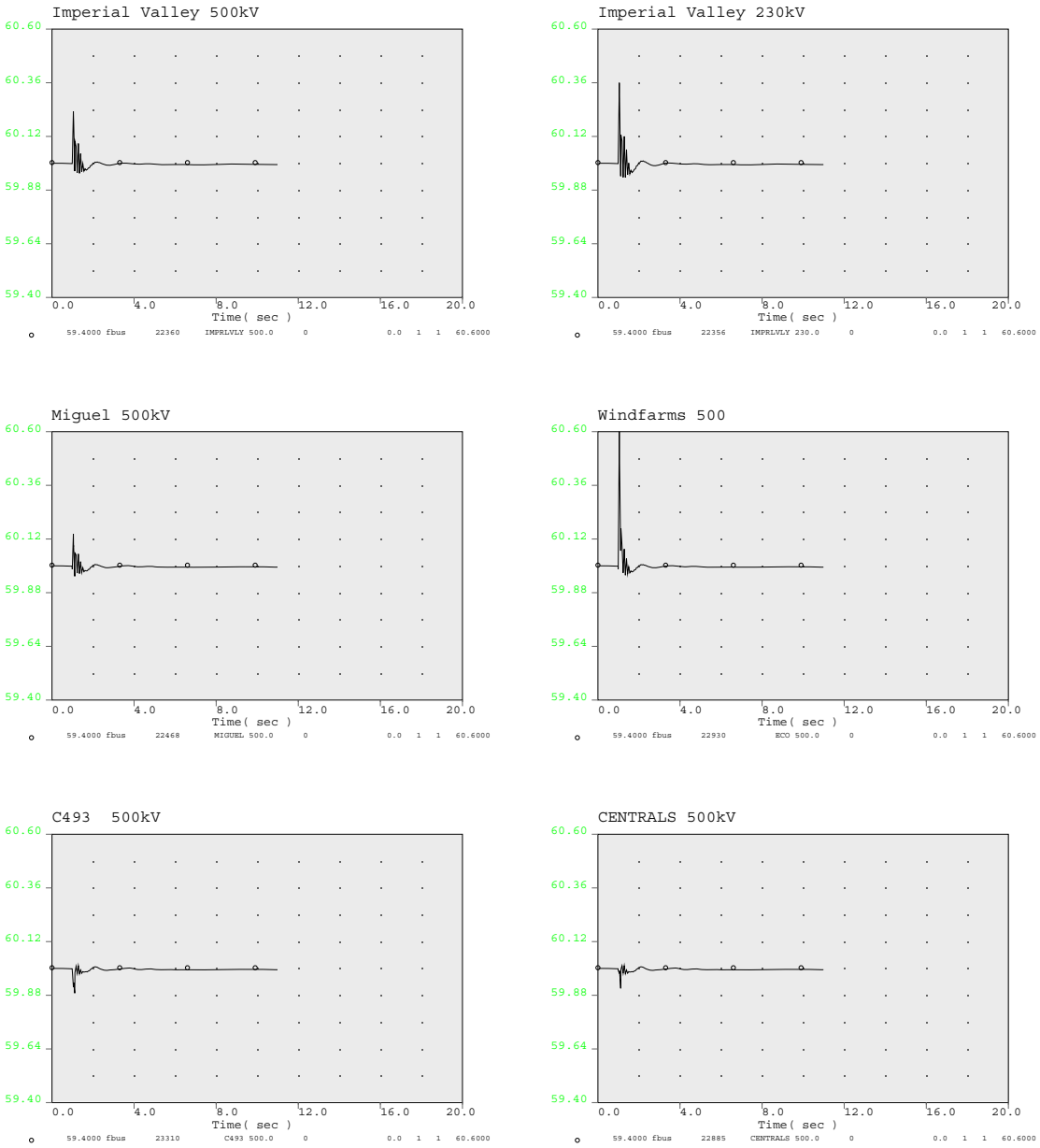






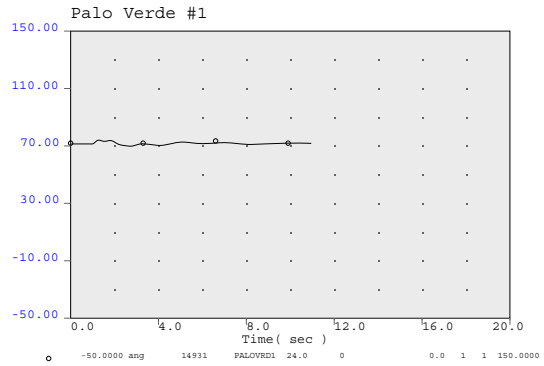
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

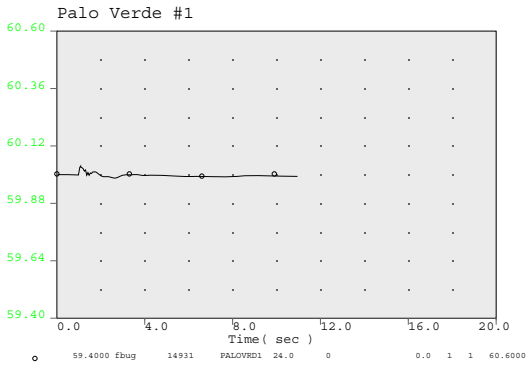
Imperial Valley Area - Frequency

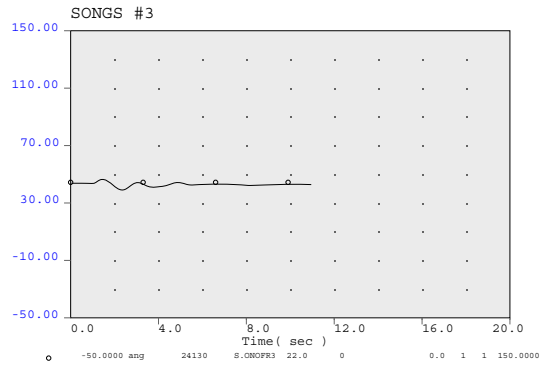


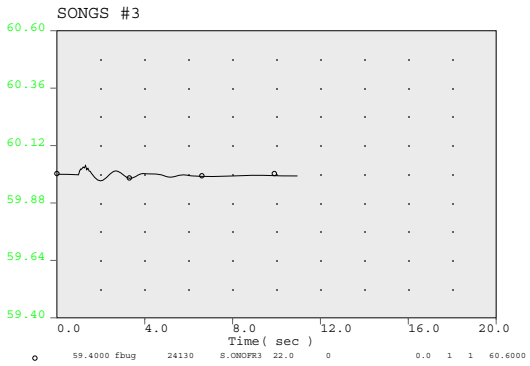
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

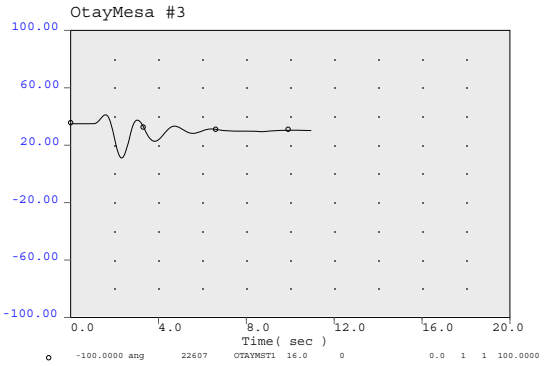
RELATIVE ROTOR ANGLE & FREQUENCY

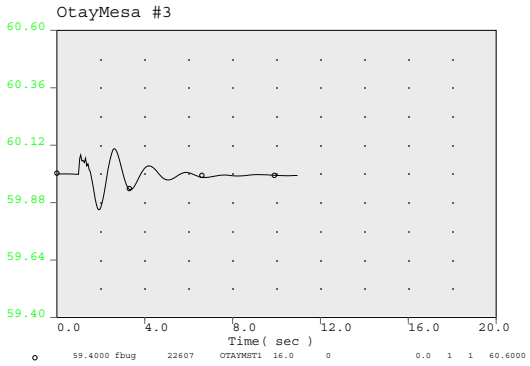










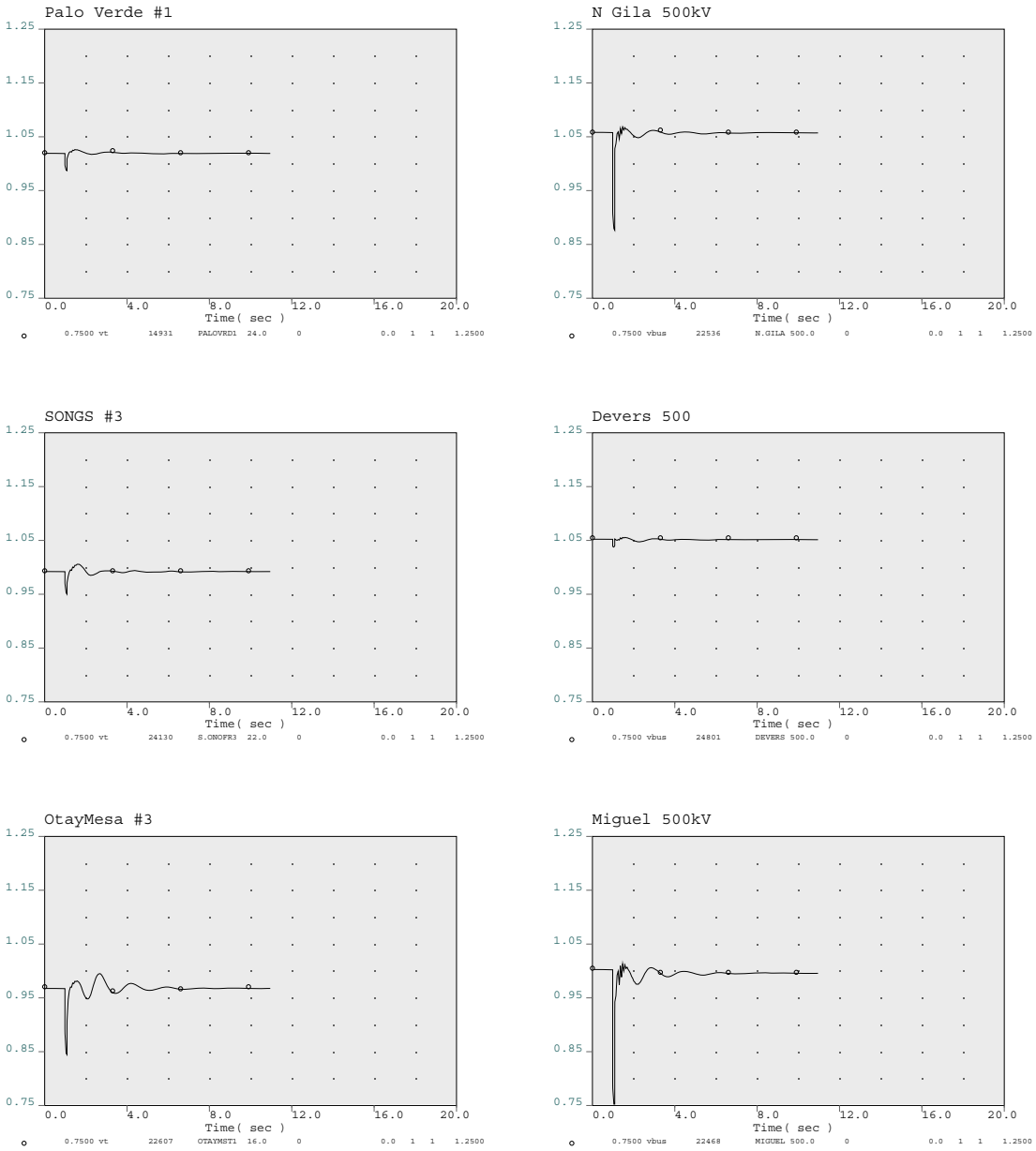


SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

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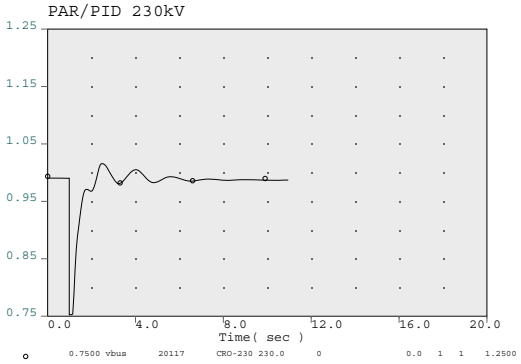
RELATIVE VOLTAGE



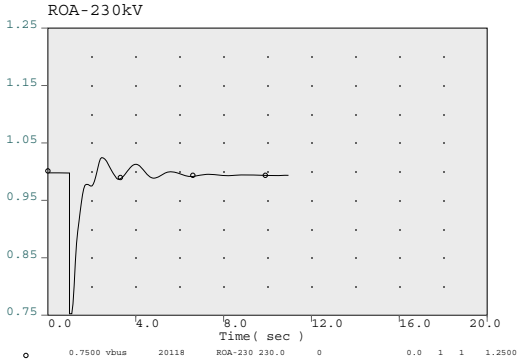
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

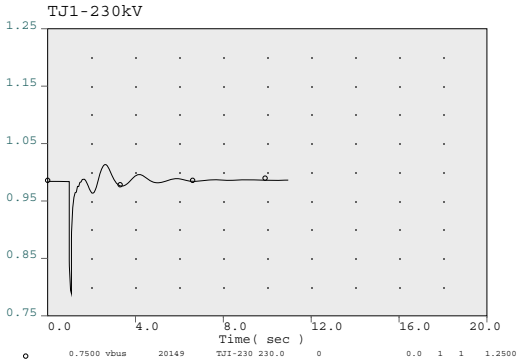
PAR/PID 230kV



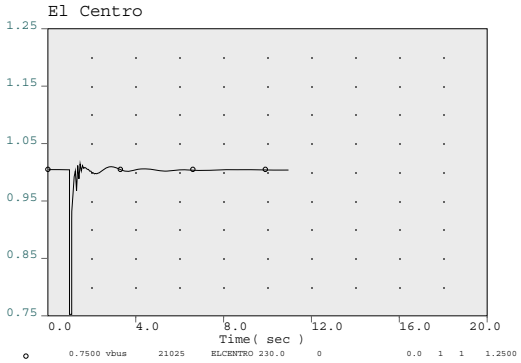
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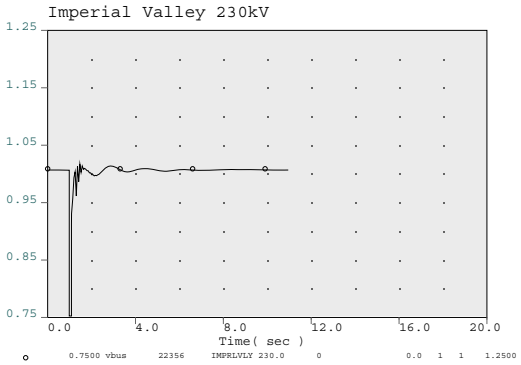
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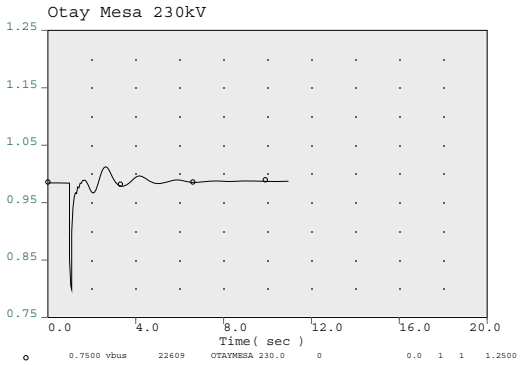
El Centro



Imperial Valley 230kV



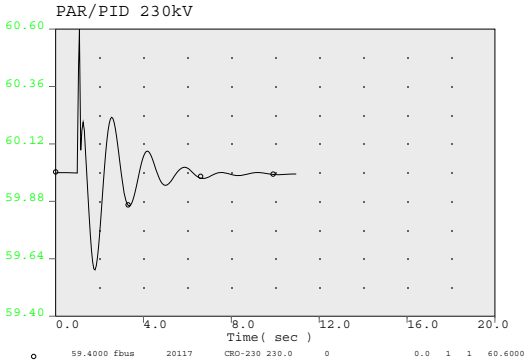
Otay Mesa 230kV



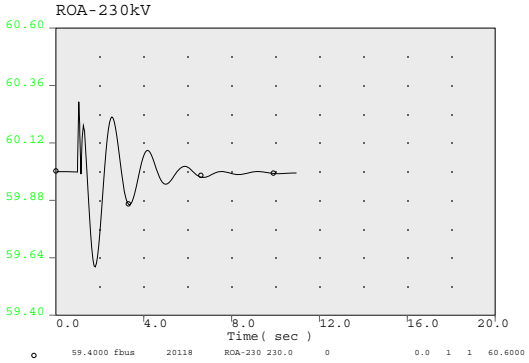
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Affected System Frequency Check and Comparison

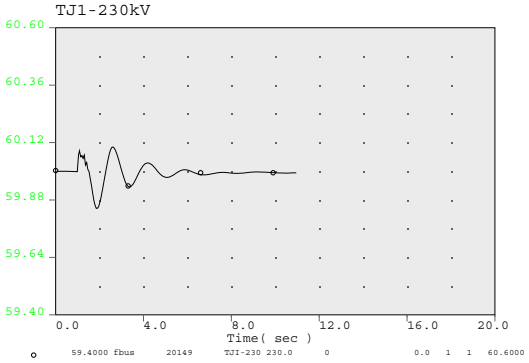
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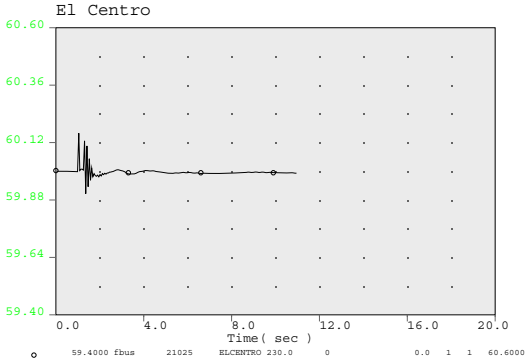
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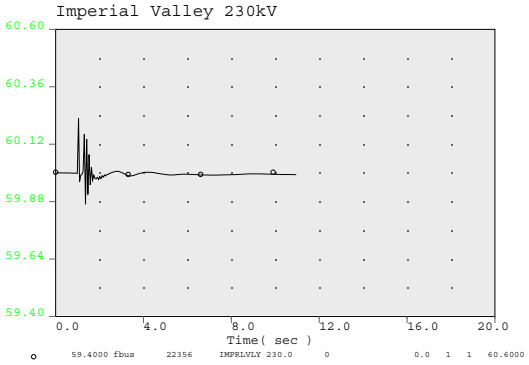
TJ1-230kV



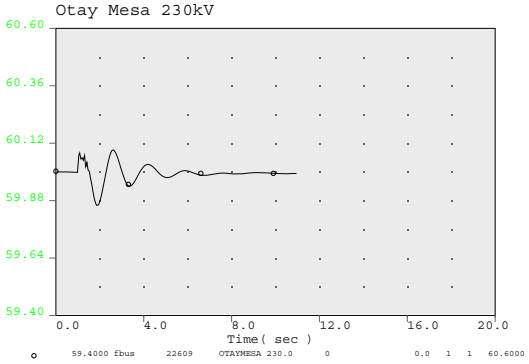
El Centro



Imperial Valley 230kV



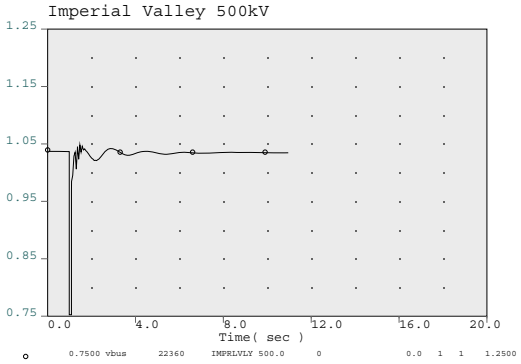
Otay Mesa 230kV



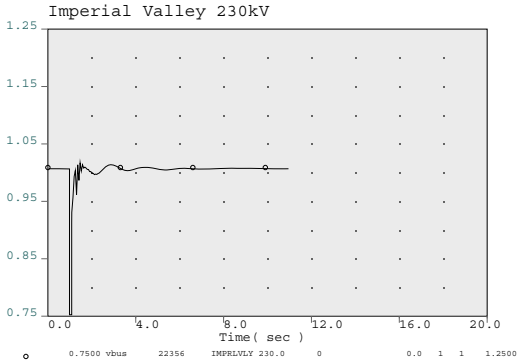
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

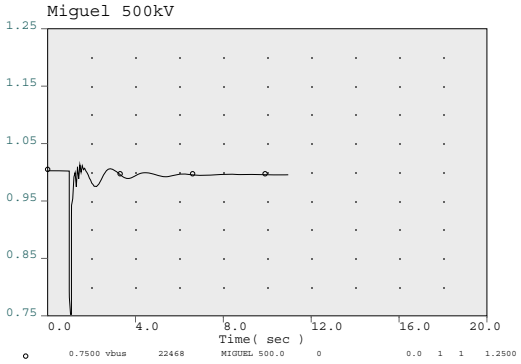
Imperial Valley 500kV



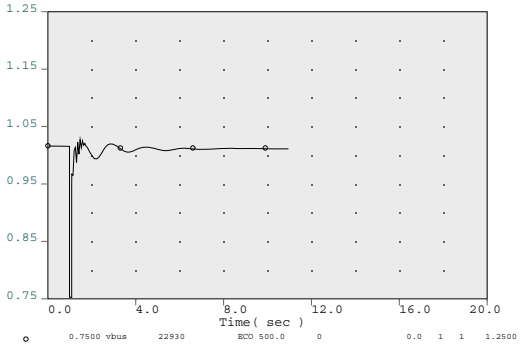
Imperial Valley 230kV



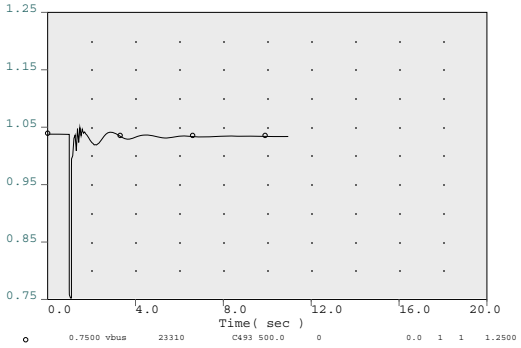
Miguel 500kV



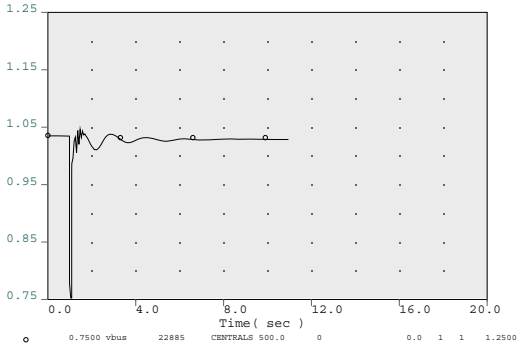
Windfarms 500



C493 500kV



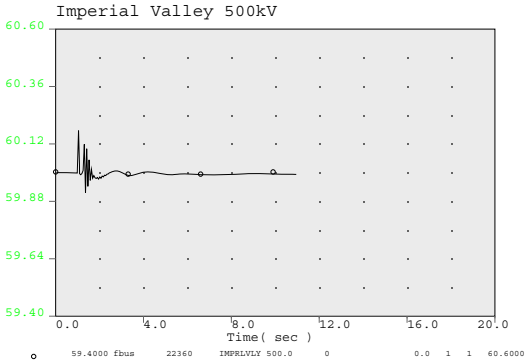
CENTRALS 500kV



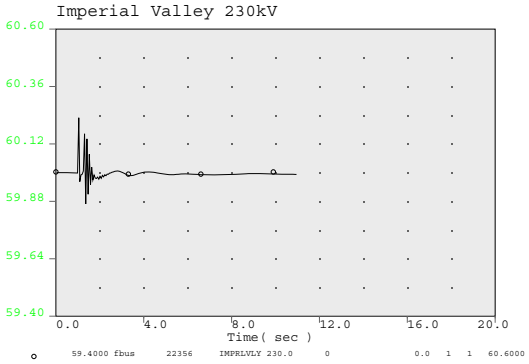
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - Frequency

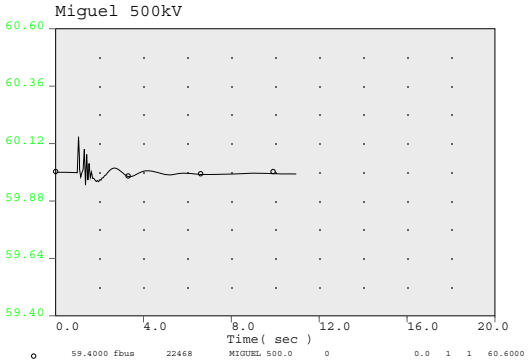
Imperial Valley 500kV



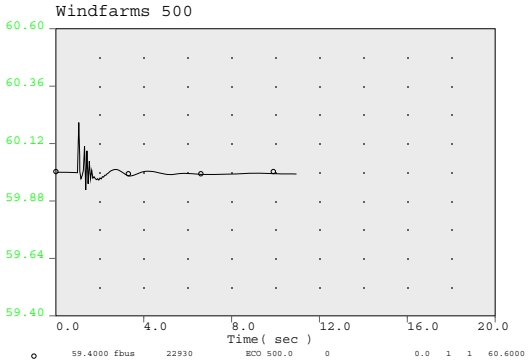
Imperial Valley 230kV



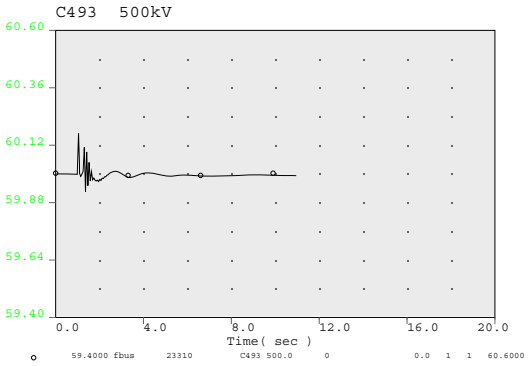
Miguel 500kV



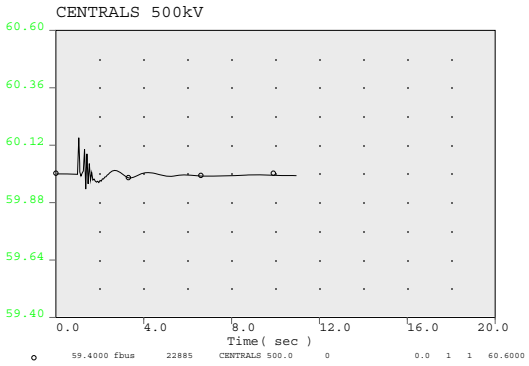
Windfarms 500



C493 500kV

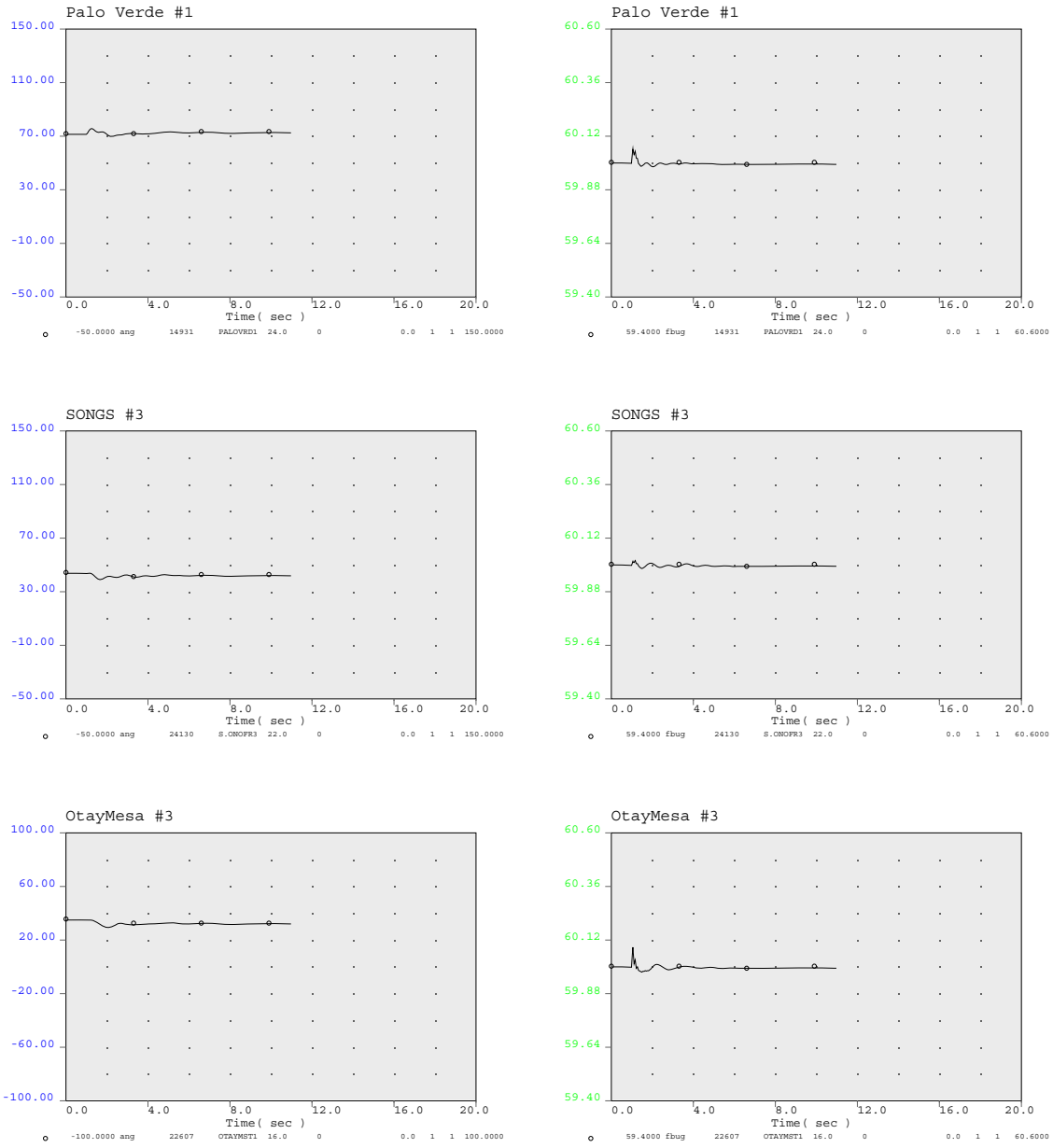


CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

RELATIVE ROTOR ANGLE & FREQUENCY

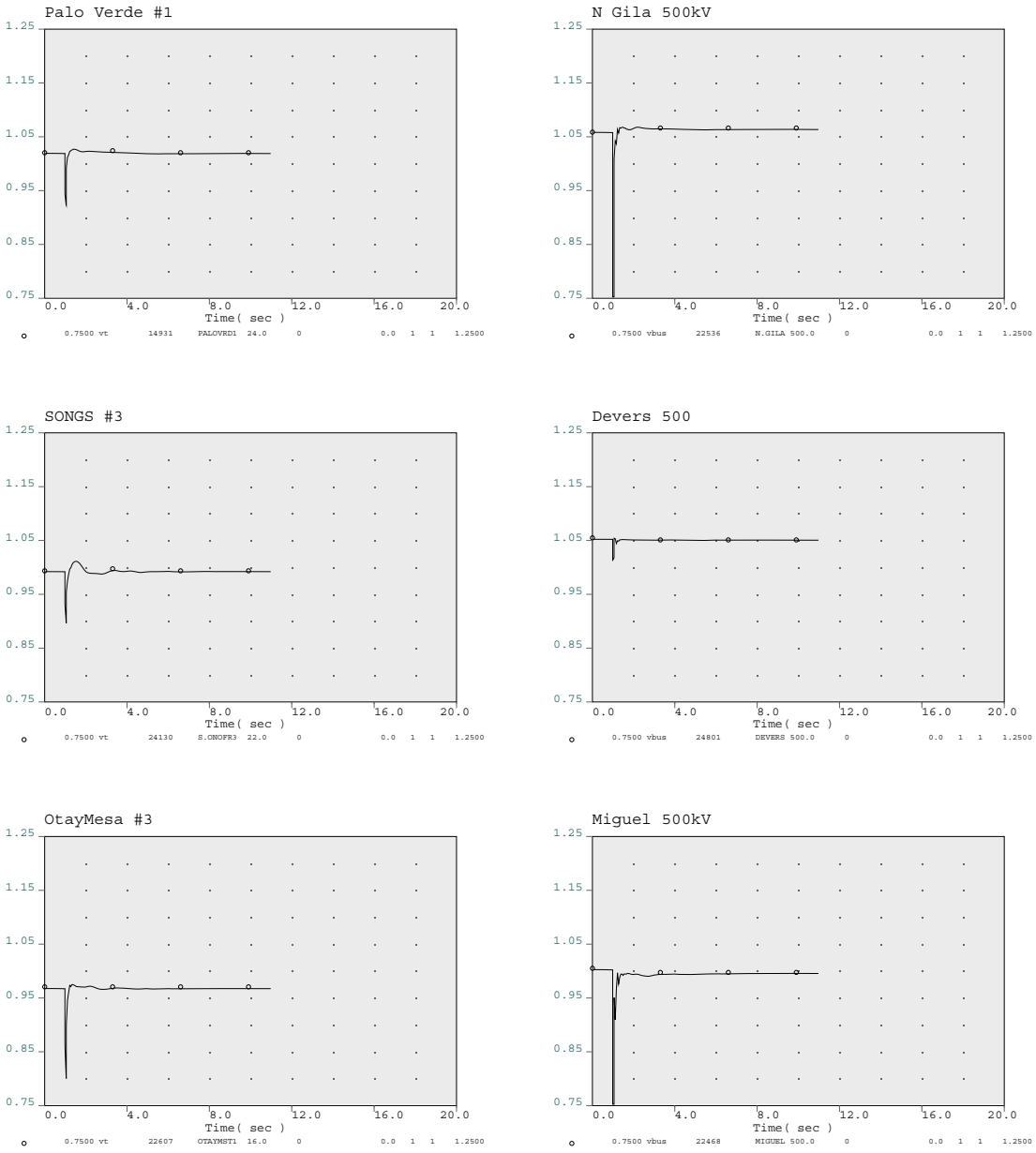


SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

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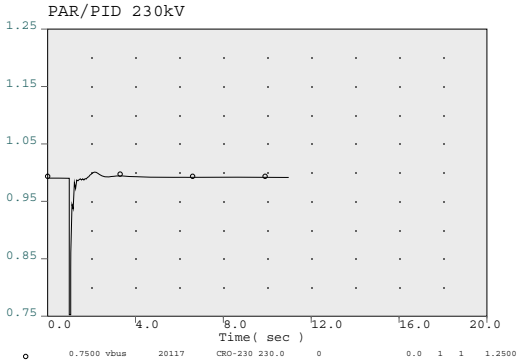
RELATIVE VOLTAGE



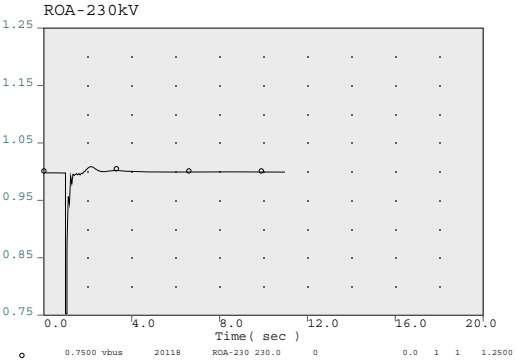
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

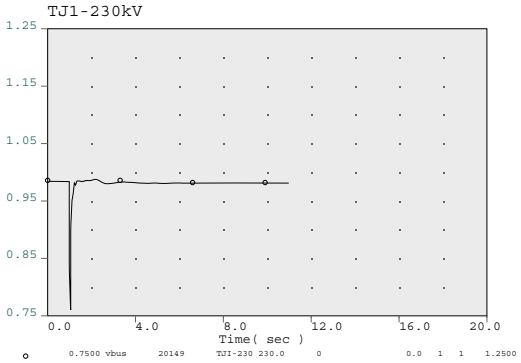
PAR/PID 230kV



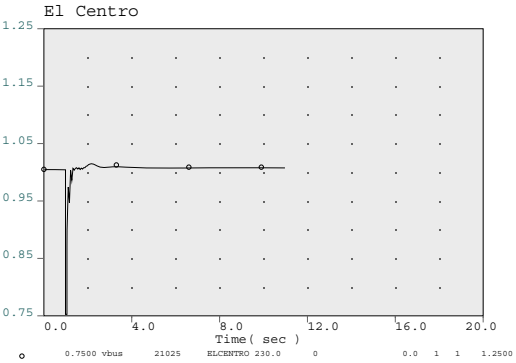
ROA-230kV



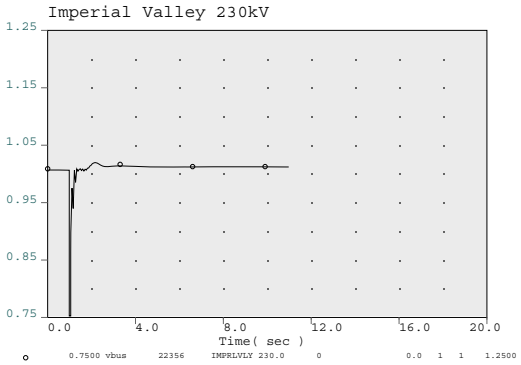
TJ1-230kV



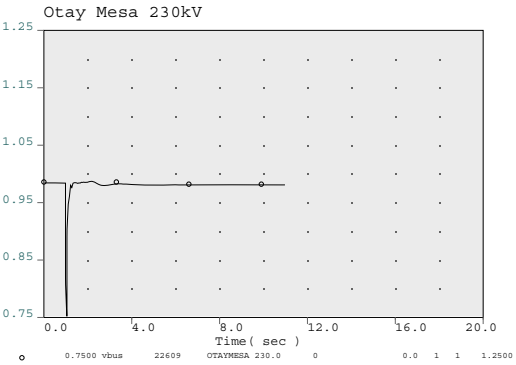
El Centro



Imperial Valley 230kV



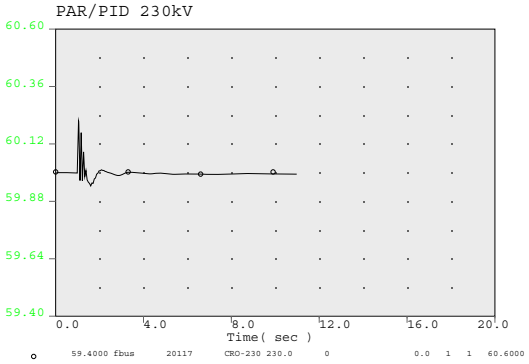
Otay Mesa 230kV



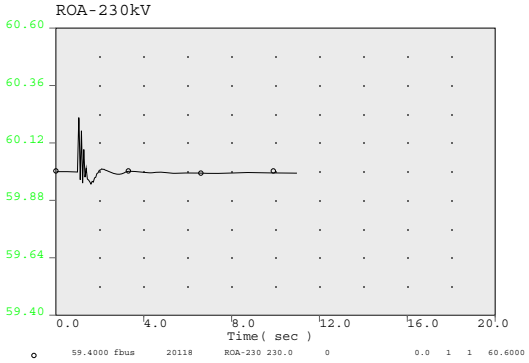
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

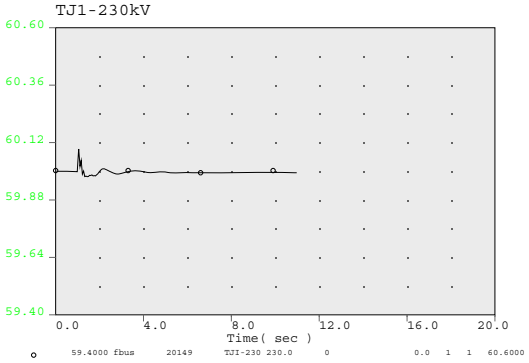
PAR/PID 230kV



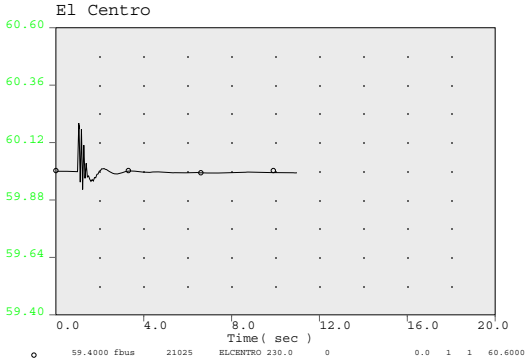
ROA-230kV



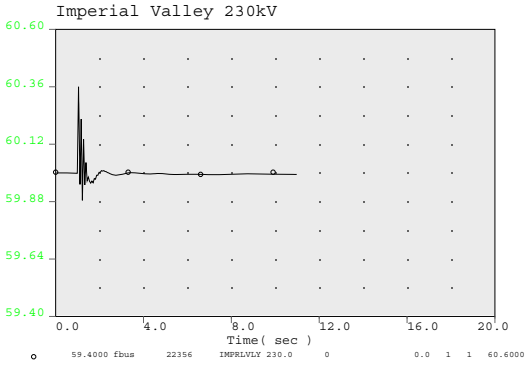
TJ1-230kV



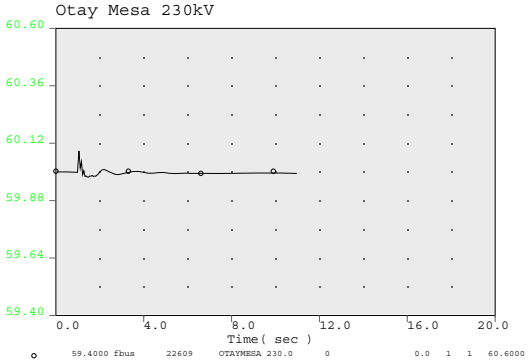
El Centro



Imperial Valley 230kV



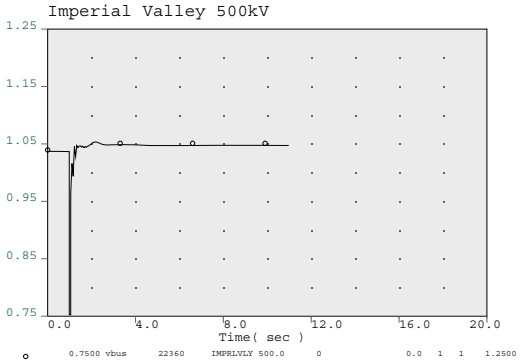
Otay Mesa 230kV



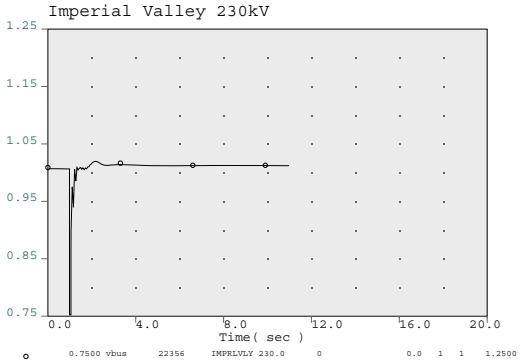
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

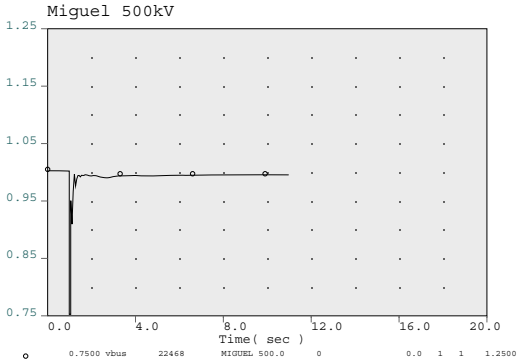
Imperial Valley 500kV



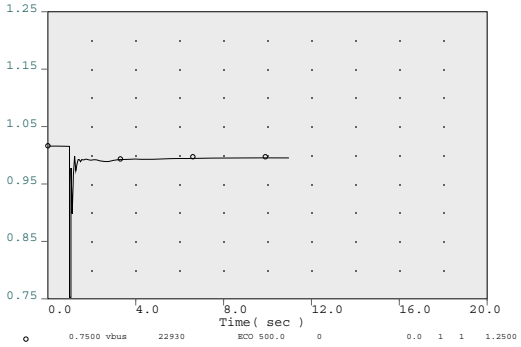
Imperial Valley 230kV



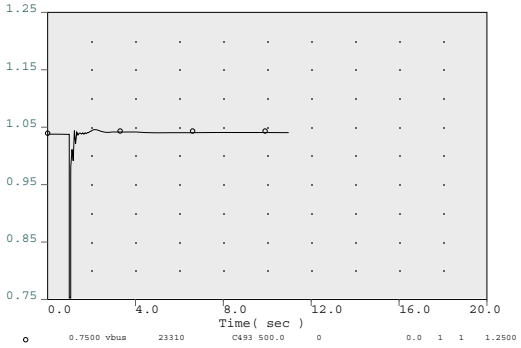
Miguel 500kV



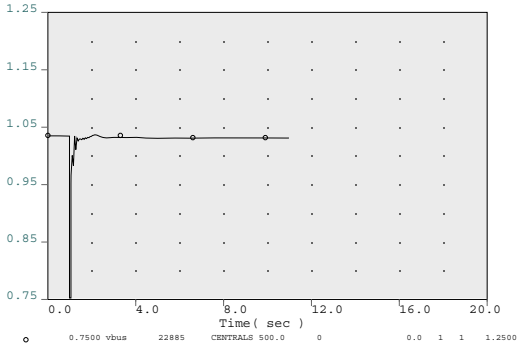
Windfarms 500



C493 500kV



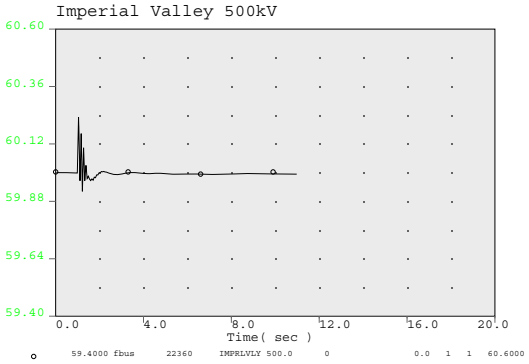
CENTRALS 500kV



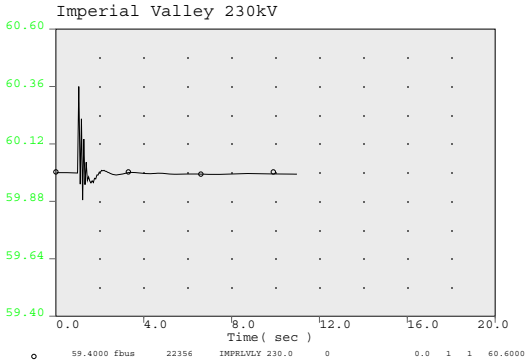
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - Frequency

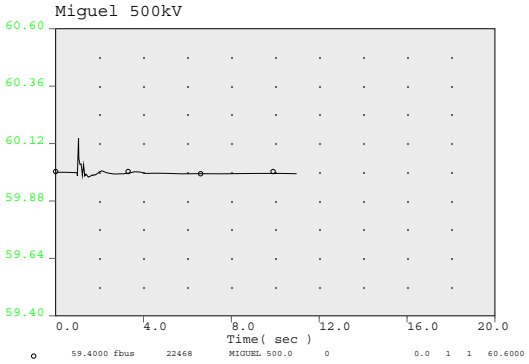
Imperial Valley 500kV



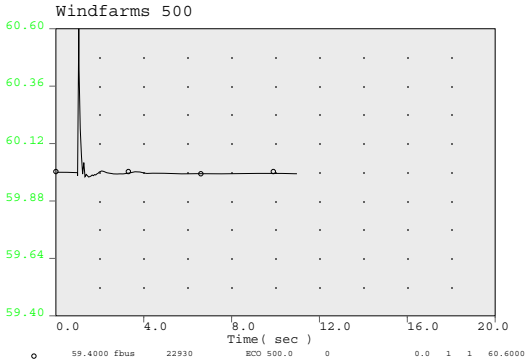
Imperial Valley 230kV



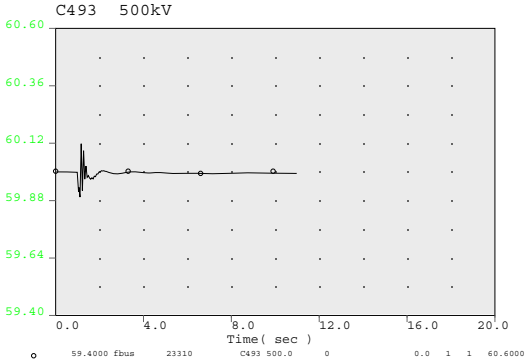
Miguel 500kV



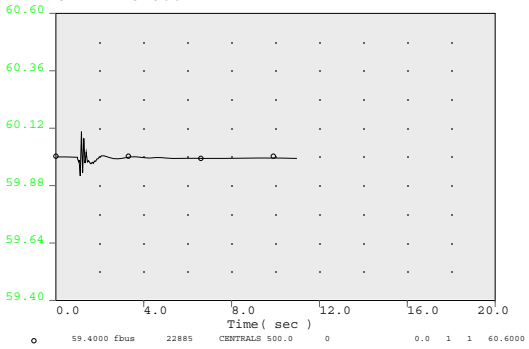
Windfarms 500



C493 500kV

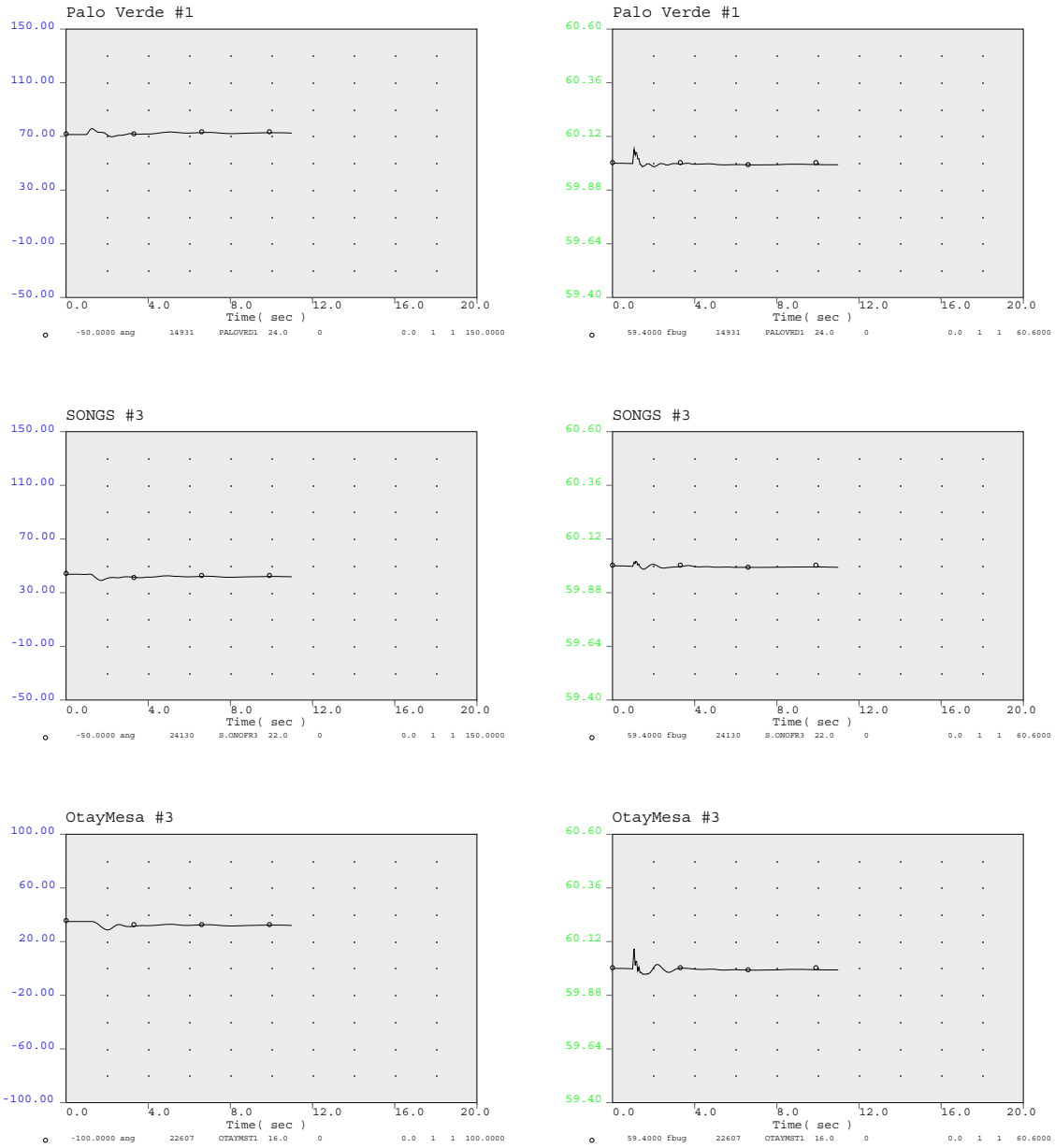


CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

RELATIVE ROTOR ANGLE & FREQUENCY

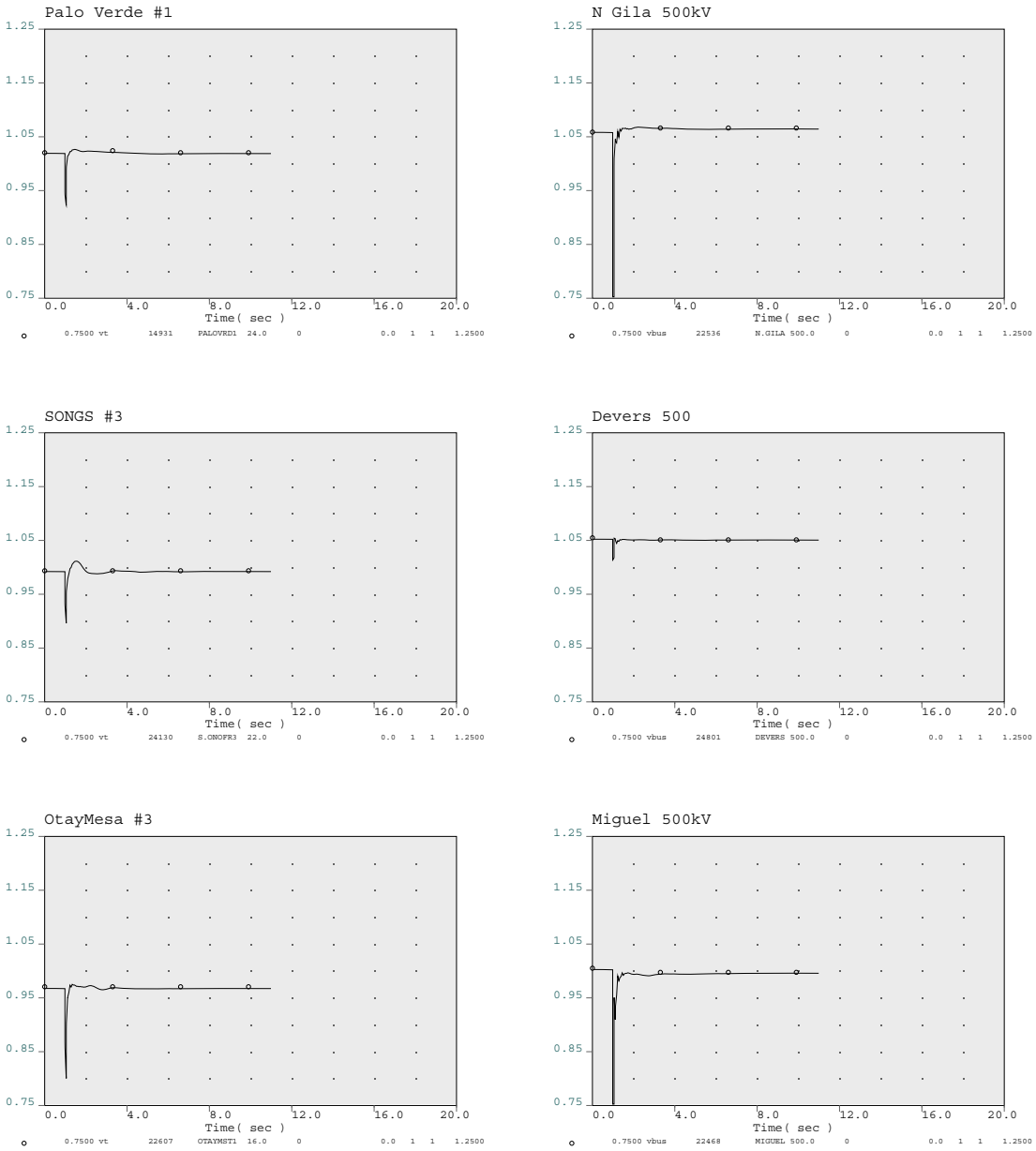


SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

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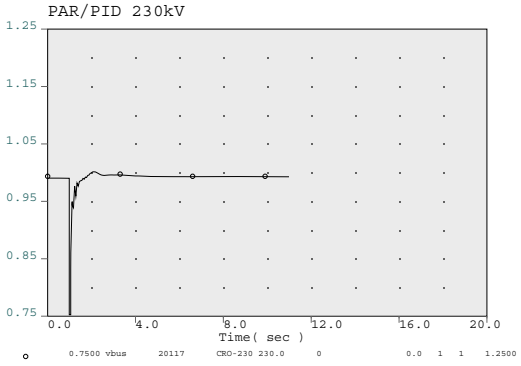
RELATIVE VOLTAGE



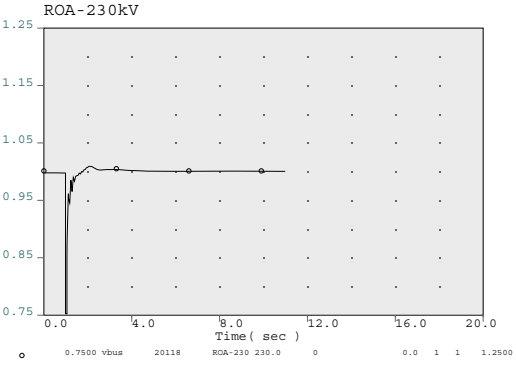
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

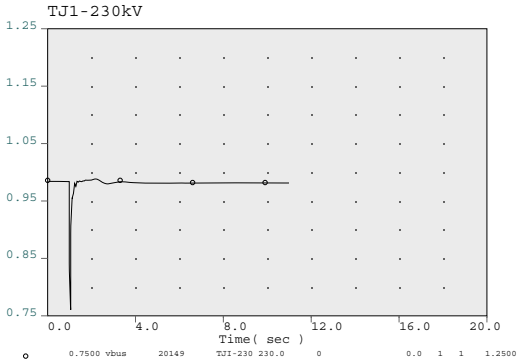
PAR/PID 230kV



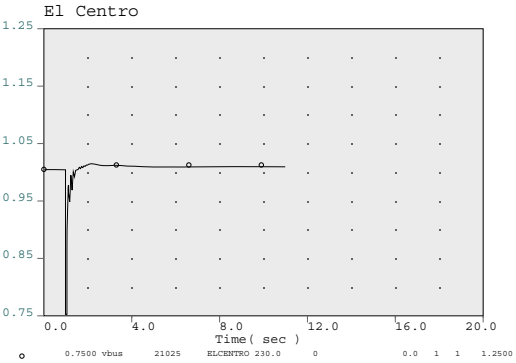
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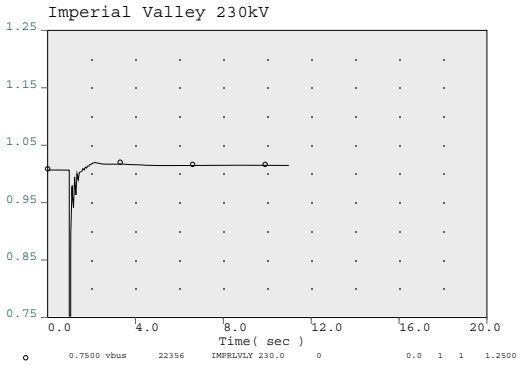
TJ1-230kV



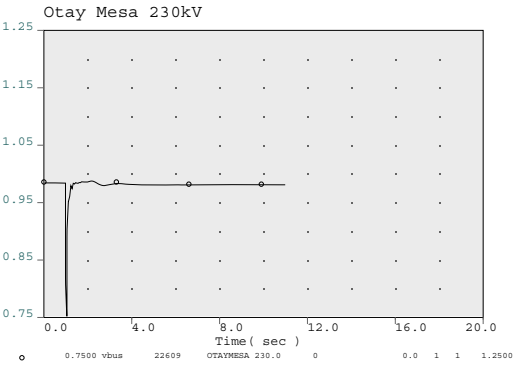
El Centro



Imperial Valley 230kV



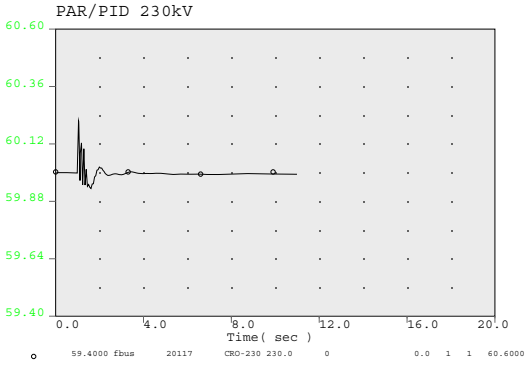
Otay Mesa 230kV



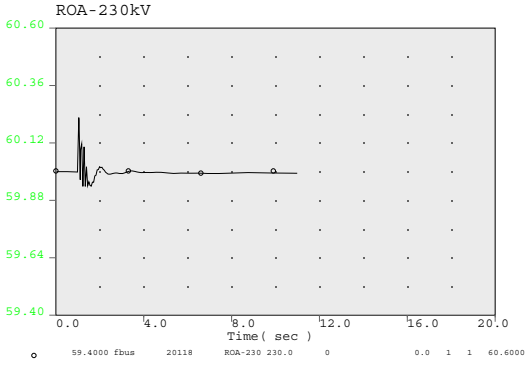
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

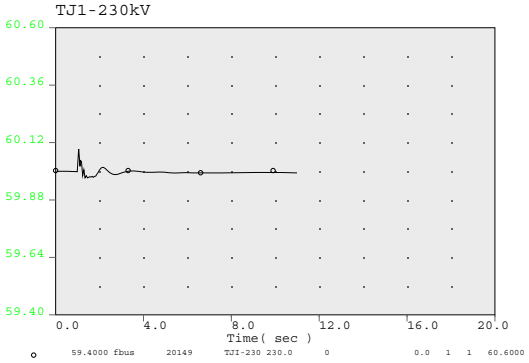
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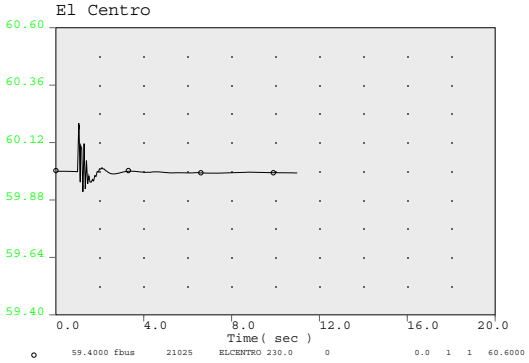
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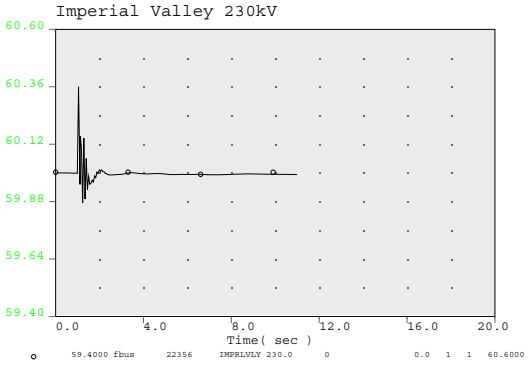
TJ1-230kV



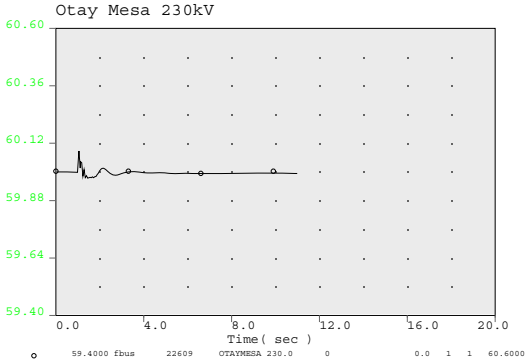
El Centro



Imperial Valley 230kV



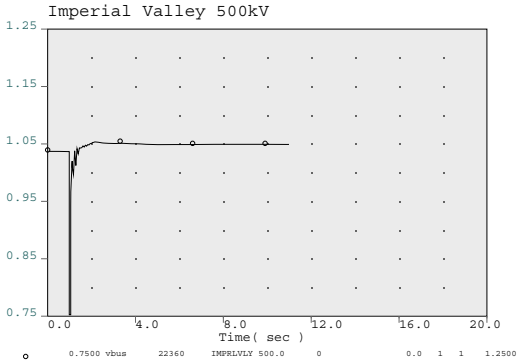
Otay Mesa 230kV



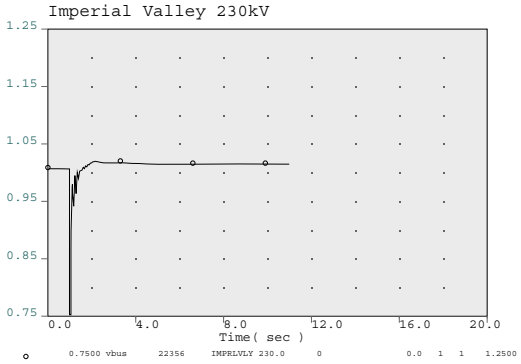
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

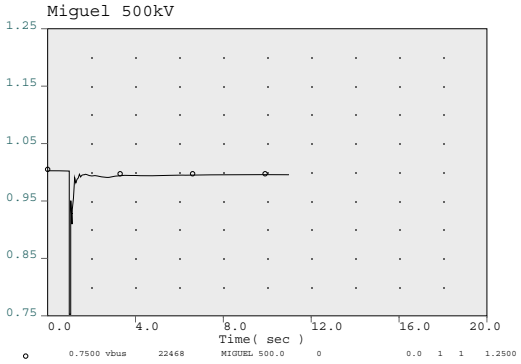
Imperial Valley 500kV



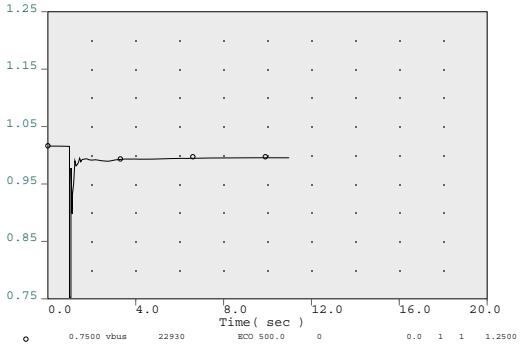
Imperial Valley 230kV



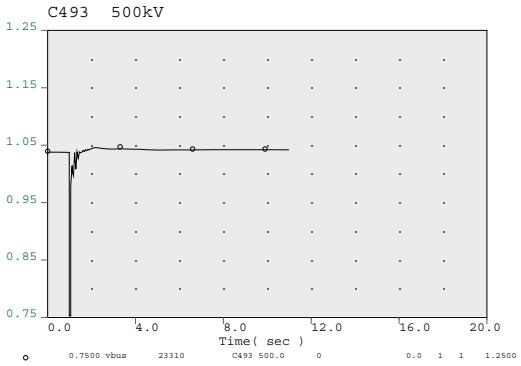
Miguel 500kV



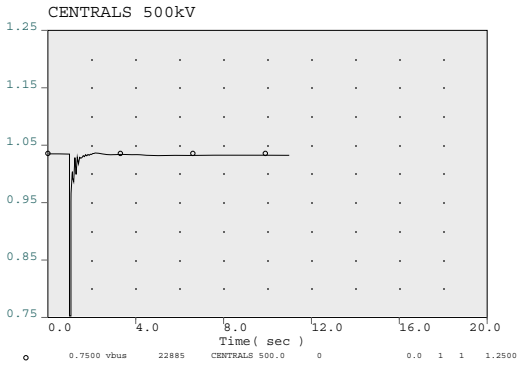
Windfarms 500



C493 500kV

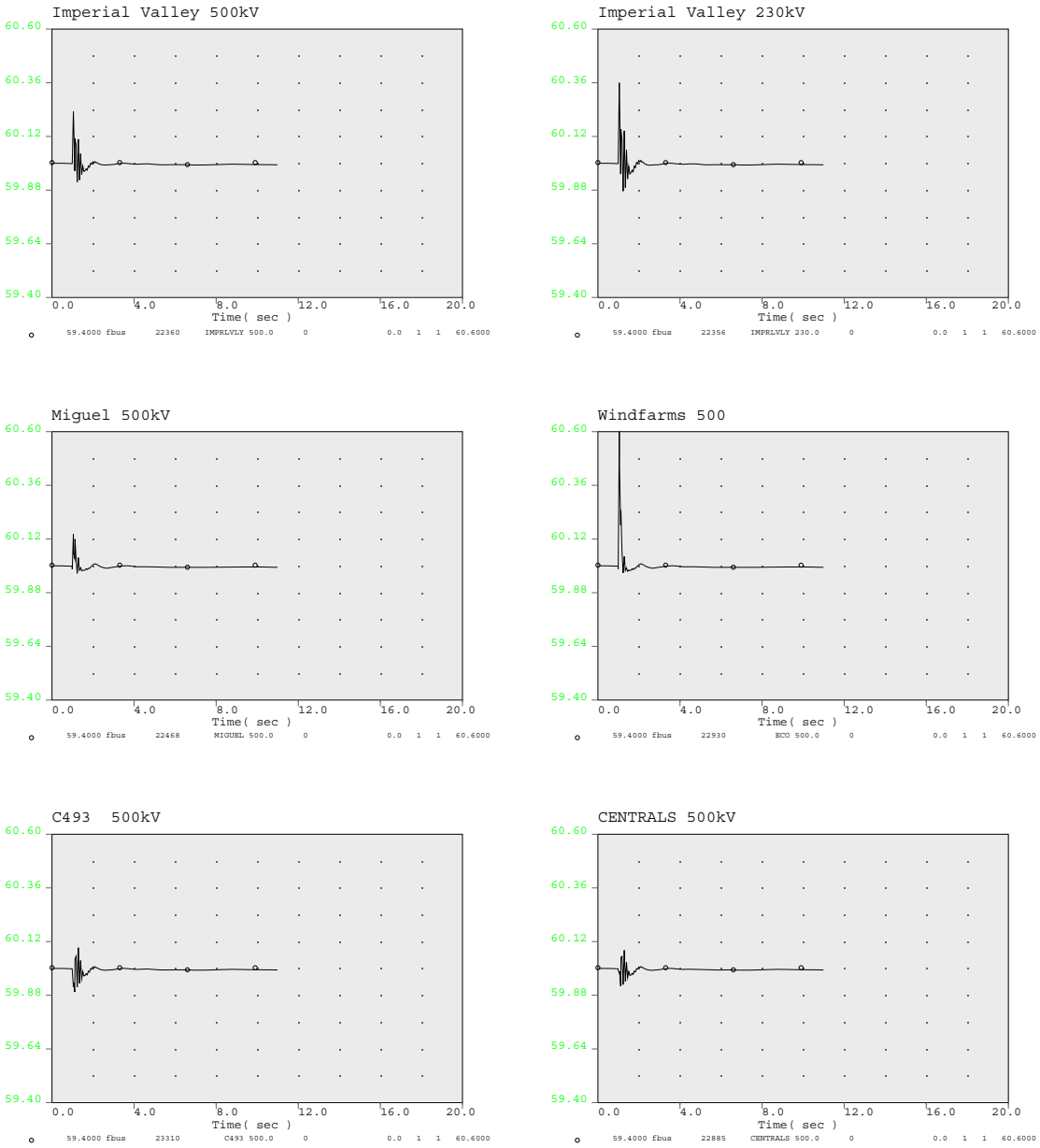


CENTRALS 500kV



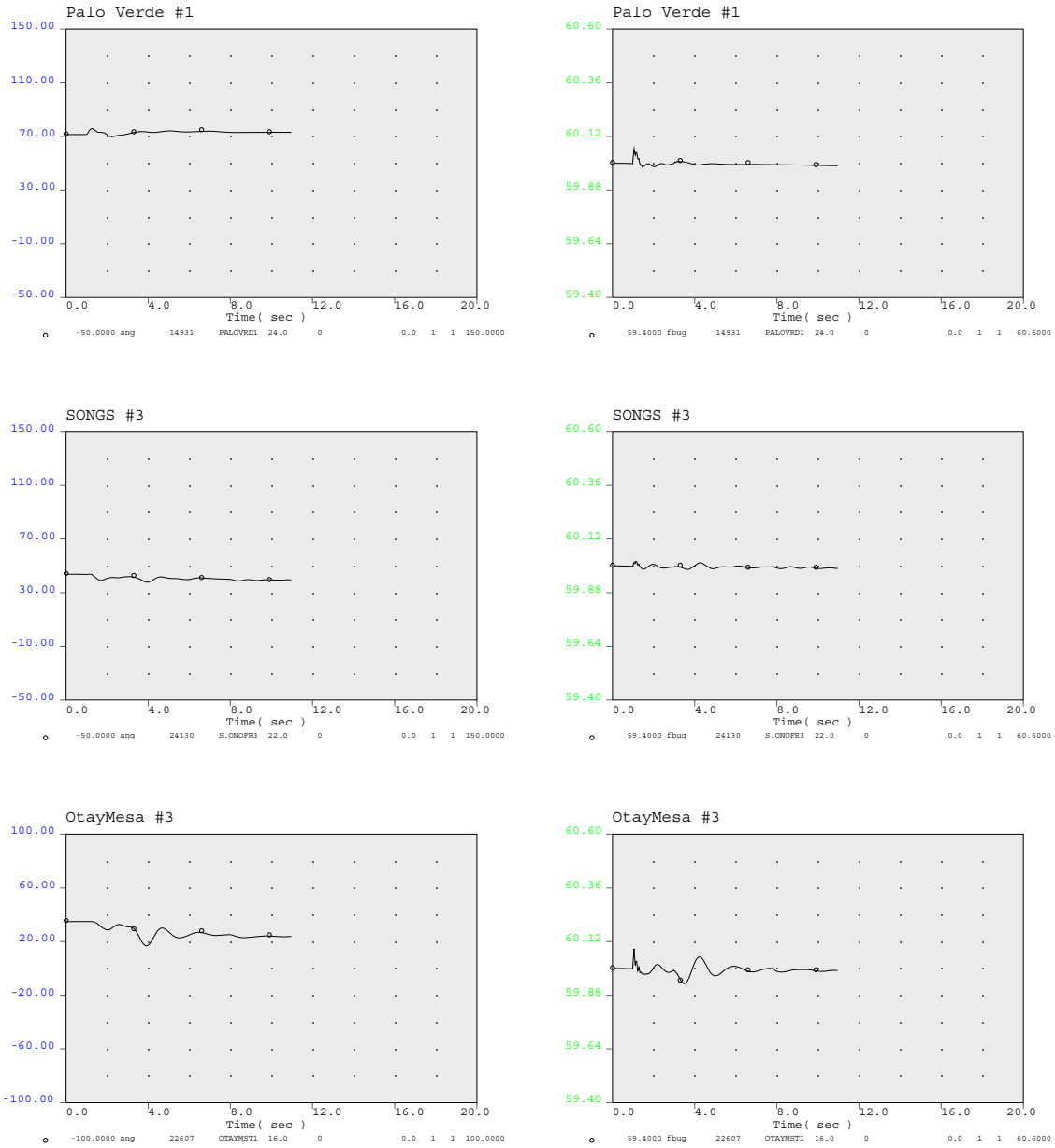
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

RELATIVE ROTOR ANGLE & FREQUENCY

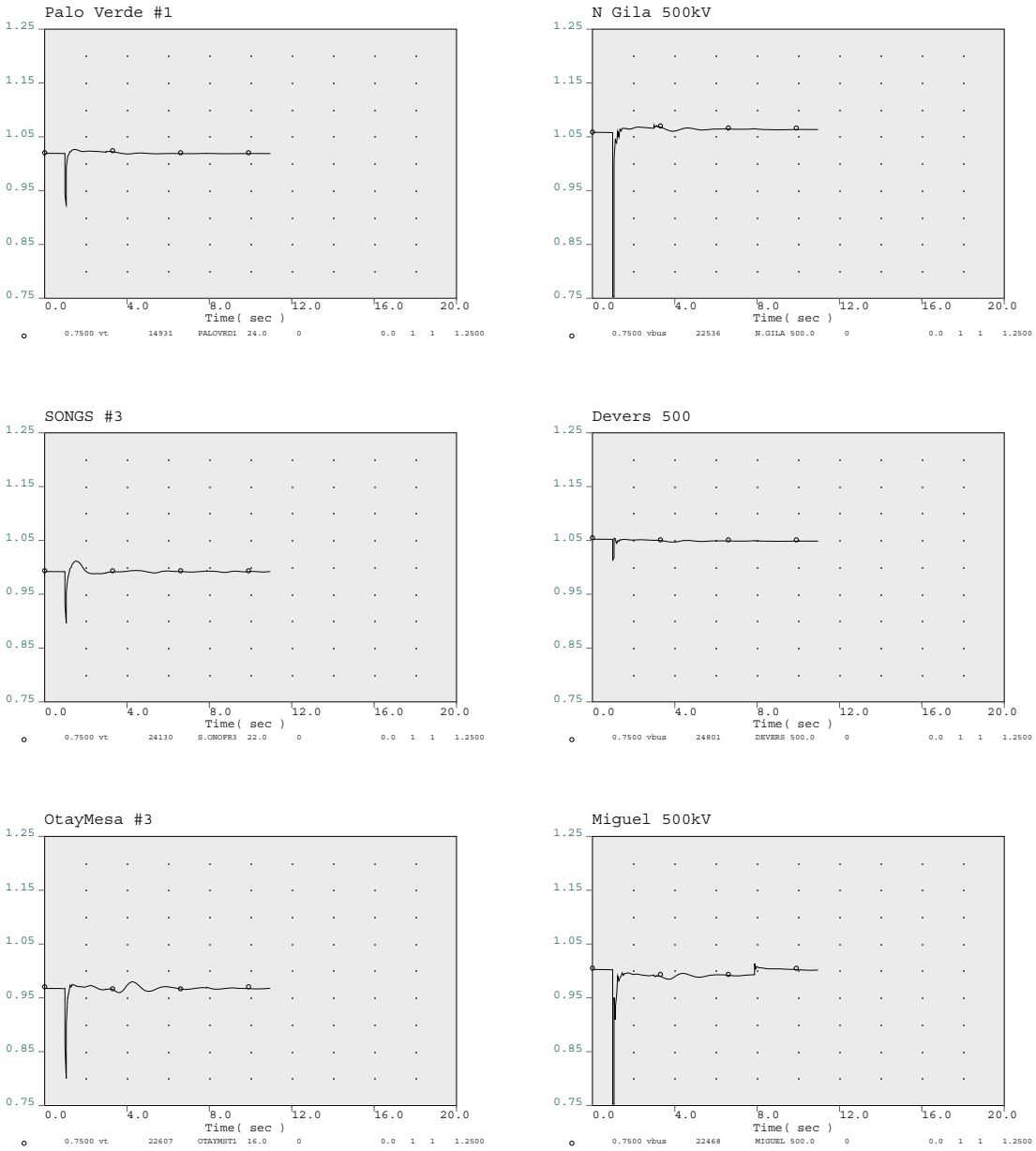


SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

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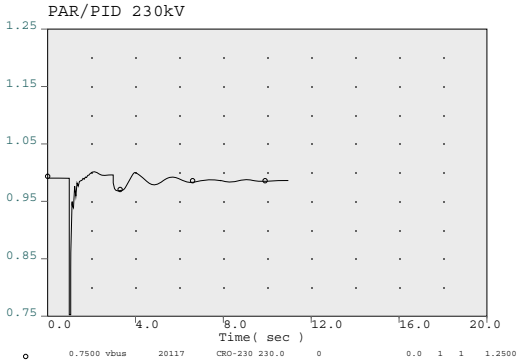
RELATIVE VOLTAGE



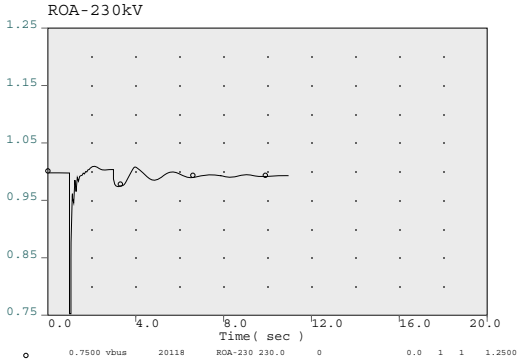
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

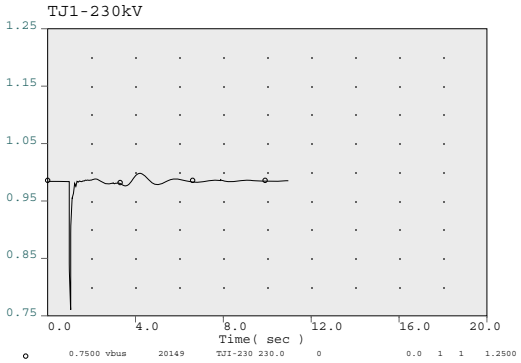
PAR/PID 230kV



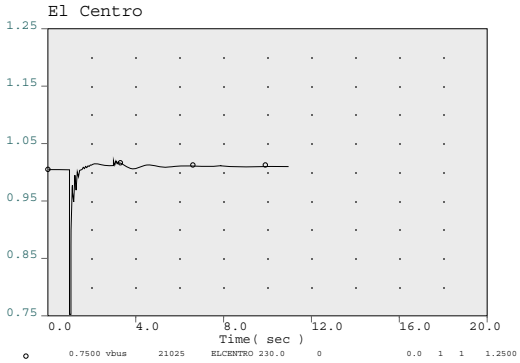
ROA-230kV



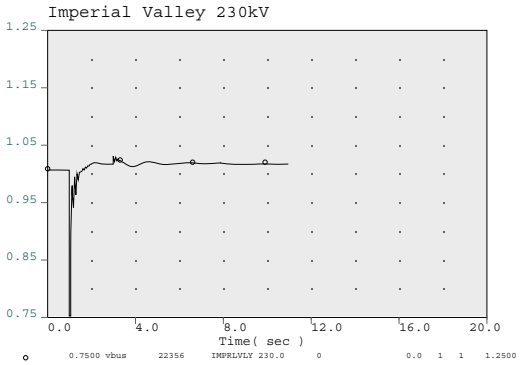
TJ1-230kV



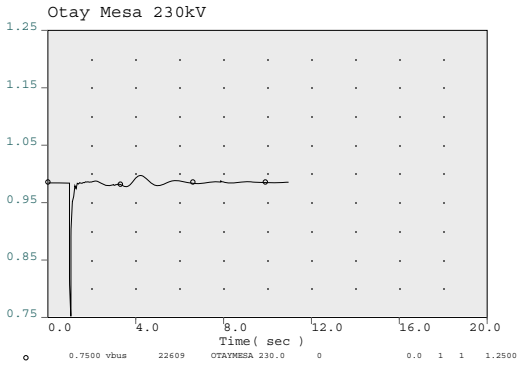
El Centro



Imperial Valley 230kV



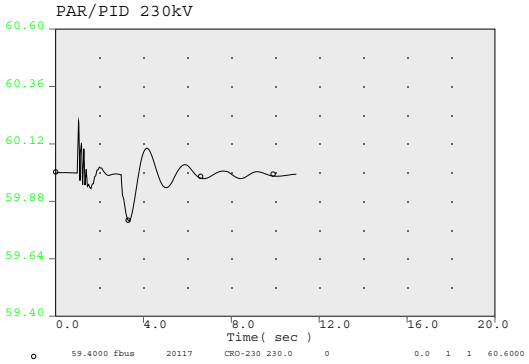
Otay Mesa 230kV



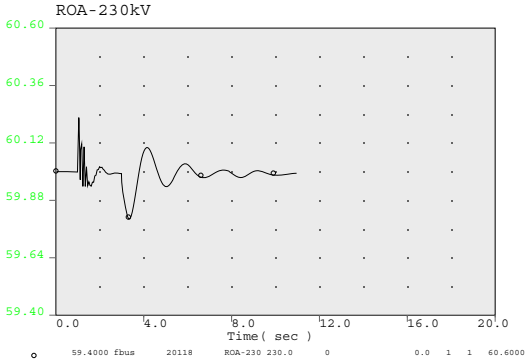
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

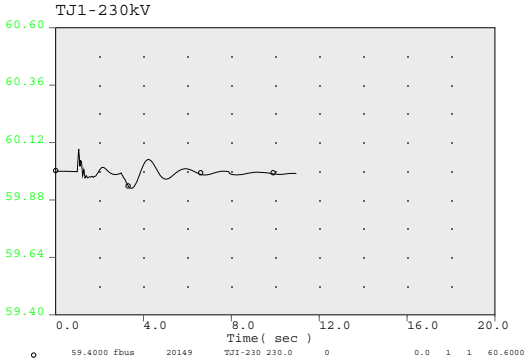
PAR/PID 230kV



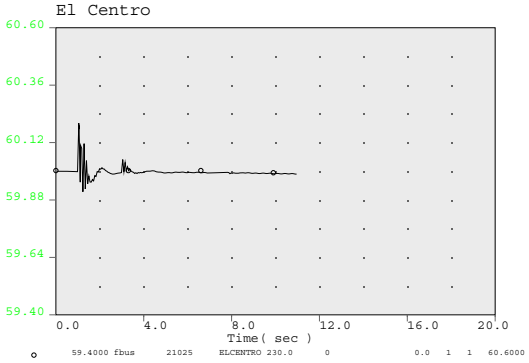
ROA-230kV



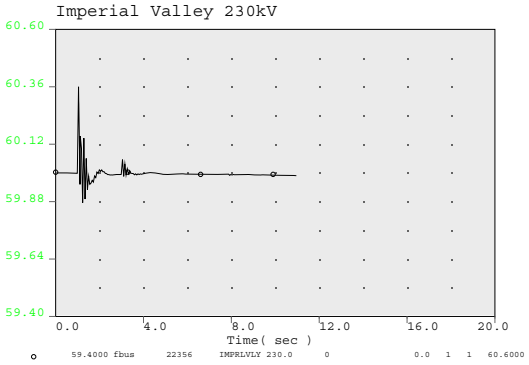
TJ1-230kV



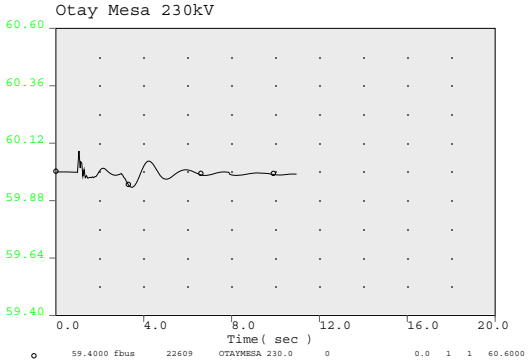
El Centro



Imperial Valley 230kV



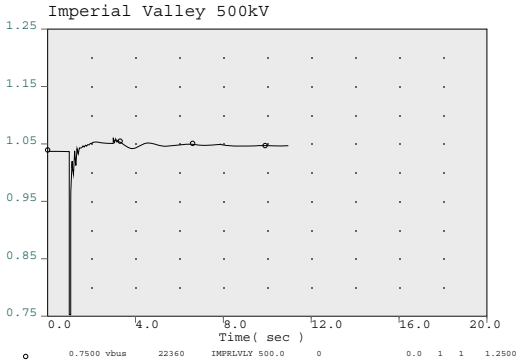
Otay Mesa 230kV



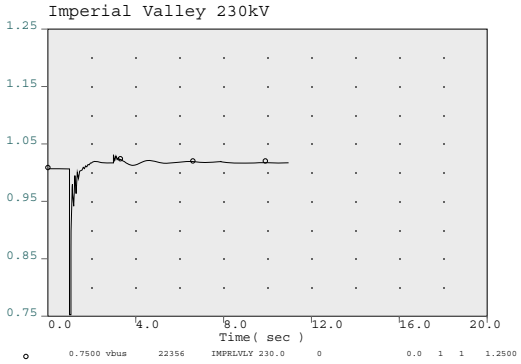
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

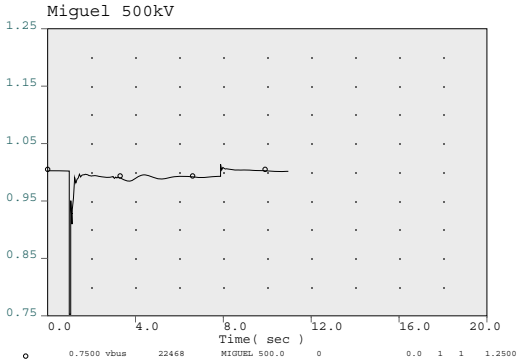
Imperial Valley 500kV



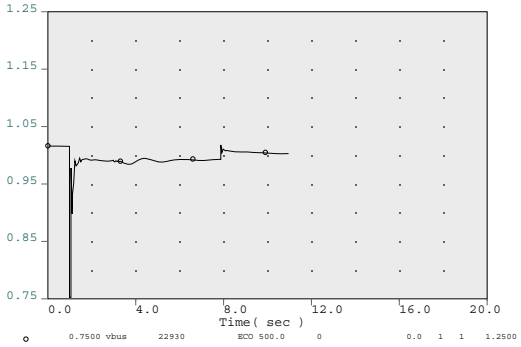
Imperial Valley 230kV



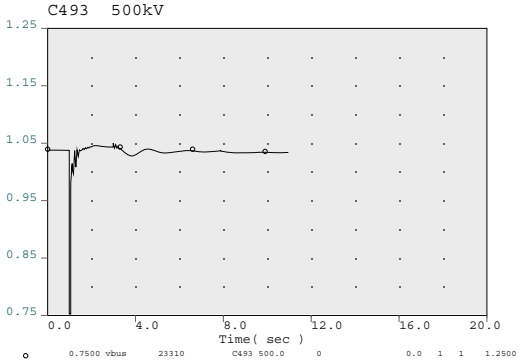
Miguel 500kV



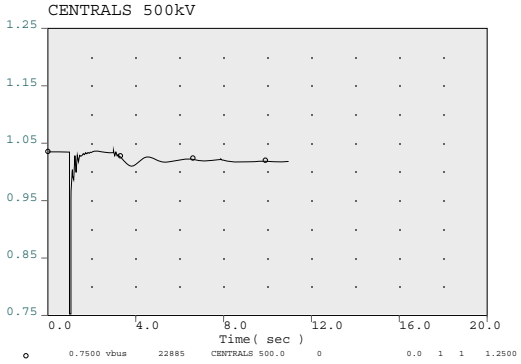
Windfarms 500



C493 500kV



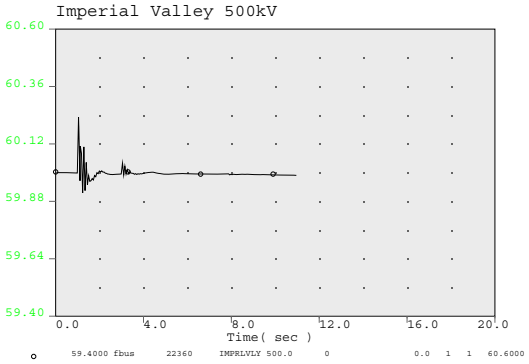
CENTRALS 500kV



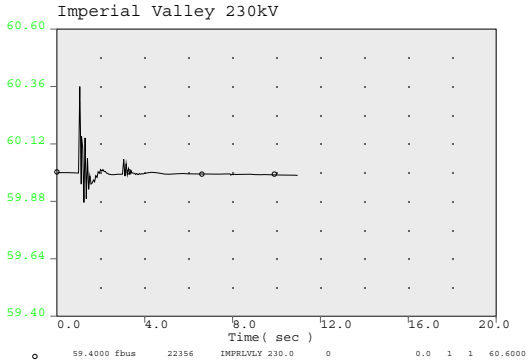
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - Frequency

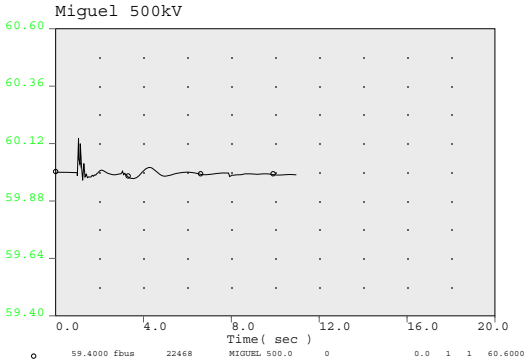
Imperial Valley 500kV



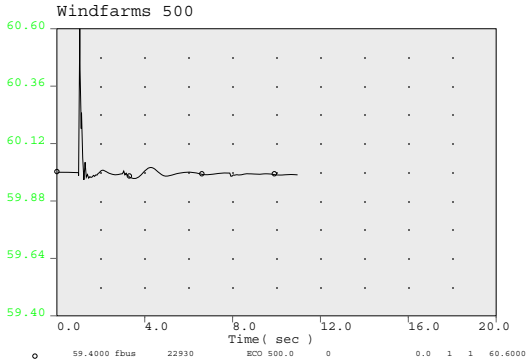
Imperial Valley 230kV



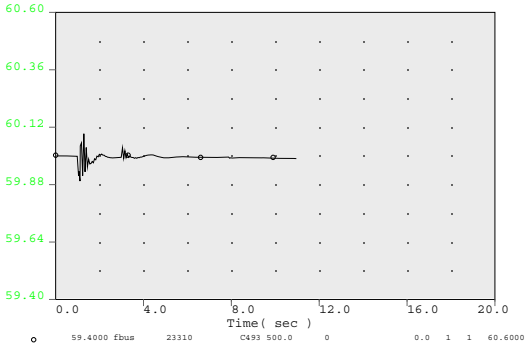
Miguel 500kV



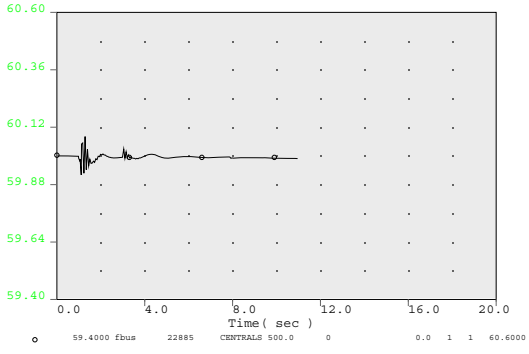
Windfarms 500



C493 500kV

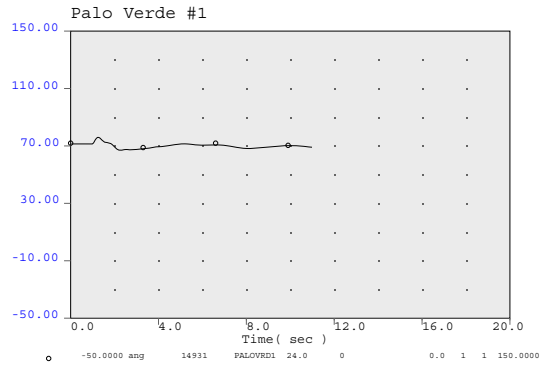


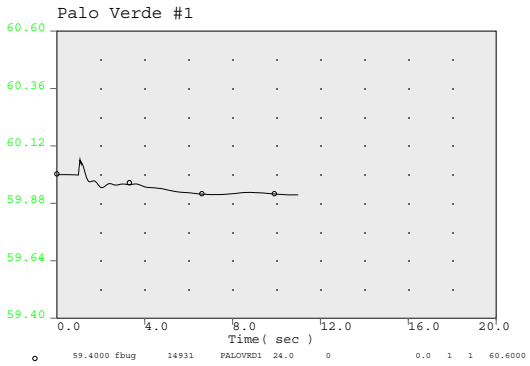
CENTRALS 500kV

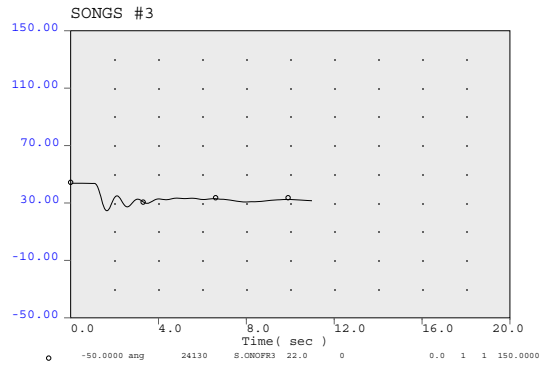


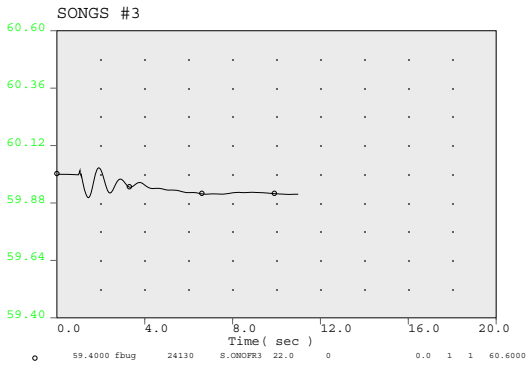
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

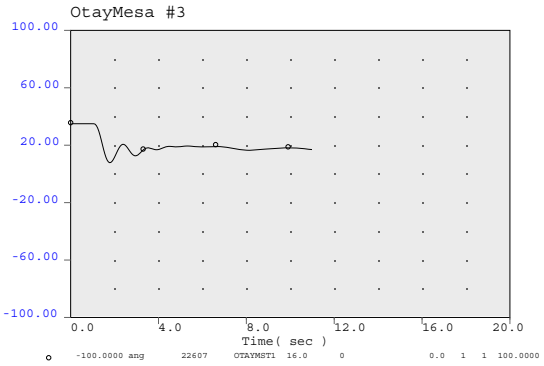
RELATIVE ROTOR ANGLE & FREQUENCY

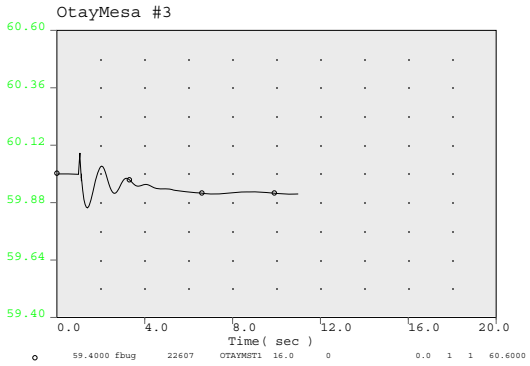










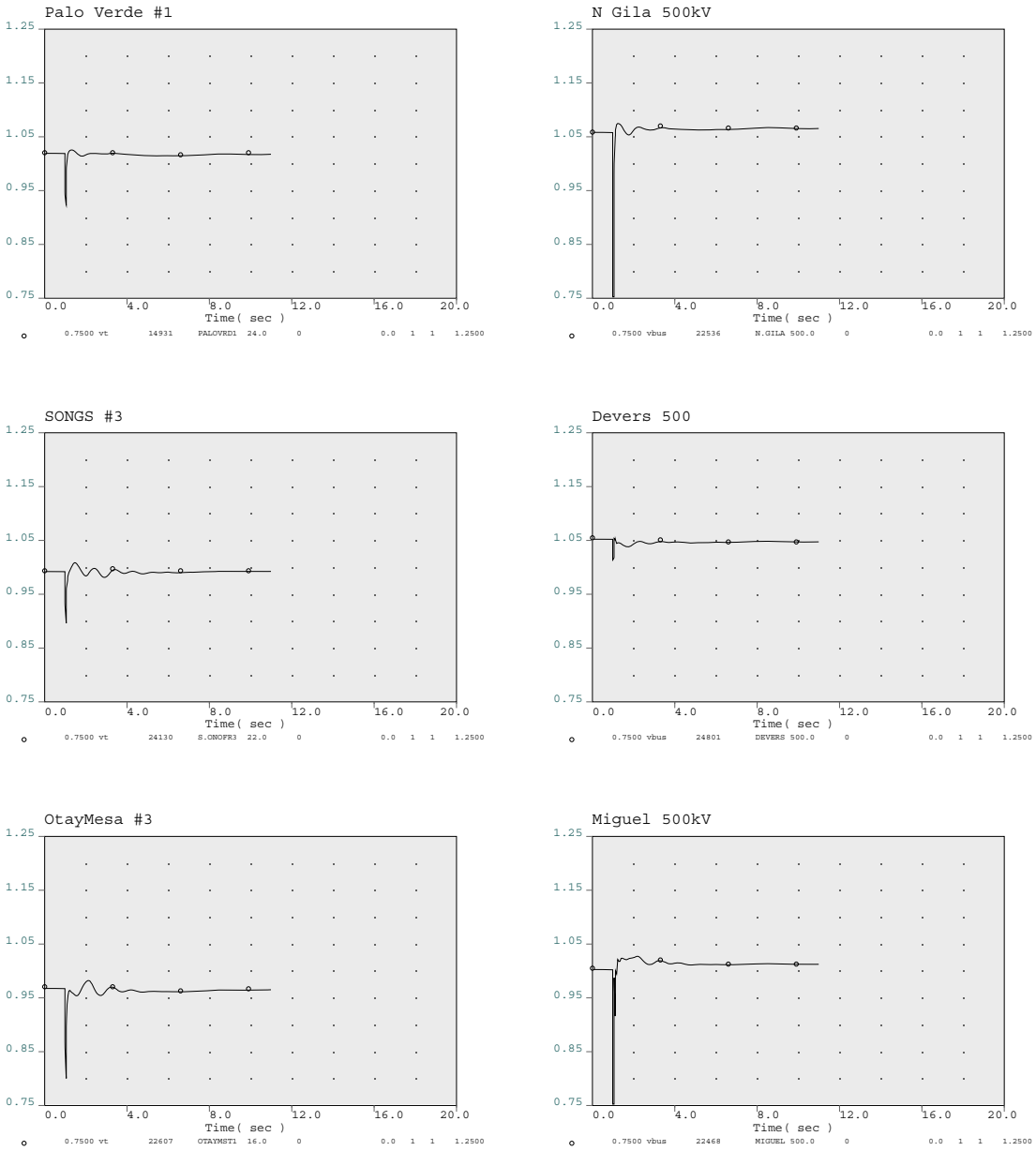


SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Page 1

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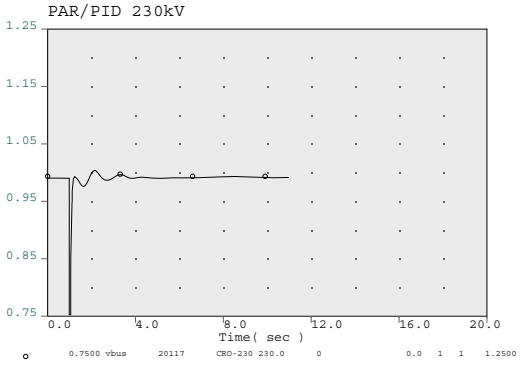
RELATIVE VOLTAGE



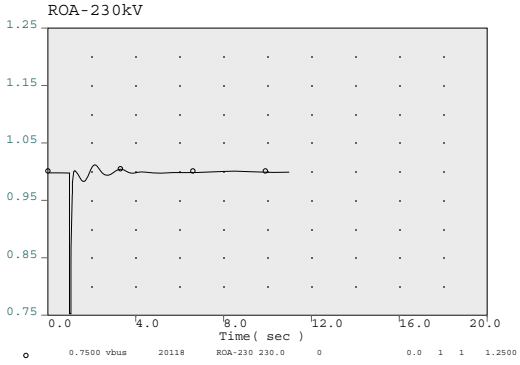
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Affected System Voltage Check and Comparison

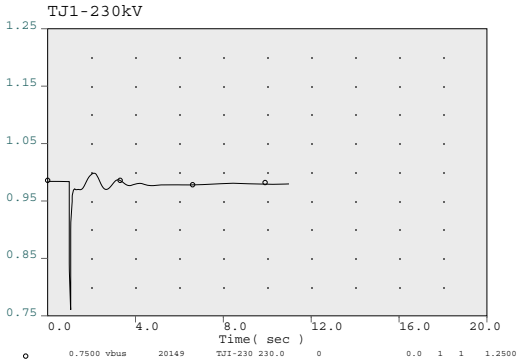
PAR/PID 230kV



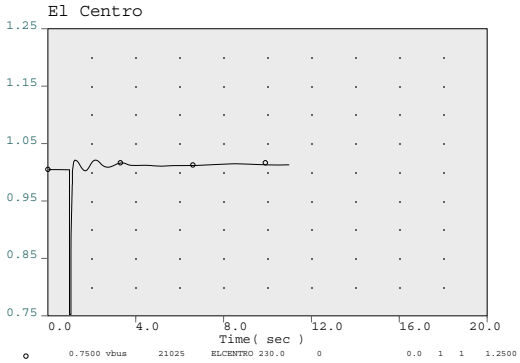
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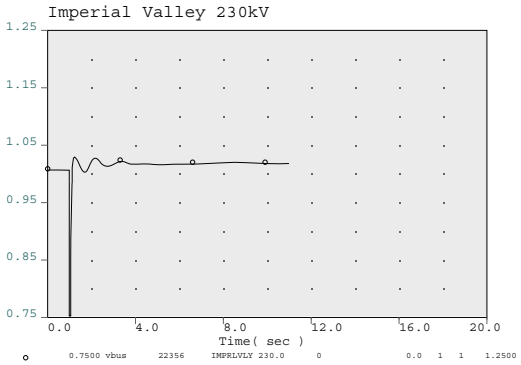
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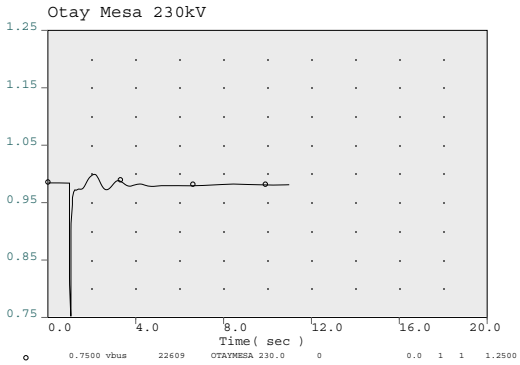
El Centro



Imperial Valley 230kV



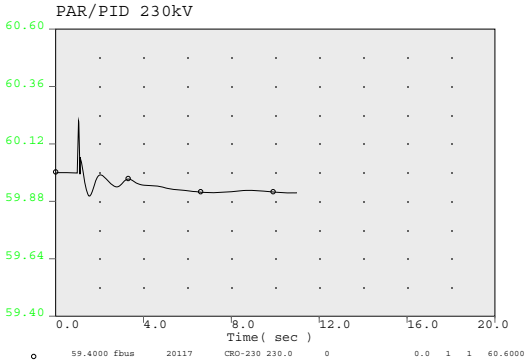
Otay Mesa 230kV



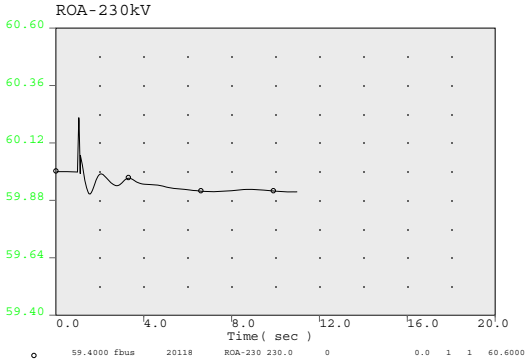
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Affected System Frequency Check and Comparison

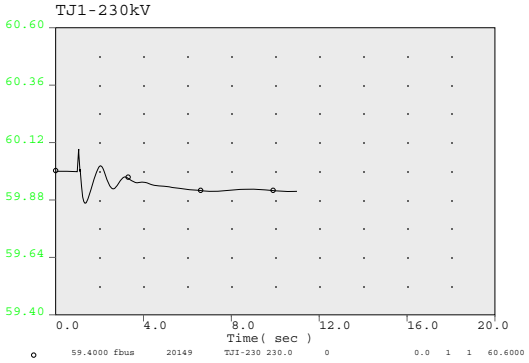
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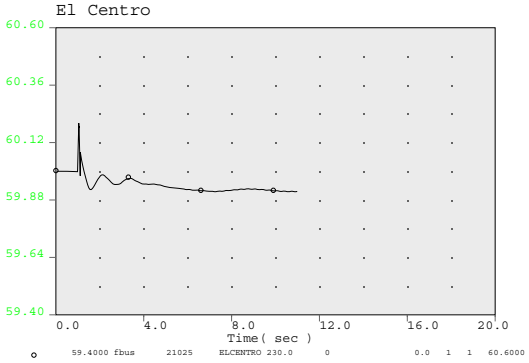
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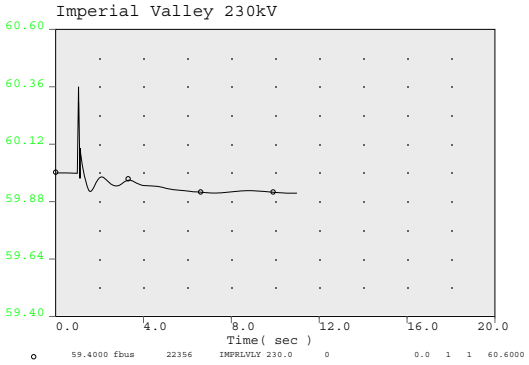
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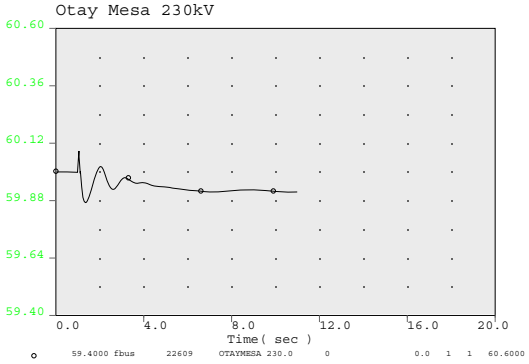
El Centro



Imperial Valley 230kV



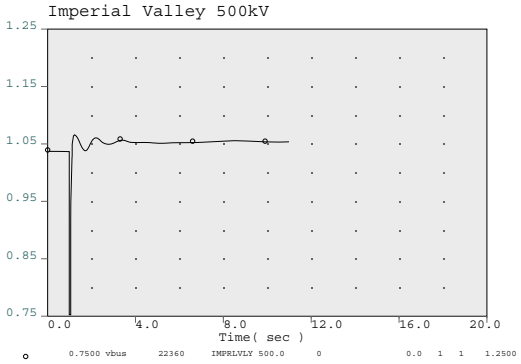
Otay Mesa 230kV



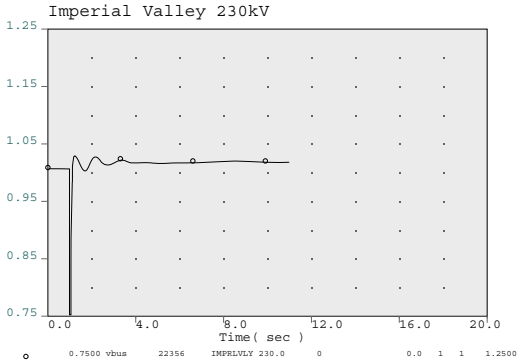
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Imperial Valley Area - VOLTAGE

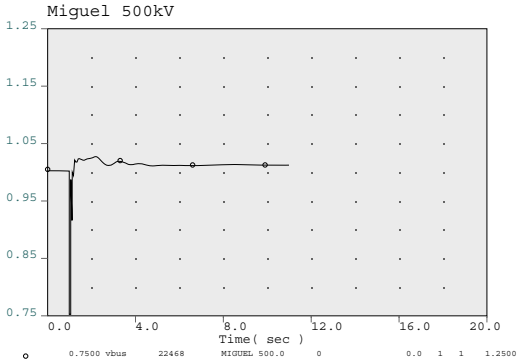
Imperial Valley 500kV



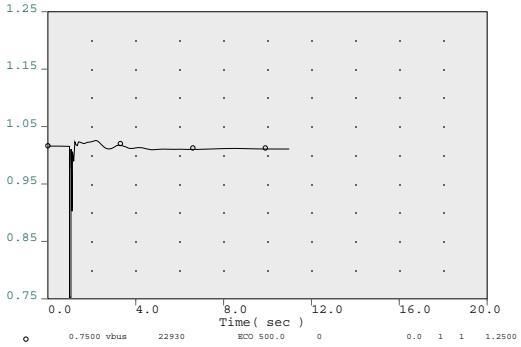
Imperial Valley 230kV



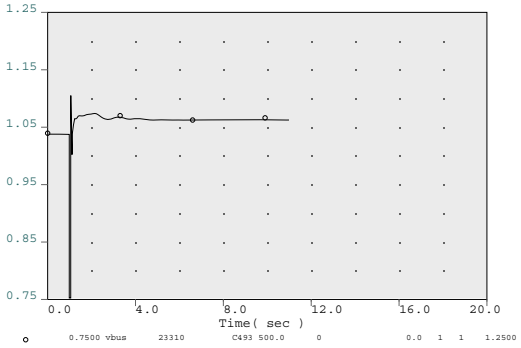
Miguel 500kV



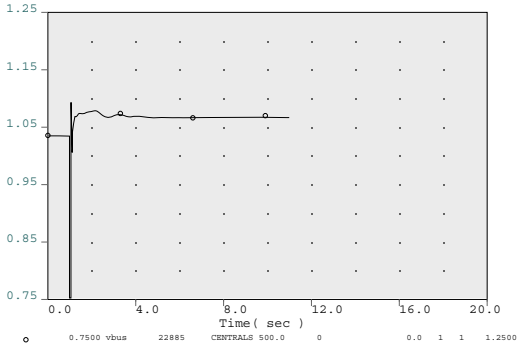
Windfarms 500



C493 500kV

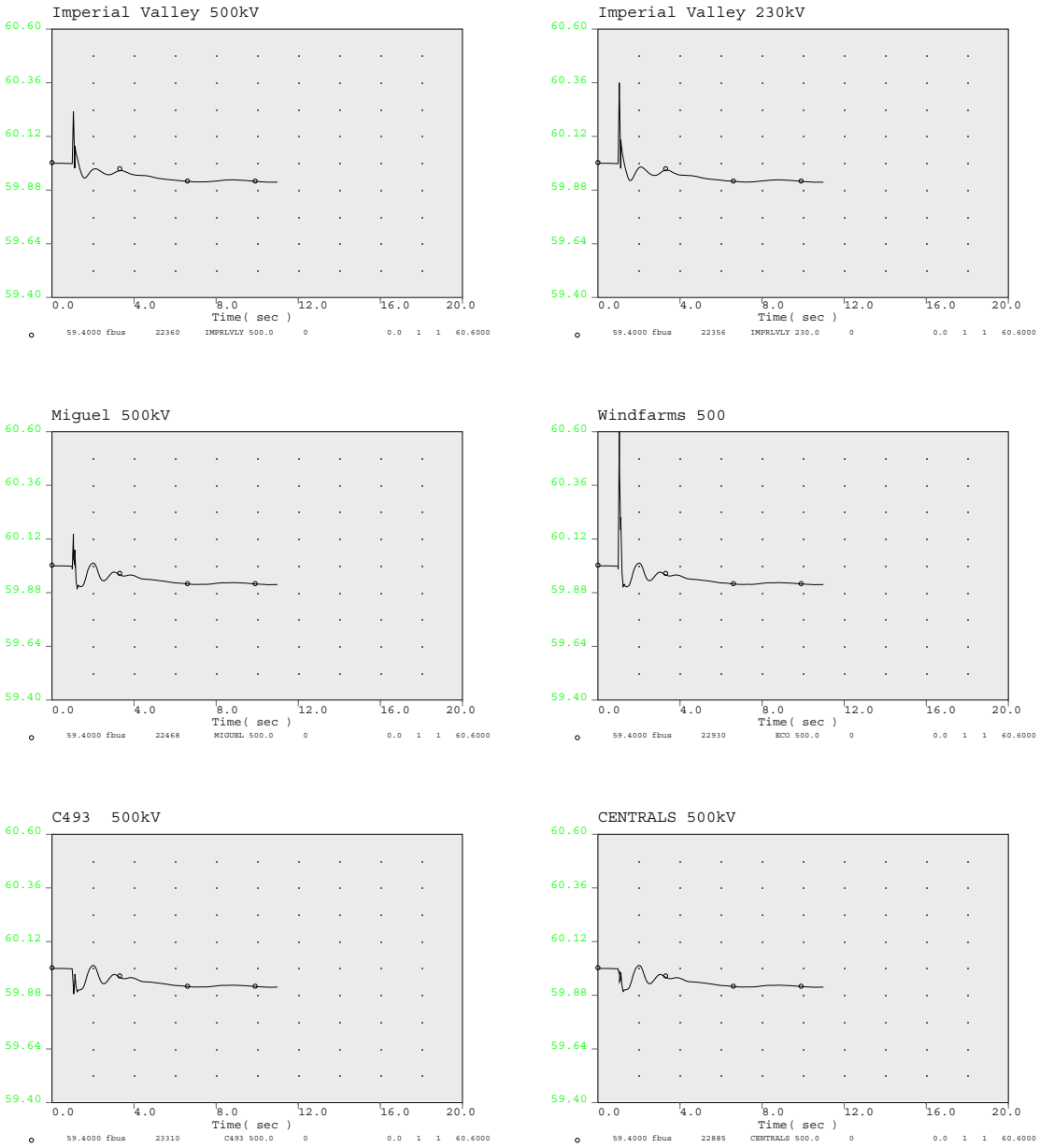


CENTRALS 500kV



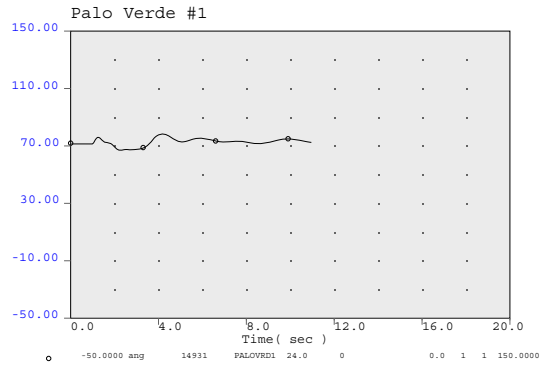
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

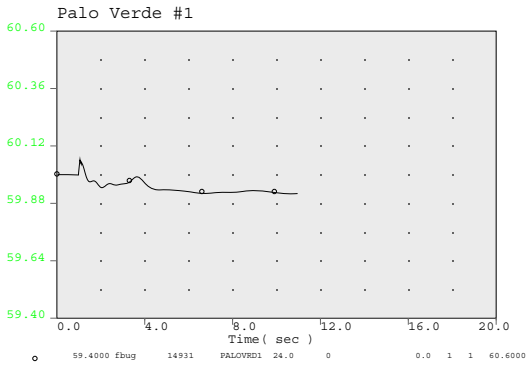
Imperial Valley Area - Frequency

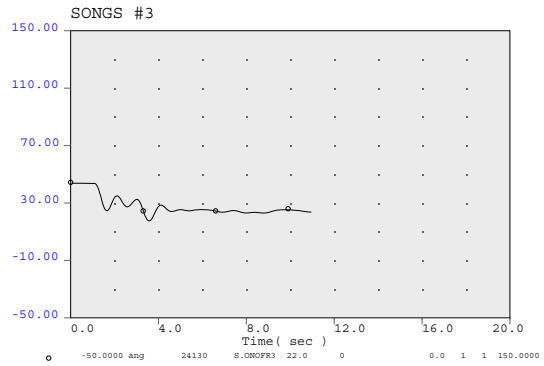


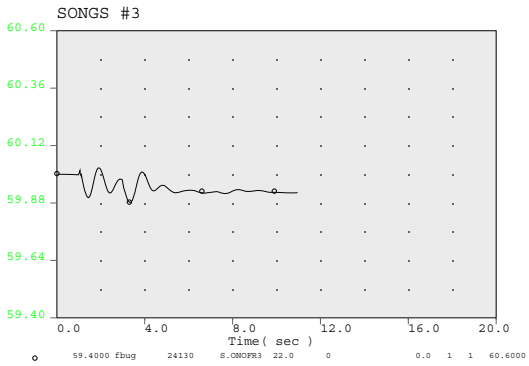
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

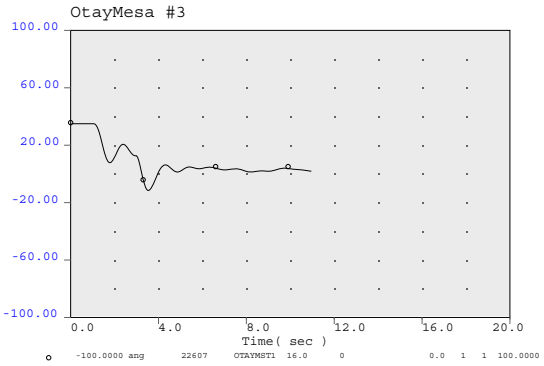
RELATIVE ROTOR ANGLE & FREQUENCY

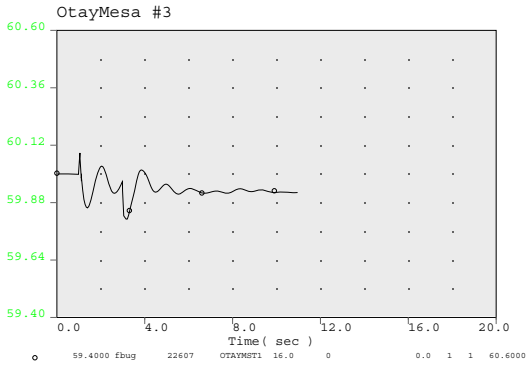










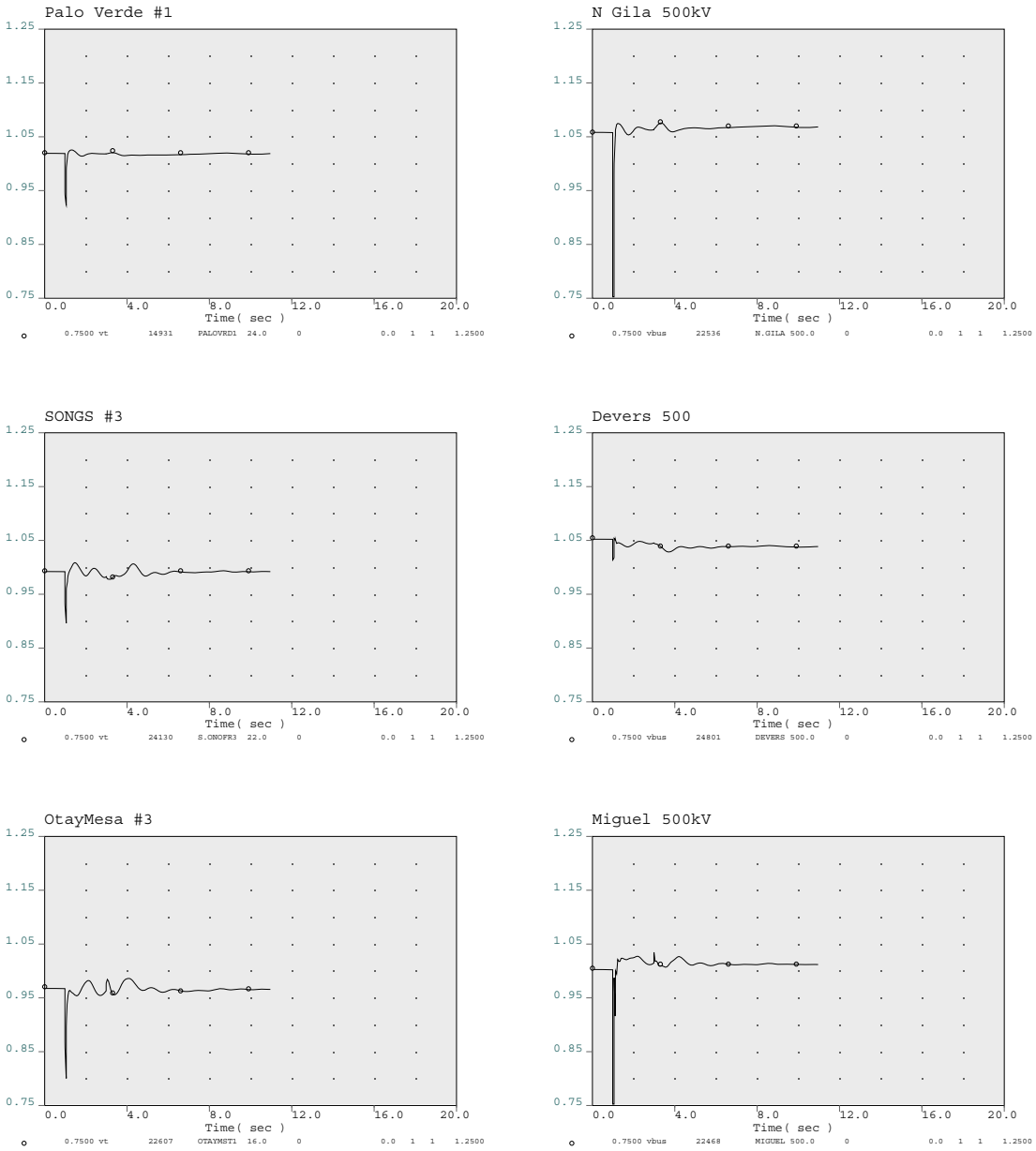


SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Page 1

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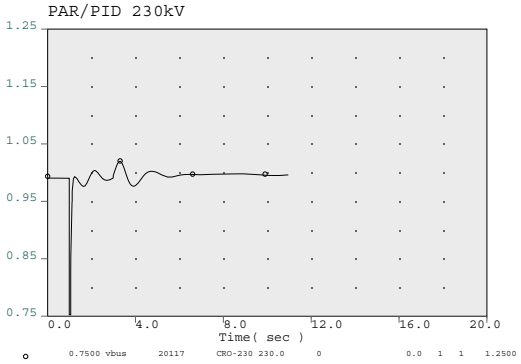
RELATIVE VOLTAGE



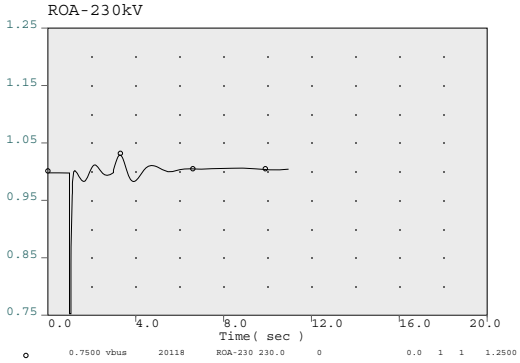
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Affected System Voltage Check and Comparison

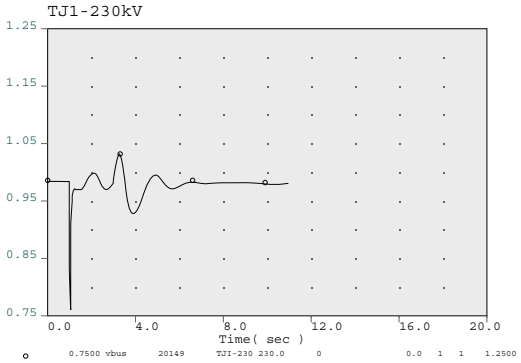
PAR/PID 230kV



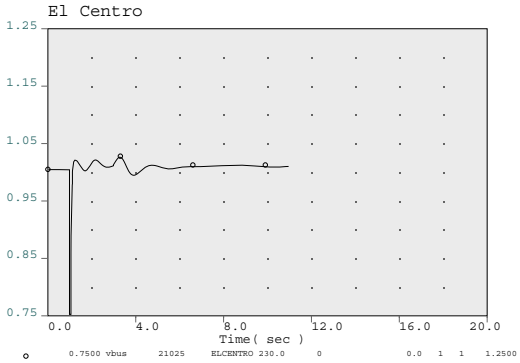
ROA-230kV



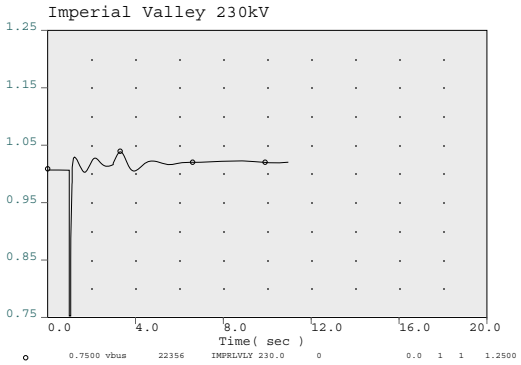
TJ1-230kV



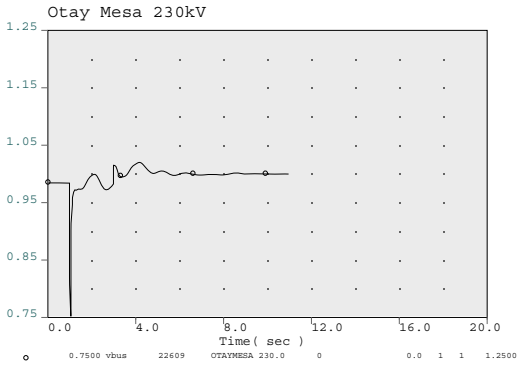
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



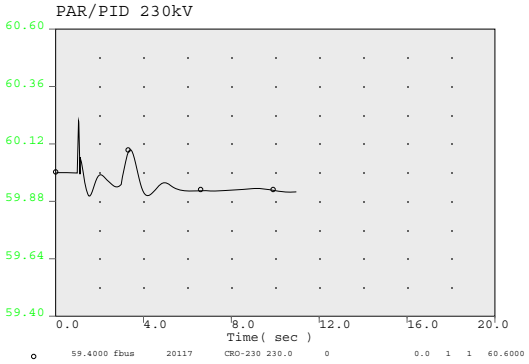
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Page 3

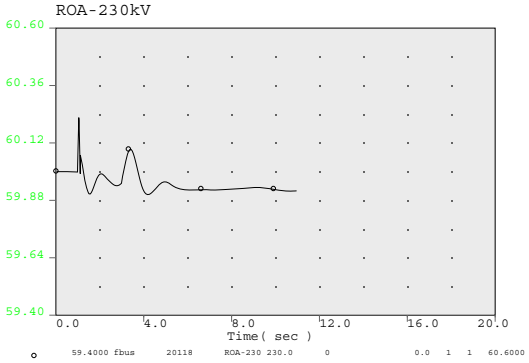
SDGE	IV_Wnd_dlo_RxR_pre_iv4_hs.chf	p_i\hs\pre_iv4\ws_pre_iv4 Wed Oct 13 15:41:33 2010

Affected System Frequency Check and Comparison

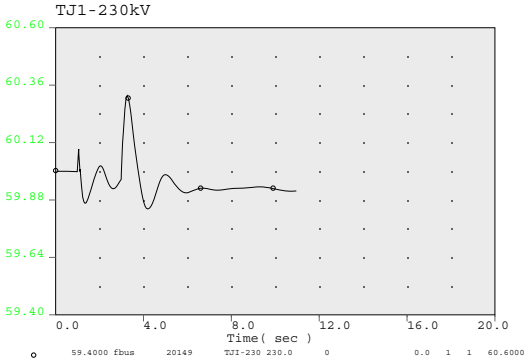
PAR/PID 230kV



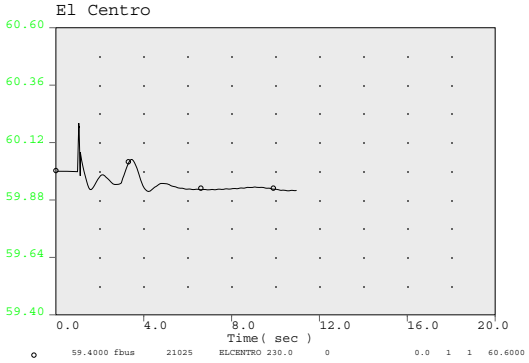
ROA-230kV



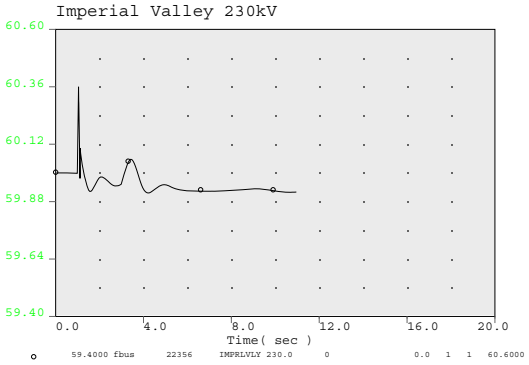
TJ1-230kV



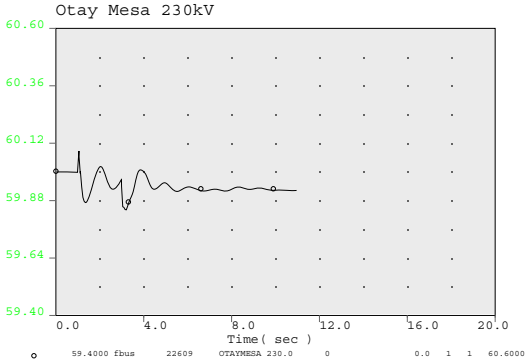
El Centro



Imperial Valley 230kV

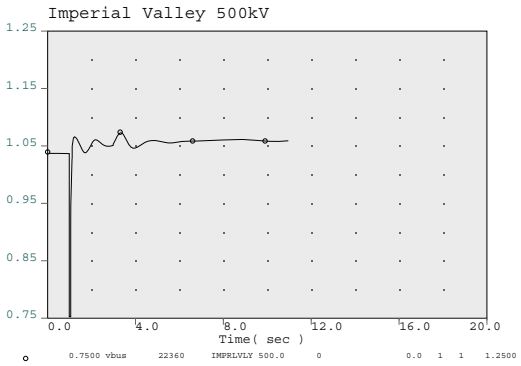


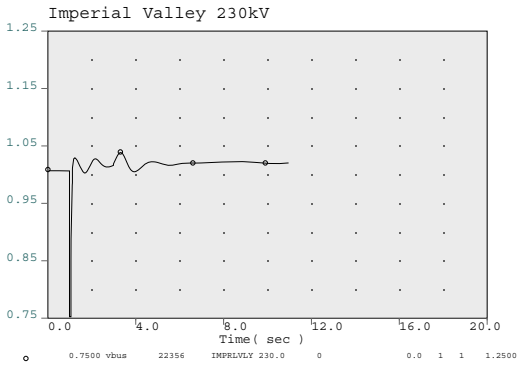
Otay Mesa 230kV

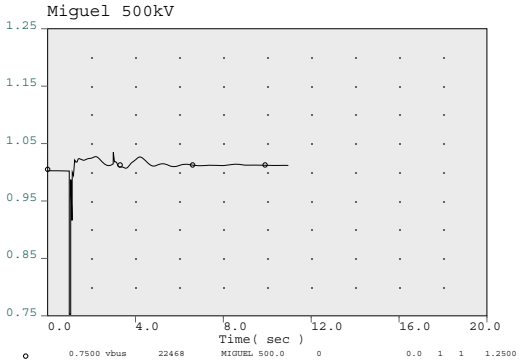


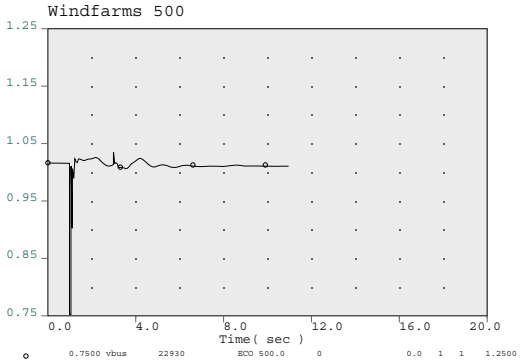
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

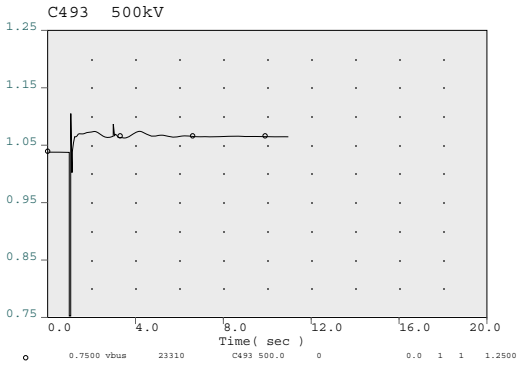
Imperial Valley Area - VOLTAGE

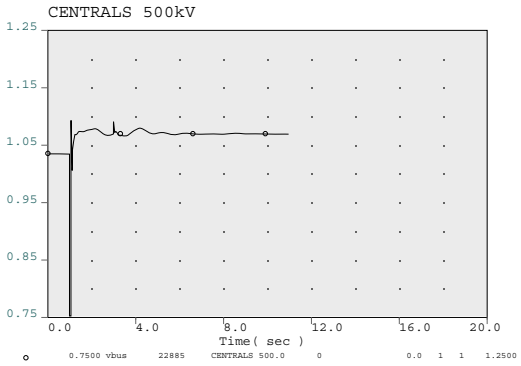






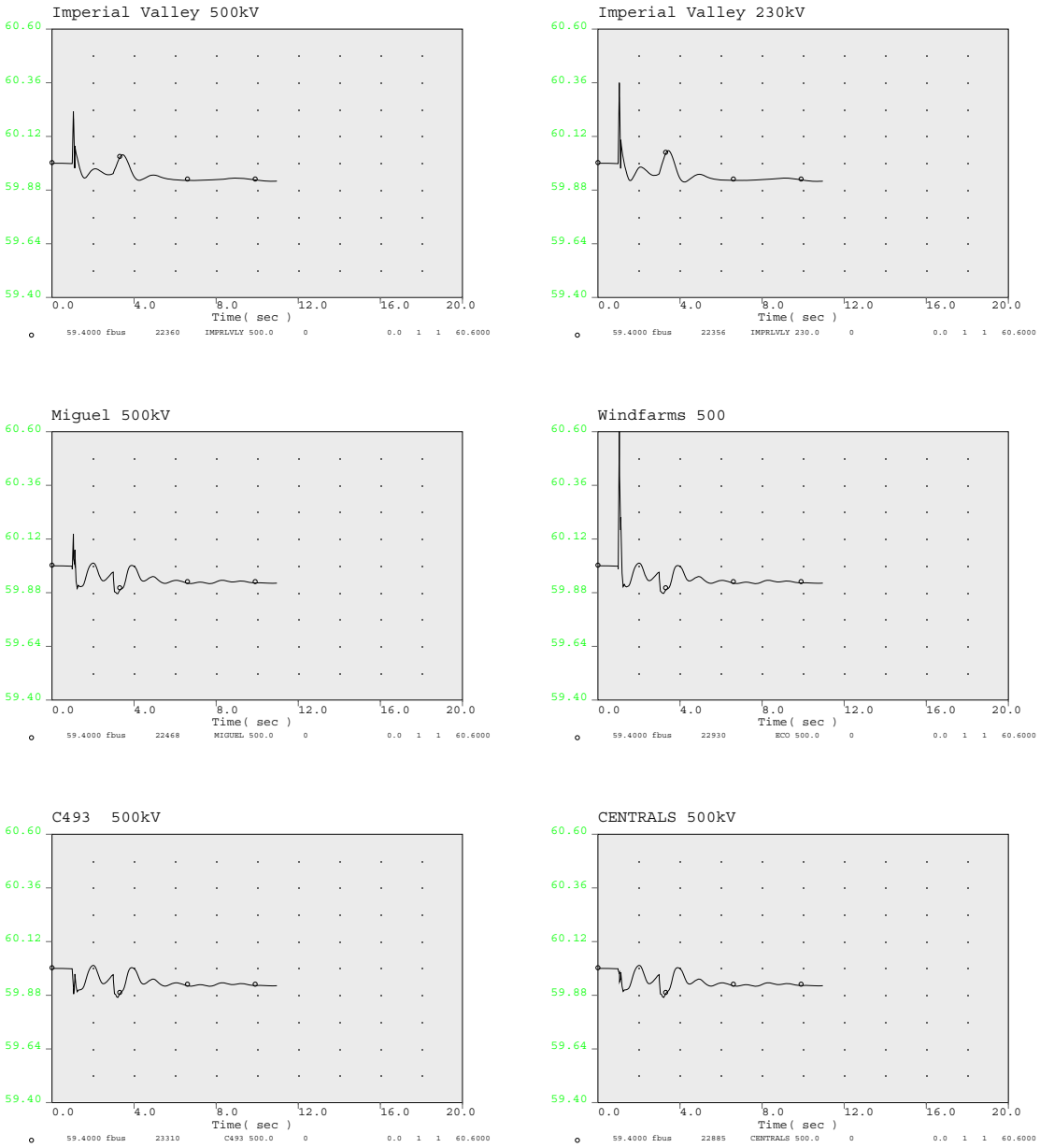






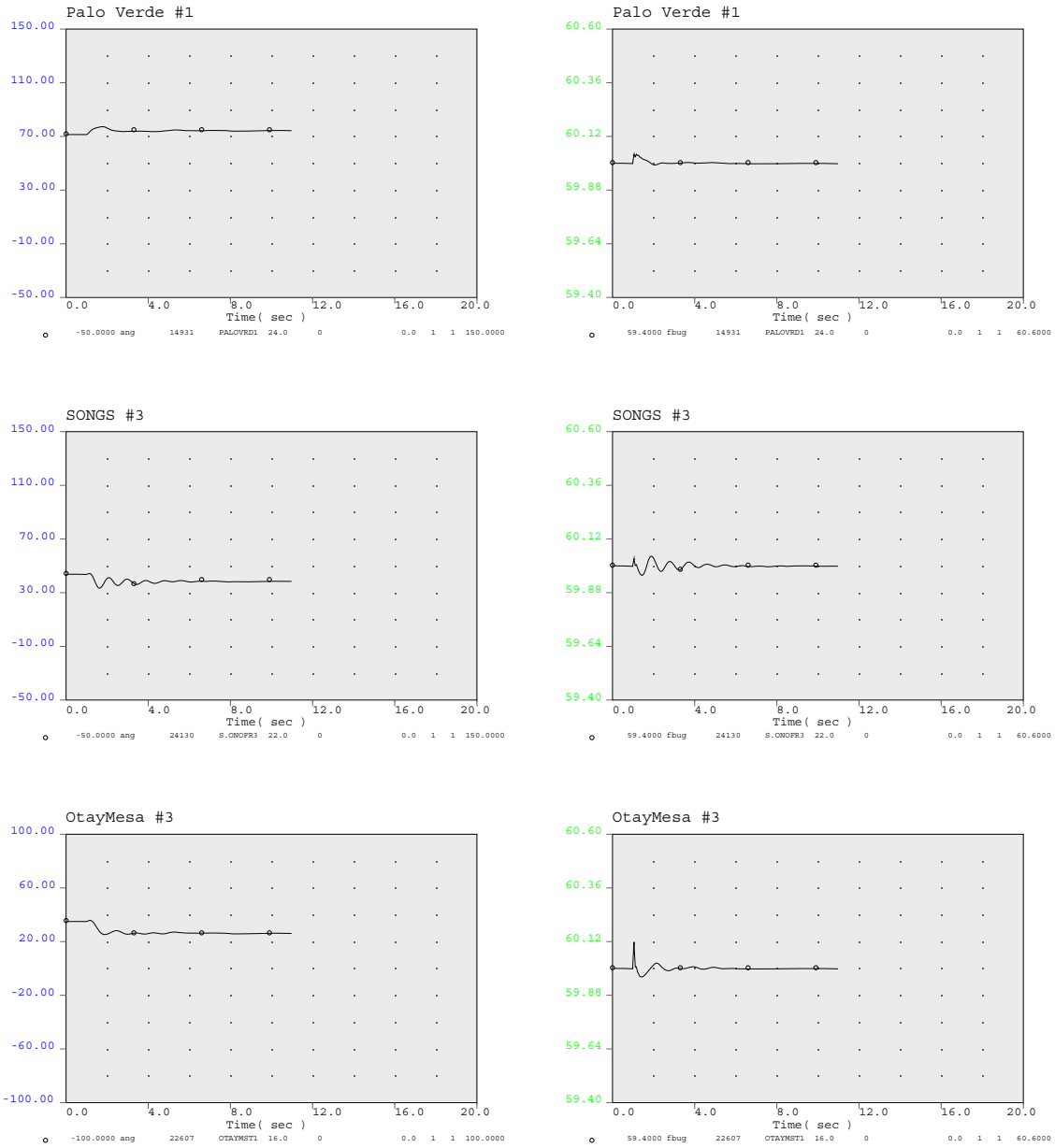
SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Heavy Summer
IV-ECO & IV-C493 500 kV Double line outage

RELATIVE ROTOR ANGLE & FREQUENCY

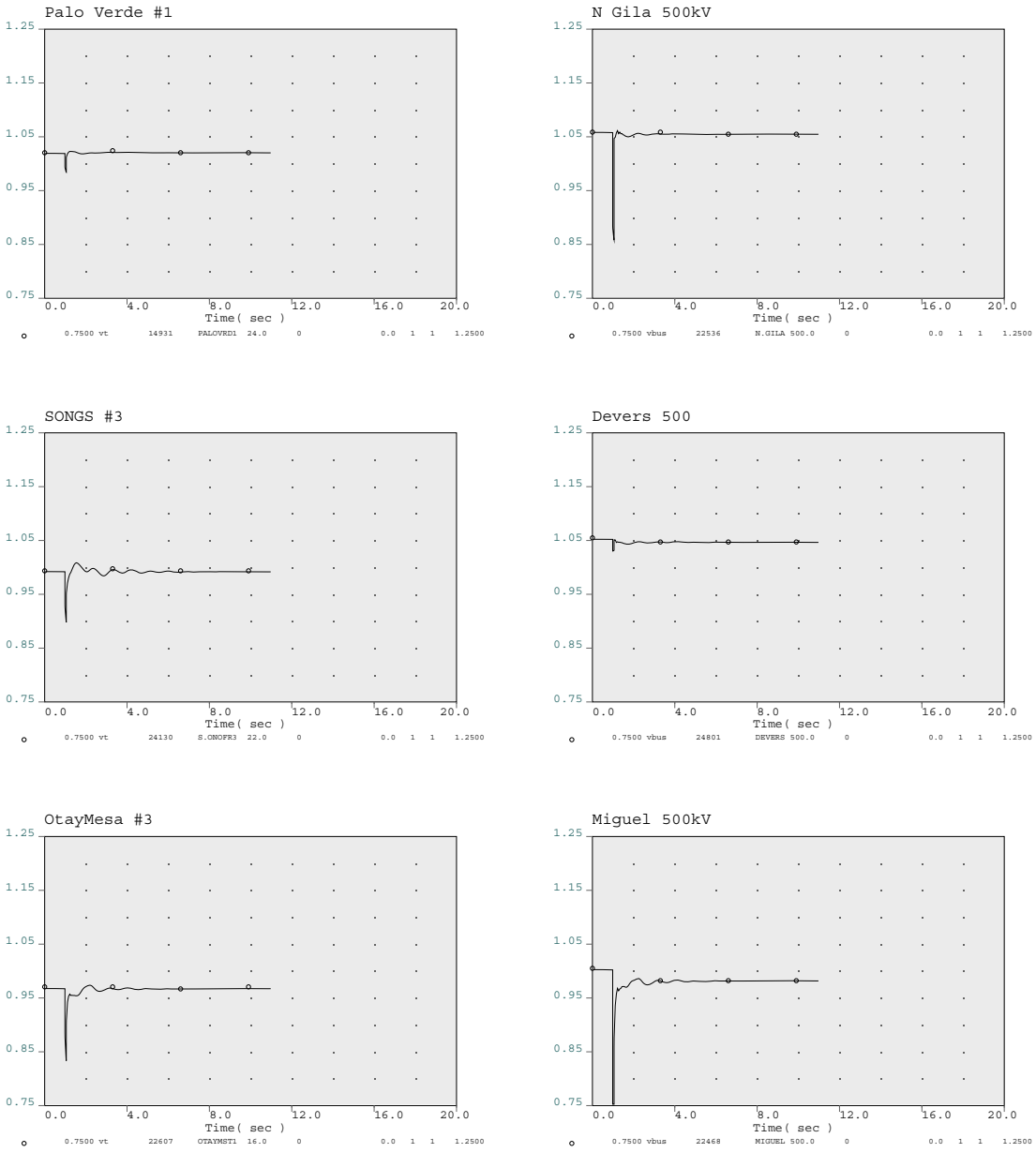


SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

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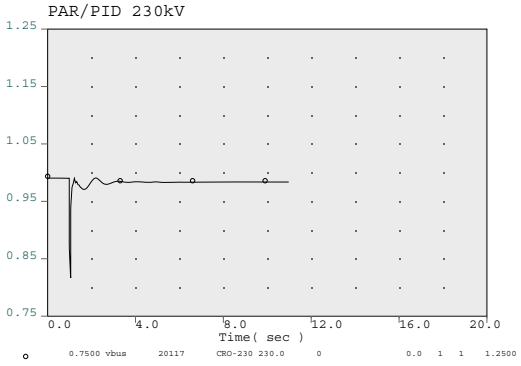
RELATIVE VOLTAGE



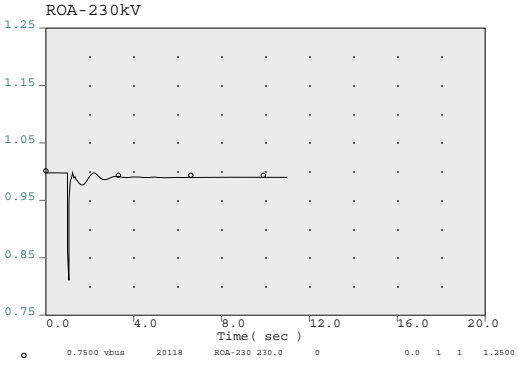
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

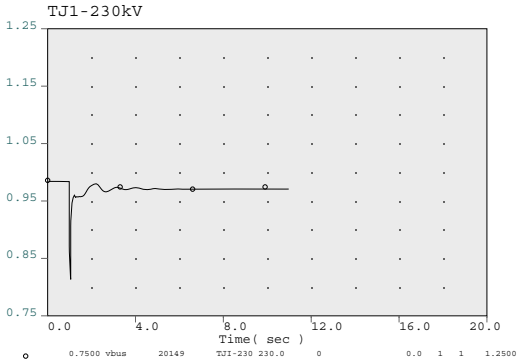
PAR/PID 230kV



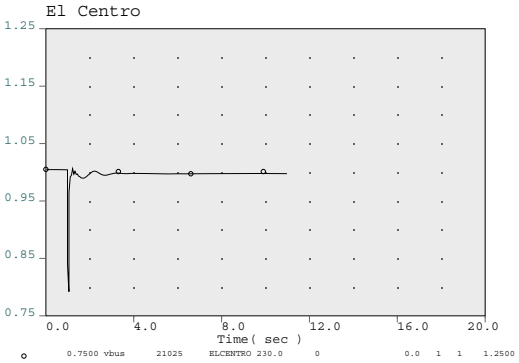
ROA-230kV



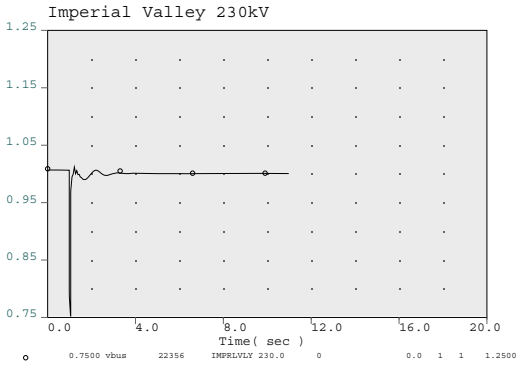
TJ1-230kV



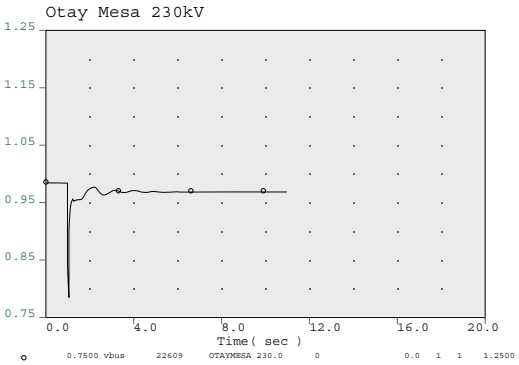
El Centro



Imperial Valley 230kV



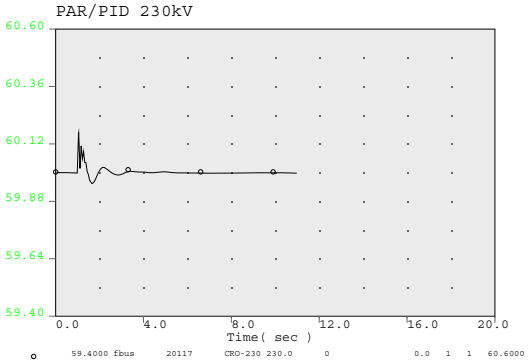
Otay Mesa 230kV



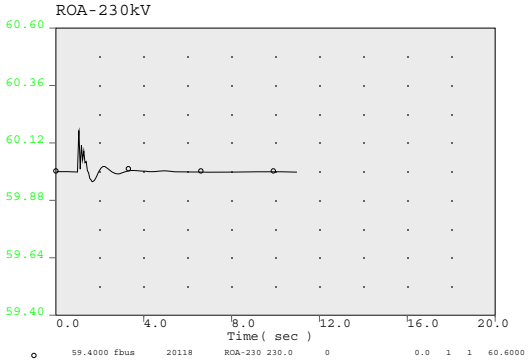
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

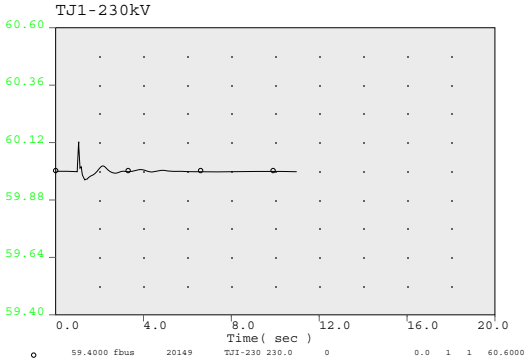
PAR/PID 230kV



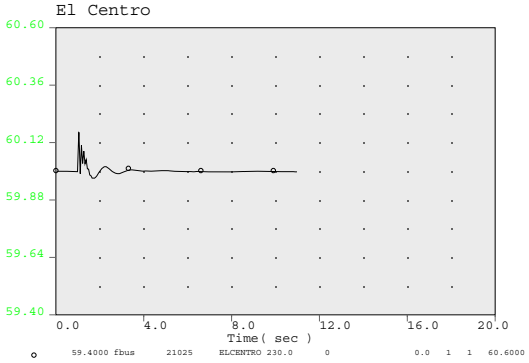
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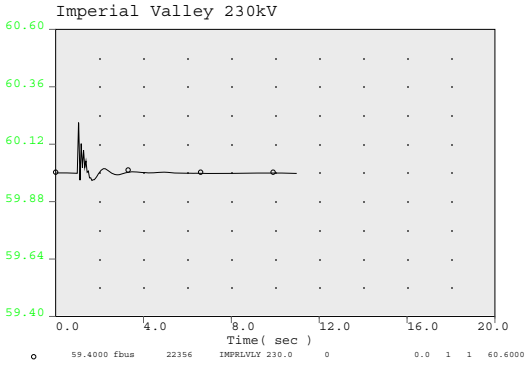
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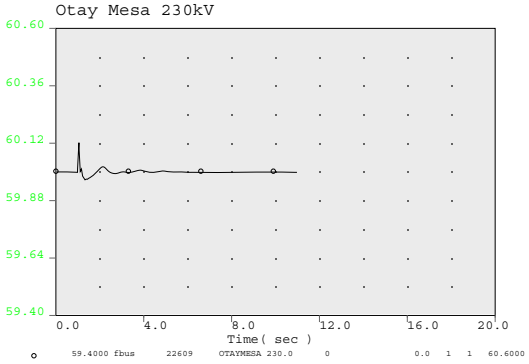
El Centro



Imperial Valley 230kV



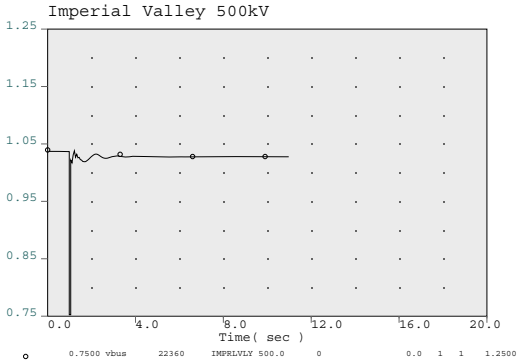
Otay Mesa 230kV



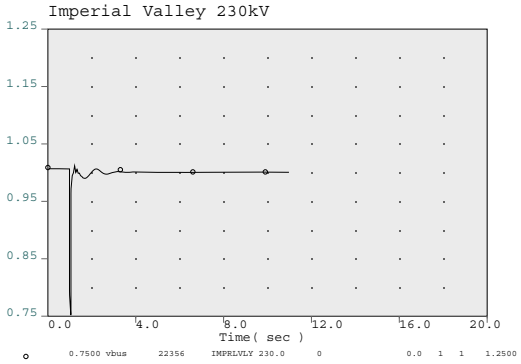
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

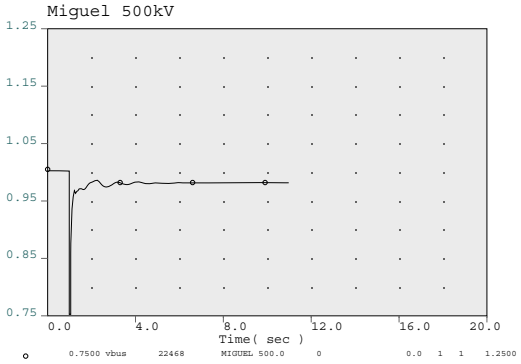
Imperial Valley 500kV



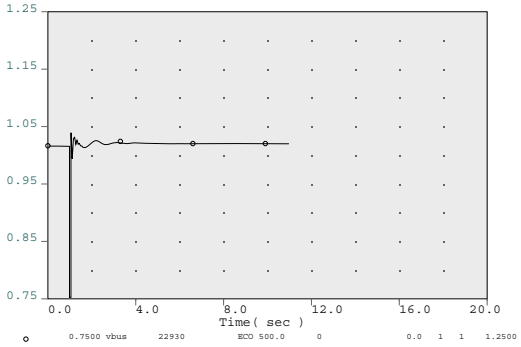
Imperial Valley 230kV



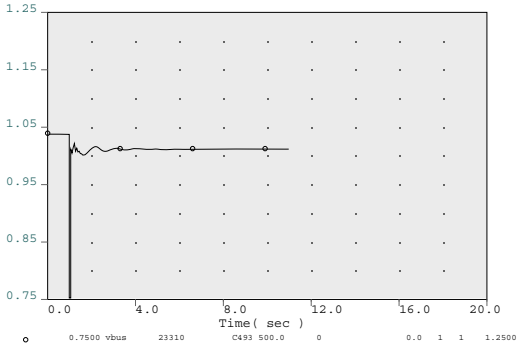
Miguel 500kV



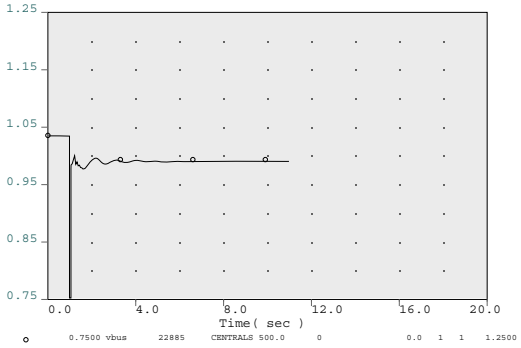
Windfarms 500



C493 500kV

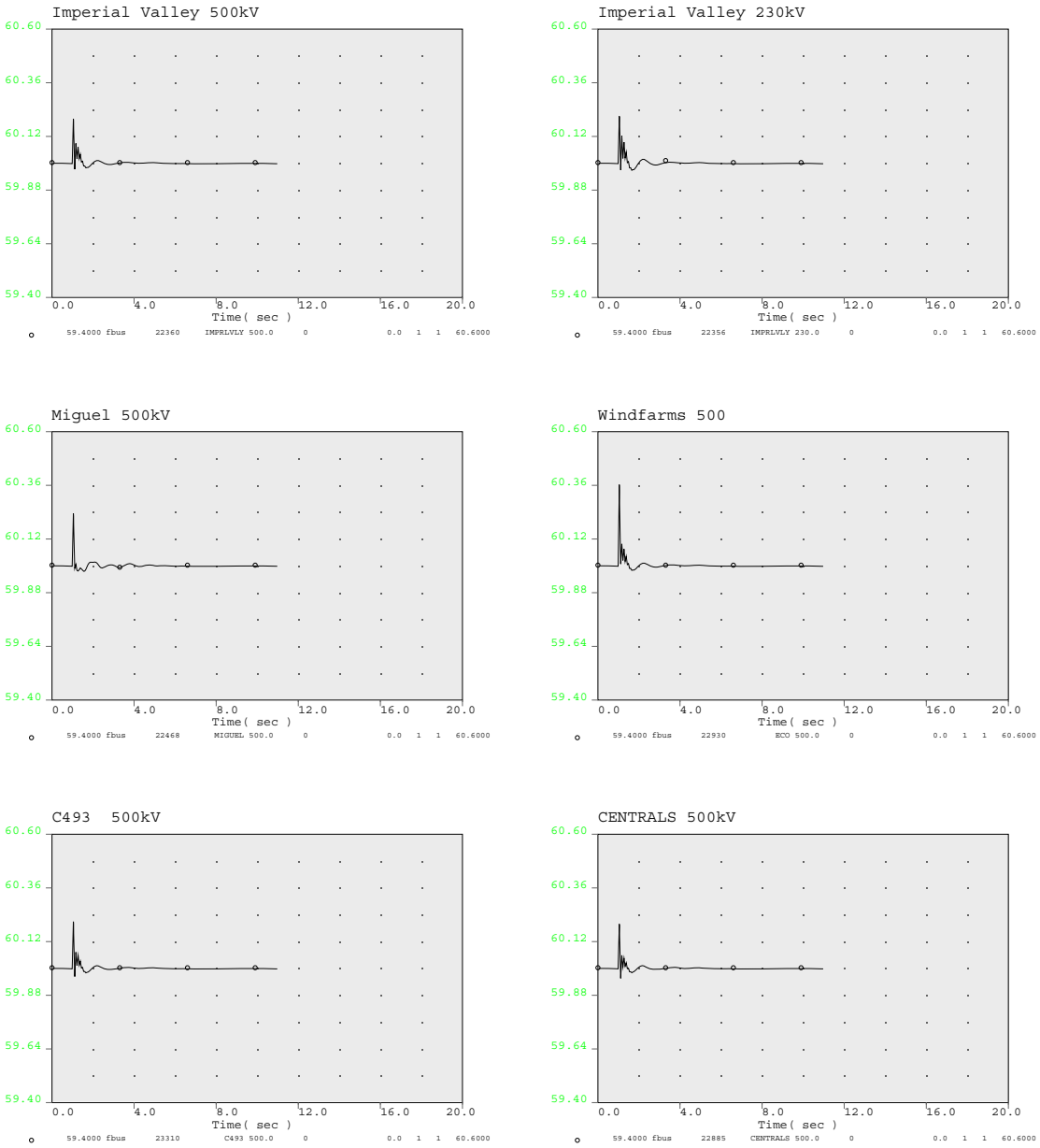


CENTRALS 500kV



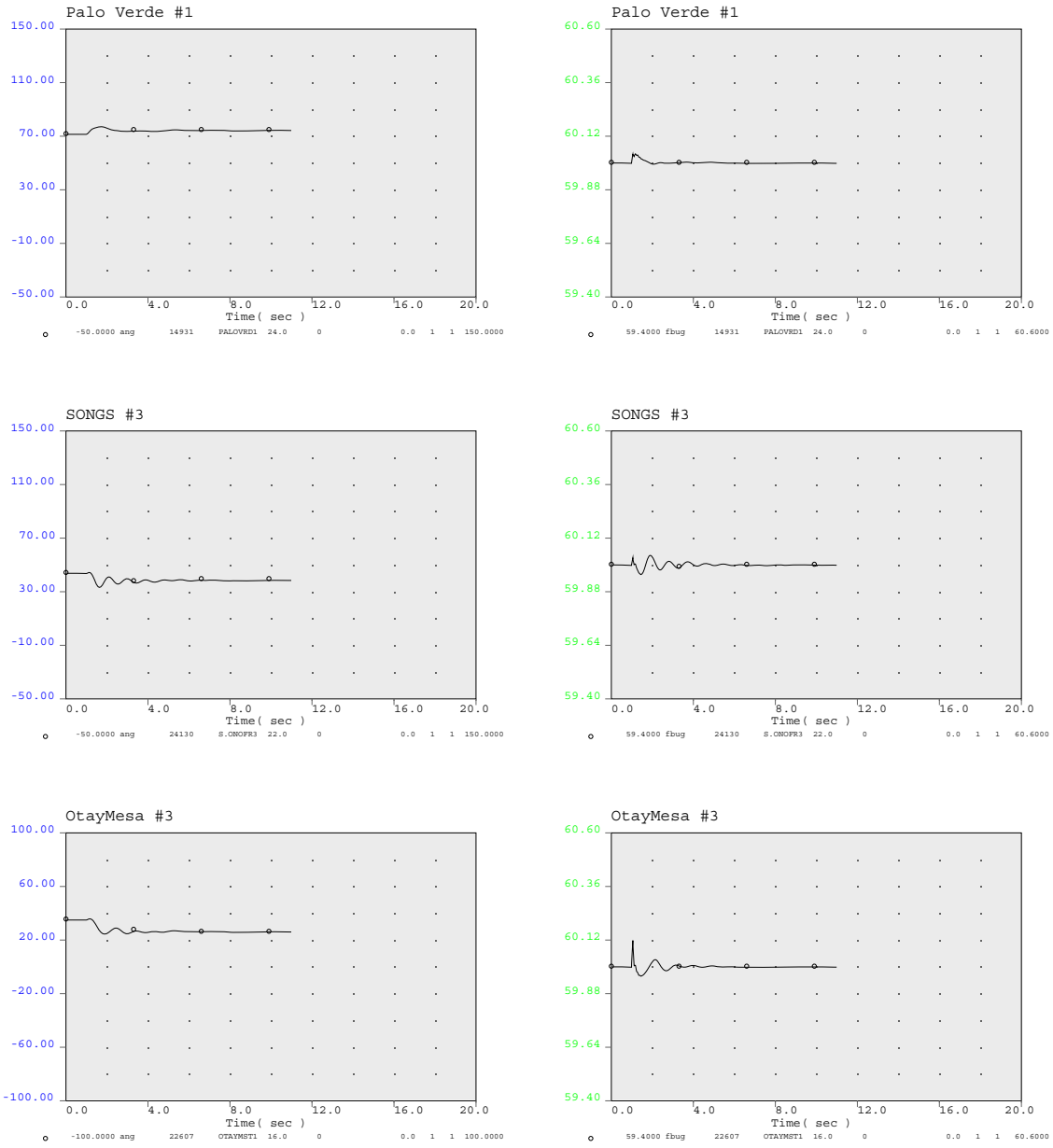
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

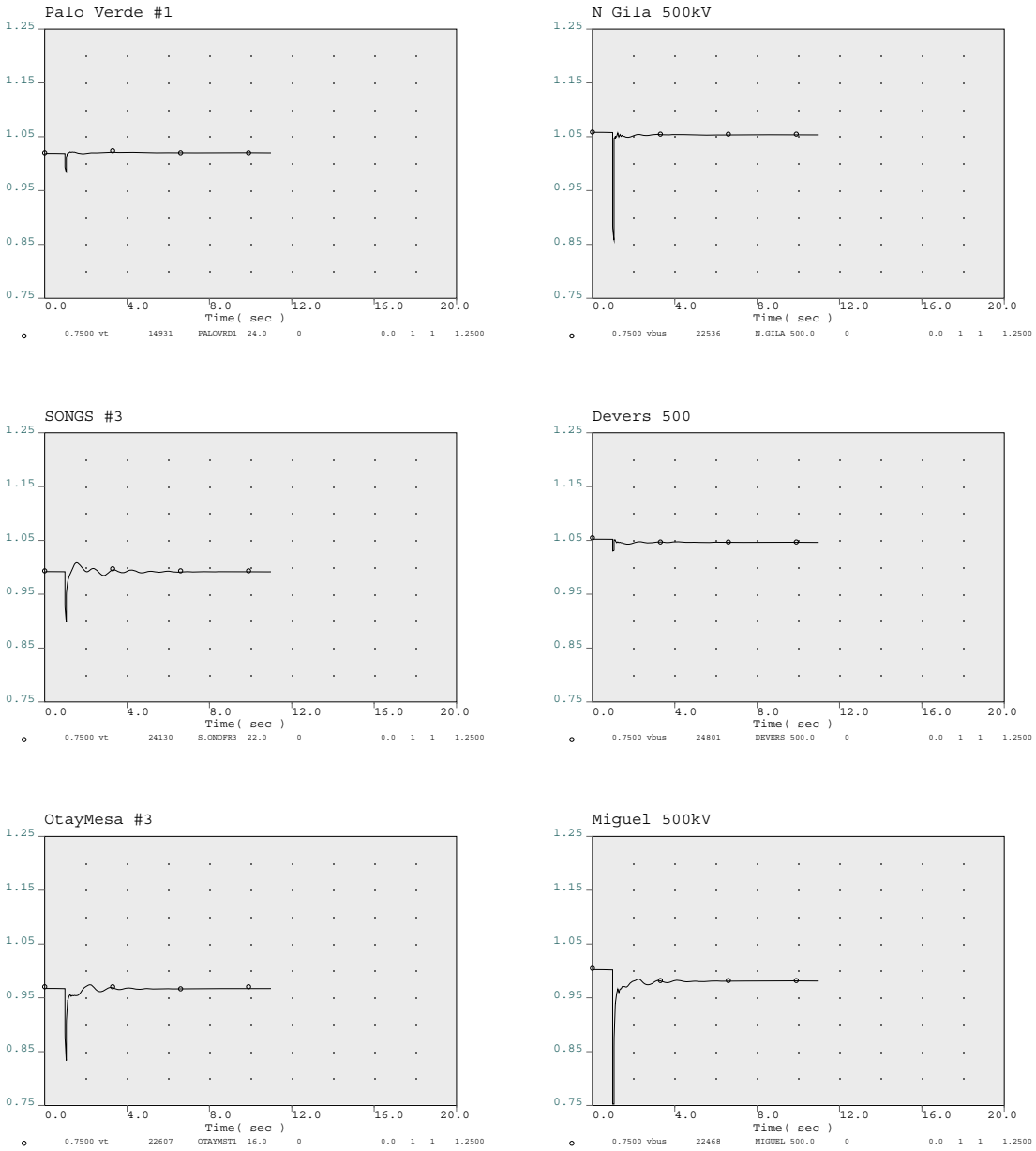


SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

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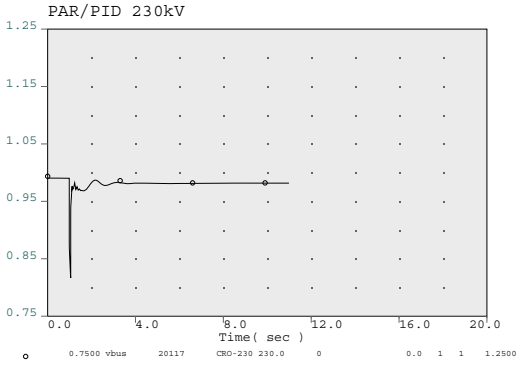
RELATIVE VOLTAGE



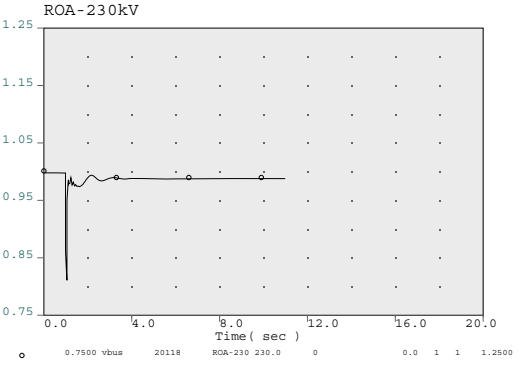
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

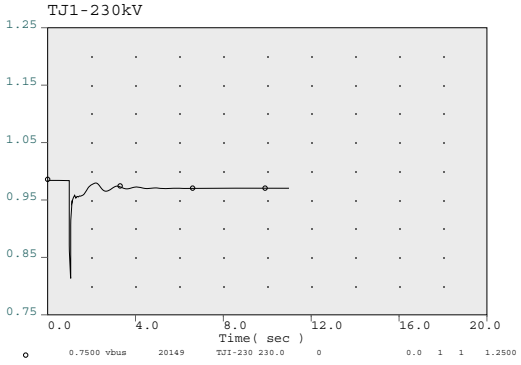
PAR/PID 230kV



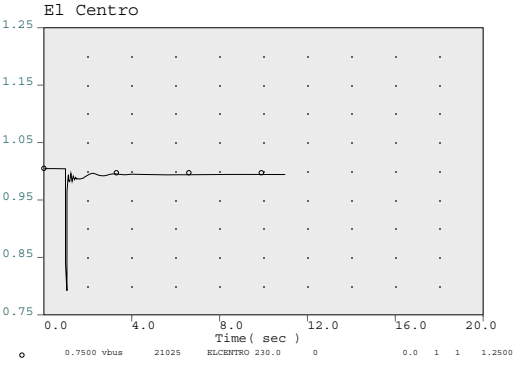
ROA-230kV



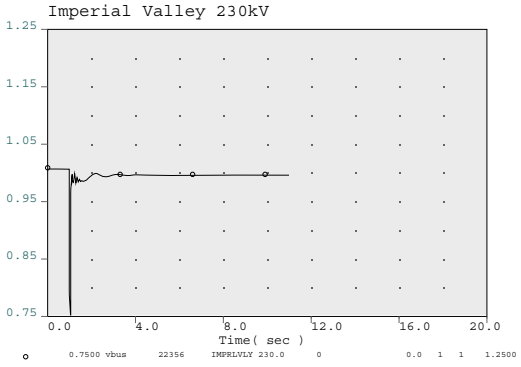
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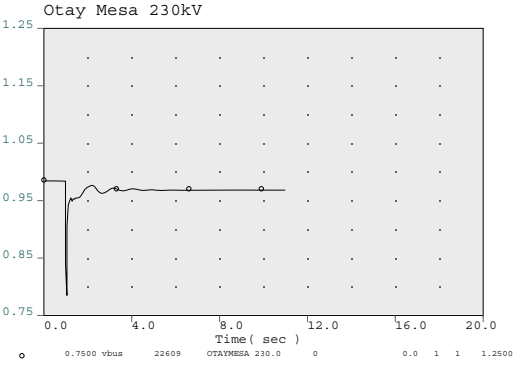
El Centro



Imperial Valley 230kV



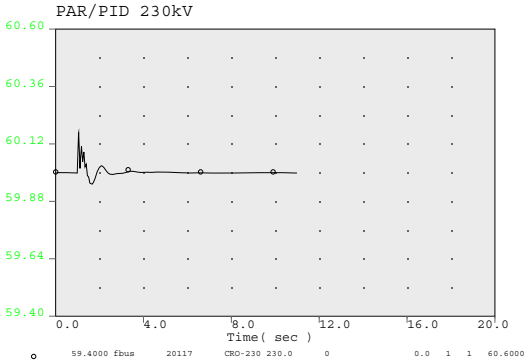
Otay Mesa 230kV



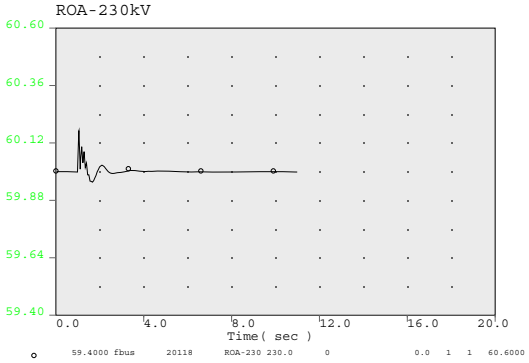
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

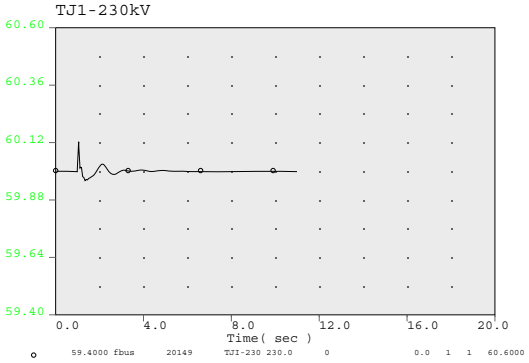
PAR/PID 230kV



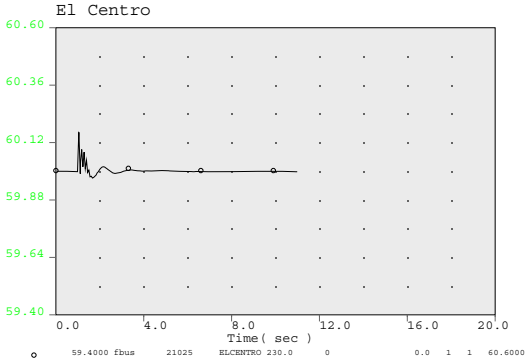
ROA-230kV



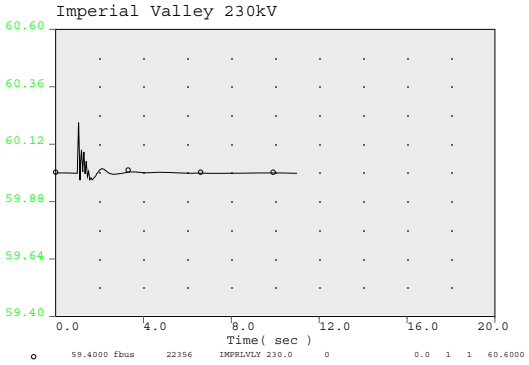
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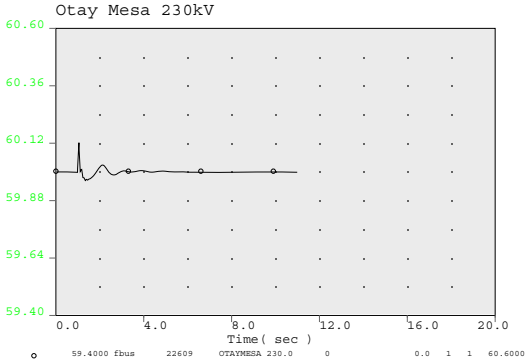
El Centro



Imperial Valley 230kV



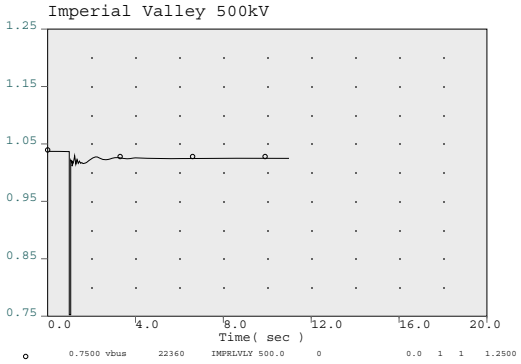
Otay Mesa 230kV



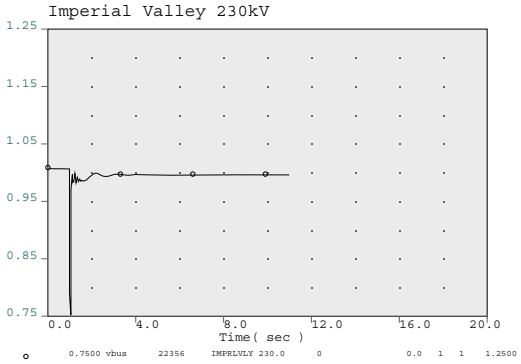
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

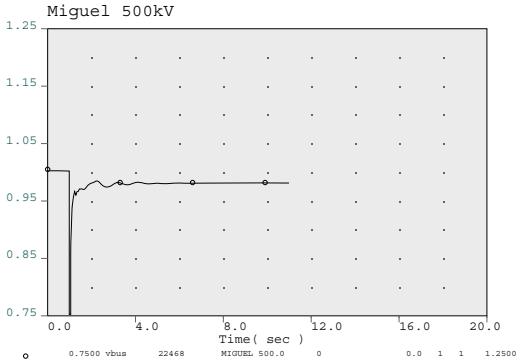
Imperial Valley 500kV



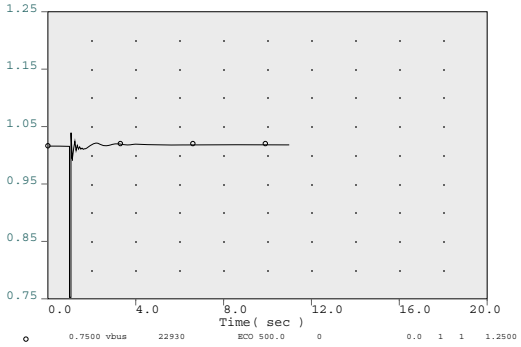
Imperial Valley 230kV



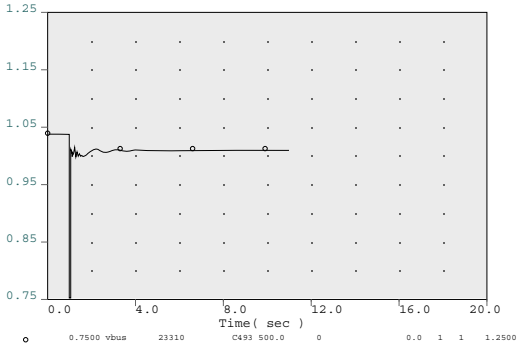
Miguel 500kV



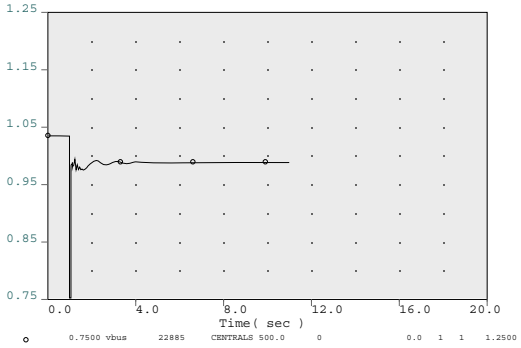
Windfarms 500



C493 500kV



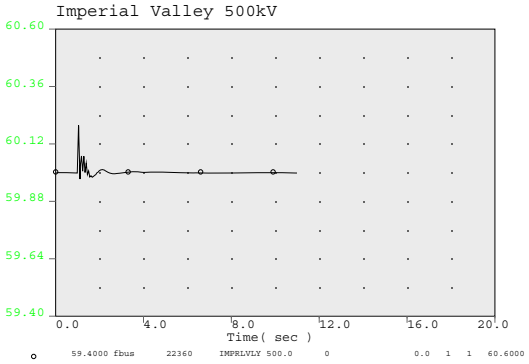
CENTRALS 500kV



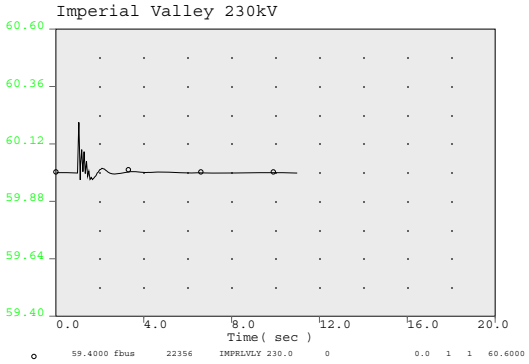
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - Frequency

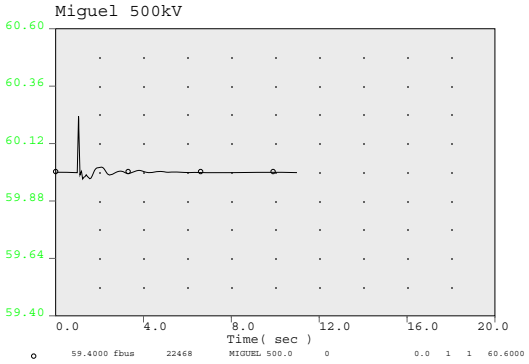
Imperial Valley 500kV



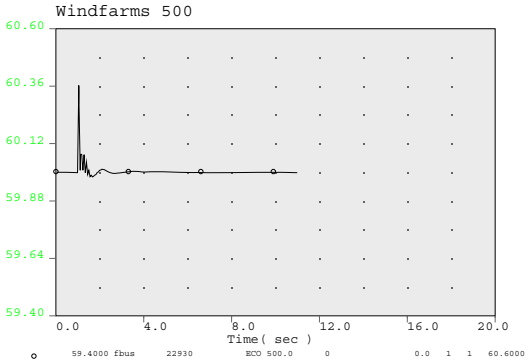
Imperial Valley 230kV



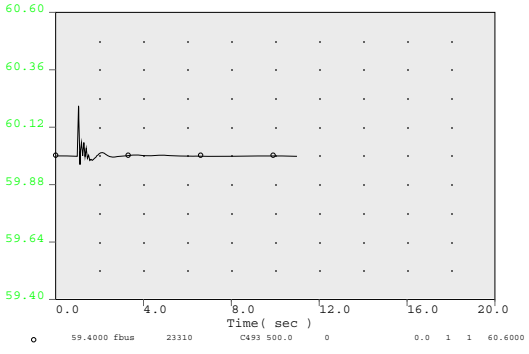
Miguel 500kV



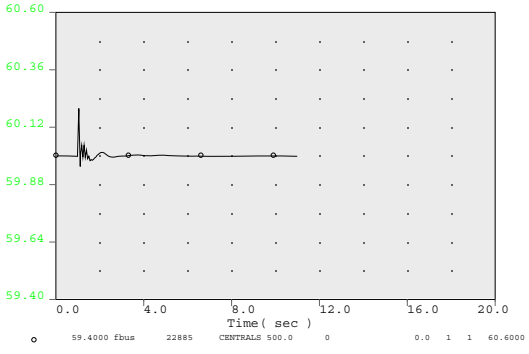
Windfarms 500



C493 500kV

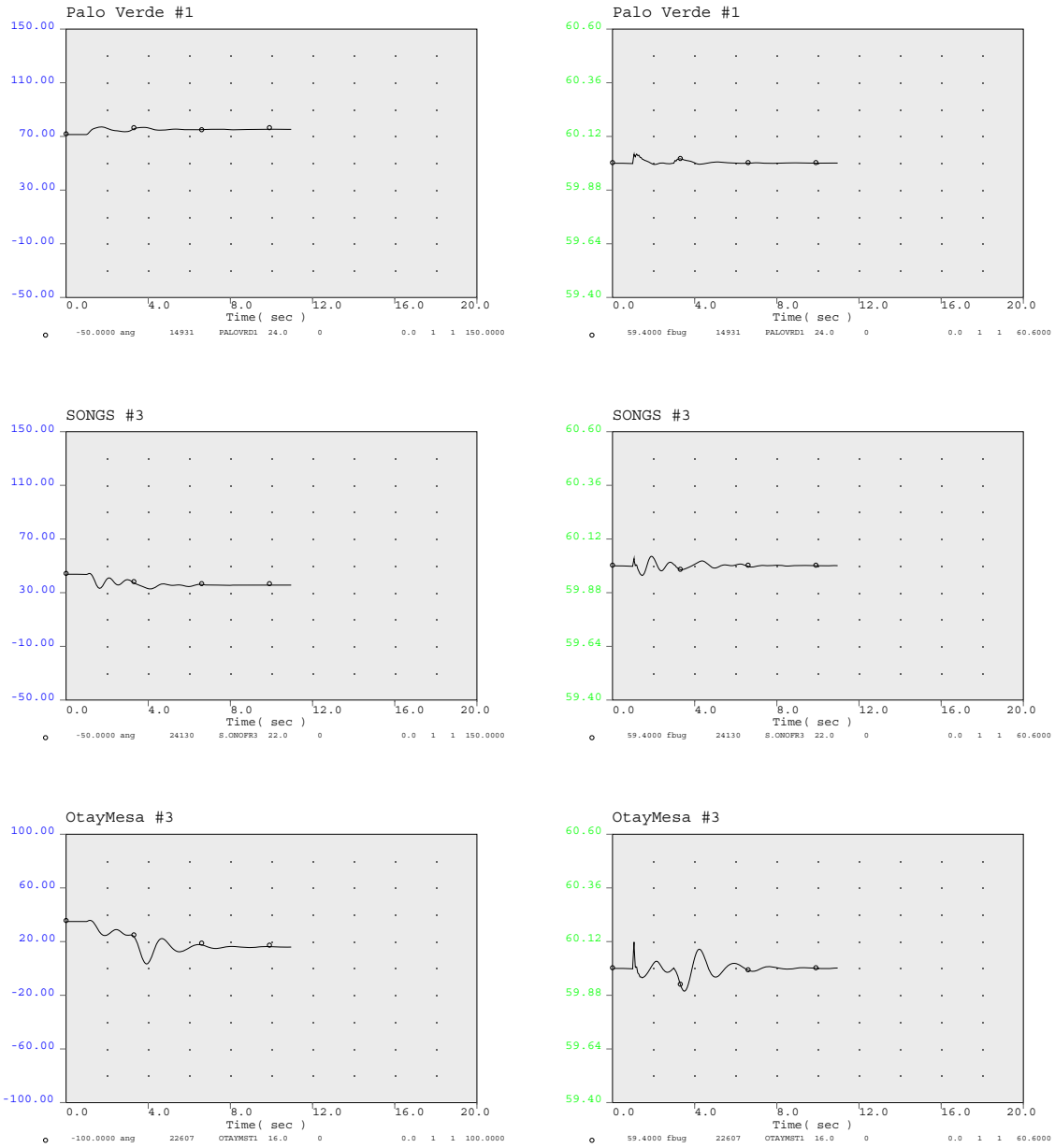


CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

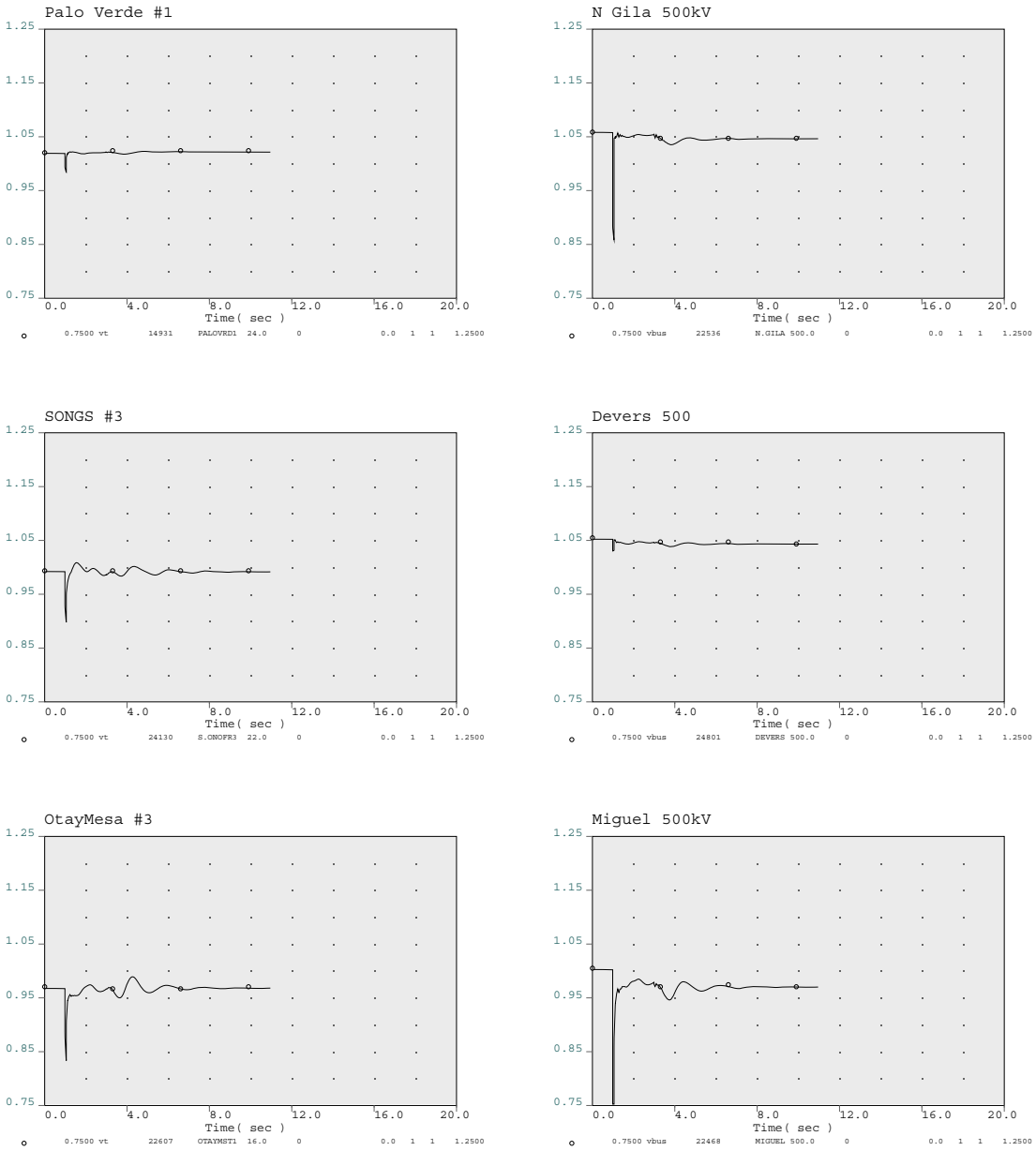


SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

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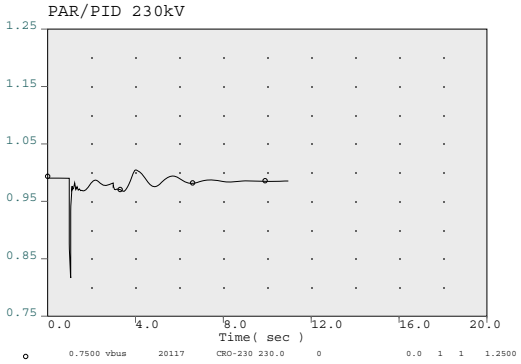
RELATIVE VOLTAGE



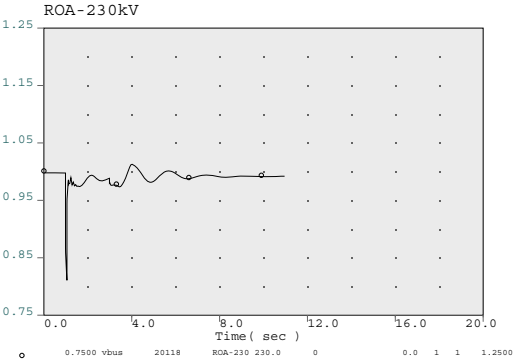
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

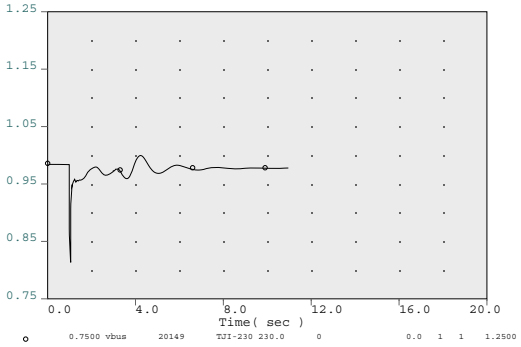
PAR/PID 230kV



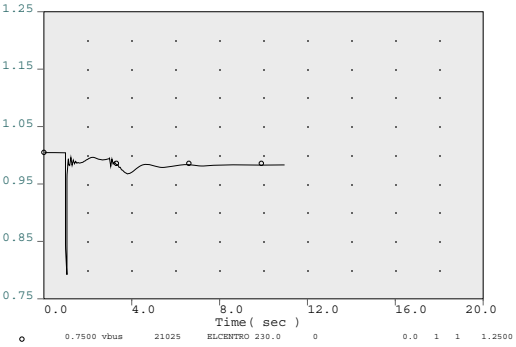
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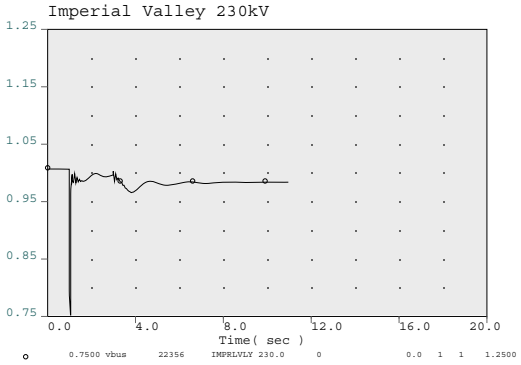
TJ1-230kV



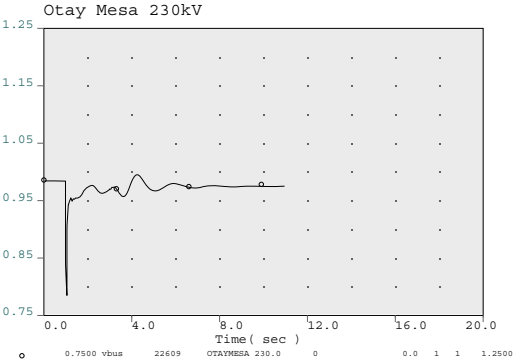
El Centro



Imperial Valley 230kV



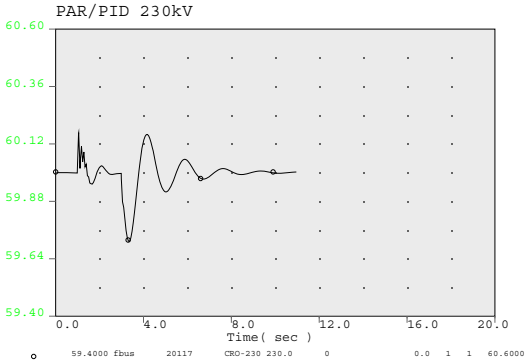
Otay Mesa 230kV



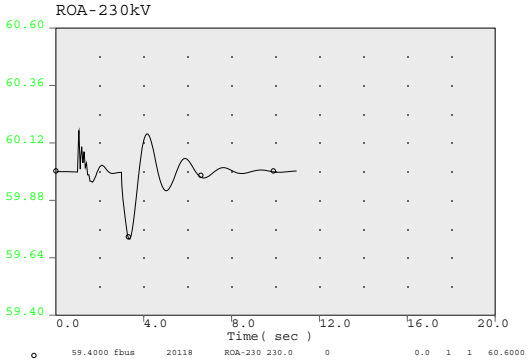
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

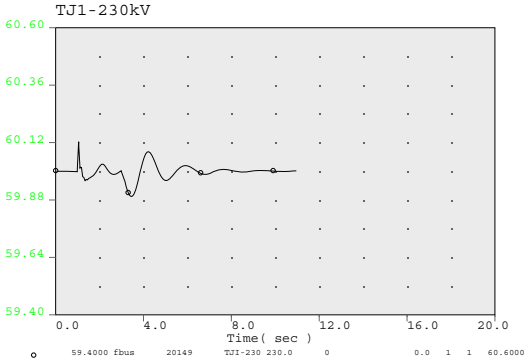
PAR/PID 230kV



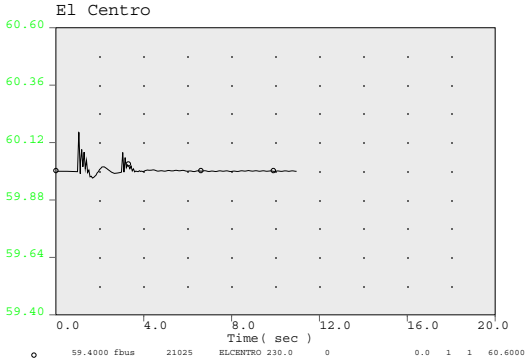
ROA-230kV



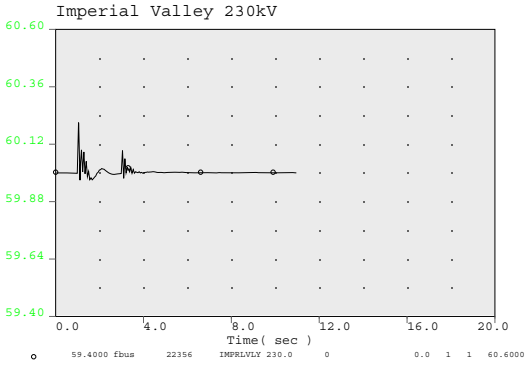
TJ1-230kV



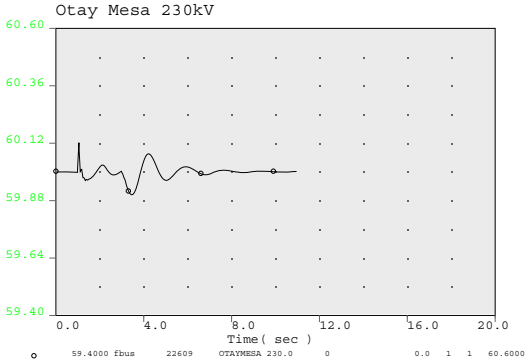
El Centro



Imperial Valley 230kV



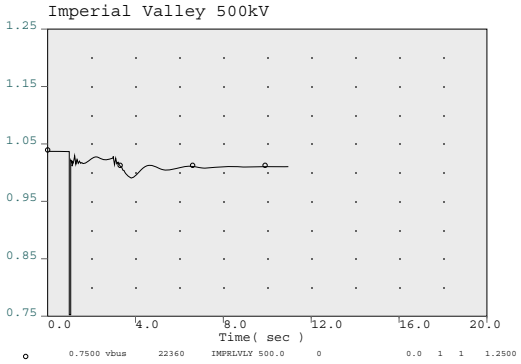
Otay Mesa 230kV



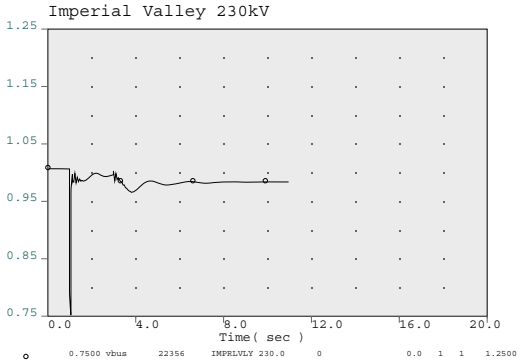
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

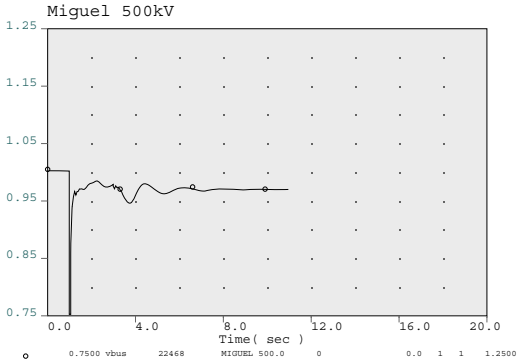
Imperial Valley 500kV



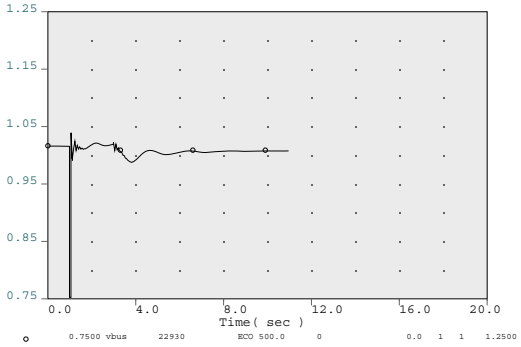
Imperial Valley 230kV



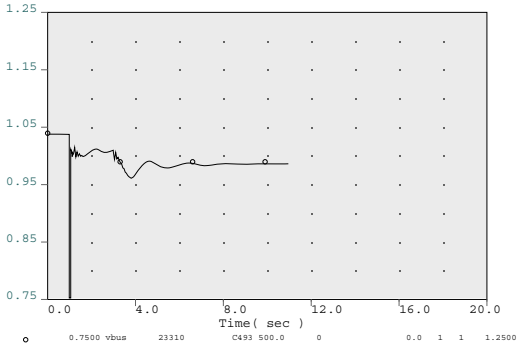
Miguel 500kV



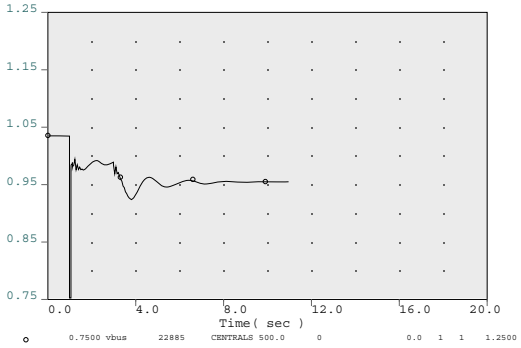
Windfarms 500



C493 500kV

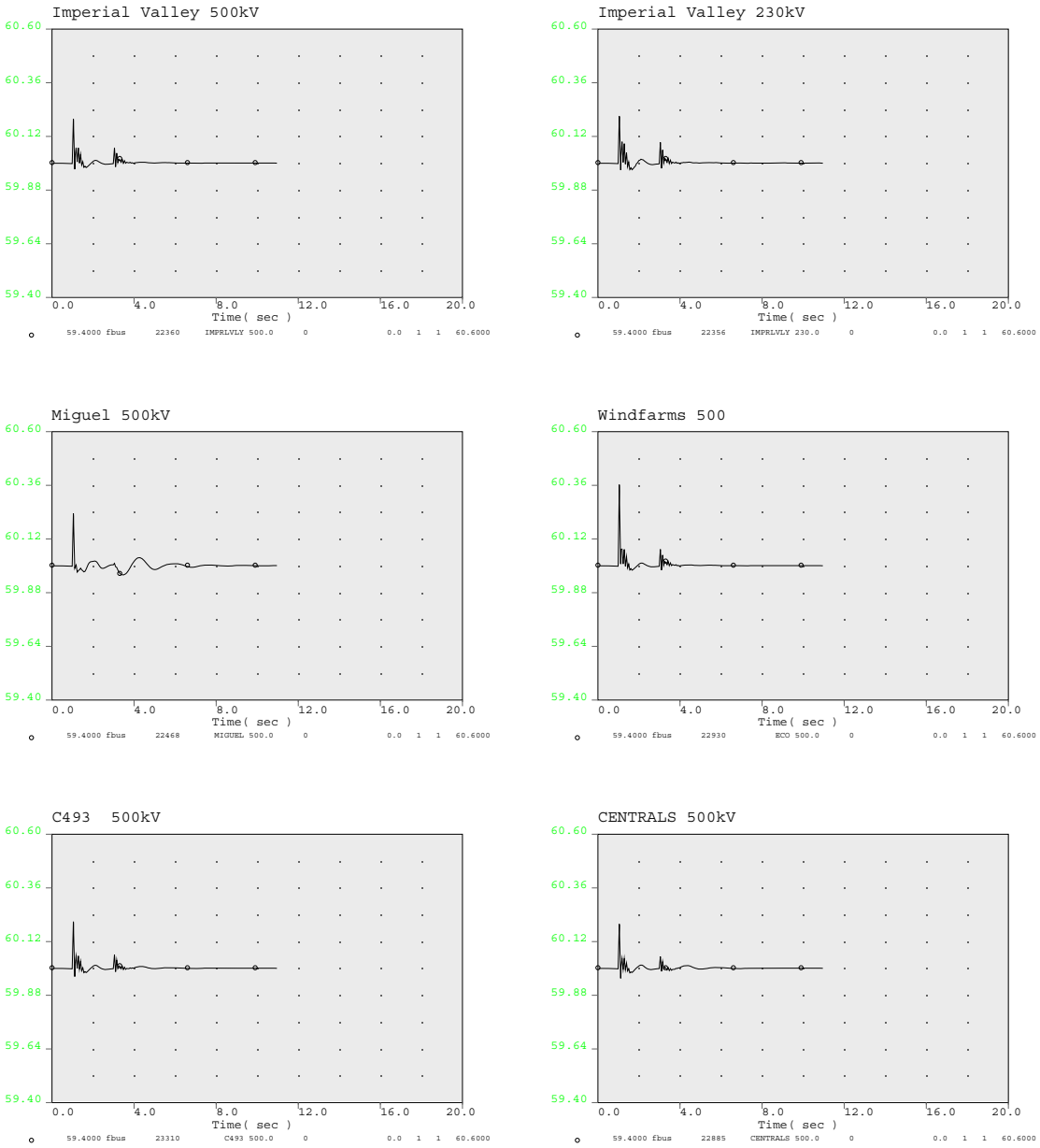


CENTRALS 500kV



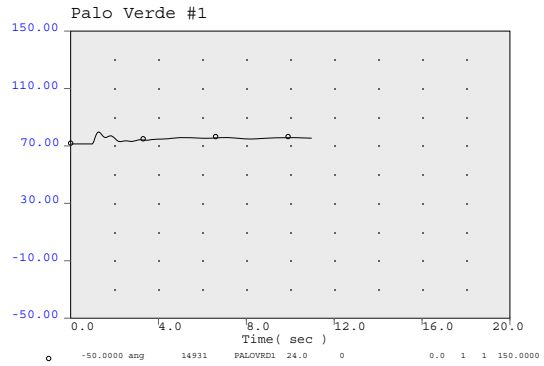
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

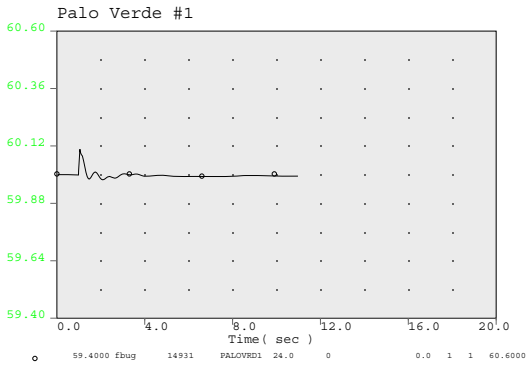
Imperial Valley Area - Frequency

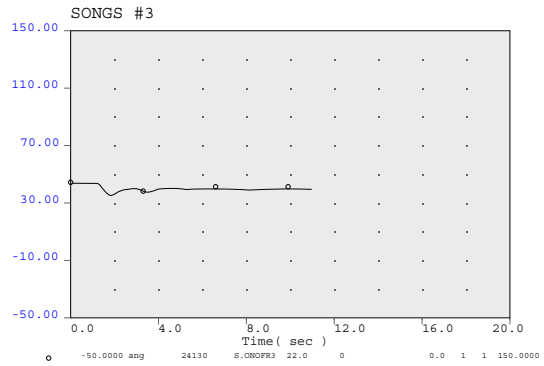


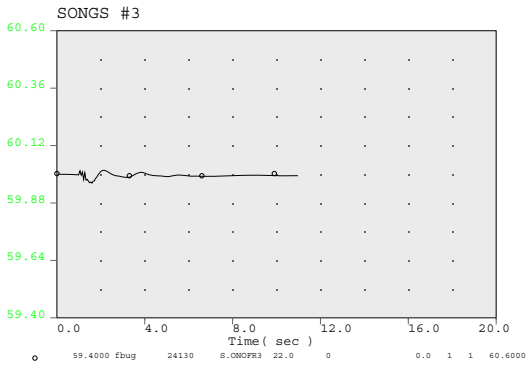
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-ECO 500 kV line

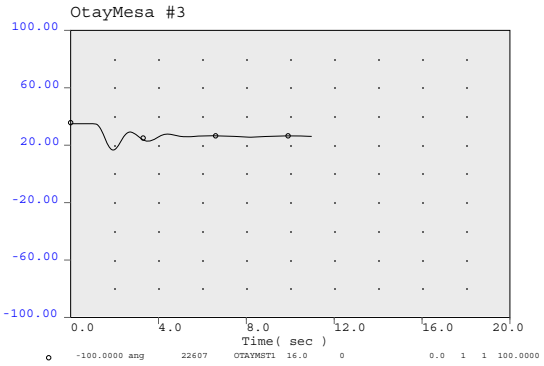
RELATIVE ROTOR ANGLE & FREQUENCY

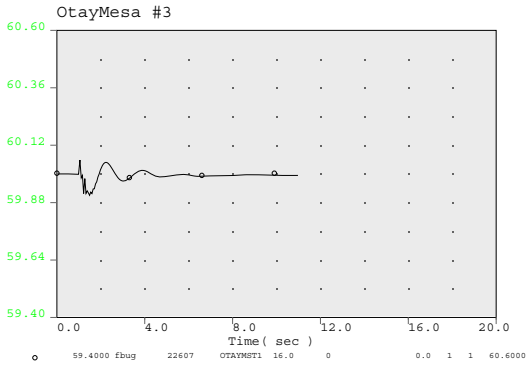










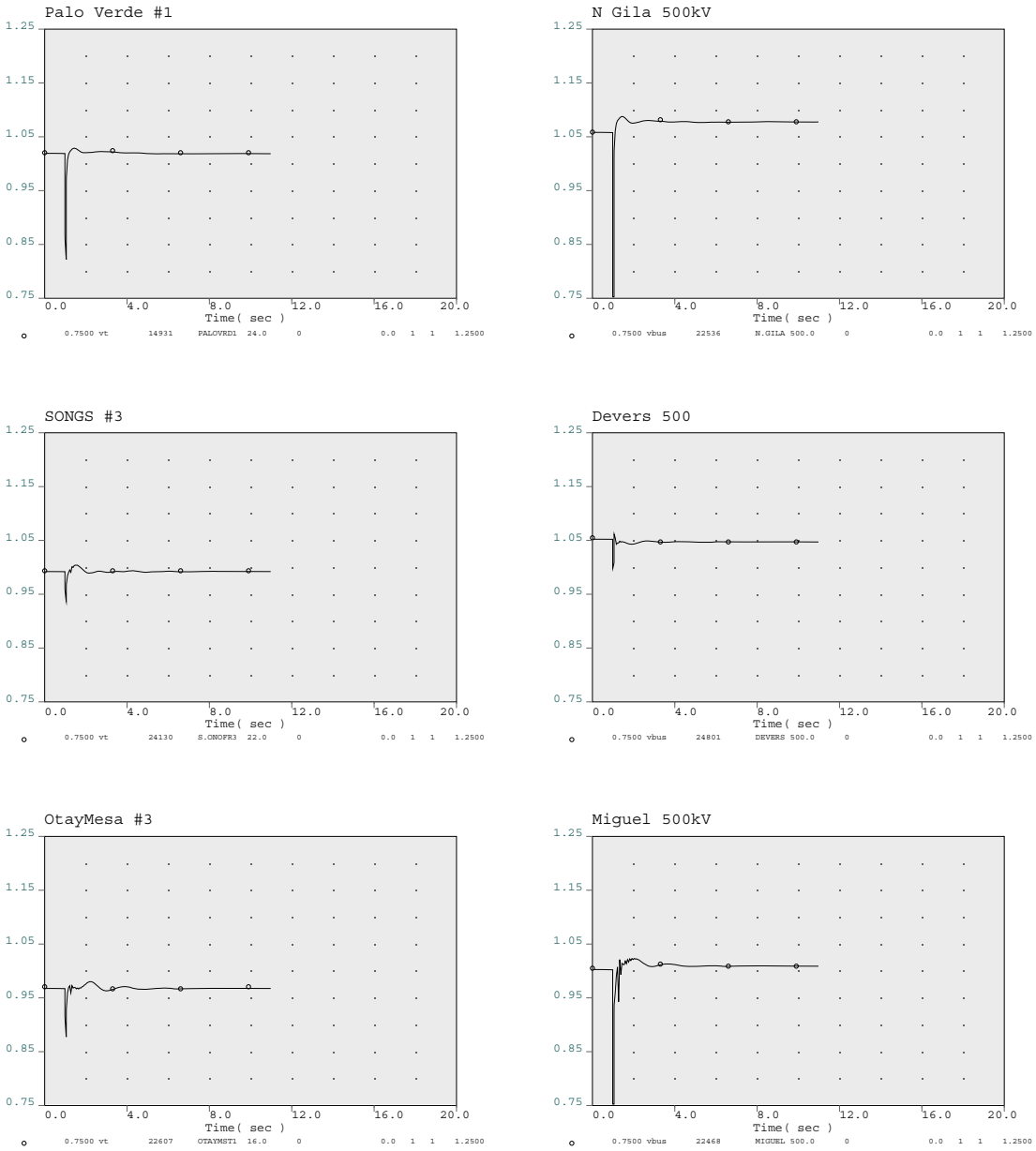


SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Page 1

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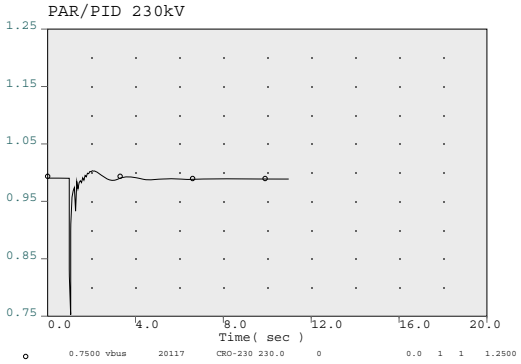
RELATIVE VOLTAGE



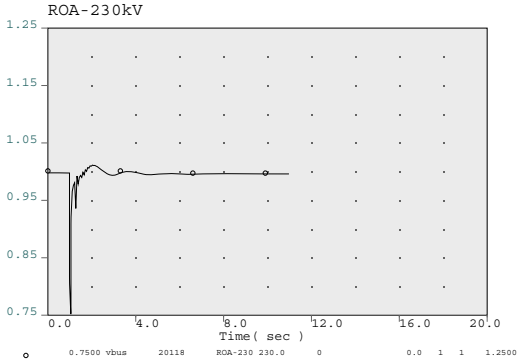
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

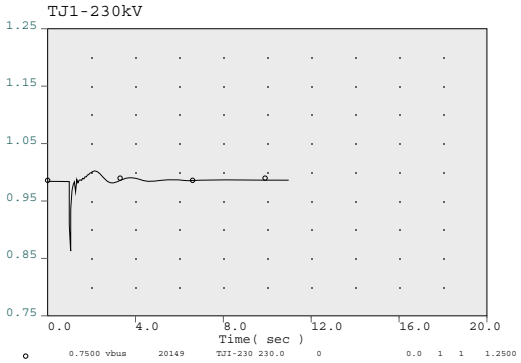
PAR/PID 230kV



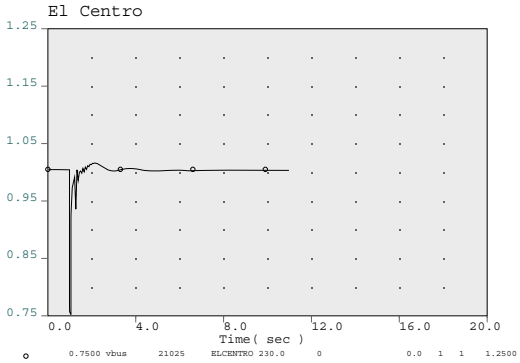
ROA-230kV



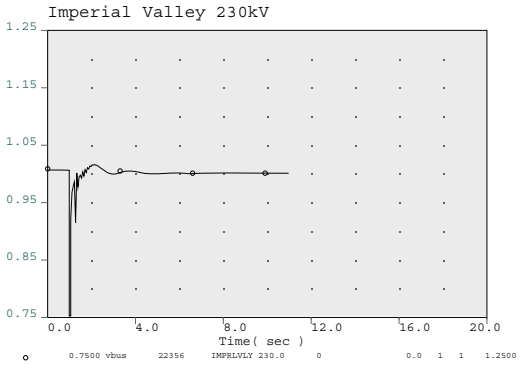
TJ1-230kV



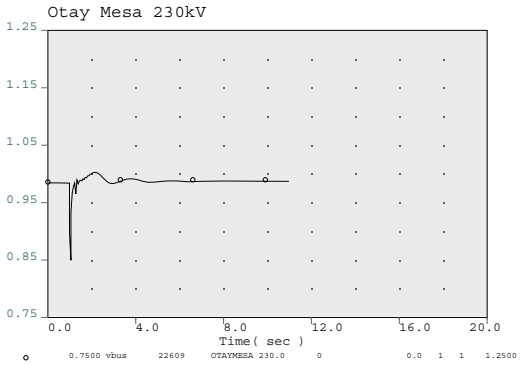
El Centro



Imperial Valley 230kV



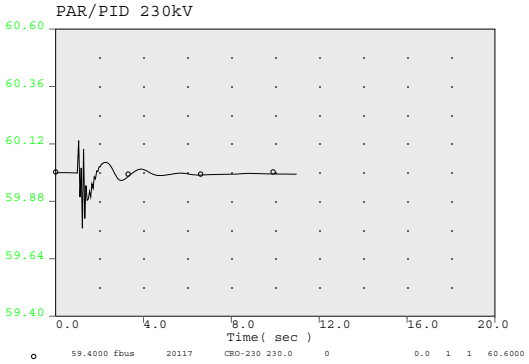
Otay Mesa 230kV



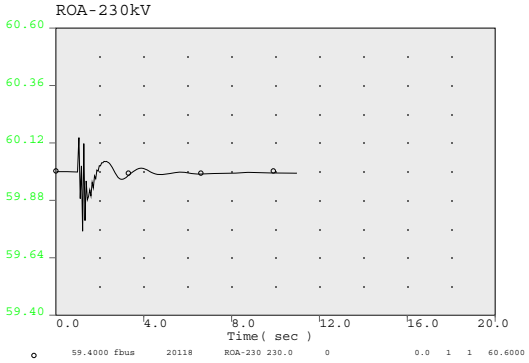
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

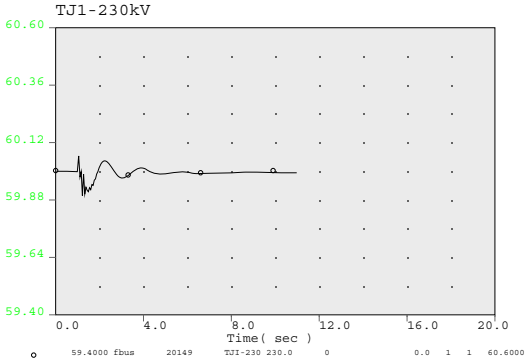
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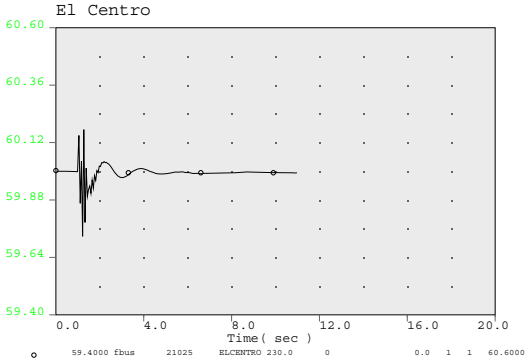
ROA-230kV



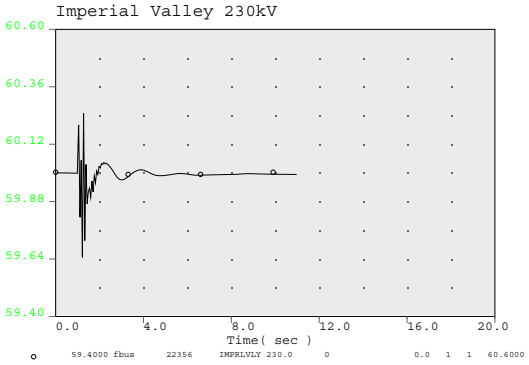
TJ1-230kV



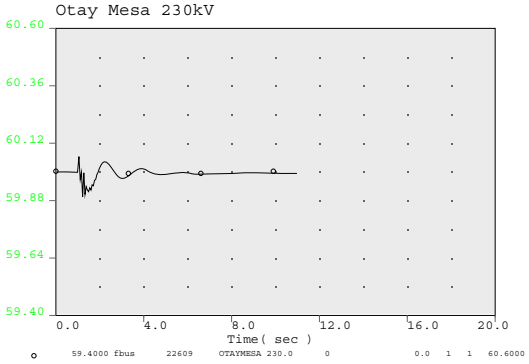
El Centro



Imperial Valley 230kV



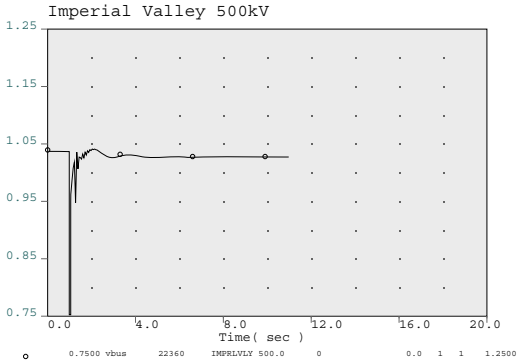
Otay Mesa 230kV



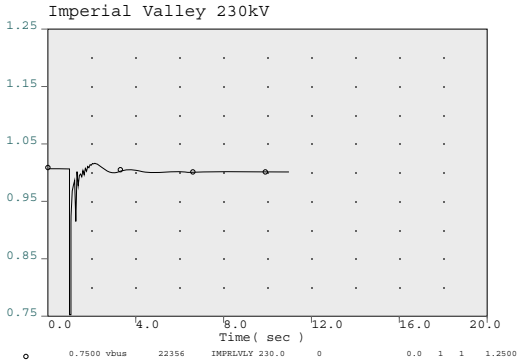
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

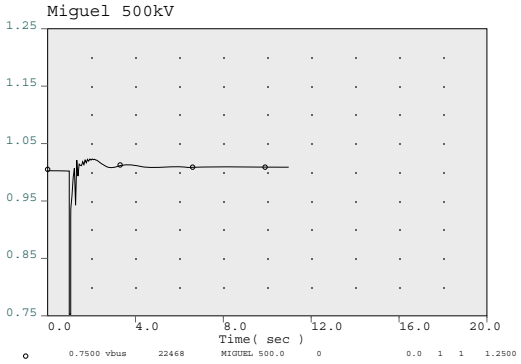
Imperial Valley 500kV



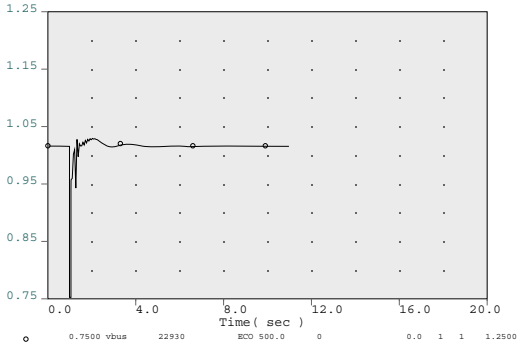
Imperial Valley 230kV



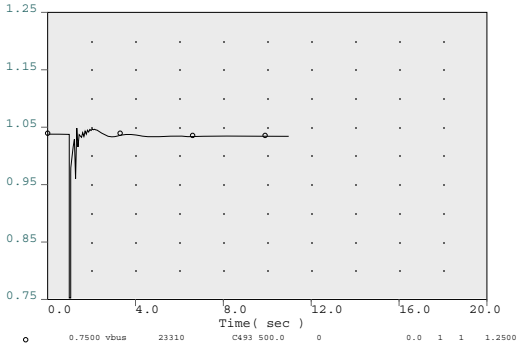
Miguel 500kV



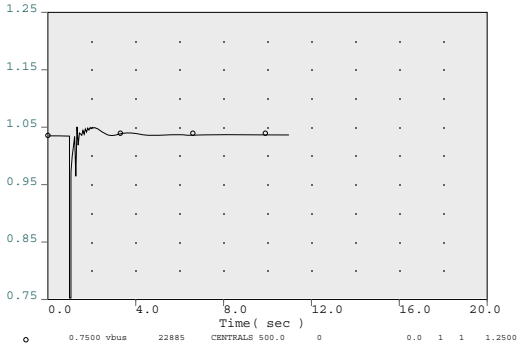
Windfarms 500



C493 500kV



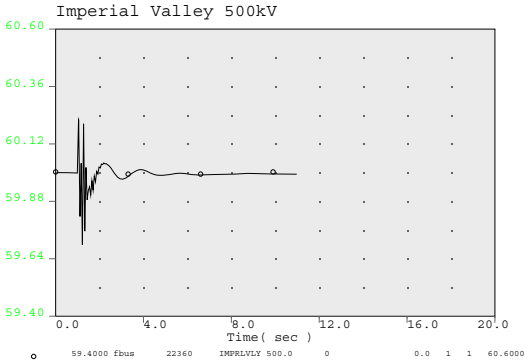
CENTRALS 500kV



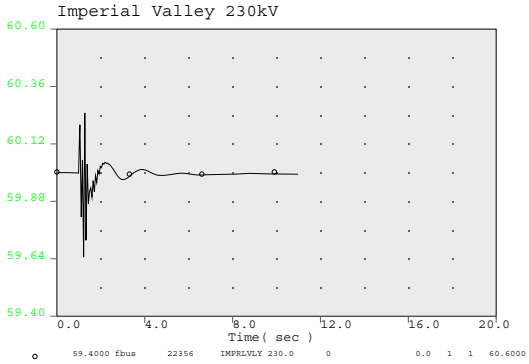
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - Frequency

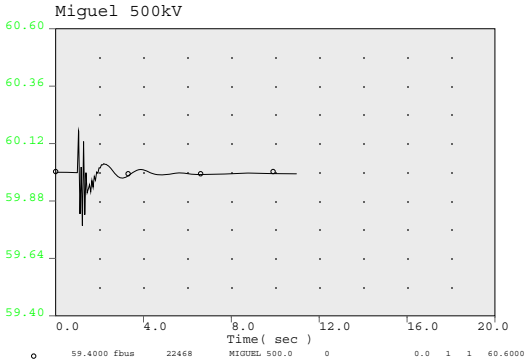
Imperial Valley 500kV



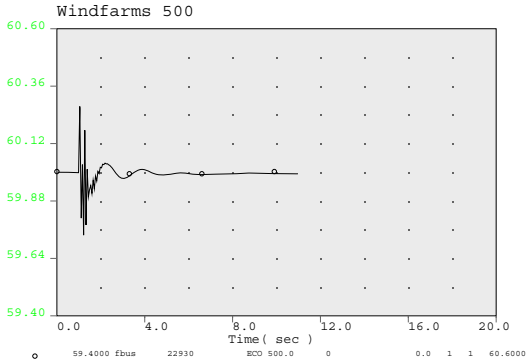
Imperial Valley 230kV



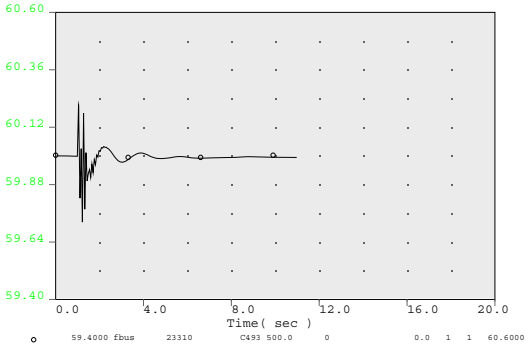
Miguel 500kV



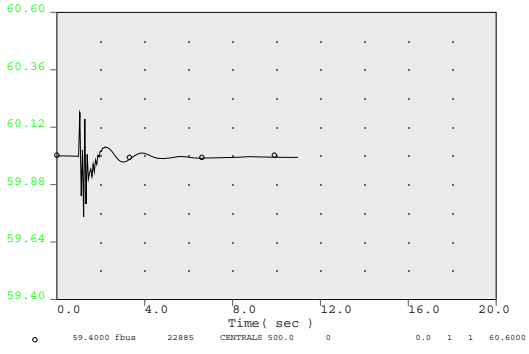
Windfarms 500



C493 500kV

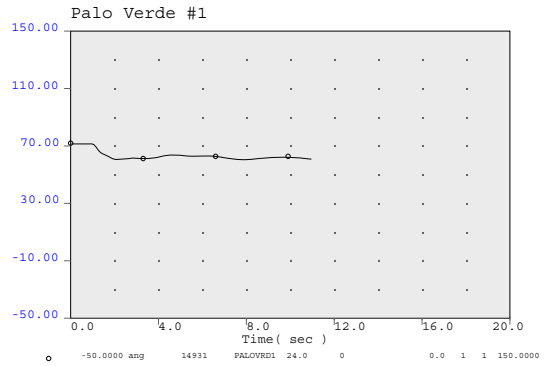


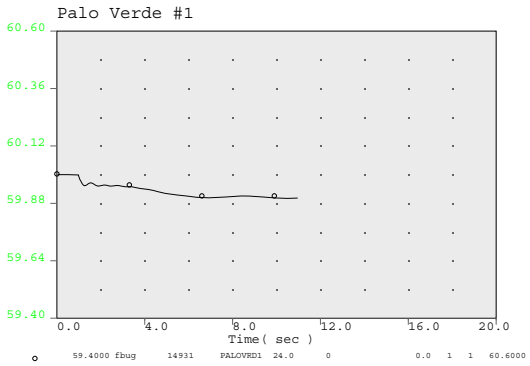
CENTRALS 500kV

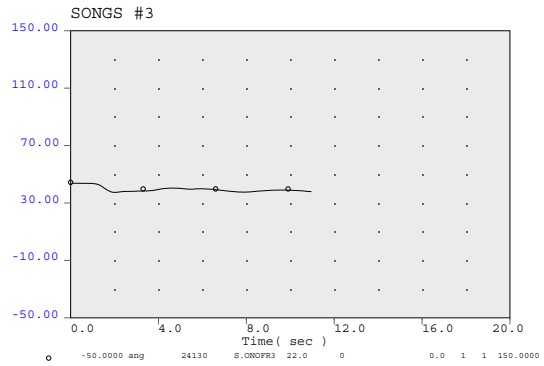


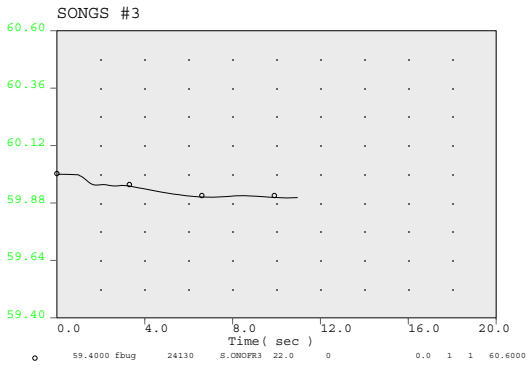
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

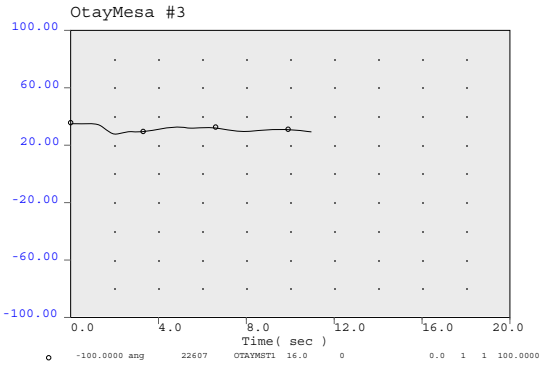
RELATIVE ROTOR ANGLE & FREQUENCY

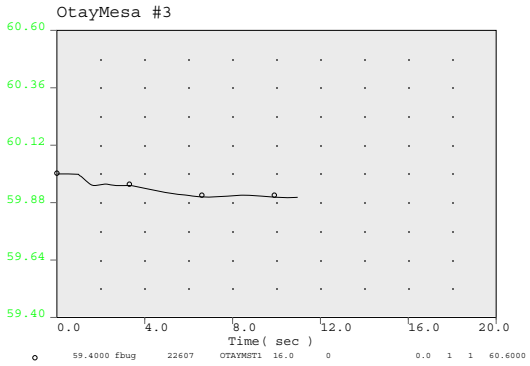






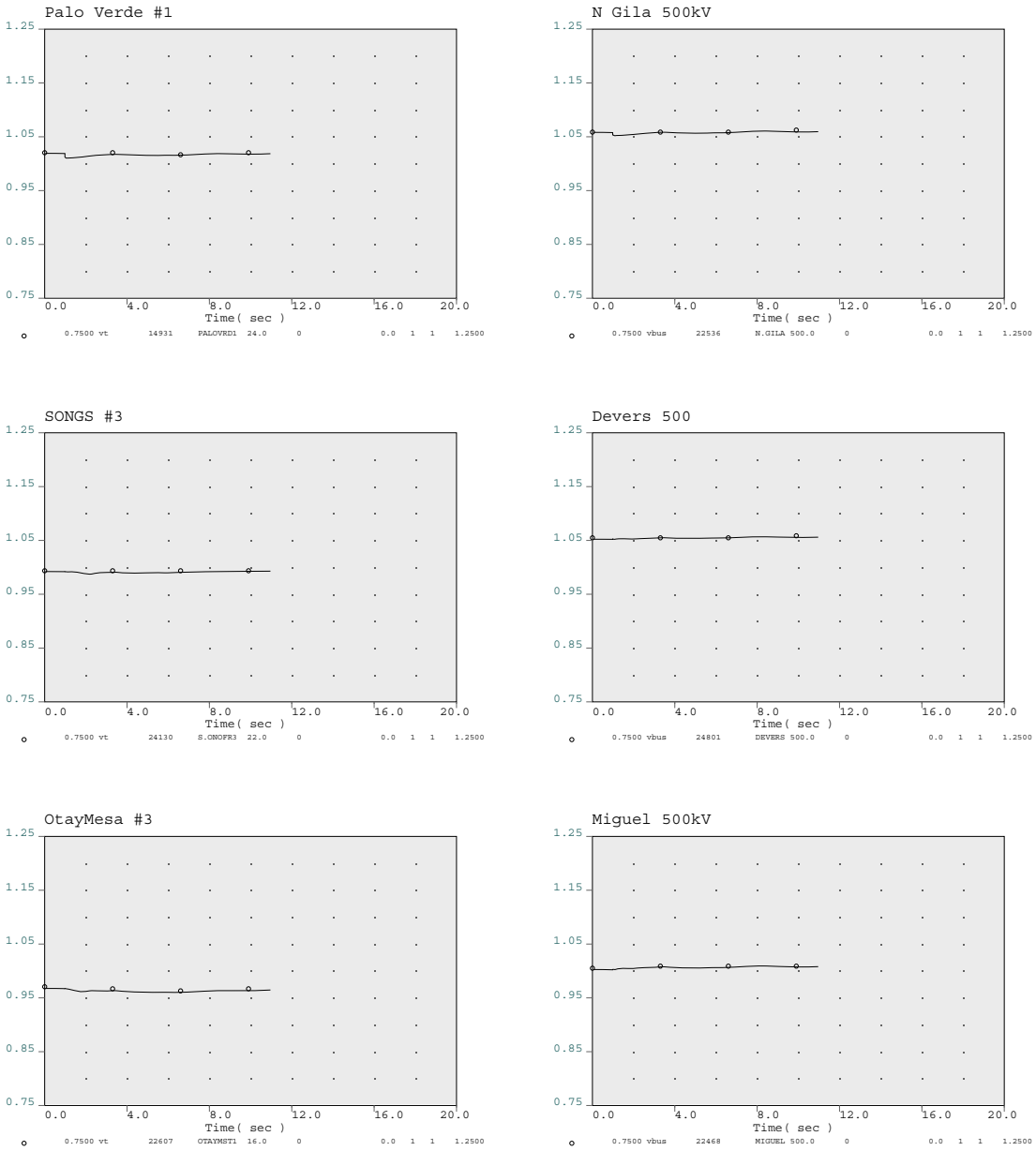






SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

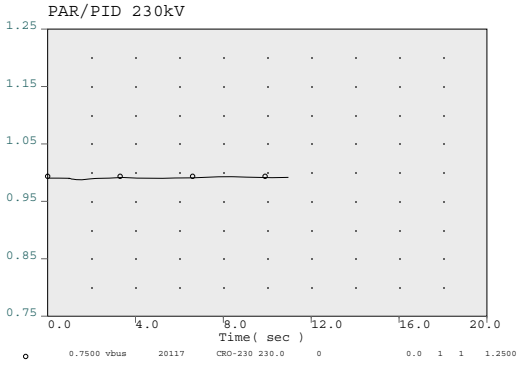
RELATIVE VOLTAGE



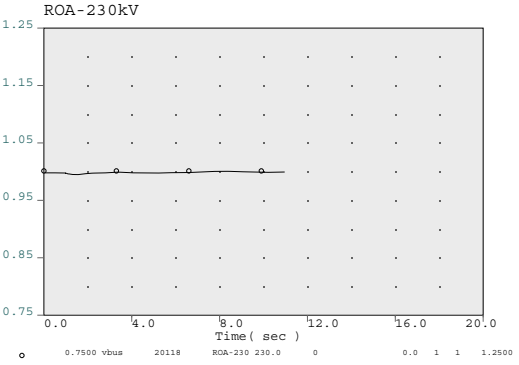
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

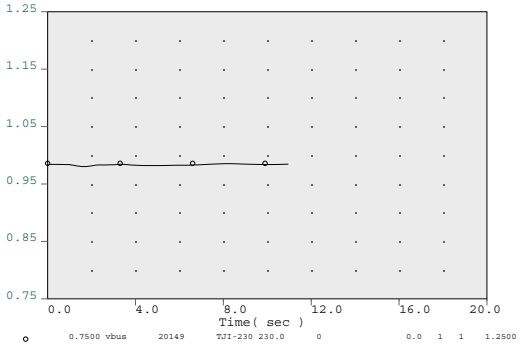
PAR/PID 230kV



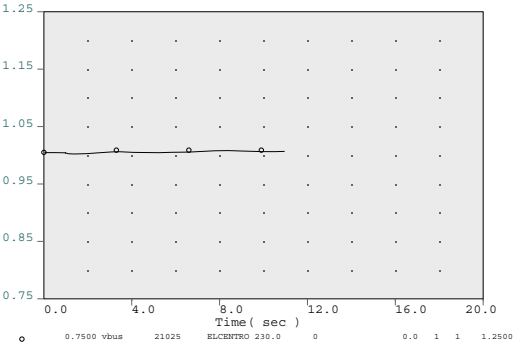
ROA-230kV



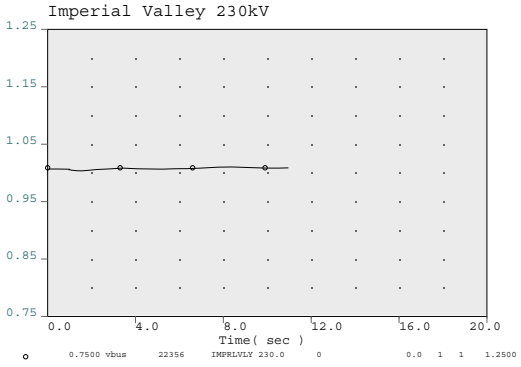
TJ1-230kV



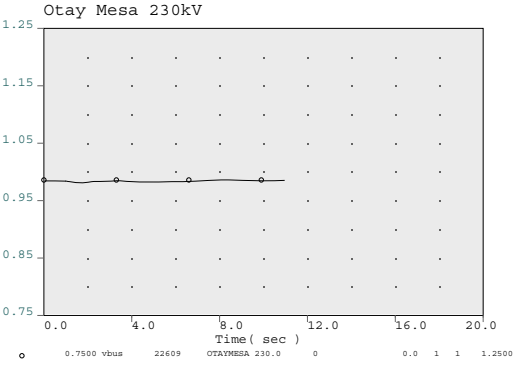
El Centro



Imperial Valley 230kV



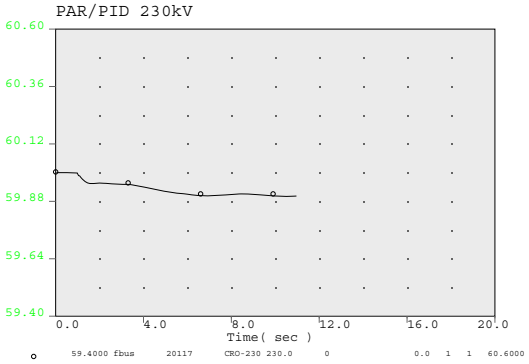
Otay Mesa 230kV



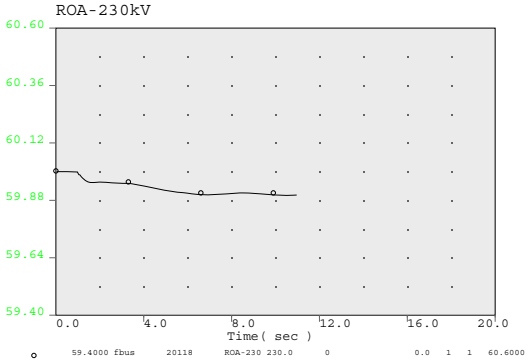
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

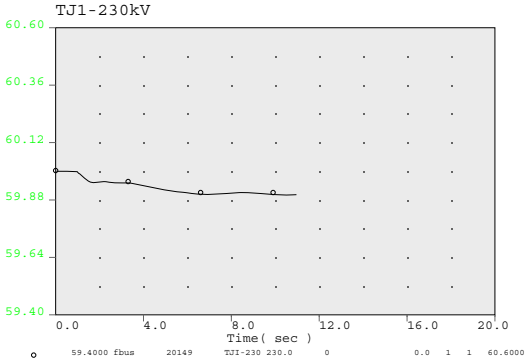
PAR/PID 230kV



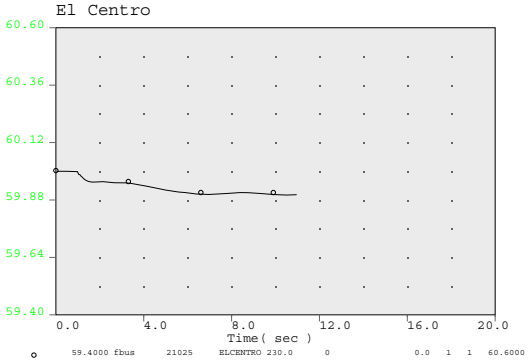
ROA-230kV



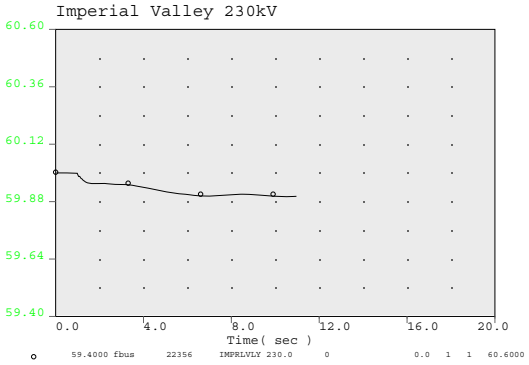
TJ1-230kV



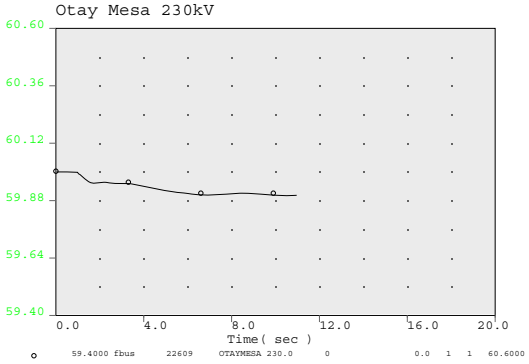
El Centro



Imperial Valley 230kV

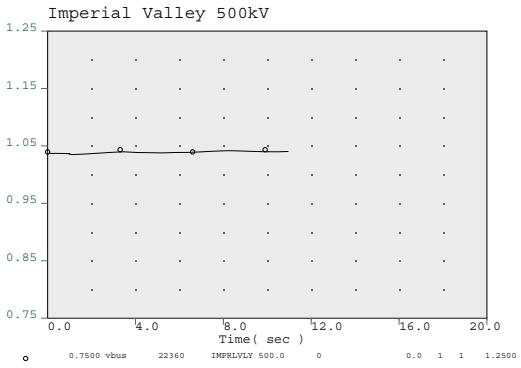


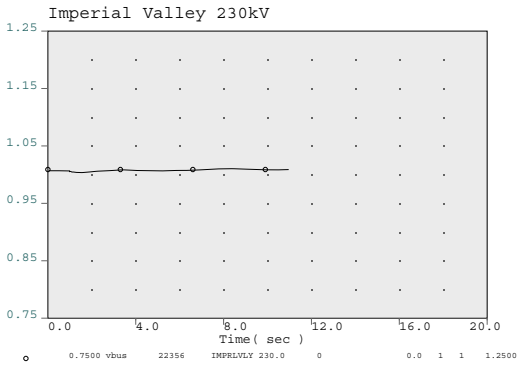
Otay Mesa 230kV

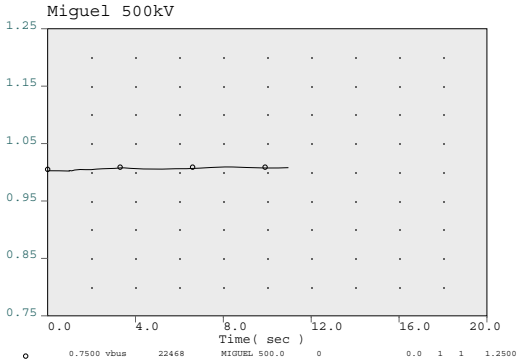


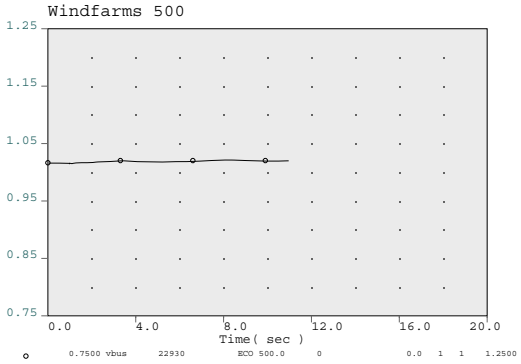
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

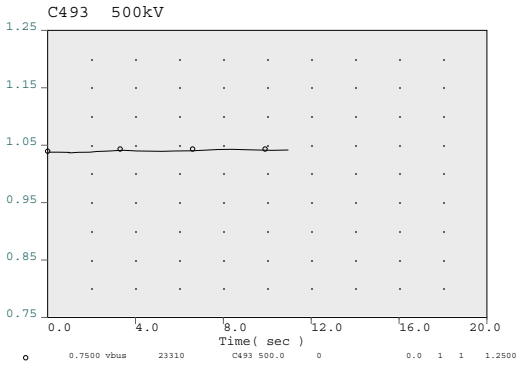
Imperial Valley Area - VOLTAGE

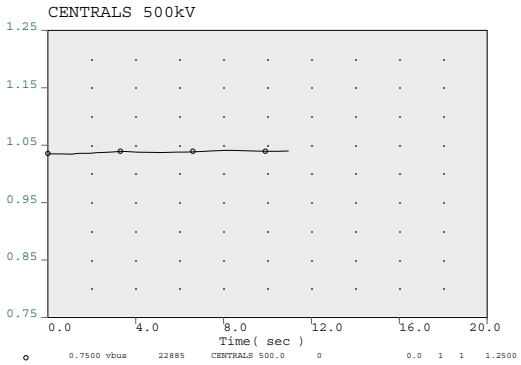








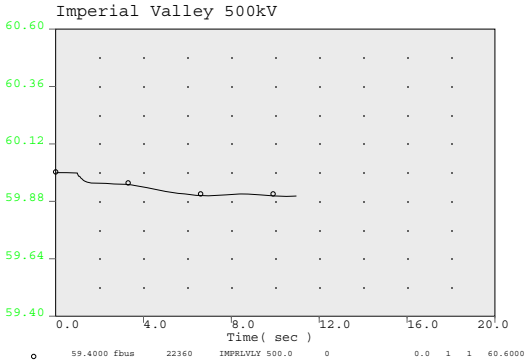




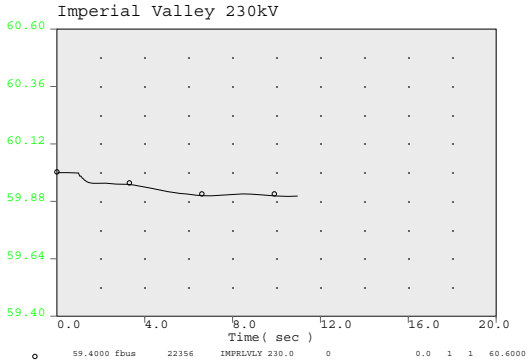
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

Imperial Valley Area - Frequency

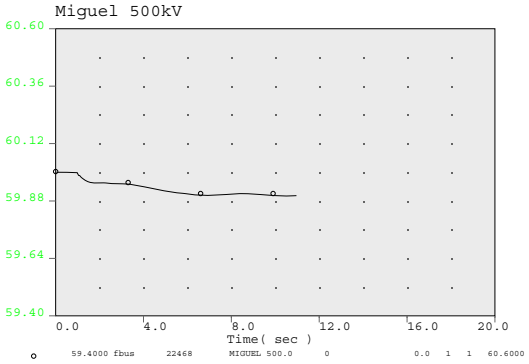
Imperial Valley 500kV



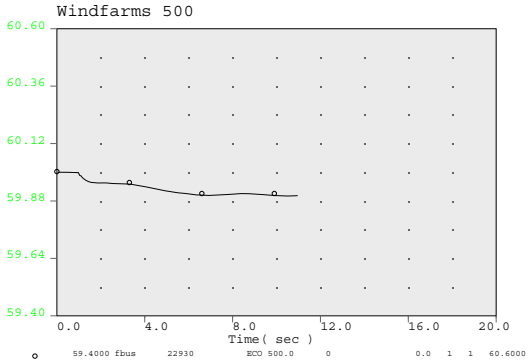
Imperial Valley 230kV



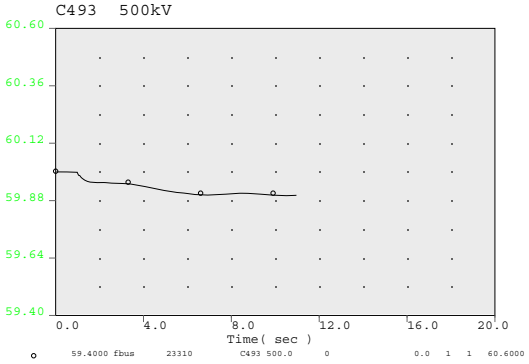
Miguel 500kV



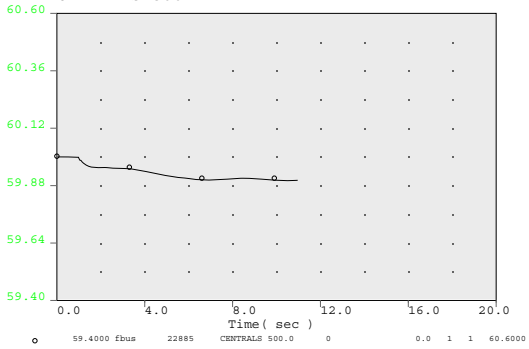
Windfarms 500



C493 500kV

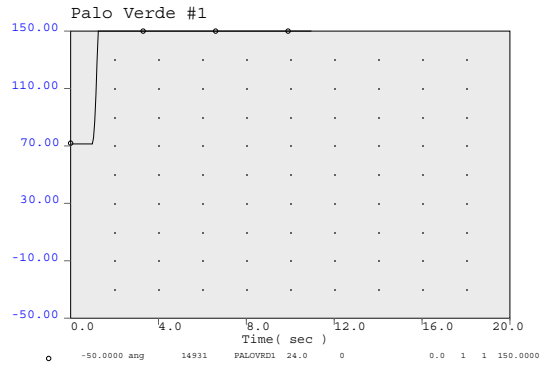


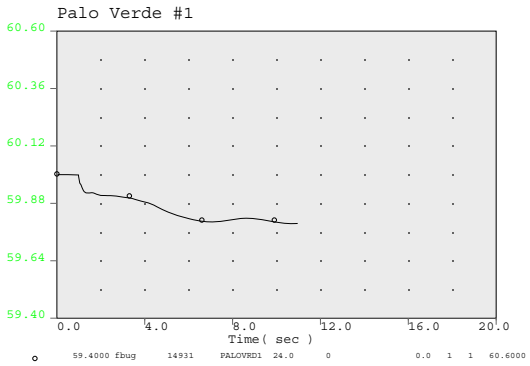
CENTRALS 500kV

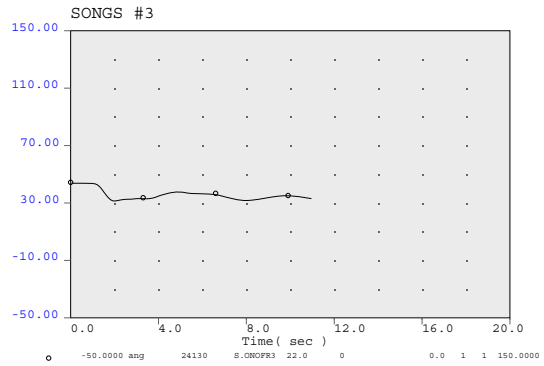


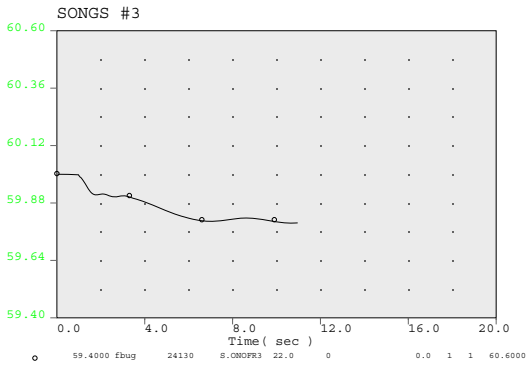
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

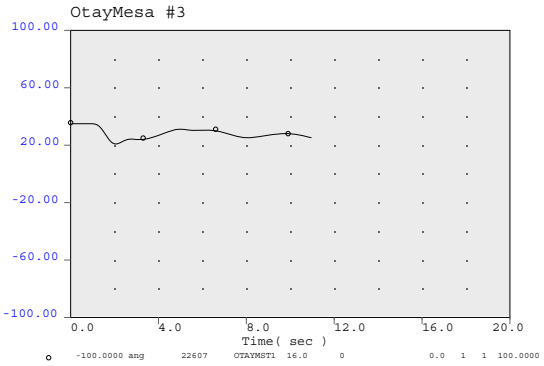
RELATIVE ROTOR ANGLE & FREQUENCY

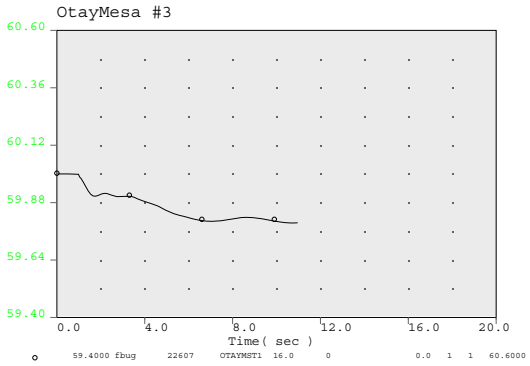








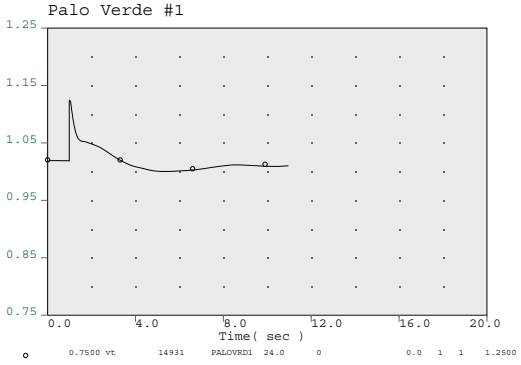




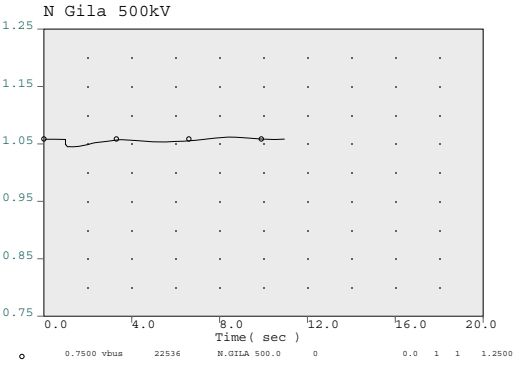
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

RELATIVE VOLTAGE

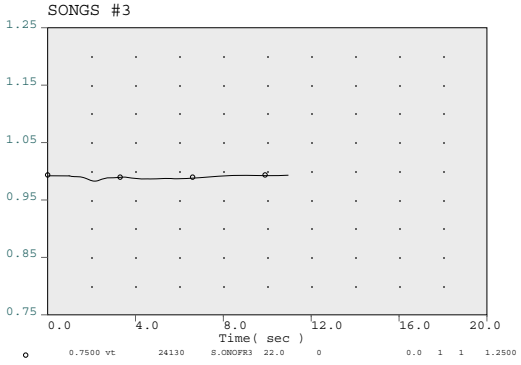
Palo Verde #1



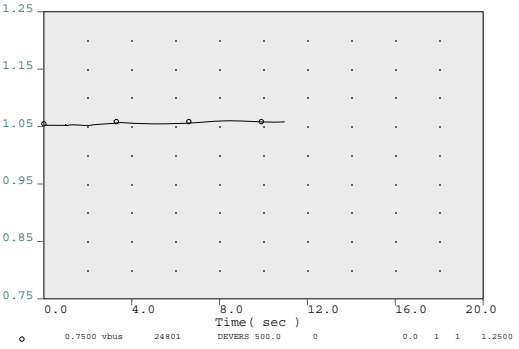
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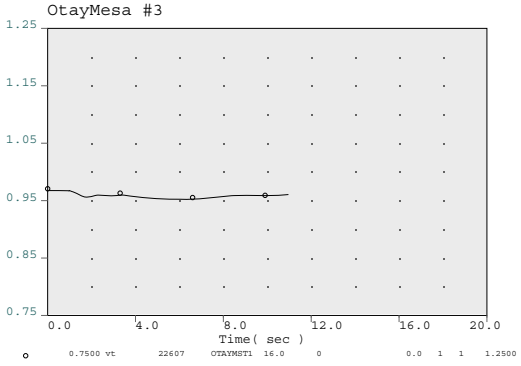
SONGS #3



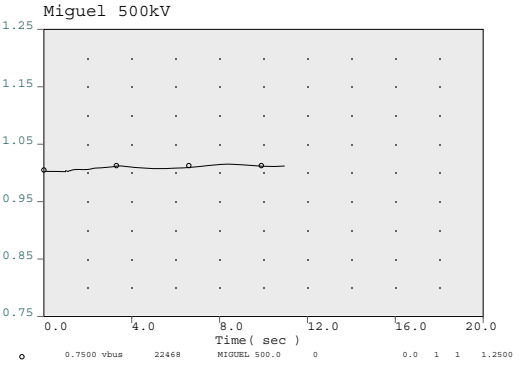
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OtayMesa #3



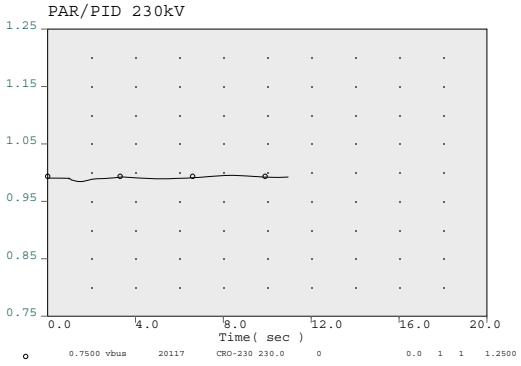
Miguel 500kV



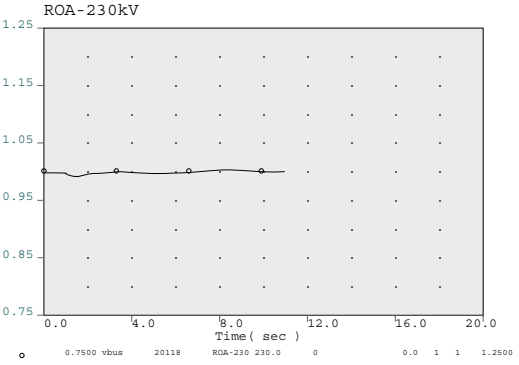
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

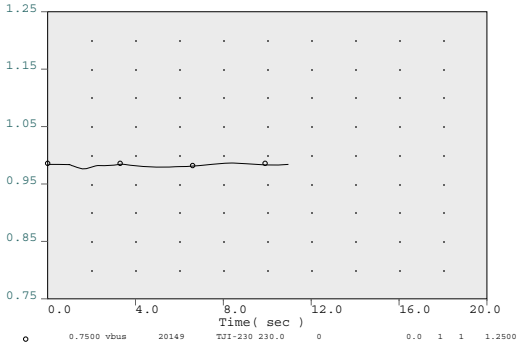
PAR/PID 230kV



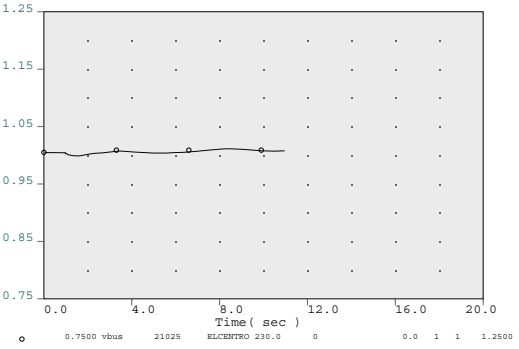
ROA-230kV



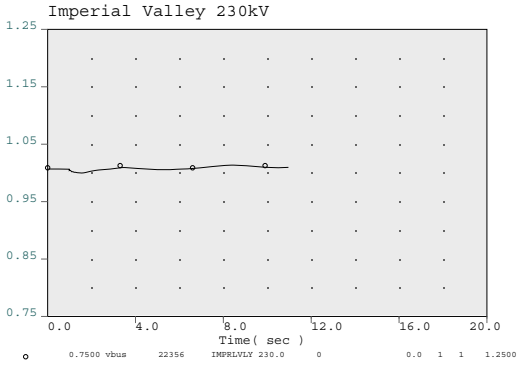
TJ1-230kV



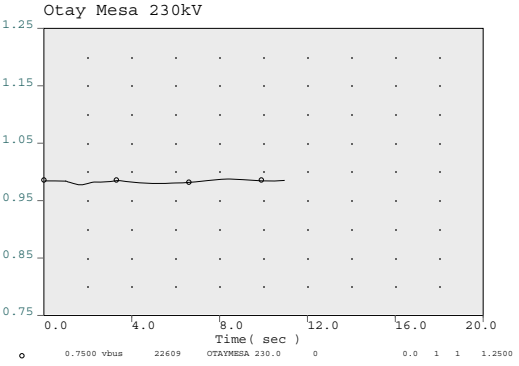
El Centro



Imperial Valley 230kV



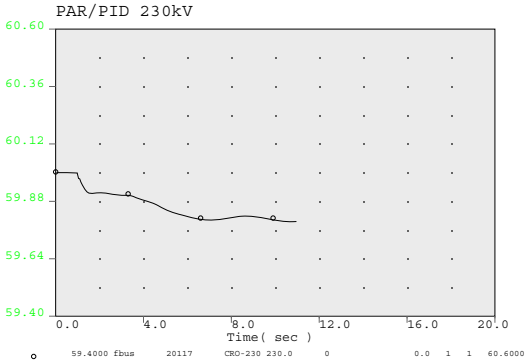
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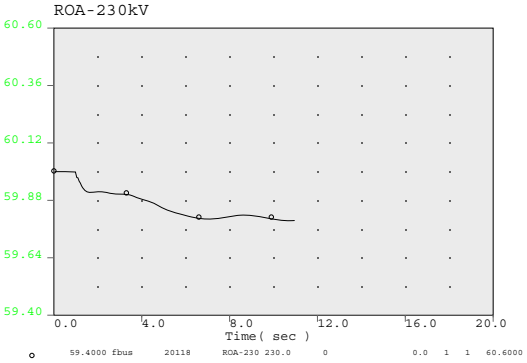
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

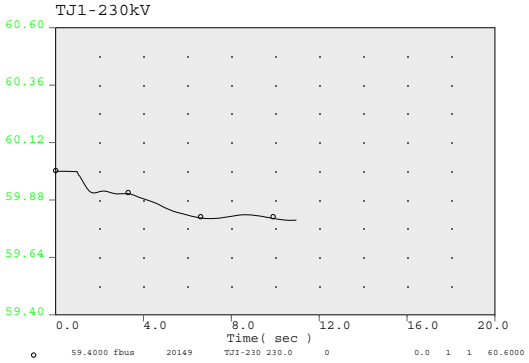
PAR/PID 230kV



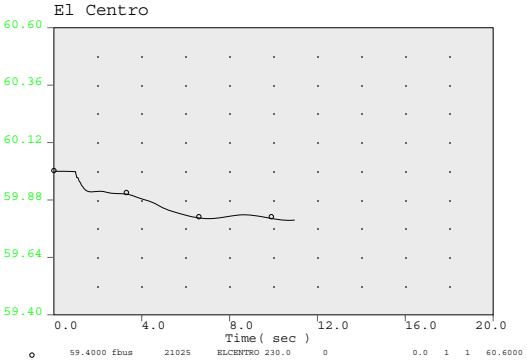
ROA-230kV



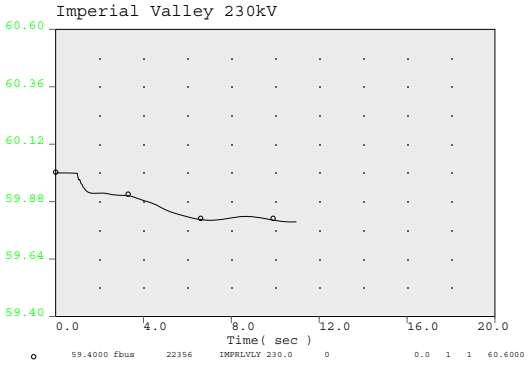
TJ1-230kV



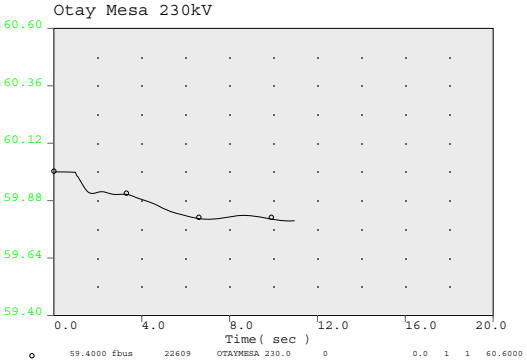
El Centro



Imperial Valley 230kV



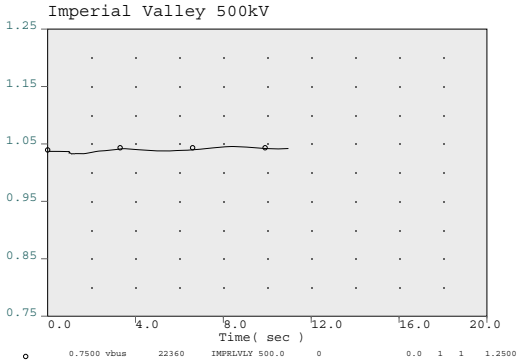
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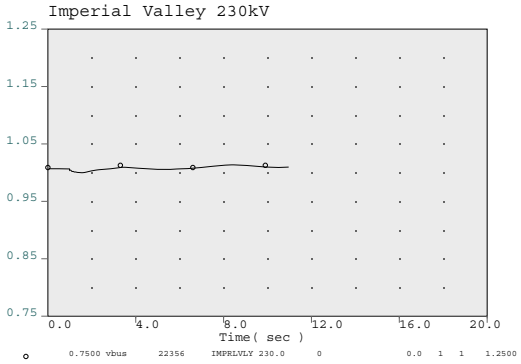
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - VOLTAGE

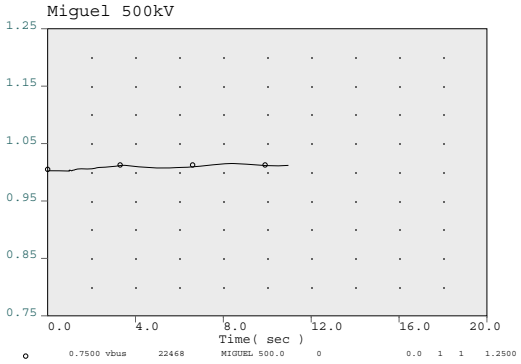
Imperial Valley 500kV



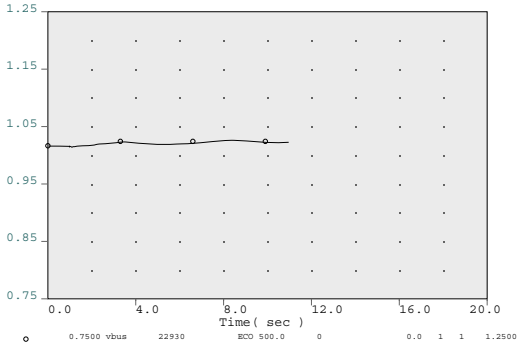
Imperial Valley 230kV



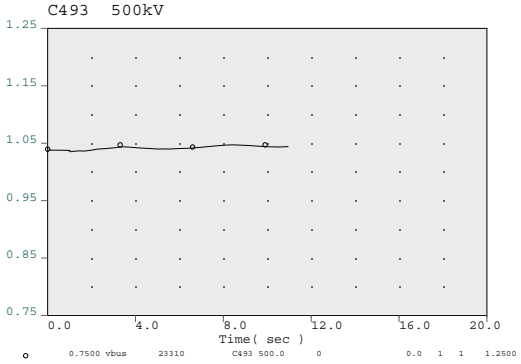
Miguel 500kV



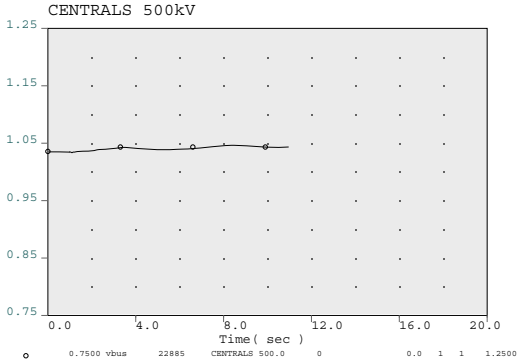
Windfarms 500



C493 500kV

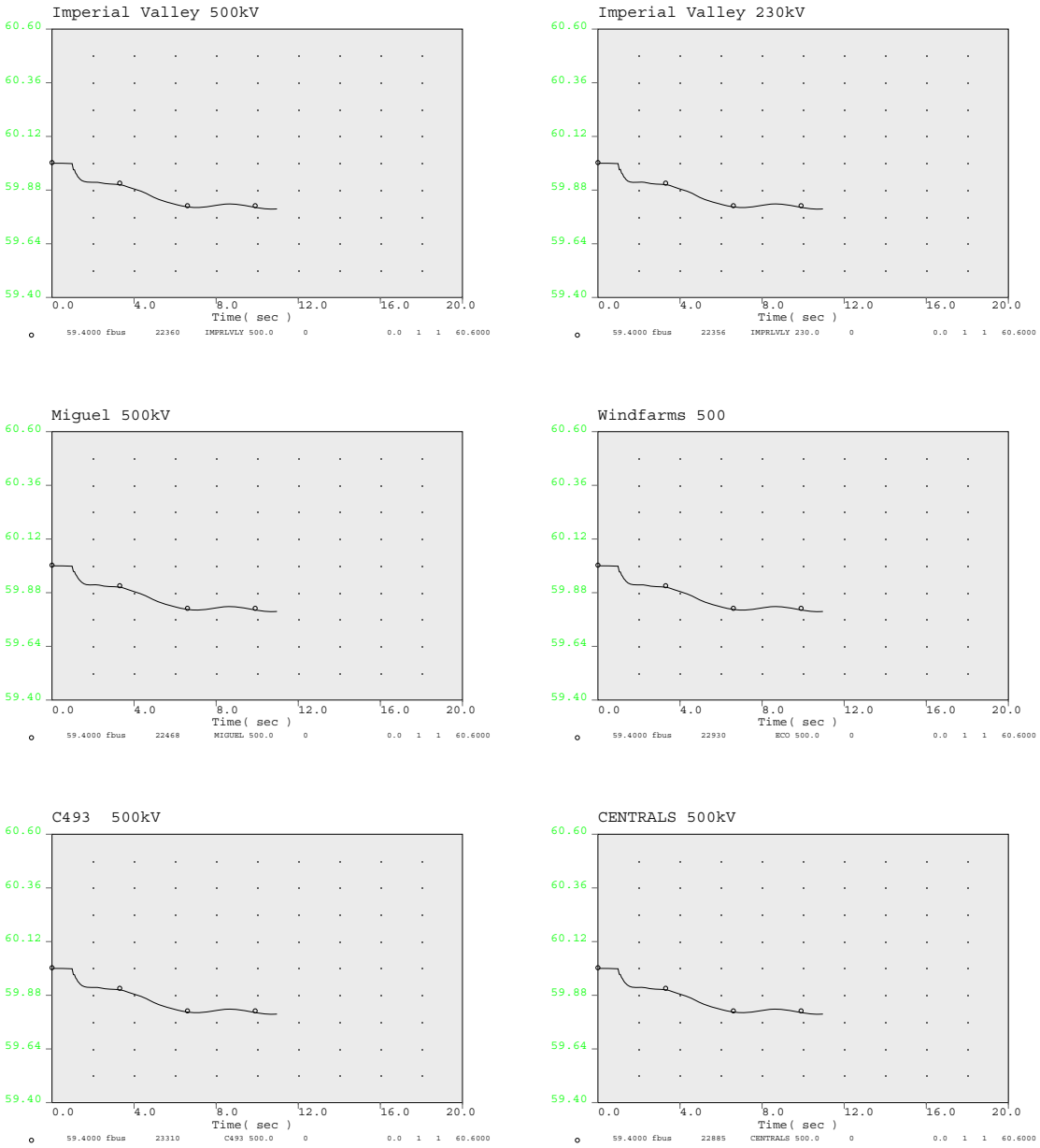


CENTRALS 500kV



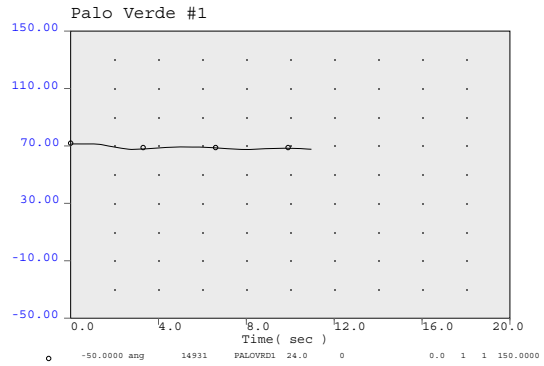
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

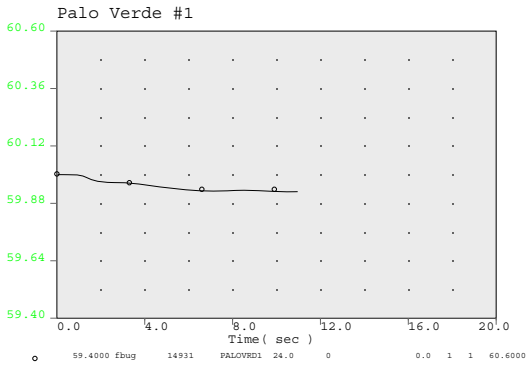
Imperial Valley Area - Frequency

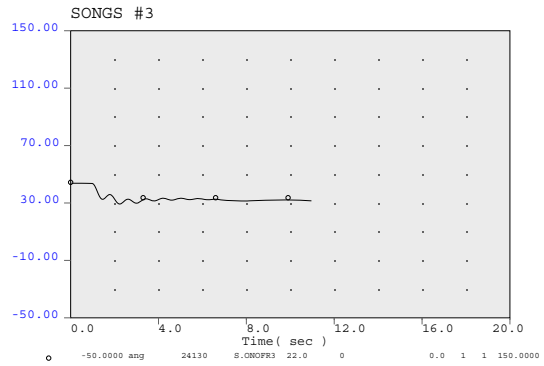


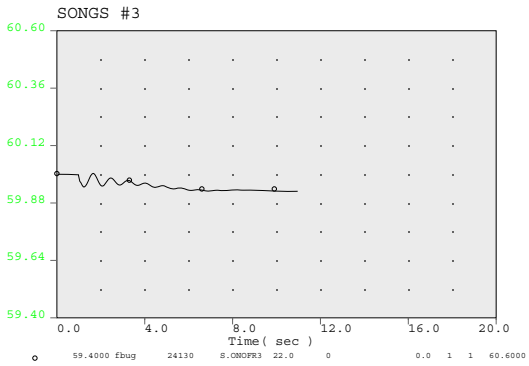
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

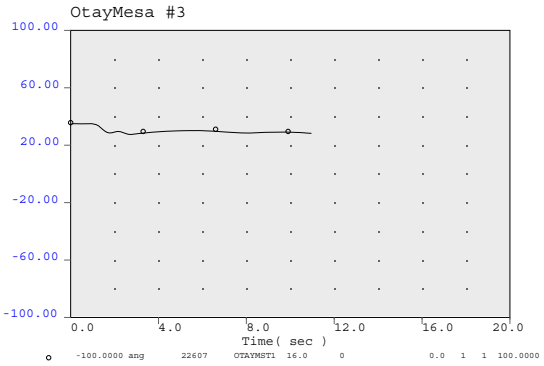
RELATIVE ROTOR ANGLE & FREQUENCY

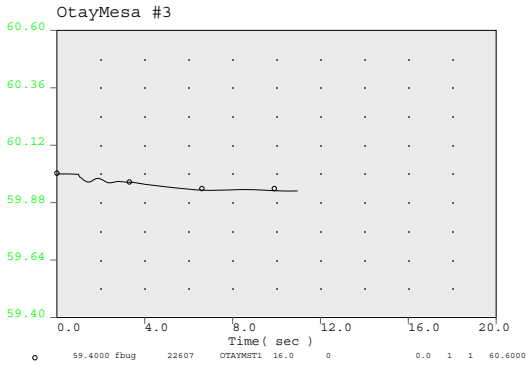










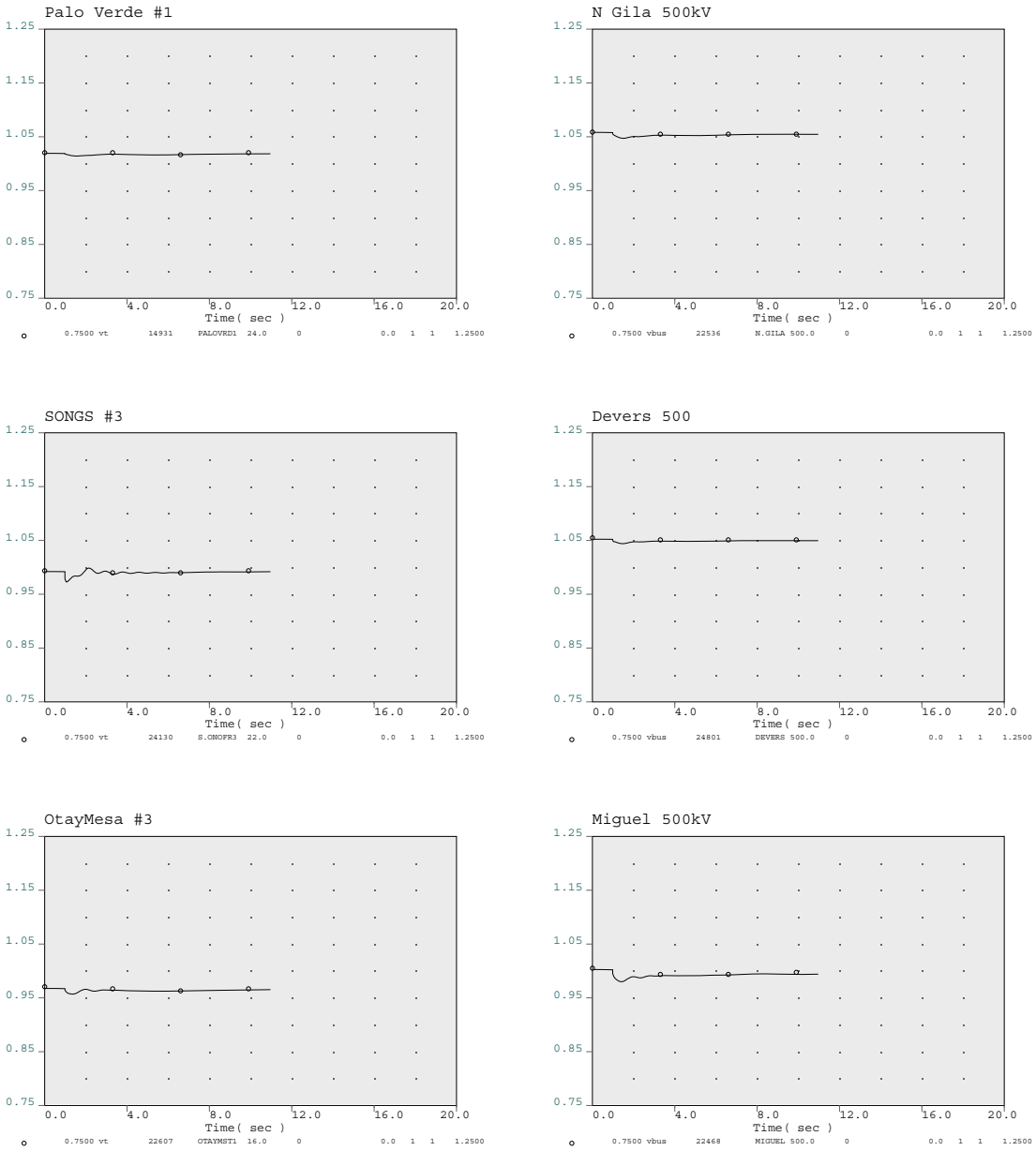


SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Page 1

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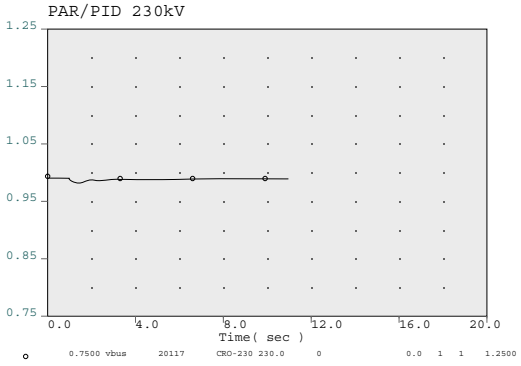
RELATIVE VOLTAGE



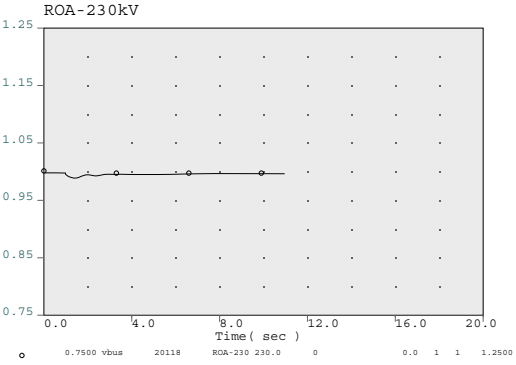
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

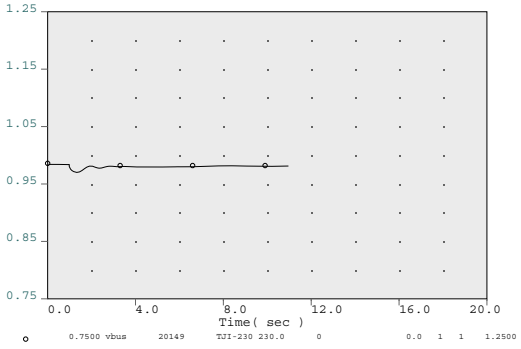
PAR/PID 230kV



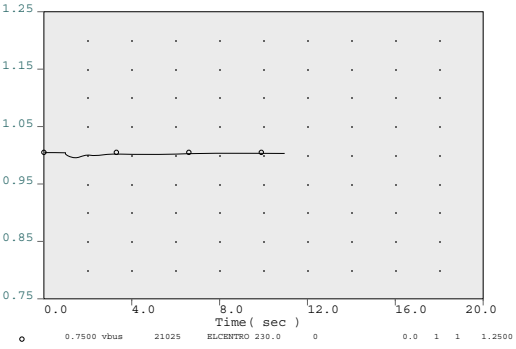
ROA-230kV



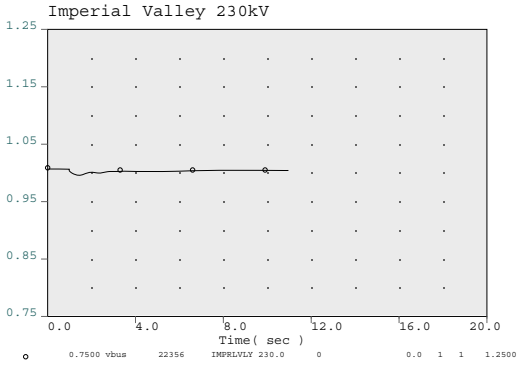
TJ1-230kV



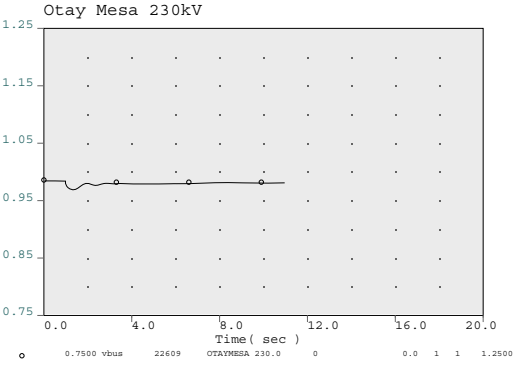
El Centro



Imperial Valley 230kV



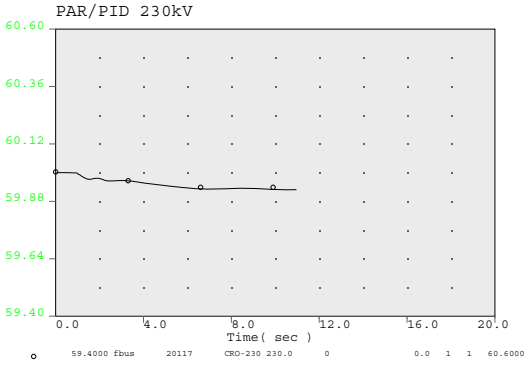
Otay Mesa 230kV



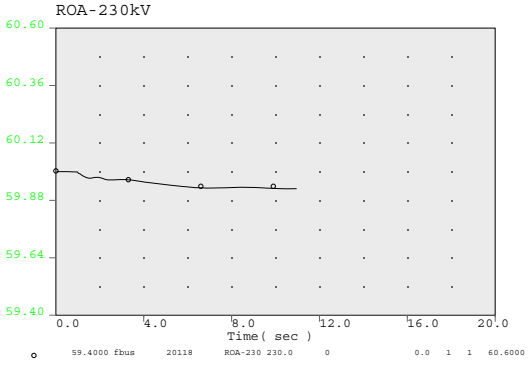
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison

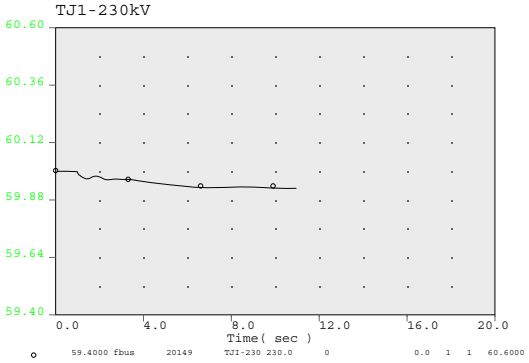
PAR/PID 230kV



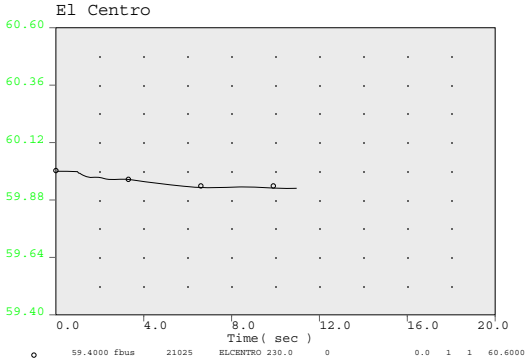
ROA-230kV



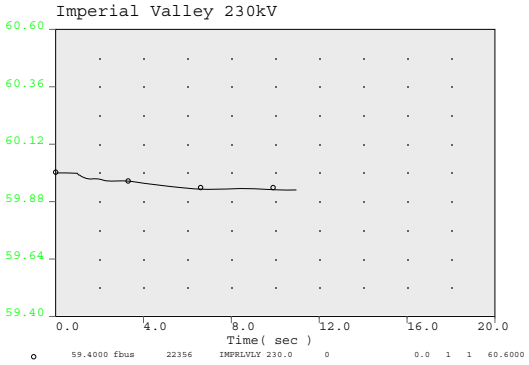
TJ1-230kV



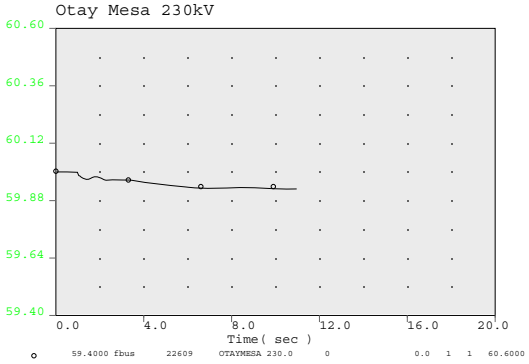
El Centro



Imperial Valley 230kV



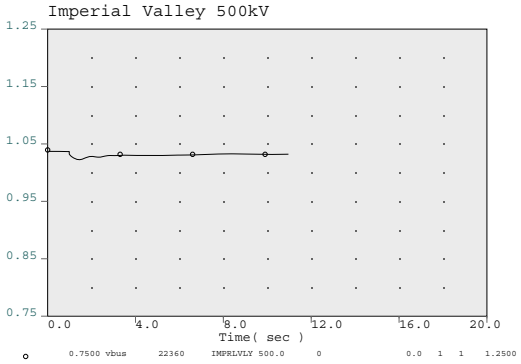
Otay Mesa 230kV



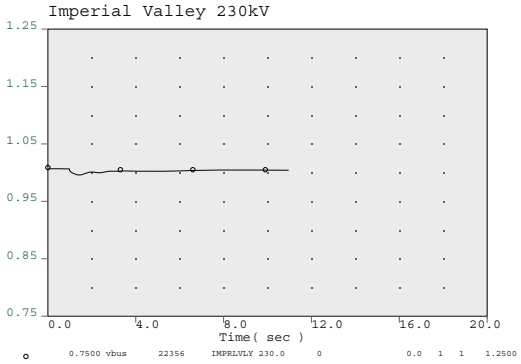
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Imperial Valley Area - VOLTAGE

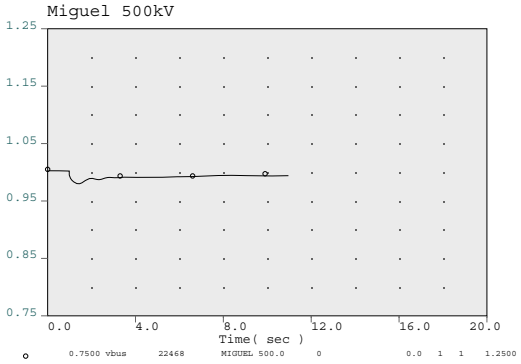
Imperial Valley 500kV



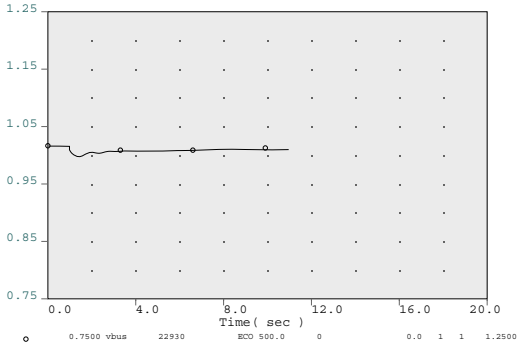
Imperial Valley 230kV



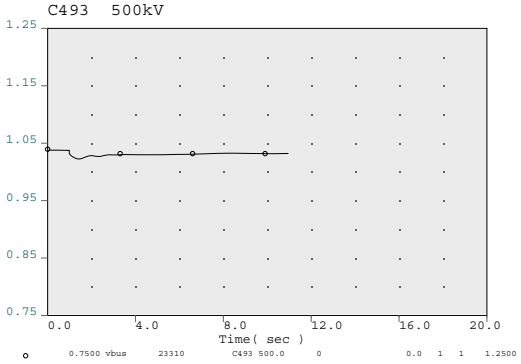
Miguel 500kV



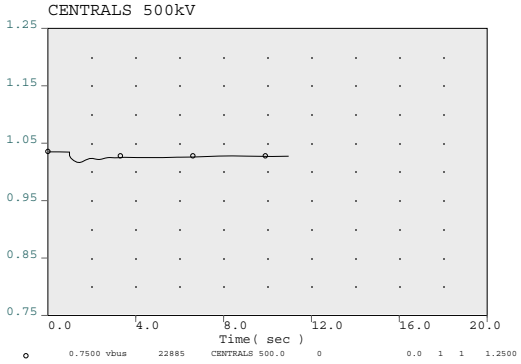
Windfarms 500



C493 500kV

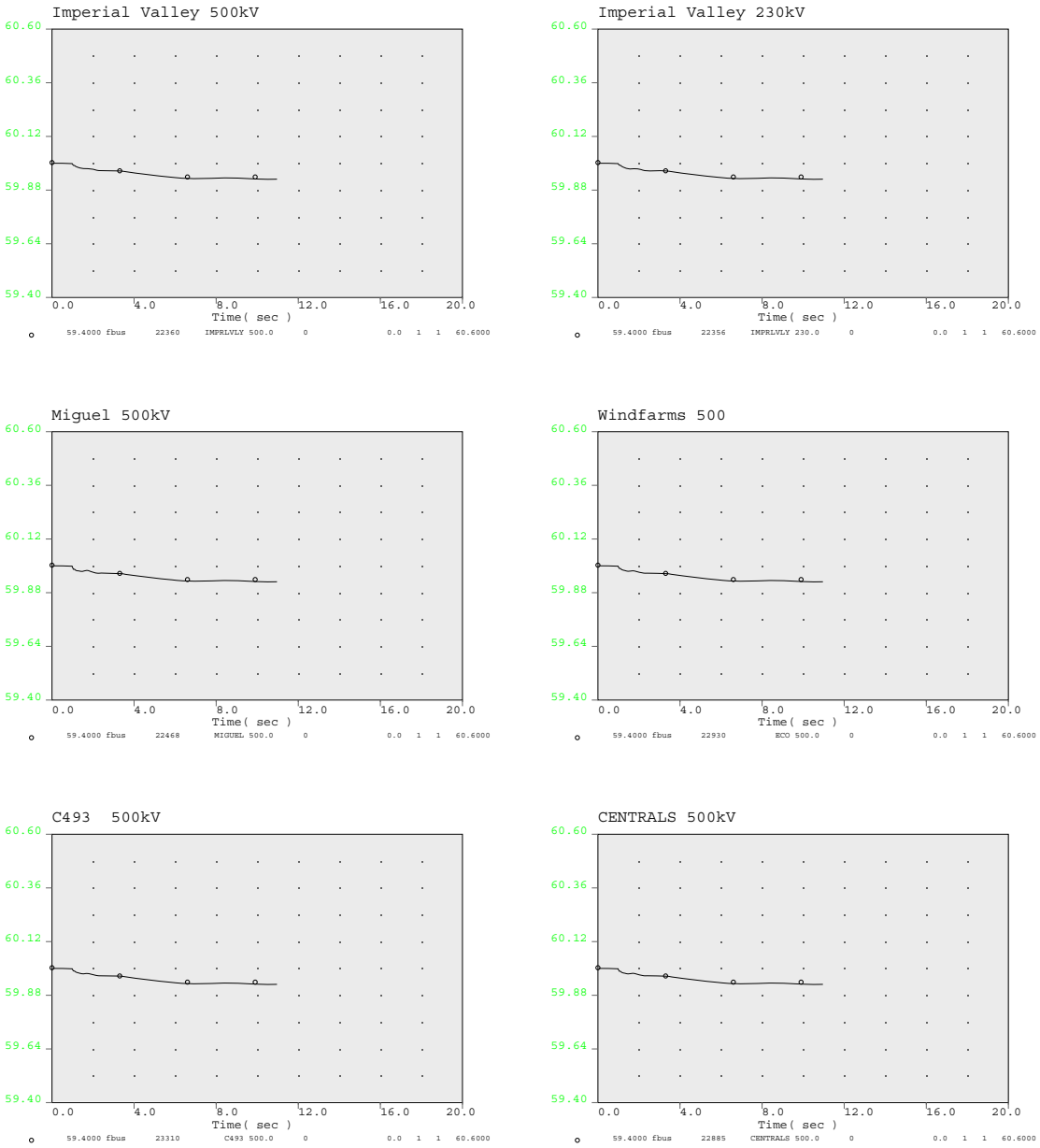


CENTRALS 500kV



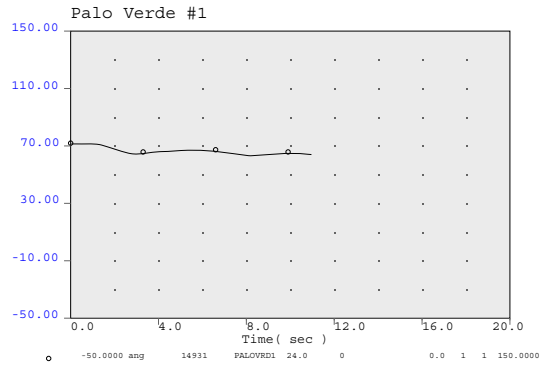
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

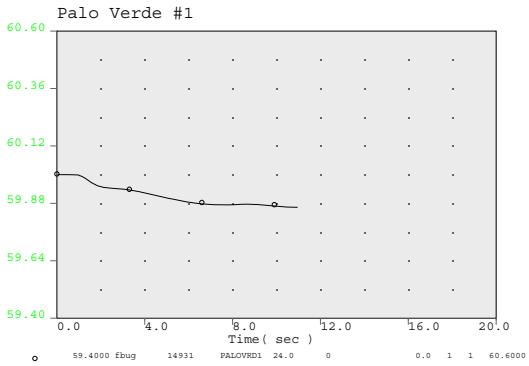
Imperial Valley Area - Frequency

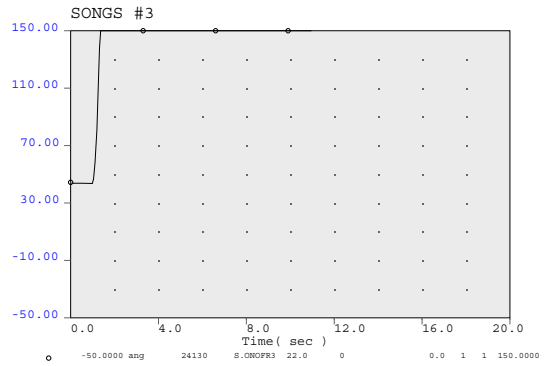


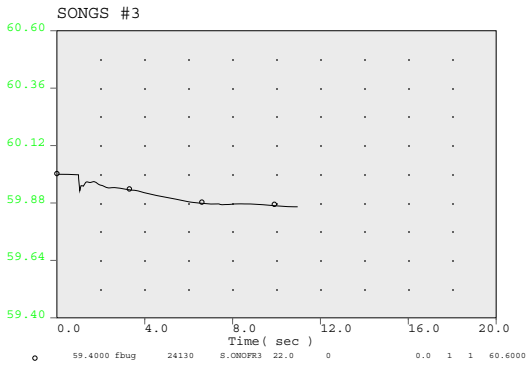
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

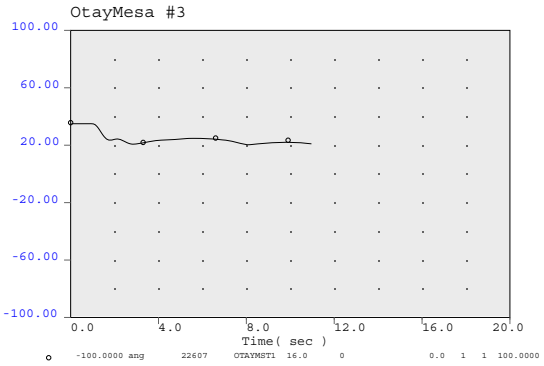
RELATIVE ROTOR ANGLE & FREQUENCY

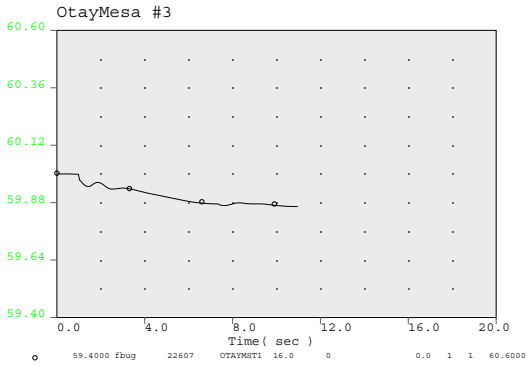










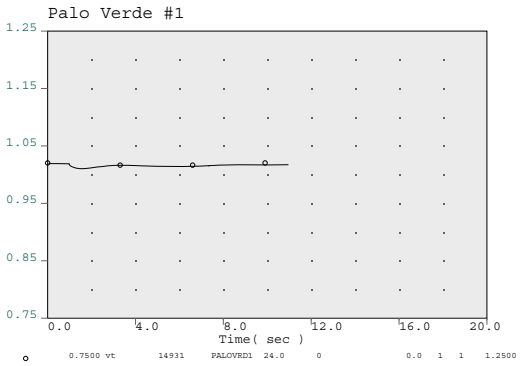


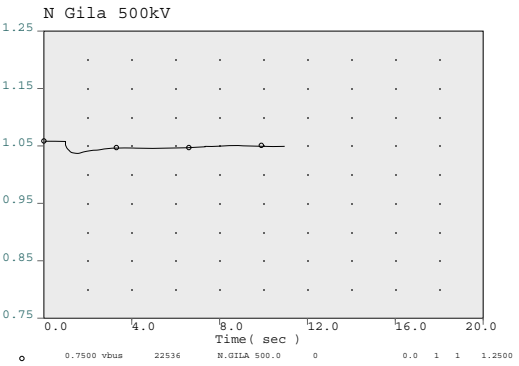
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

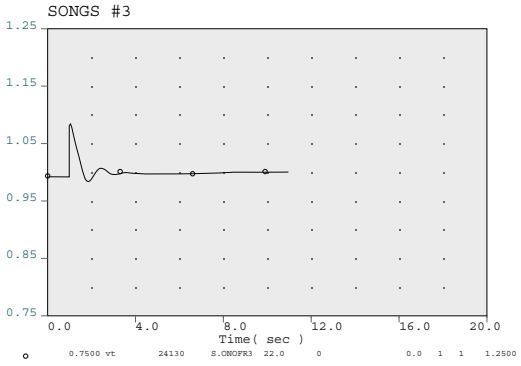
Page 1

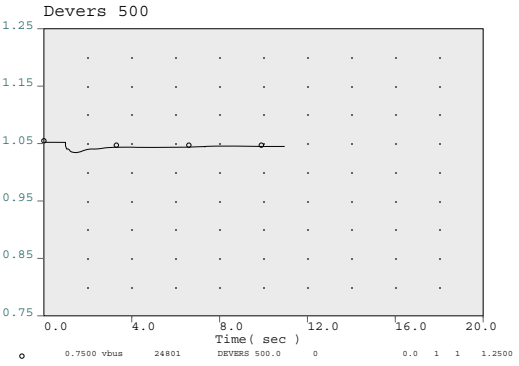
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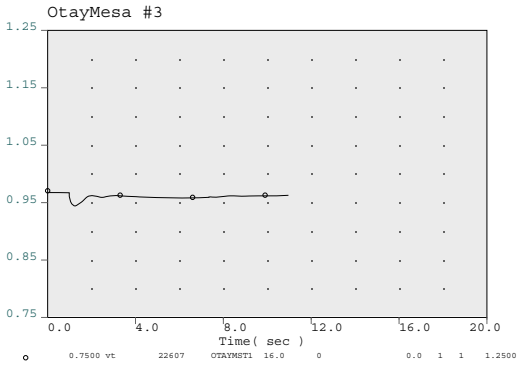
RELATIVE VOLTAGE

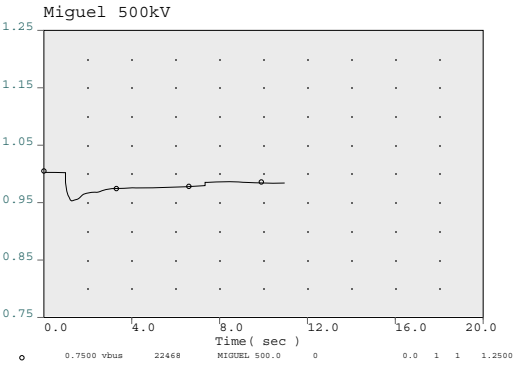








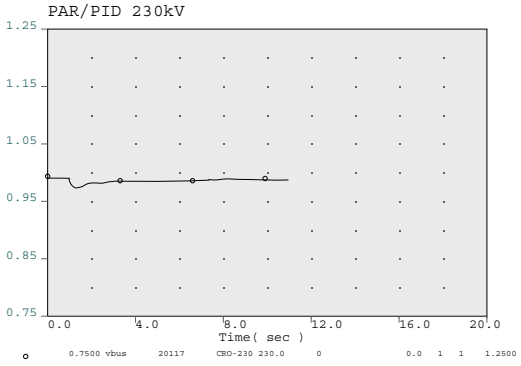




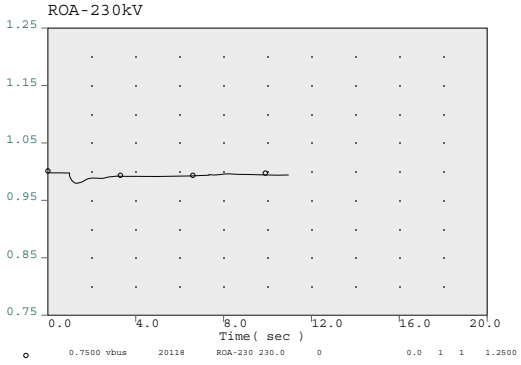
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

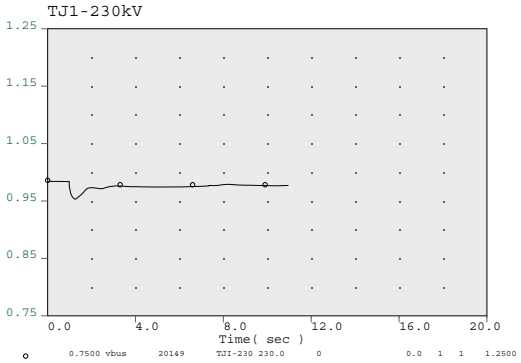
PAR/PID 230kV



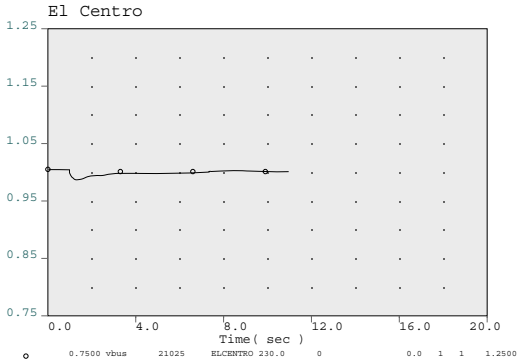
ROA-230kV



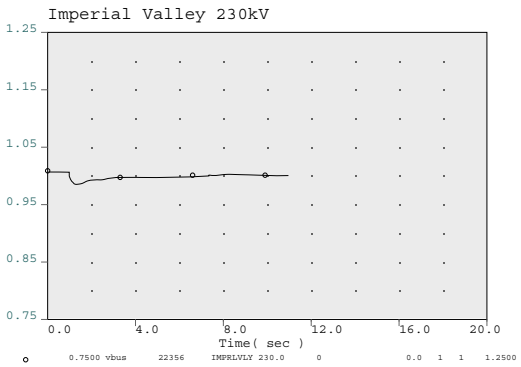
TJ1-230kV



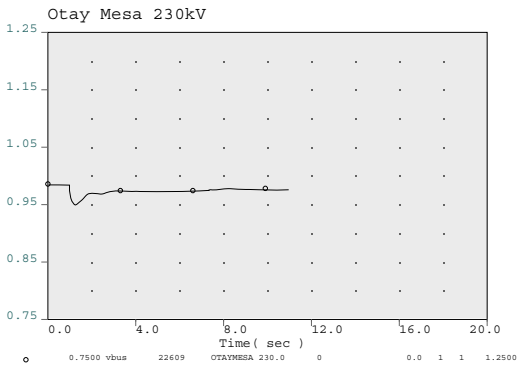
El Centro



Imperial Valley 230kV



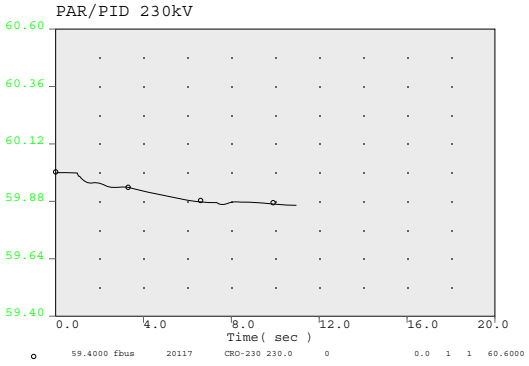
Otay Mesa 230kV



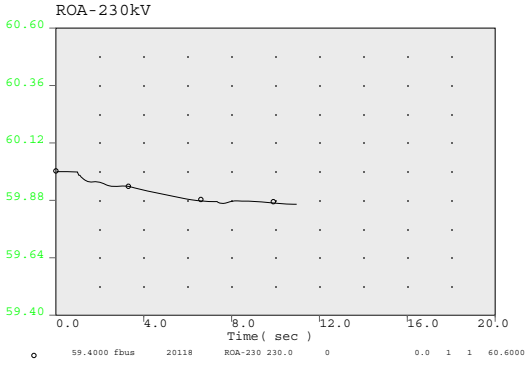
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Affected System Frequency Check and Comparison

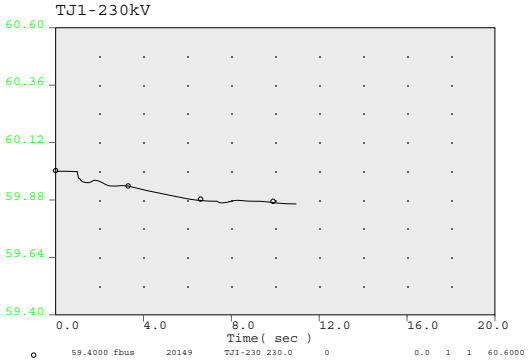
PAR/PID 230kV



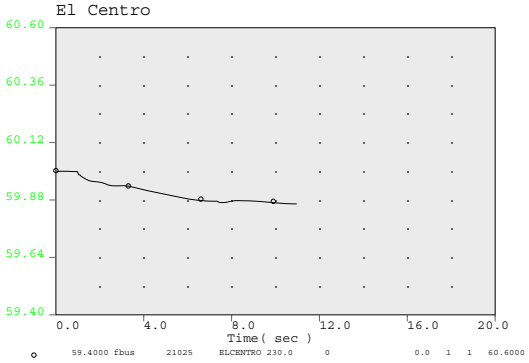
ROA-230kV



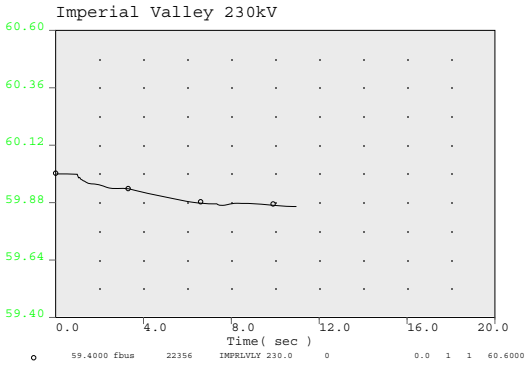
TJ1-230kV



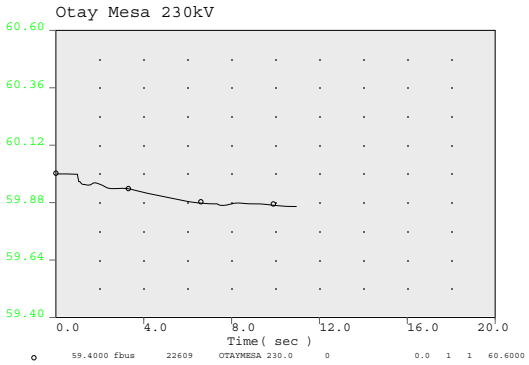
El Centro



Imperial Valley 230kV



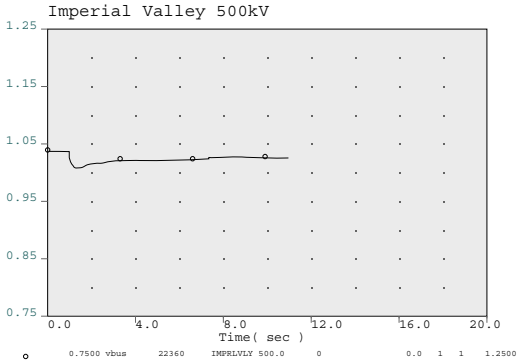
Otay Mesa 230kV



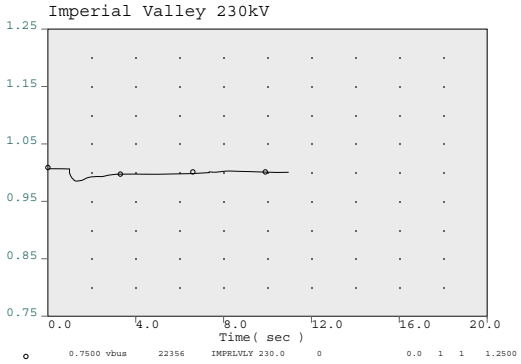
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

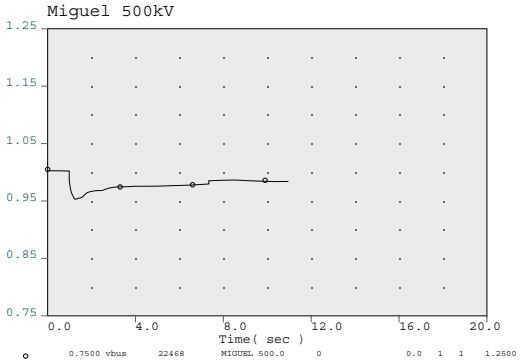
Imperial Valley 500kV



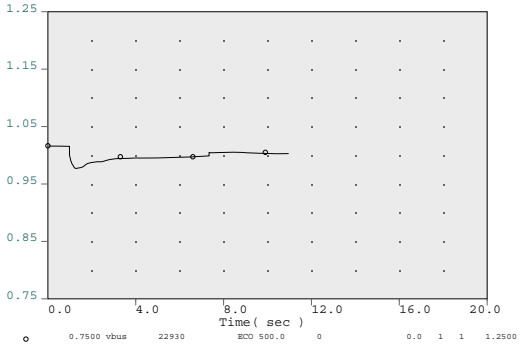
Imperial Valley 230kV



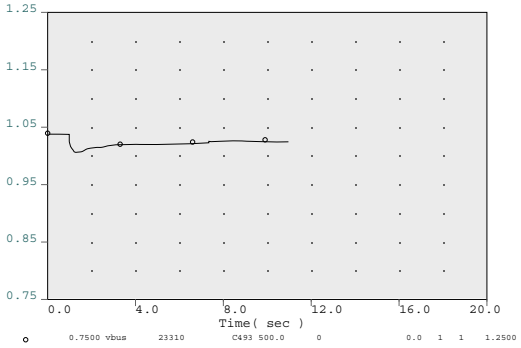
Miguel 500kV



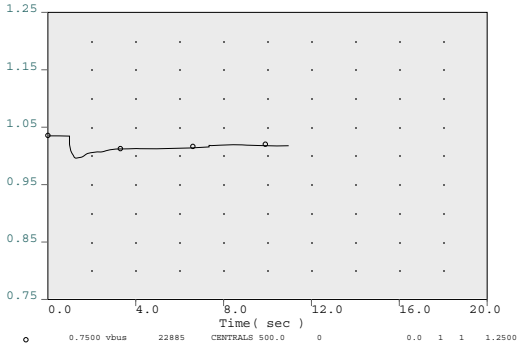
Windfarms 500



C493 500kV

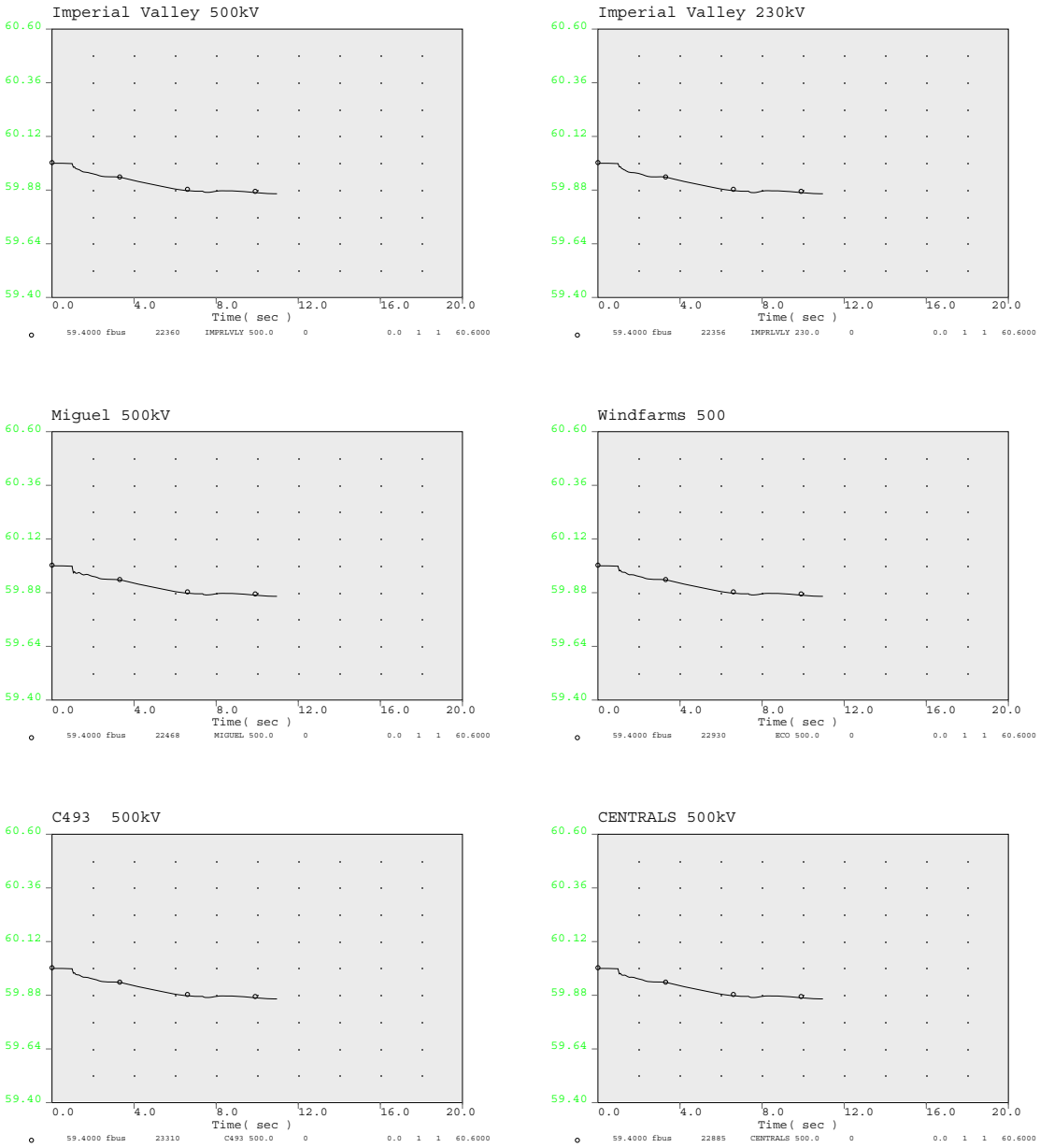


CENTRALS 500kV



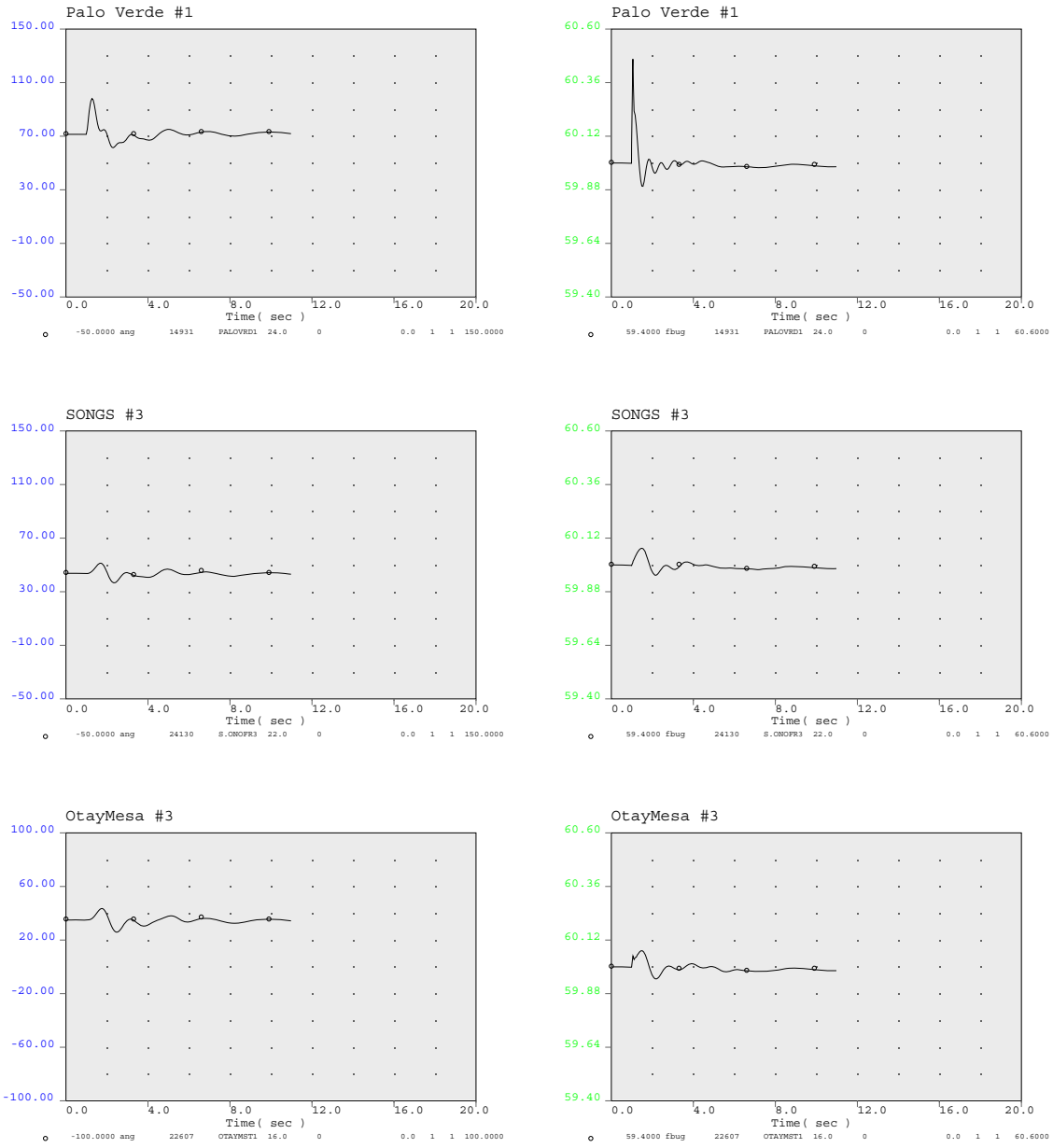
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

RELATIVE ROTOR ANGLE & FREQUENCY

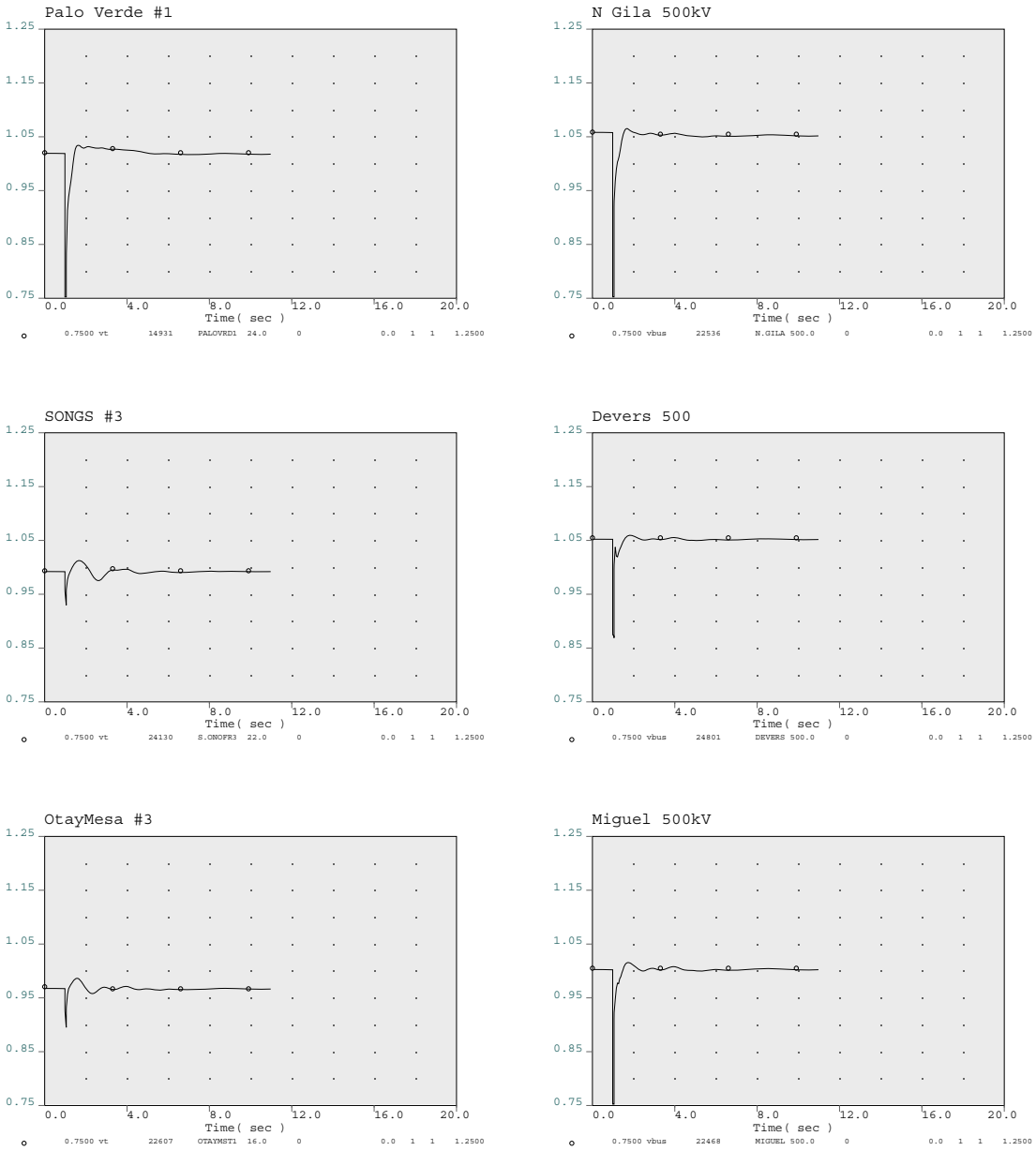


SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-Hassyampa 500 kV line

Page 1

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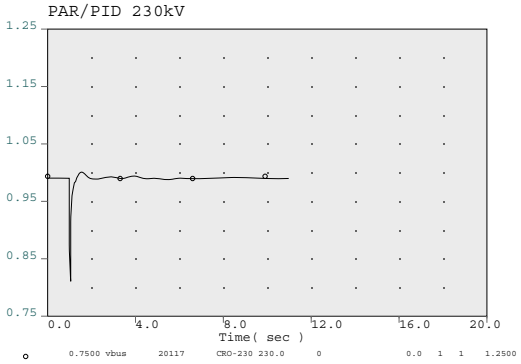
RELATIVE VOLTAGE



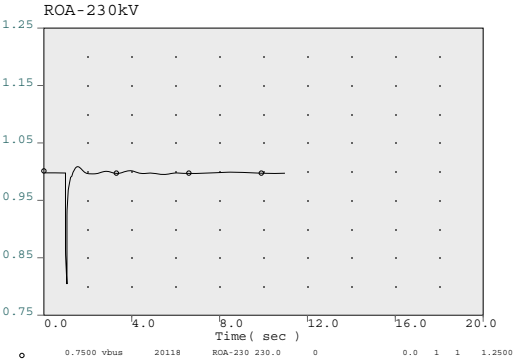
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

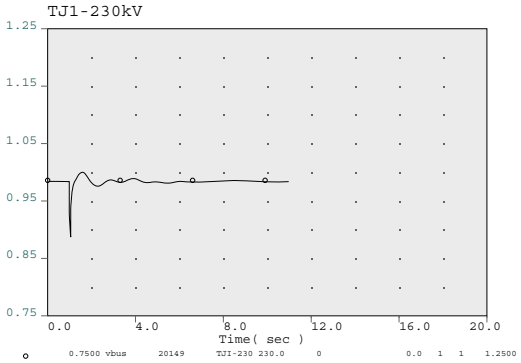
PAR/PID 230kV



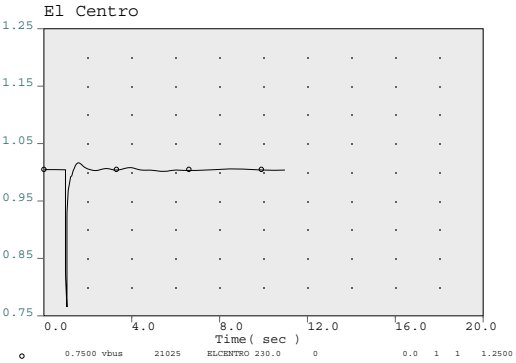
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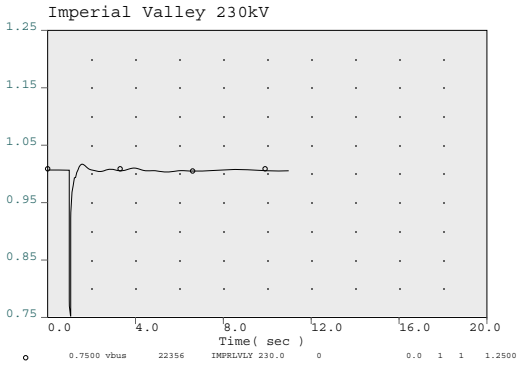
TJ1-230kV



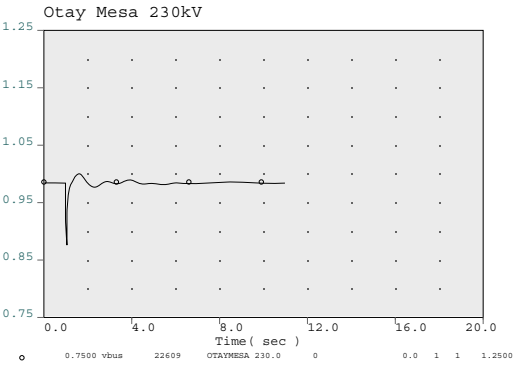
El Centro



Imperial Valley 230kV



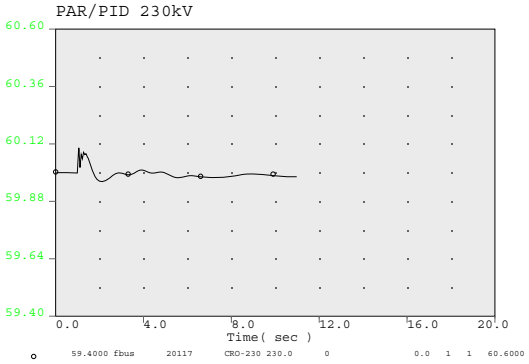
Otay Mesa 230kV



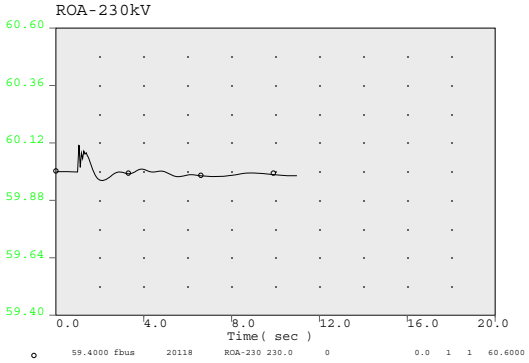
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Frequency Check and Comparison

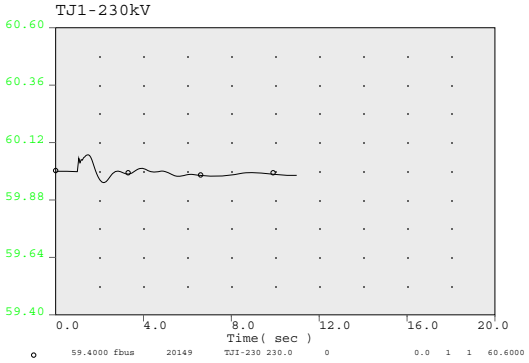
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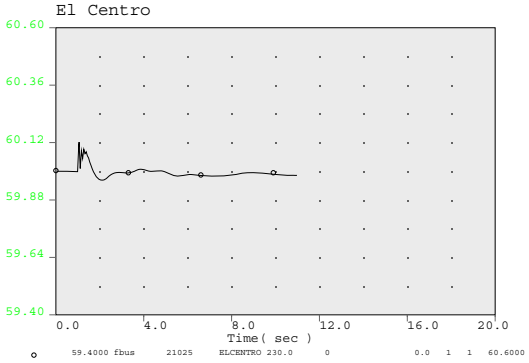
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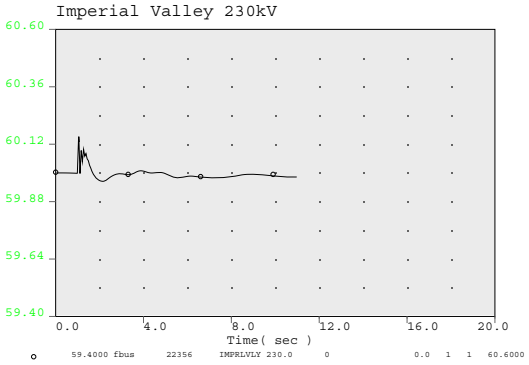
TJ1-230kV



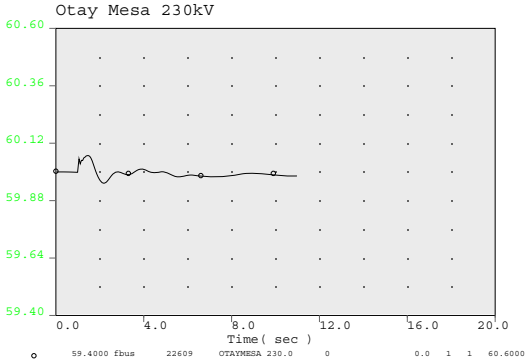
El Centro



Imperial Valley 230kV



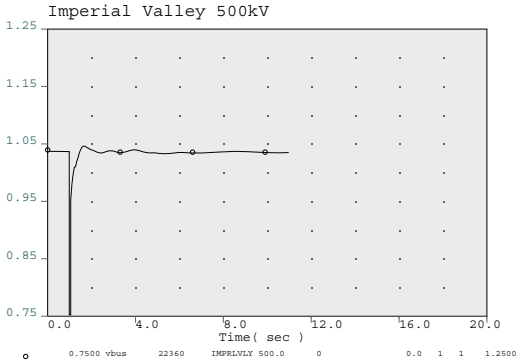
Otay Mesa 230kV



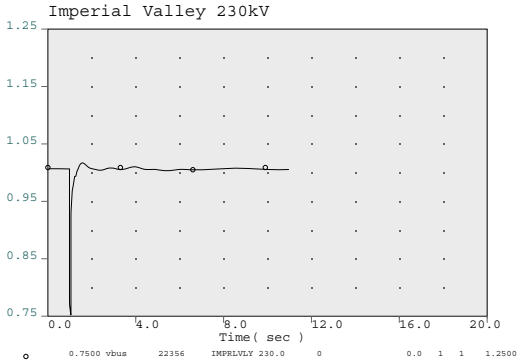
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-Hassyampa 500 kV line

Imperial Valley Area - VOLTAGE

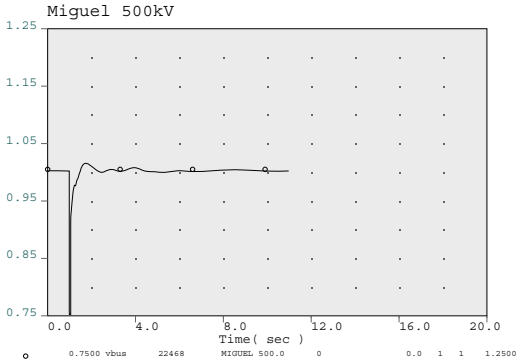
Imperial Valley 500kV



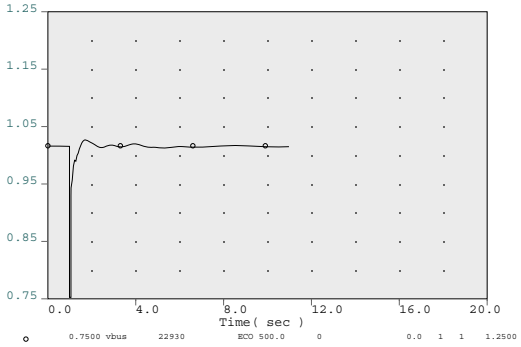
Imperial Valley 230kV



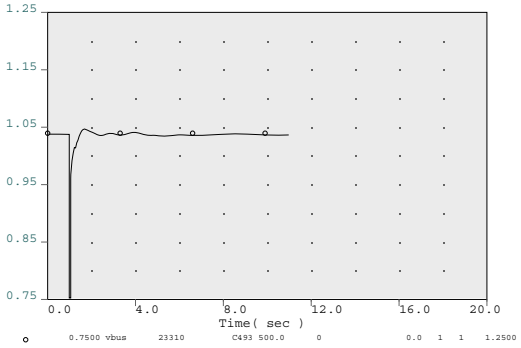
Miguel 500kV



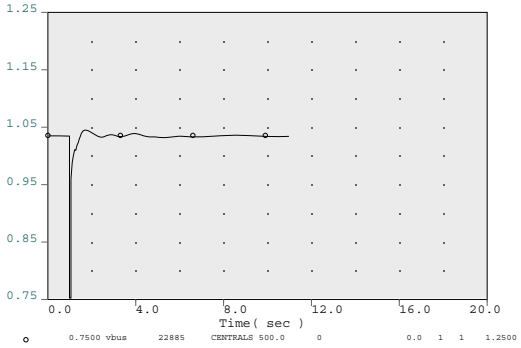
Windfarms 500



C493 500kV

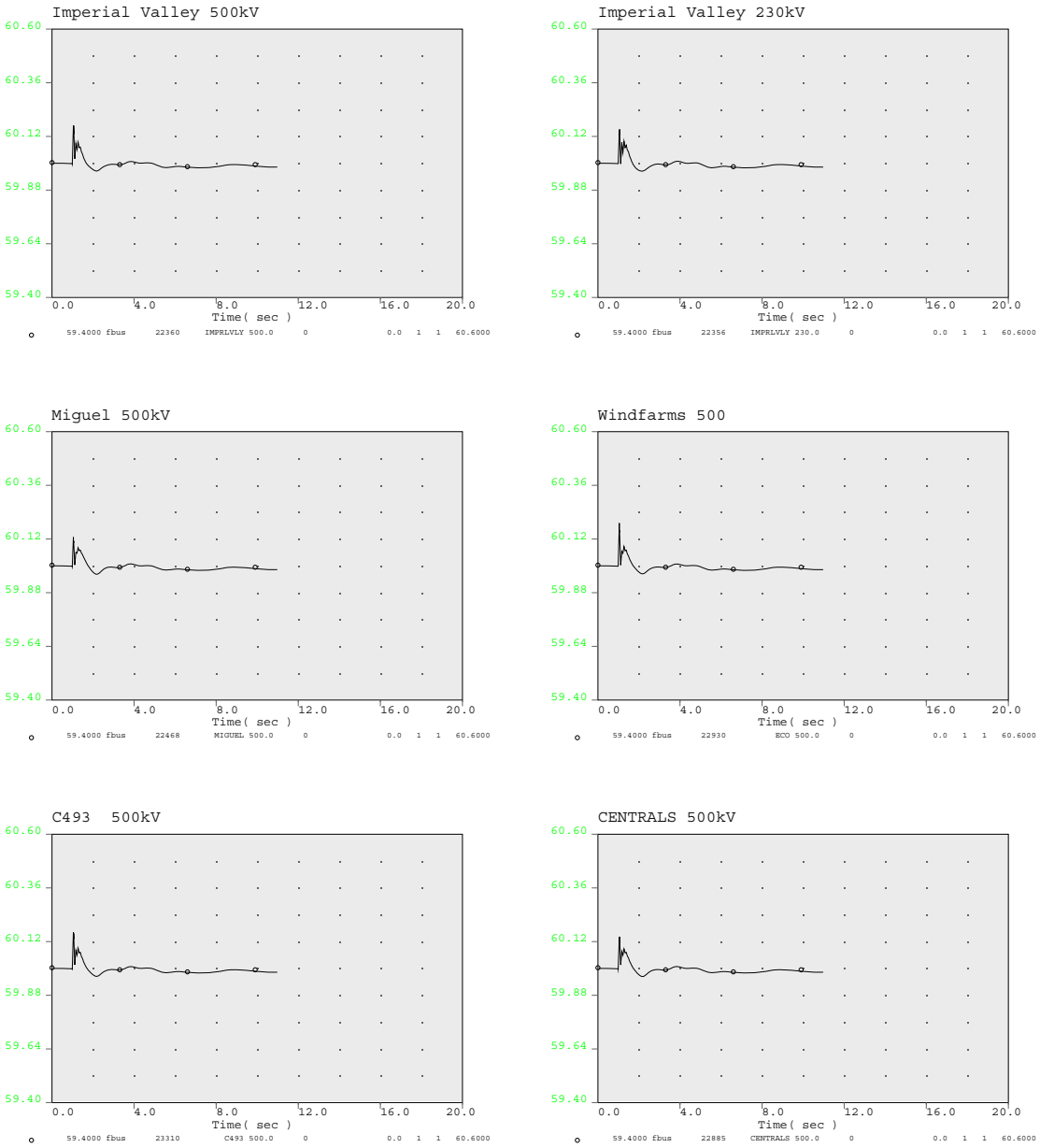


CENTRALS 500kV



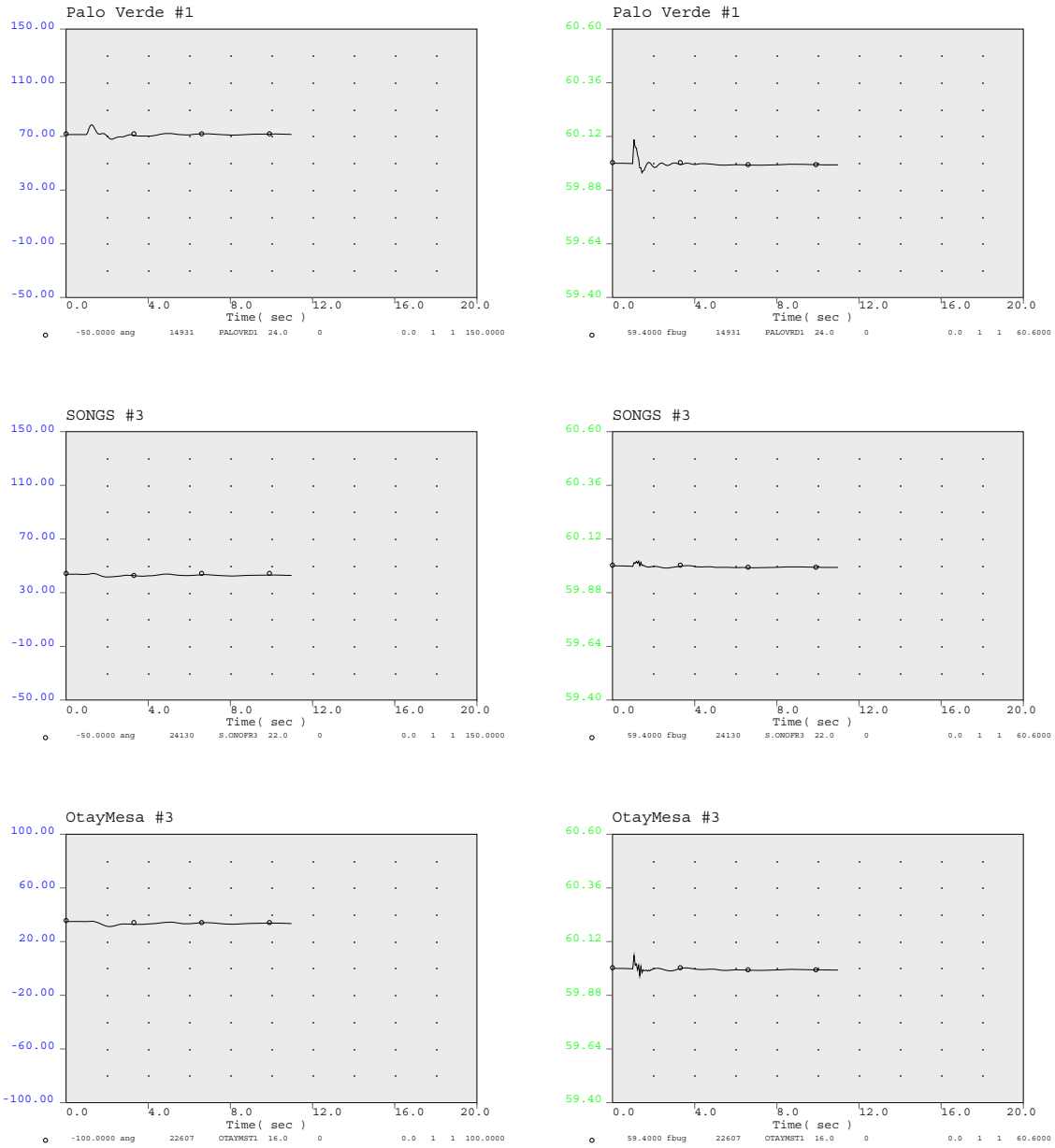
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-Hassyampa 500 kV line

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-Hassyampa 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

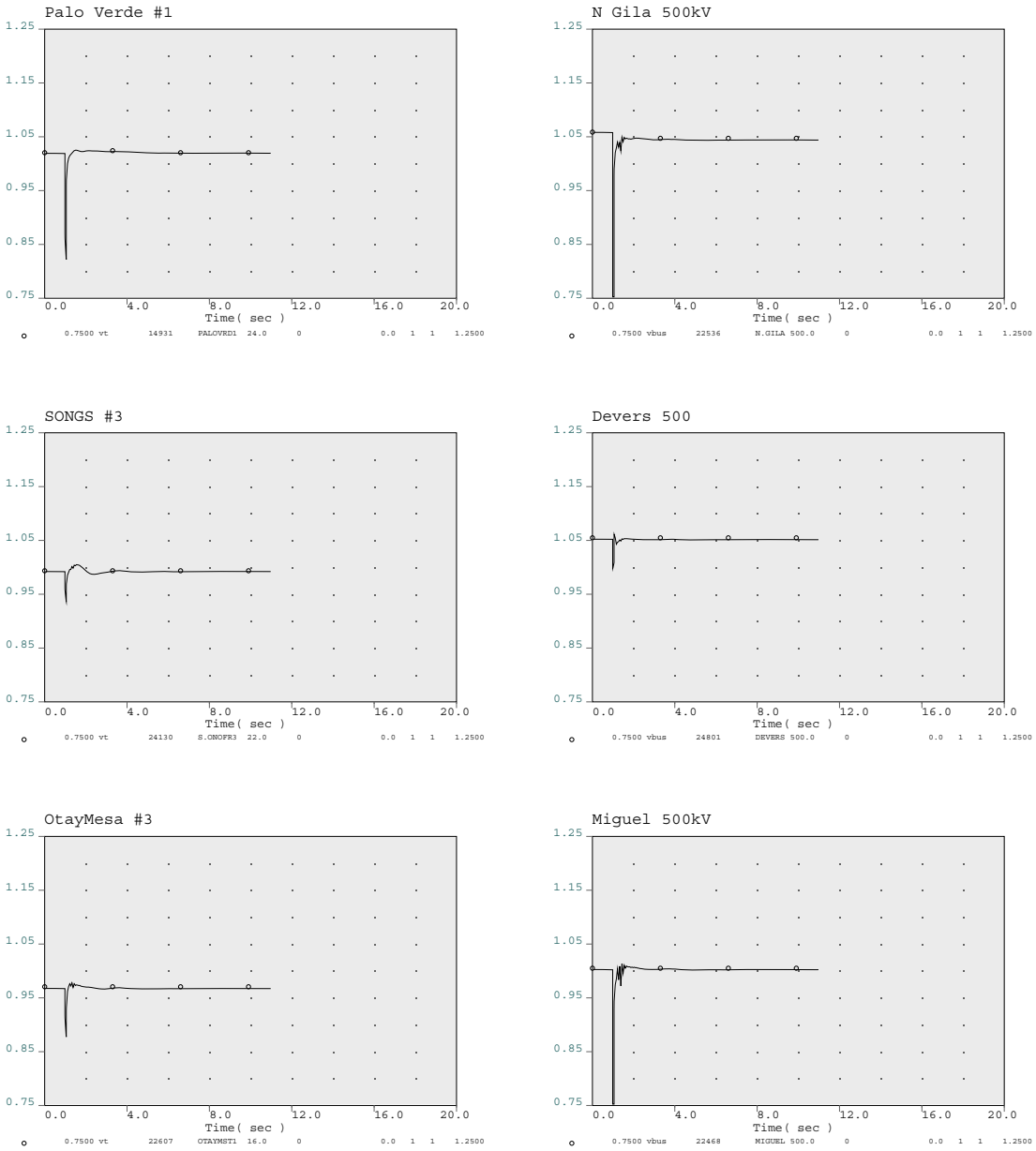


SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Page 1

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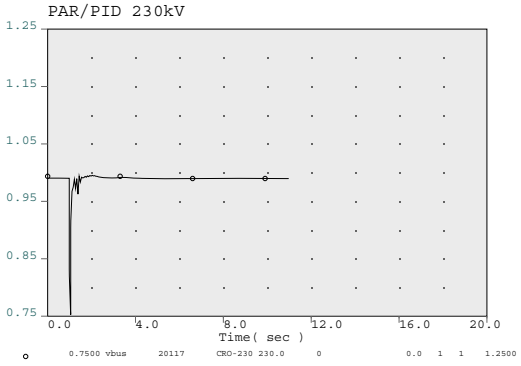
RELATIVE VOLTAGE



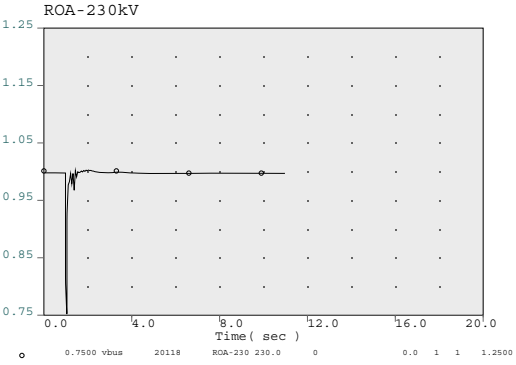
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

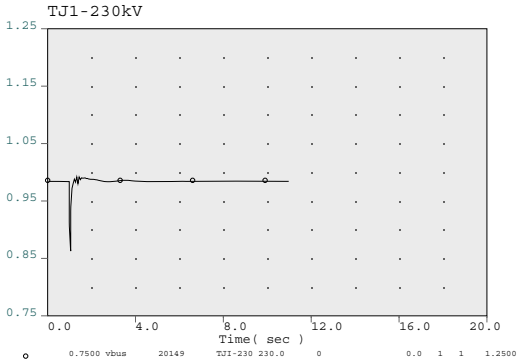
PAR/PID 230kV



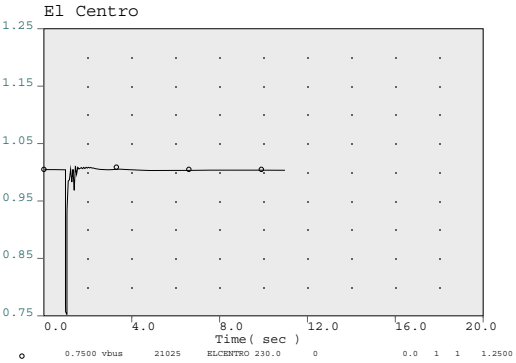
ROA-230kV



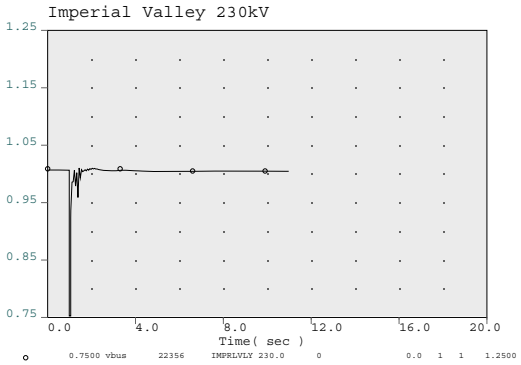
TJ1-230kV



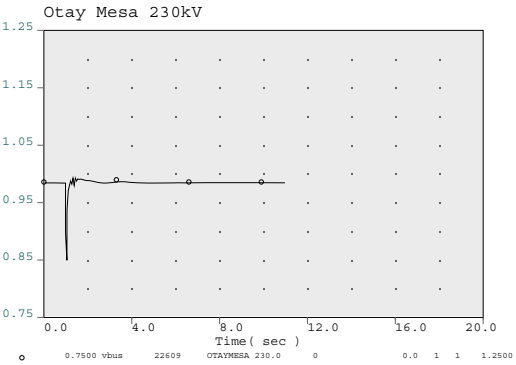
El Centro



Imperial Valley 230kV



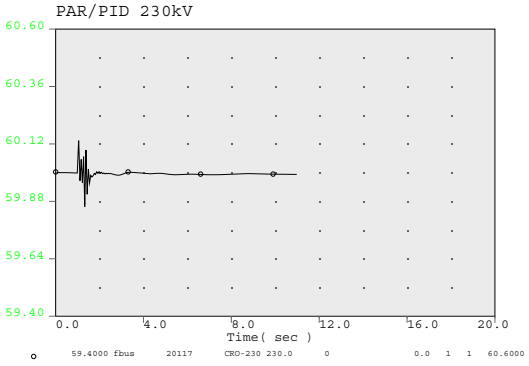
Otay Mesa 230kV



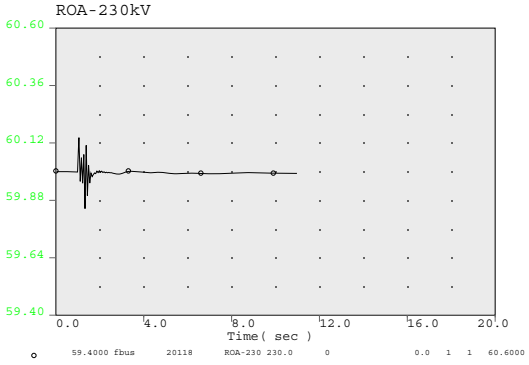
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

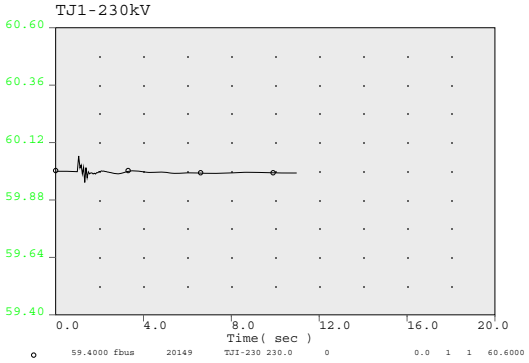
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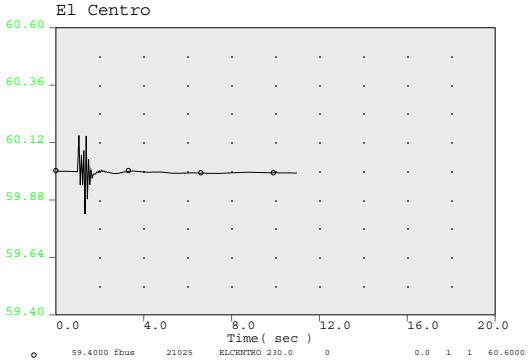
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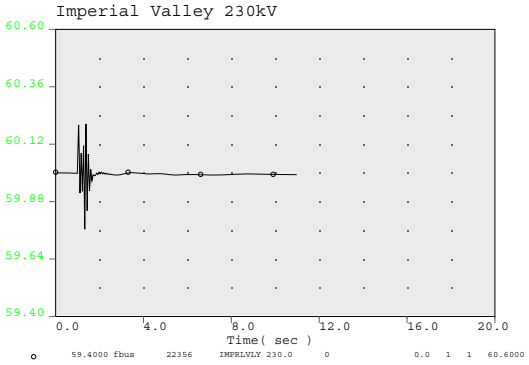
TJ1-230kV



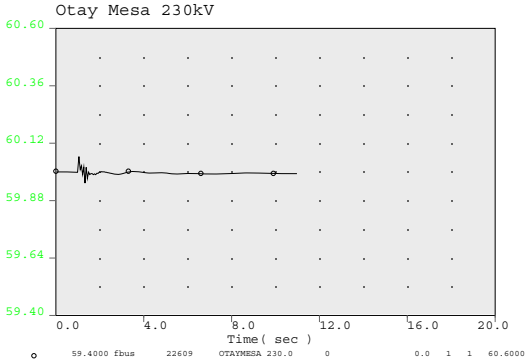
El Centro



Imperial Valley 230kV



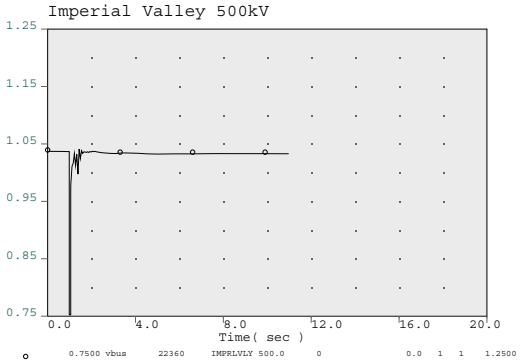
Otay Mesa 230kV



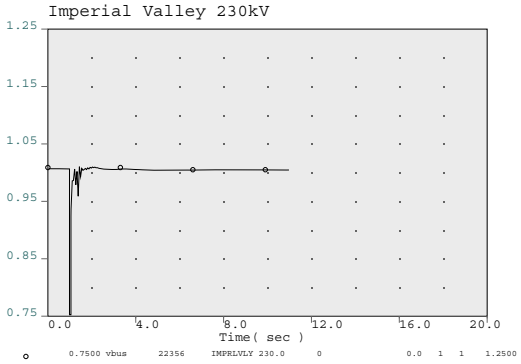
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

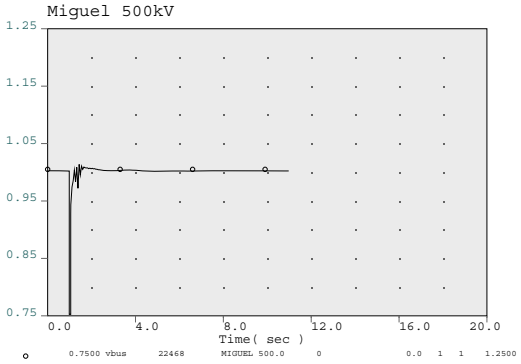
Imperial Valley 500kV



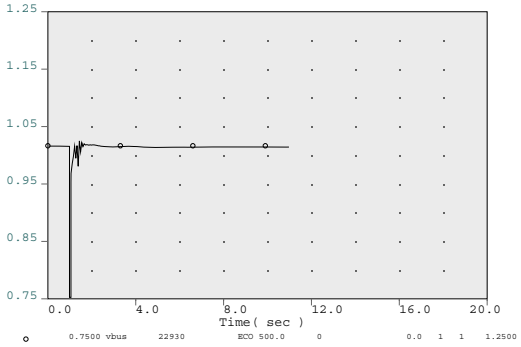
Imperial Valley 230kV



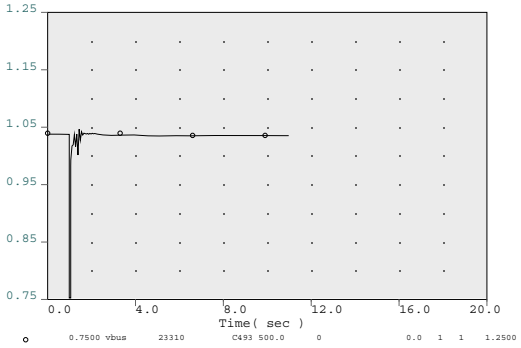
Miguel 500kV



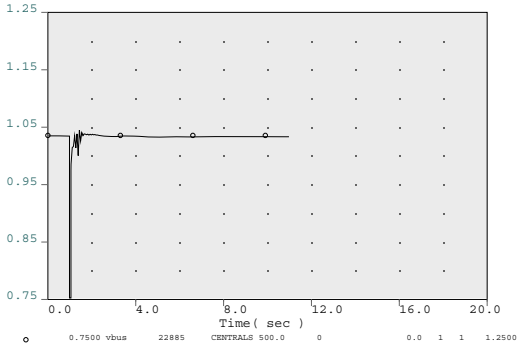
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Appendix J-10

Transient Stability Analysis Plots

Internal Cluster

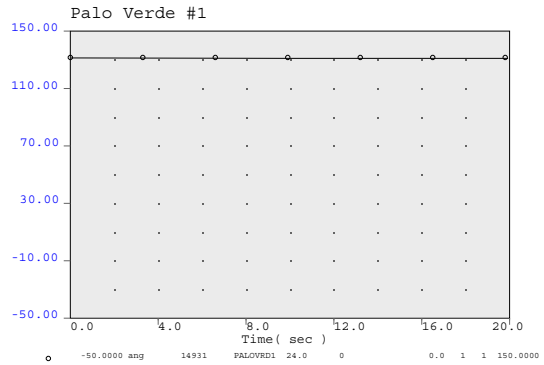
Light Load (Spring or Light Autumn) Post

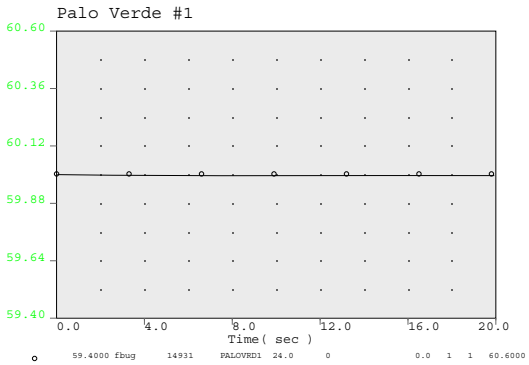
Imperial Valley Area - Frequency

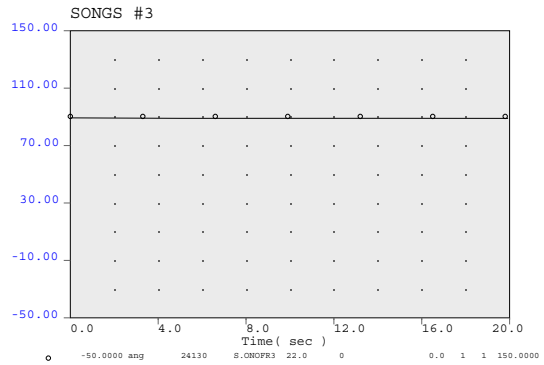


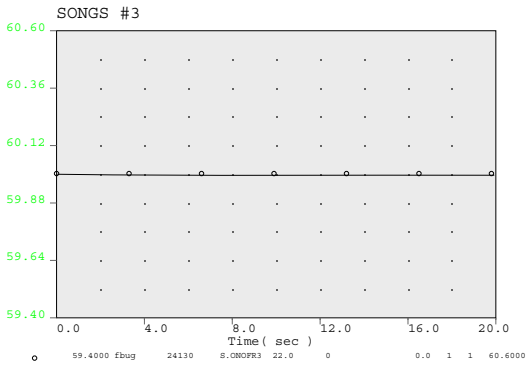
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

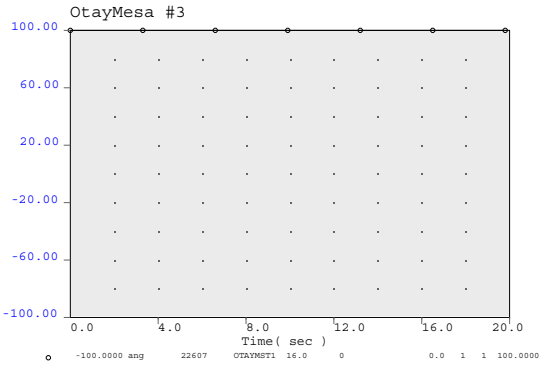
RELATIVE ROTOR ANGLE & FREQUENCY

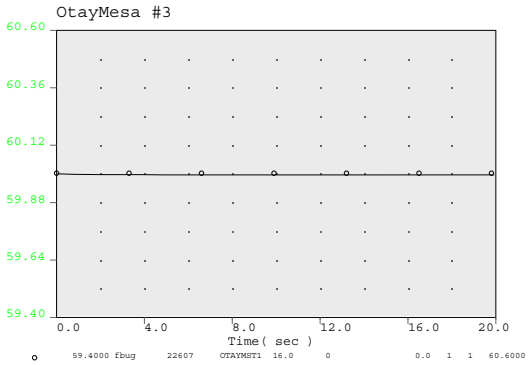












SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Page 1

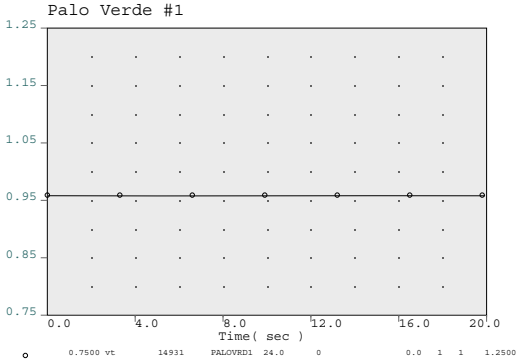
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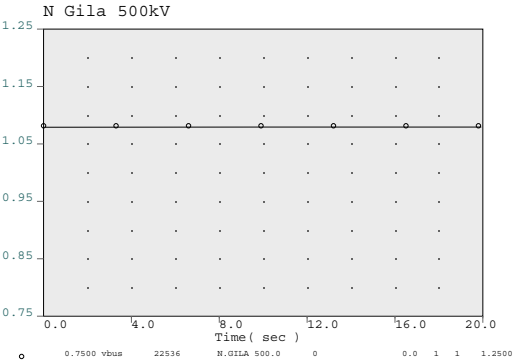
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RELATIVE VOLTAGE

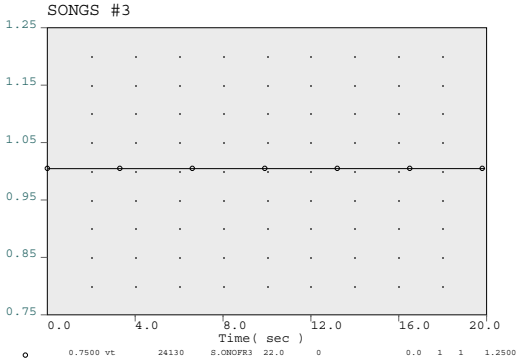
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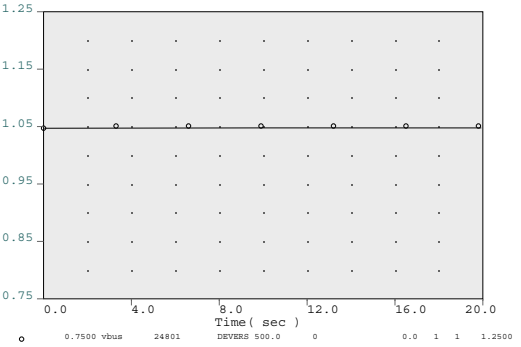
N Gila 500kV



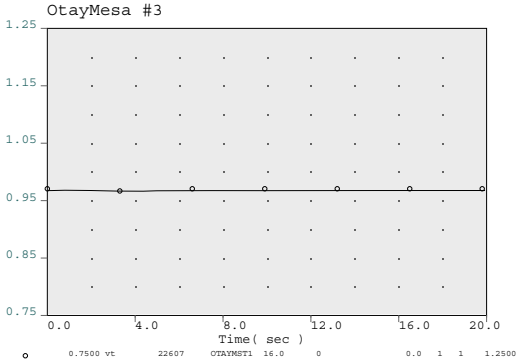
SONGS #3



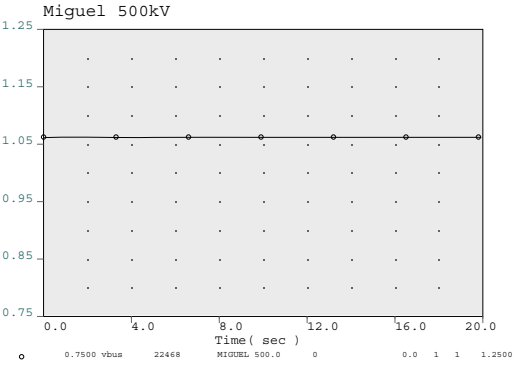
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OtayMesa #3



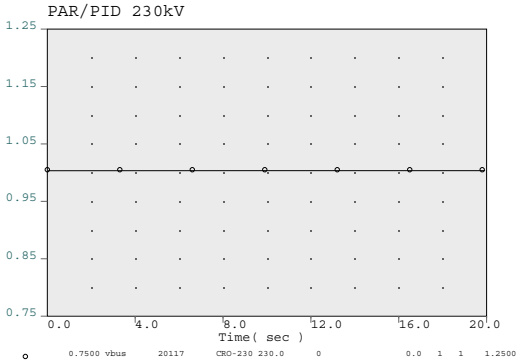
Miguel 500kV



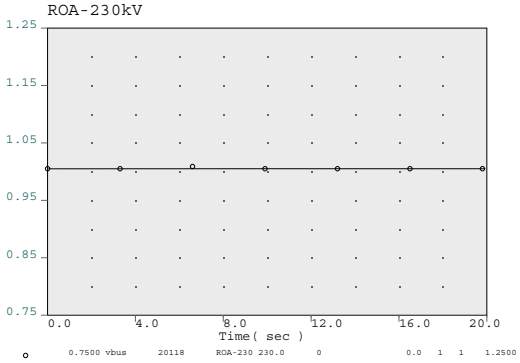
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Affected System Voltage Check and Comparison

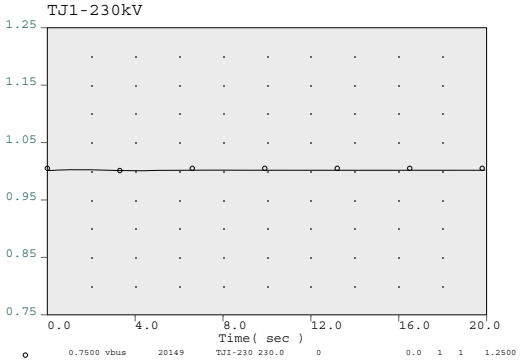
PAR/PID 230kV



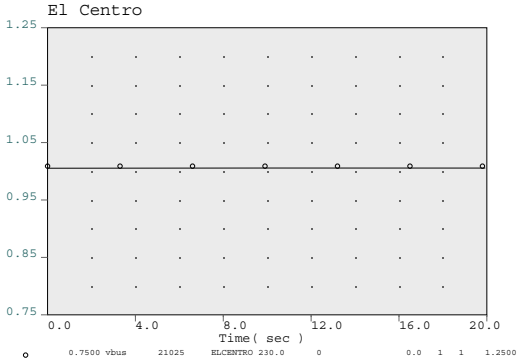
ROA-230kV



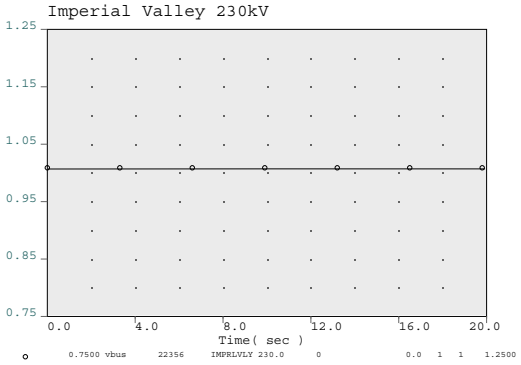
TJ1-230kV



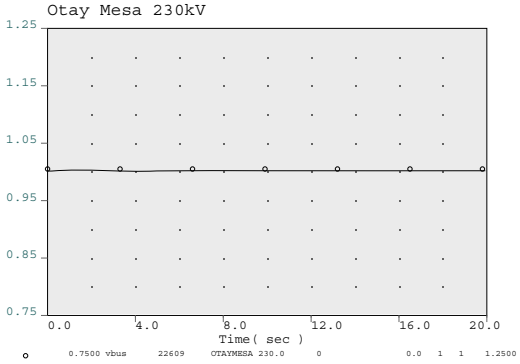
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Flat

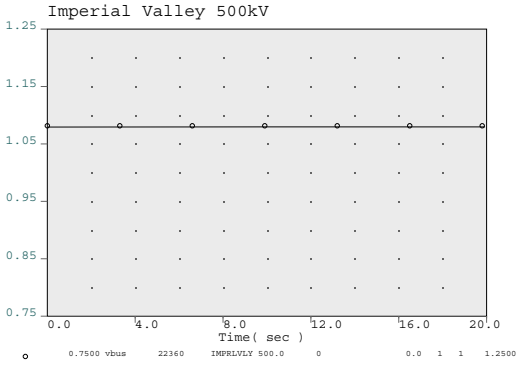
Affected System Frequency Check and Comparison



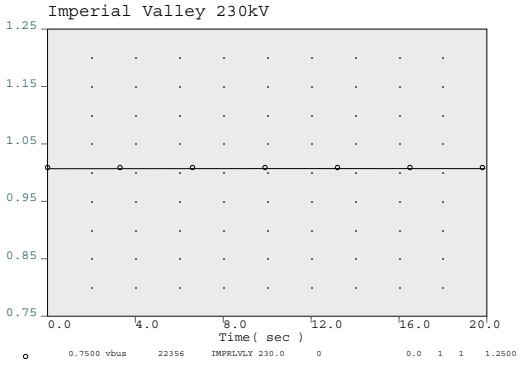
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Imperial Valley Area - VOLTAGE

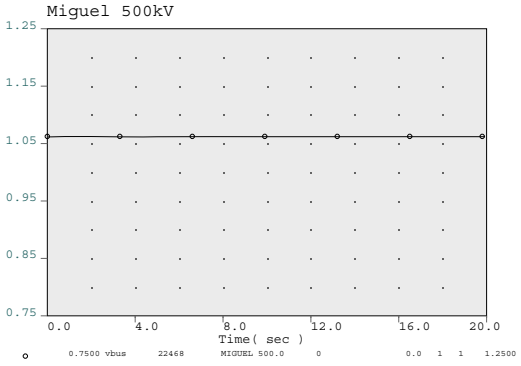
Imperial Valley 500kV



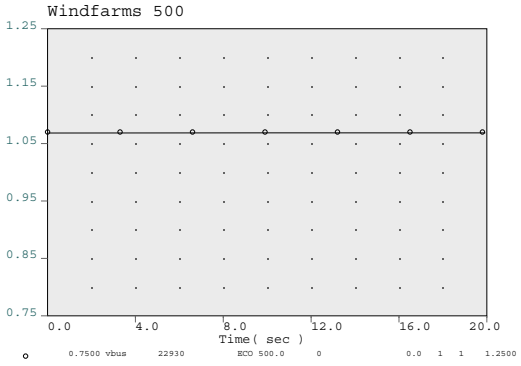
Imperial Valley 230kV



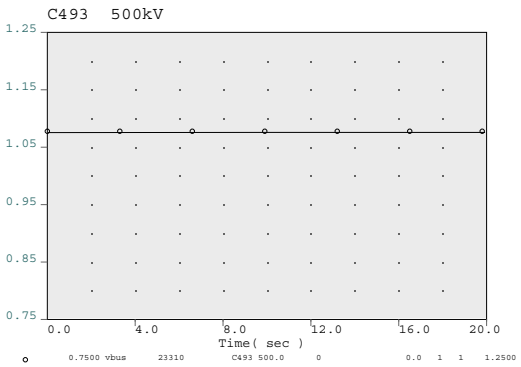
Miguel 500kV



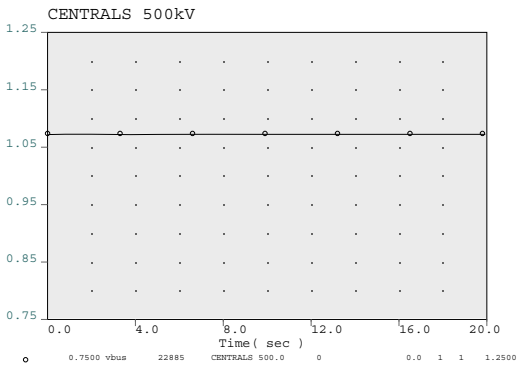
Windfarms 500



C493 500kV



CENTRALS 500kV



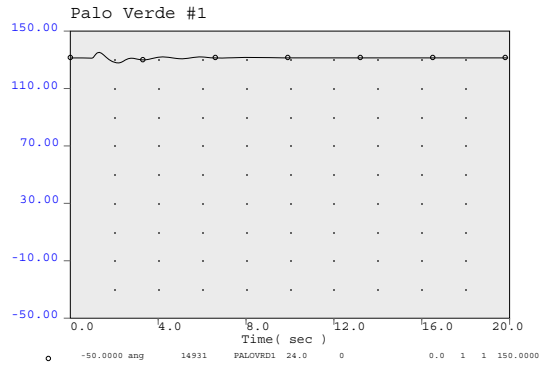
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

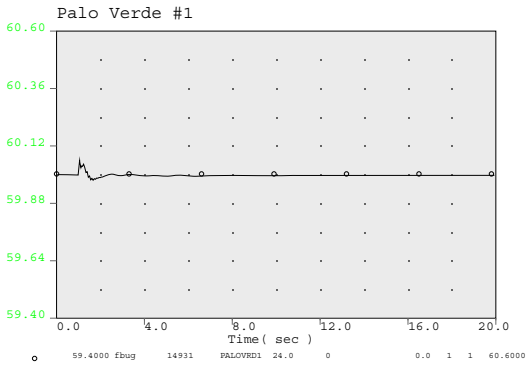
Imperial Valley Area - Frequency

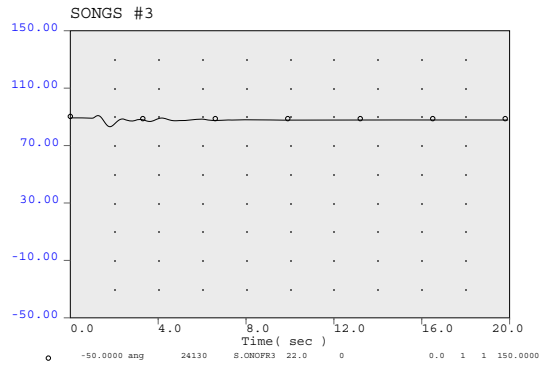


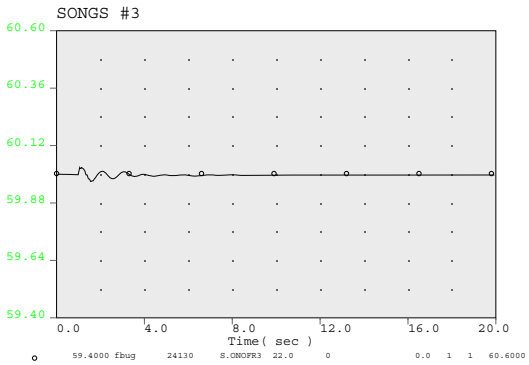
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

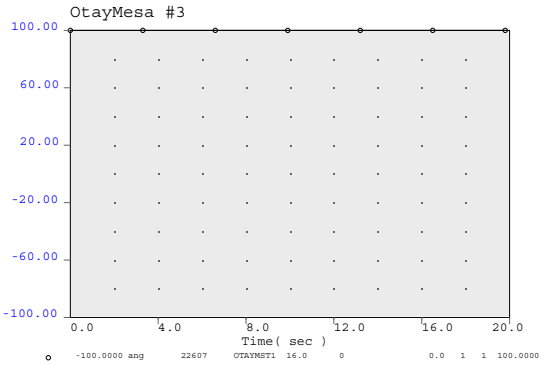
RELATIVE ROTOR ANGLE & FREQUENCY

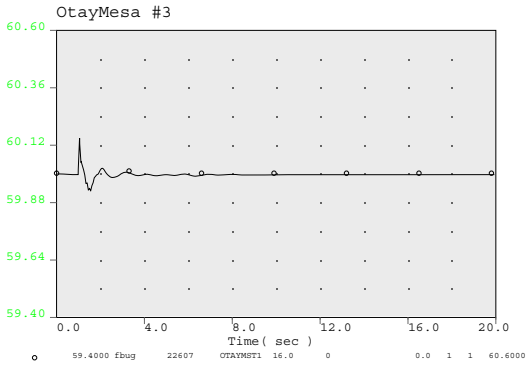












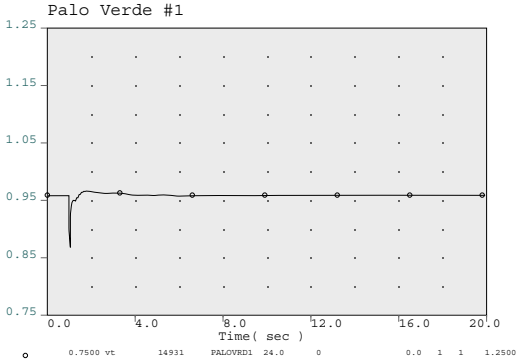
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Page 1

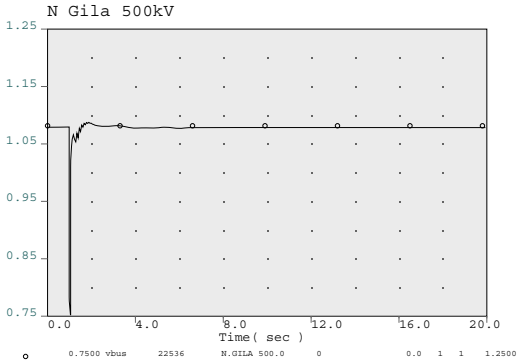
SDGE	C493_Centrals_pst_int_ll.chf	p_i\ll\pst_int\ws_pst_int Tue Nov 02 07:25:57 2010

RELATIVE VOLTAGE

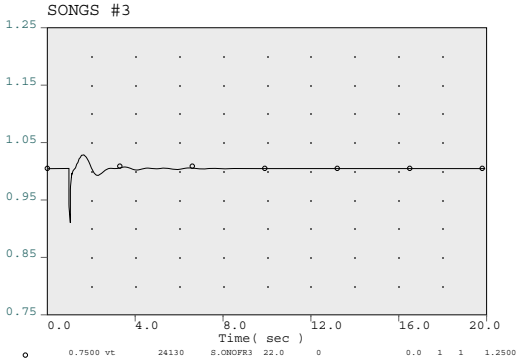
Palo Verde #1



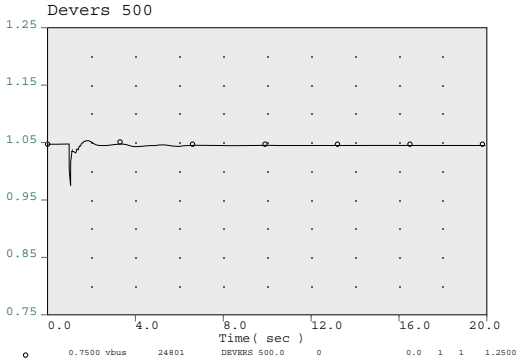
N Gila 500kV



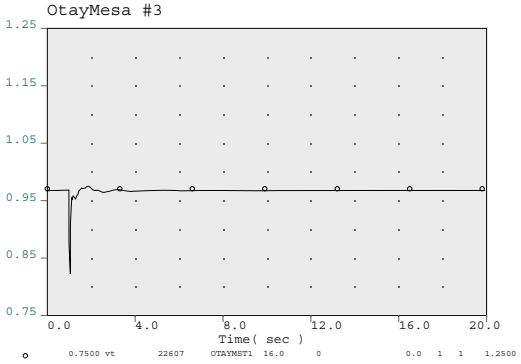
SONGS #3



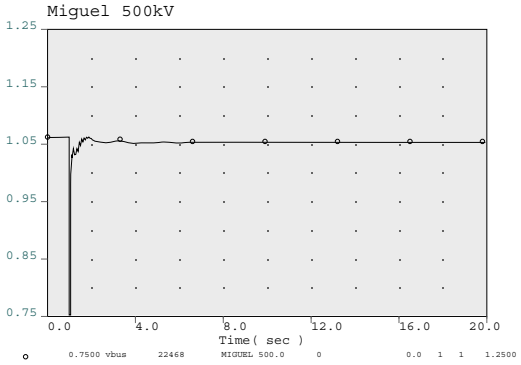
Devers 500



OtayMesa #3



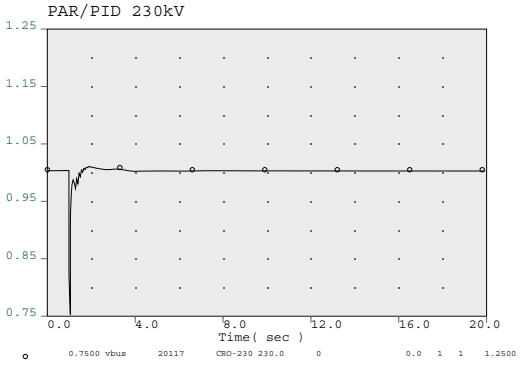
Miguel 500kV



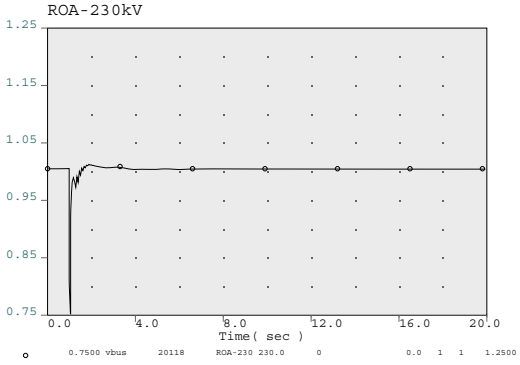
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

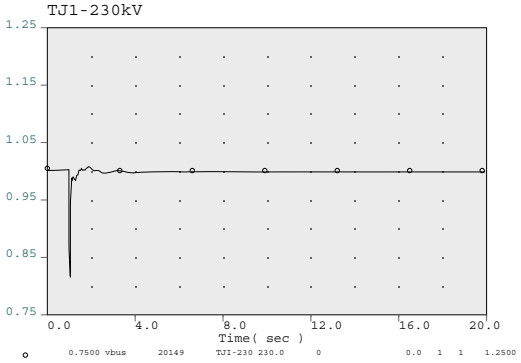
PAR/PID 230kV



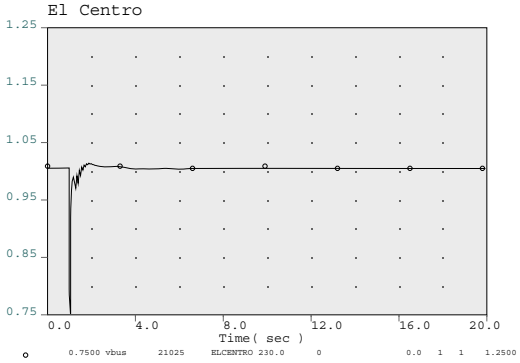
ROA-230kV



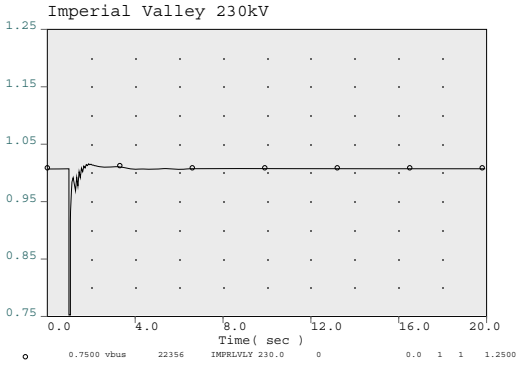
TJ1-230kV



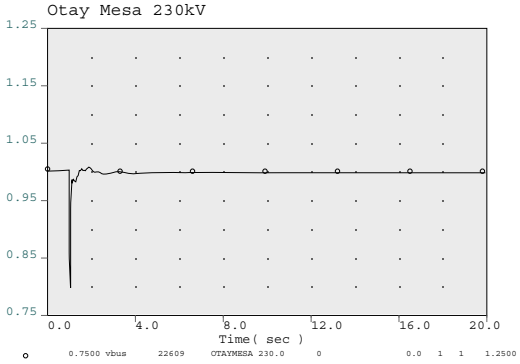
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

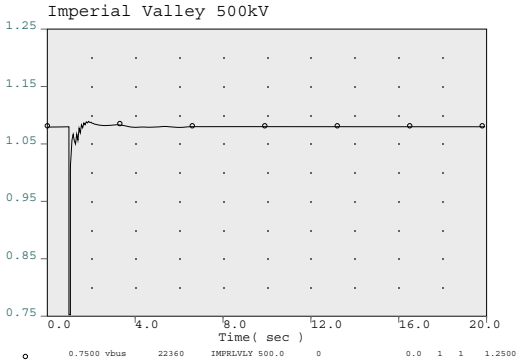
Affected System Frequency Check and Comparison



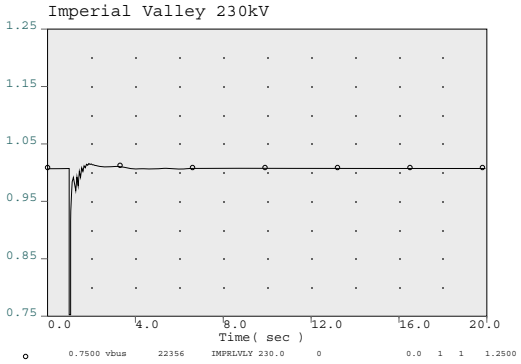
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Imperial Valley Area - VOLTAGE

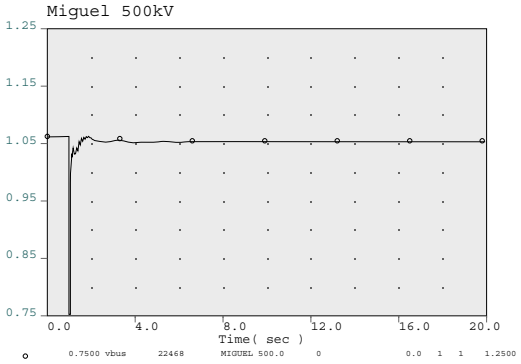
Imperial Valley 500kV



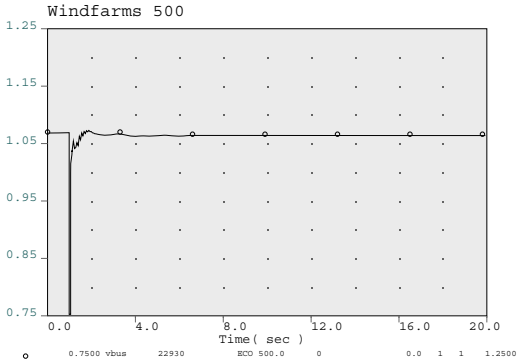
Imperial Valley 230kV



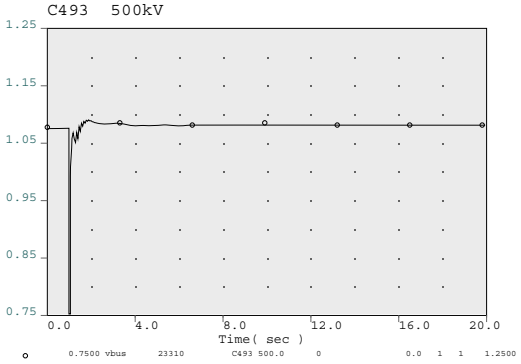
Miguel 500kV



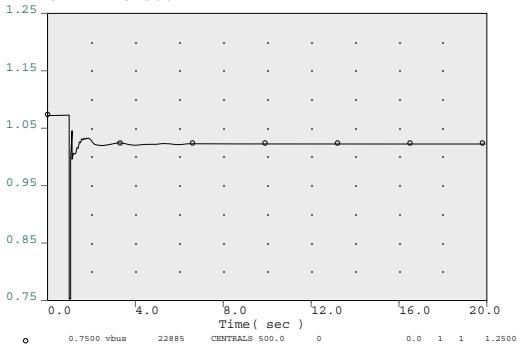
Windfarms 500



C493 500kV

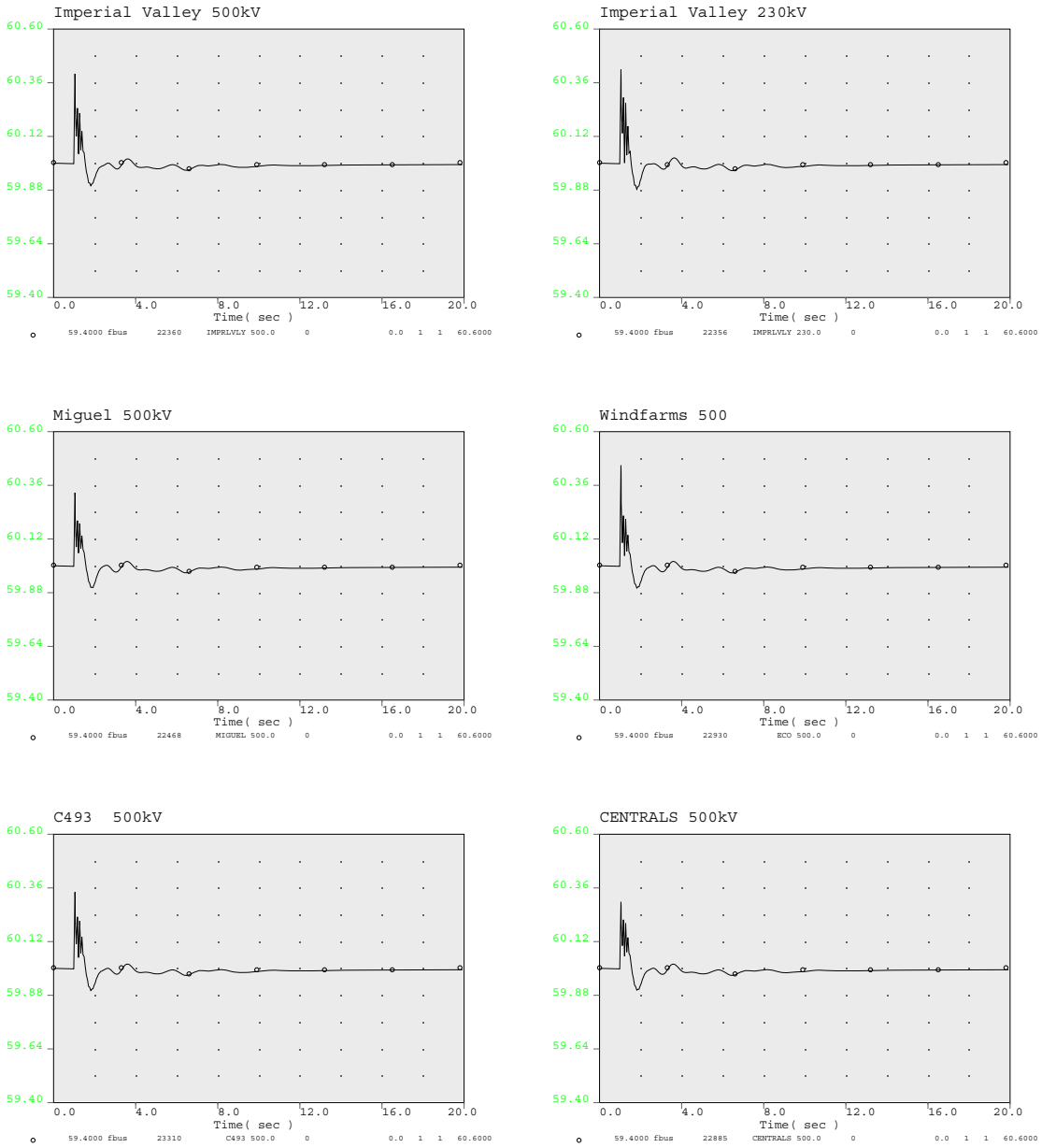


CENTRALS 500kV



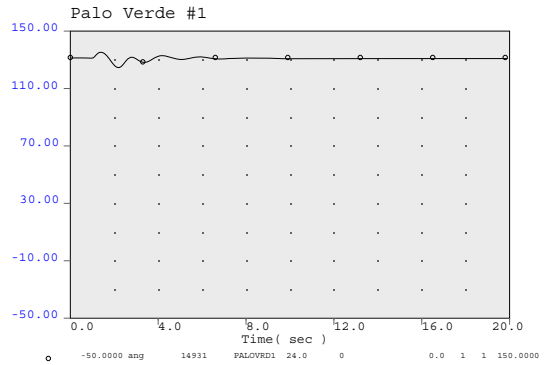
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

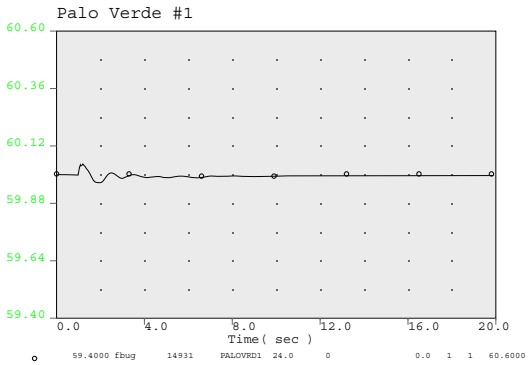
Imperial Valley Area - Frequency

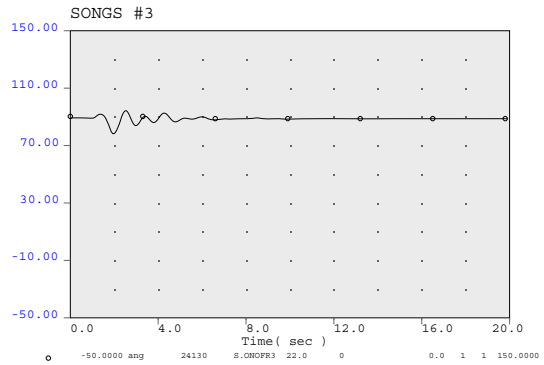


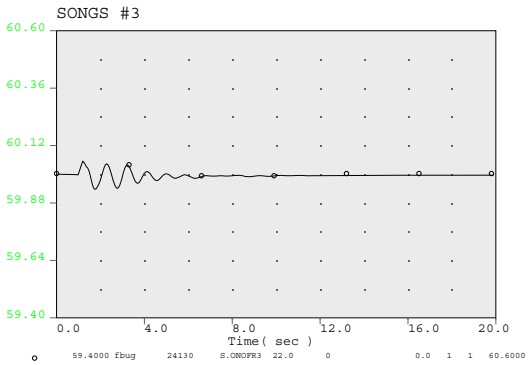
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

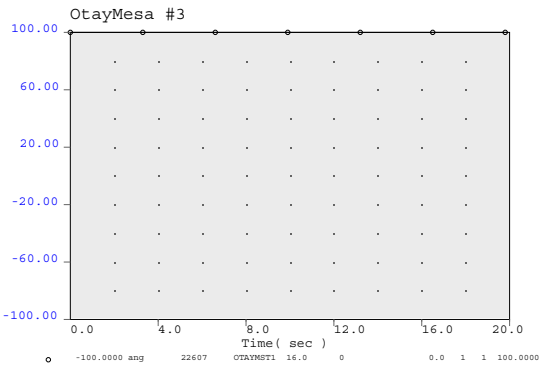
RELATIVE ROTOR ANGLE & FREQUENCY

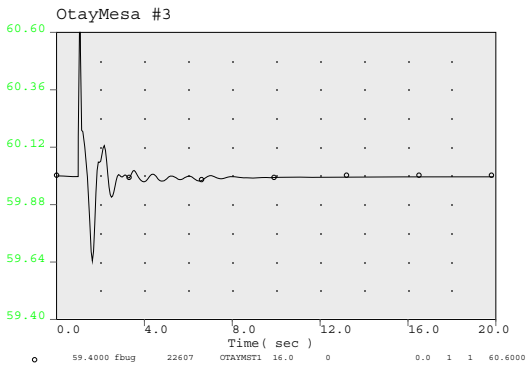








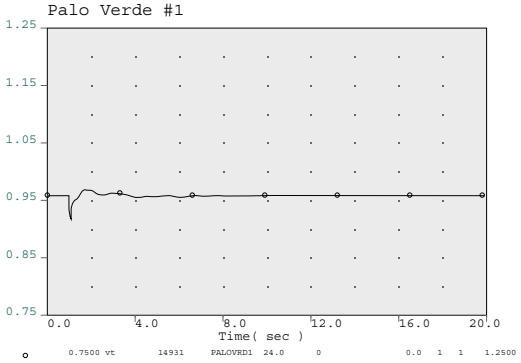




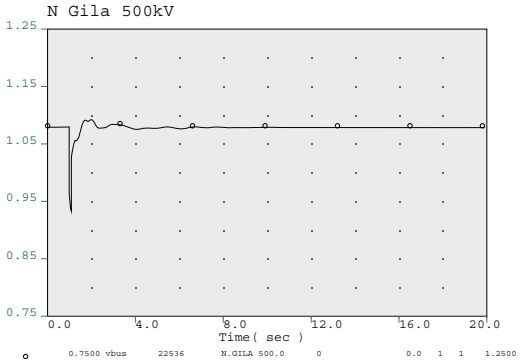
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SX 230 kV N-1

RELATIVE VOLTAGE

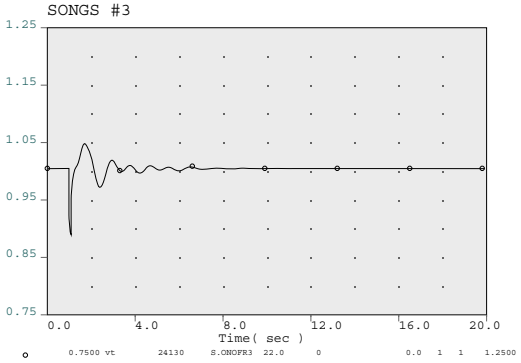
Palo Verde #1



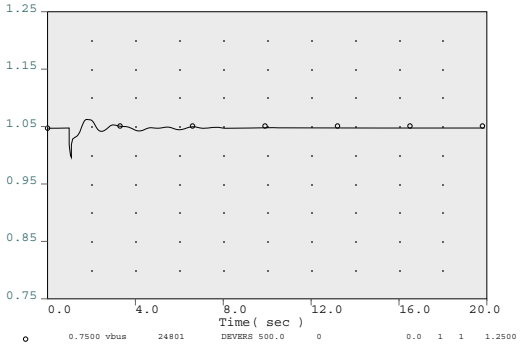
N Gila 500kV



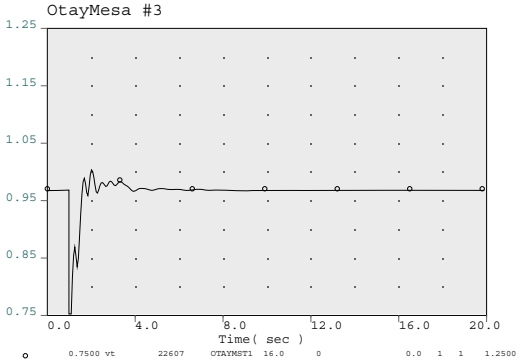
SONGS #3



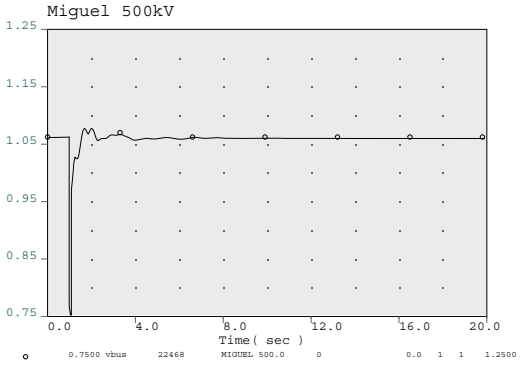
Devers 500



OtayMesa #3



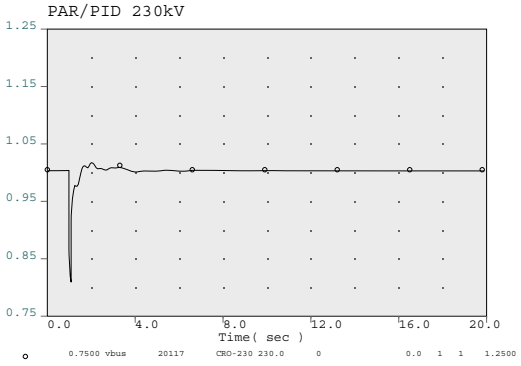
Miguel 500kV



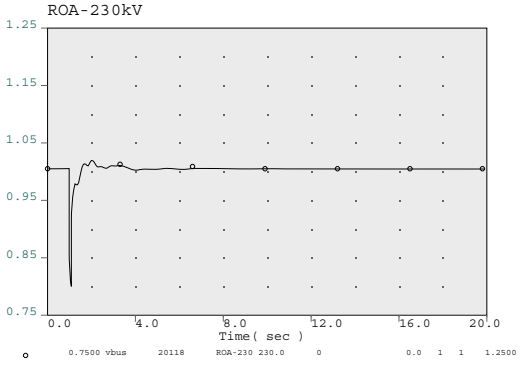
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SX 230 kV N-1

Affected System Voltage Check and Comparison

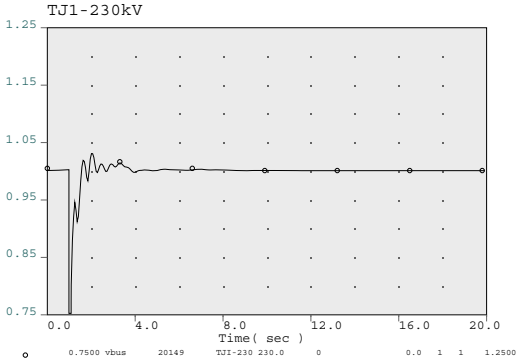
PAR/PID 230kV



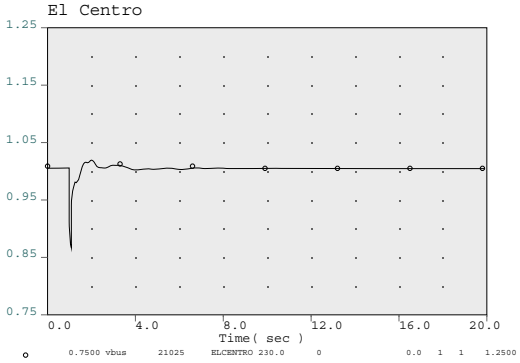
ROA-230kV



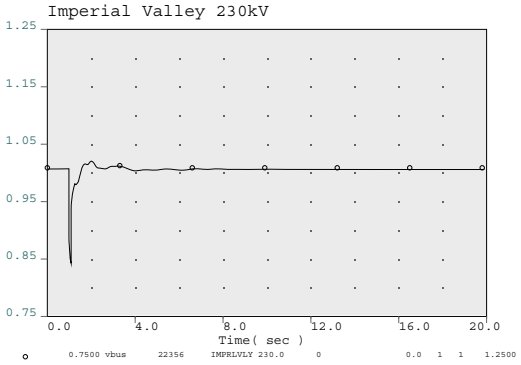
TJ1-230kV



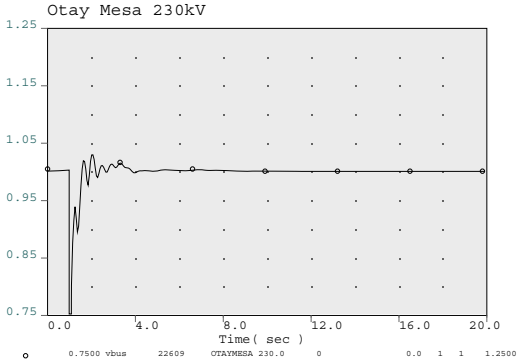
El Centro



Imperial Valley 230kV

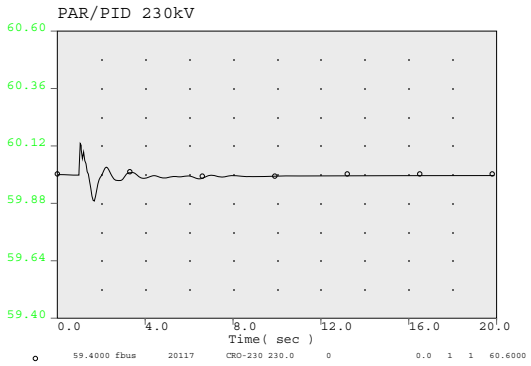


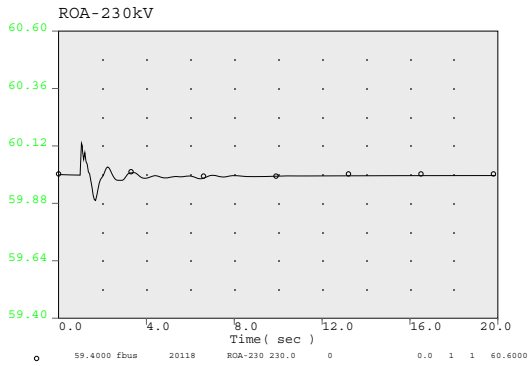
Otay Mesa 230kV

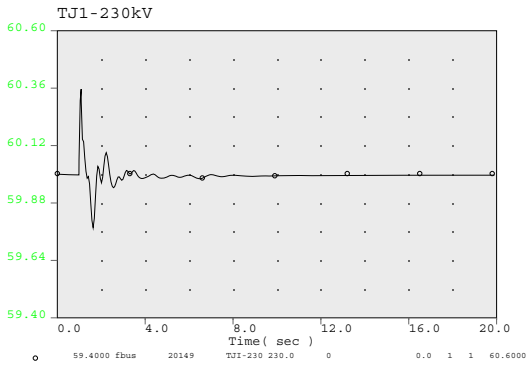


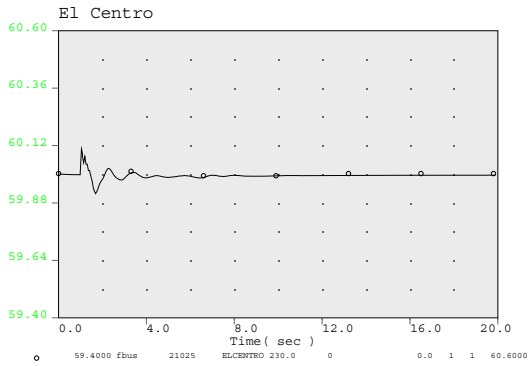
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SX 230 kV N-1

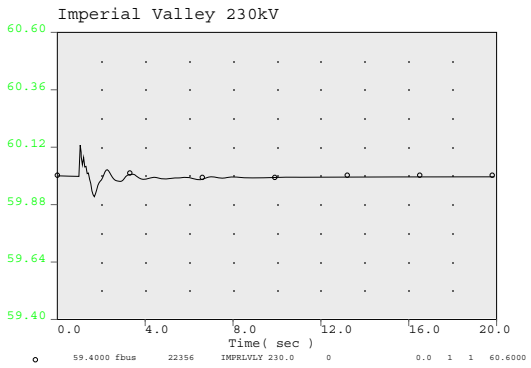
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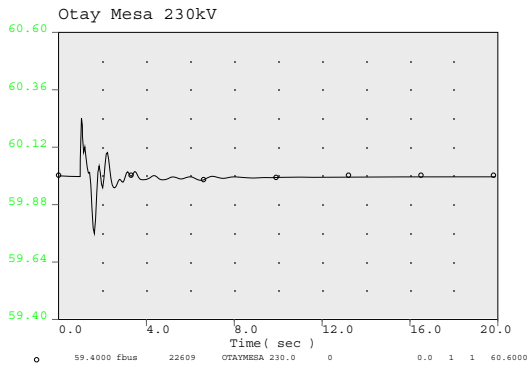








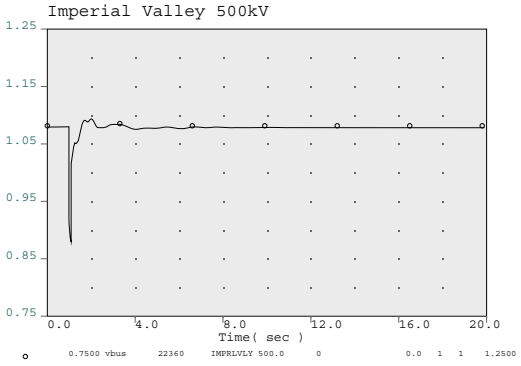




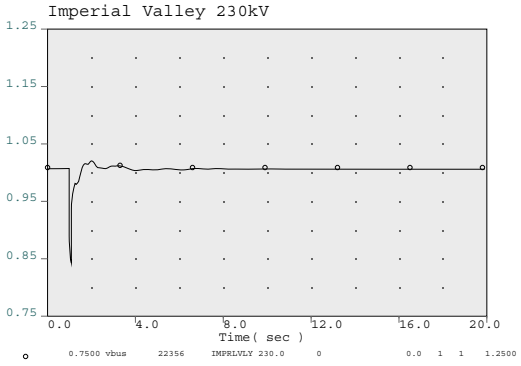
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SX 230 kV N-1

Imperial Valley Area - VOLTAGE

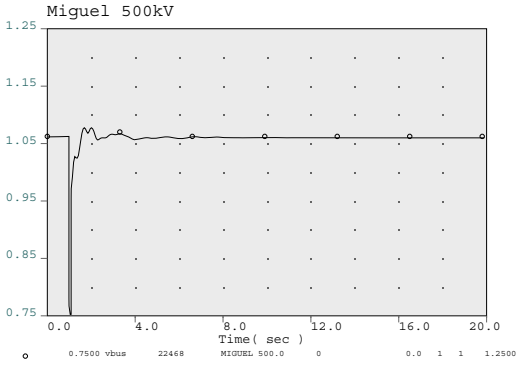
Imperial Valley 500kV



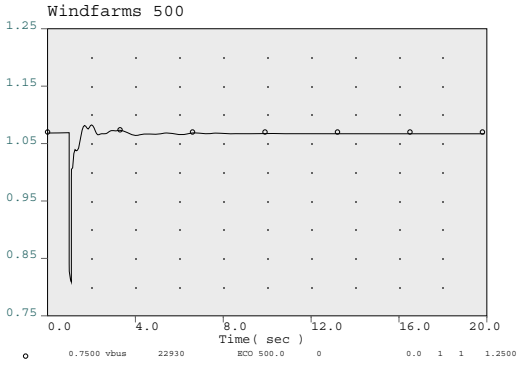
Imperial Valley 230kV



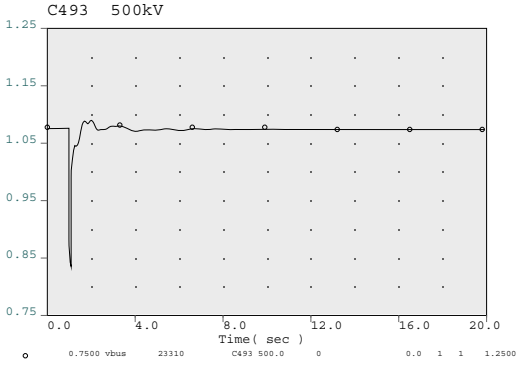
Miguel 500kV



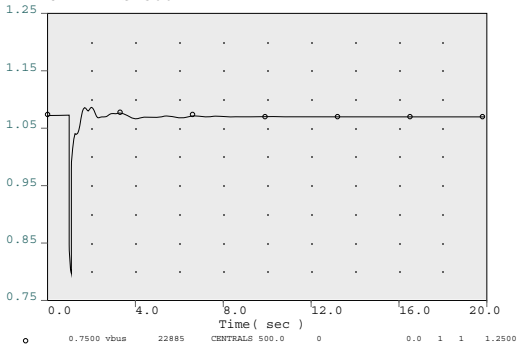
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SX 230 kV N-1

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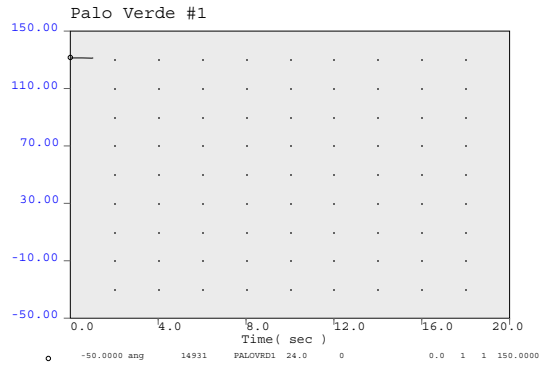
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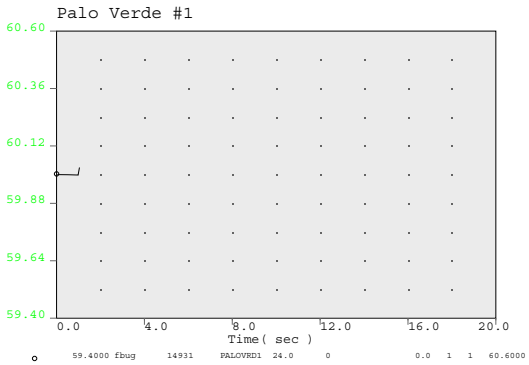
Imperial Valley Area - Frequency

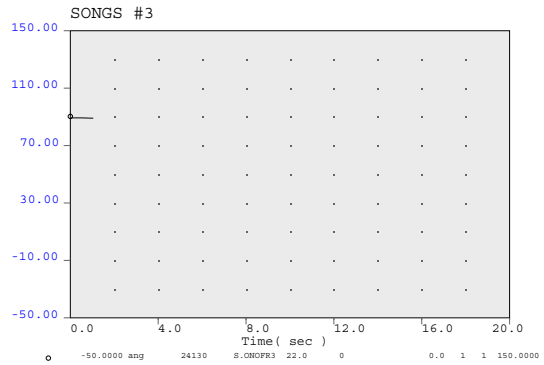


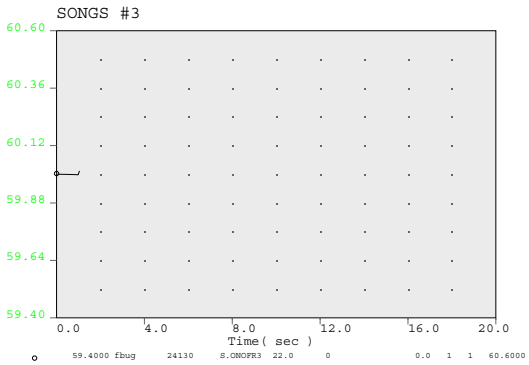
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SX 230 kV N-1

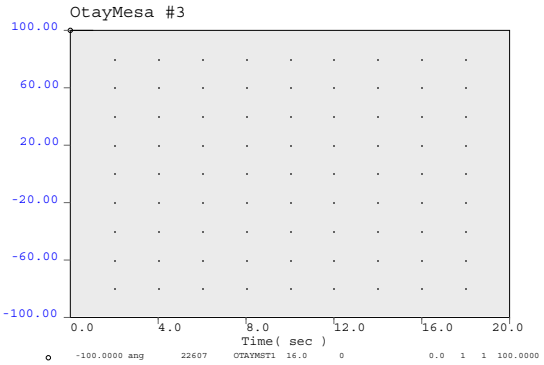
RELATIVE ROTOR ANGLE & FREQUENCY

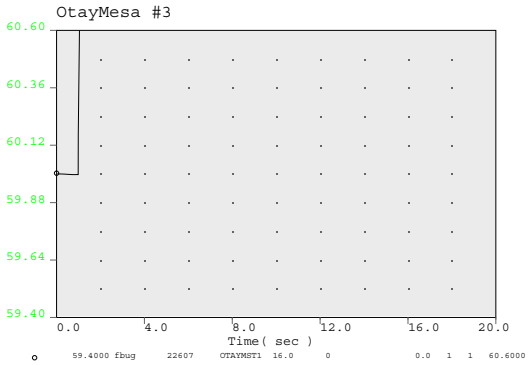












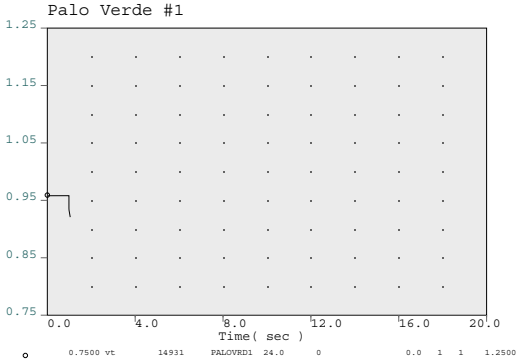
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SY 230 kV N-1

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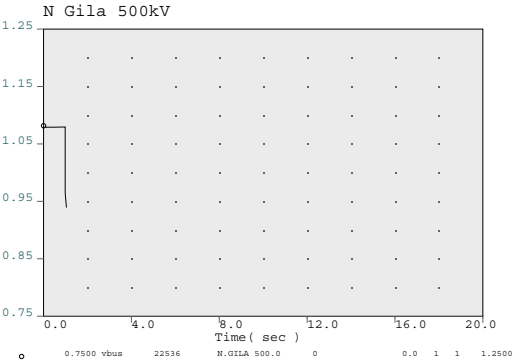
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RELATIVE VOLTAGE

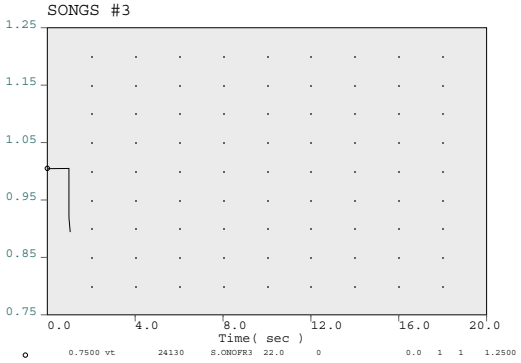
Palo Verde #1



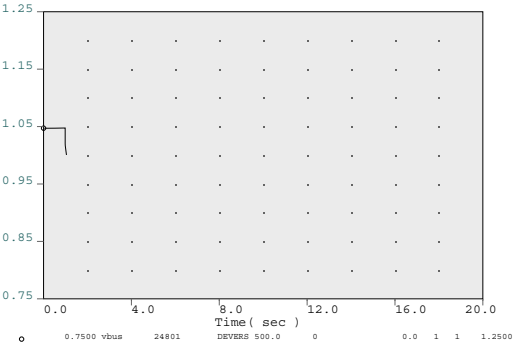
N Gila 500kV



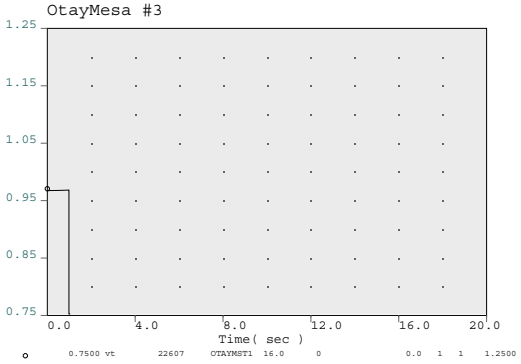
SONGS #3



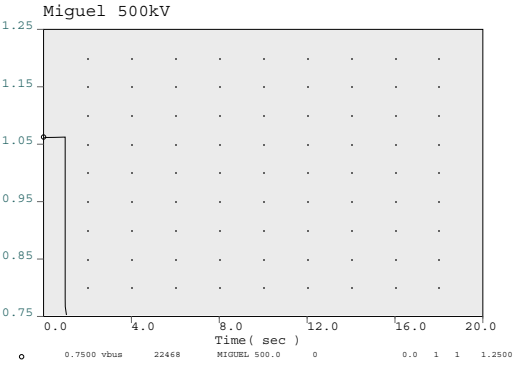
Devers 500



OtayMesa #3



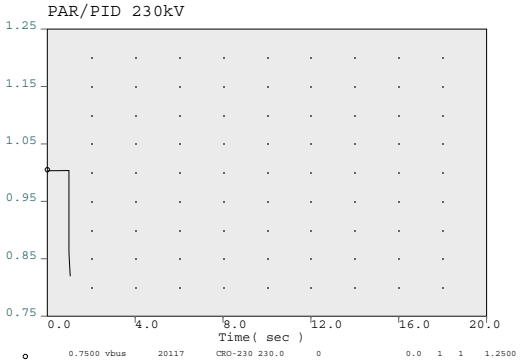
Miguel 500kV



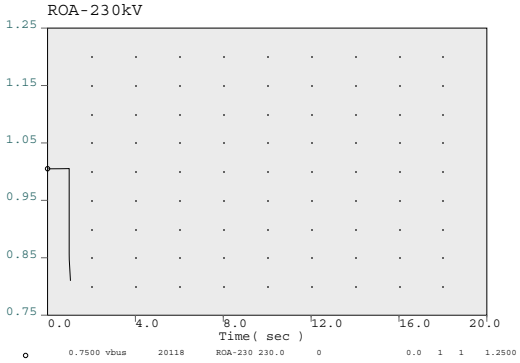
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SY 230 kV N-1

Affected System Voltage Check and Comparison

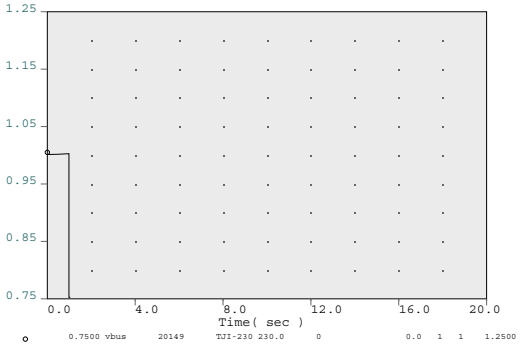
PAR/PID 230kV



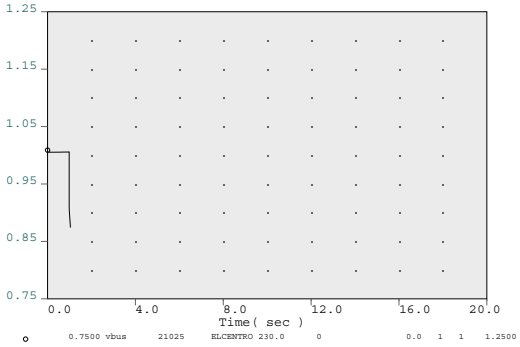
ROA-230kV



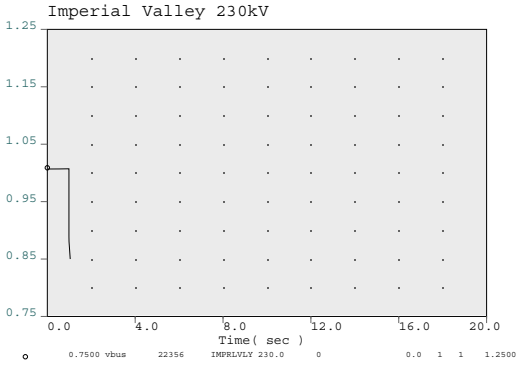
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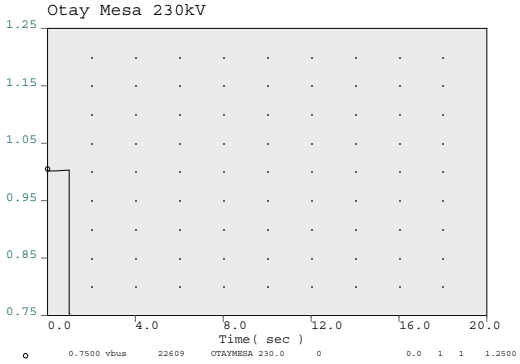
El Centro



Imperial Valley 230kV

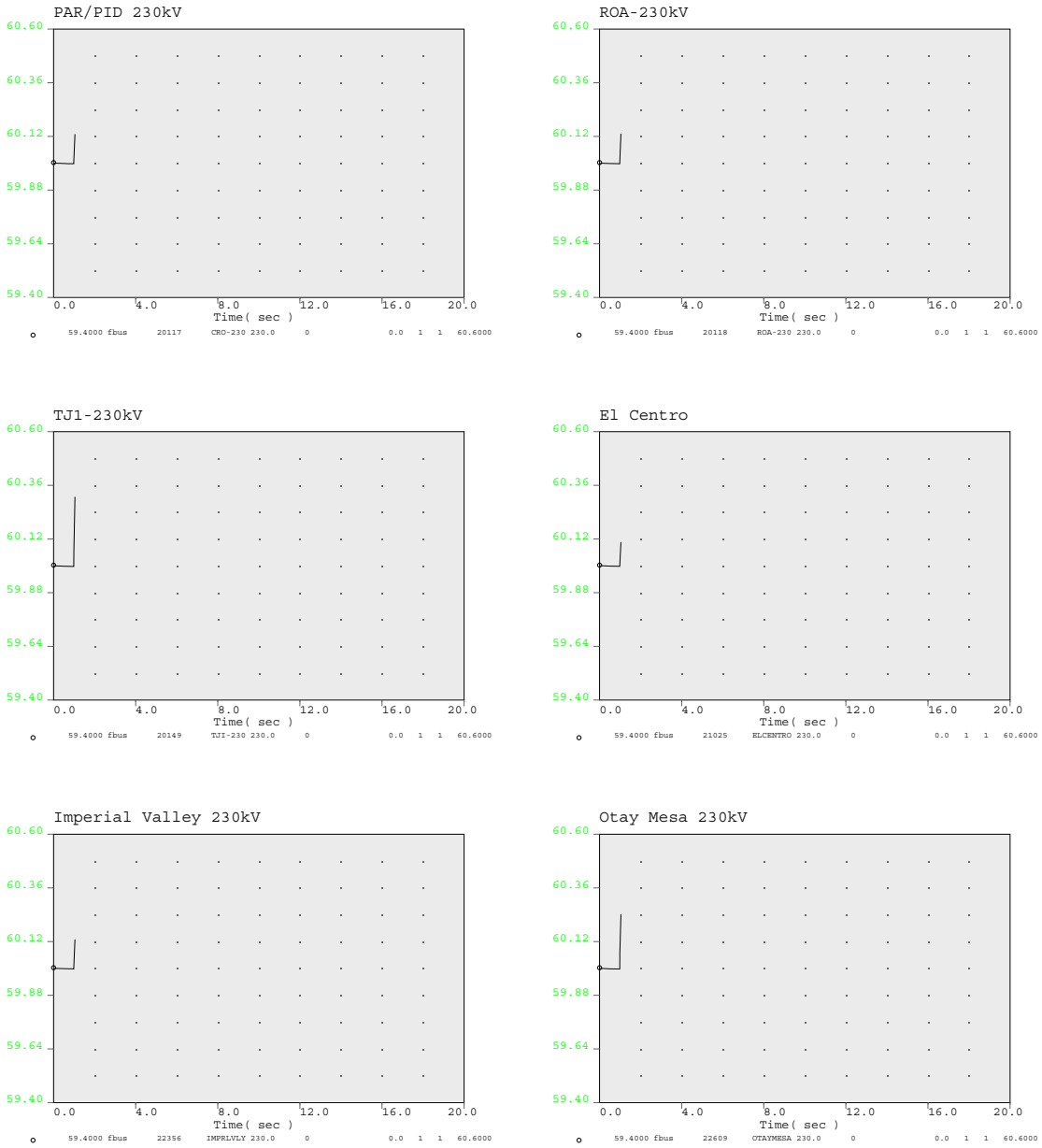


Otay Mesa 230kV



SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SY 230 kV N-1

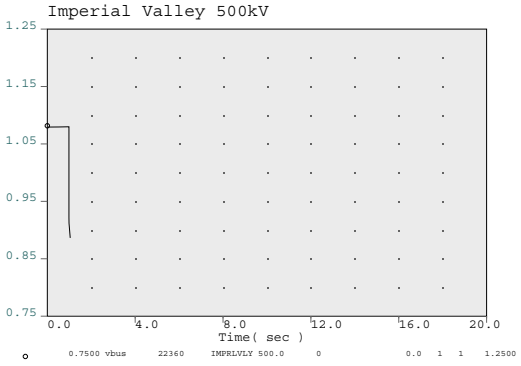
Affected System Frequency Check and Comparison



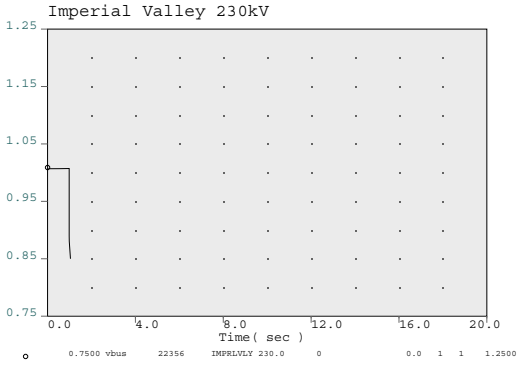
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SY 230 kV N-1

Imperial Valley Area - VOLTAGE

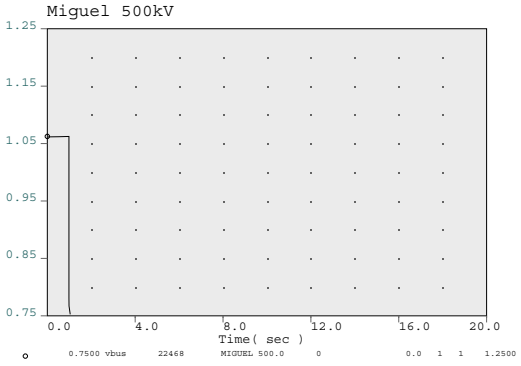
Imperial Valley 500kV



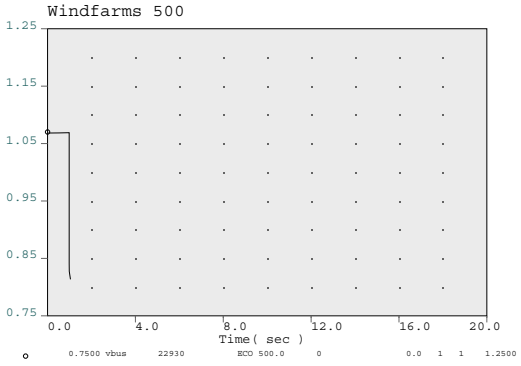
Imperial Valley 230kV



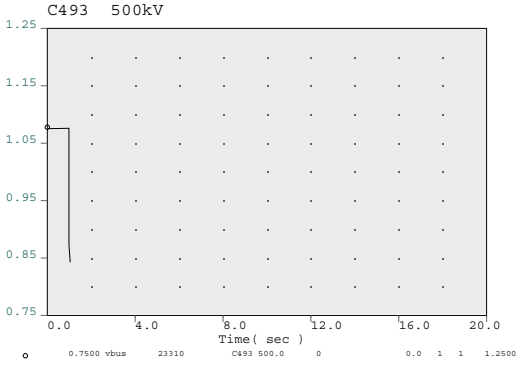
Miguel 500kV



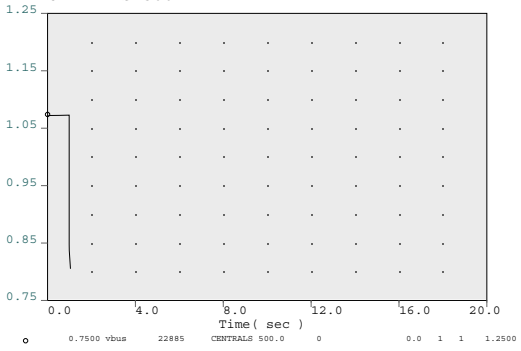
Windfarms 500



C493 500kV



CENTRALS 500kV

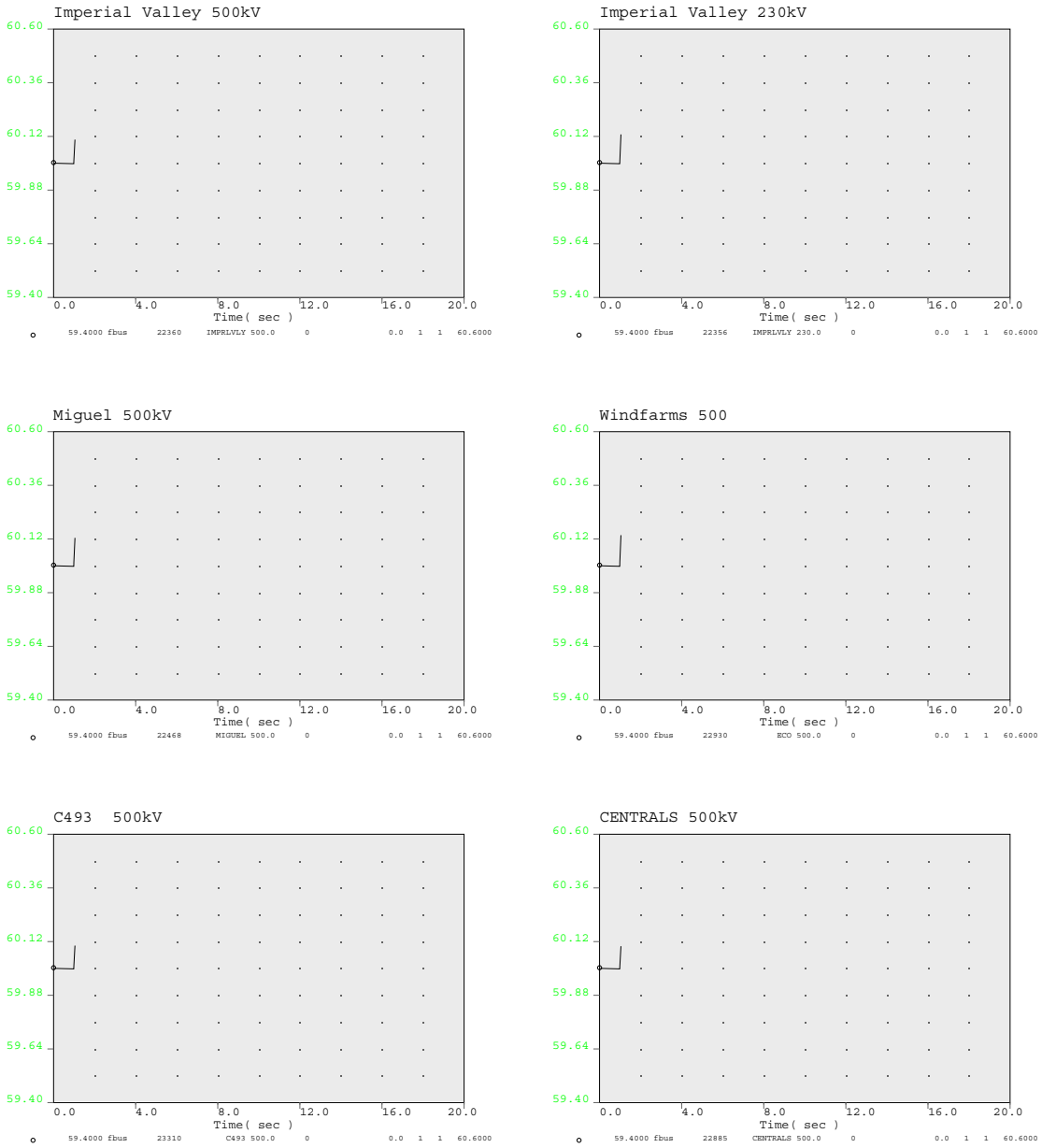


SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SY 230 kV N-1

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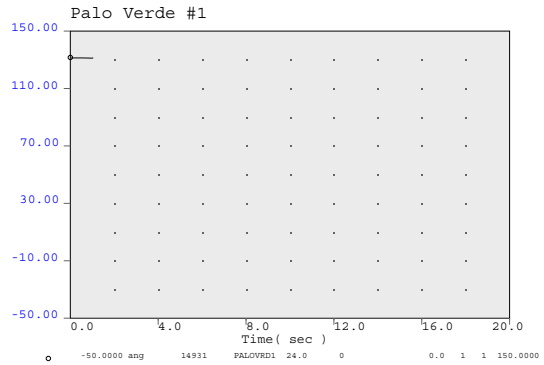
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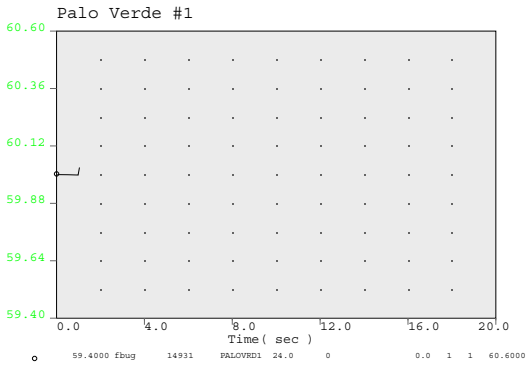
Imperial Valley Area - Frequency

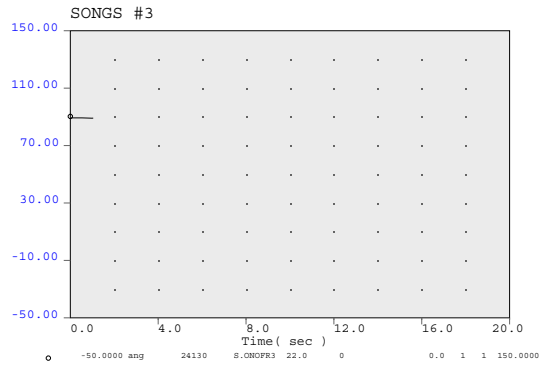


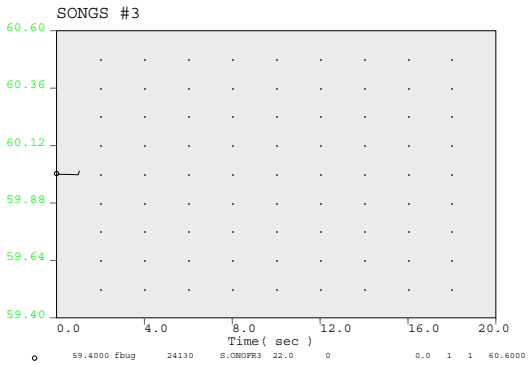
SDG&E Cluster 2 - pst int
2014 Light Autumn
C574 - SY 230 kV N-1

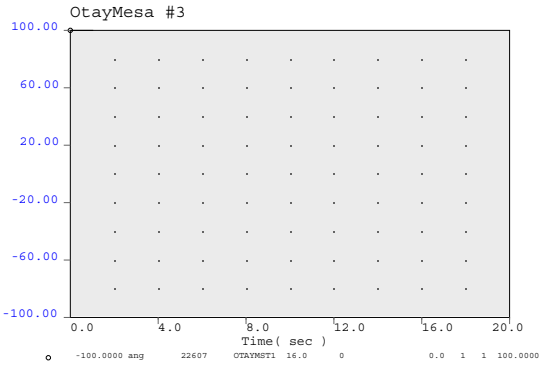
RELATIVE ROTOR ANGLE & FREQUENCY

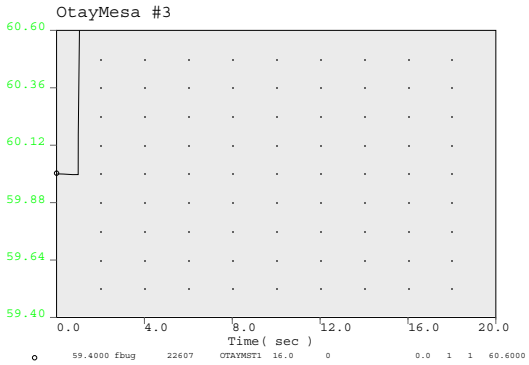












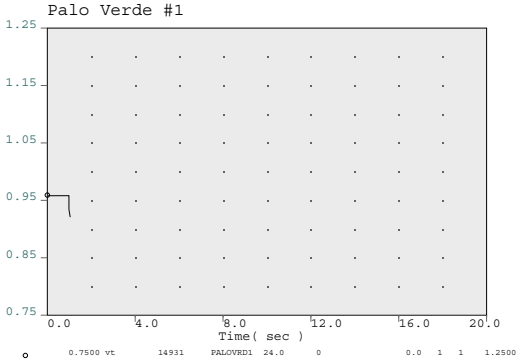
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

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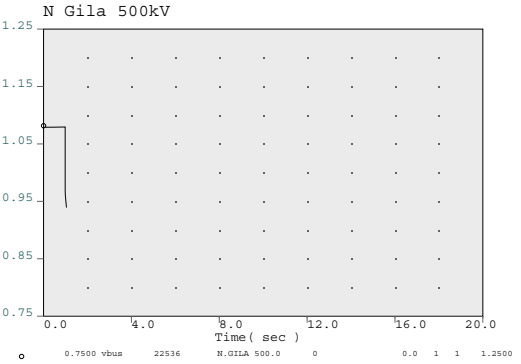
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RELATIVE VOLTAGE

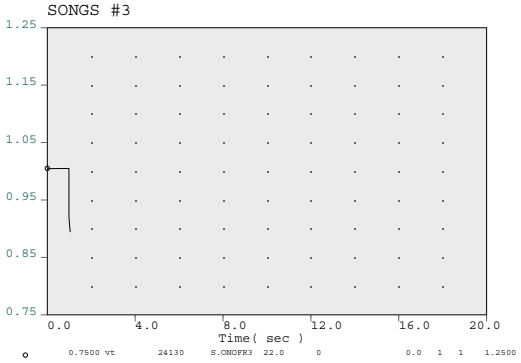
Palo Verde #1



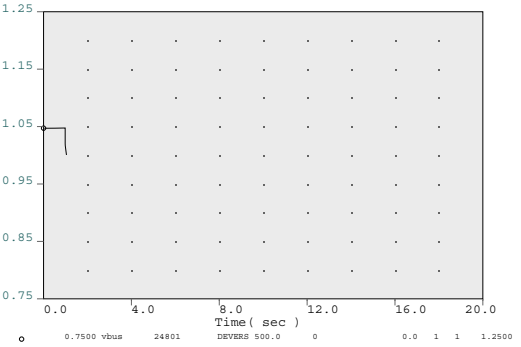
N Gila 500kV



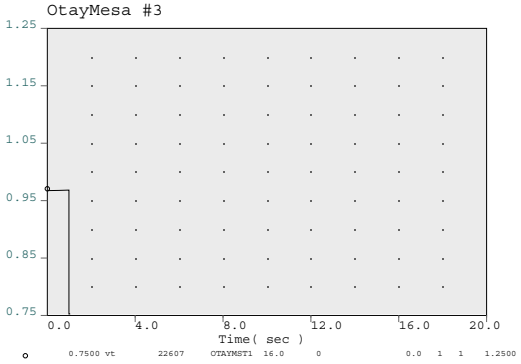
SONGS #3



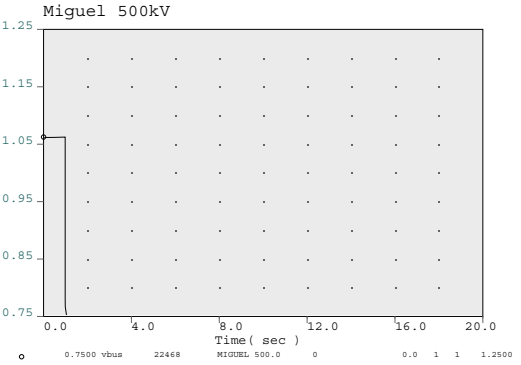
Devers 500



OtayMesa #3



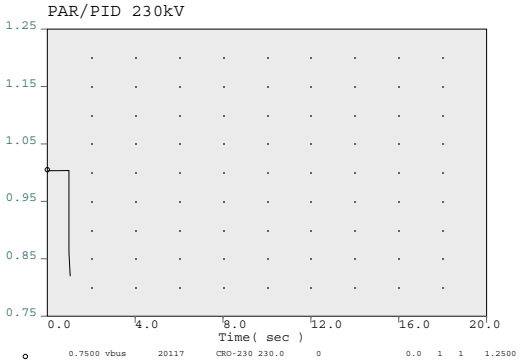
Miguel 500kV



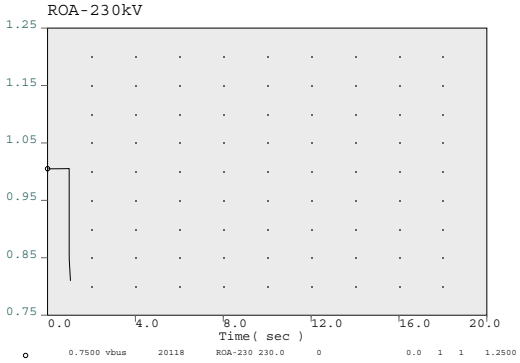
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

Affected System Voltage Check and Comparison

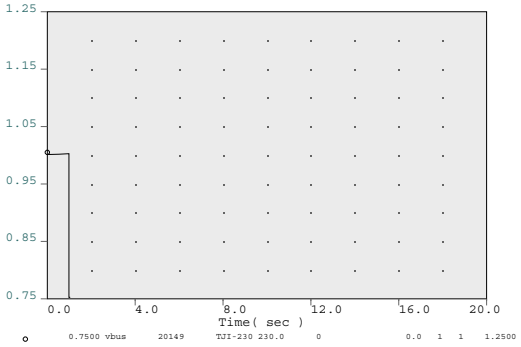
PAR/PID 230kV



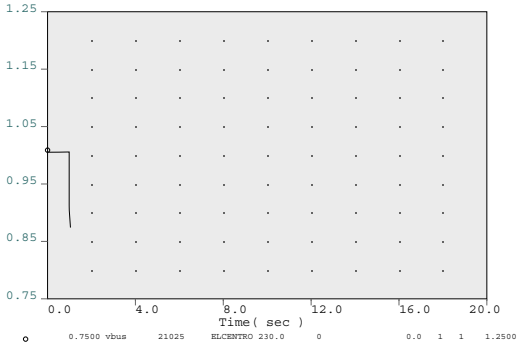
ROA-230kV



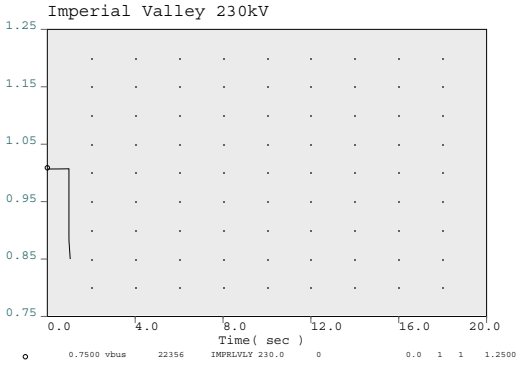
TJ1-230kV



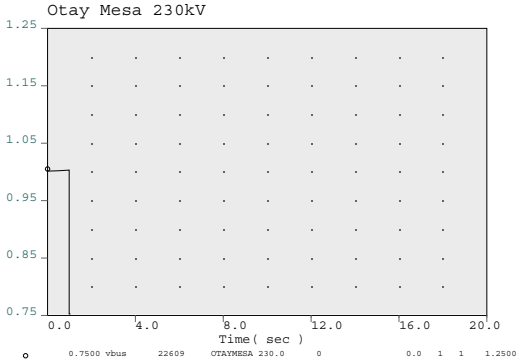
El Centro



Imperial Valley 230kV

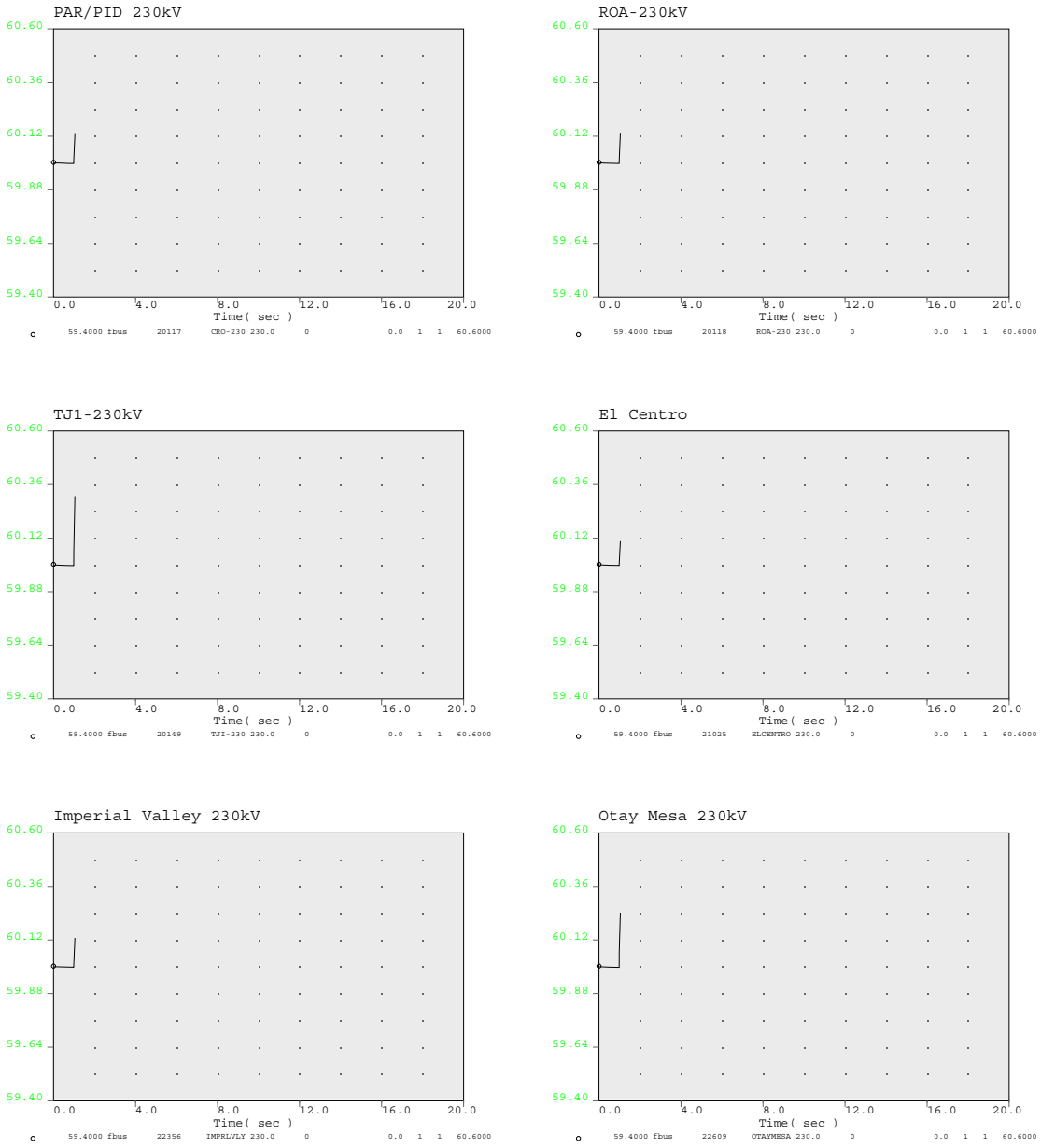


Otay Mesa 230kV



SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

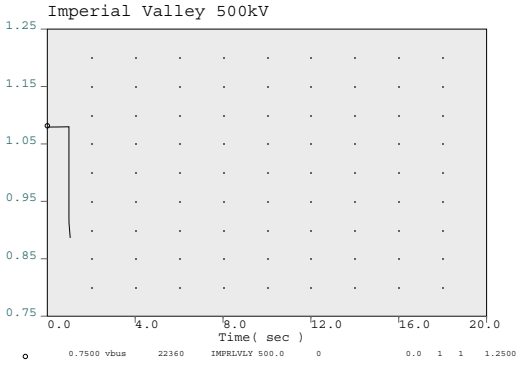
Affected System Frequency Check and Comparison



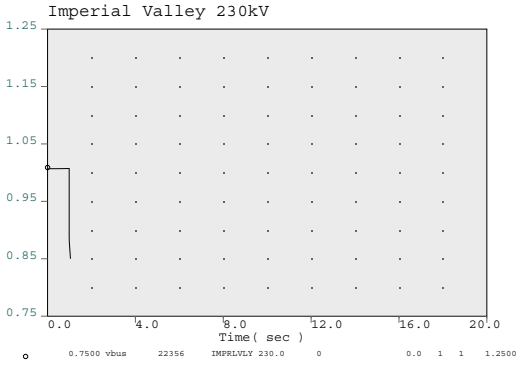
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

Imperial Valley Area - VOLTAGE

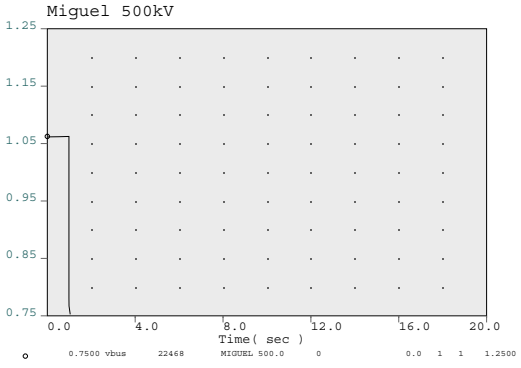
Imperial Valley 500kV



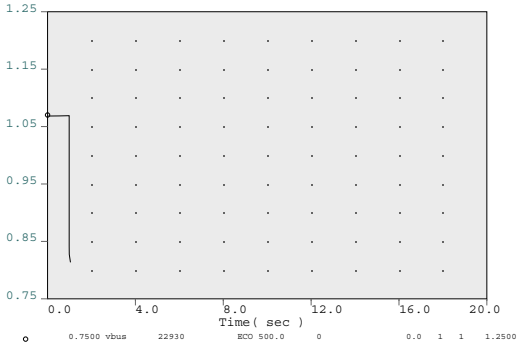
Imperial Valley 230kV



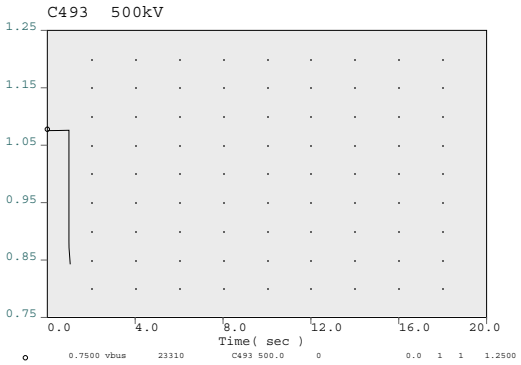
Miguel 500kV



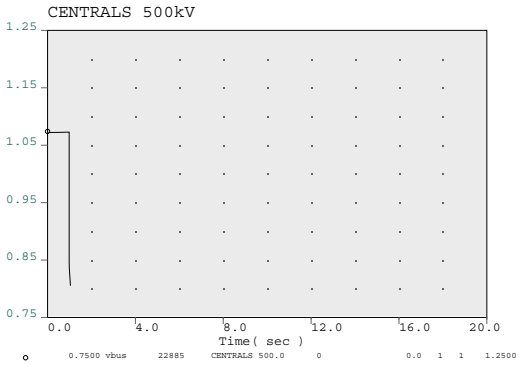
Windfarms 500



C493 500kV

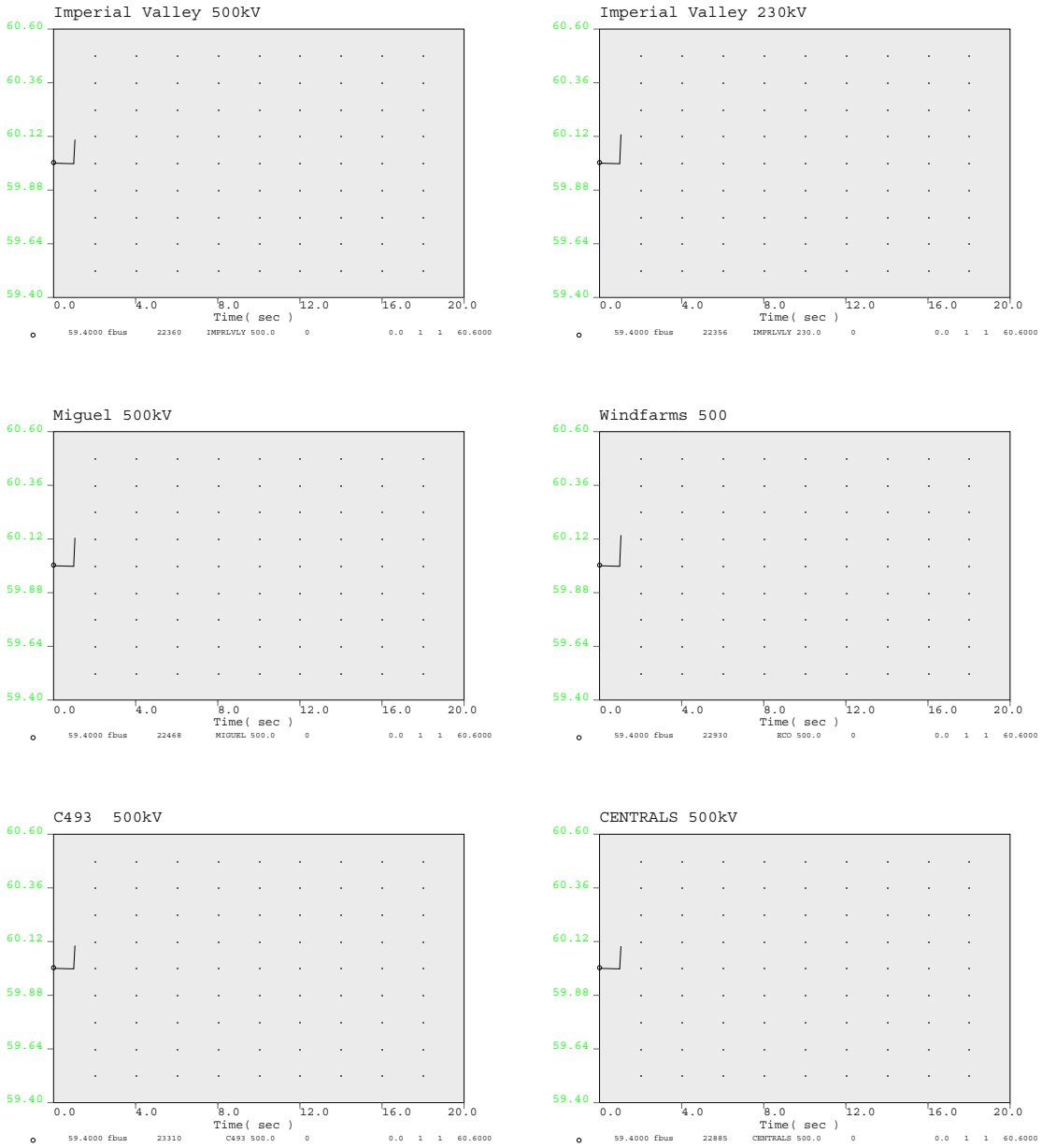


CENTRALS 500kV



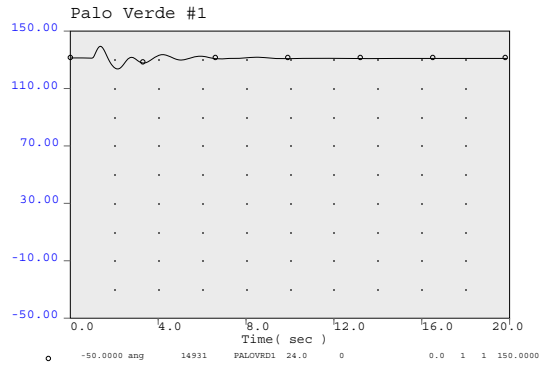
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

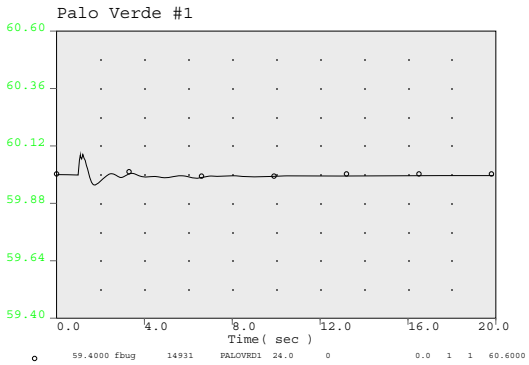
Imperial Valley Area - Frequency

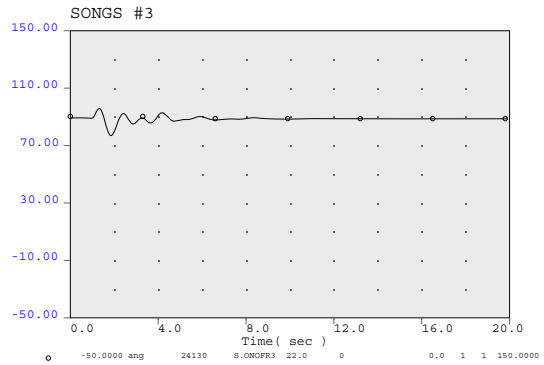


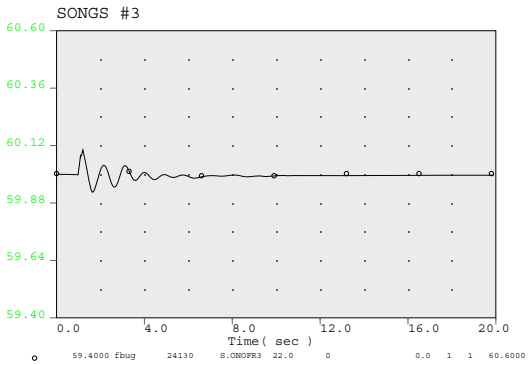
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

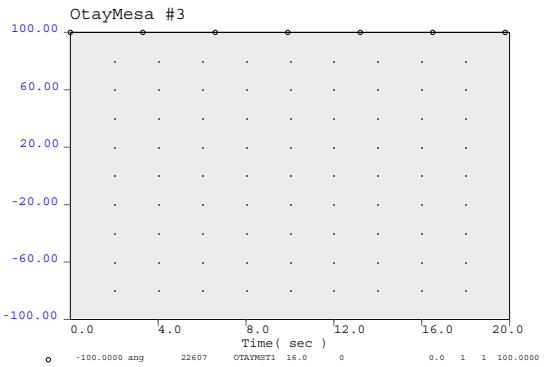
RELATIVE ROTOR ANGLE & FREQUENCY

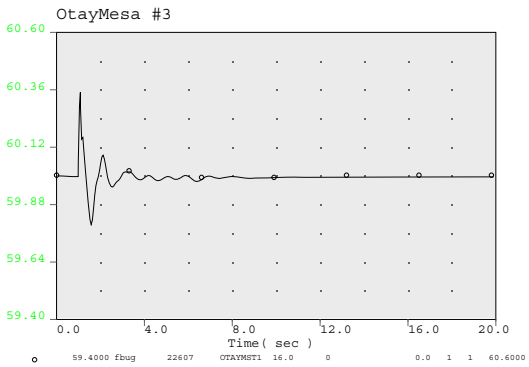












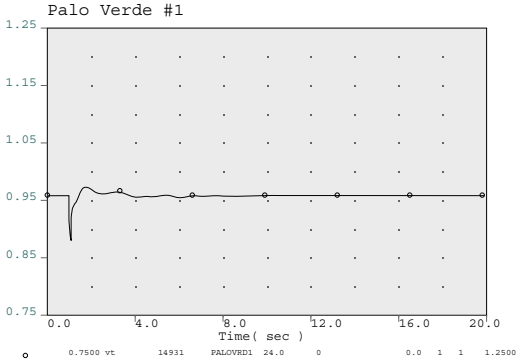
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

Page 1

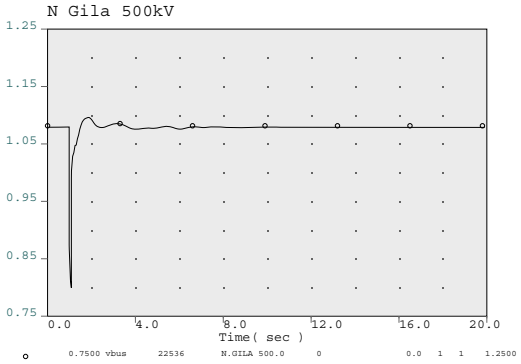
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RELATIVE VOLTAGE

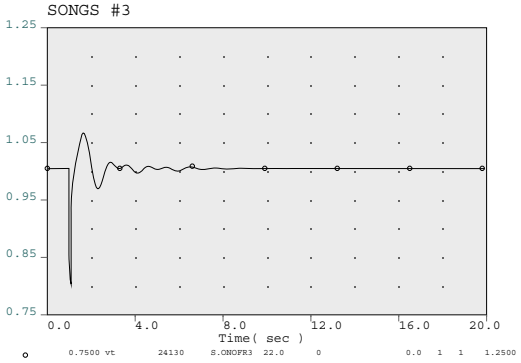
Palo Verde #1



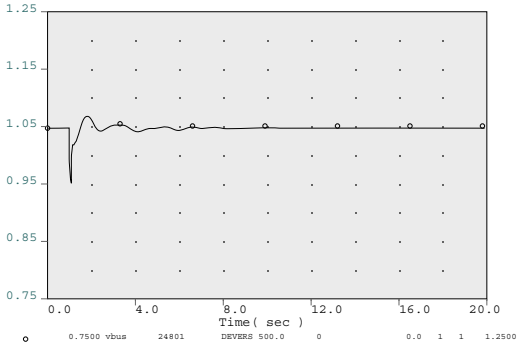
N Gila 500kV



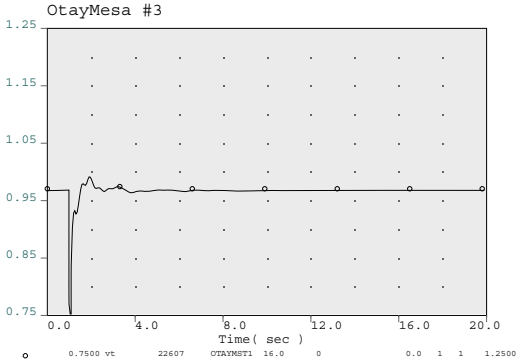
SONGS #3



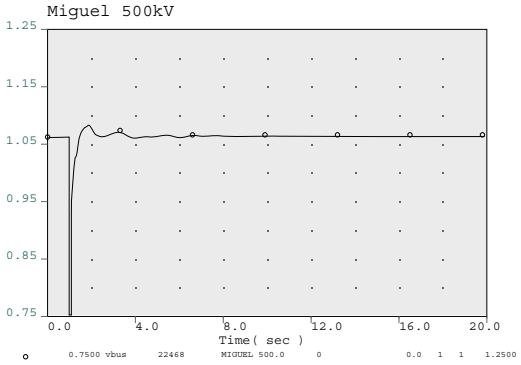
Devers 500



OtayMesa #3



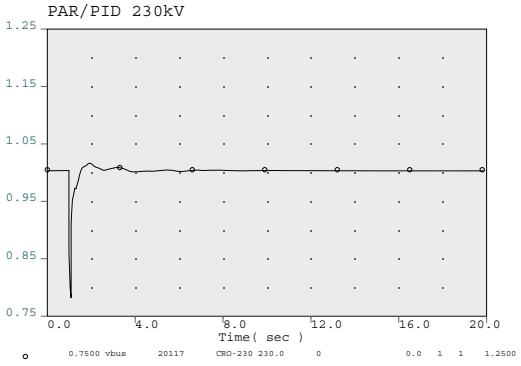
Miguel 500kV



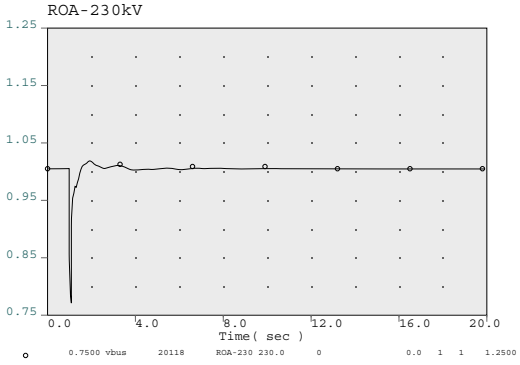
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

Affected System Voltage Check and Comparison

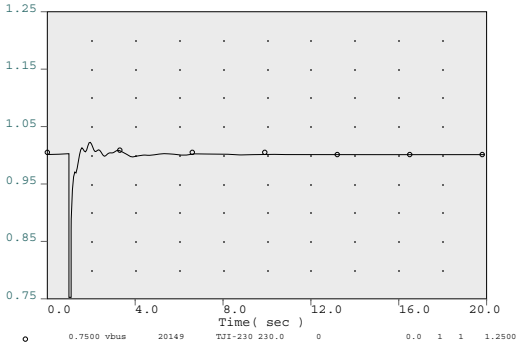
PAR/PID 230kV



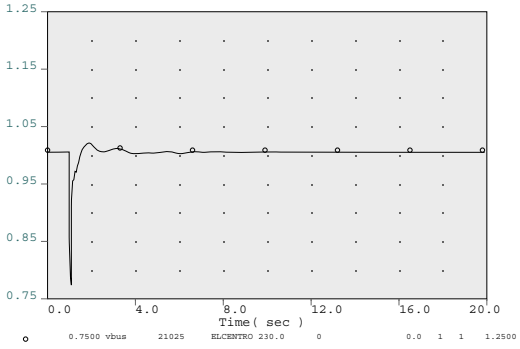
ROA-230kV



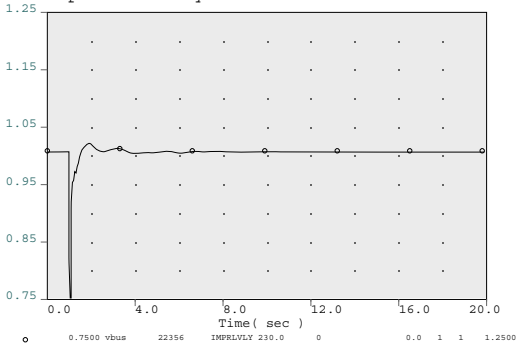
TJ1-230kV



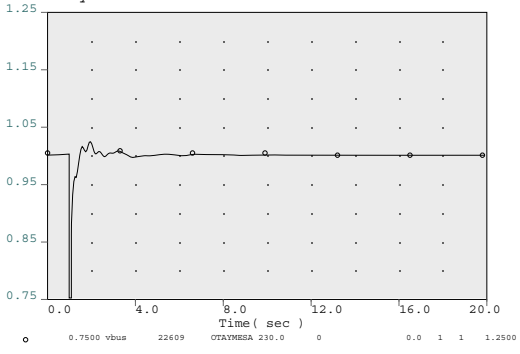
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

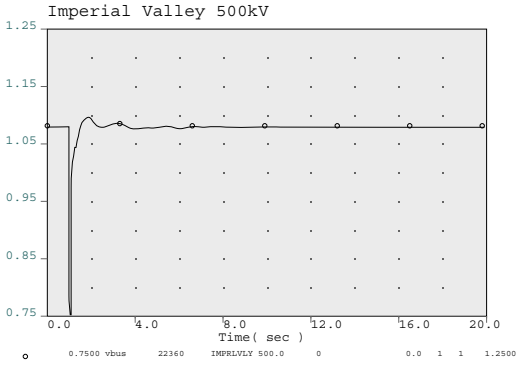
Affected System Frequency Check and Comparison



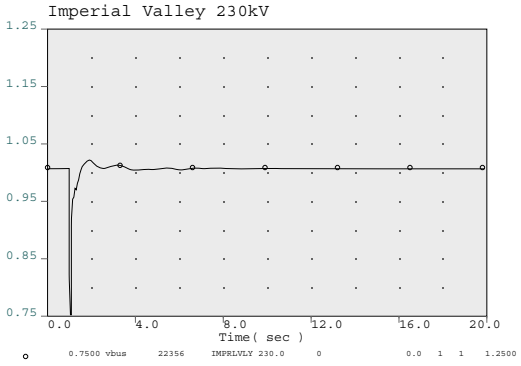
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

Imperial Valley Area - VOLTAGE

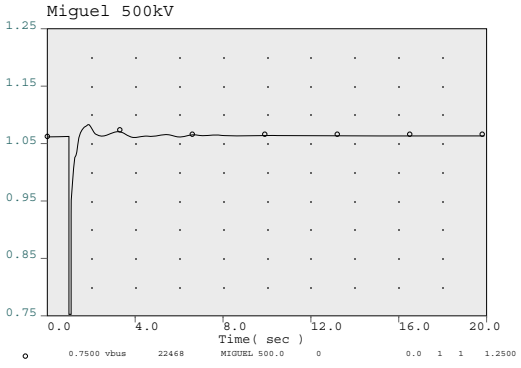
Imperial Valley 500kV



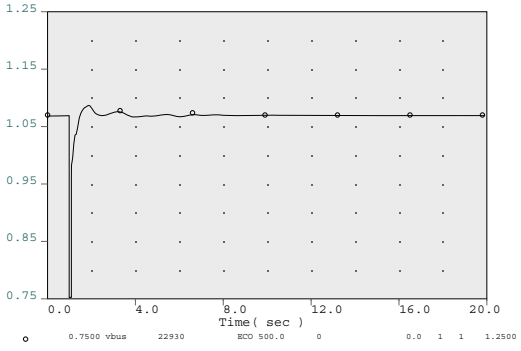
Imperial Valley 230kV



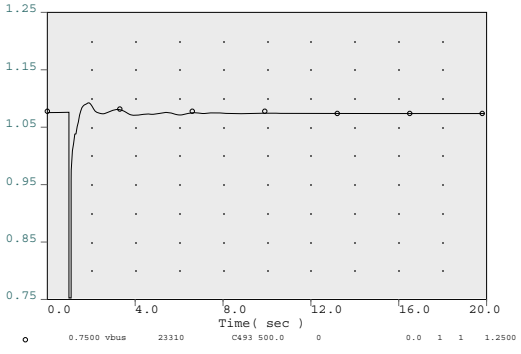
Miguel 500kV



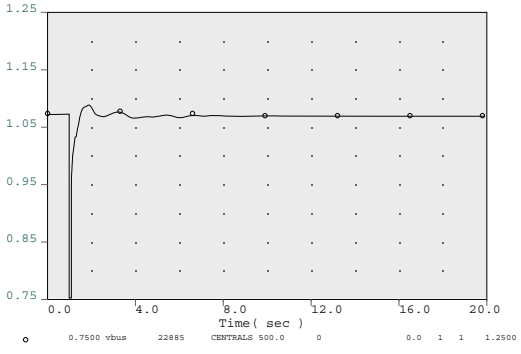
Windfarms 500



C493 500kV



CENTRALS 500kV



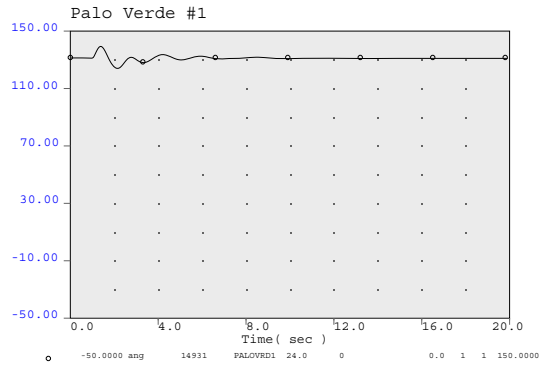
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

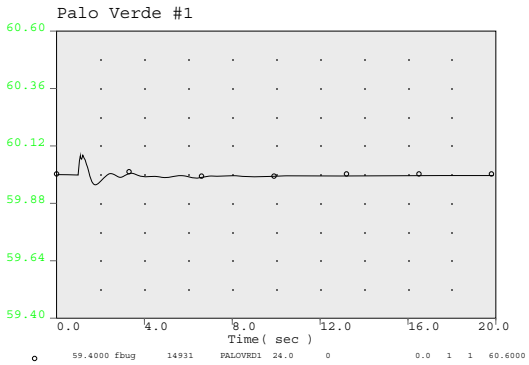
Imperial Valley Area - Frequency

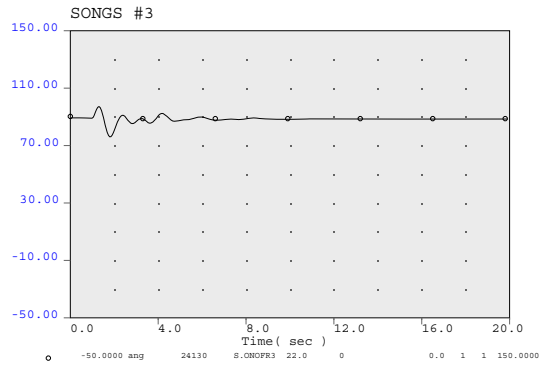


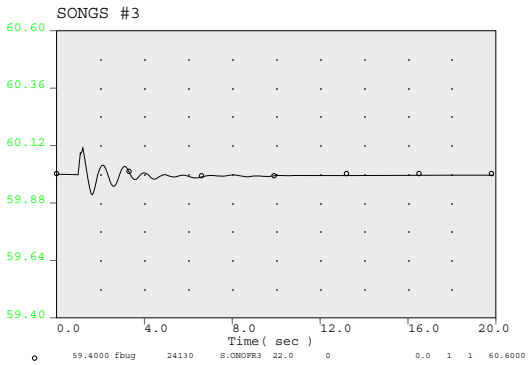
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - C565 230 kV N-1

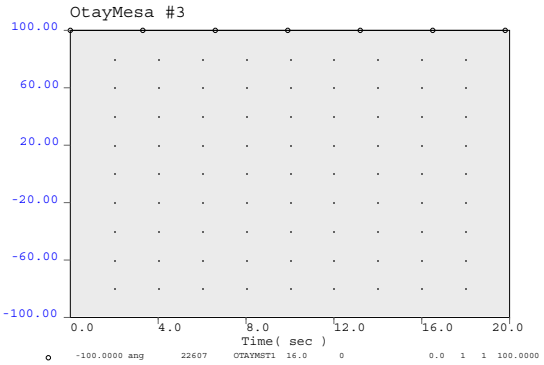
RELATIVE ROTOR ANGLE & FREQUENCY

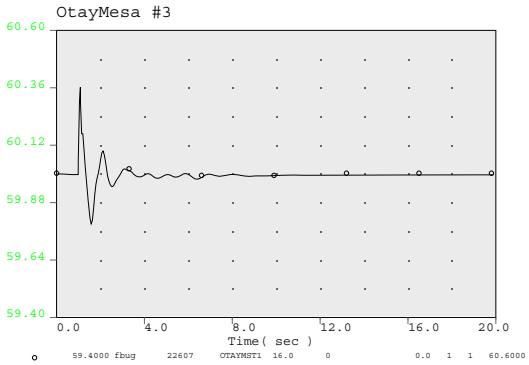












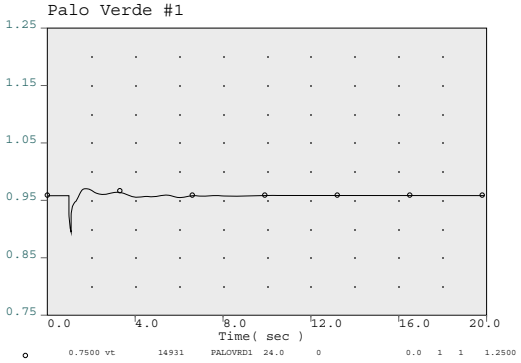
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - Penasquitos 230 kV N-1

Page 1

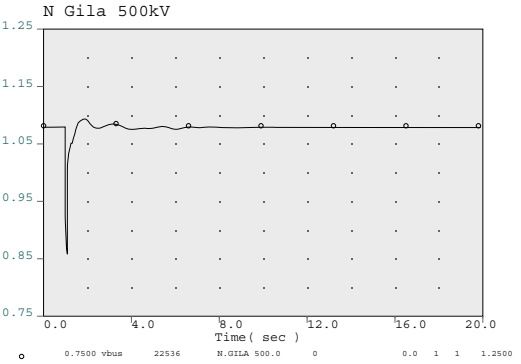
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RELATIVE VOLTAGE

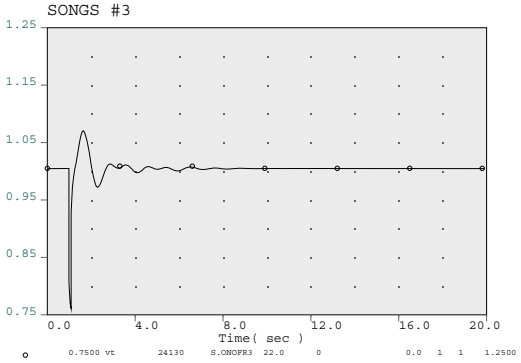
Palo Verde #1



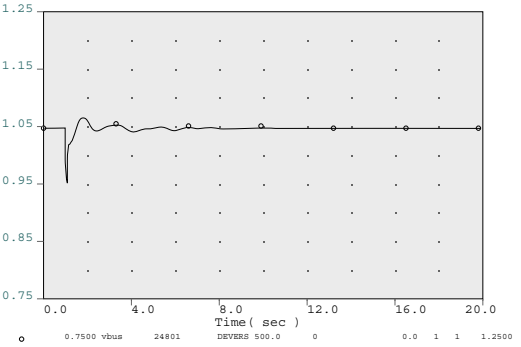
N Gila 500kV



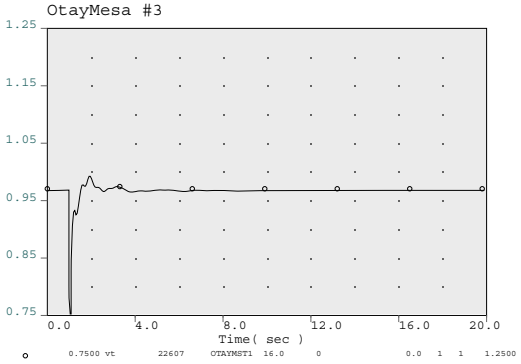
SONGS #3



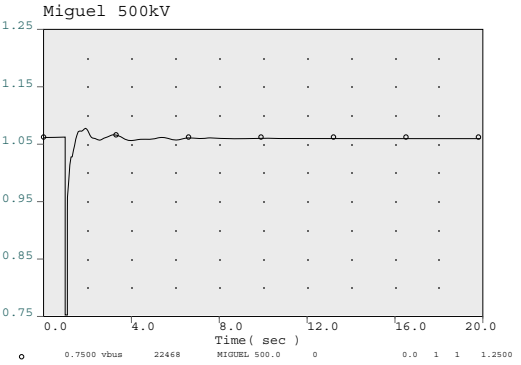
Devers 500



OtayMesa #3



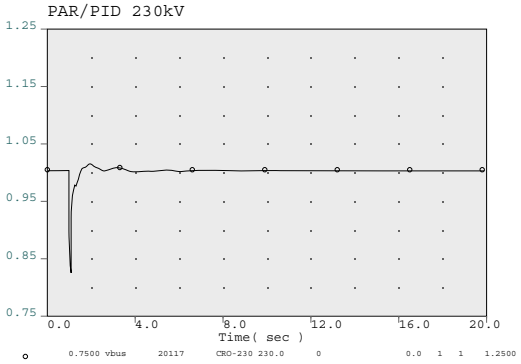
Miguel 500kV



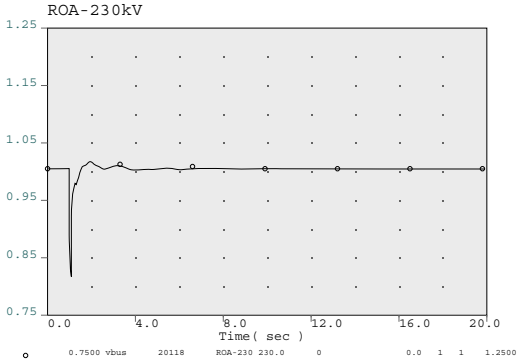
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - Penasquitos 230 kV N-1

Affected System Voltage Check and Comparison

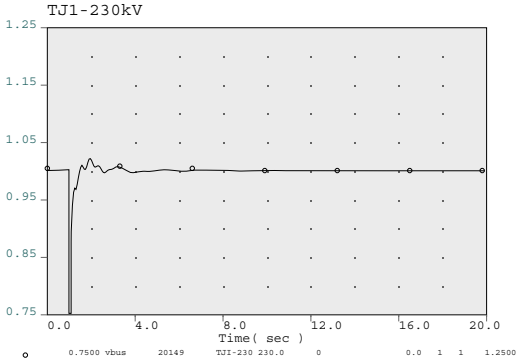
PAR/PID 230kV



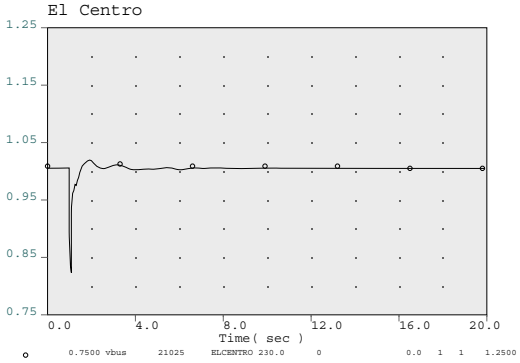
ROA-230kV



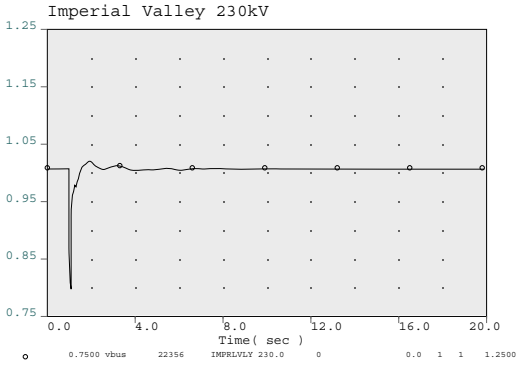
TJ1-230kV



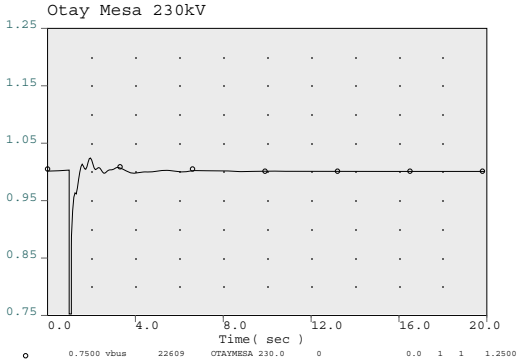
El Centro



Imperial Valley 230kV



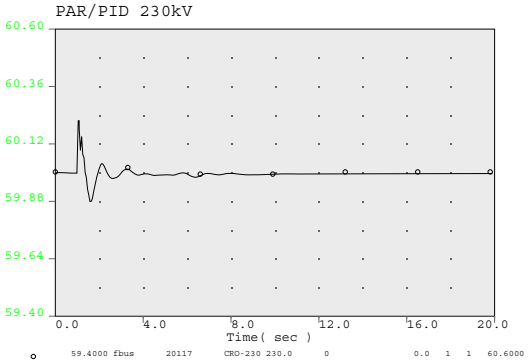
Otay Mesa 230kV



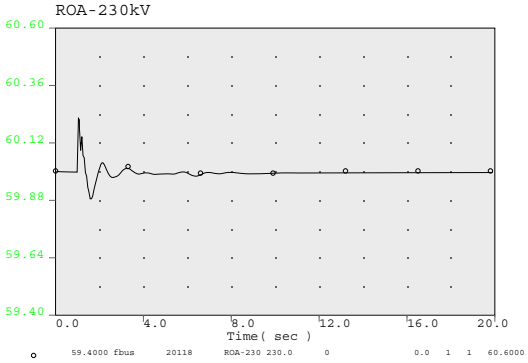
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - Penasquitos 230 kV N-1

Affected System Frequency Check and Comparison

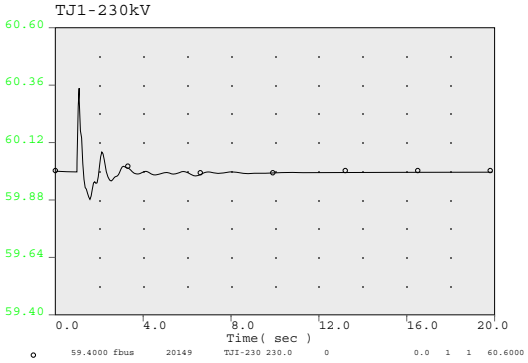
PAR/PID 230kV



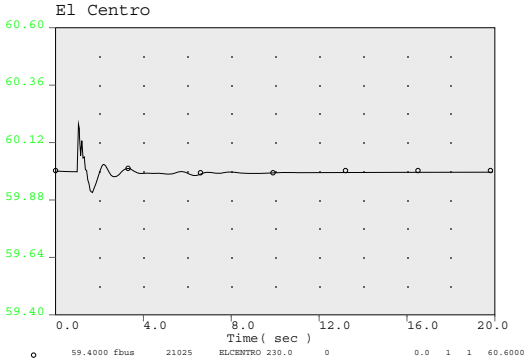
ROA-230kV



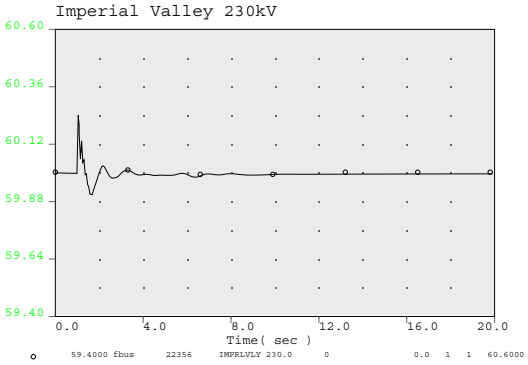
TJ1-230kV



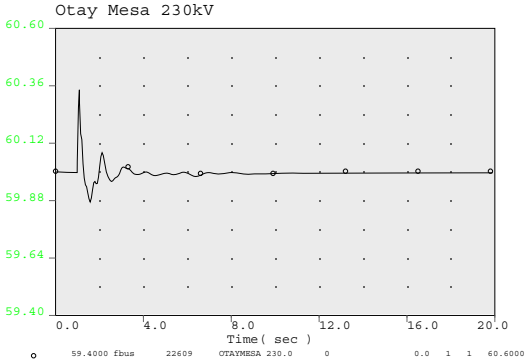
El Centro



Imperial Valley 230kV



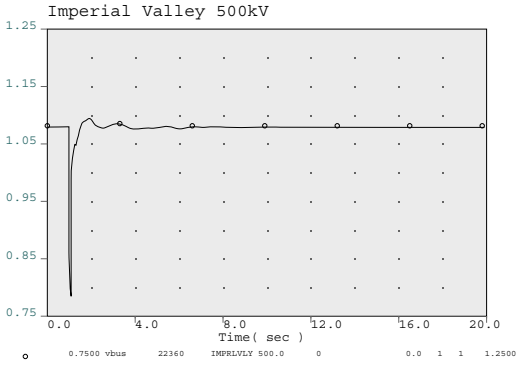
Otay Mesa 230kV



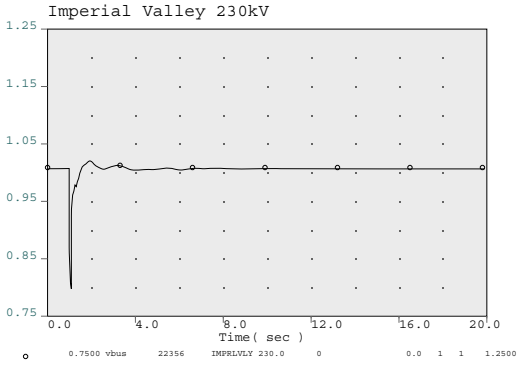
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - Penasquitos 230 kV N-1

Imperial Valley Area - VOLTAGE

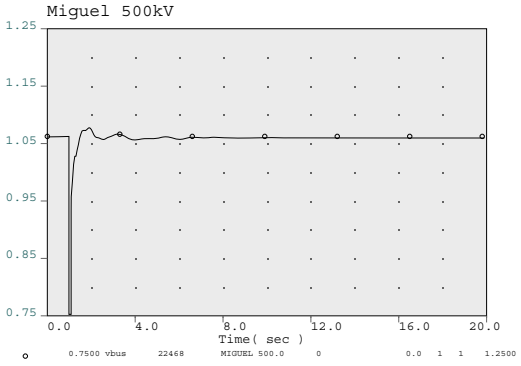
Imperial Valley 500kV



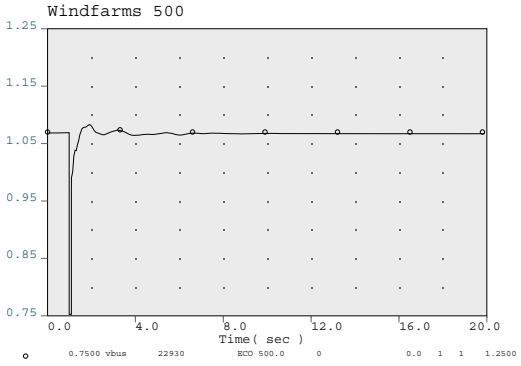
Imperial Valley 230kV



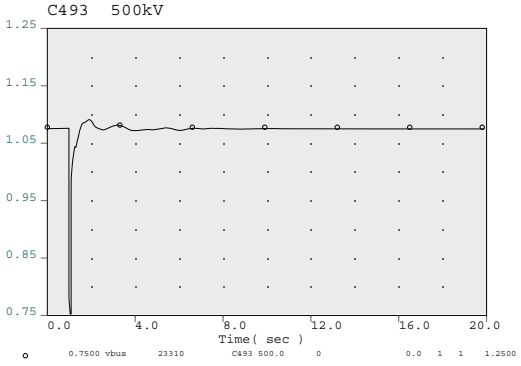
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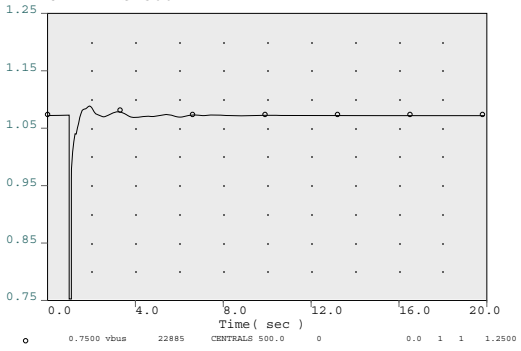
Windfarms 500



C493 500kV



CENTRALS 500kV



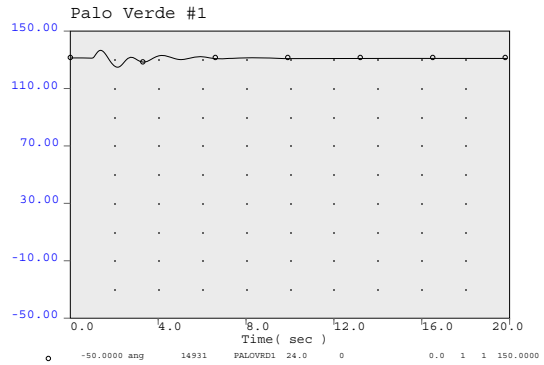
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - Penasquitos 230 kV N-1

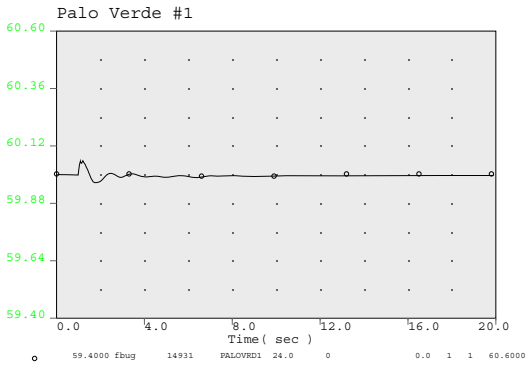
Imperial Valley Area - Frequency

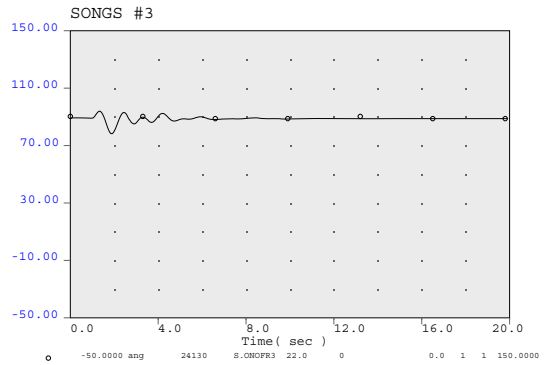


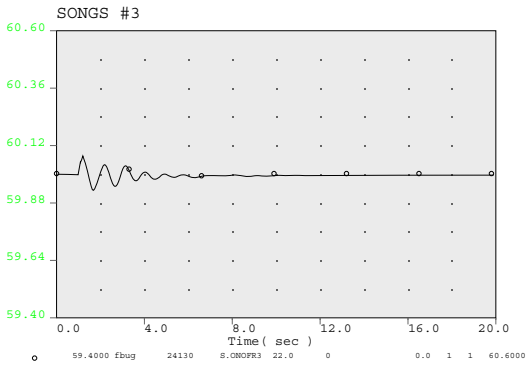
SDG&E Cluster 2 - pst int
2014 Light Autumn
Sycamore - Penasquitos 230 kV N-1

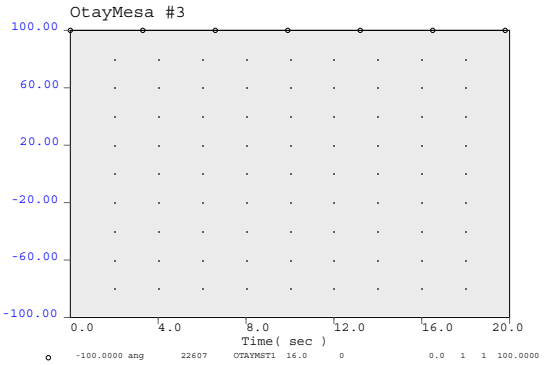
RELATIVE ROTOR ANGLE & FREQUENCY

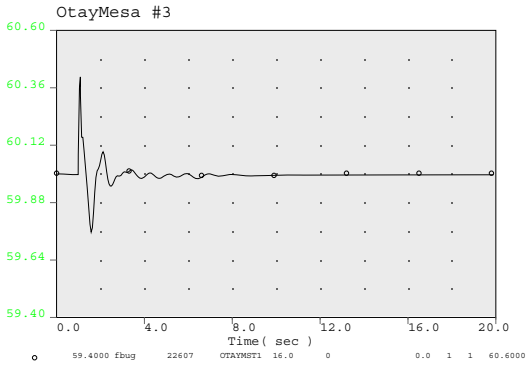












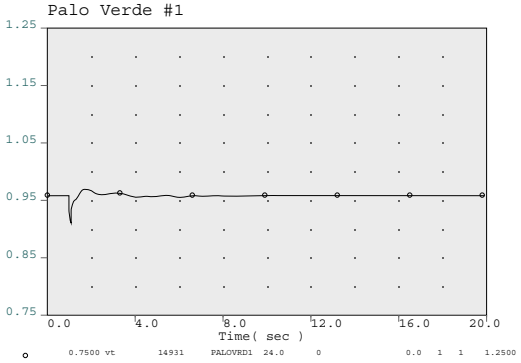
SDG&E Cluster 2 - pst int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Page 1

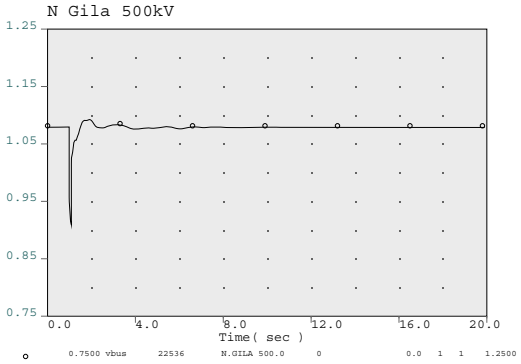
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RELATIVE VOLTAGE

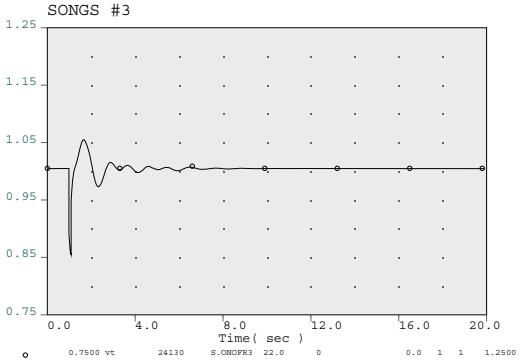
Palo Verde #1



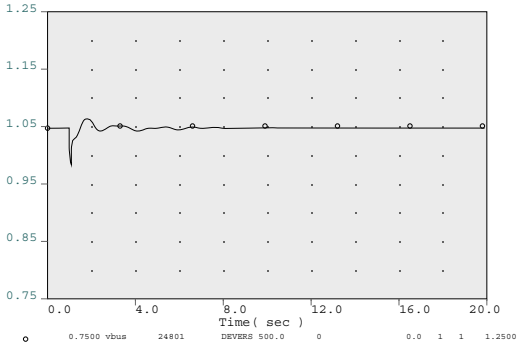
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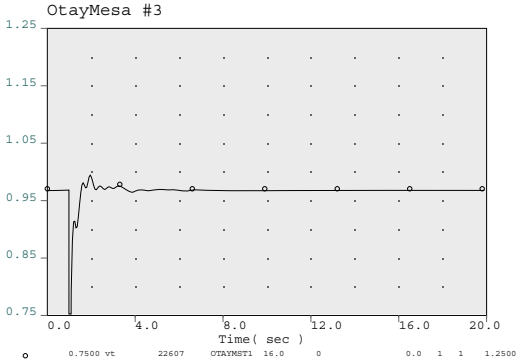
SONGS #3



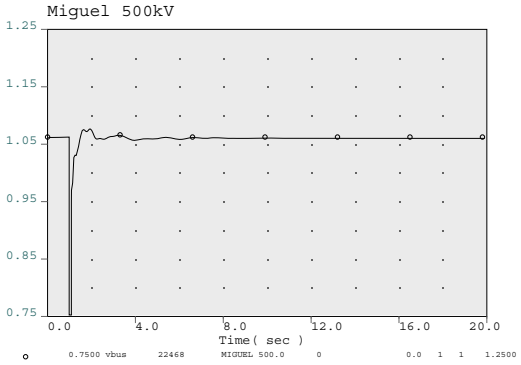
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OtayMesa #3



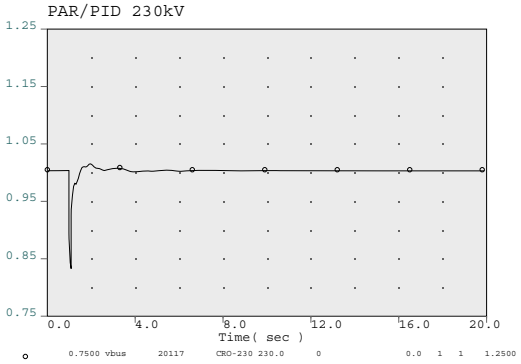
Miguel 500kV



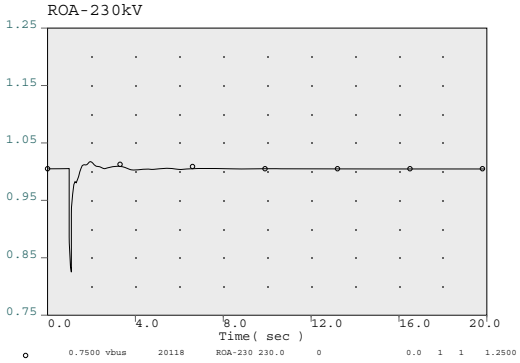
SDG&E Cluster 2 - pst int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Affected System Voltage Check and Comparison

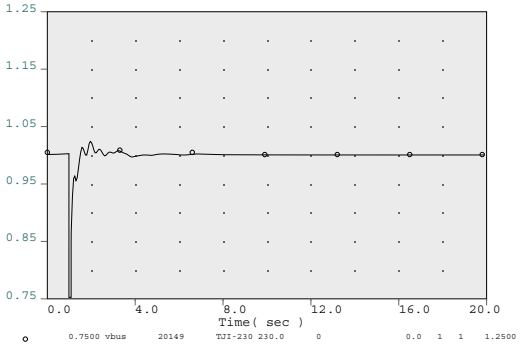
PAR/PID 230kV



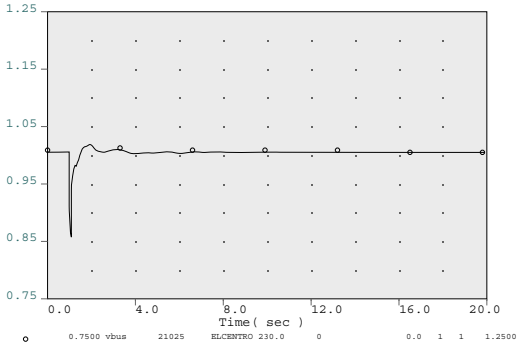
ROA-230kV



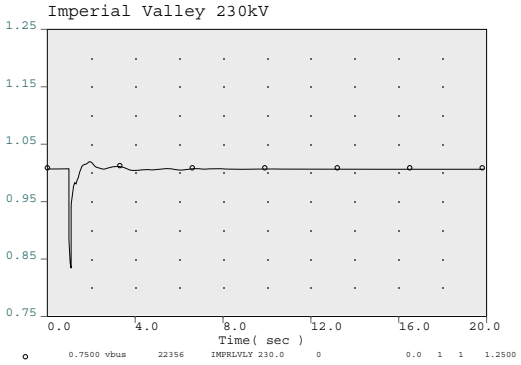
TJ1-230kV



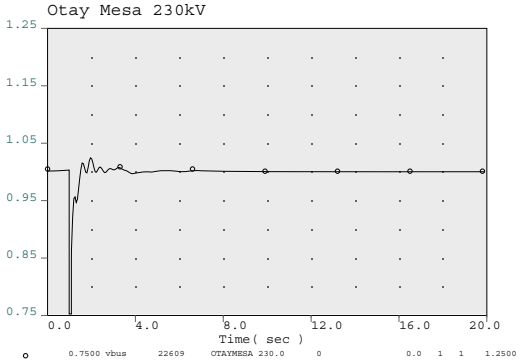
El Centro



Imperial Valley 230kV



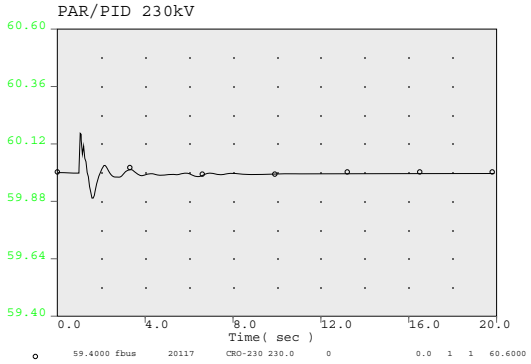
Otay Mesa 230kV



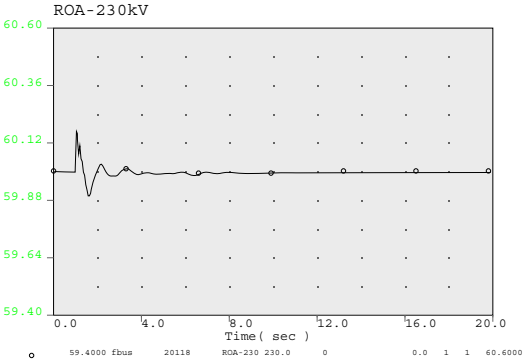
SDG&E Cluster 2 - pst int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Affected System Frequency Check and Comparison

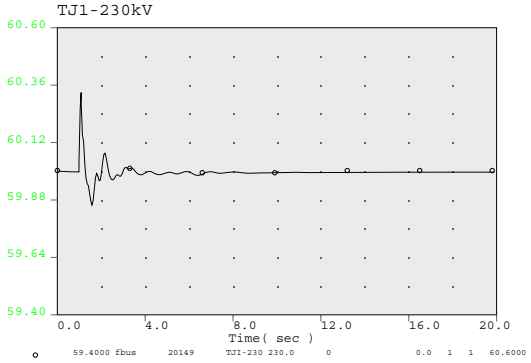
PAR/PID 230kV



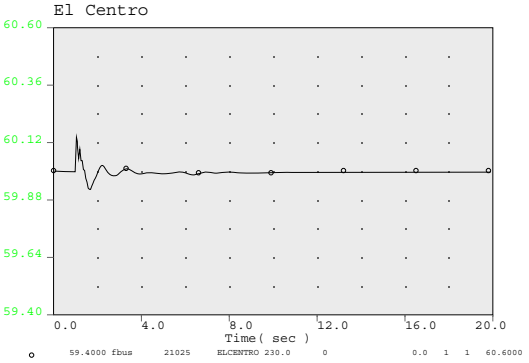
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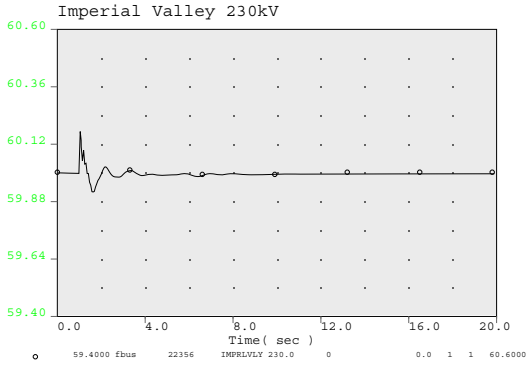
TJ1-230kV



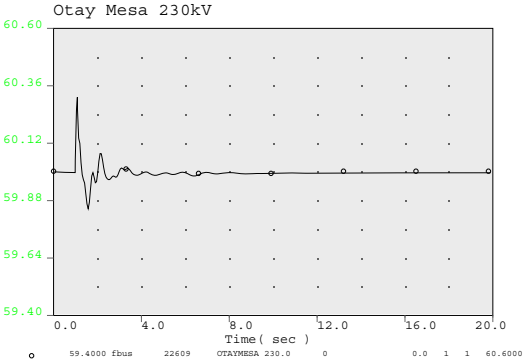
El Centro



Imperial Valley 230kV



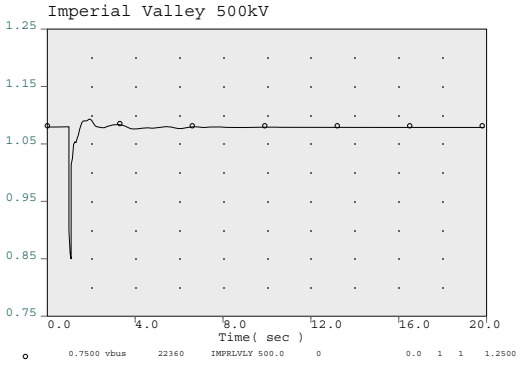
Otay Mesa 230kV



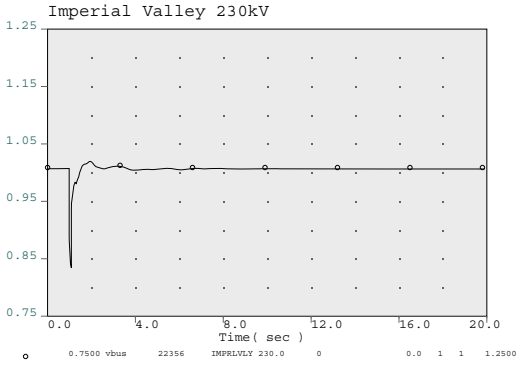
SDG&E Cluster 2 - pst int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Imperial Valley Area - VOLTAGE

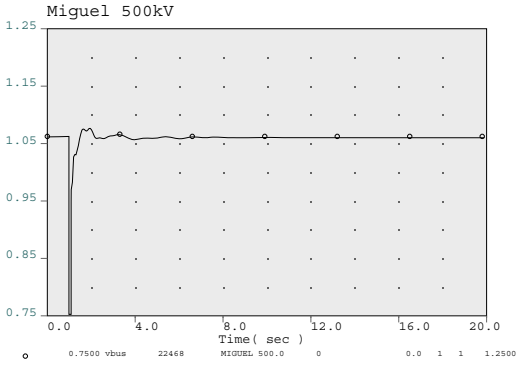
Imperial Valley 500kV



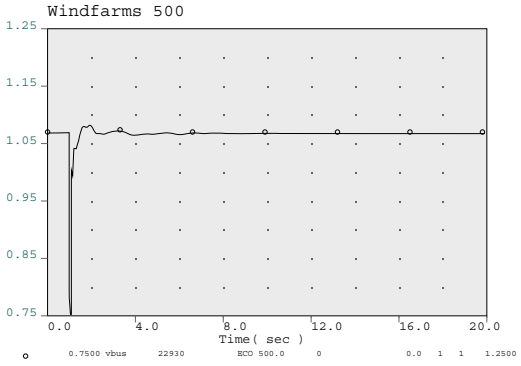
Imperial Valley 230kV



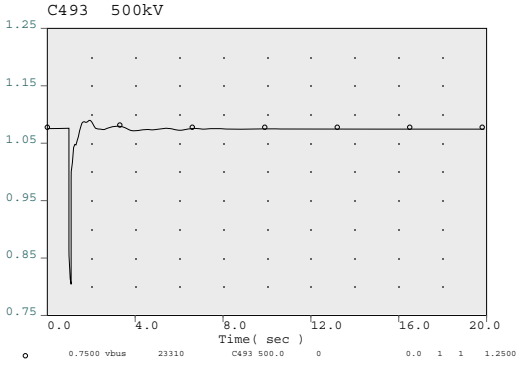
Miguel 500kV



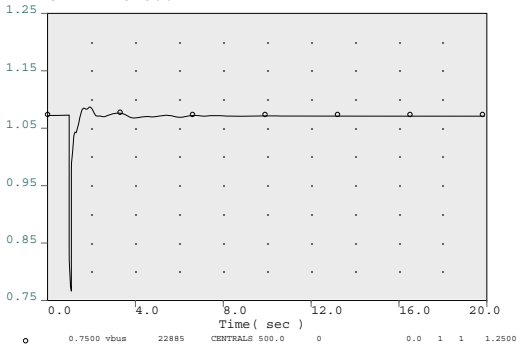
Windfarms 500



C493 500kV



CENTRALS 500kV



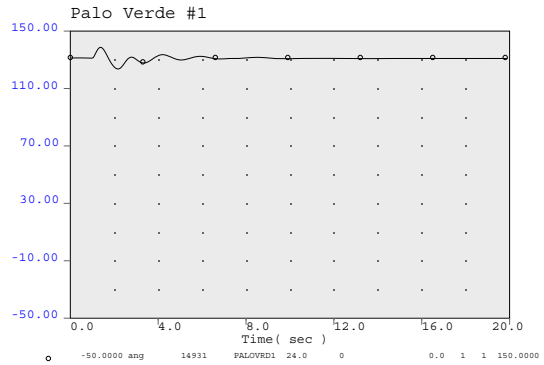
SDG&E Cluster 2 - pst int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

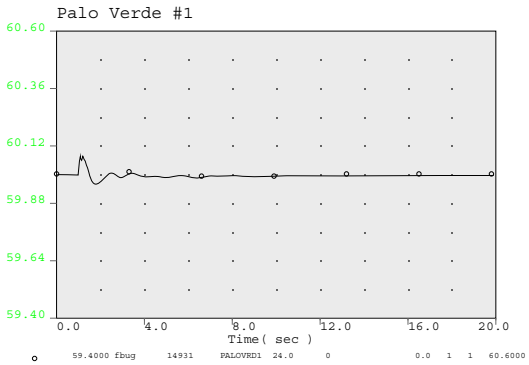
Imperial Valley Area - Frequency

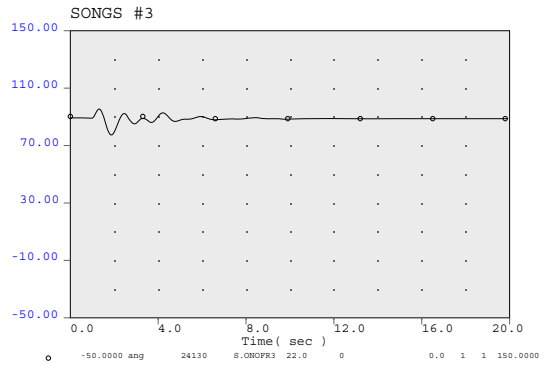


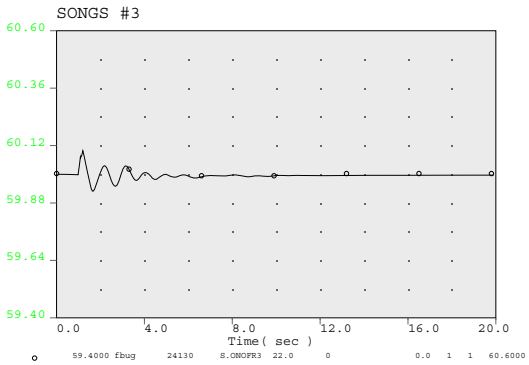
SDG&E Cluster 2 - pst int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

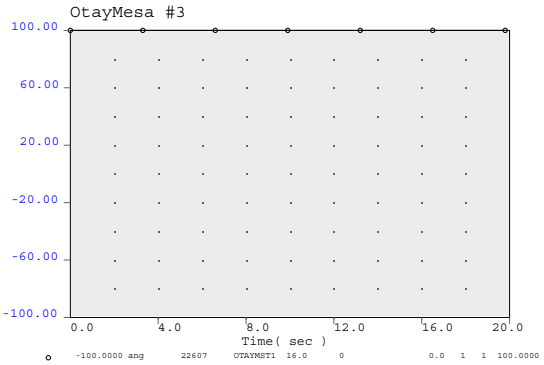
RELATIVE ROTOR ANGLE & FREQUENCY

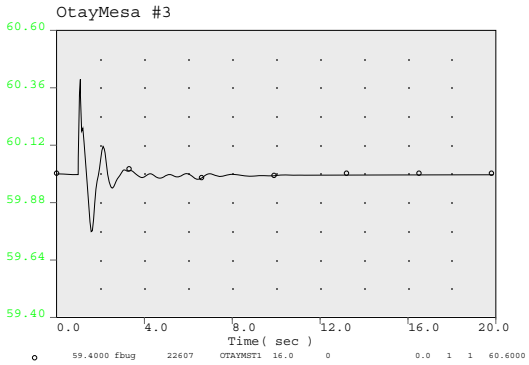












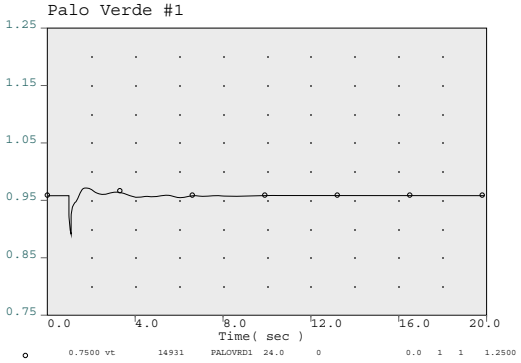
SDG&E Cluster 2 - pst int
2014 Light Autumn
Southbay - Mission 230 kV N-1

Page 1

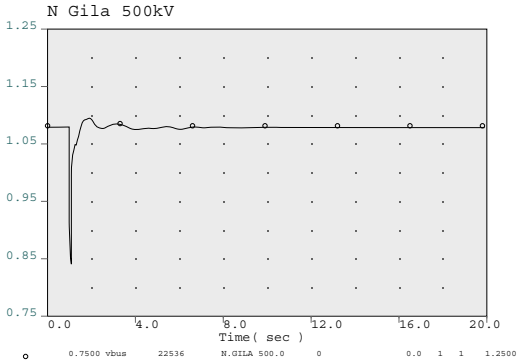
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RELATIVE VOLTAGE

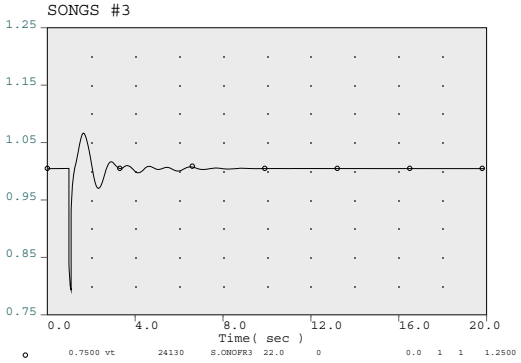
Palo Verde #1



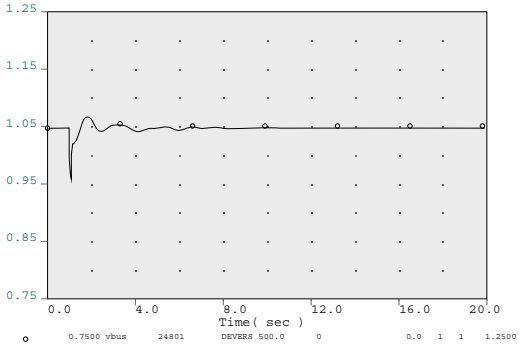
N Gila 500kV



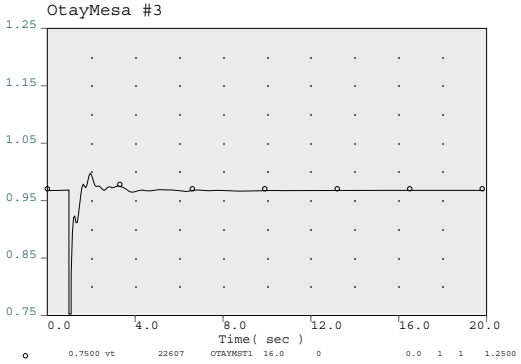
SONGS #3



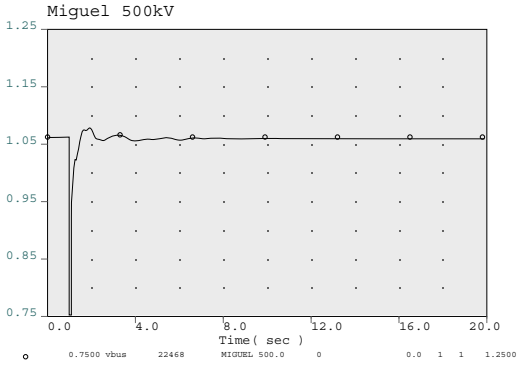
Devers 500



OtayMesa #3



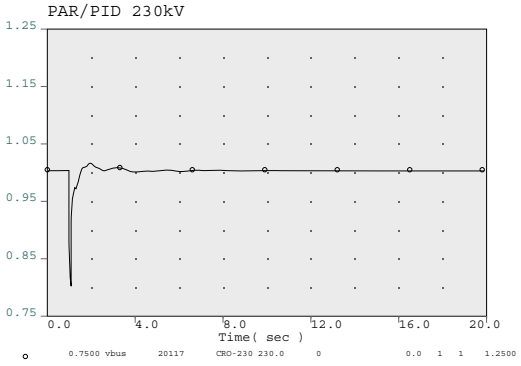
Miguel 500kV



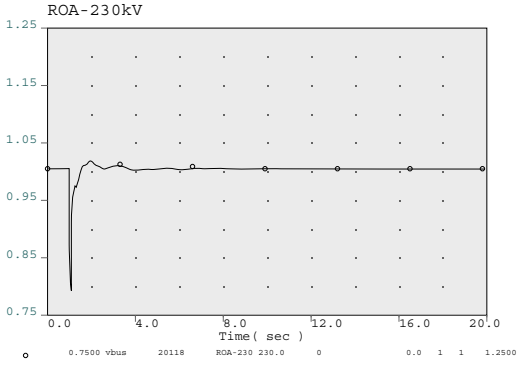
SDG&E Cluster 2 - pst int
2014 Light Autumn
Southbay - Mission 230 kV N-1

Affected System Voltage Check and Comparison

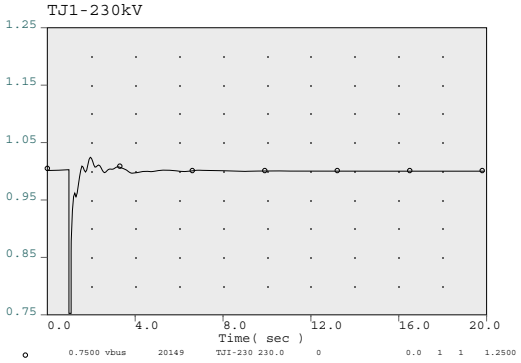
PAR/PID 230kV



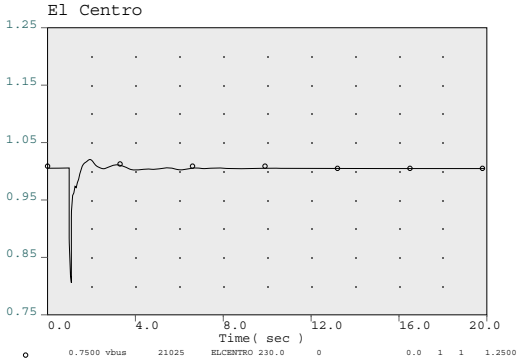
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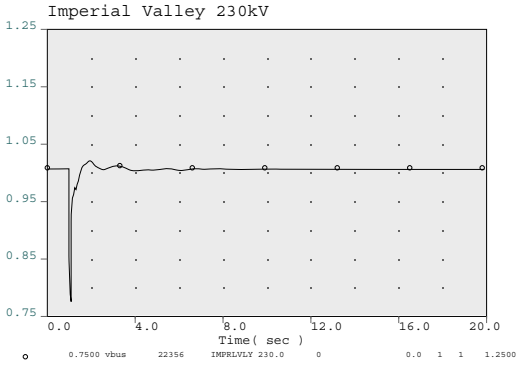
TJ1-230kV



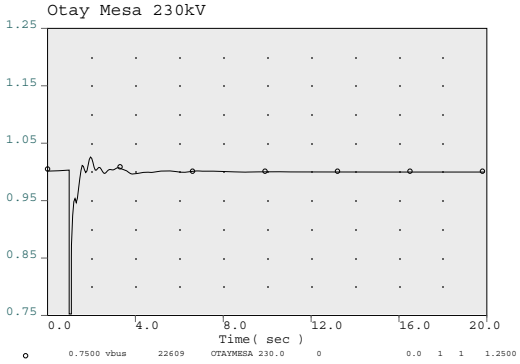
El Centro



Imperial Valley 230kV

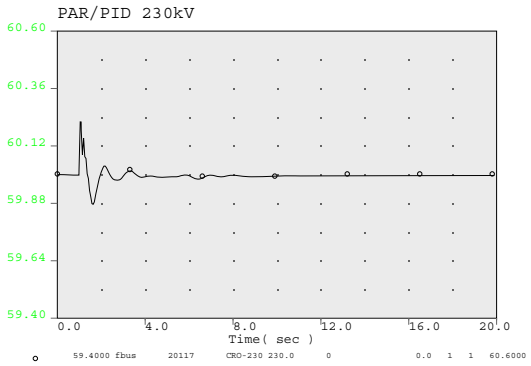


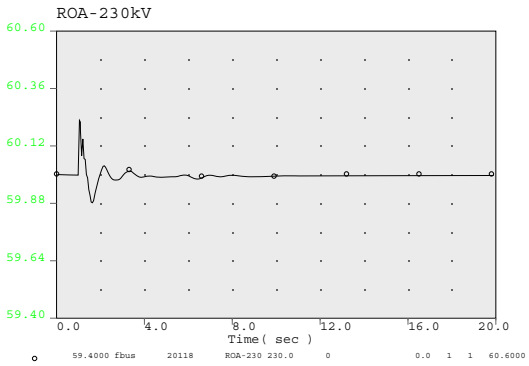
Otay Mesa 230kV

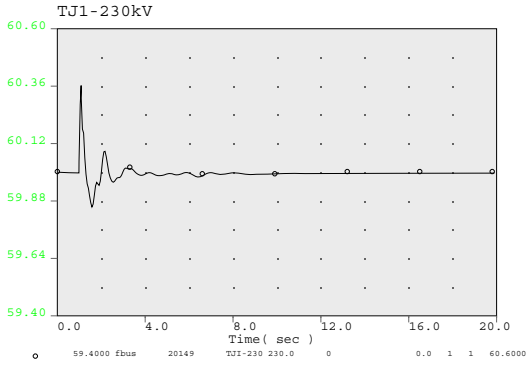


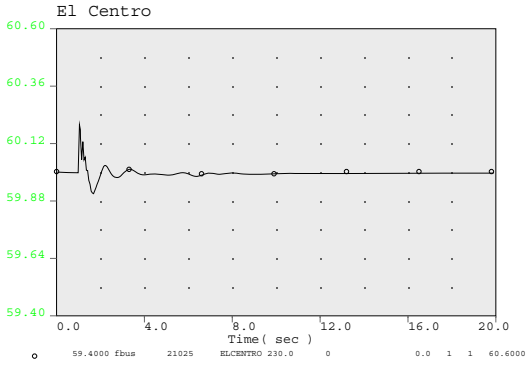
SDG&E Cluster 2 - pst int
2014 Light Autumn
Southbay - Mission 230 kV N-1

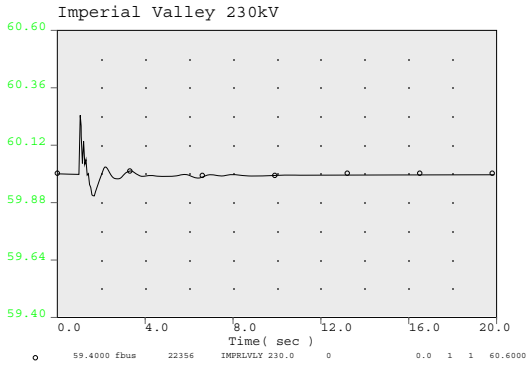
Affected System Frequency Check and Comparison

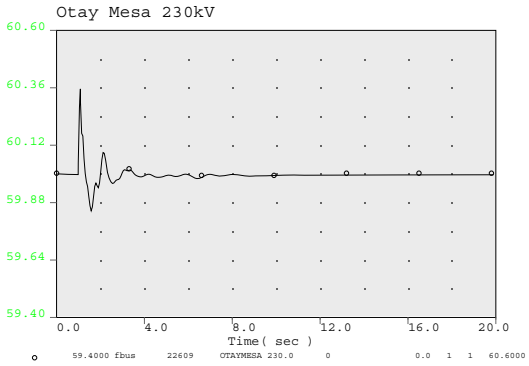








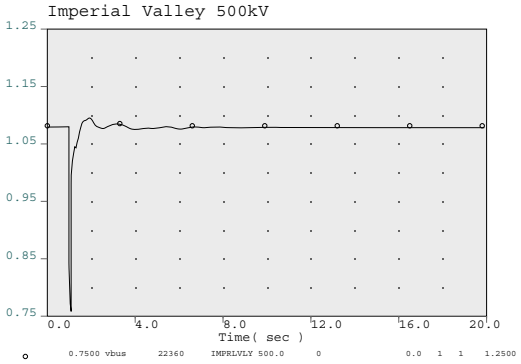




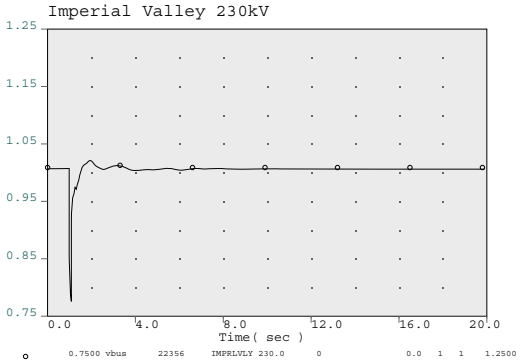
SDG&E Cluster 2 - pst int
2014 Light Autumn
Southbay - Mission 230 kV N-1

Imperial Valley Area - VOLTAGE

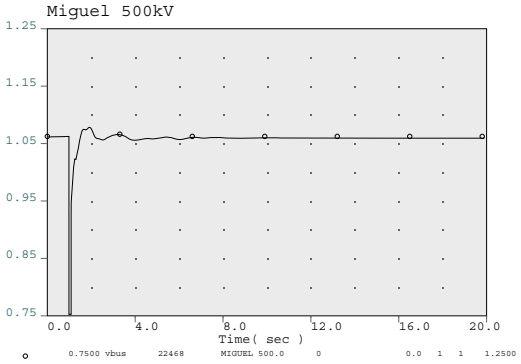
Imperial Valley 500kV



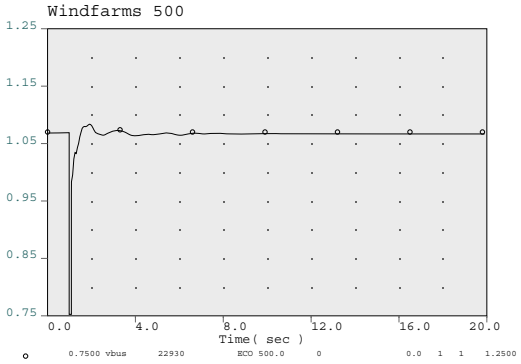
Imperial Valley 230kV



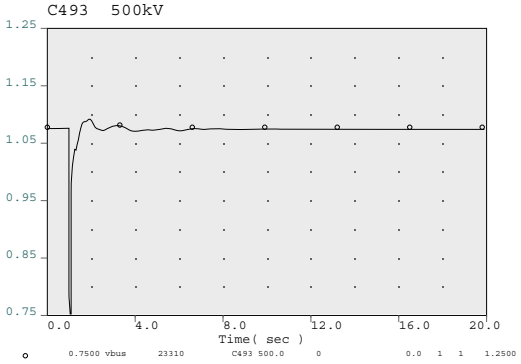
Miguel 500kV



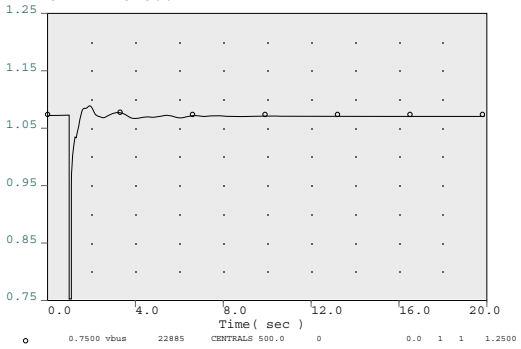
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C493 500kV

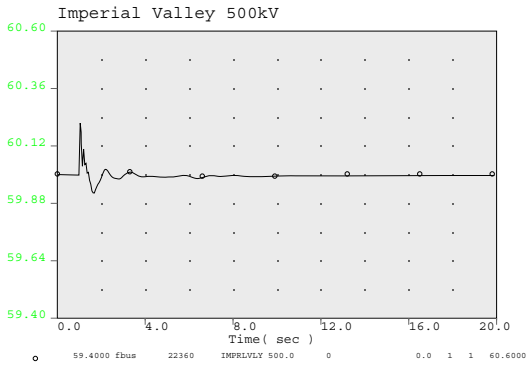


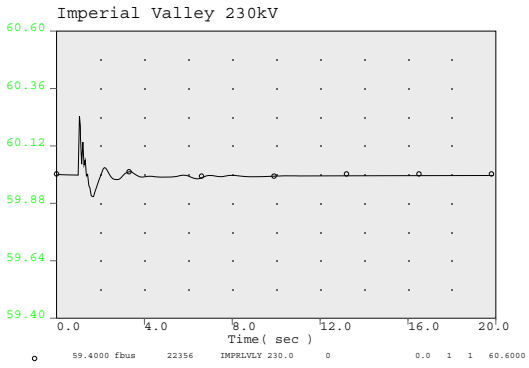
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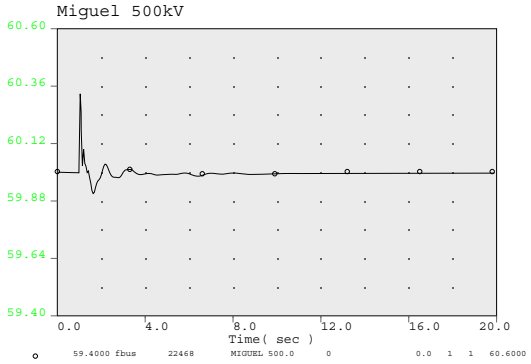


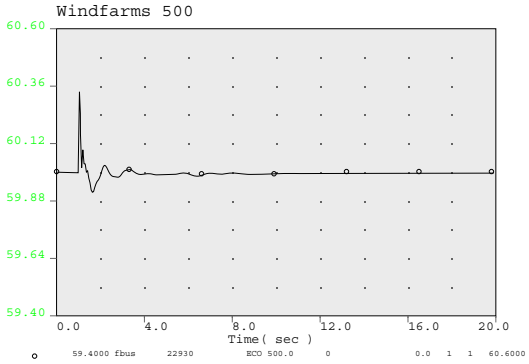
SDG&E Cluster 2 - pst int
2014 Light Autumn
Southbay - Mission 230 kV N-1

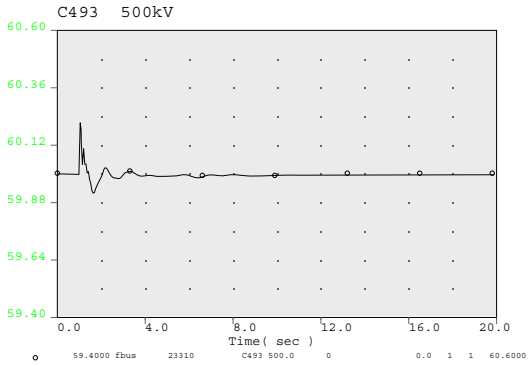
Imperial Valley Area - Frequency

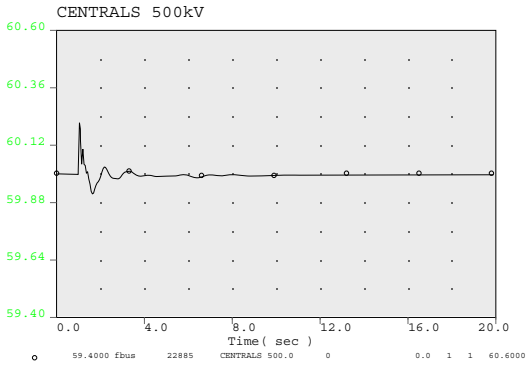






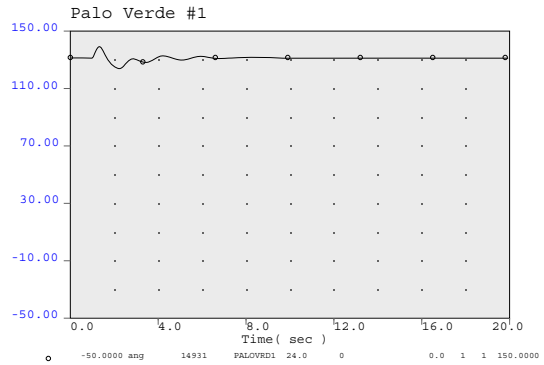


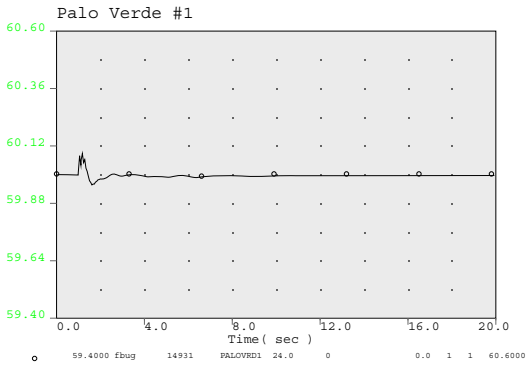


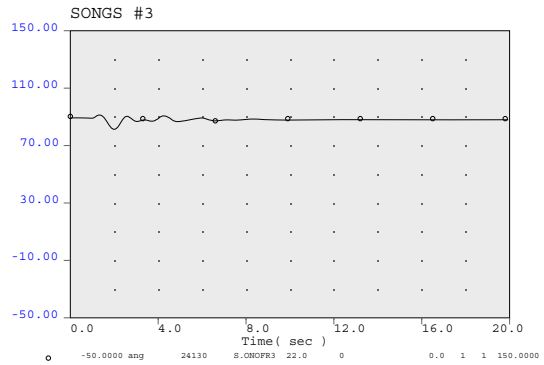


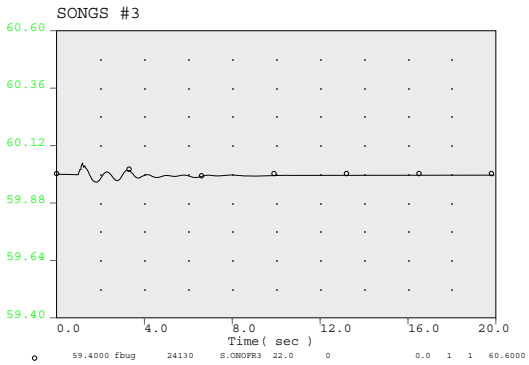
SDG&E Cluster 2 - pst int
2014 Light Autumn
Southbay - Mission 230 kV N-1

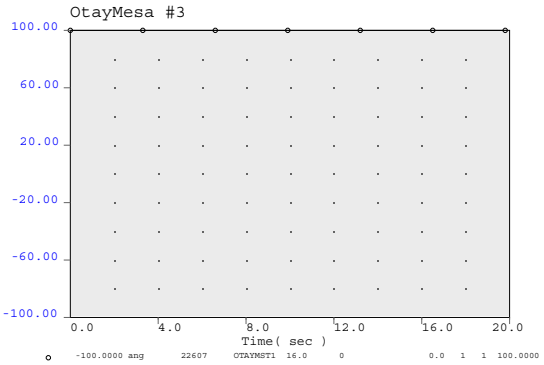
RELATIVE ROTOR ANGLE & FREQUENCY

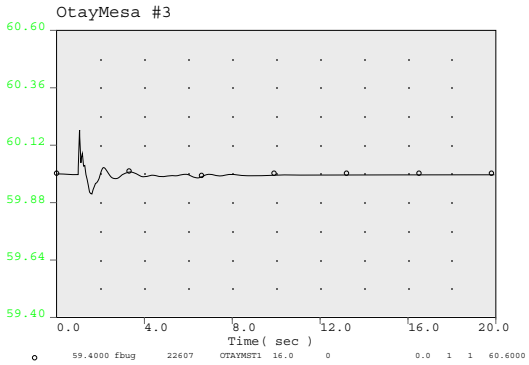












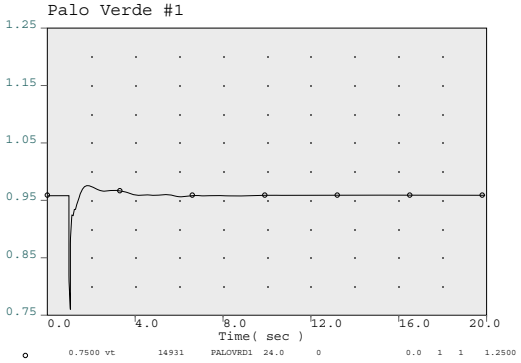
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Page 1

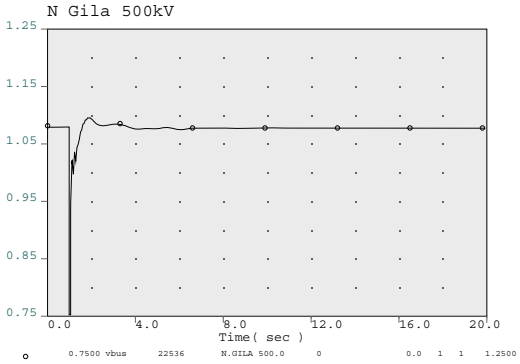
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RELATIVE VOLTAGE

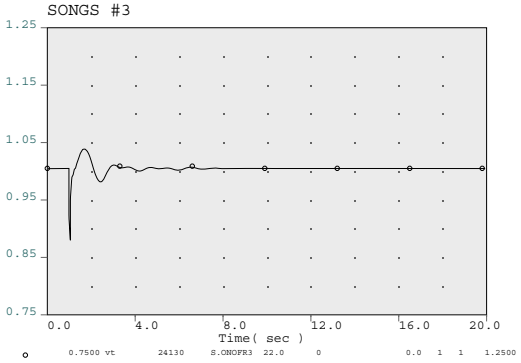
Palo Verde #1



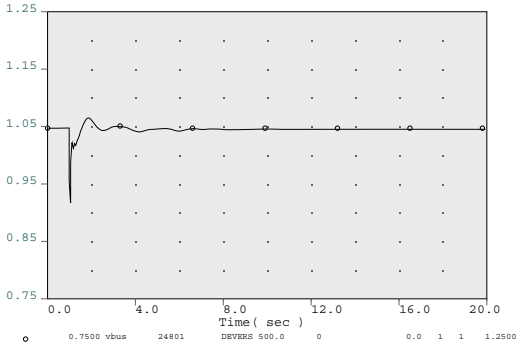
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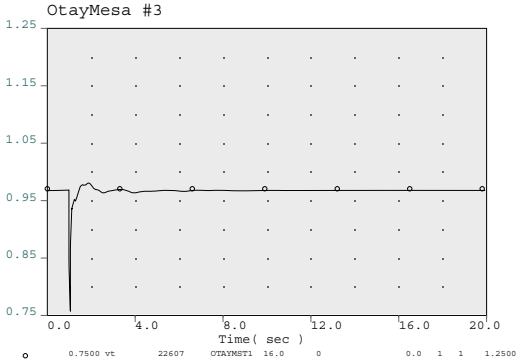
SONGS #3



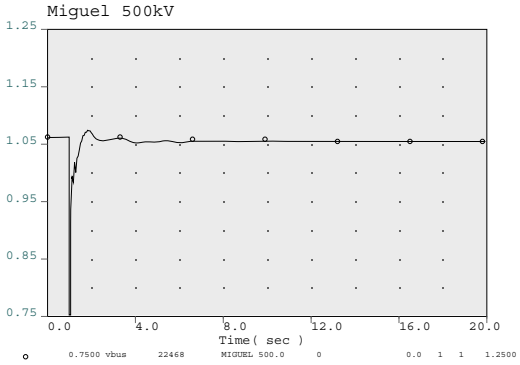
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OtayMesa #3



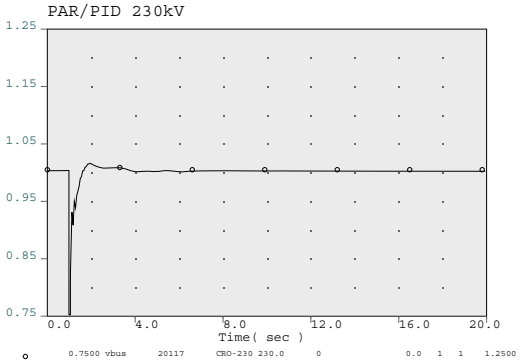
Miguel 500kV



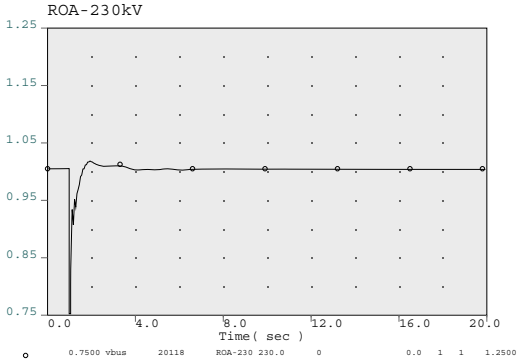
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

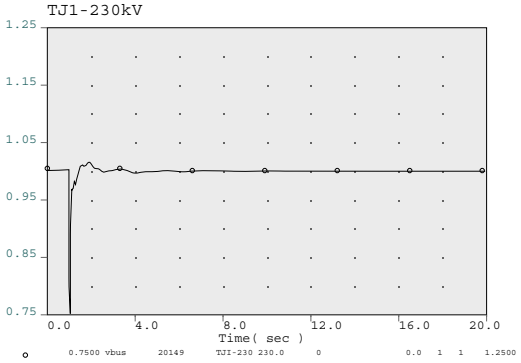
PAR/PID 230kV



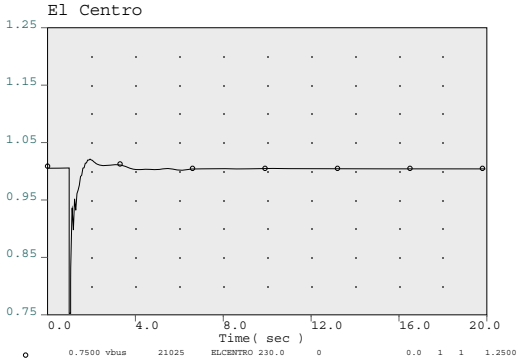
ROA-230kV



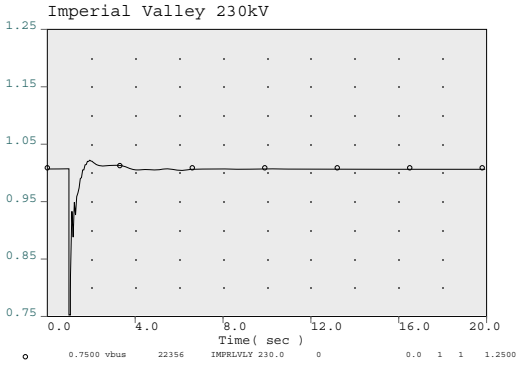
TJ1-230kV



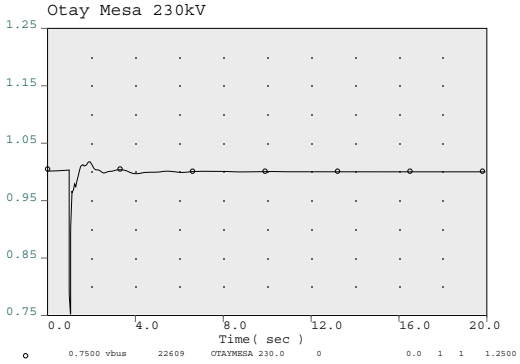
El Centro



Imperial Valley 230kV



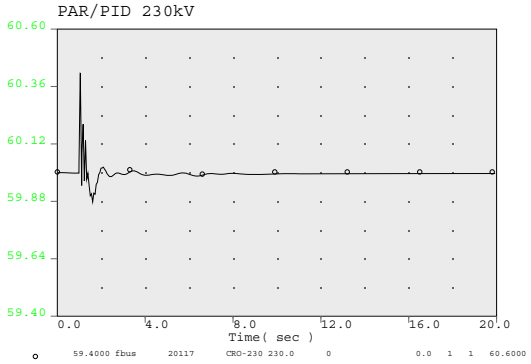
Otay Mesa 230kV



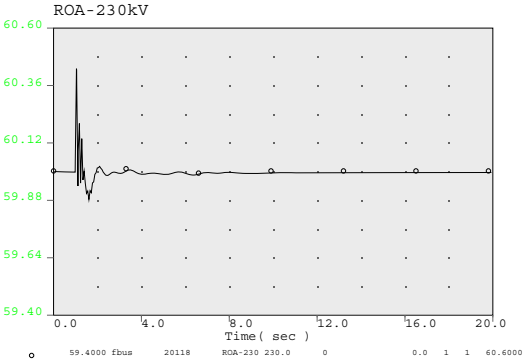
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

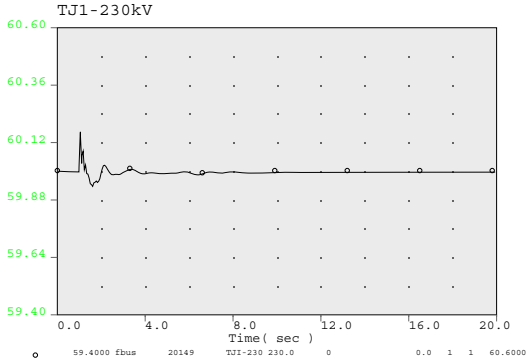
PAR/PID 230kV



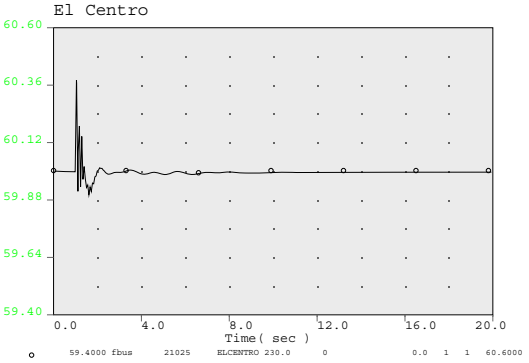
ROA-230kV



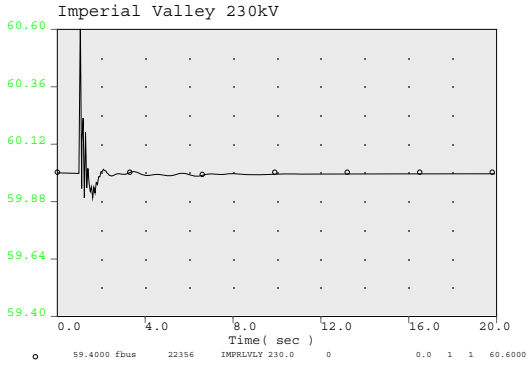
TJ1-230kV



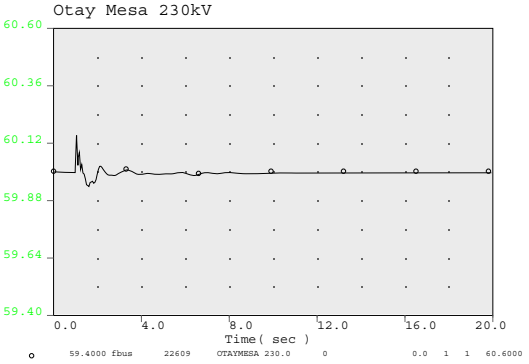
El Centro



Imperial Valley 230kV



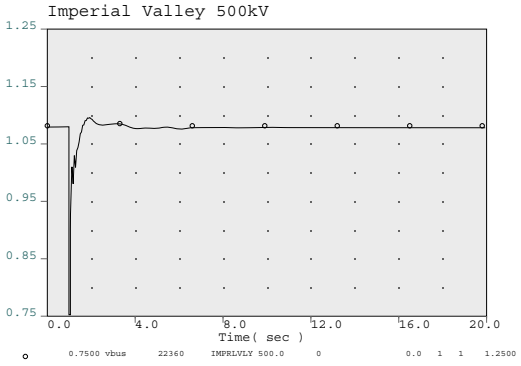
Otay Mesa 230kV



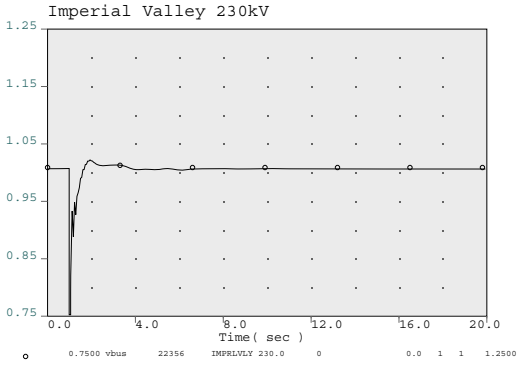
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Imperial Valley Area - VOLTAGE

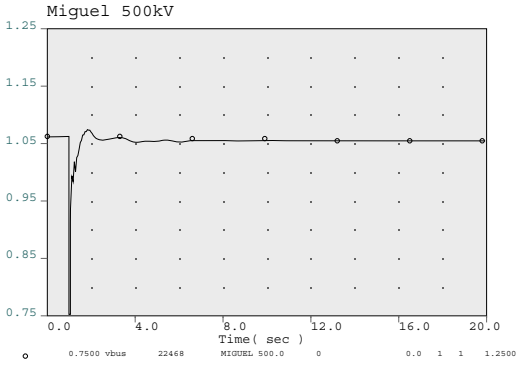
Imperial Valley 500kV



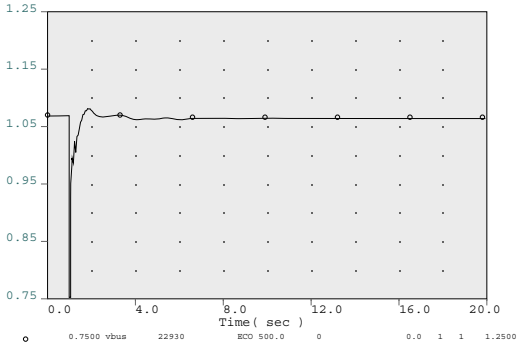
Imperial Valley 230kV



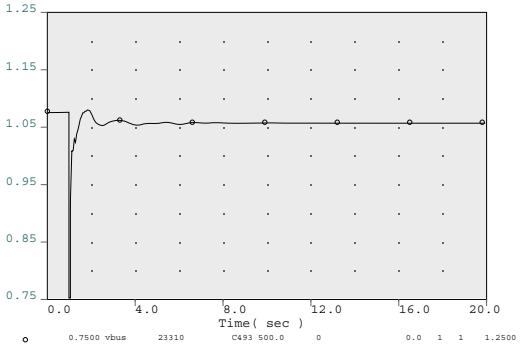
Miguel 500kV



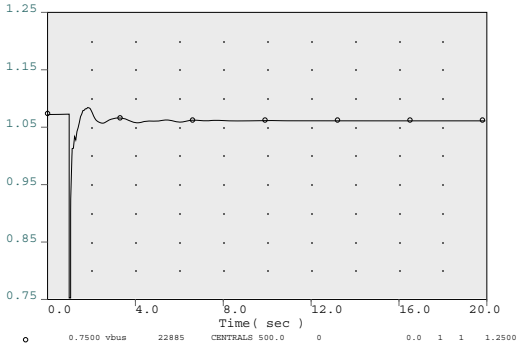
Windfarms 500



C493 500kV



CENTRALS 500kV



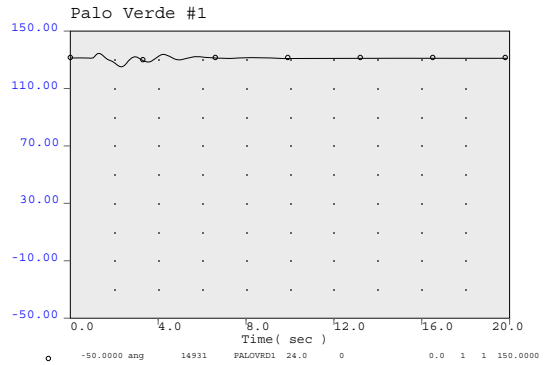
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

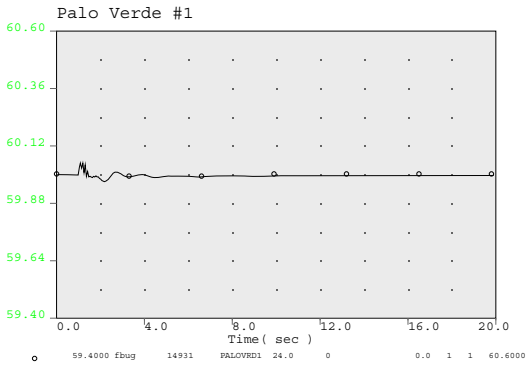
Imperial Valley Area - Frequency

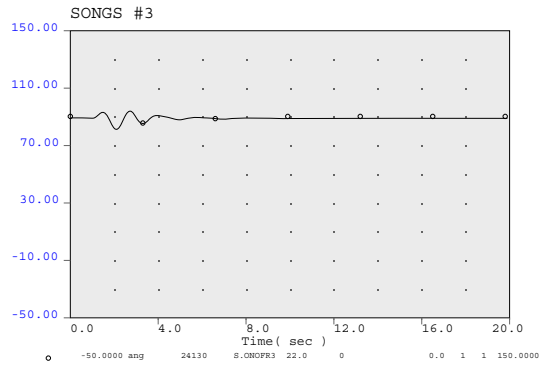


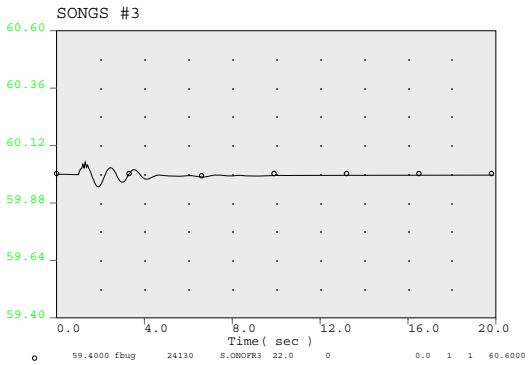
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

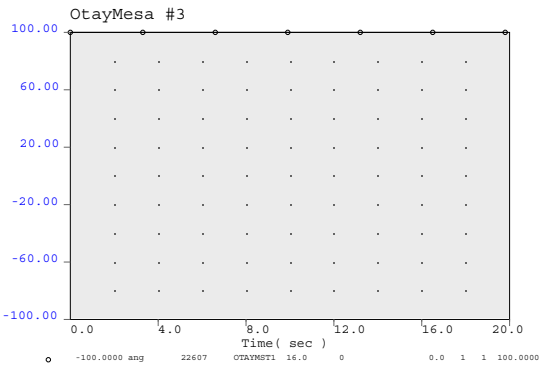
RELATIVE ROTOR ANGLE & FREQUENCY

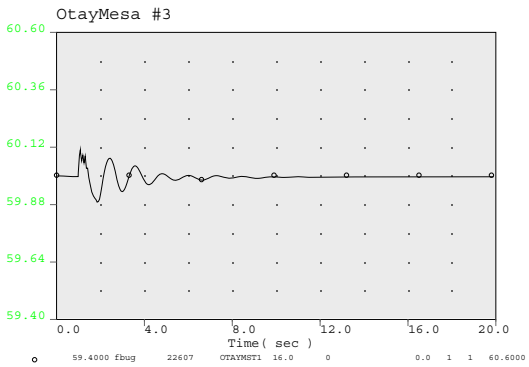












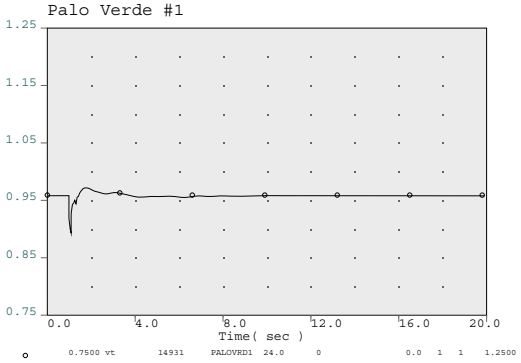
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Page 1

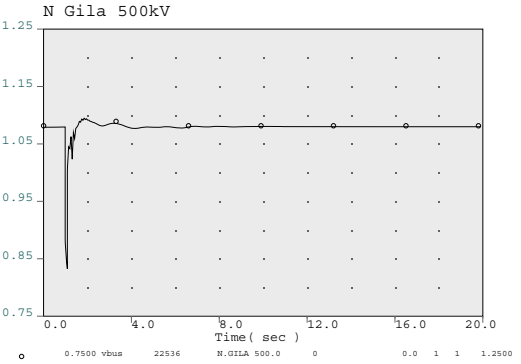
IV_ROA_6_slo_pst_int_ll.chf | p_i\ll\pst_int\ws_pst_int | Tue Nov 02 07:29:22 2010

RELATIVE VOLTAGE

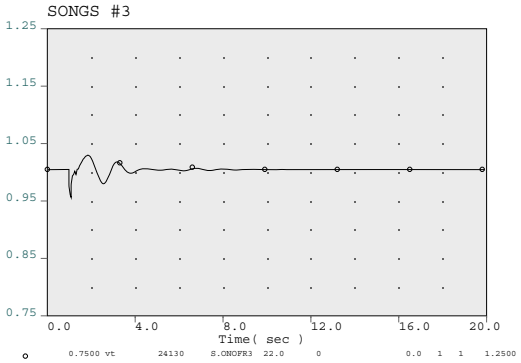
Palo Verde #1



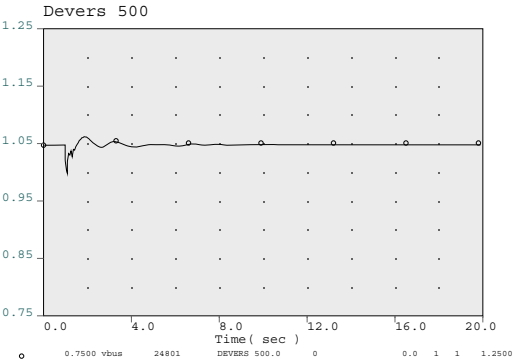
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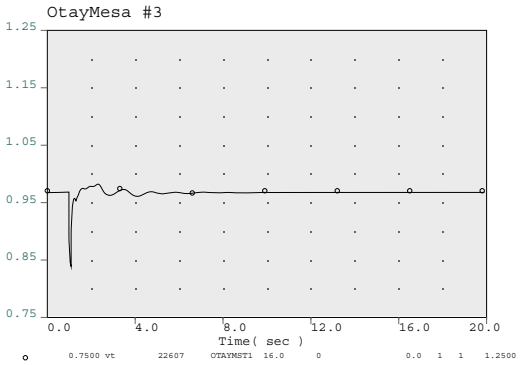
SONGS #3



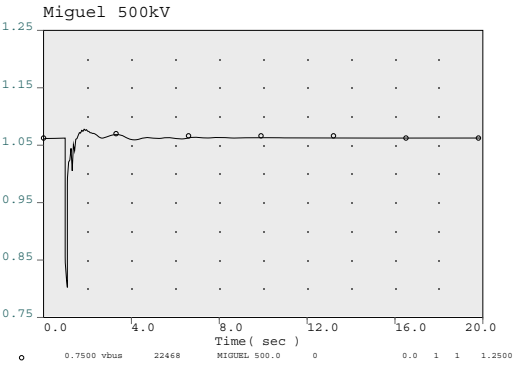
Devers 500



OtayMesa #3



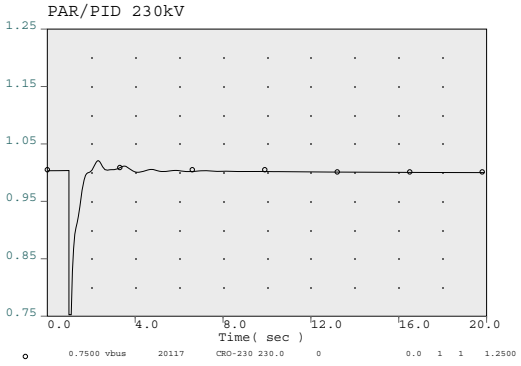
Miguel 500kV



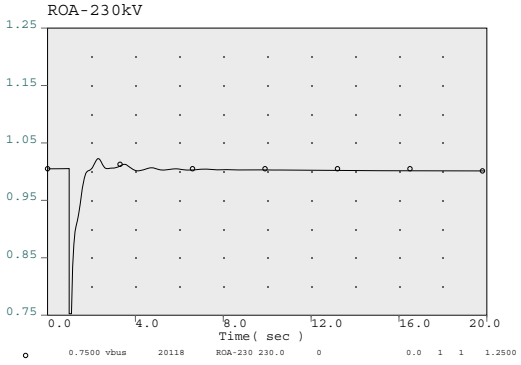
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

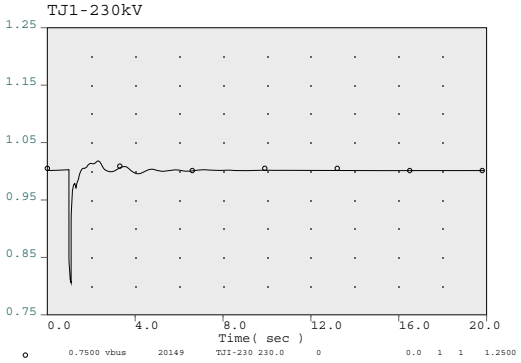
PAR/PID 230kV



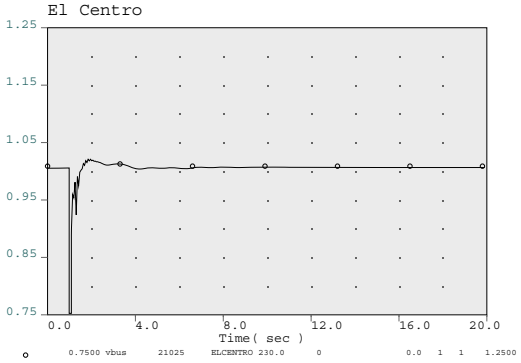
ROA-230kV



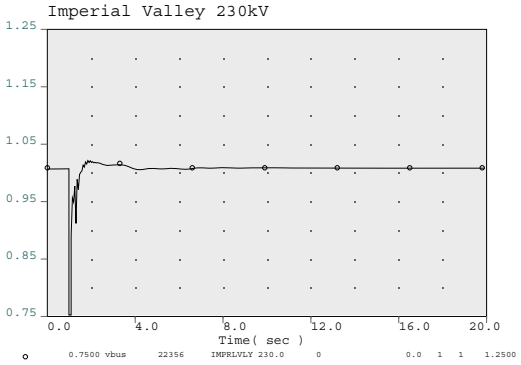
TJ1-230kV



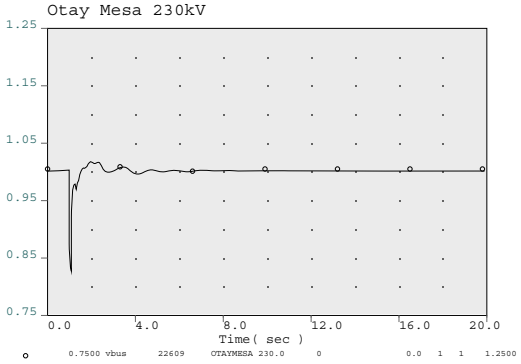
El Centro



Imperial Valley 230kV

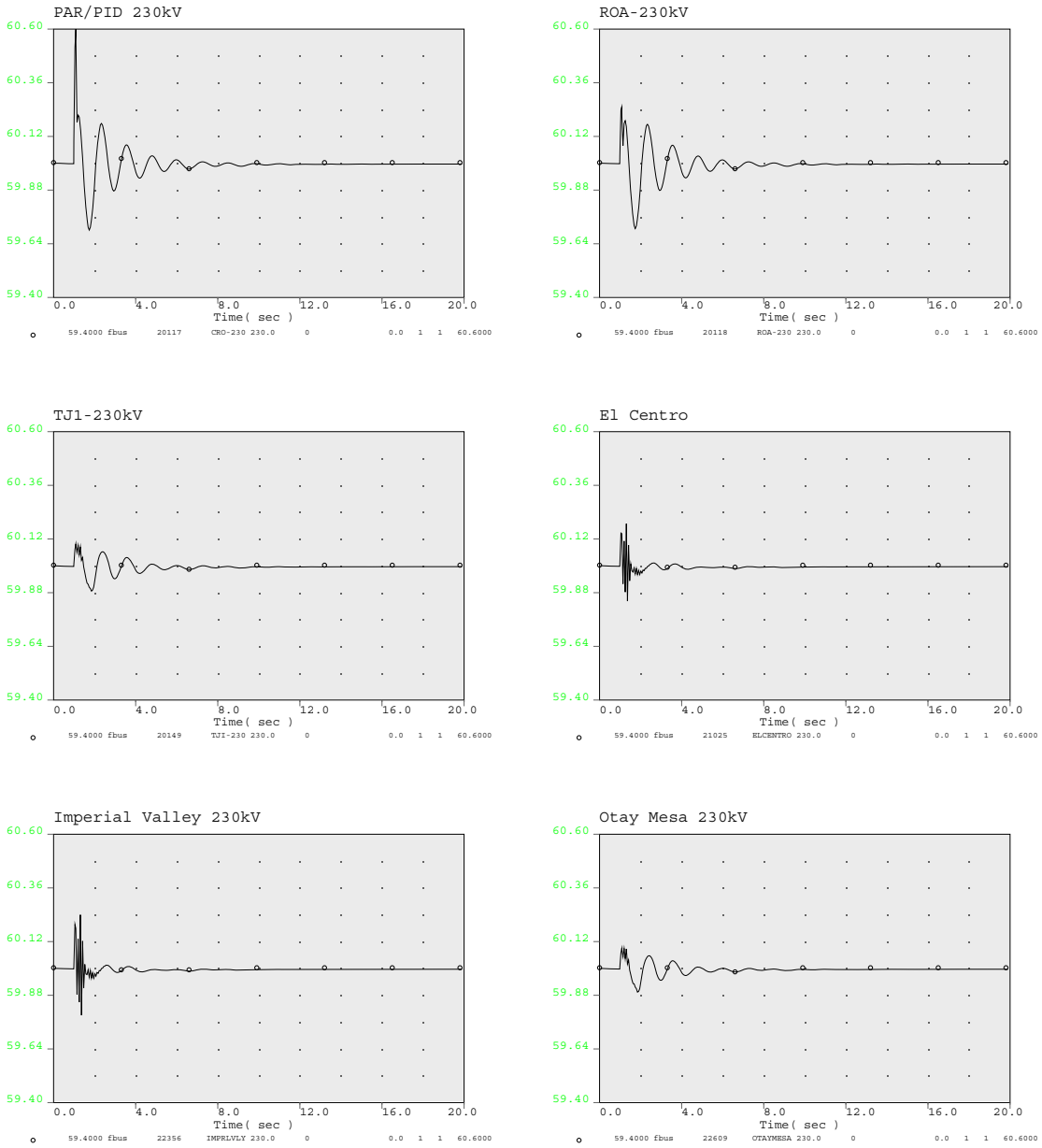


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

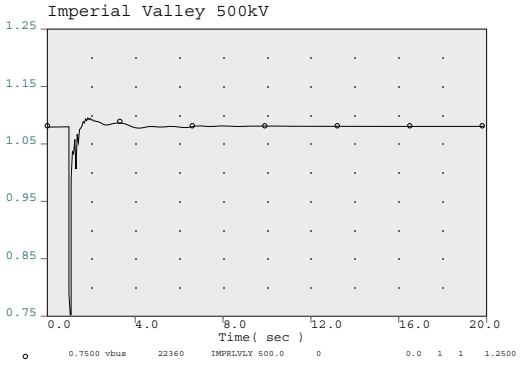
Affected System Frequency Check and Comparison



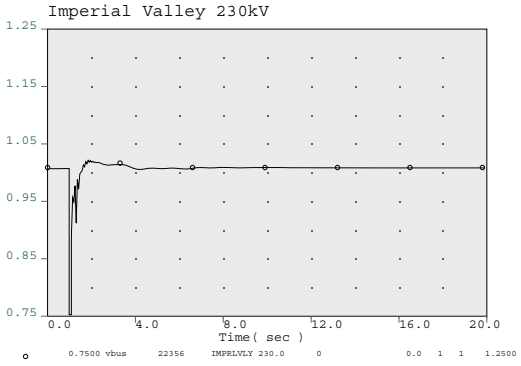
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

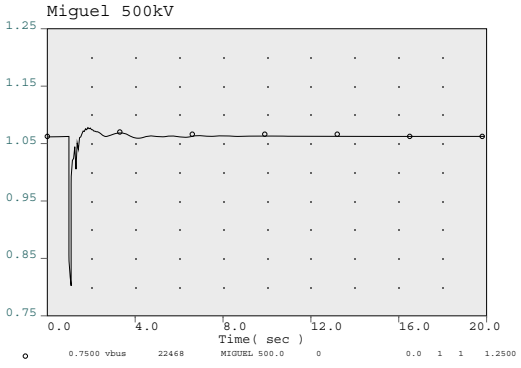
Imperial Valley 500kV



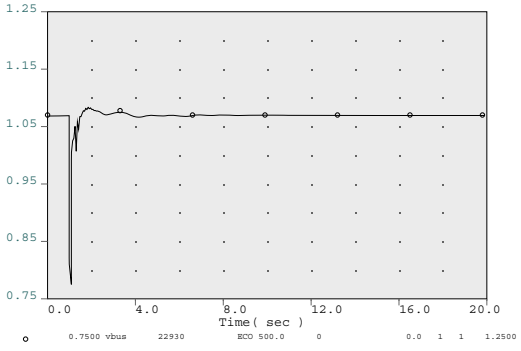
Imperial Valley 230kV



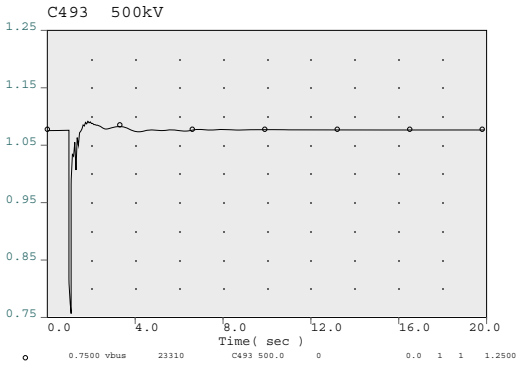
Miguel 500kV



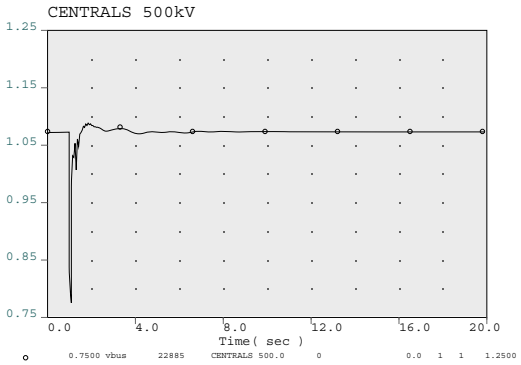
Windfarms 500



C493 500kV

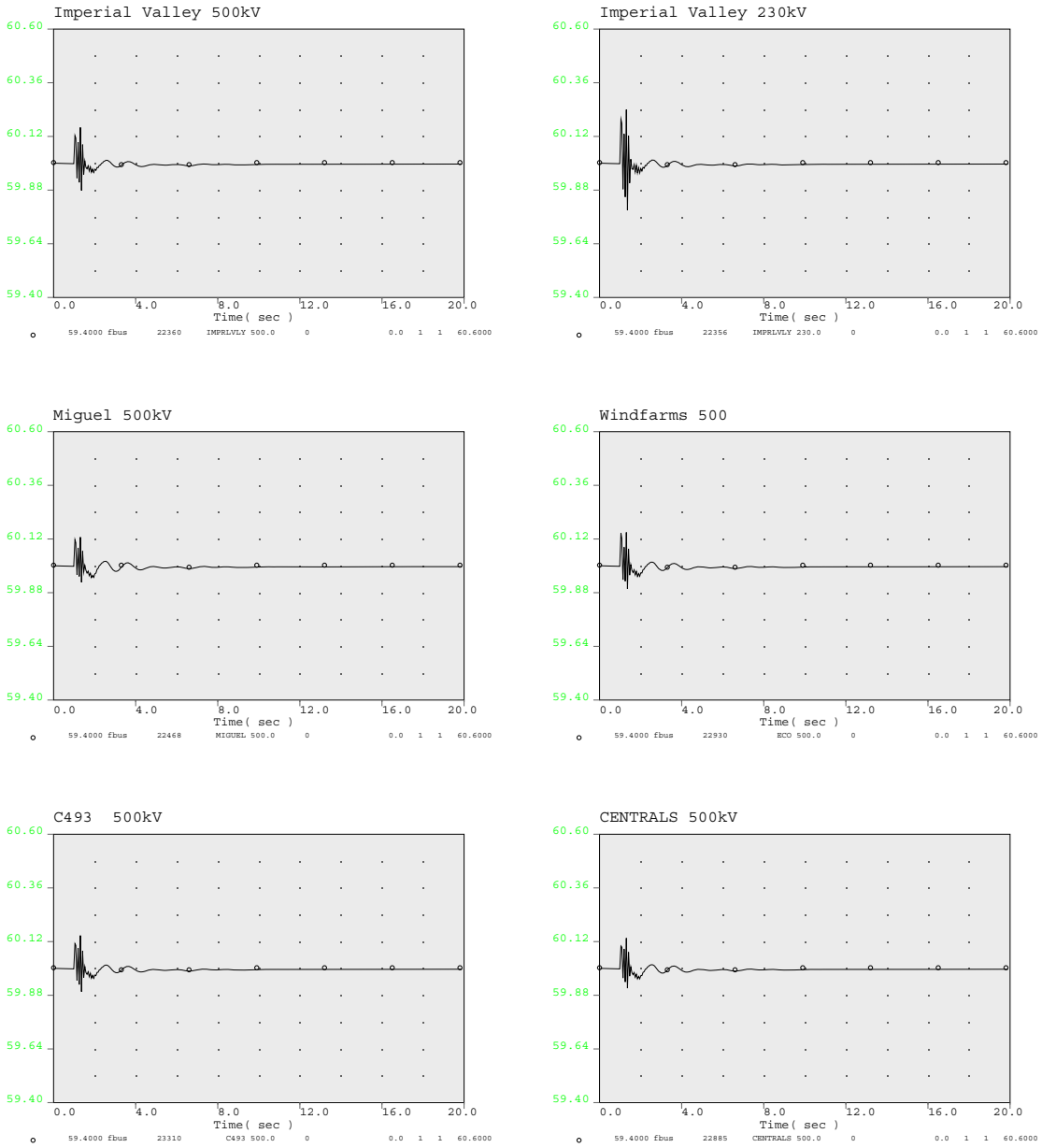


CENTRALS 500kV



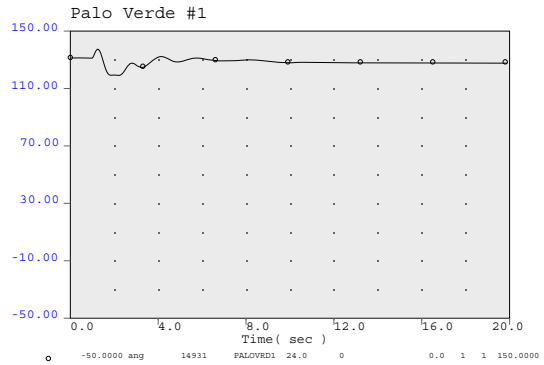
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

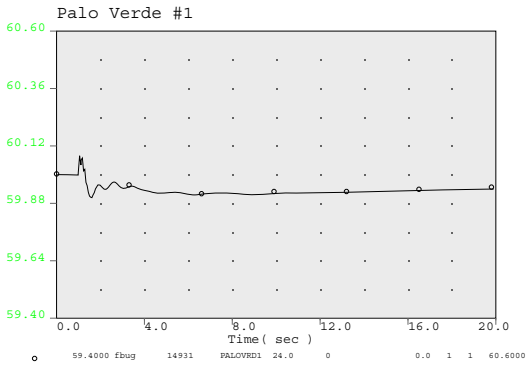
Imperial Valley Area - Frequency

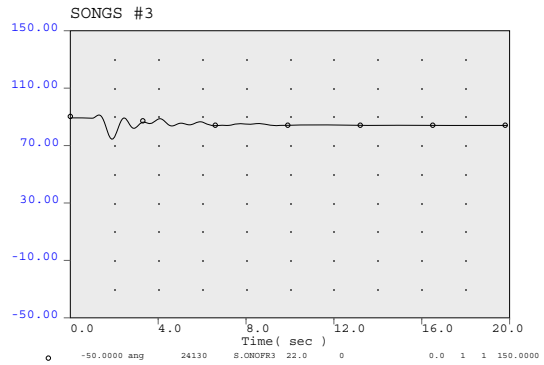


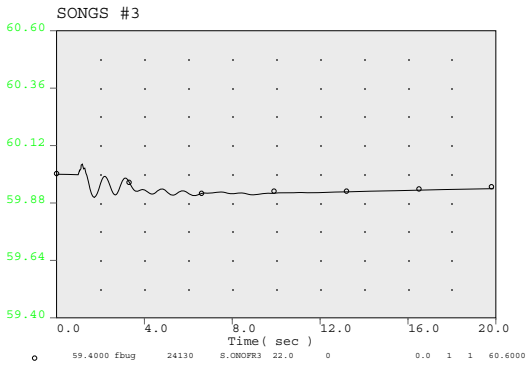
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

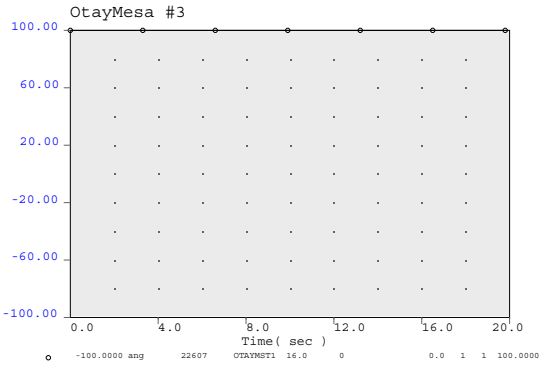
RELATIVE ROTOR ANGLE & FREQUENCY

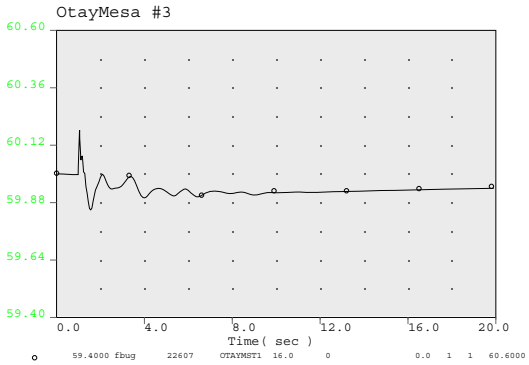












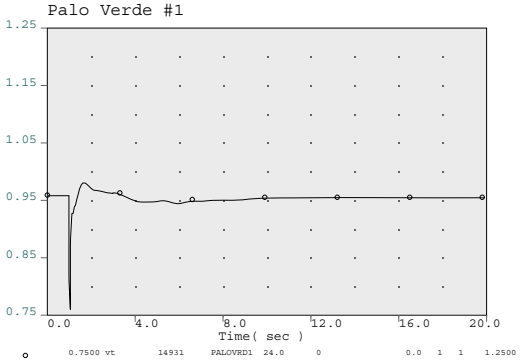
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

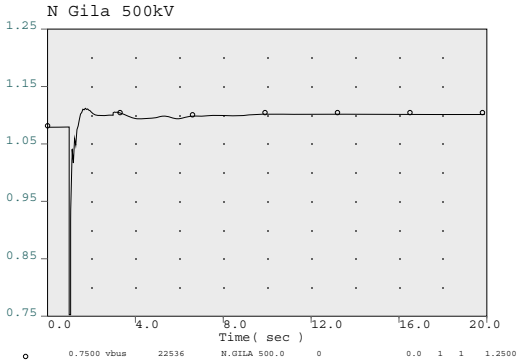
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RELATIVE VOLTAGE

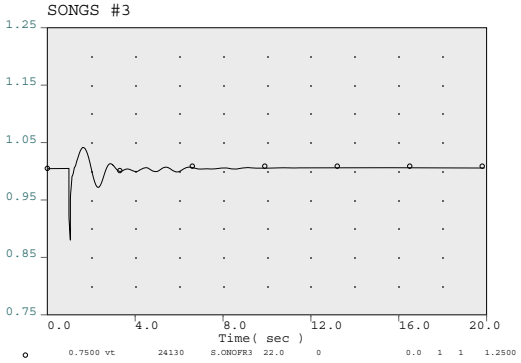
Palo Verde #1



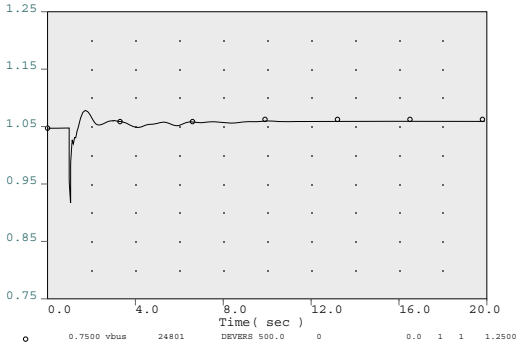
N Gila 500kV



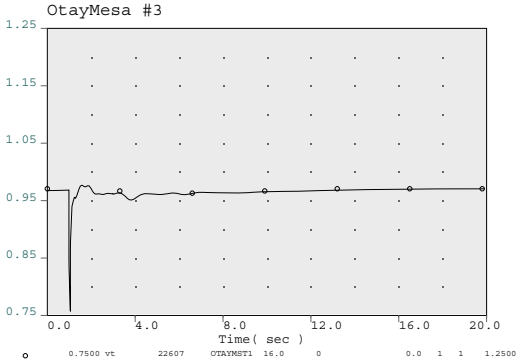
SONGS #3



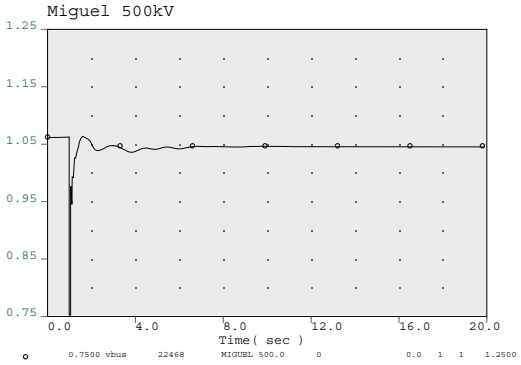
Devers 500



OtayMesa #3



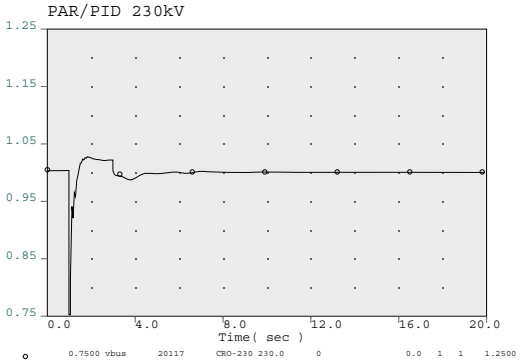
Miguel 500kV



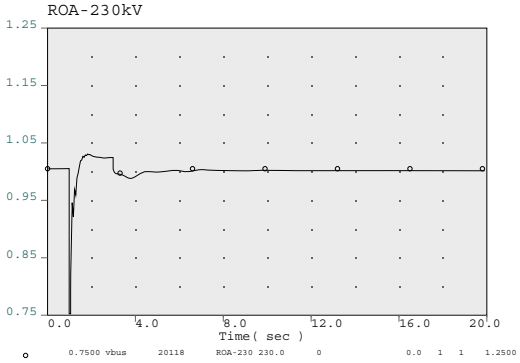
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

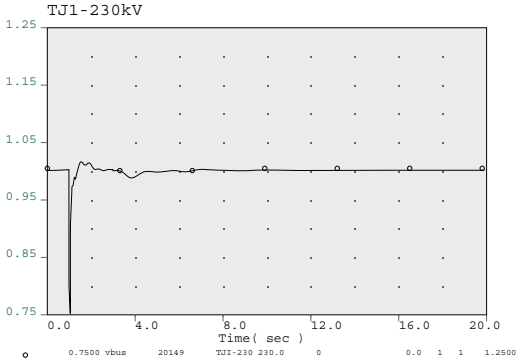
PAR/PID 230kV



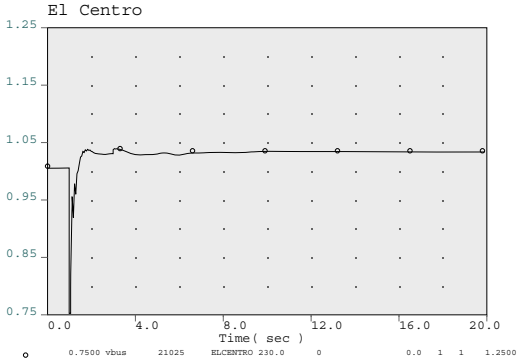
ROA-230kV



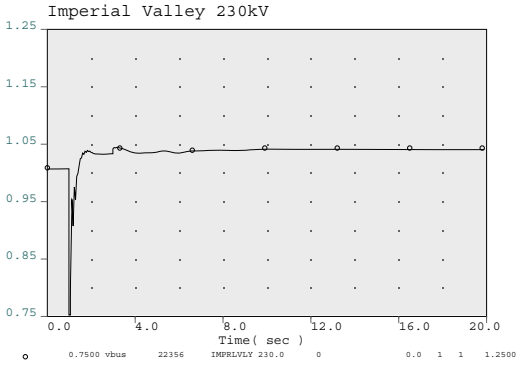
TJ1-230kV



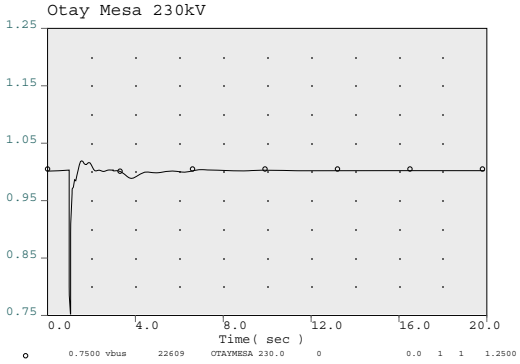
El Centro



Imperial Valley 230kV



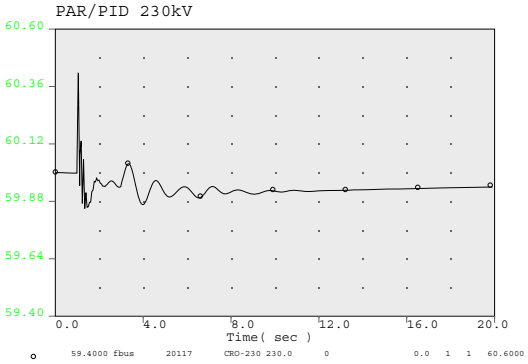
Otay Mesa 230kV



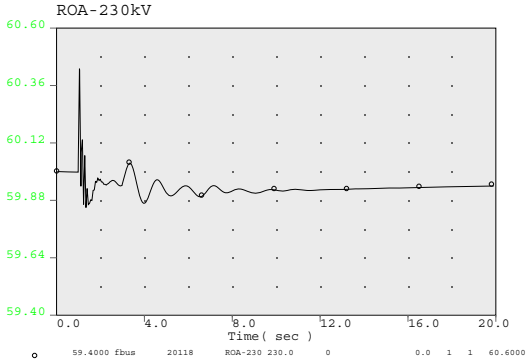
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

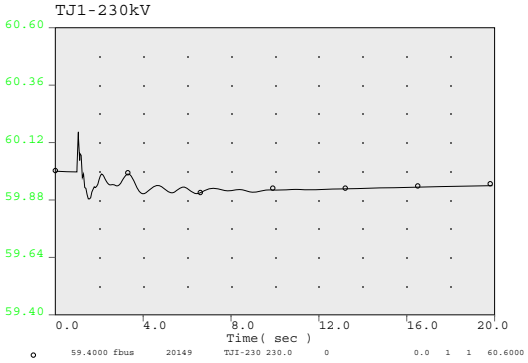
PAR/PID 230kV



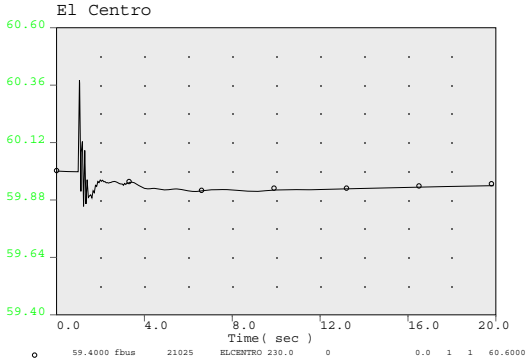
ROA-230kV



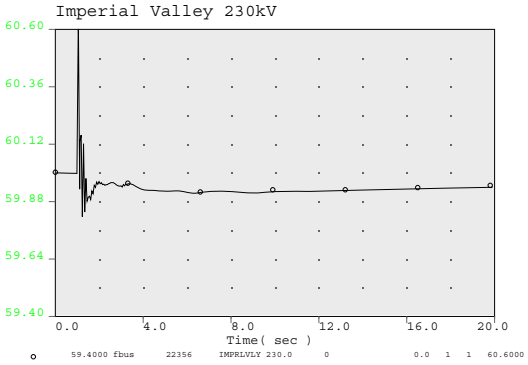
TJ1-230kV



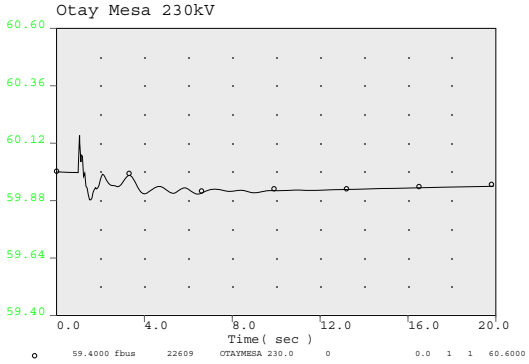
El Centro



Imperial Valley 230kV



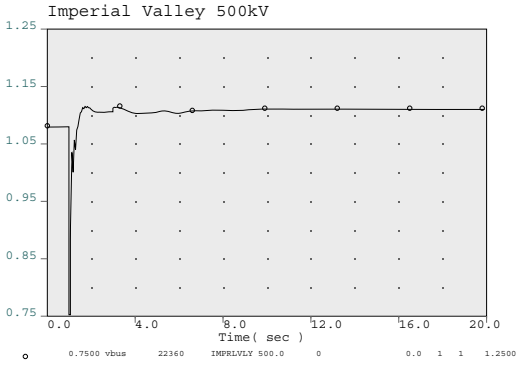
Otay Mesa 230kV



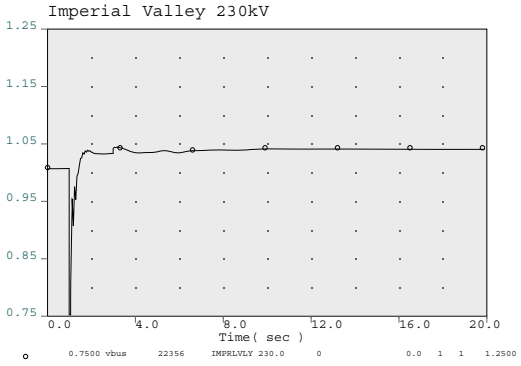
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

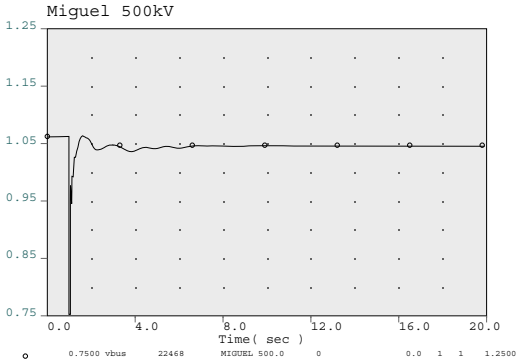
Imperial Valley 500kV



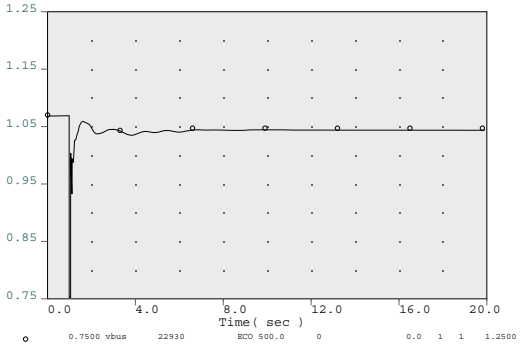
Imperial Valley 230kV



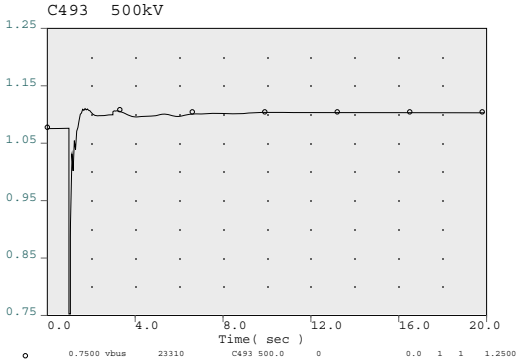
Miguel 500kV



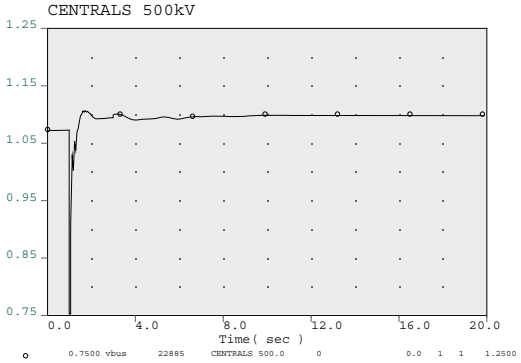
Windfarms 500



C493 500kV

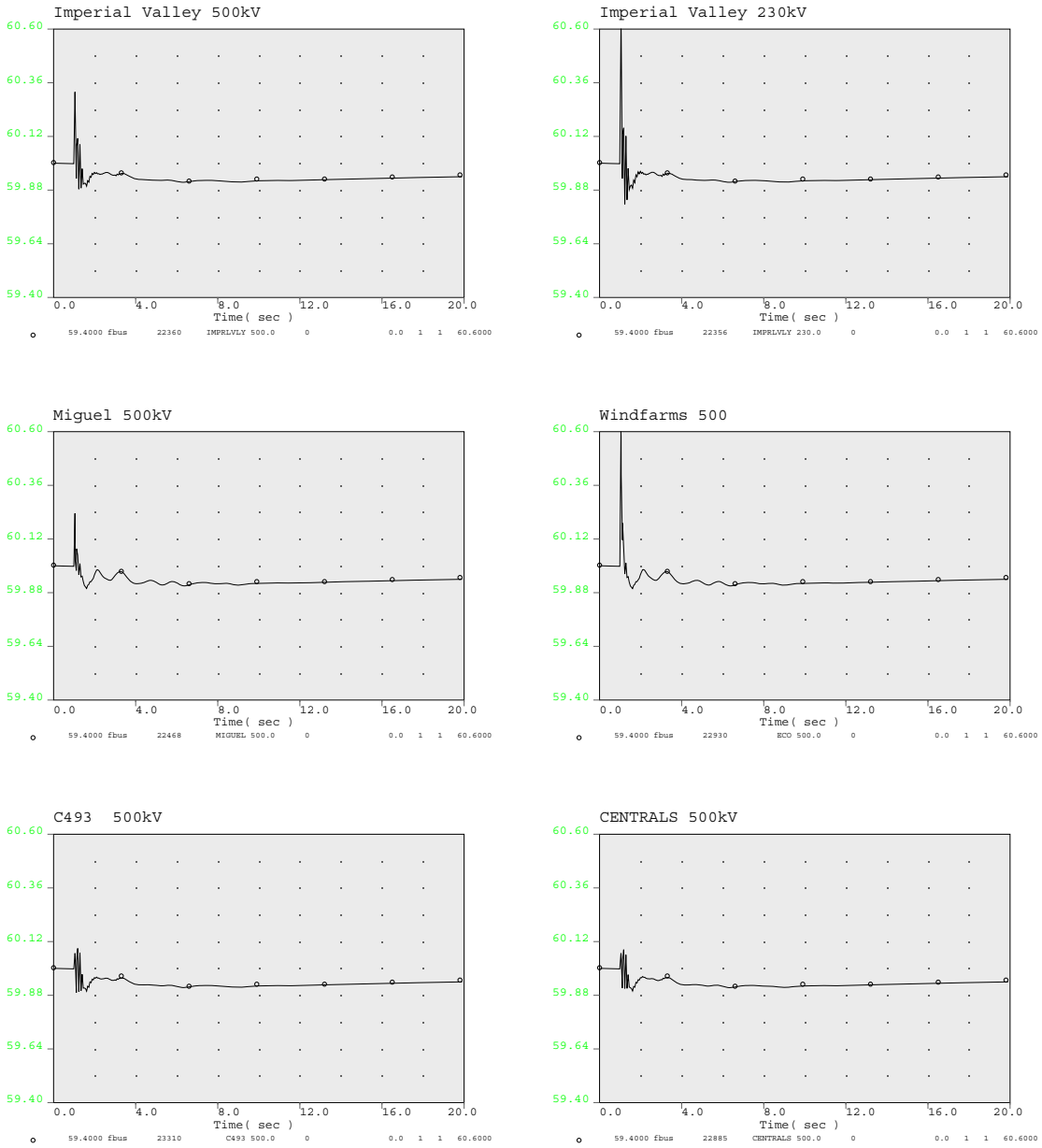


CENTRALS 500kV



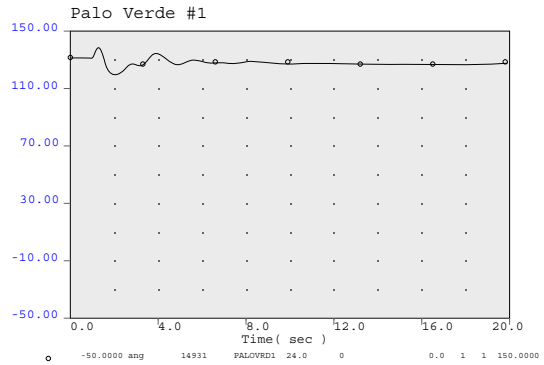
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

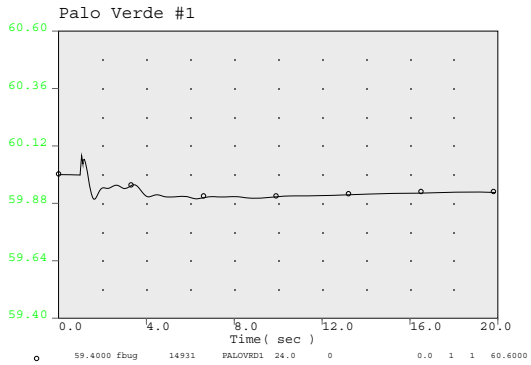
Imperial Valley Area - Frequency

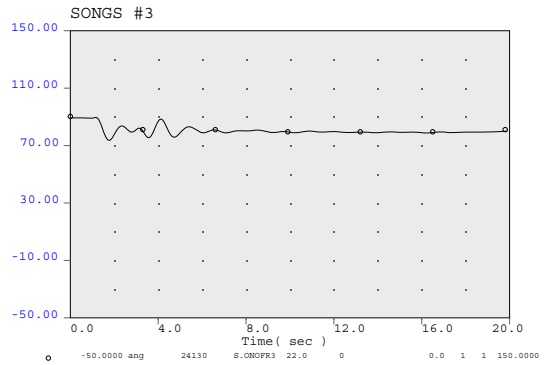


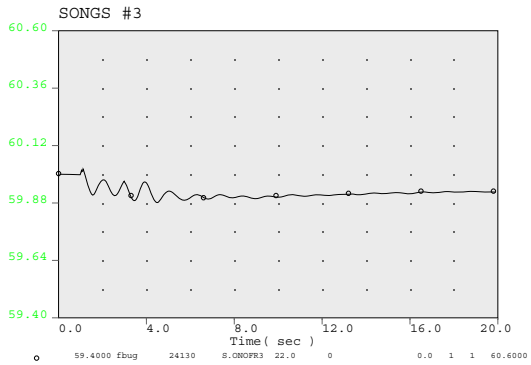
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

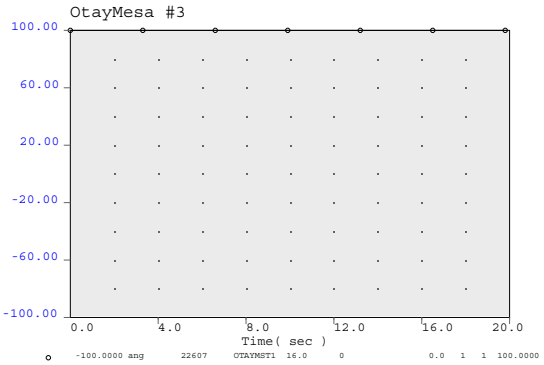
RELATIVE ROTOR ANGLE & FREQUENCY

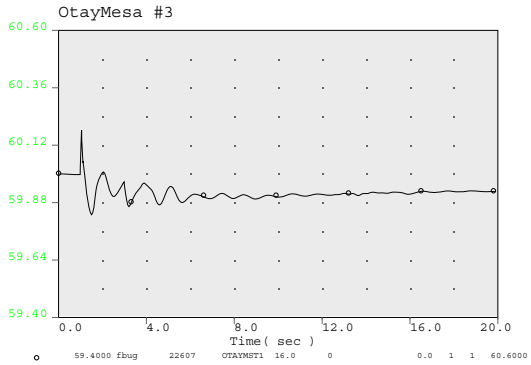












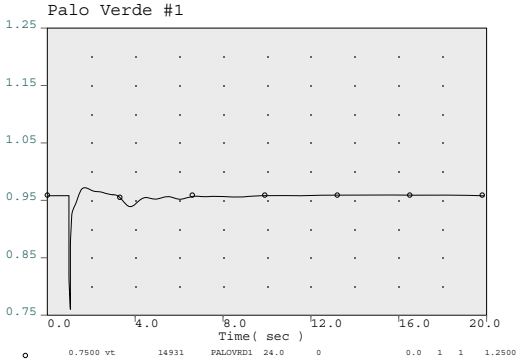
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Page 1

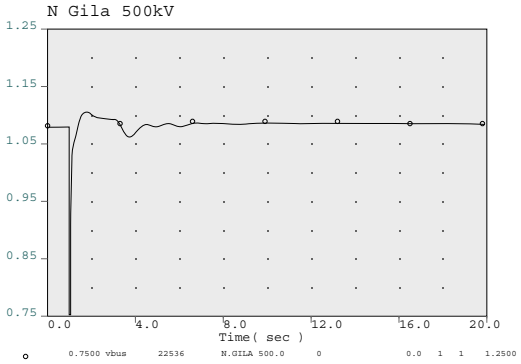
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RELATIVE VOLTAGE

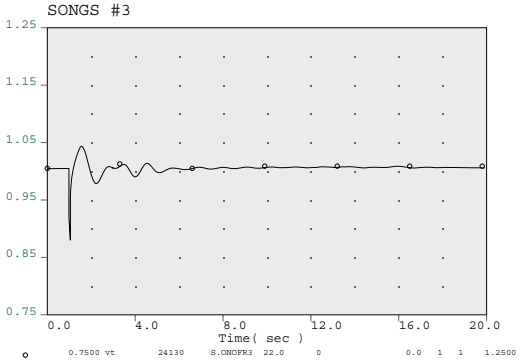
Palo Verde #1



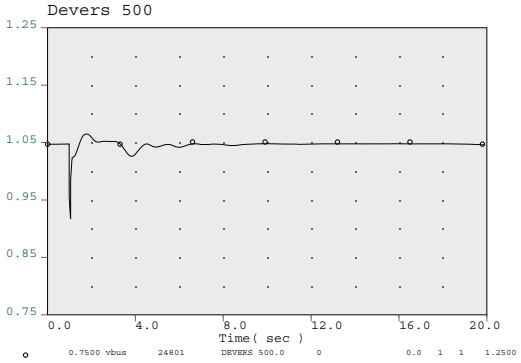
N Gila 500kV



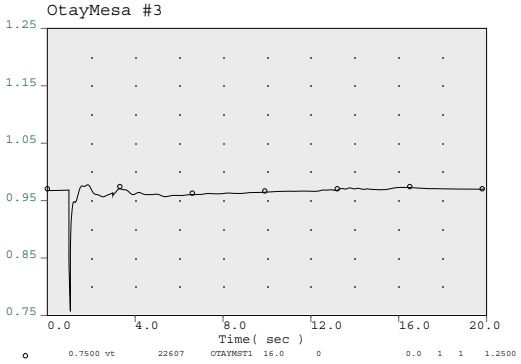
SONGS #3



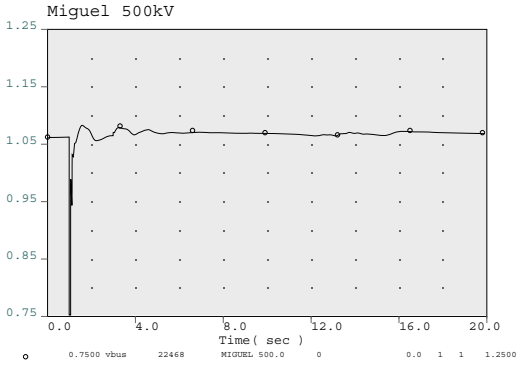
Devers 500



OtayMesa #3



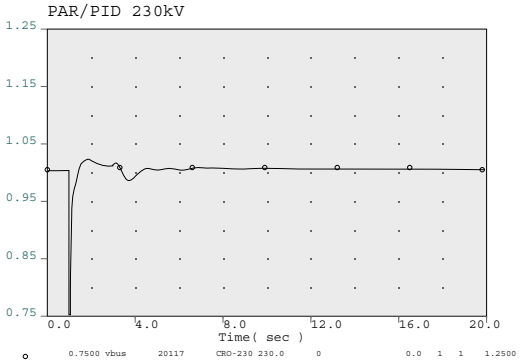
Miguel 500kV



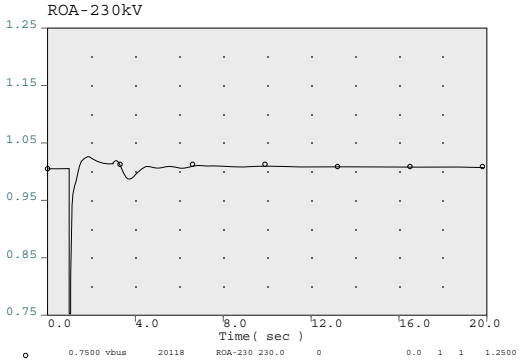
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Voltage Check and Comparison

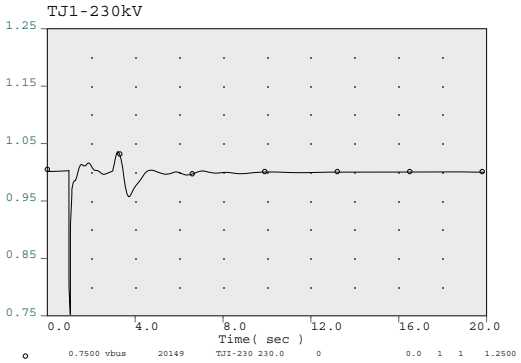
PAR/PID 230kV



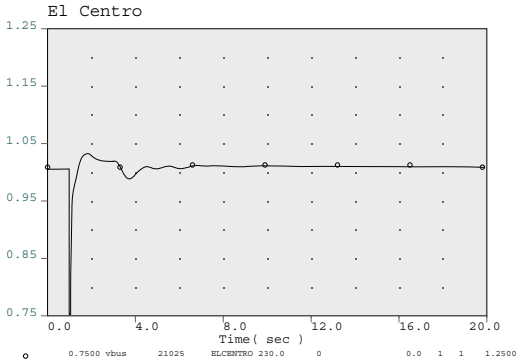
ROA-230kV



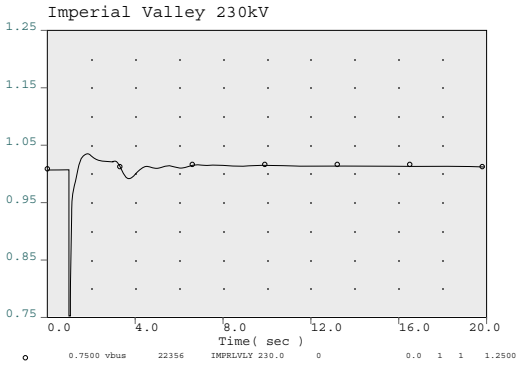
TJ1-230kV



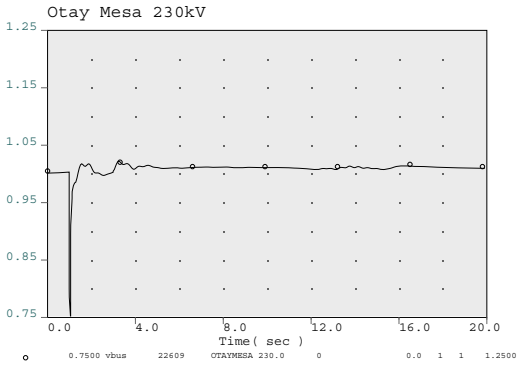
El Centro



Imperial Valley 230kV



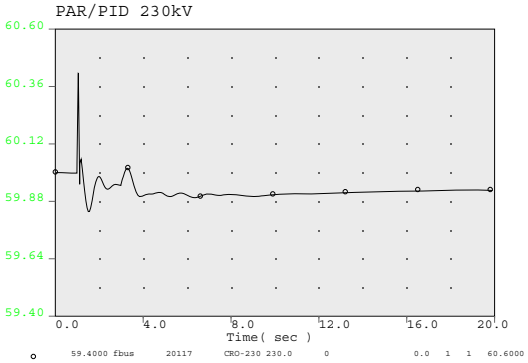
Otay Mesa 230kV



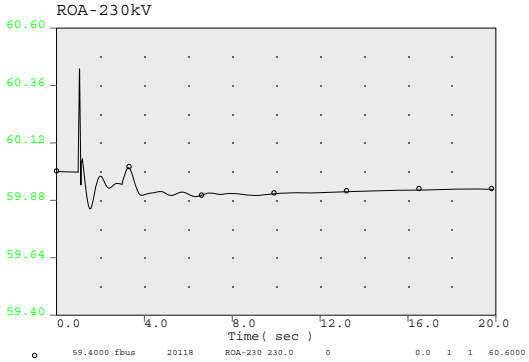
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Frequency Check and Comparison

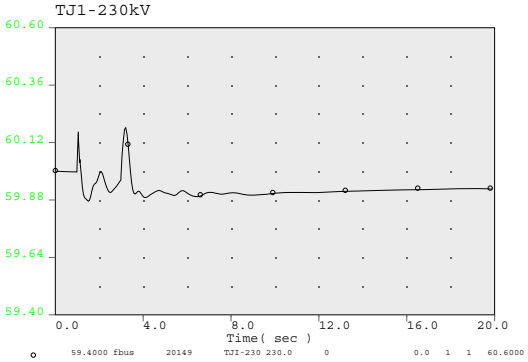
PAR/PID 230kV



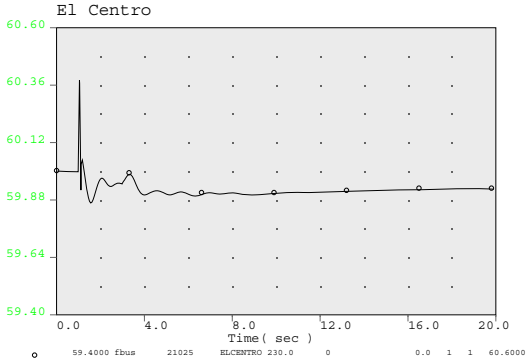
ROA-230kV



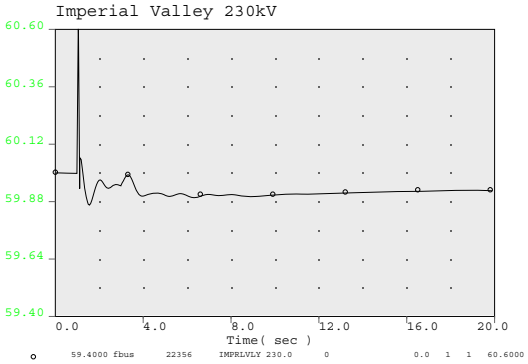
TJ1-230kV



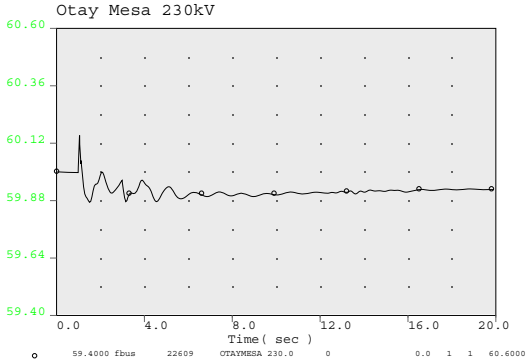
El Centro



Imperial Valley 230kV



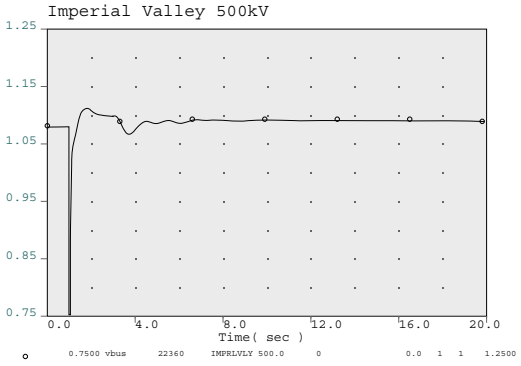
Otay Mesa 230kV



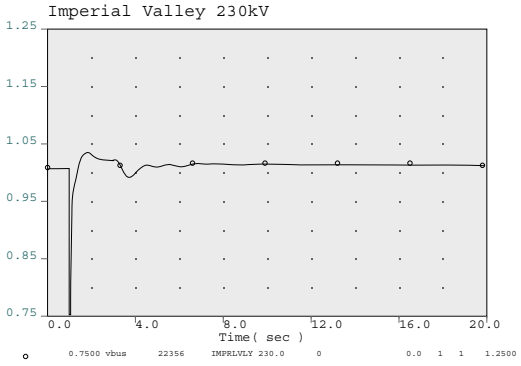
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Imperial Valley Area - VOLTAGE

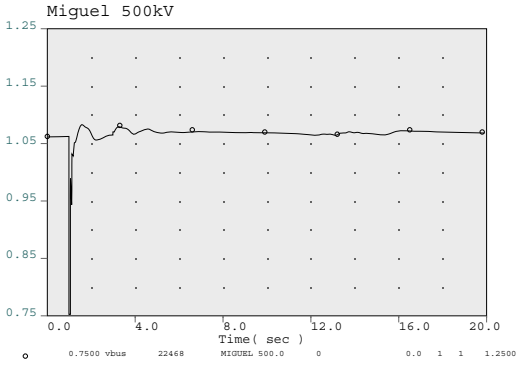
Imperial Valley 500kV



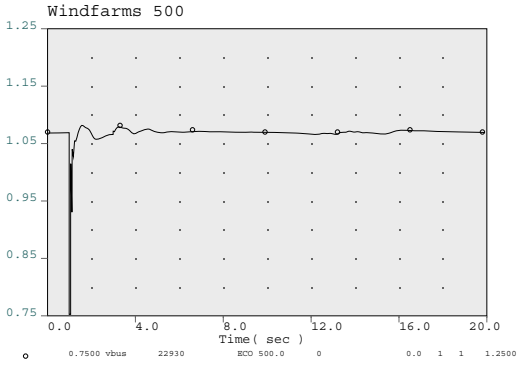
Imperial Valley 230kV



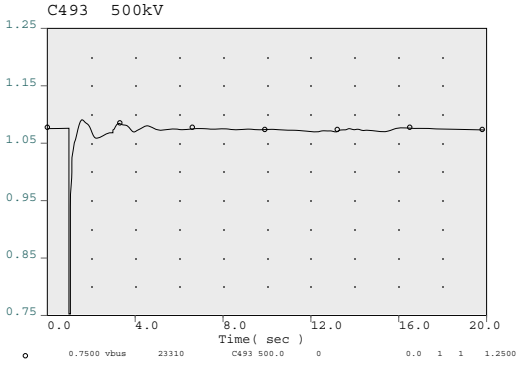
Miguel 500kV



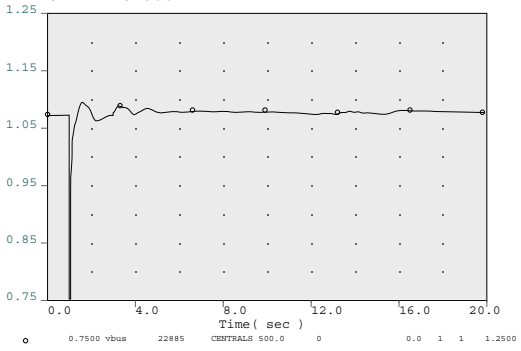
Windfarms 500



C493 500kV

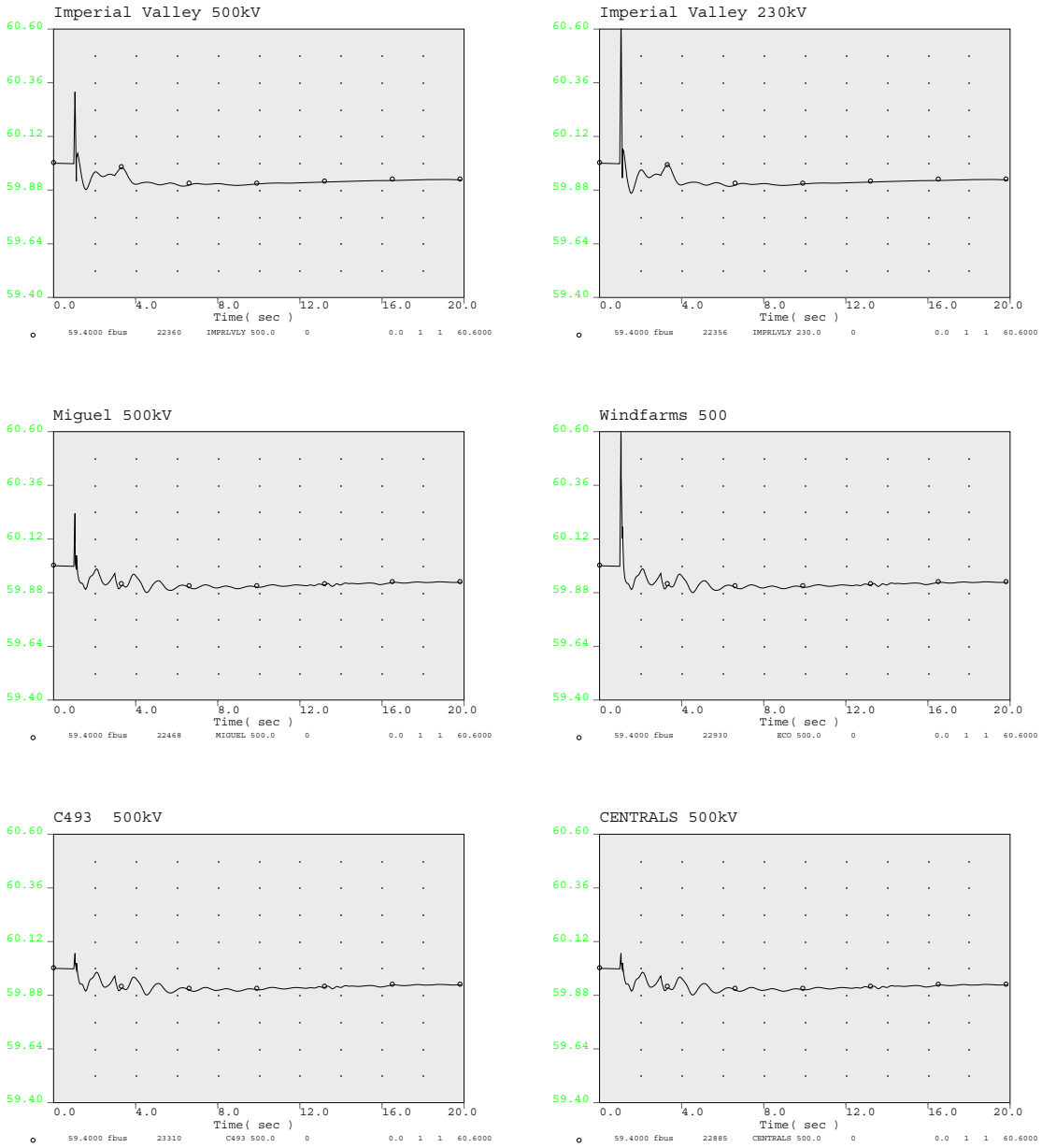


CENTRALS 500kV



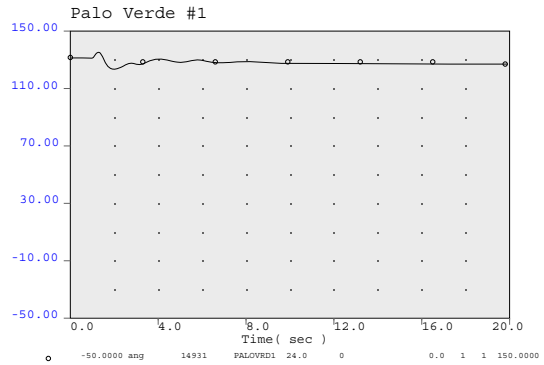
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

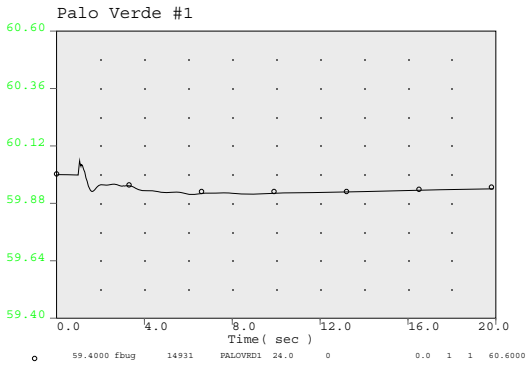
Imperial Valley Area - Frequency

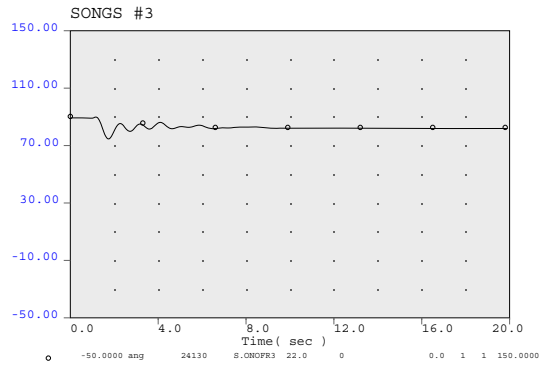


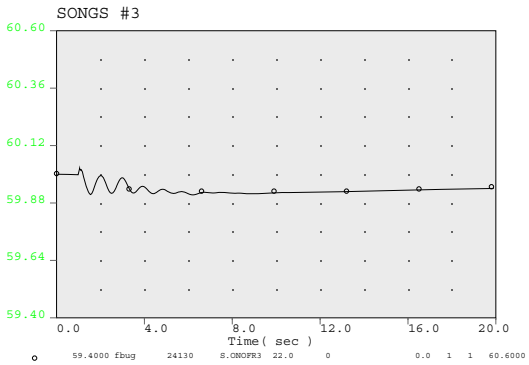
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

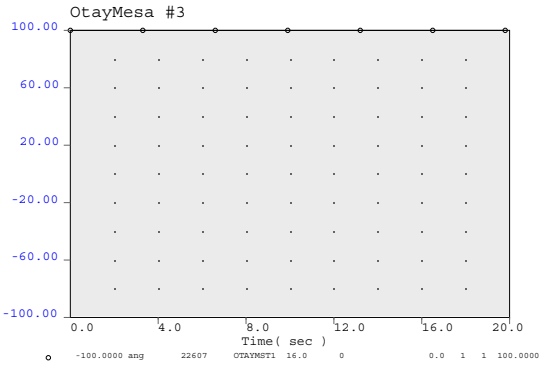
RELATIVE ROTOR ANGLE & FREQUENCY

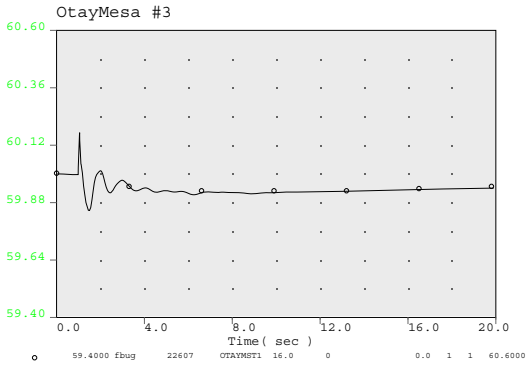












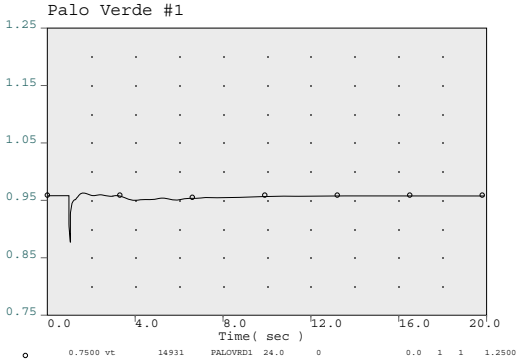
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Page 1

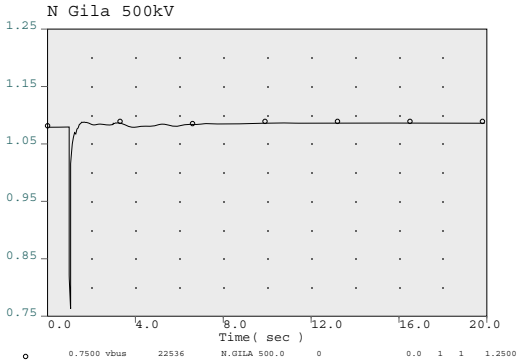
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RELATIVE VOLTAGE

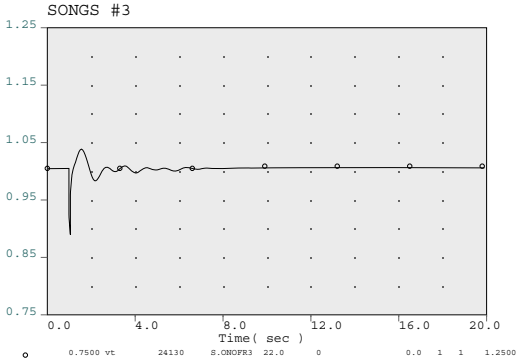
Palo Verde #1



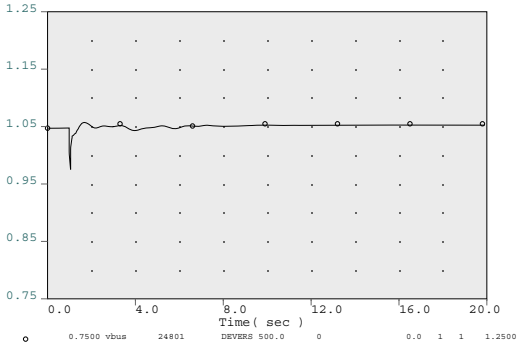
N Gila 500kV



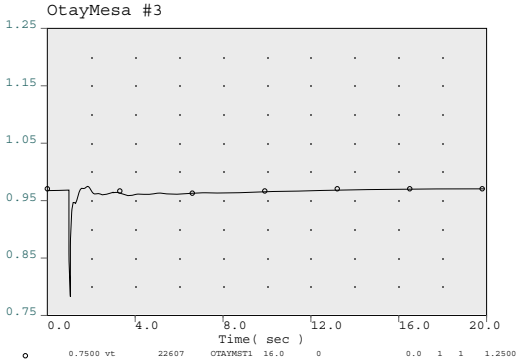
SONGS #3



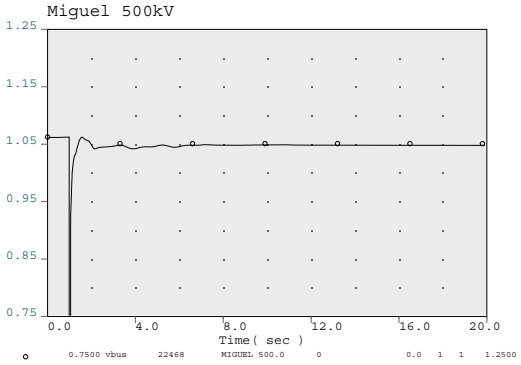
Devers 500



OtayMesa #3



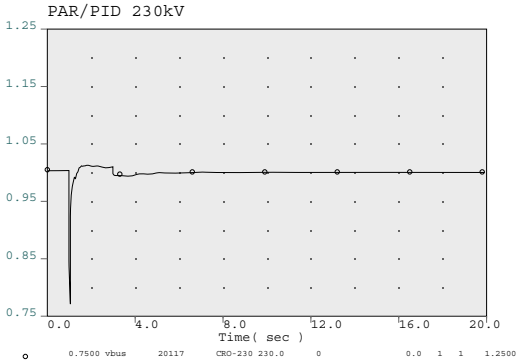
Miguel 500kV



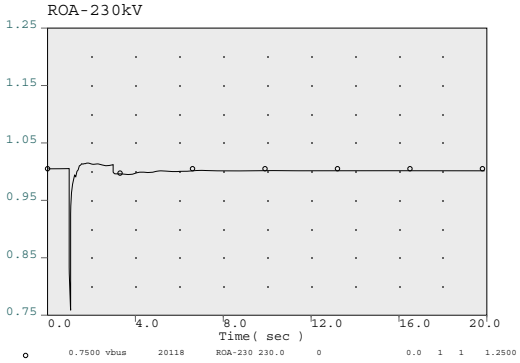
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

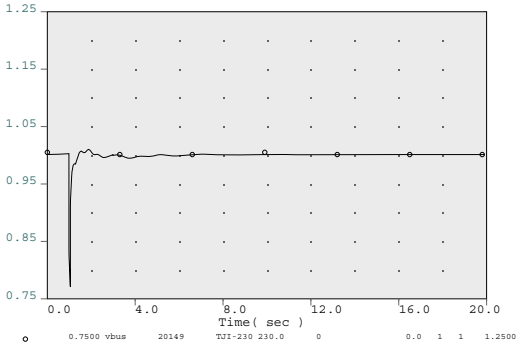
PAR/PID 230kV



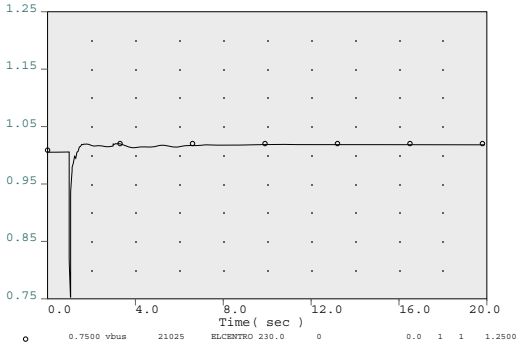
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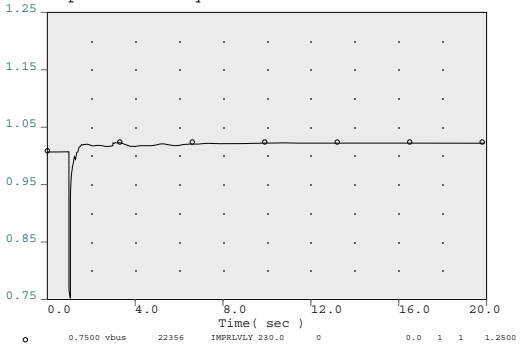
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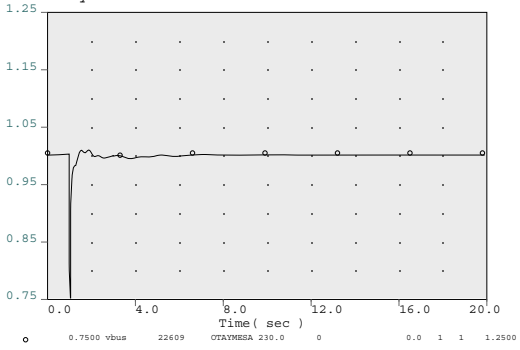
El Centro



Imperial Valley 230kV



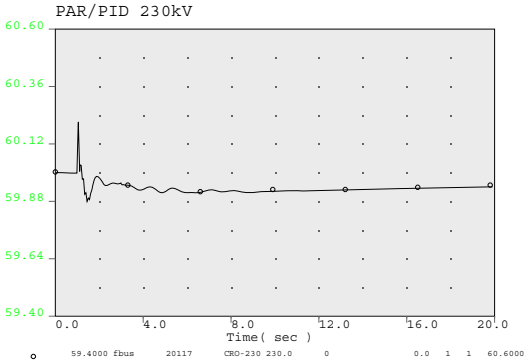
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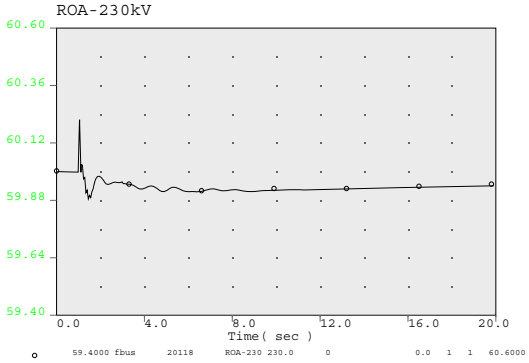
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

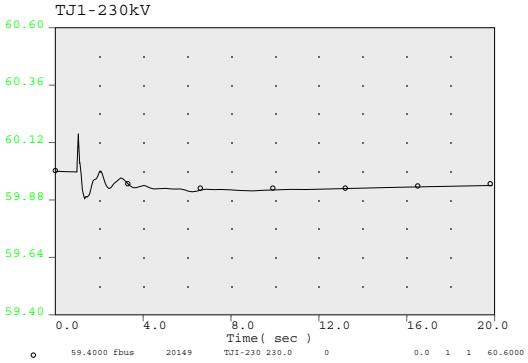
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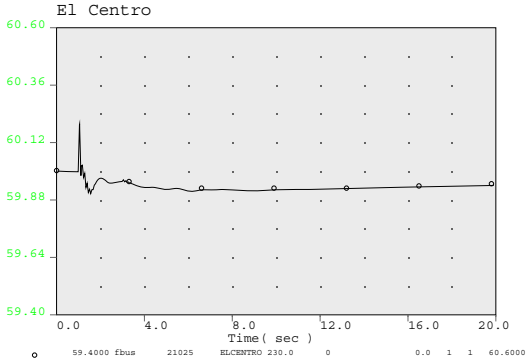
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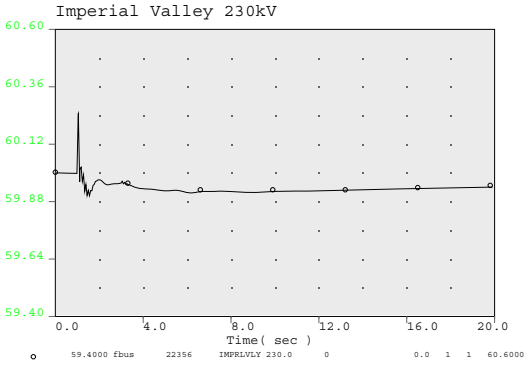
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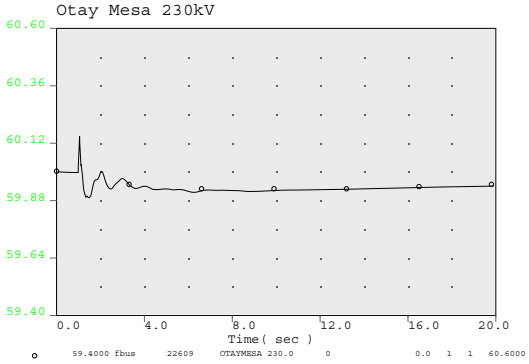
El Centro



Imperial Valley 230kV



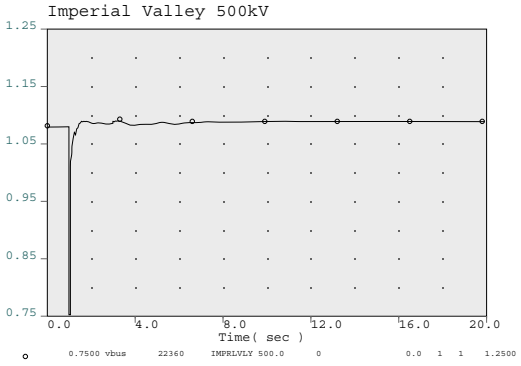
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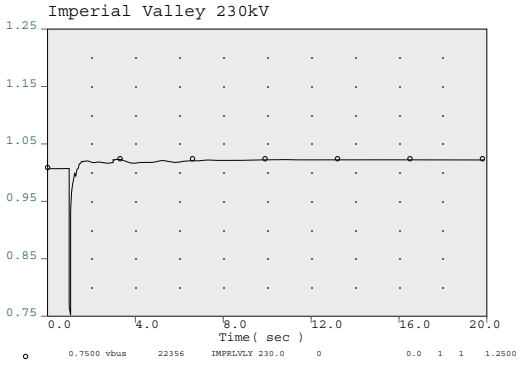
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

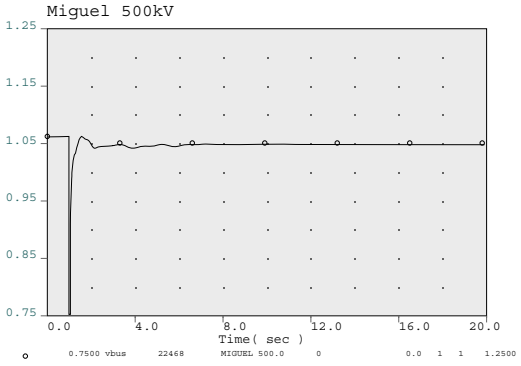
Imperial Valley 500kV



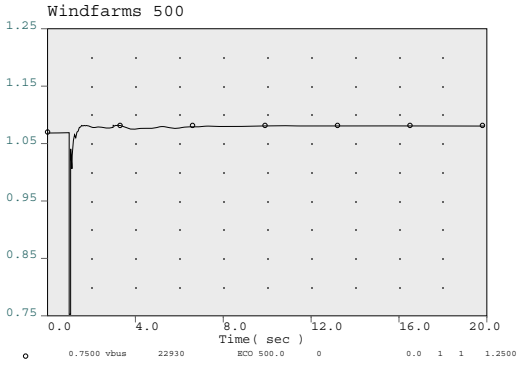
Imperial Valley 230kV



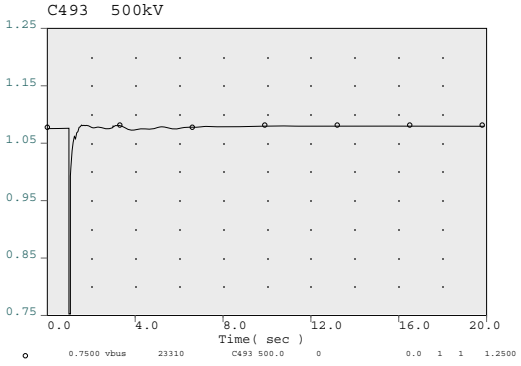
Miguel 500kV



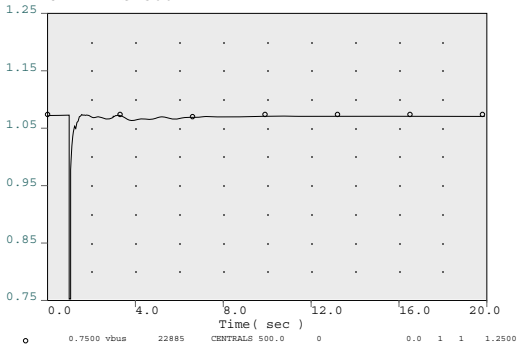
Windfarms 500



C493 500kV

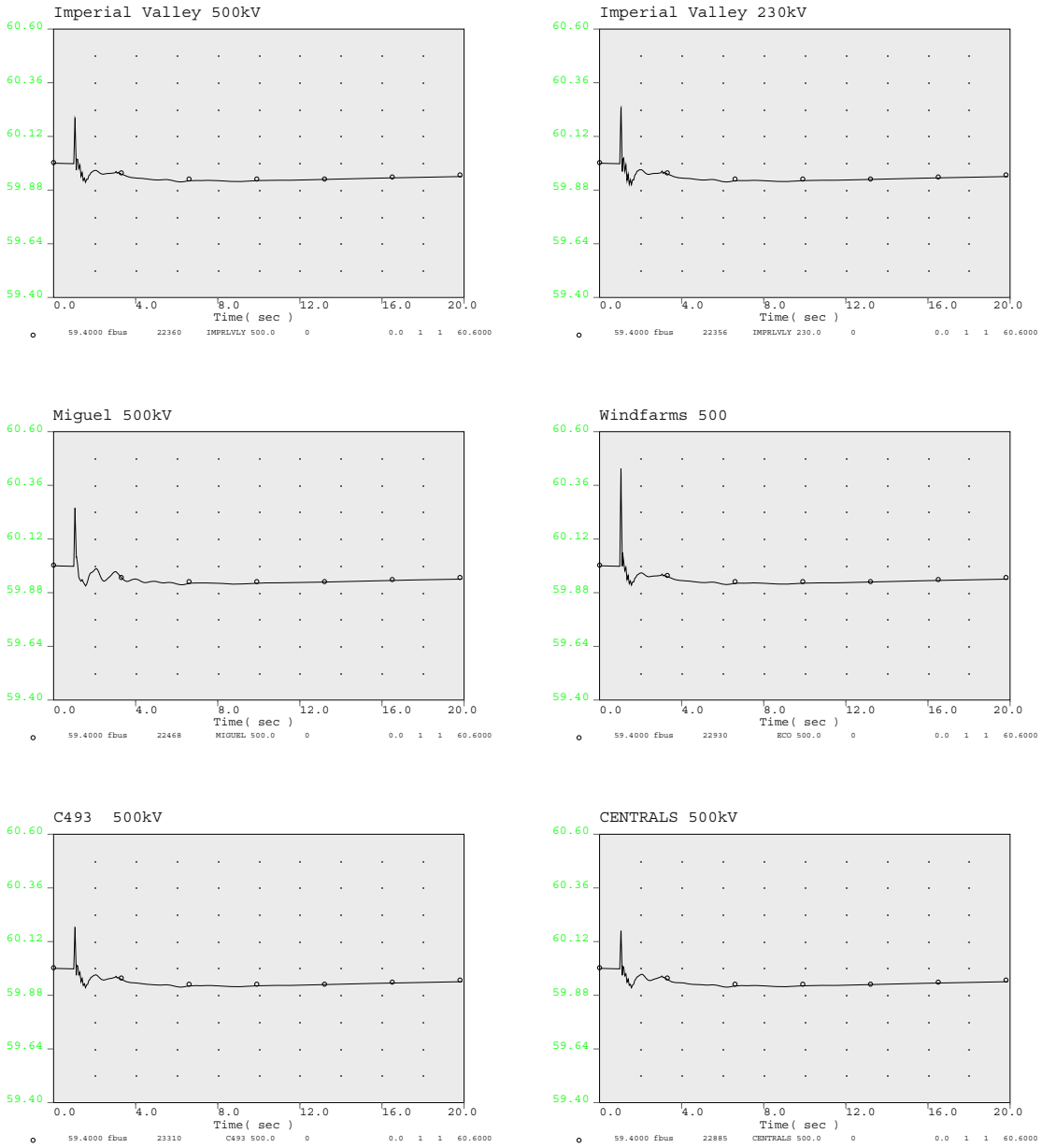


CENTRALS 500kV



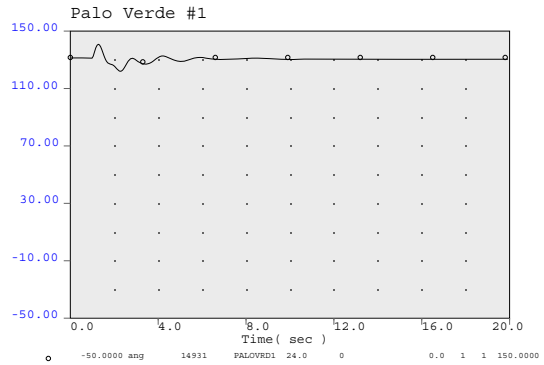
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

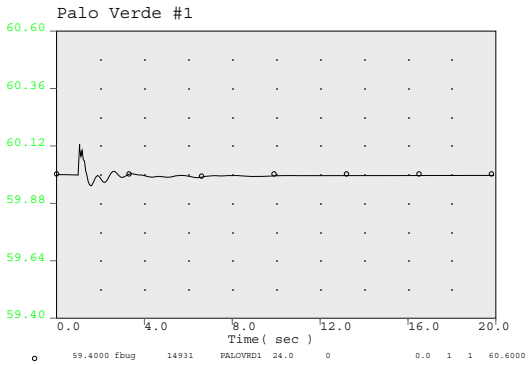
Imperial Valley Area - Frequency

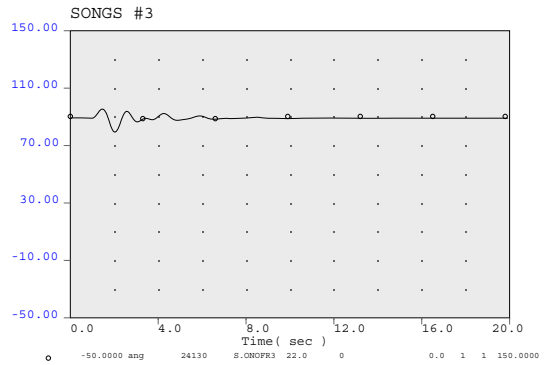


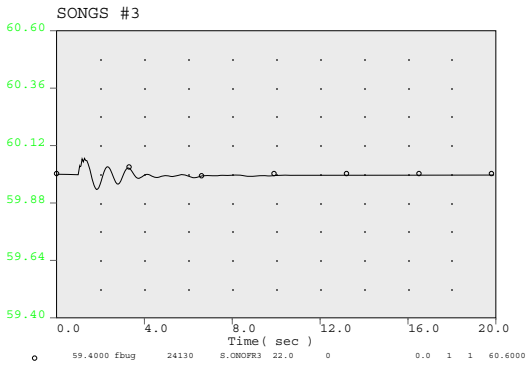
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

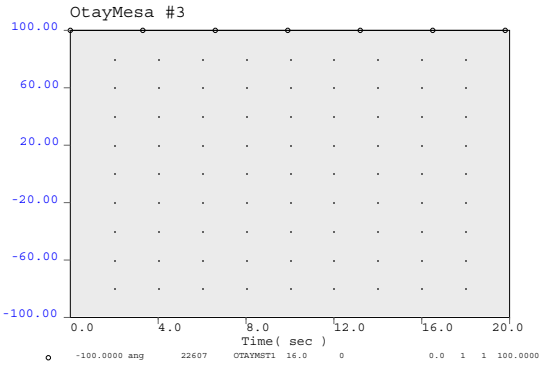
RELATIVE ROTOR ANGLE & FREQUENCY

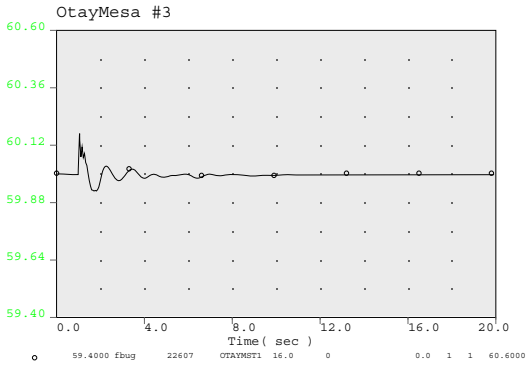












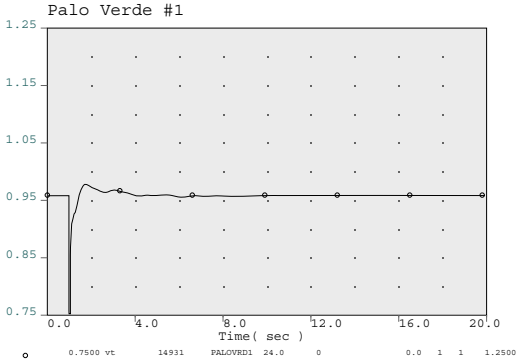
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

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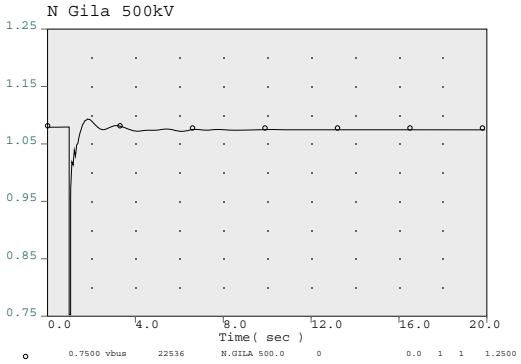
SDGE	NGila_IV_slo_pst_int_ll.chf	p_i\ll\pst_int\ws_pst_int Tue Nov 02 07:30:49 2010

RELATIVE VOLTAGE

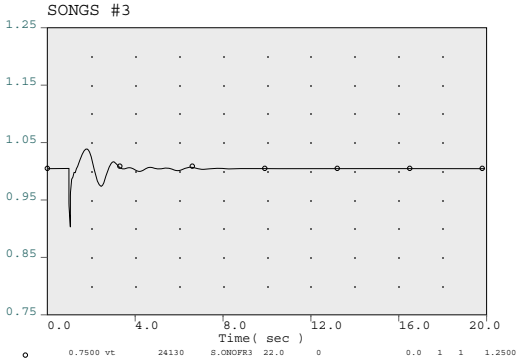
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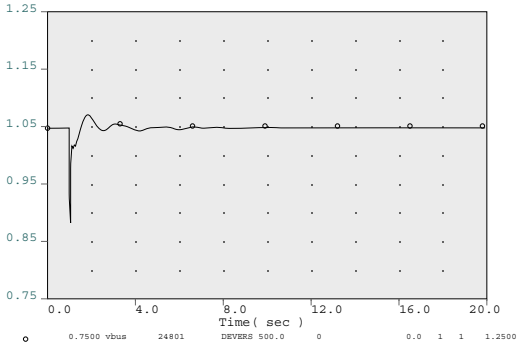
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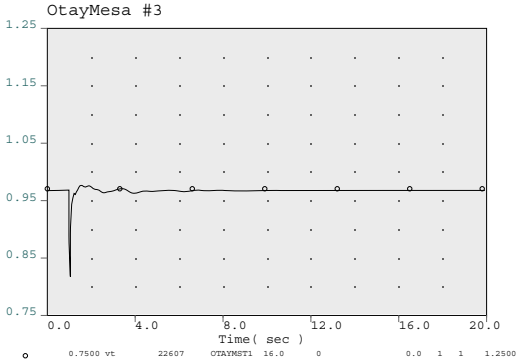
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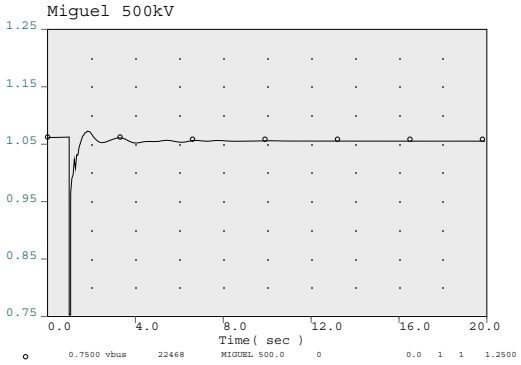
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OtayMesa #3



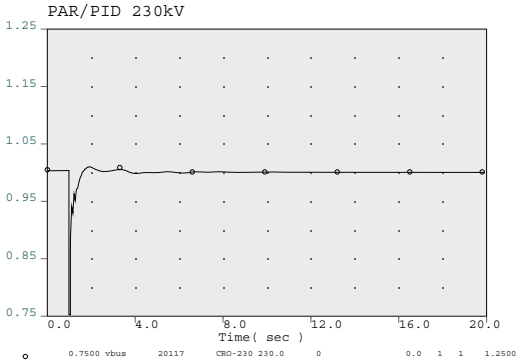
Miguel 500kV



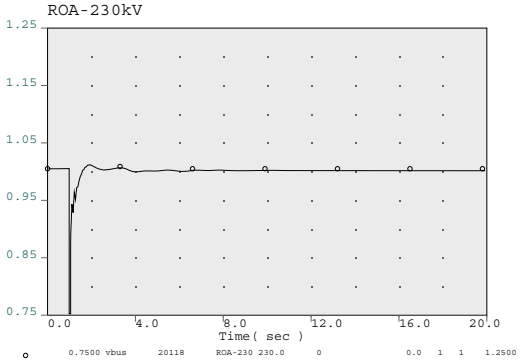
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

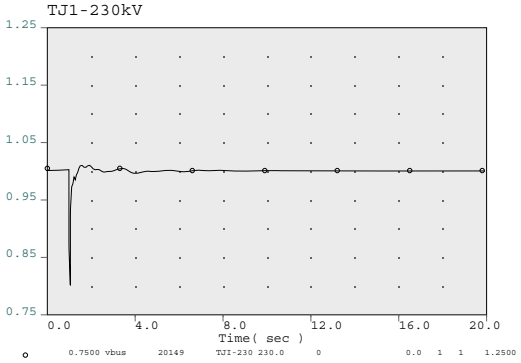
PAR/PID 230kV



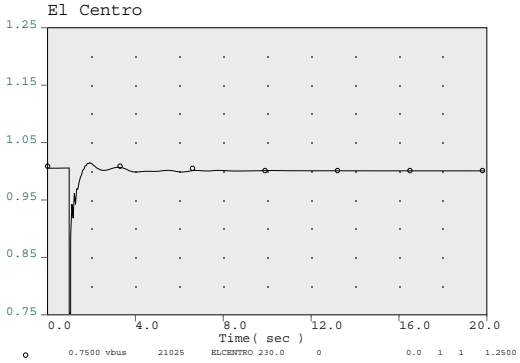
ROA-230kV



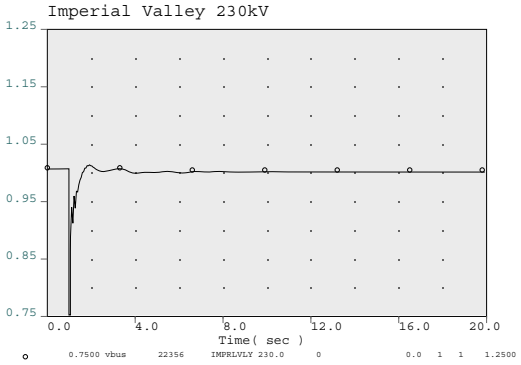
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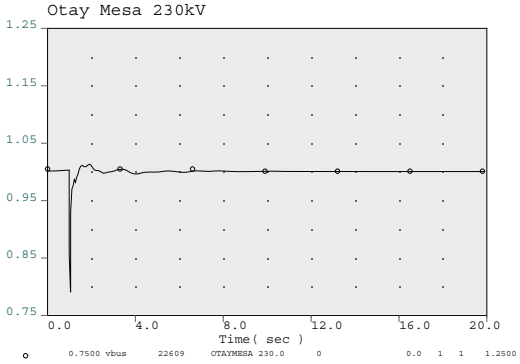
El Centro



Imperial Valley 230kV



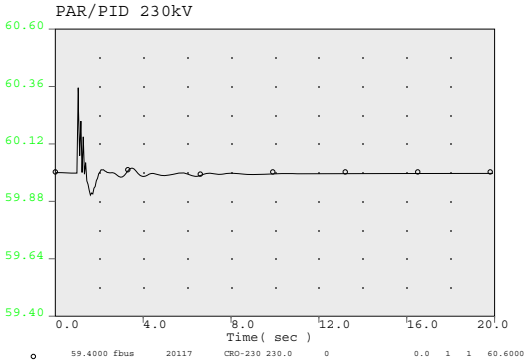
Otay Mesa 230kV



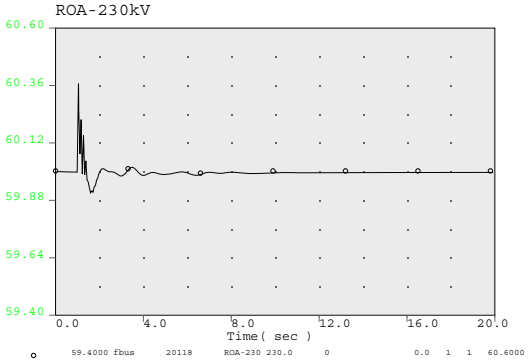
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

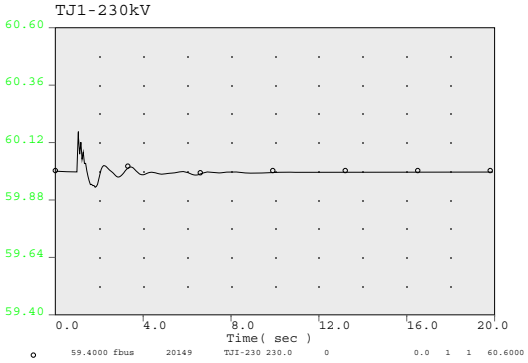
PAR/PID 230kV



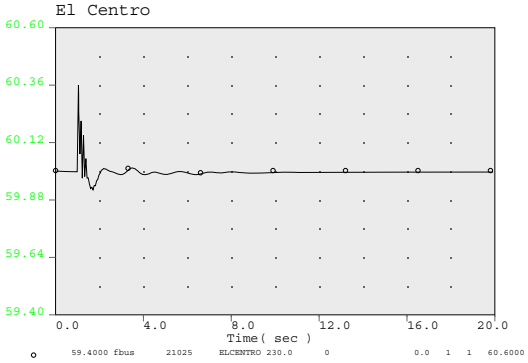
ROA-230kV



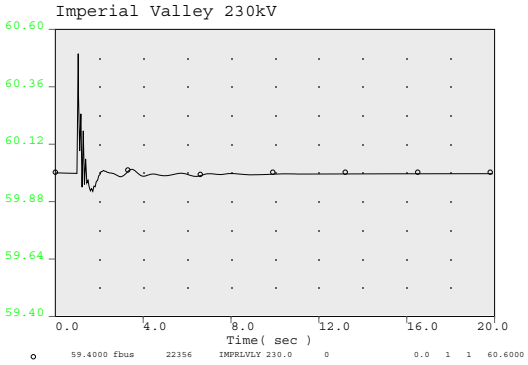
TJ1-230kV



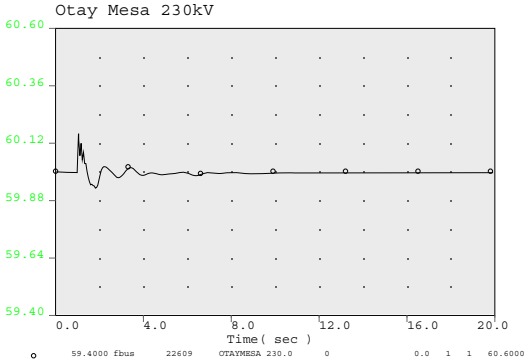
El Centro



Imperial Valley 230kV



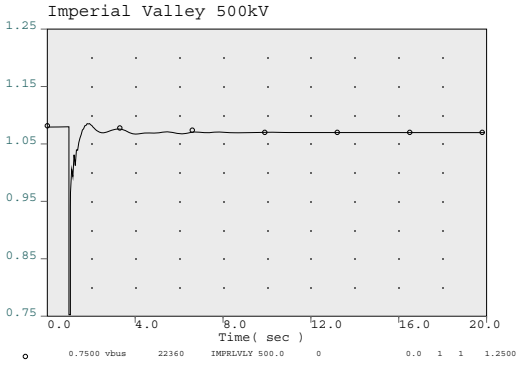
Otay Mesa 230kV



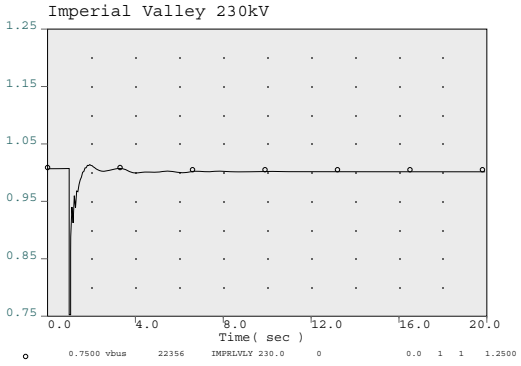
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

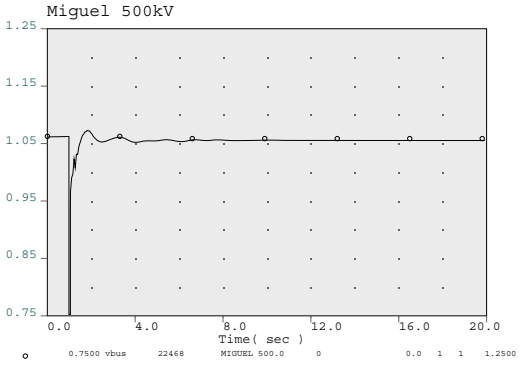
Imperial Valley 500kV



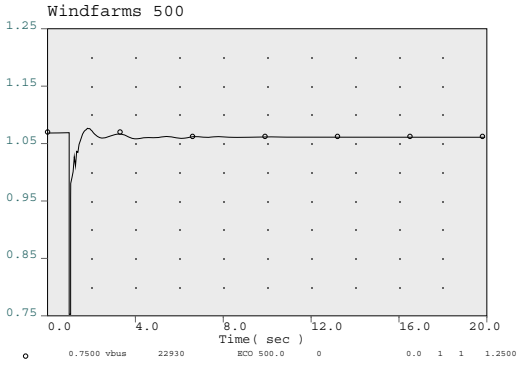
Imperial Valley 230kV



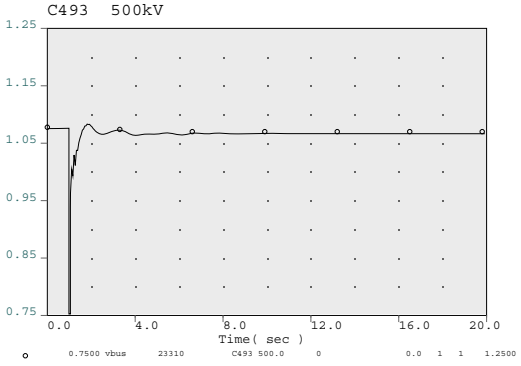
Miguel 500kV



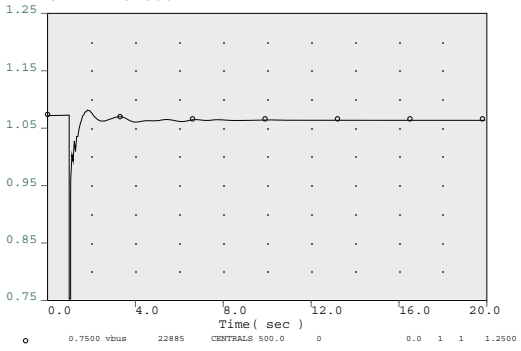
Windfarms 500



C493 500kV



CENTRALS 500kV



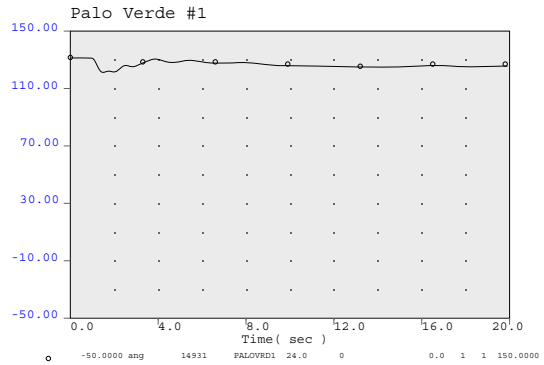
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

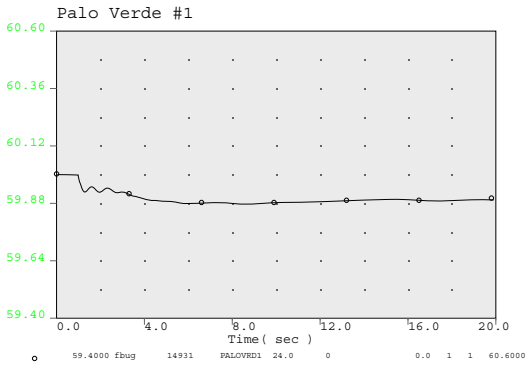
Imperial Valley Area - Frequency

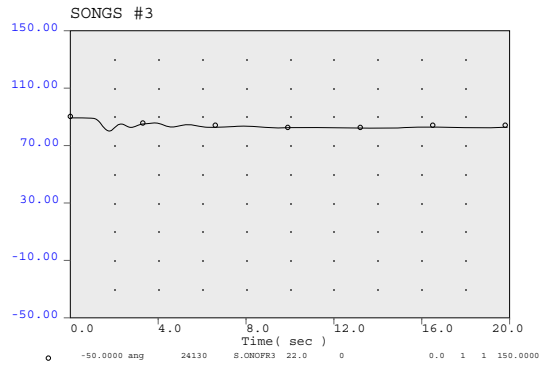


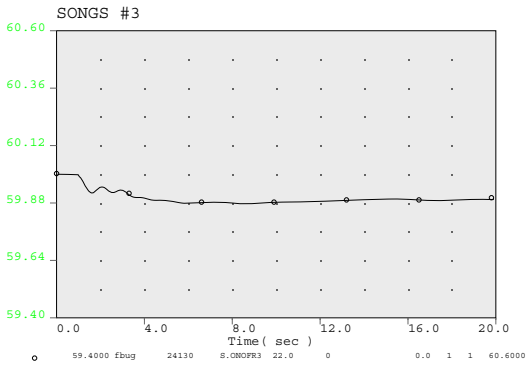
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

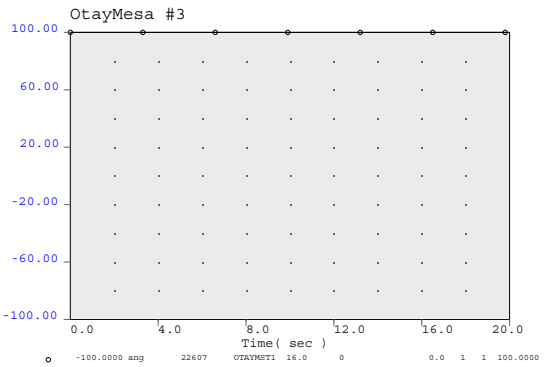
RELATIVE ROTOR ANGLE & FREQUENCY

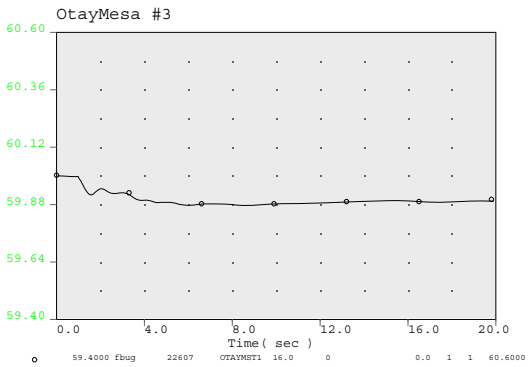












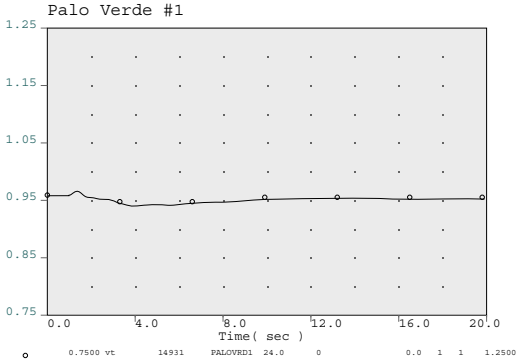
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

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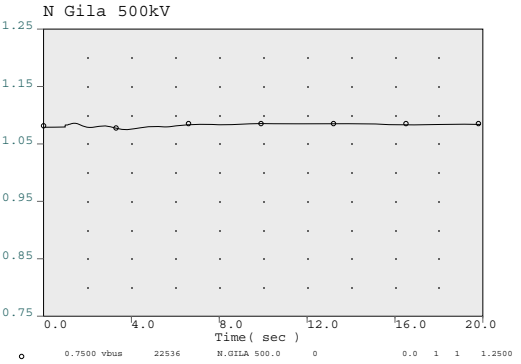
SDGE	PaloVerde-g1_pst_int_ll.chf	p_i\ll\pst_int\ws_pst_int Tue Nov 02 07:31:15 2010

RELATIVE VOLTAGE

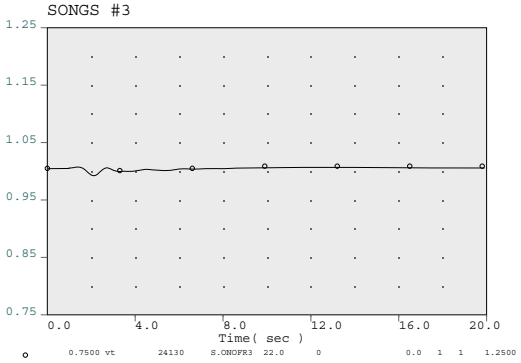
Palo Verde #1



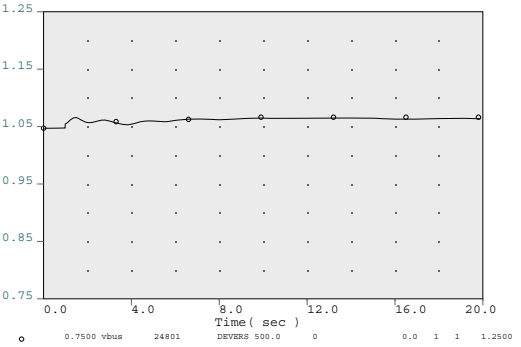
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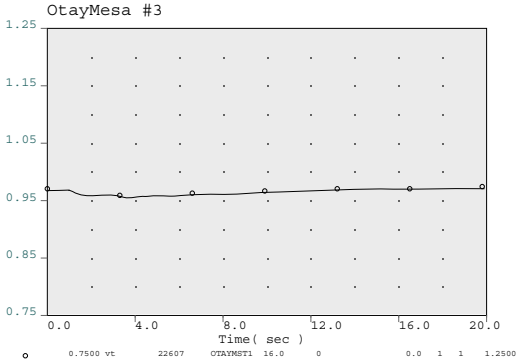
SONGS #3



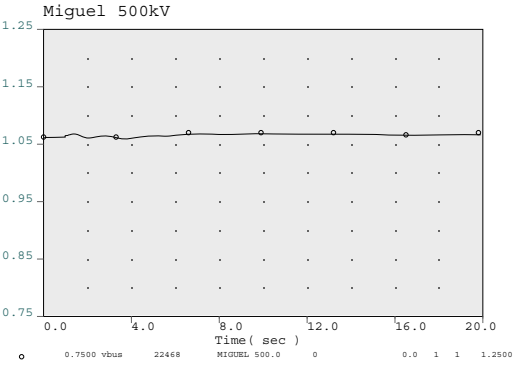
Devers 500



OtayMesa #3



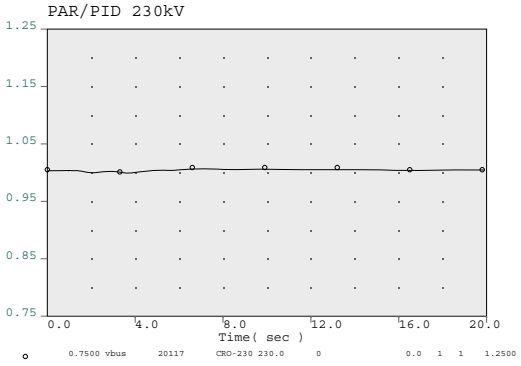
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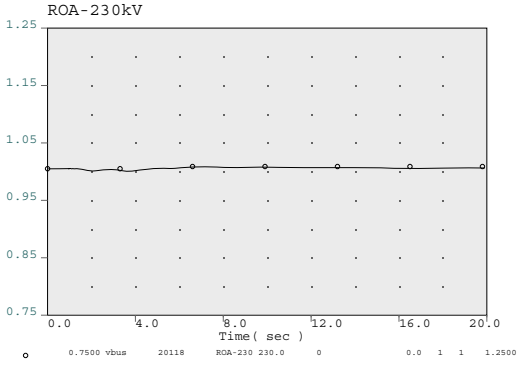
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

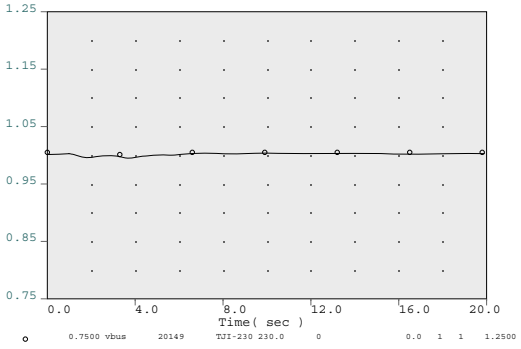
PAR/PID 230kV



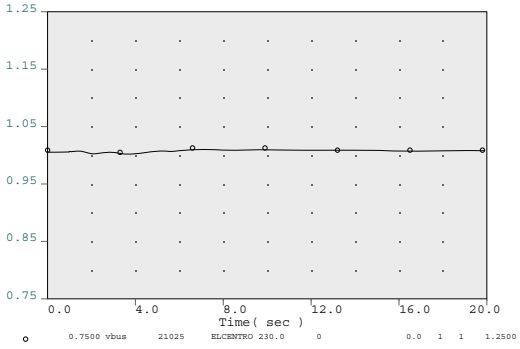
ROA-230kV



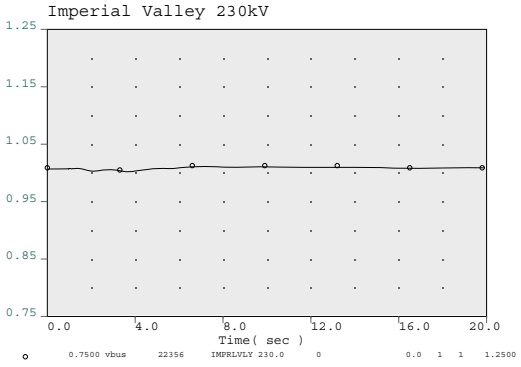
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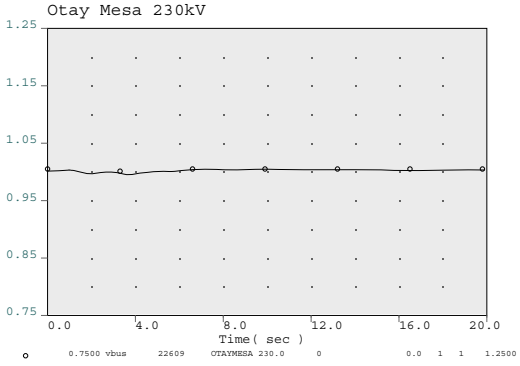
El Centro



Imperial Valley 230kV



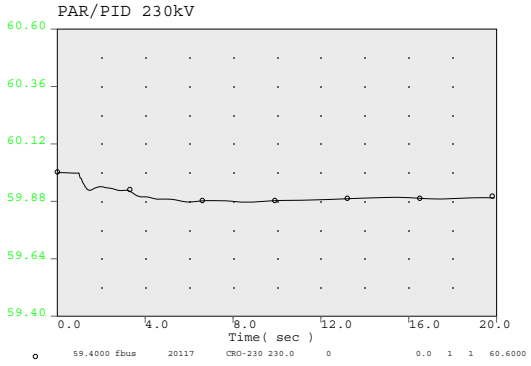
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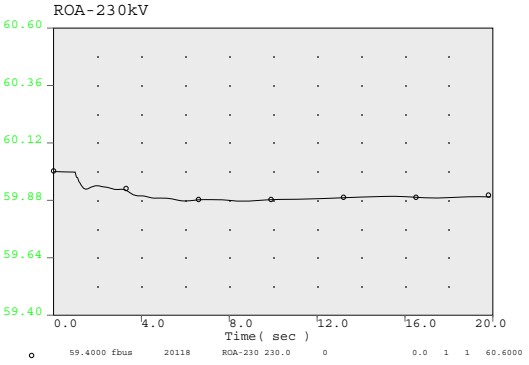
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

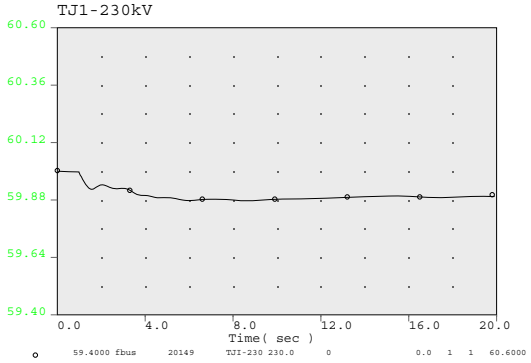
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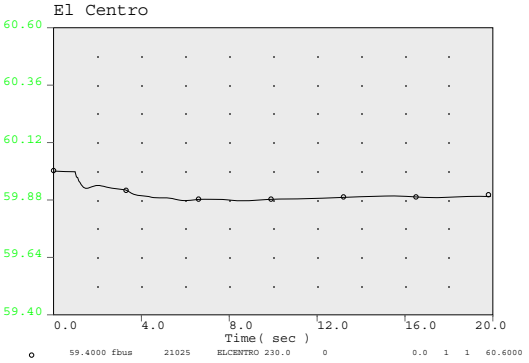
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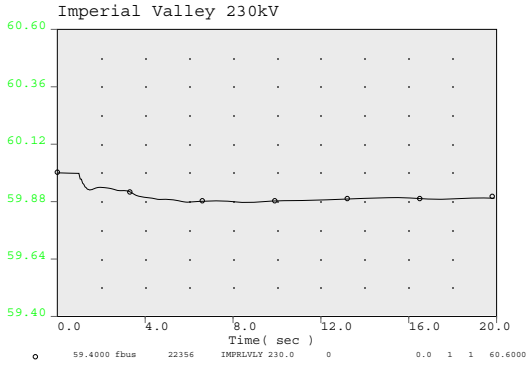
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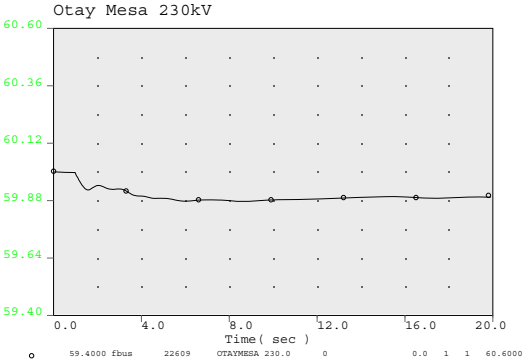
El Centro



Imperial Valley 230kV



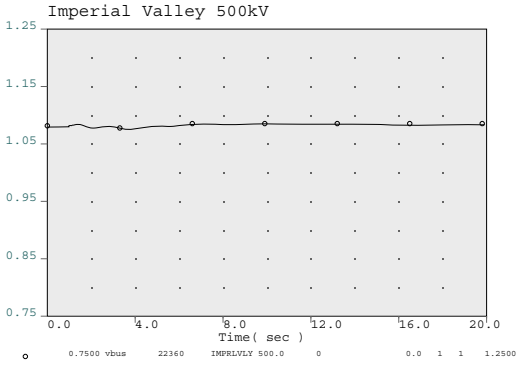
Otay Mesa 230kV



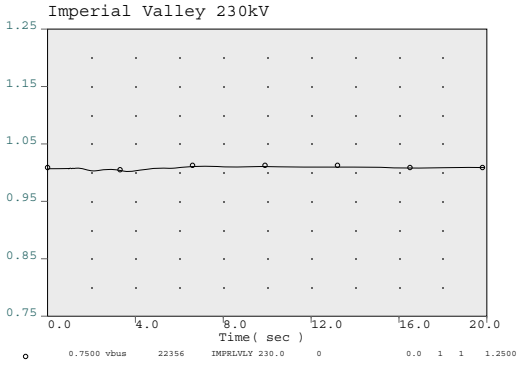
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Imperial Valley Area - VOLTAGE

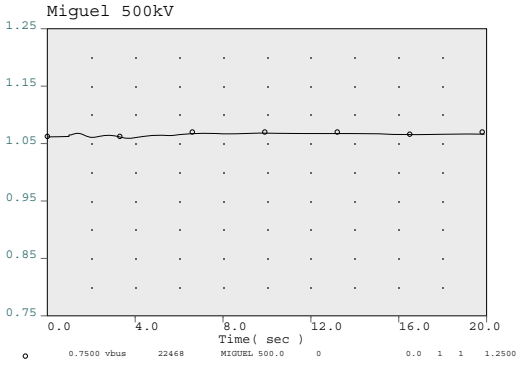
Imperial Valley 500kV



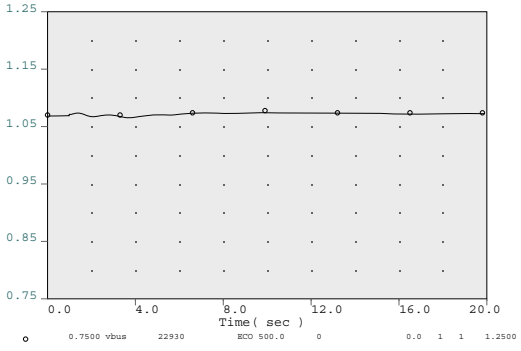
Imperial Valley 230kV



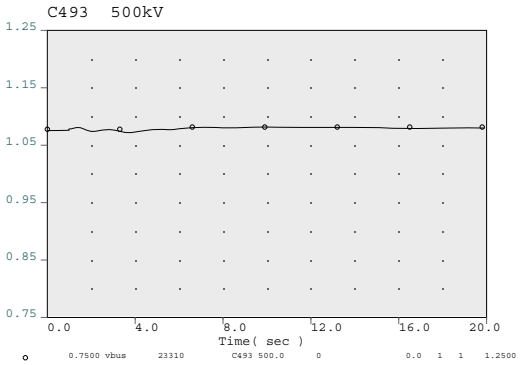
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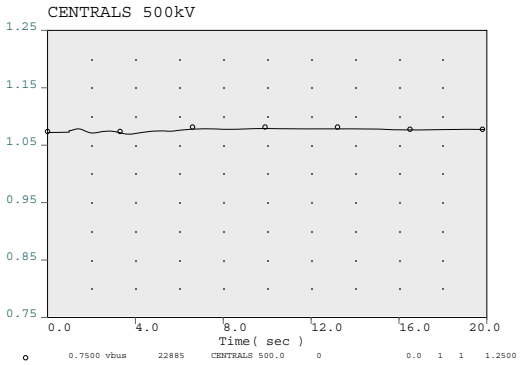
Windfarms 500



C493 500kV

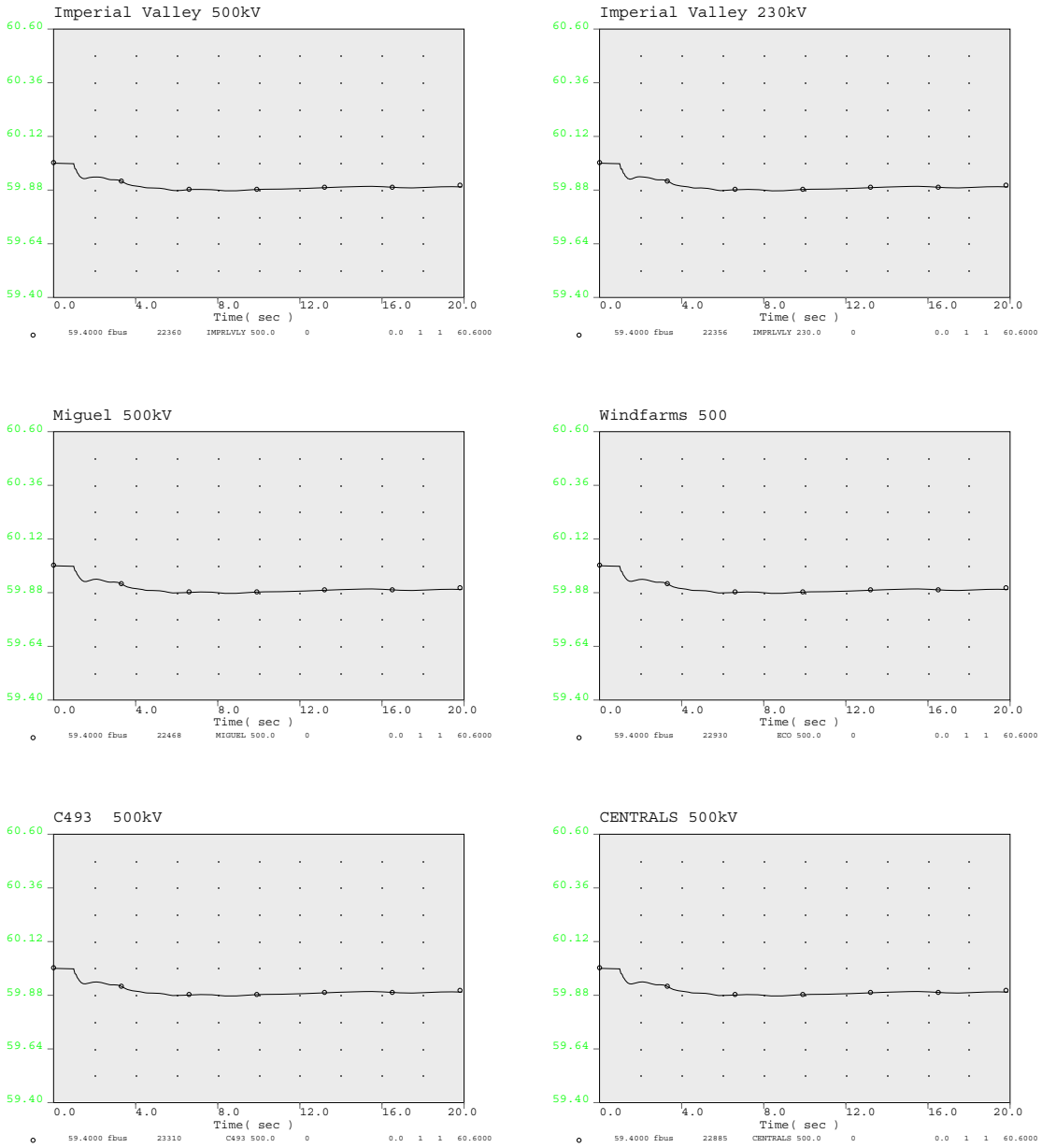


CENTRALS 500kV



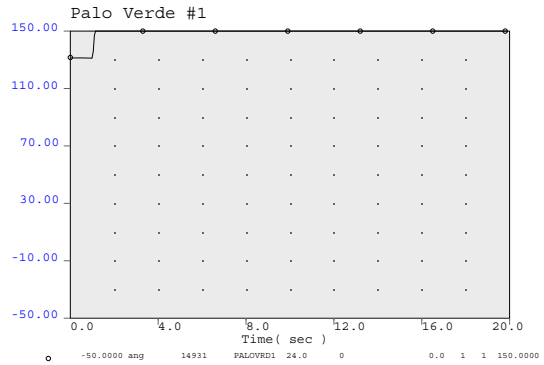
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

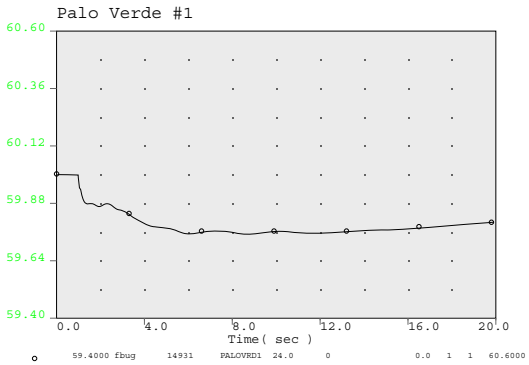
Imperial Valley Area - Frequency

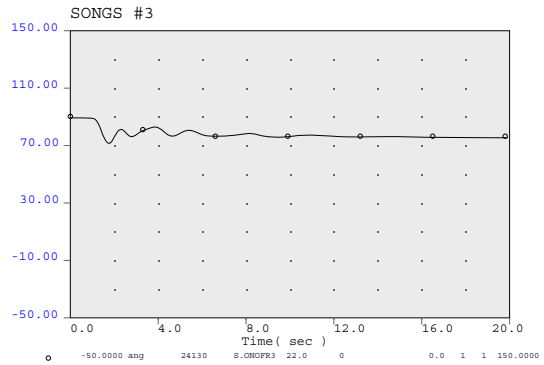


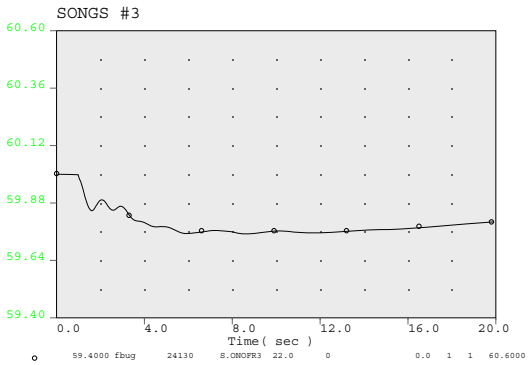
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

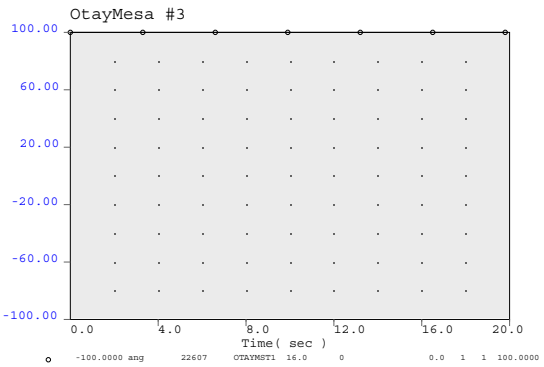
RELATIVE ROTOR ANGLE & FREQUENCY

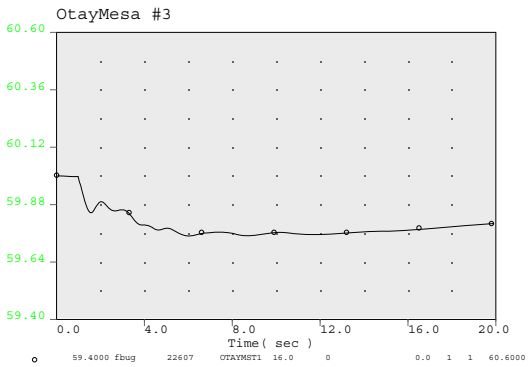












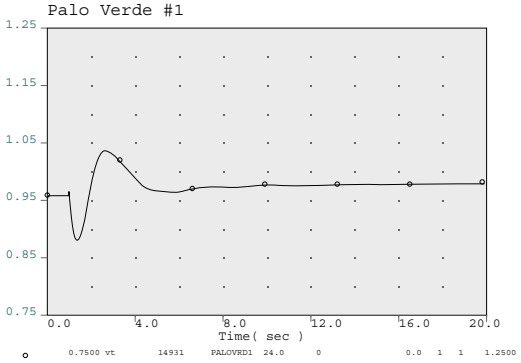
SDG&E Cluster 2 - post
2014 Light Autumn
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Page 1

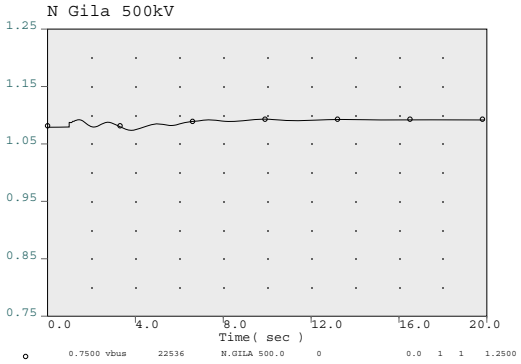
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RELATIVE VOLTAGE

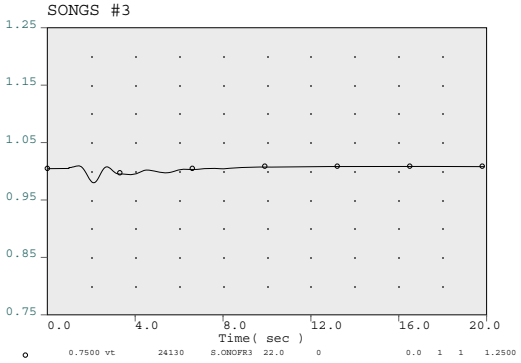
Palo Verde #1



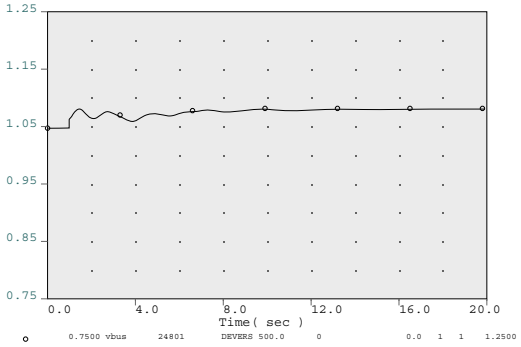
N Gila 500kV



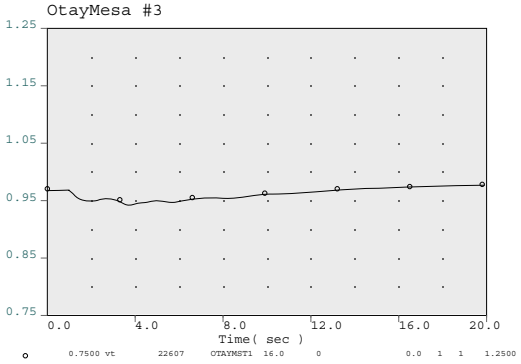
SONGS #3



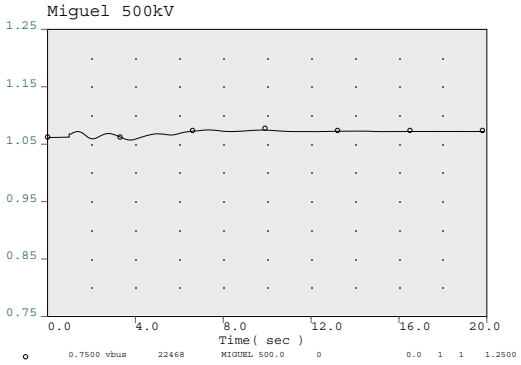
Devers 500



OtayMesa #3



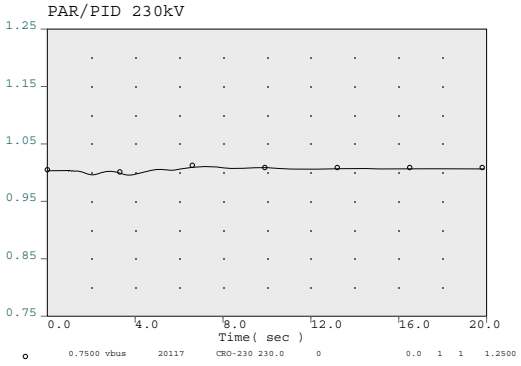
Miguel 500kV



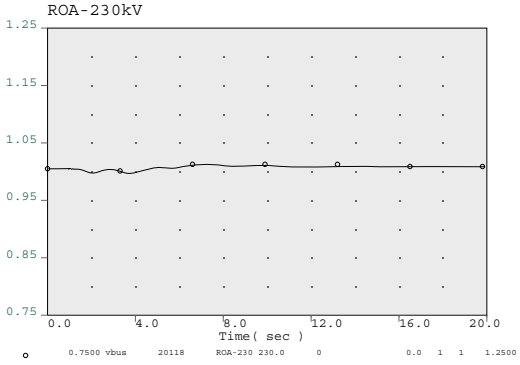
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

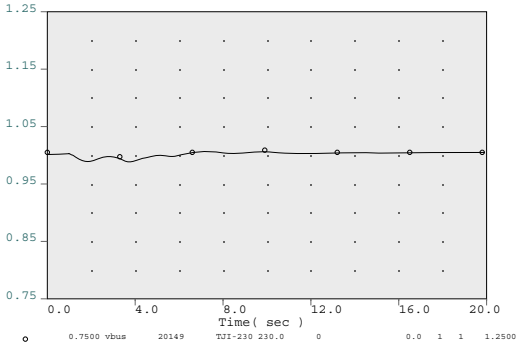
PAR/PID 230kV



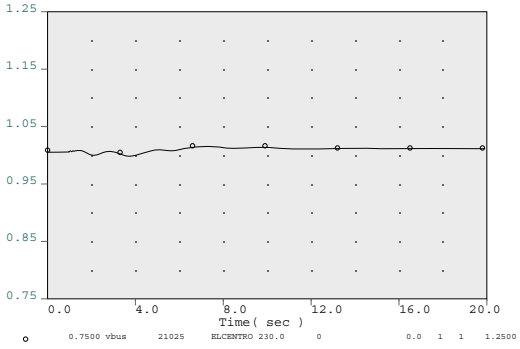
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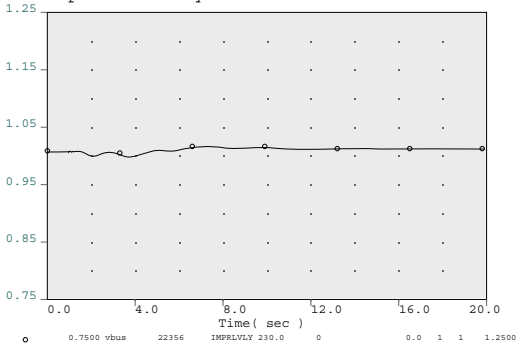
TJ1-230kV



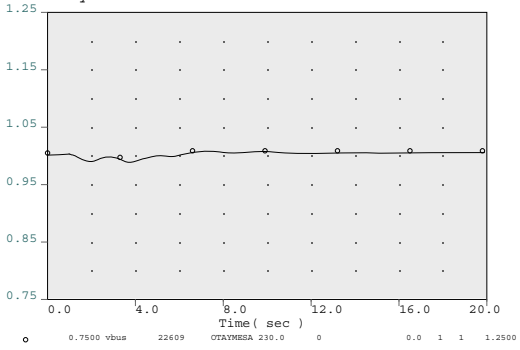
El Centro



Imperial Valley 230kV



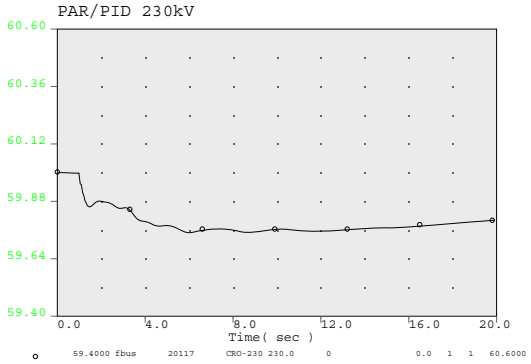
Otay Mesa 230kV



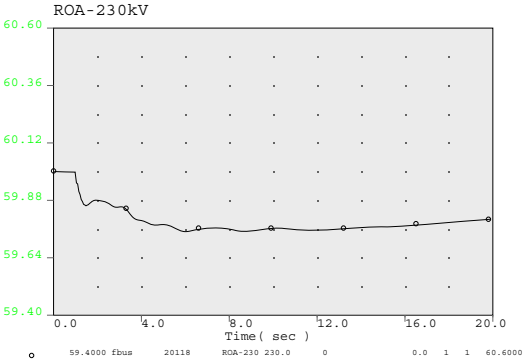
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

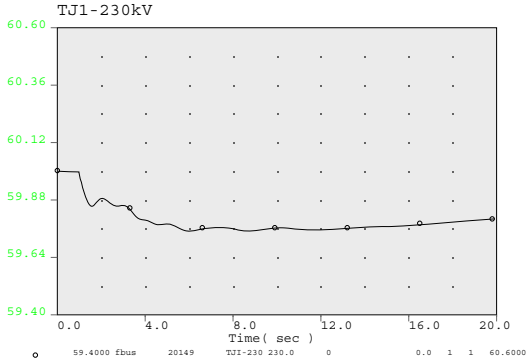
PAR/PID 230kV



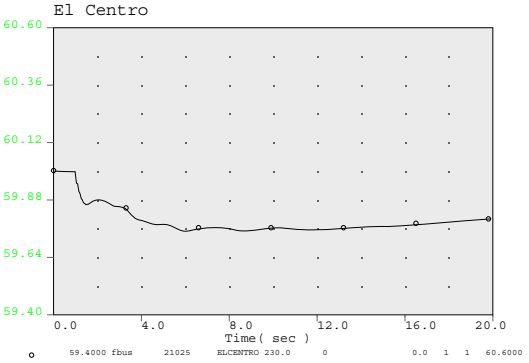
ROA-230kV



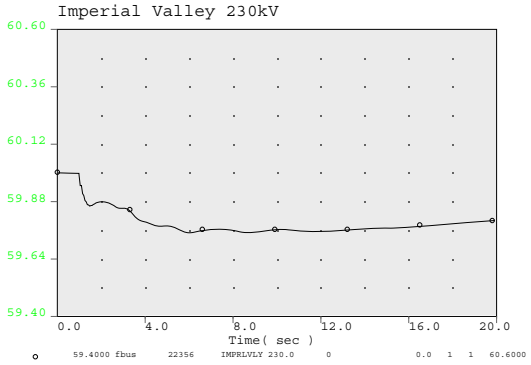
TJ1-230kV



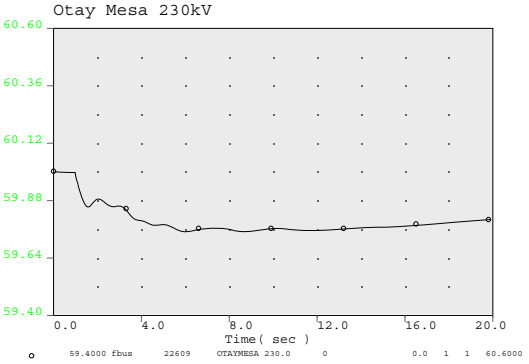
El Centro



Imperial Valley 230kV



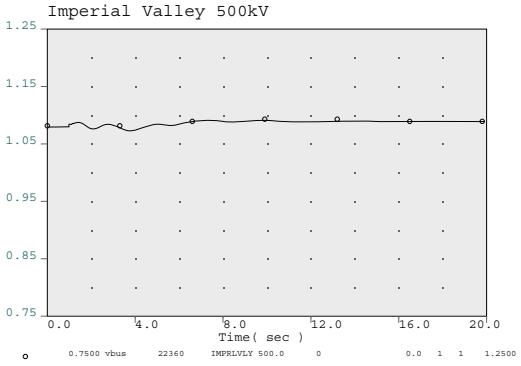
Otay Mesa 230kV



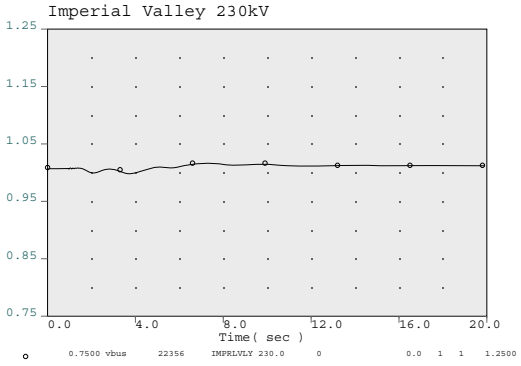
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - VOLTAGE

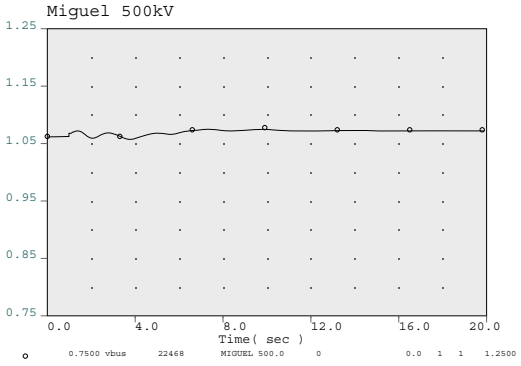
Imperial Valley 500kV



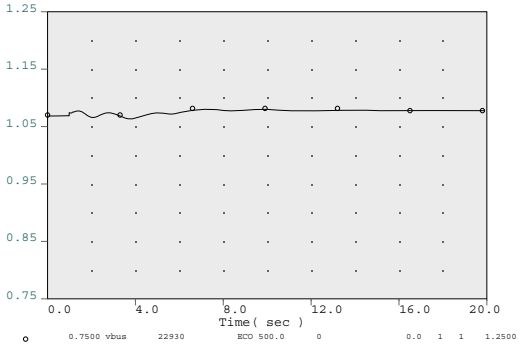
Imperial Valley 230kV



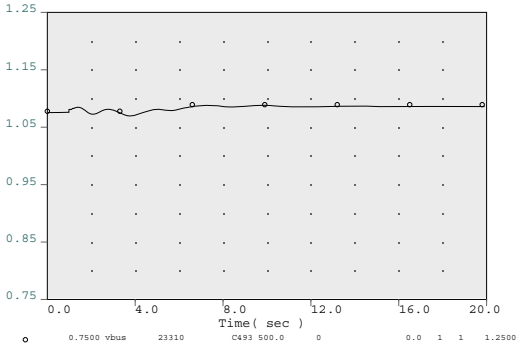
Miguel 500kV



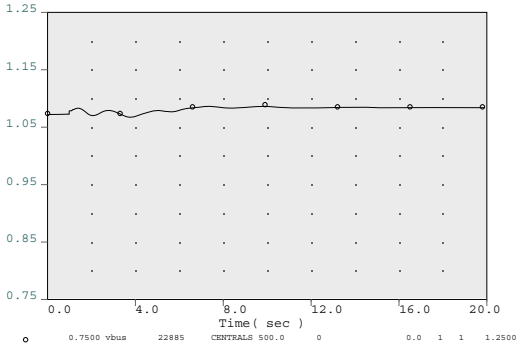
Windfarms 500



C493 500kV

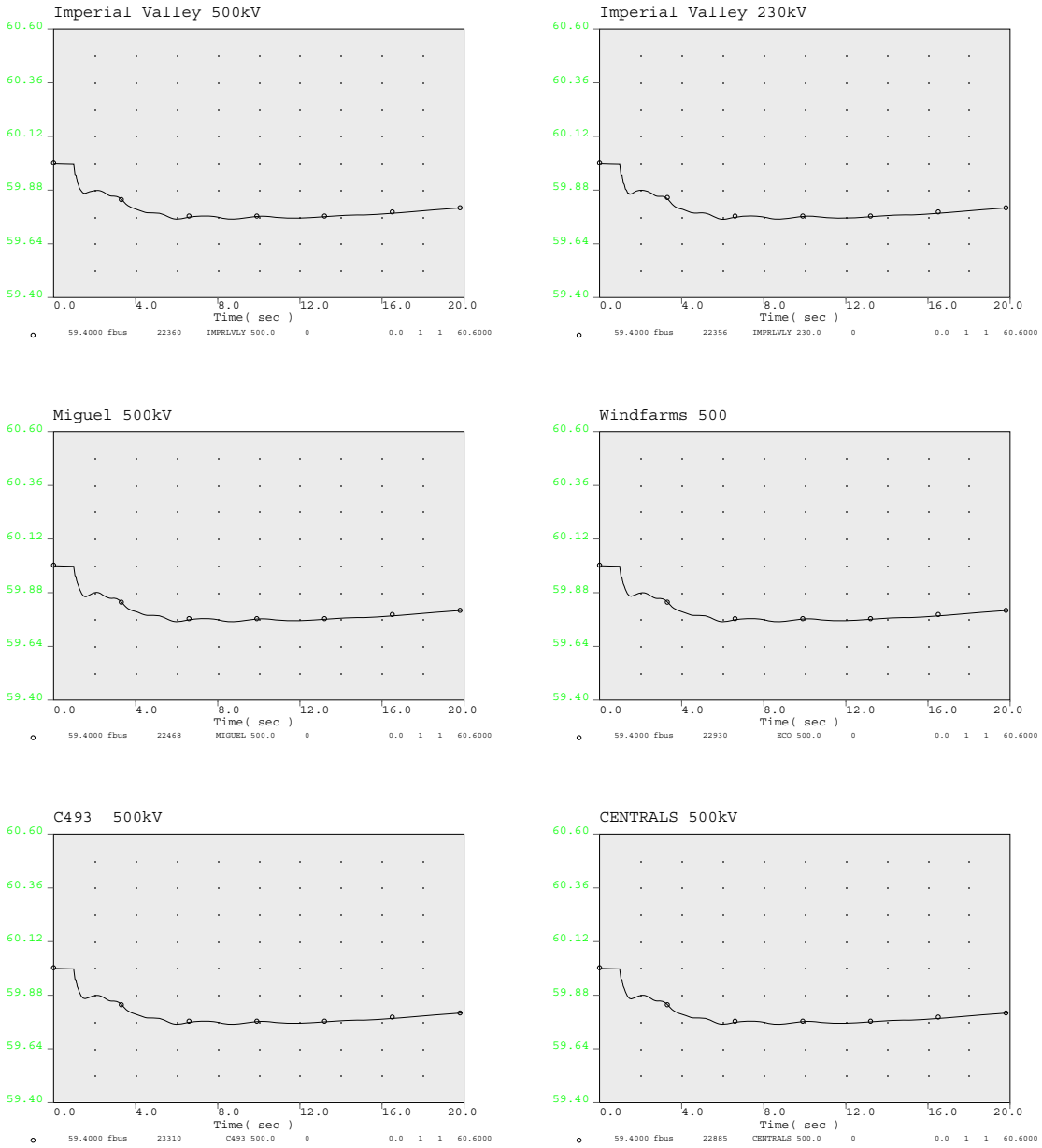


CENTRALS 500kV



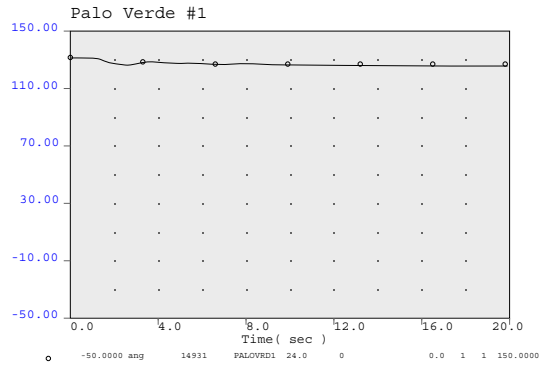
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

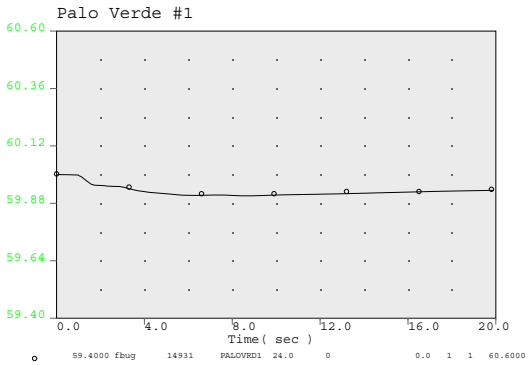
Imperial Valley Area - Frequency

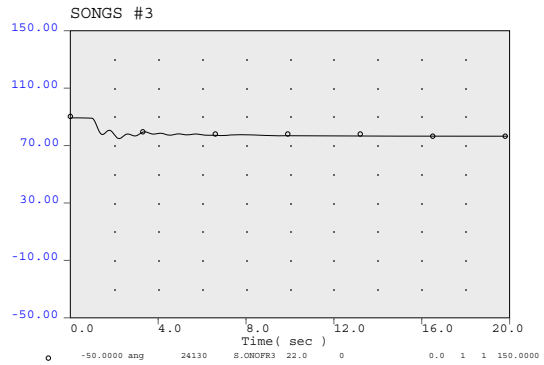


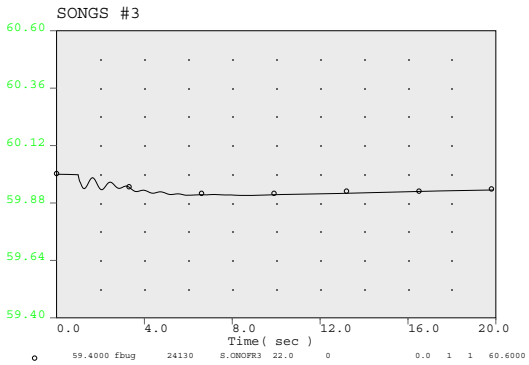
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

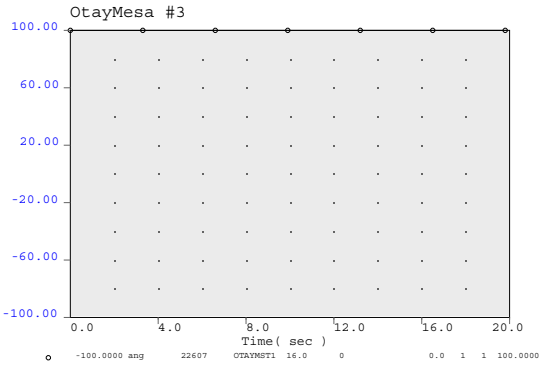
RELATIVE ROTOR ANGLE & FREQUENCY

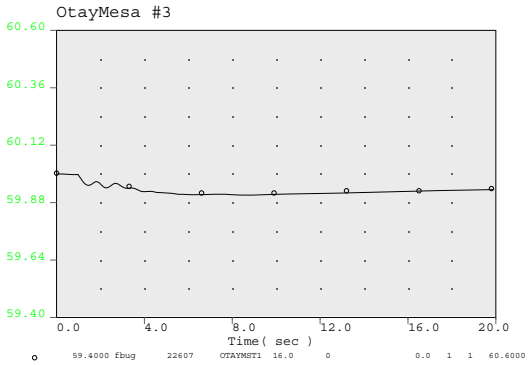












SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Page 1

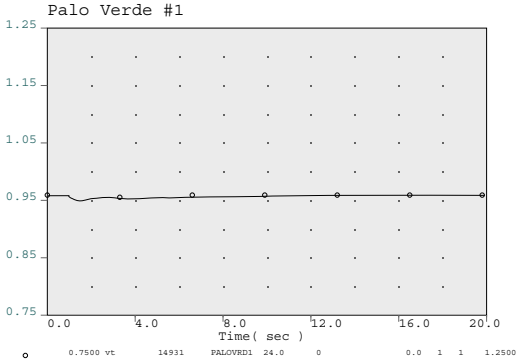
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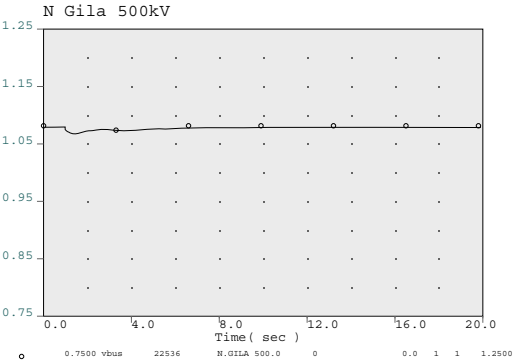
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RELATIVE VOLTAGE

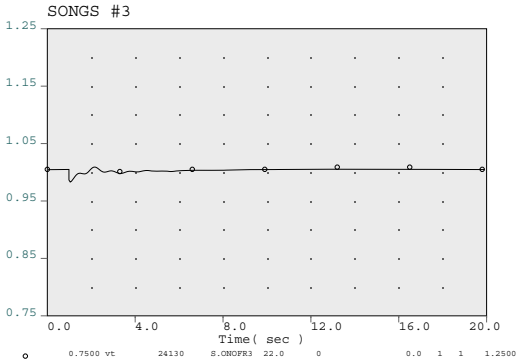
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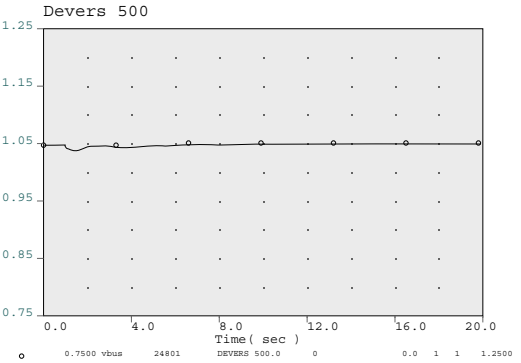
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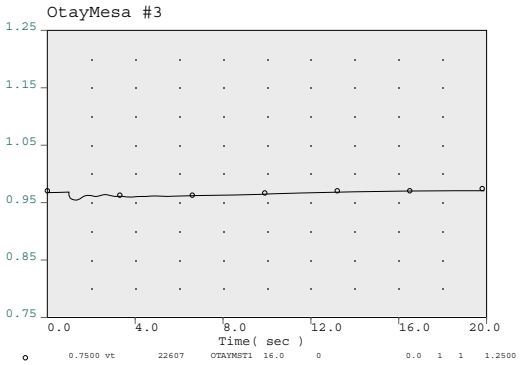
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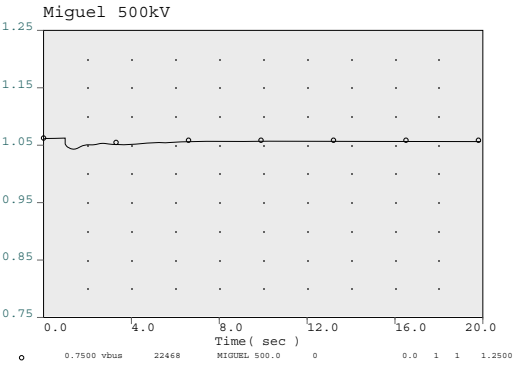
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OtayMesa #3



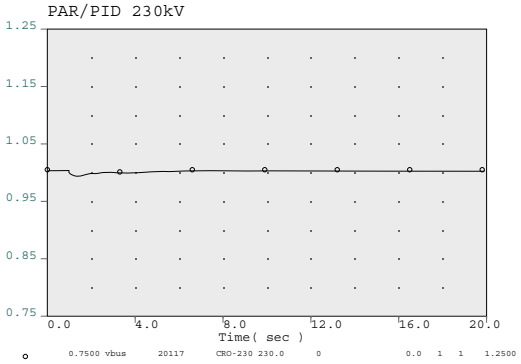
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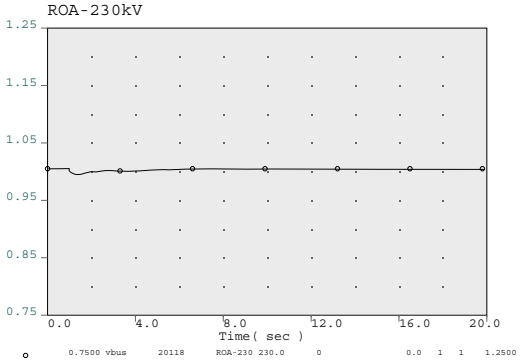
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

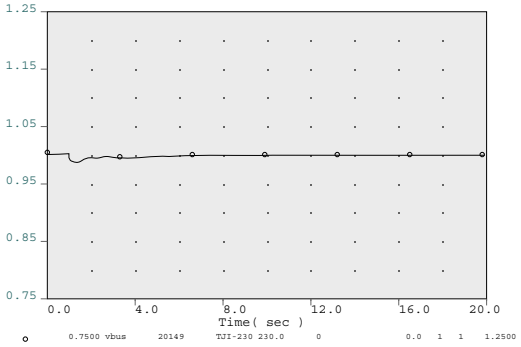
PAR/PID 230kV



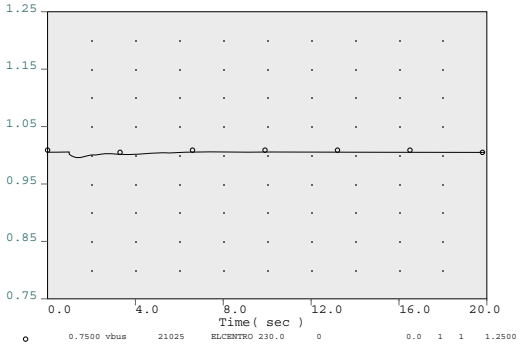
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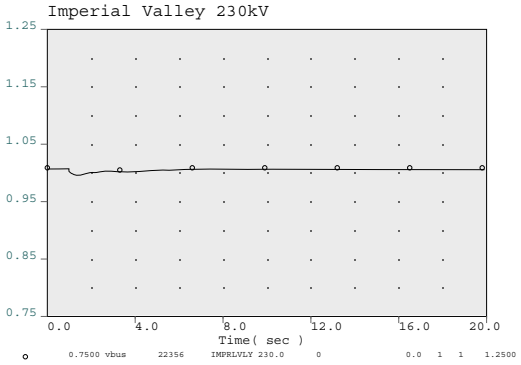
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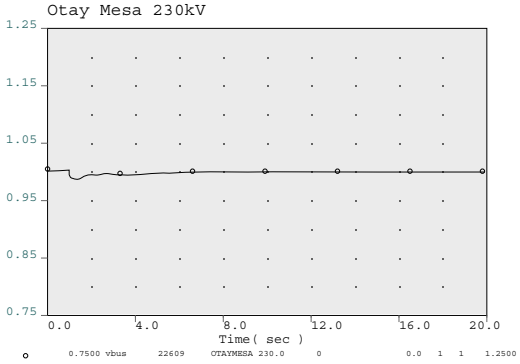
El Centro



Imperial Valley 230kV

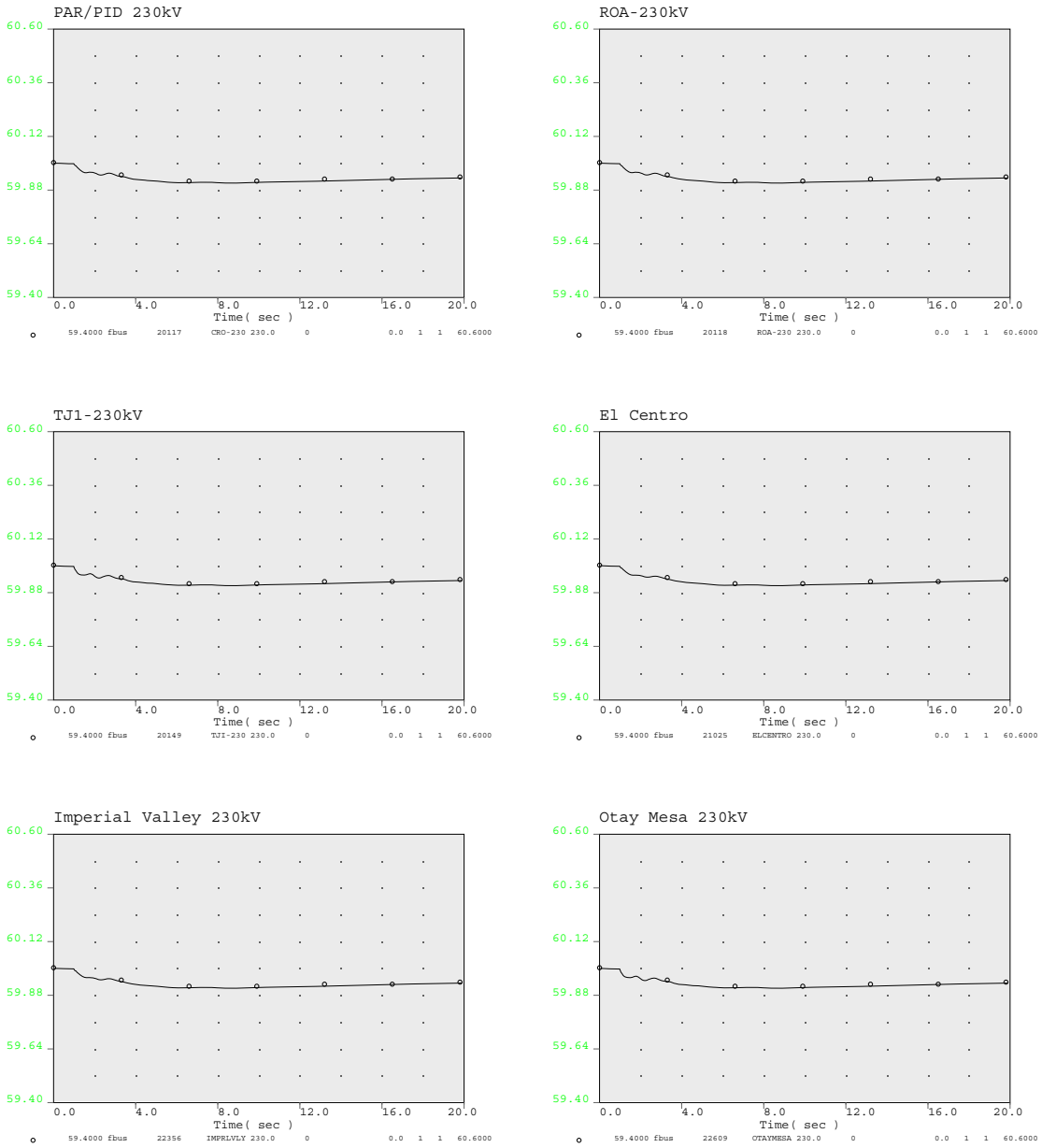


Otay Mesa 230kV



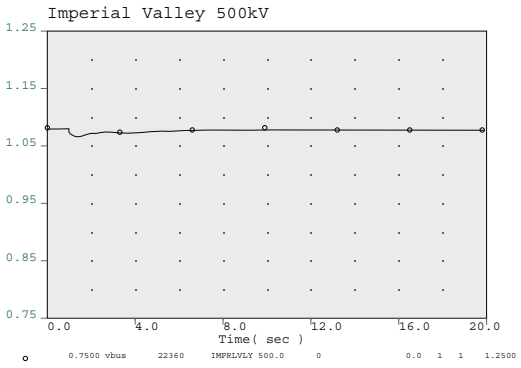
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

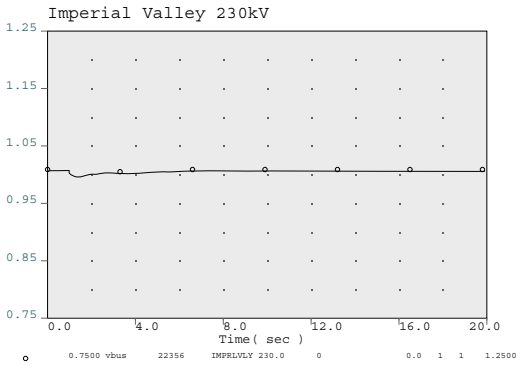
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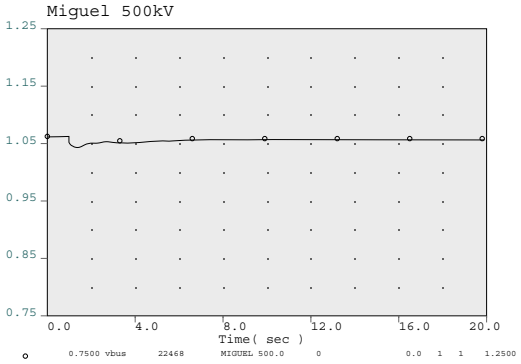


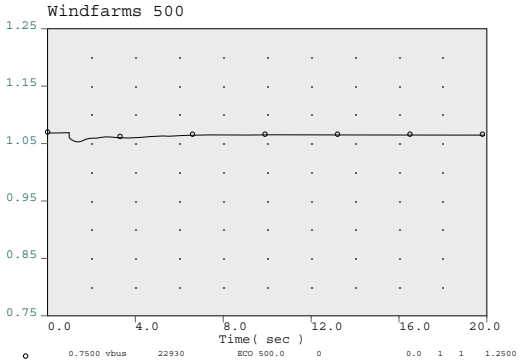
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

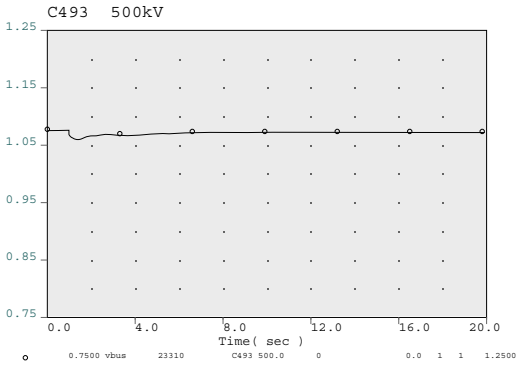
Imperial Valley Area - VOLTAGE

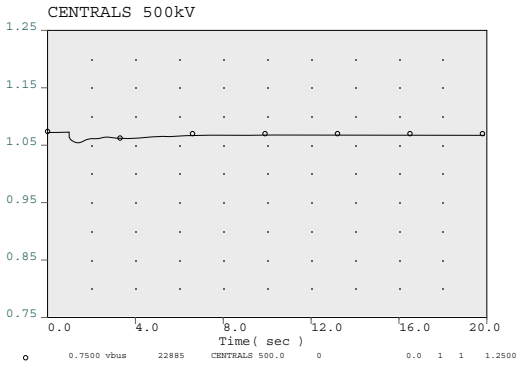






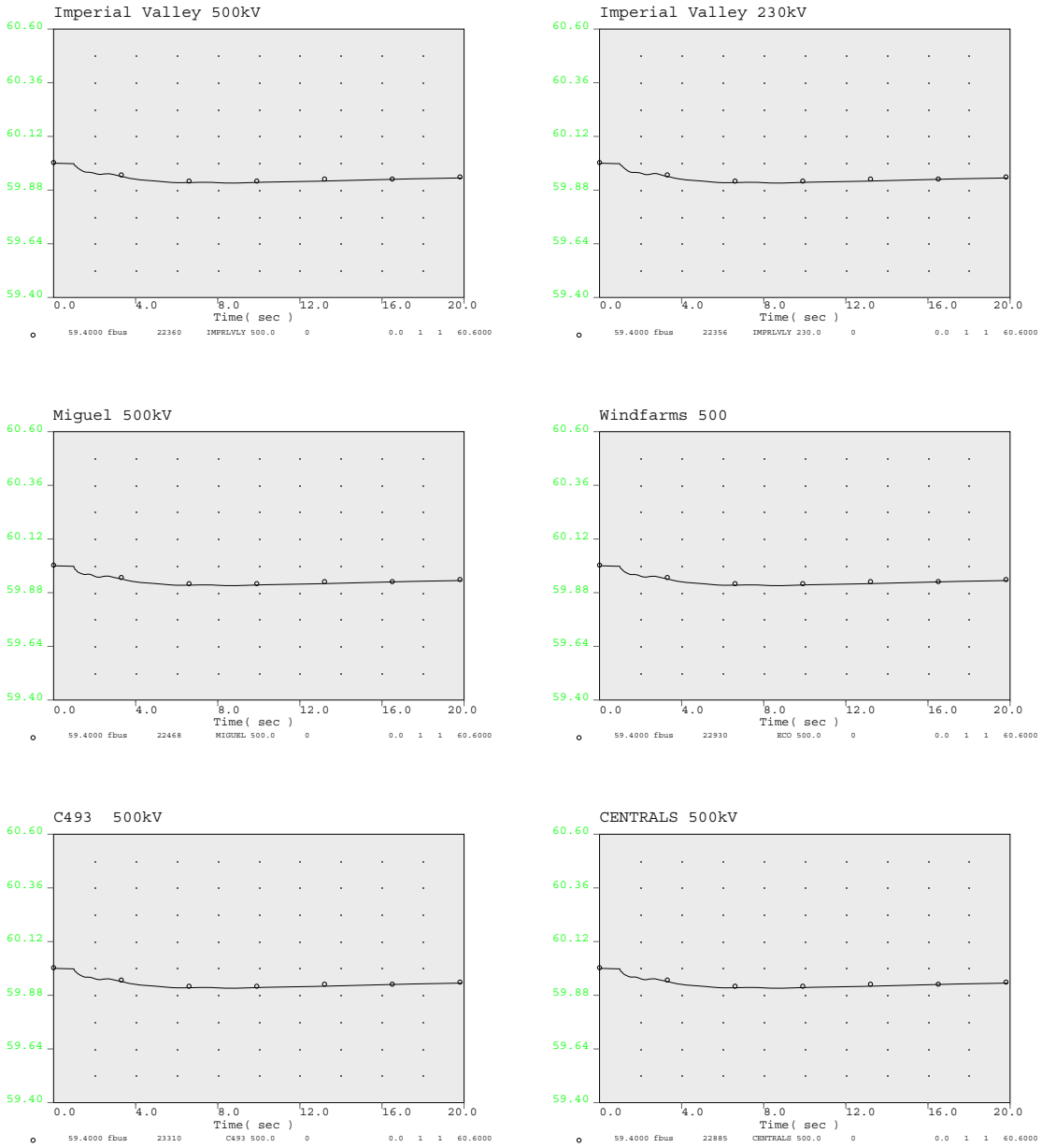






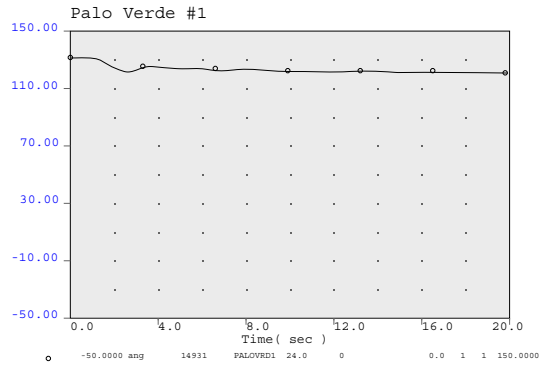
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

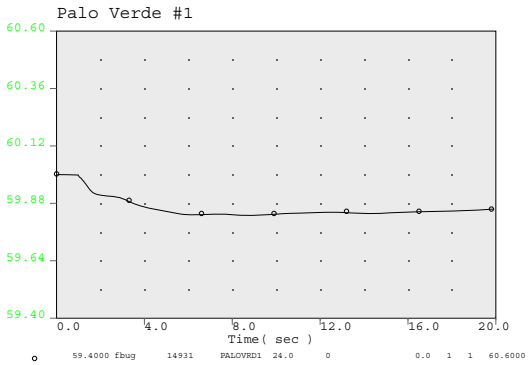
Imperial Valley Area - Frequency

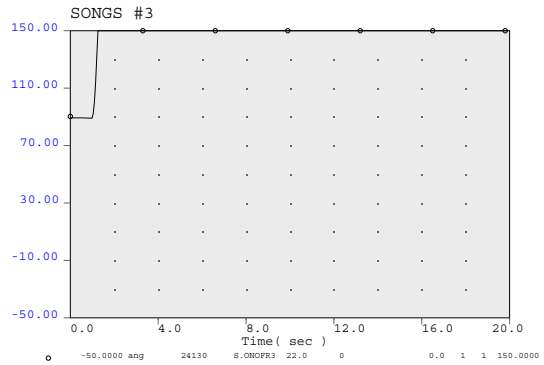


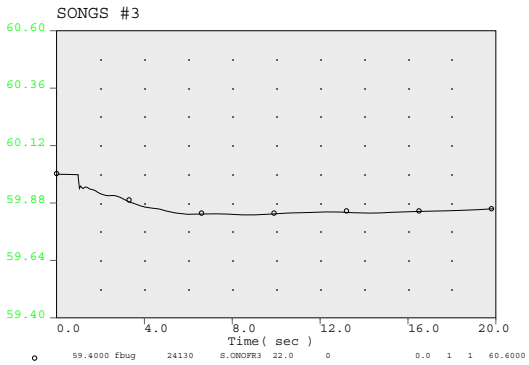
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

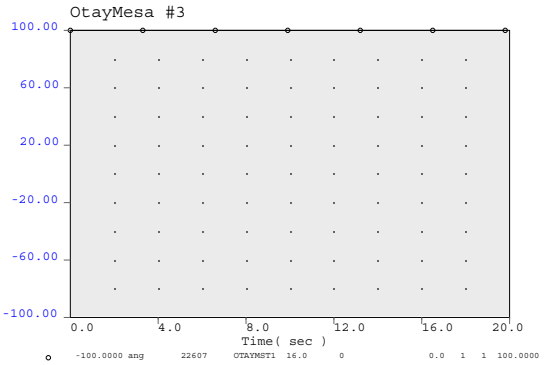
RELATIVE ROTOR ANGLE & FREQUENCY

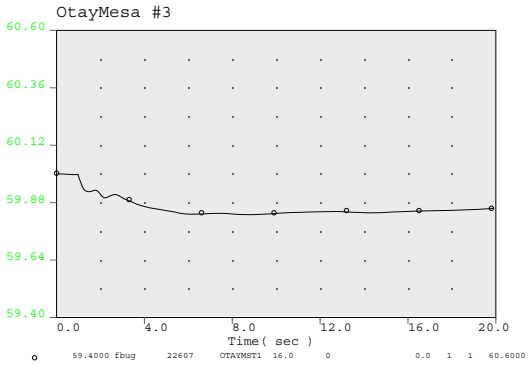












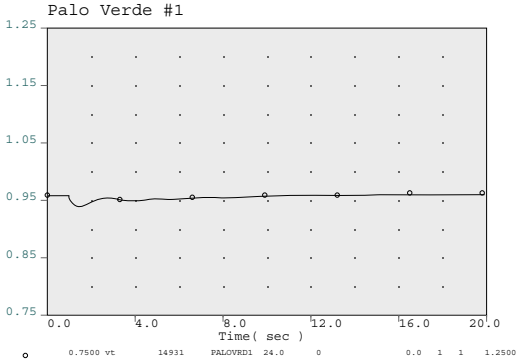
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Page 1

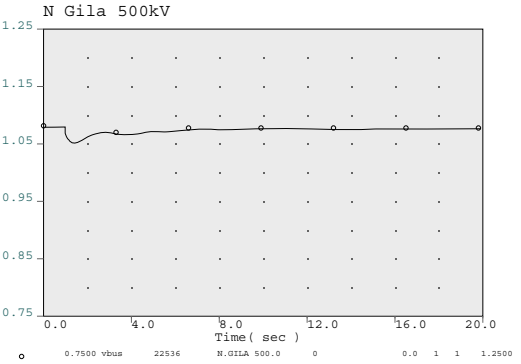
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RELATIVE VOLTAGE

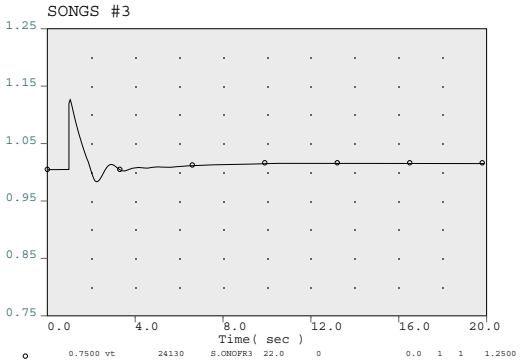
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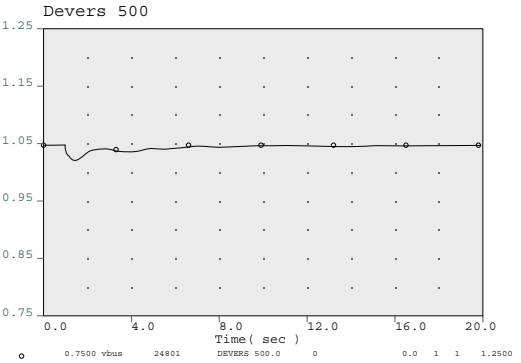
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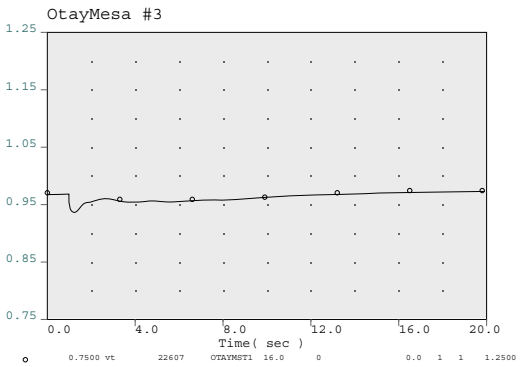
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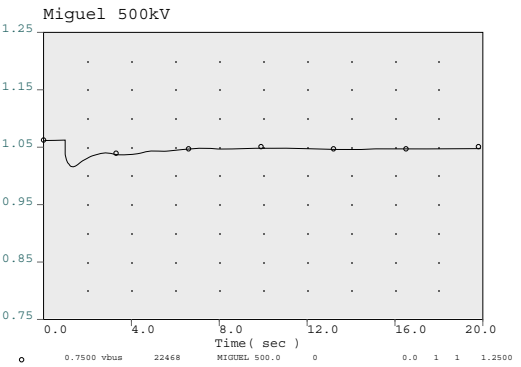
Devers 500



OtayMesa #3



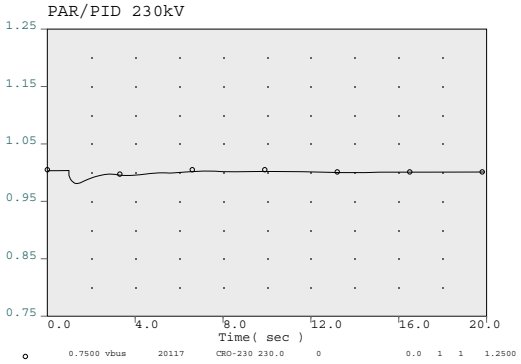
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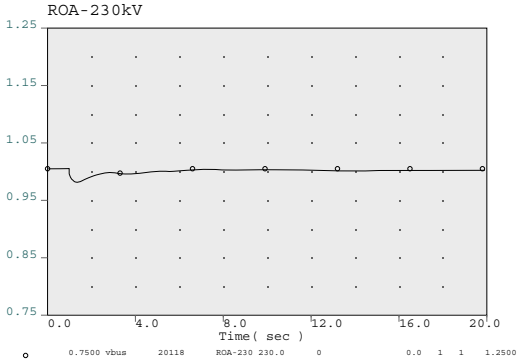
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

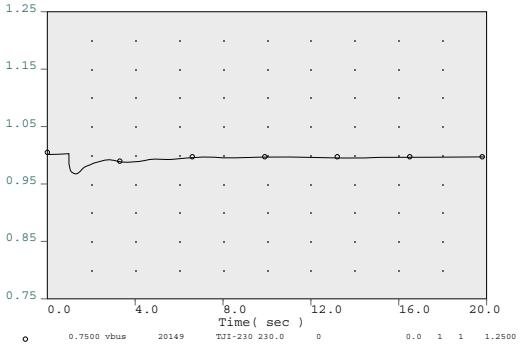
PAR/PID 230kV



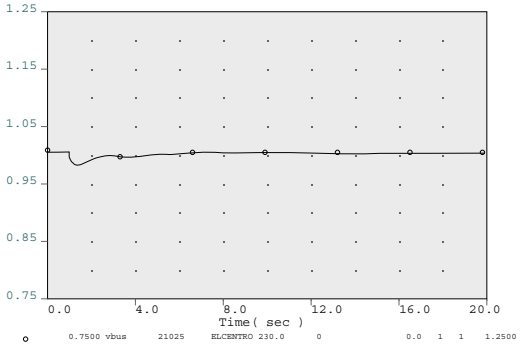
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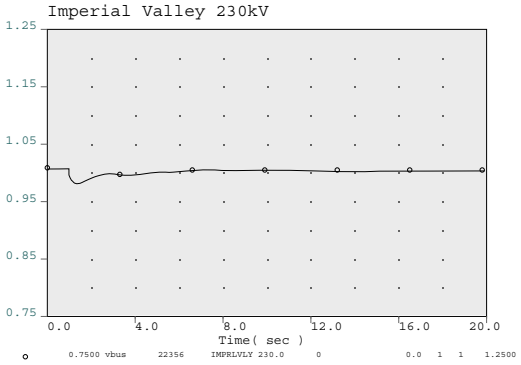
TJ1-230kV



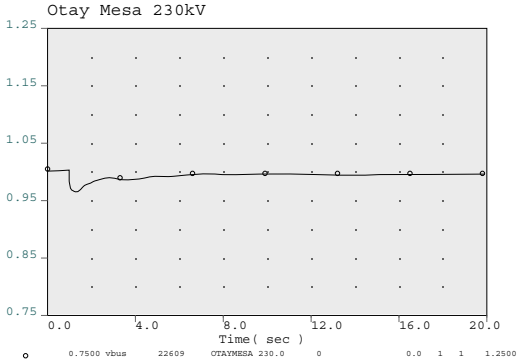
El Centro



Imperial Valley 230kV

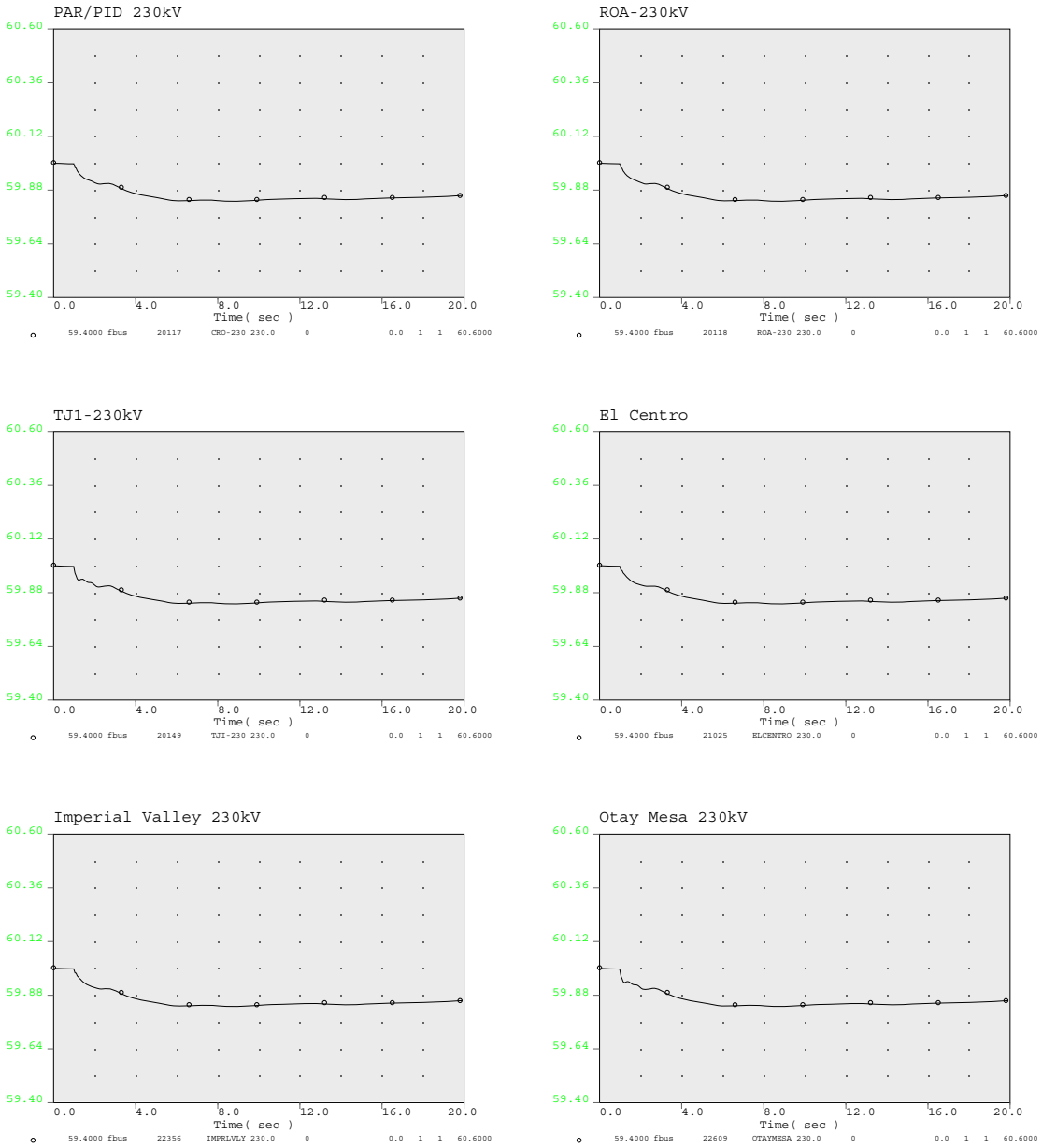


Otay Mesa 230kV



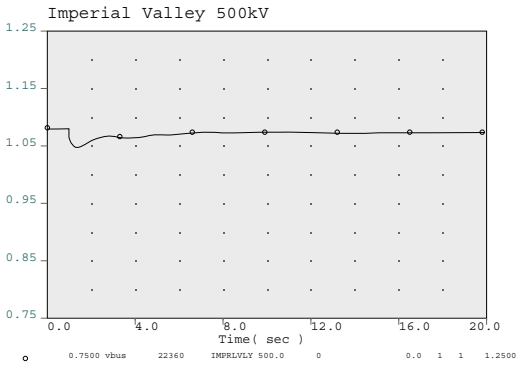
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

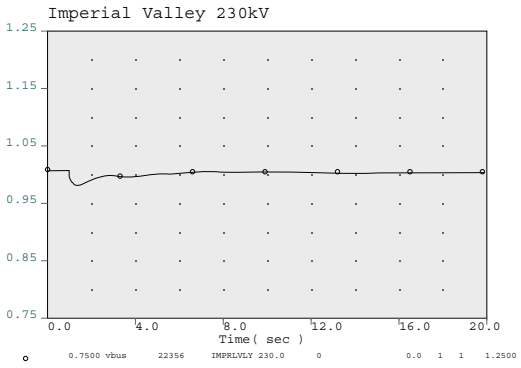
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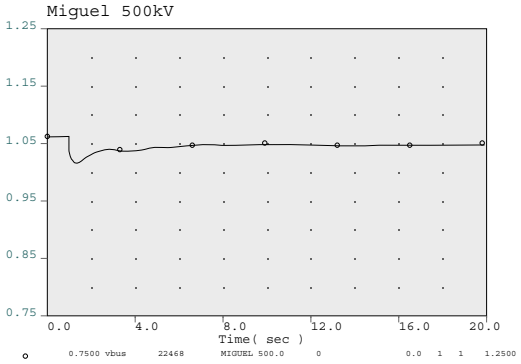


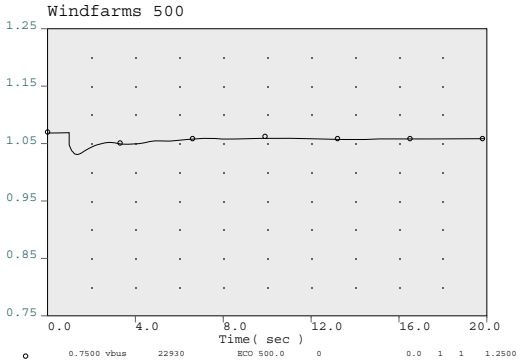
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

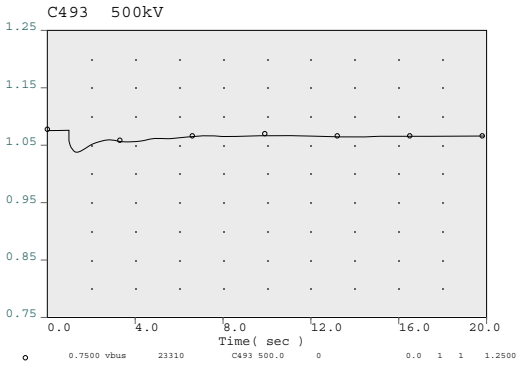
Imperial Valley Area - VOLTAGE

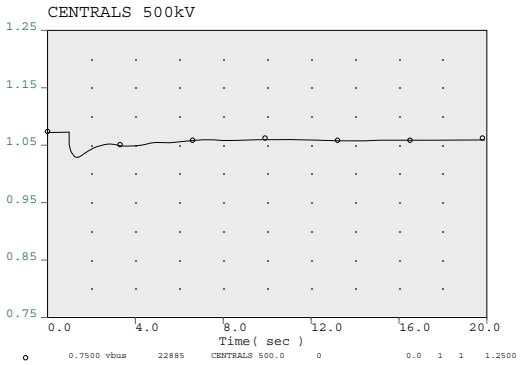






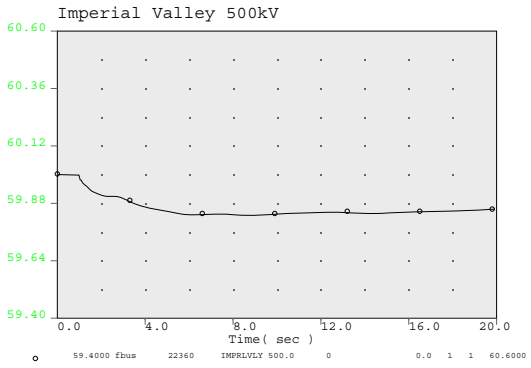


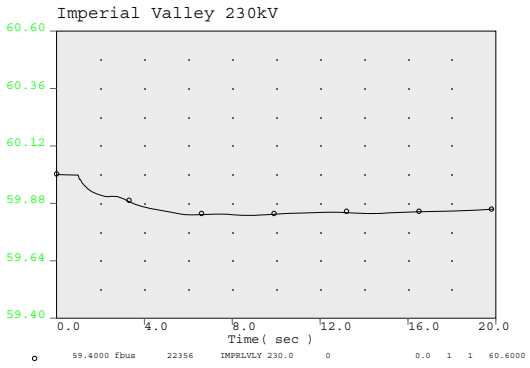


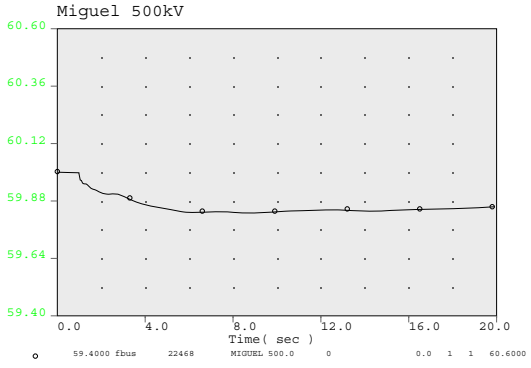


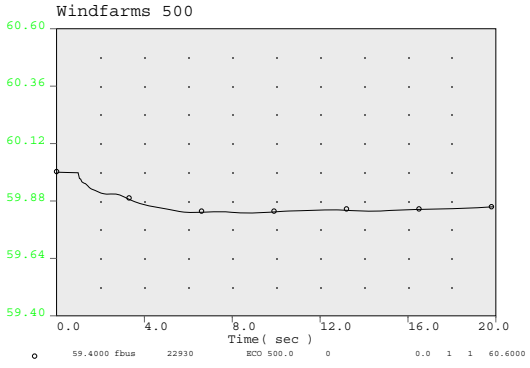
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

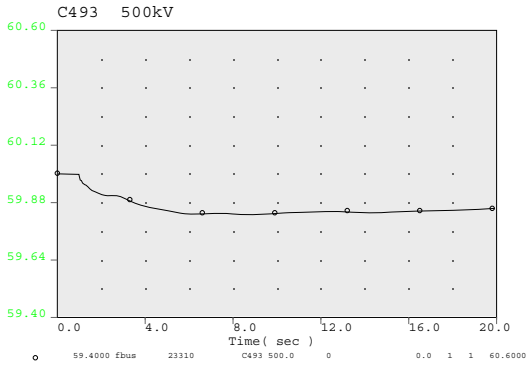
Imperial Valley Area - Frequency

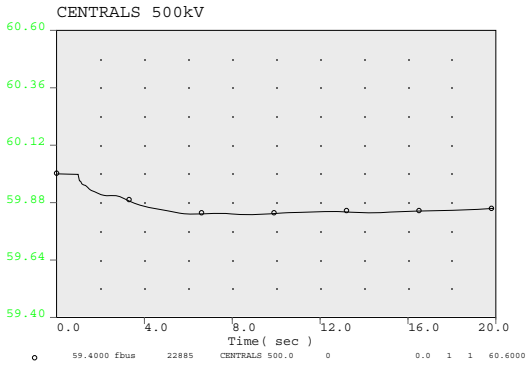






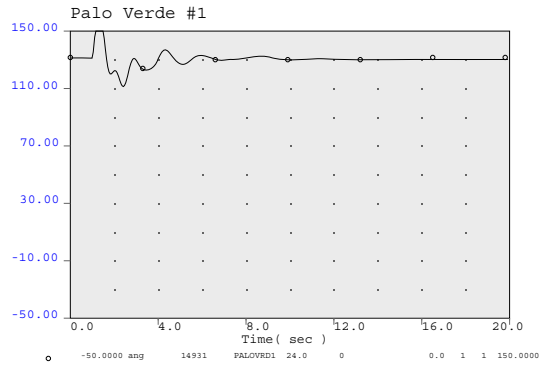


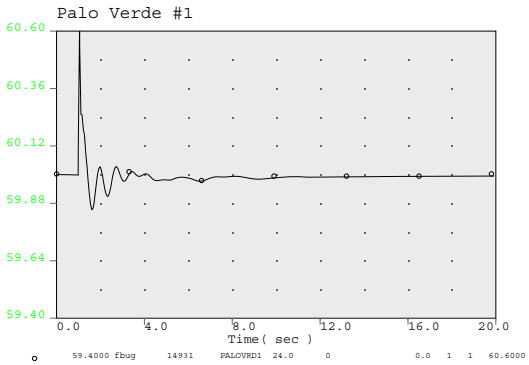


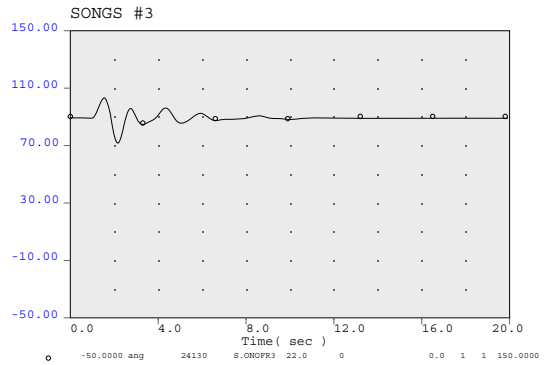


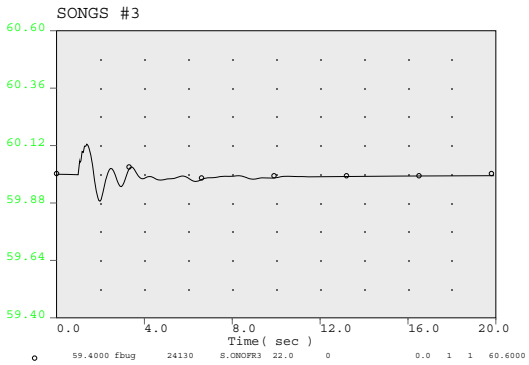
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

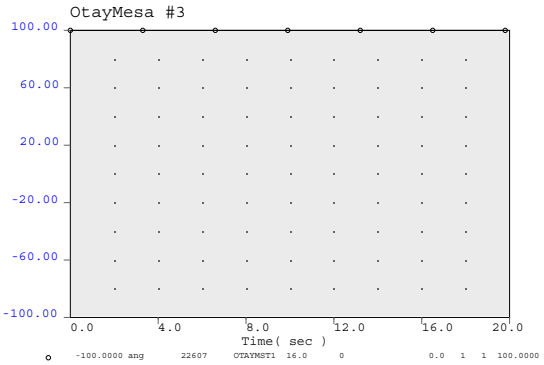
RELATIVE ROTOR ANGLE & FREQUENCY

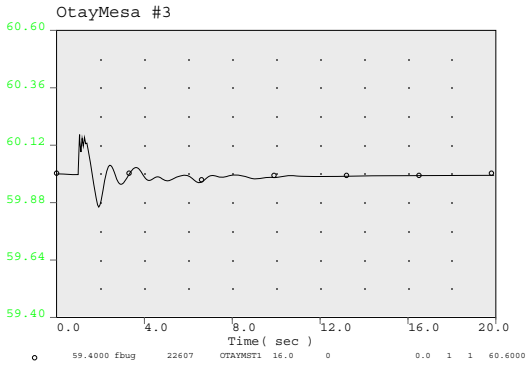












SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Page 1

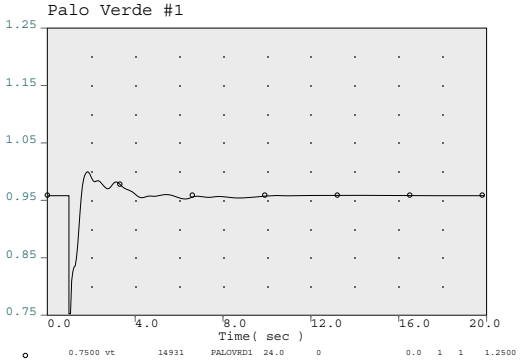
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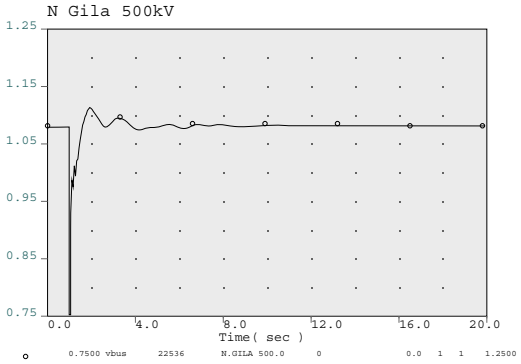
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RELATIVE VOLTAGE

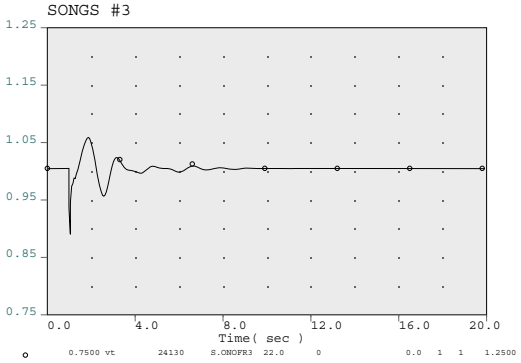
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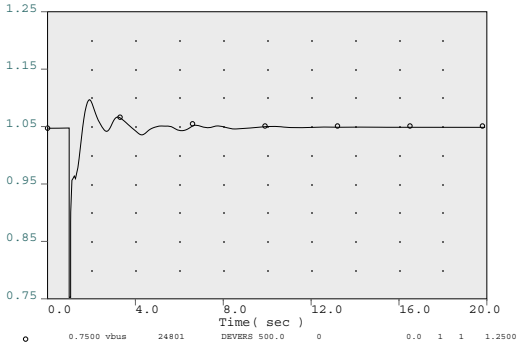
N Gila 500kV



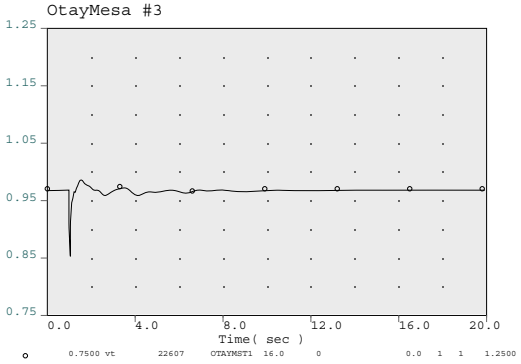
SONGS #3



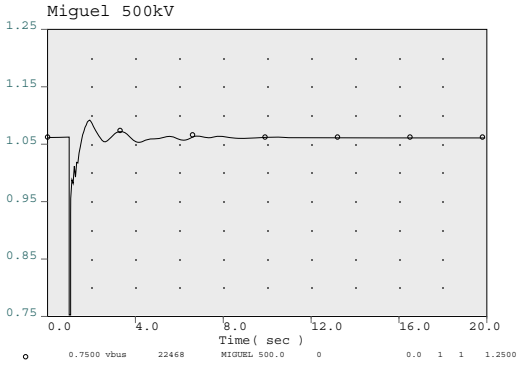
Devers 500



OtayMesa #3



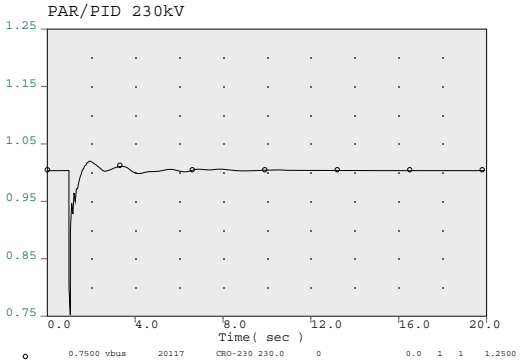
Miguel 500kV



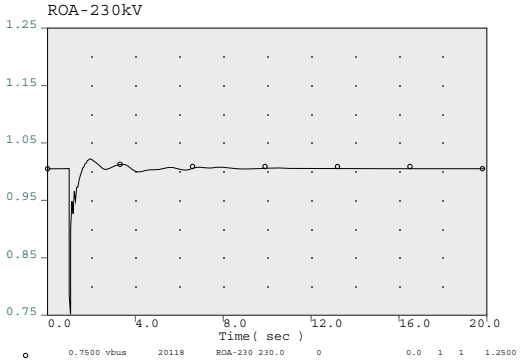
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

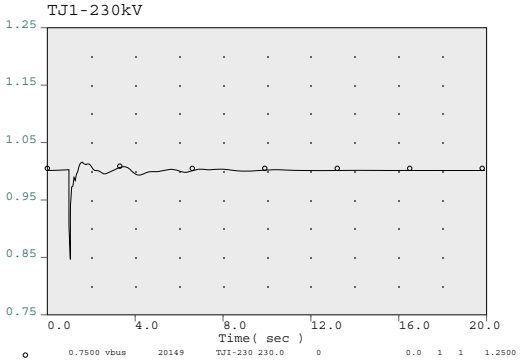
PAR/PID 230kV



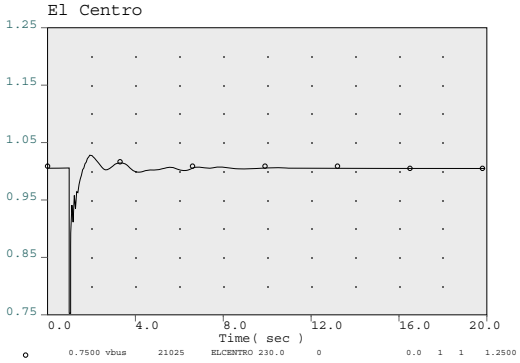
ROA-230kV



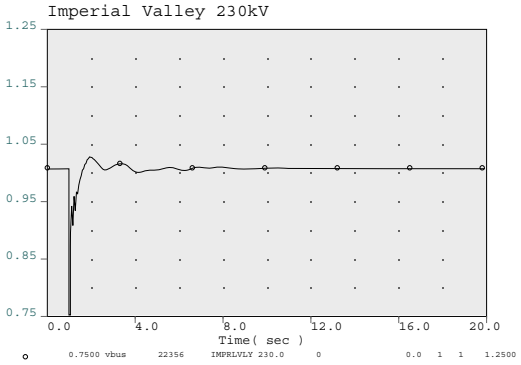
TJ1-230kV



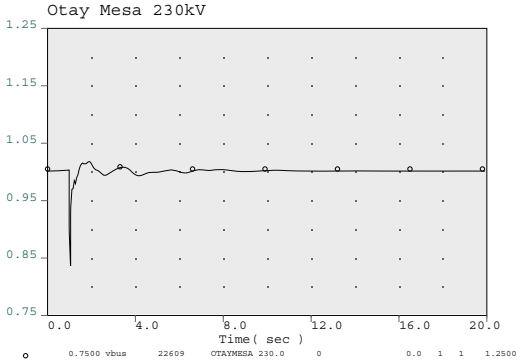
El Centro



Imperial Valley 230kV

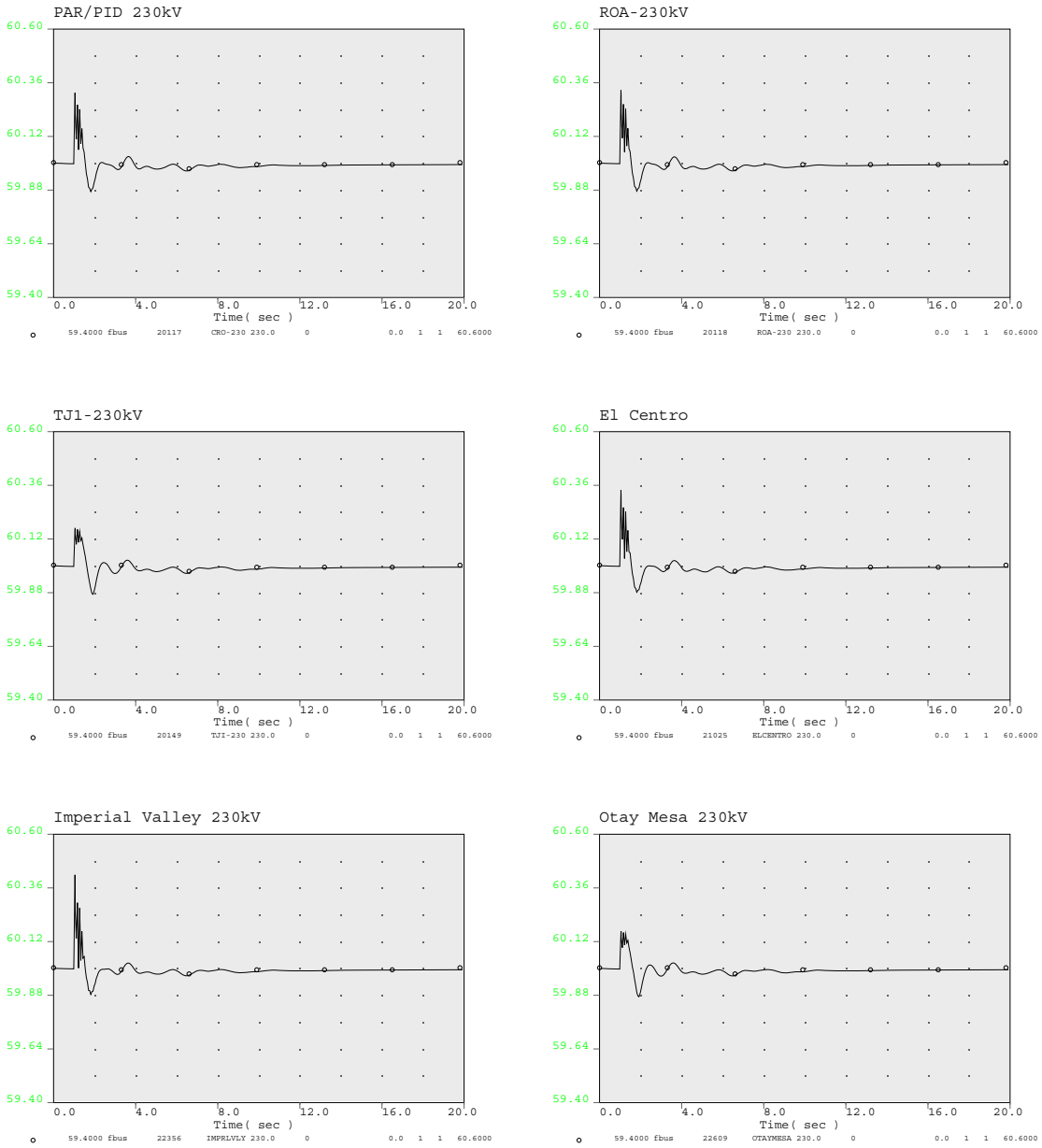


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

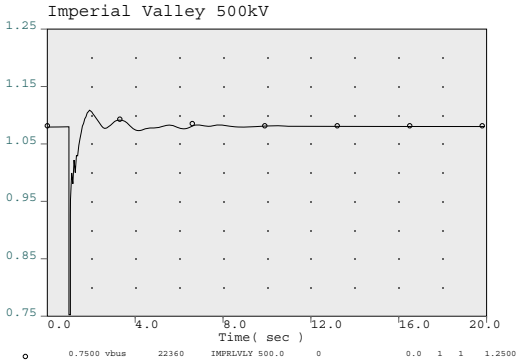
Affected System Frequency Check and Comparison



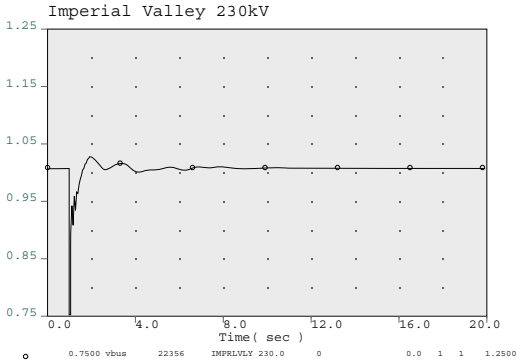
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Imperial Valley Area - VOLTAGE

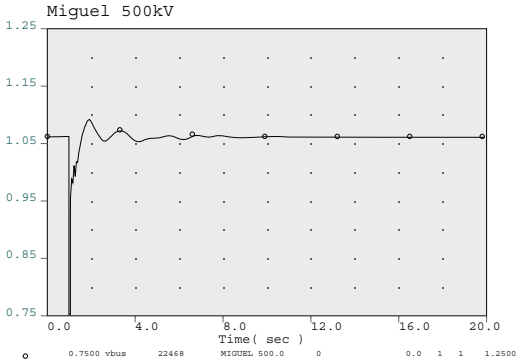
Imperial Valley 500kV



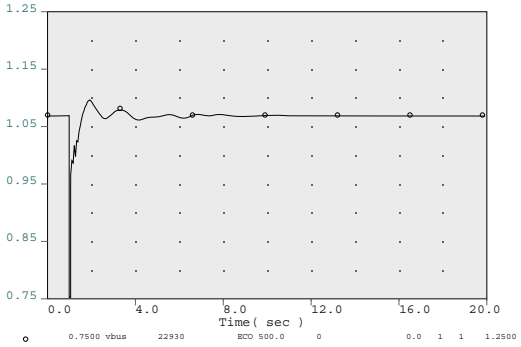
Imperial Valley 230kV



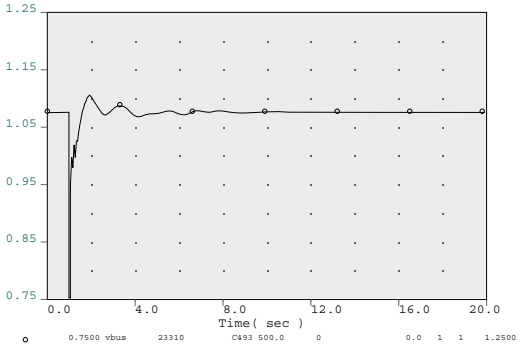
Miguel 500kV



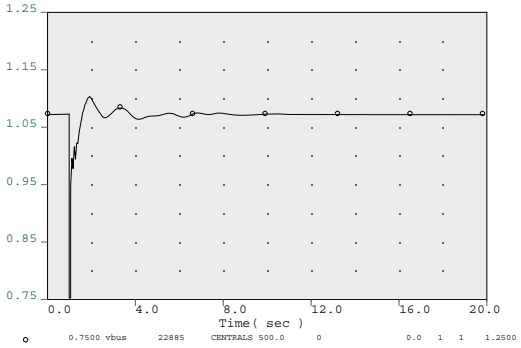
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

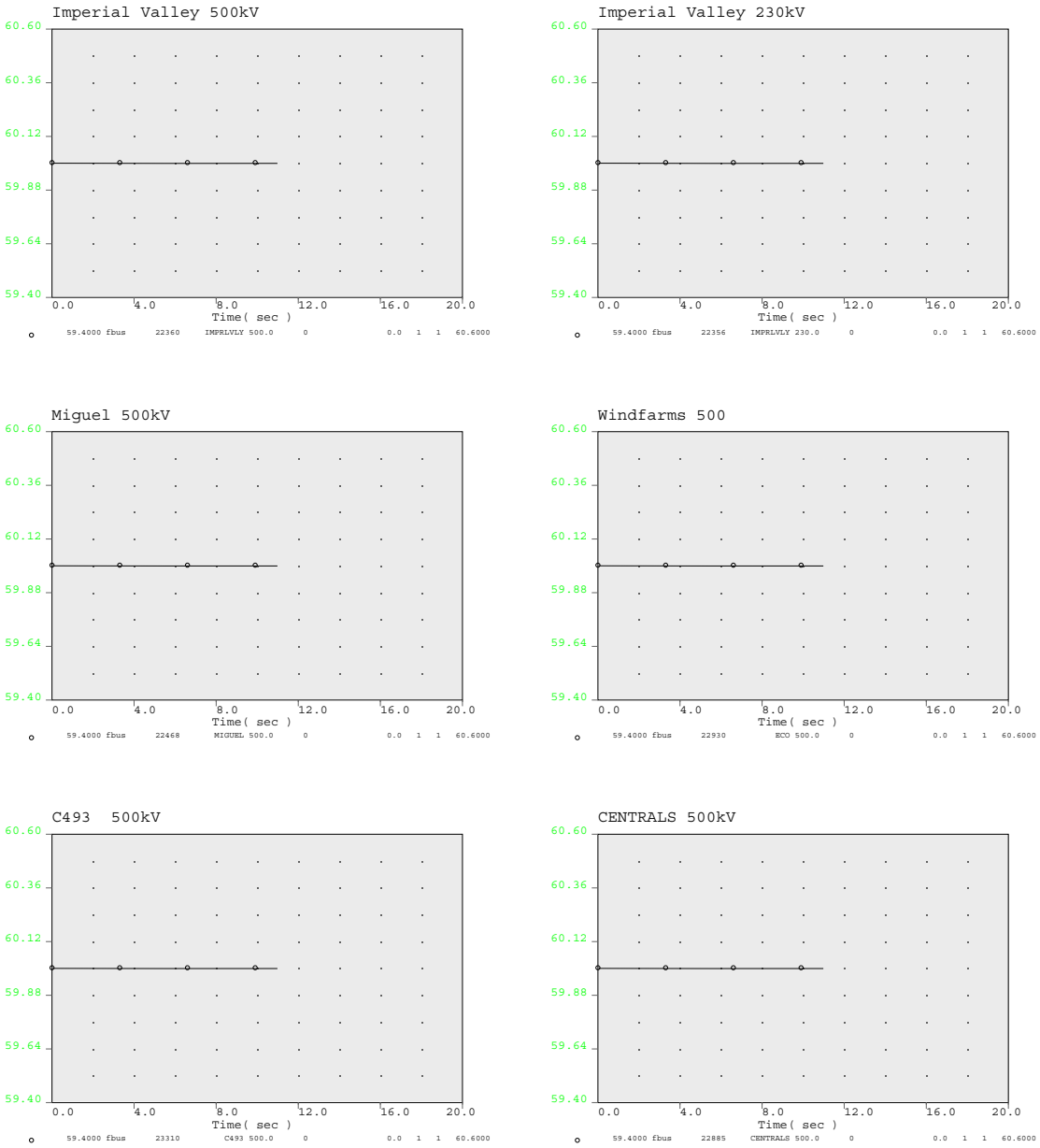
Appendix J-2

Transient Stability Analysis Plots

Imperial Valley Area Cluster &
Boulevard Cluster

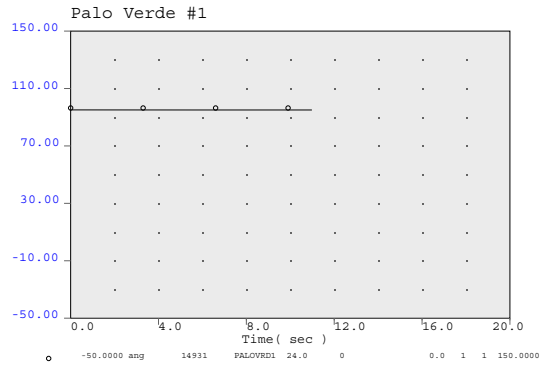
Light Load (Spring or Light Autumn) Pre

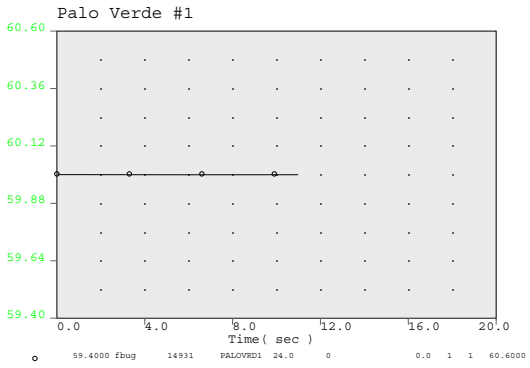
Imperial Valley Area - Frequency

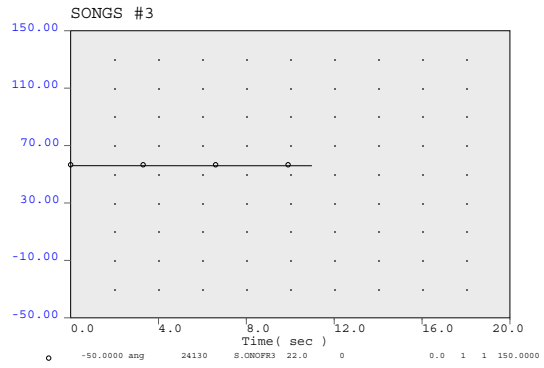


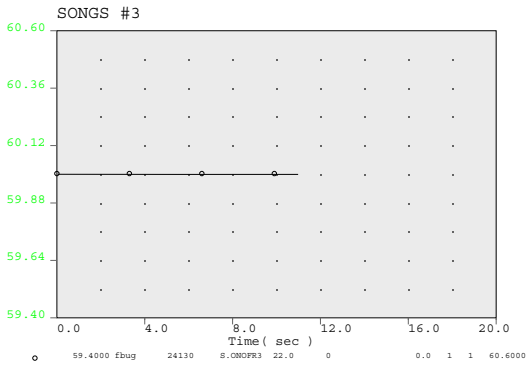
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

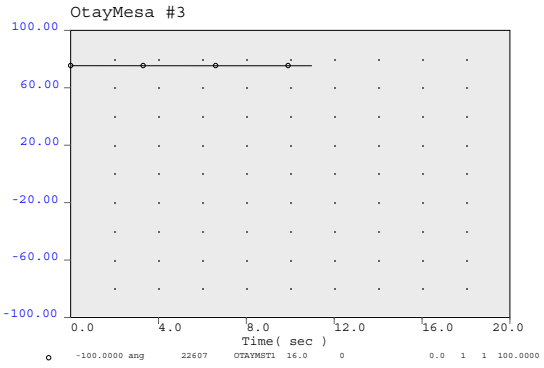
RELATIVE ROTOR ANGLE & FREQUENCY

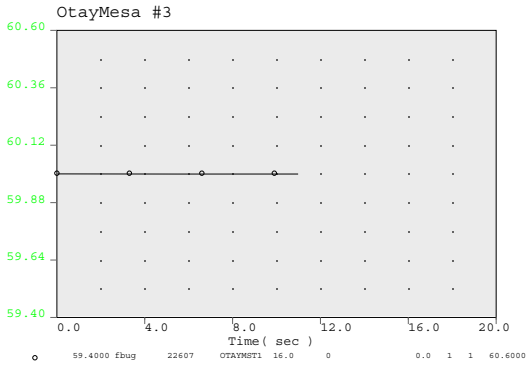










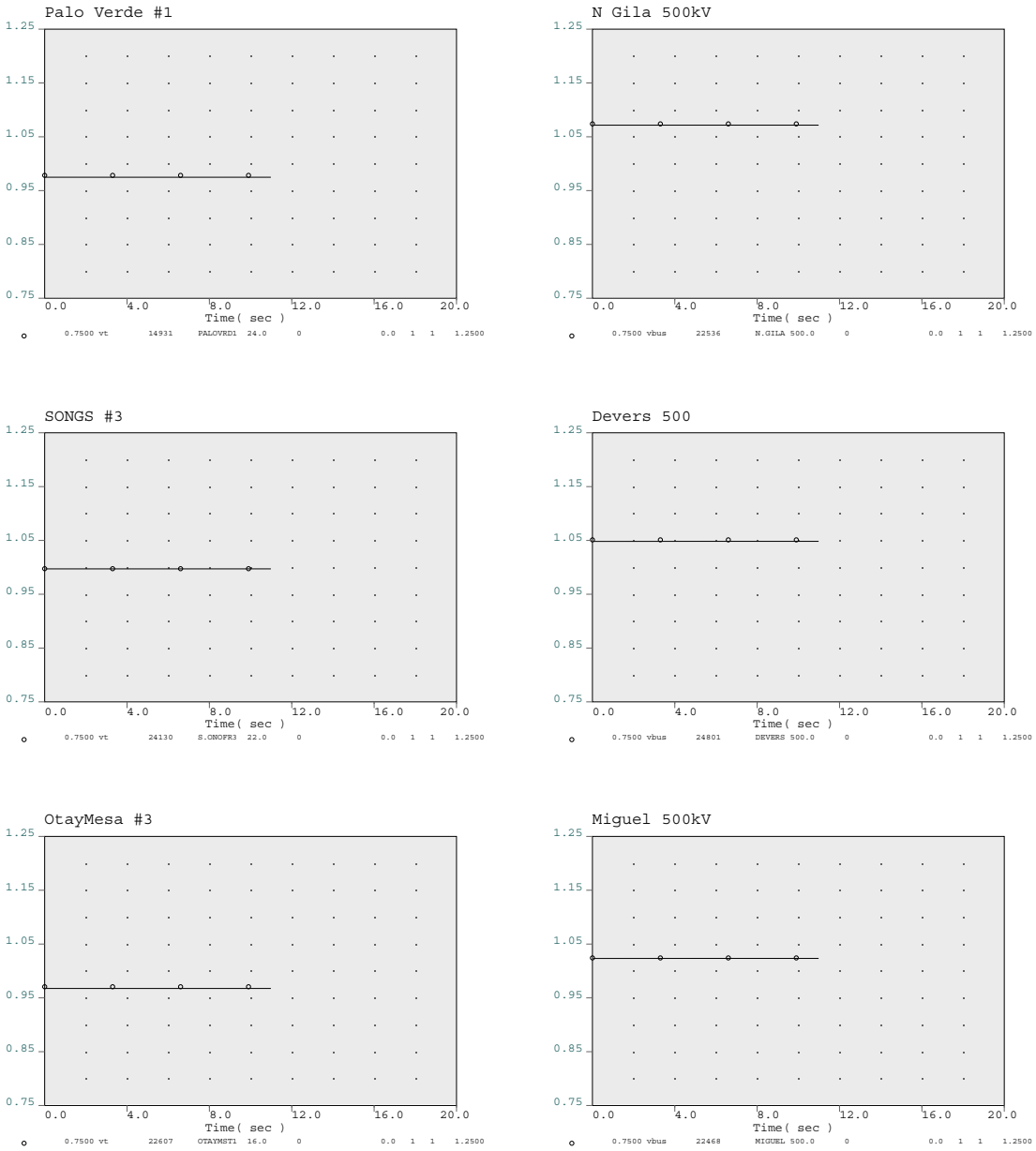


SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

Page 1

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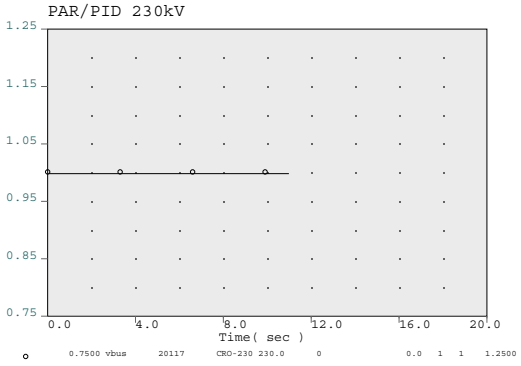
RELATIVE VOLTAGE



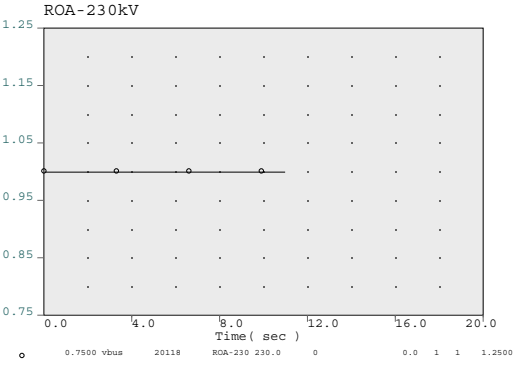
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

Affected System Voltage Check and Comparison

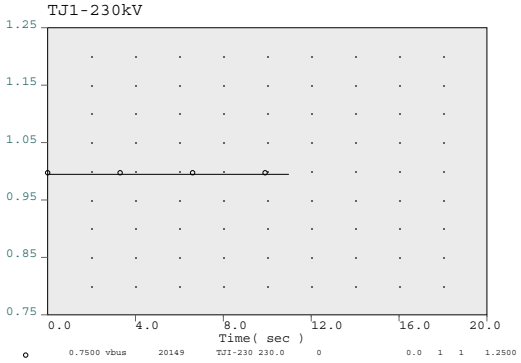
PAR/PID 230kV



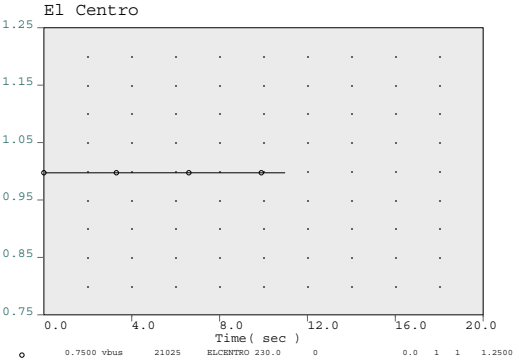
ROA-230kV



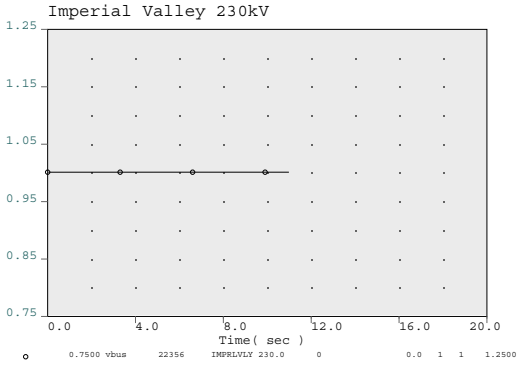
TJ1-230kV



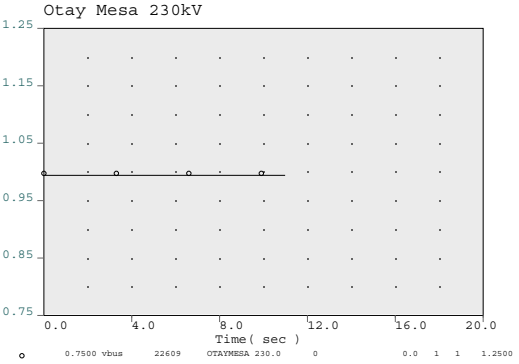
El Centro



Imperial Valley 230kV

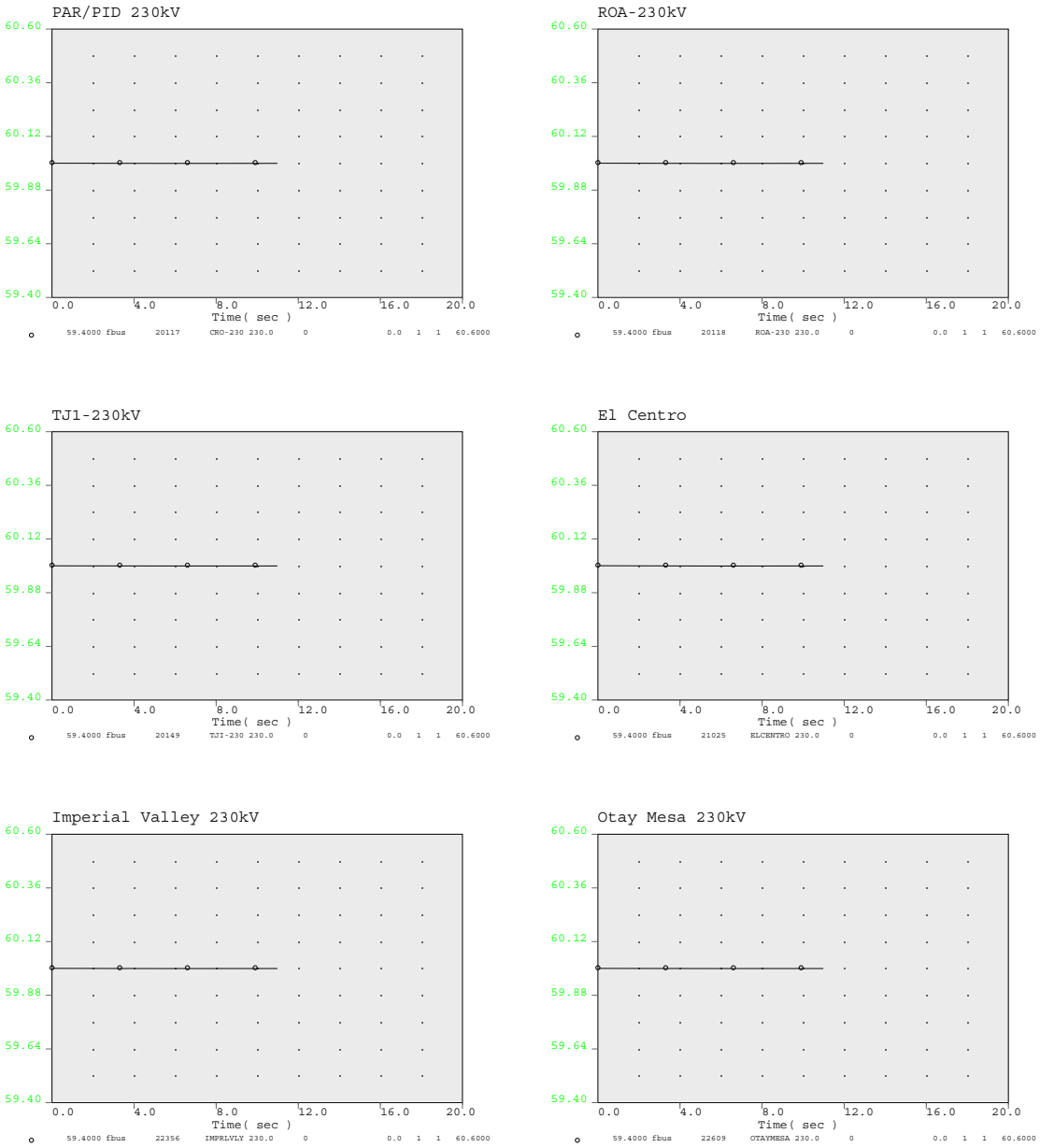


Otay Mesa 230kV



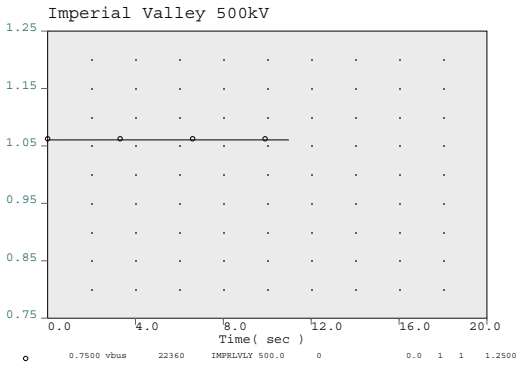
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

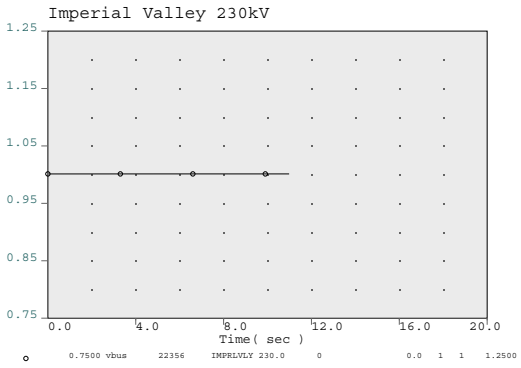
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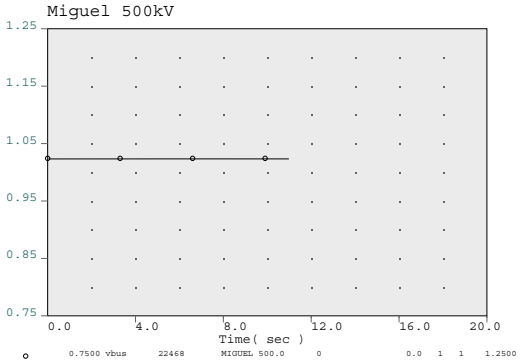


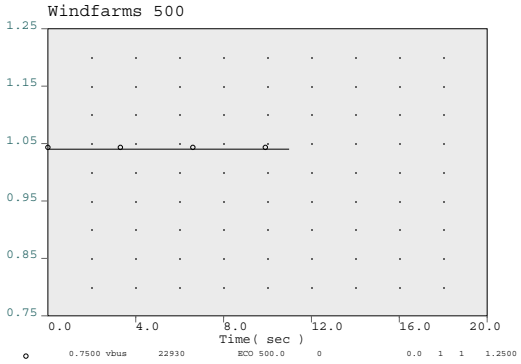
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

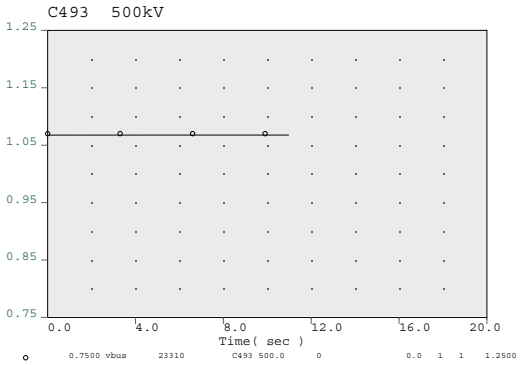
Imperial Valley Area - VOLTAGE

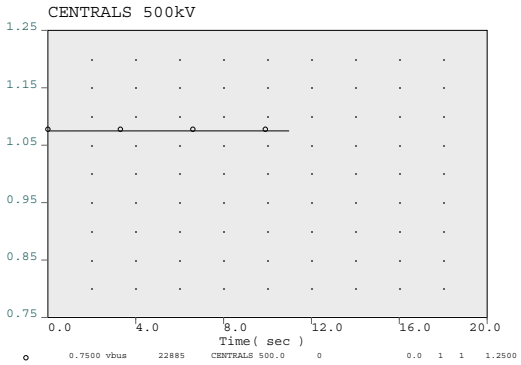












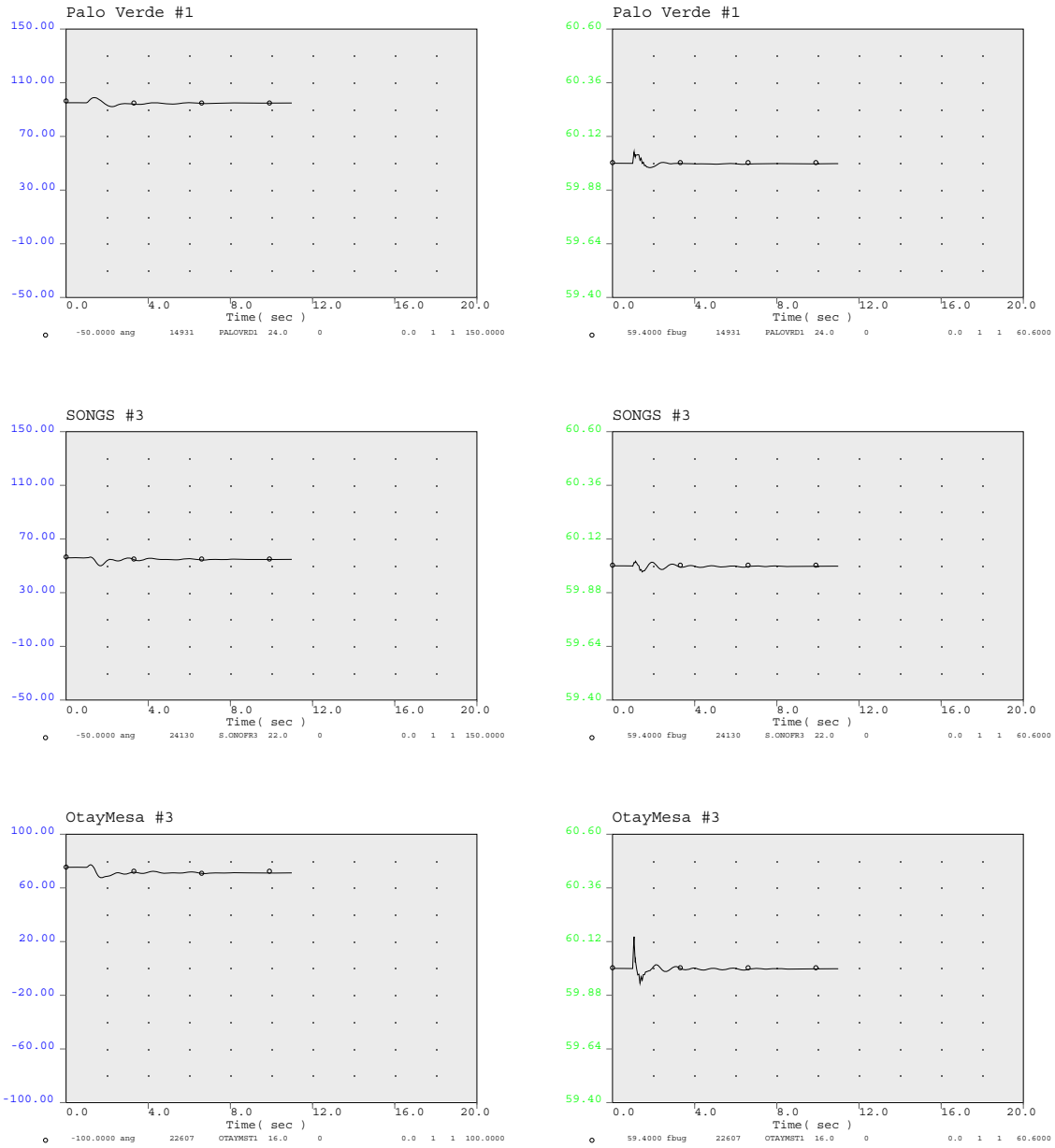
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Light Autumn
Valley - Devers 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

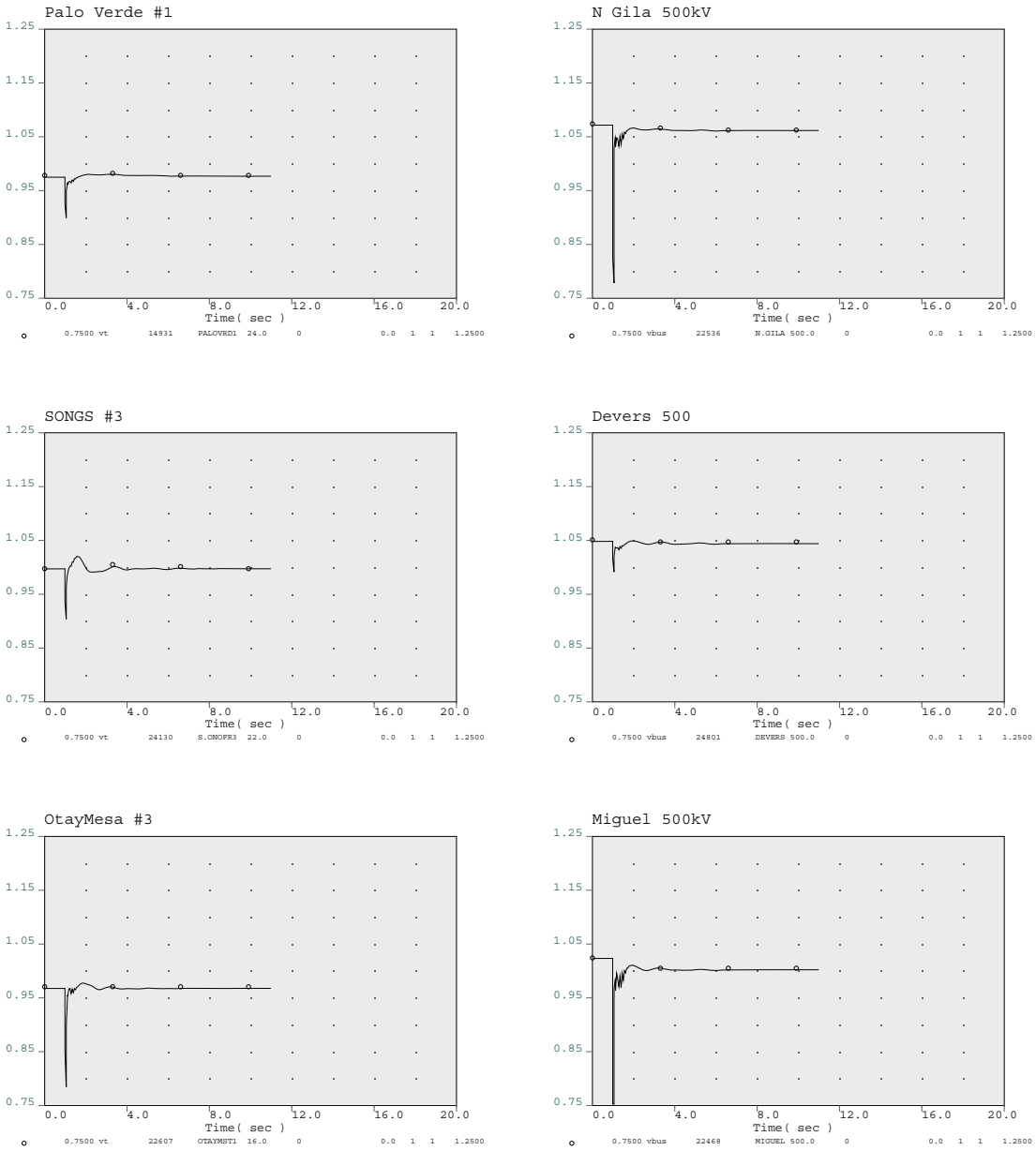


SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

Page 1

SDGE	C493_Cen_slo_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:28:30 2010

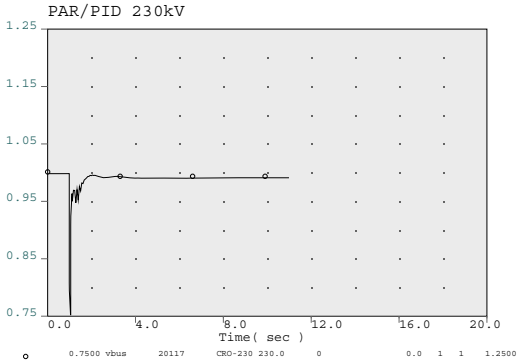
RELATIVE VOLTAGE



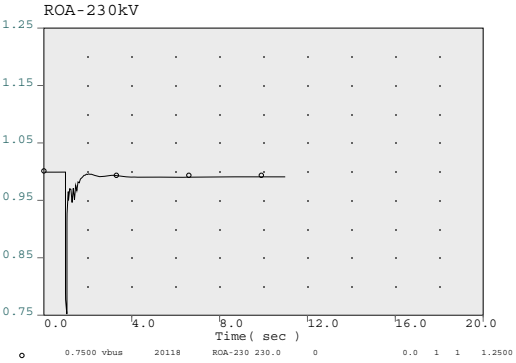
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

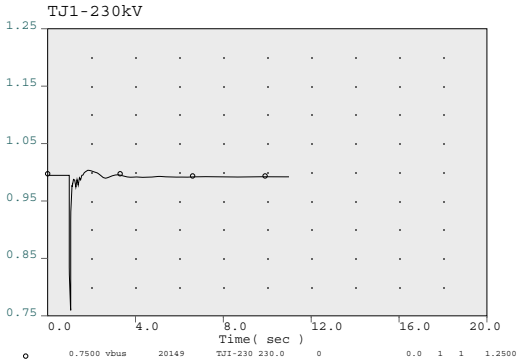
PAR/PID 230kV



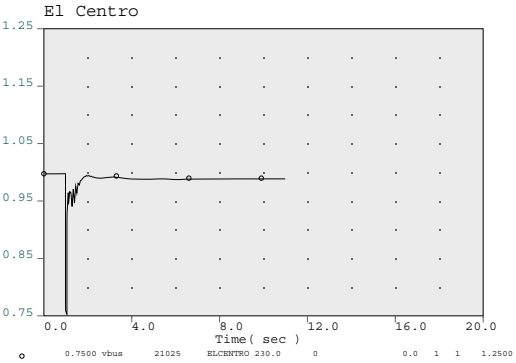
ROA-230kV



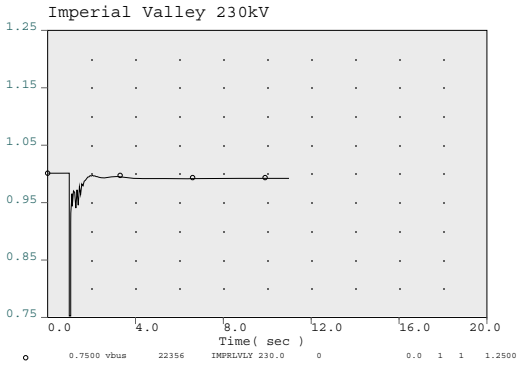
TJ1-230kV



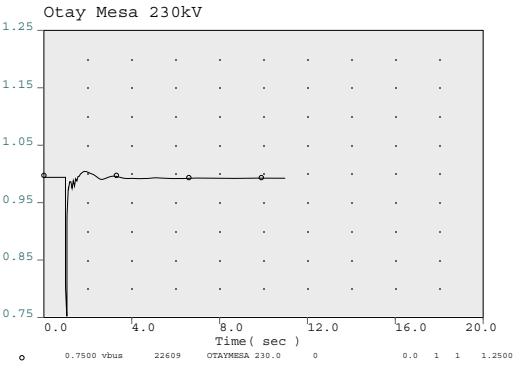
El Centro



Imperial Valley 230kV



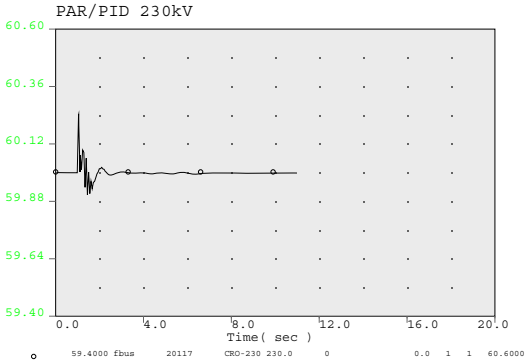
Otay Mesa 230kV



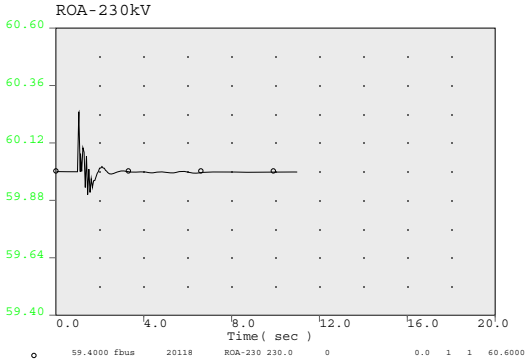
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Frequency Check and Comparison

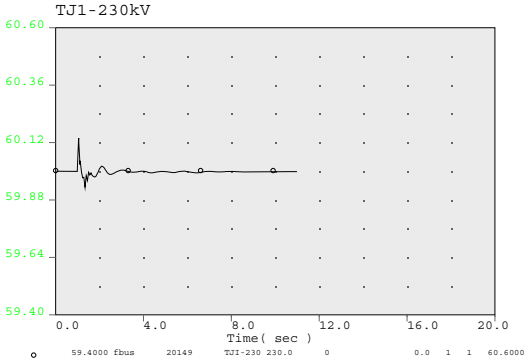
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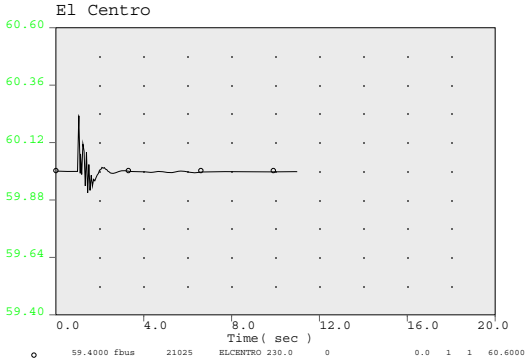
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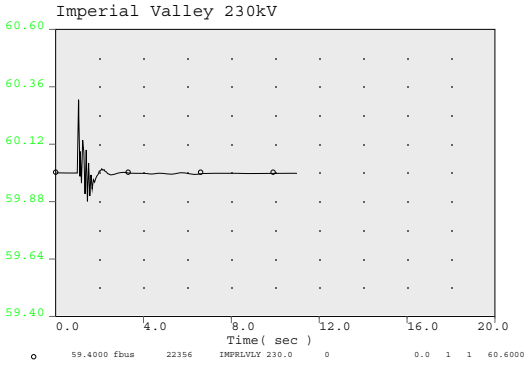
TJ1-230kV



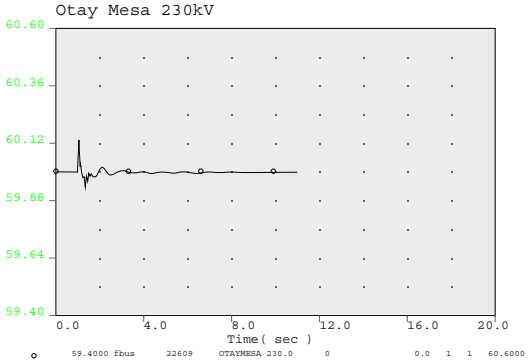
El Centro



Imperial Valley 230kV

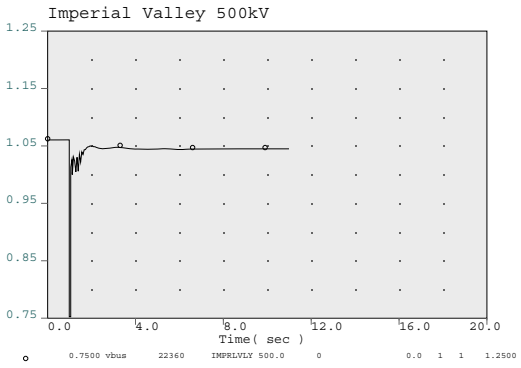


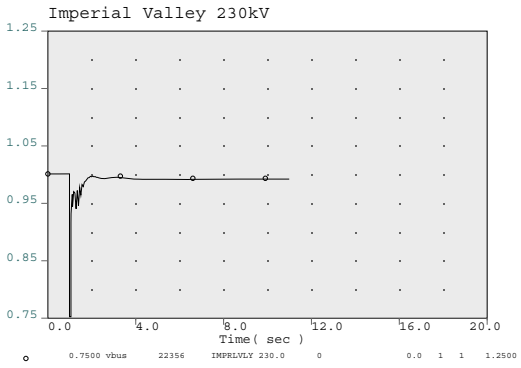
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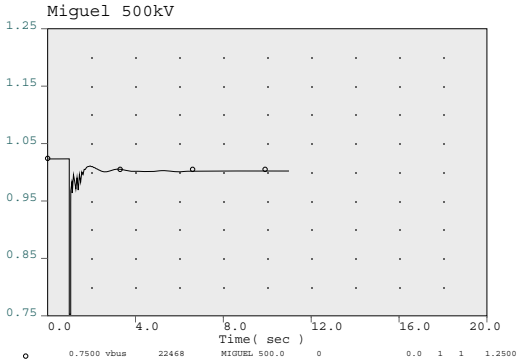


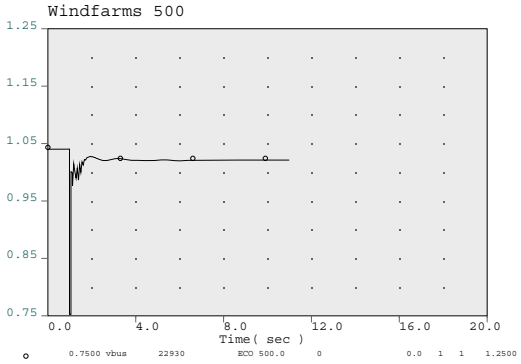
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

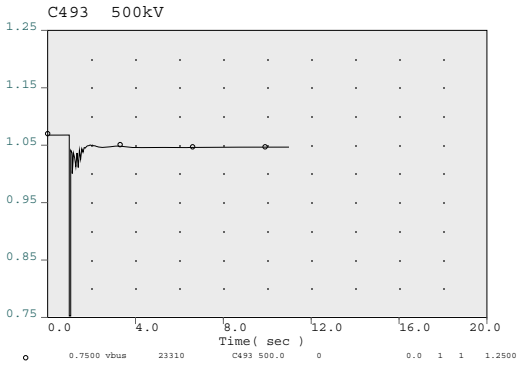
Imperial Valley Area - VOLTAGE

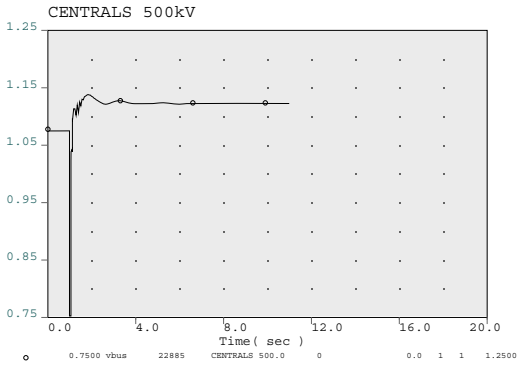






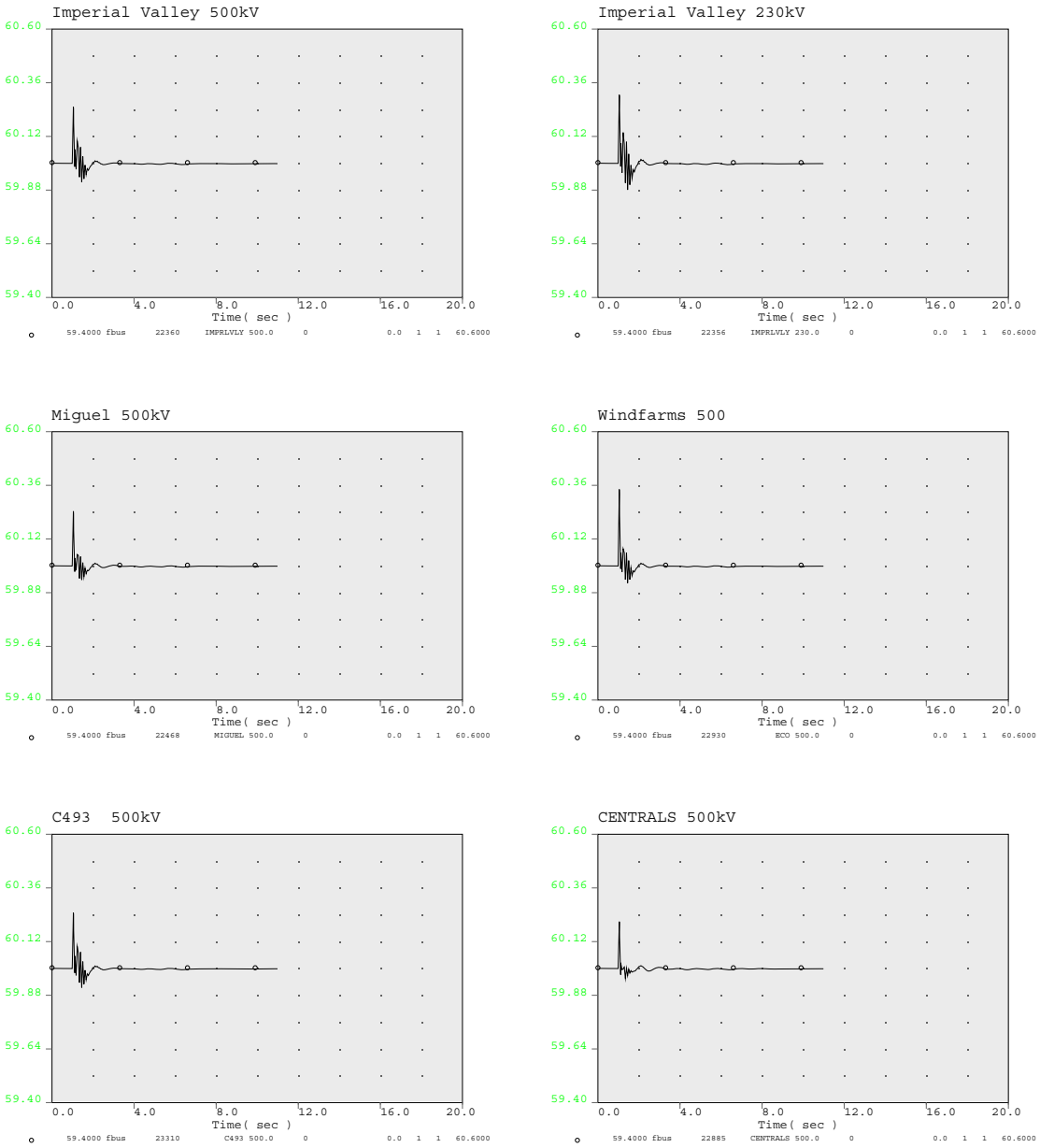






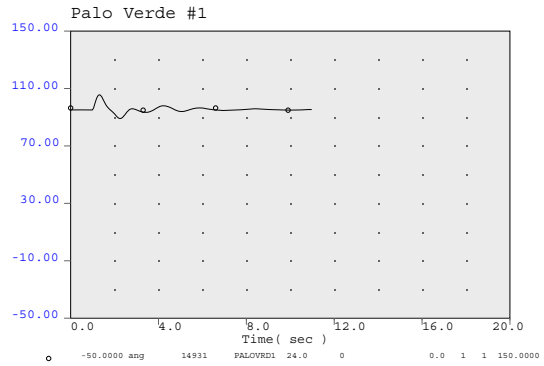
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

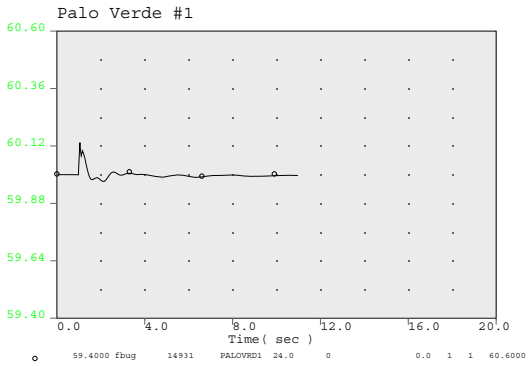
Imperial Valley Area - Frequency

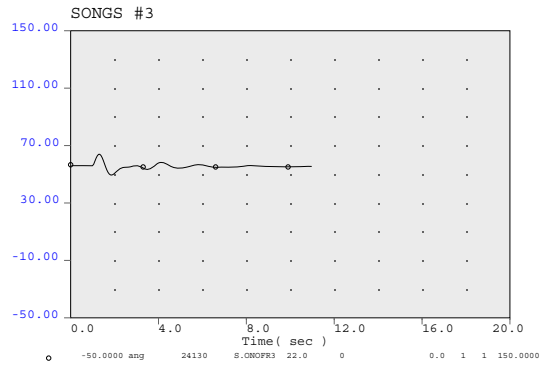


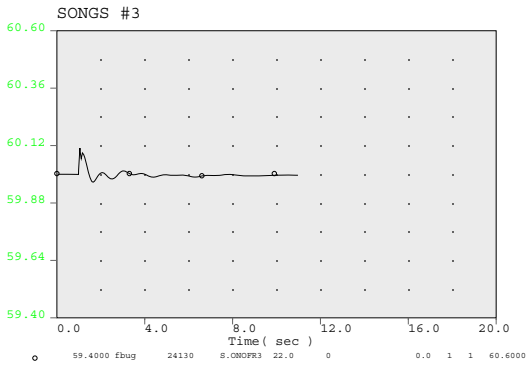
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

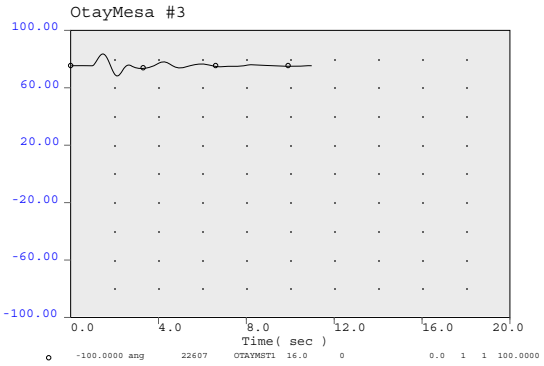
RELATIVE ROTOR ANGLE & FREQUENCY

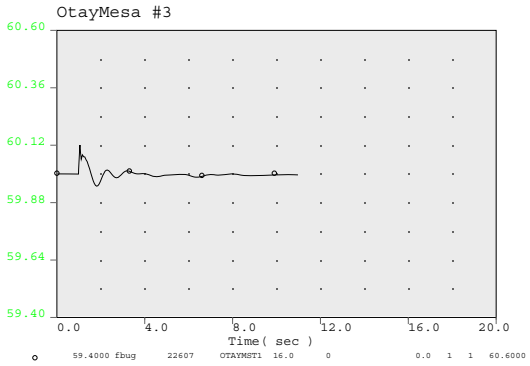






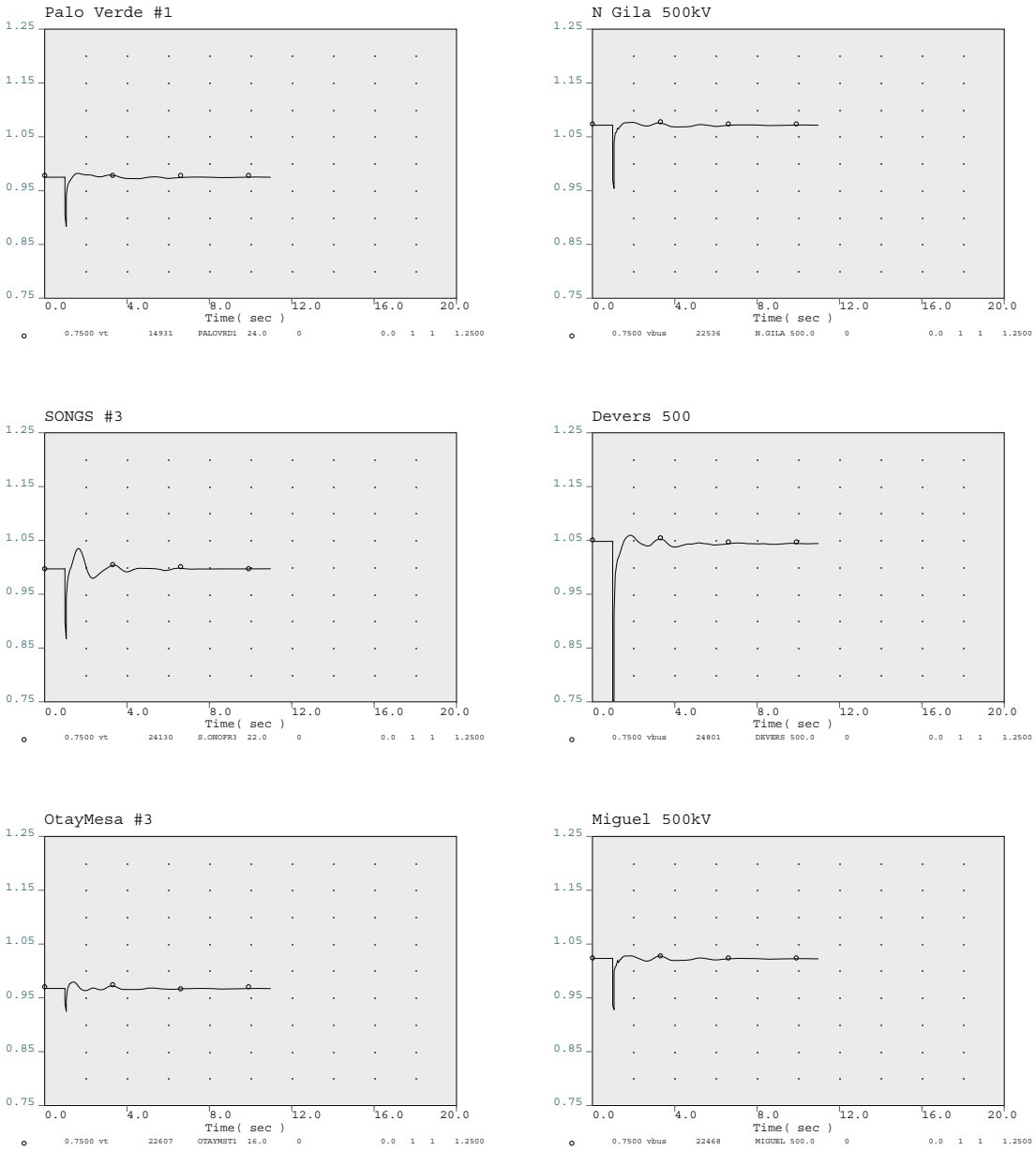






SDG&E Cluster 2 - pre
2014 Light Autumn
Valley - Devers 500 kV line

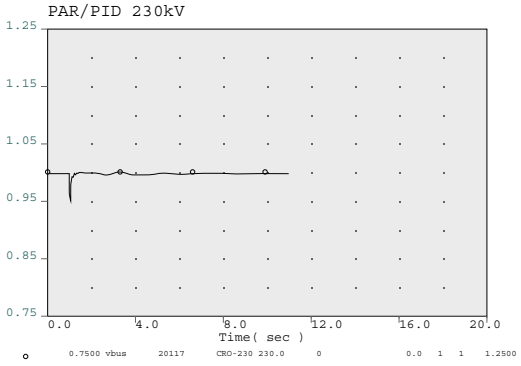
RELATIVE VOLTAGE



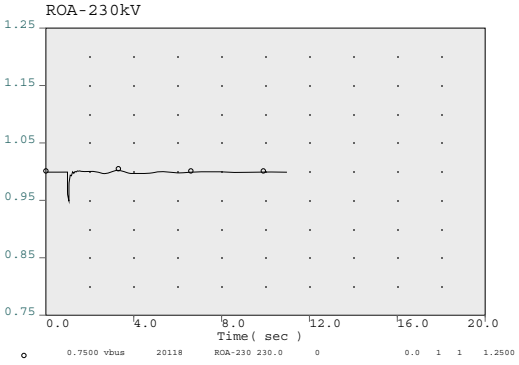
SDG&E Cluster 2 - pre
2014 Light Autumn
Valley - Devers 500 kV line

Affected System Voltage Check and Comparison

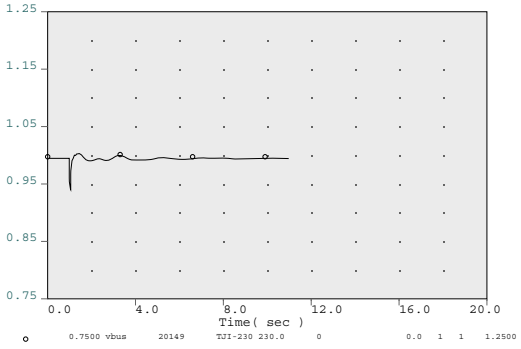
PAR/PID 230kV



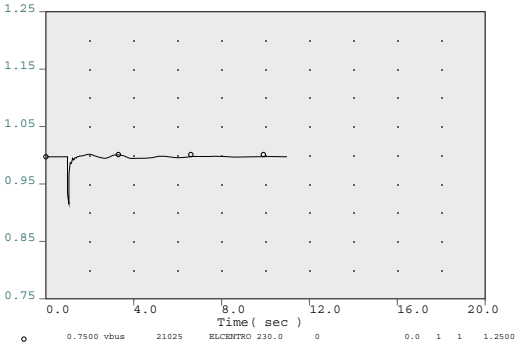
ROA-230kV



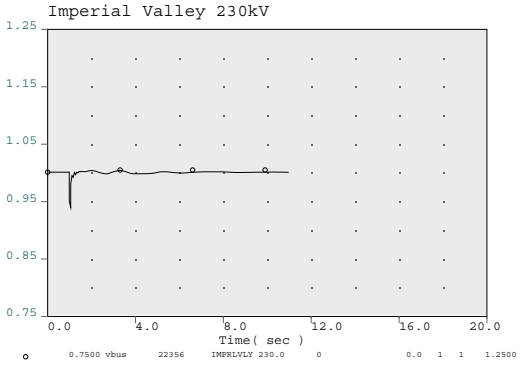
TJ1-230kV



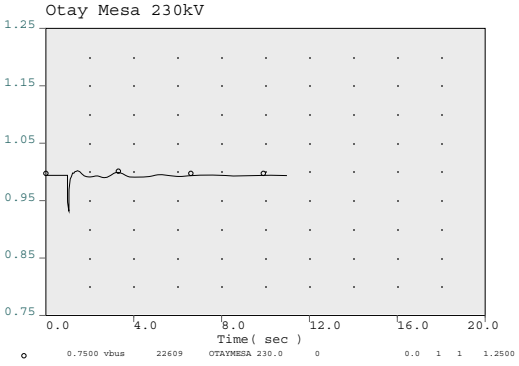
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Valley - Devers 500 kV line

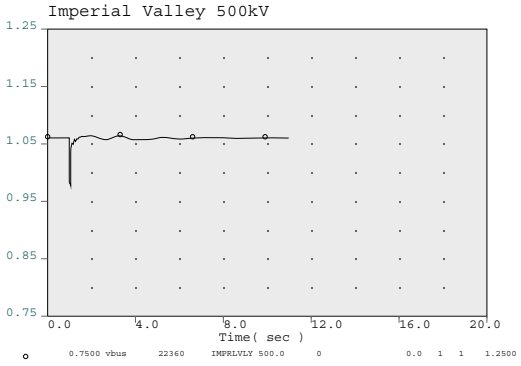
Affected System Frequency Check and Comparison



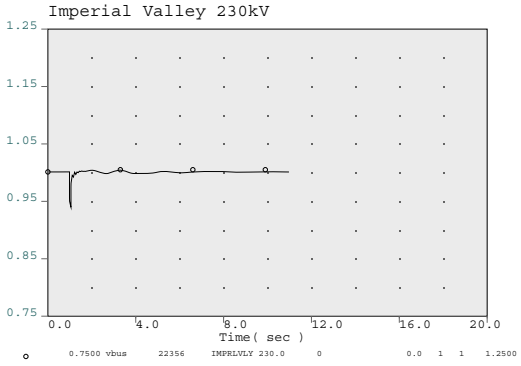
SDG&E Cluster 2 - pre
2014 Light Autumn
Valley - Devers 500 kV line

Imperial Valley Area - VOLTAGE

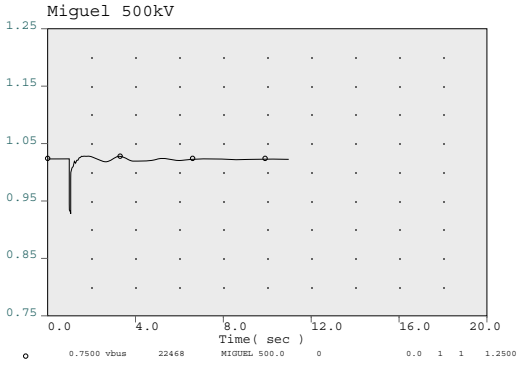
Imperial Valley 500kV



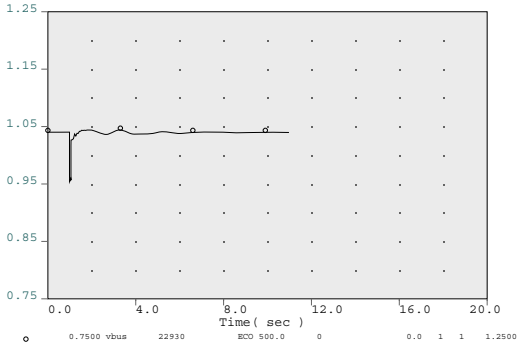
Imperial Valley 230kV



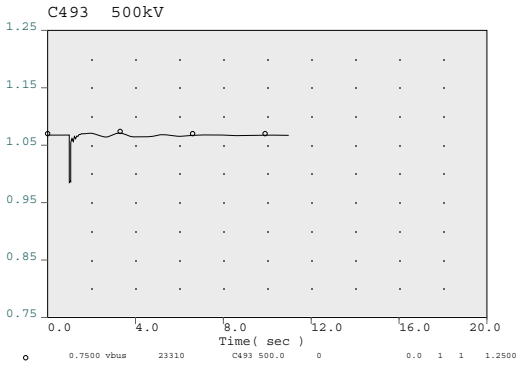
Miguel 500kV



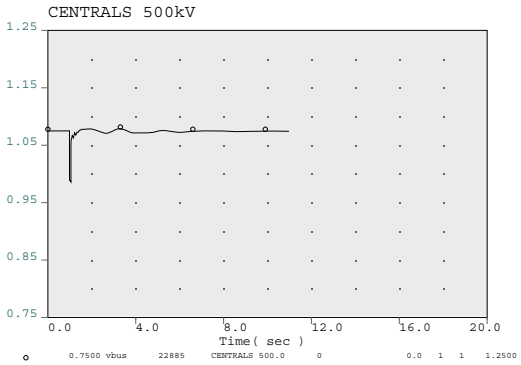
Windfarms 500



C493 500kV

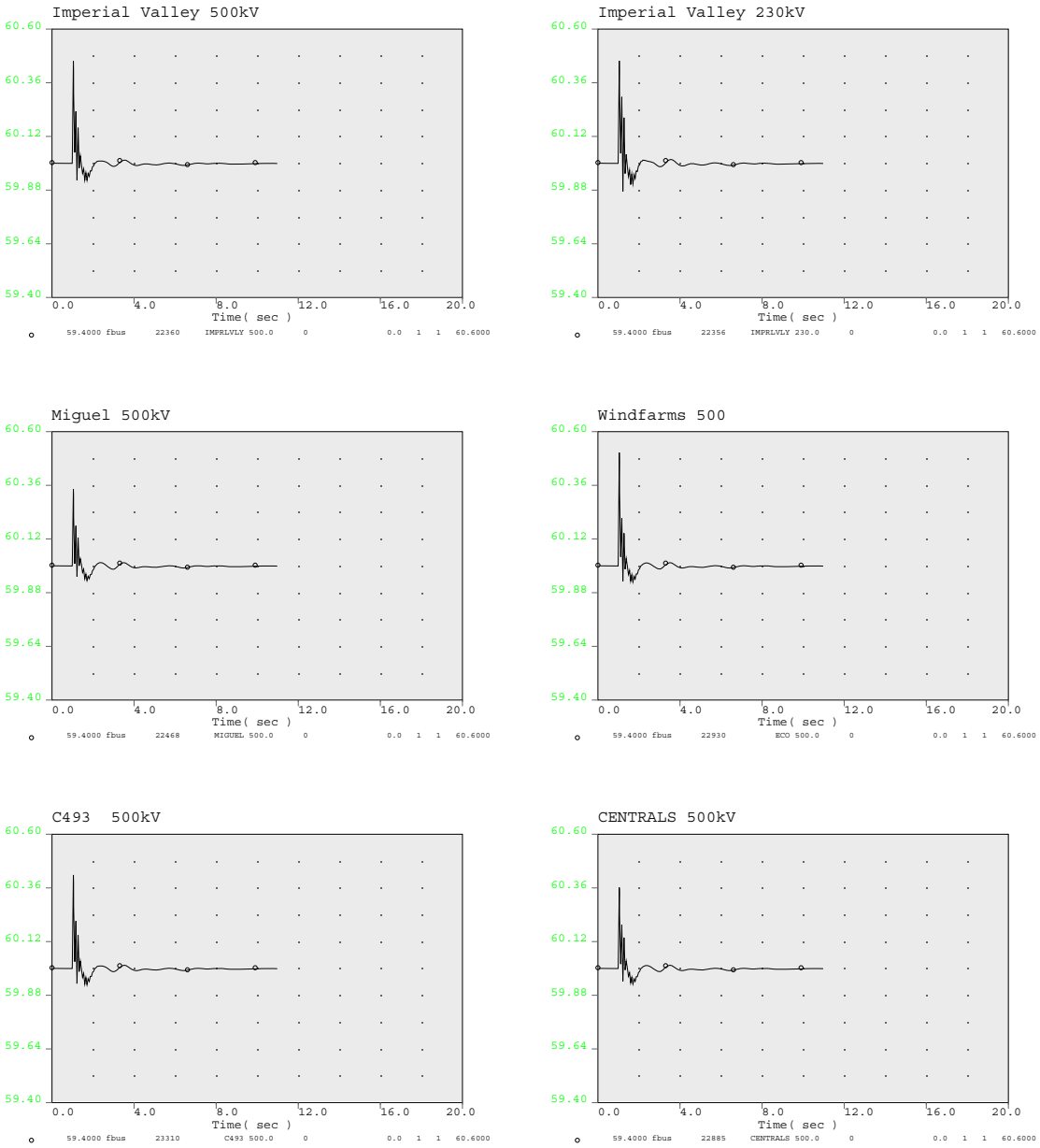


CENTRALS 500kV



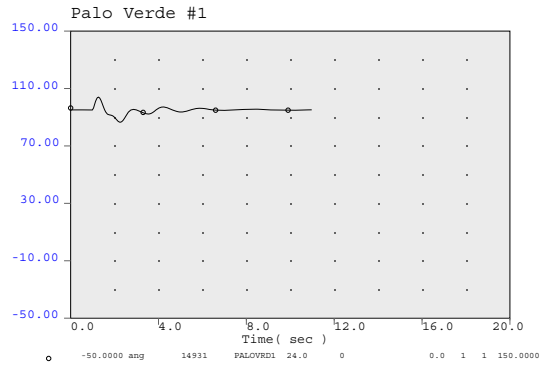
SDG&E Cluster 2 - pre
2014 Light Autumn
Valley - Devers 500 kV line

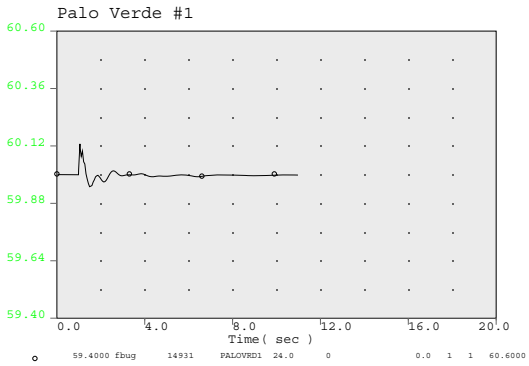
Imperial Valley Area - Frequency

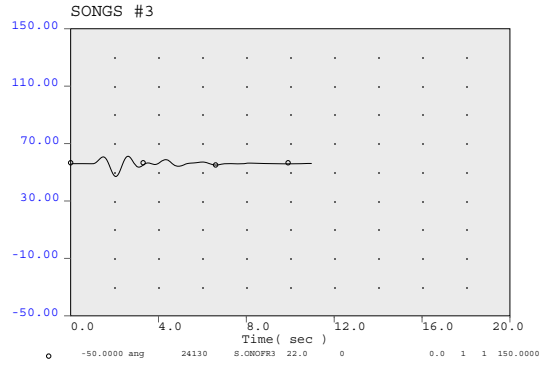


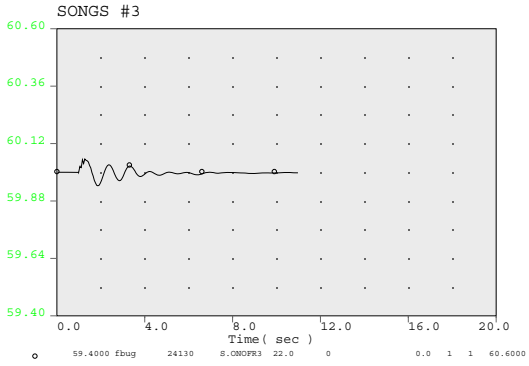
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

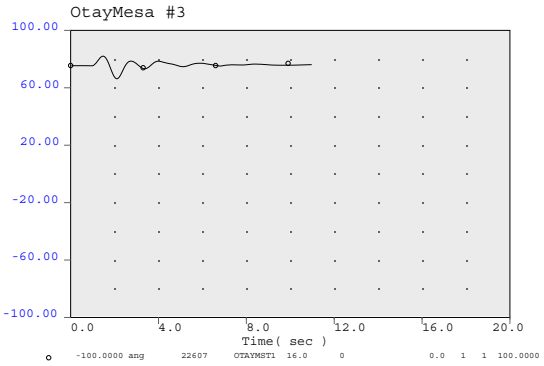
RELATIVE ROTOR ANGLE & FREQUENCY

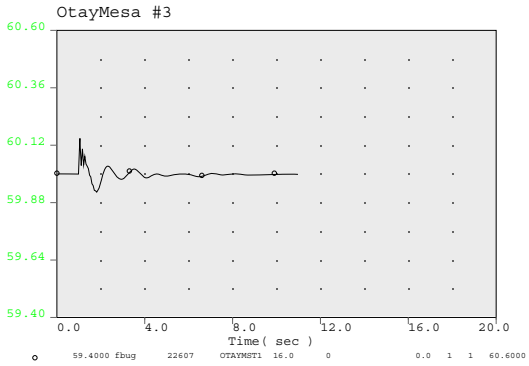










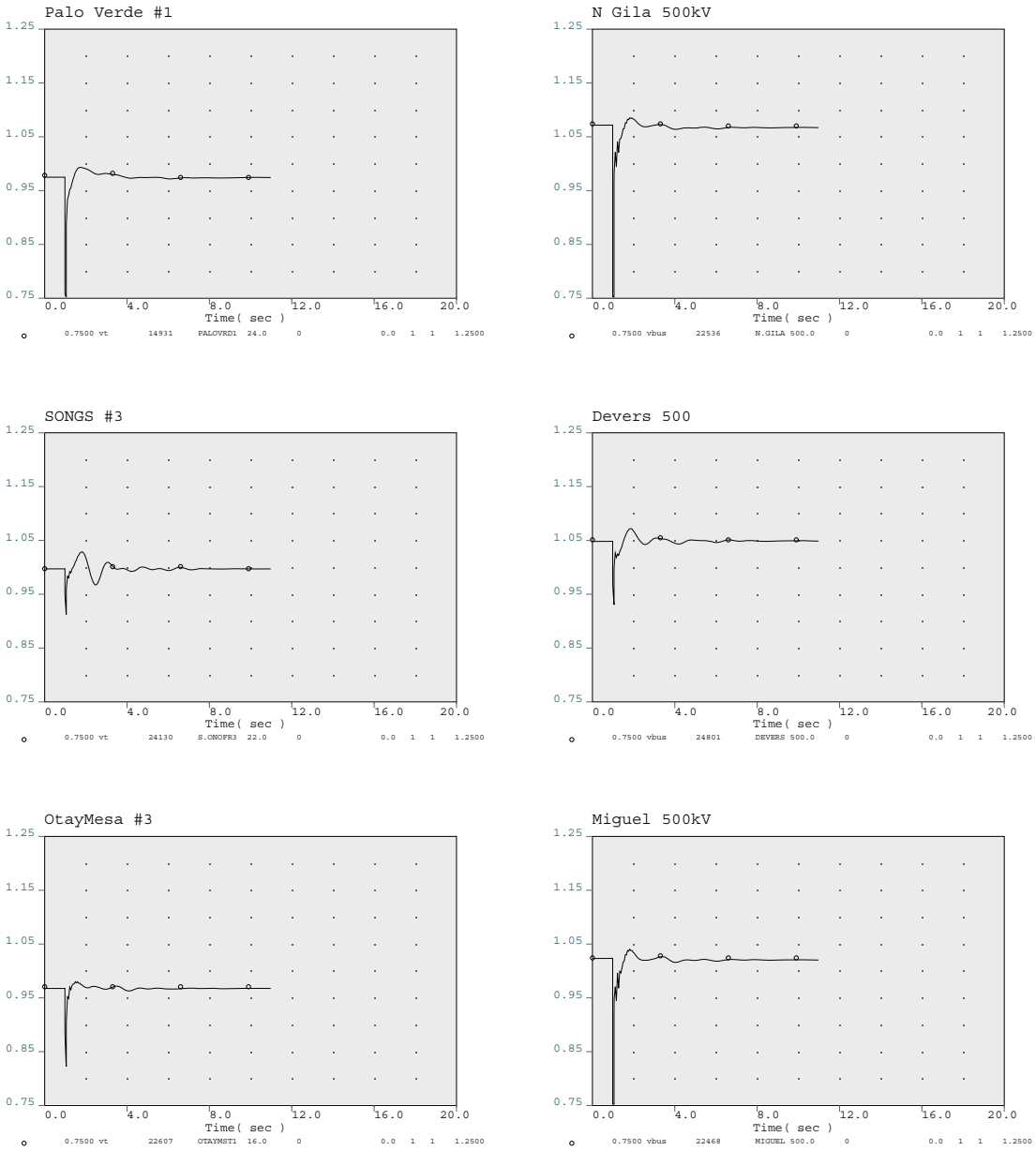


SDG&E Cluster 2 - pre
Light Autumn
Haasyampa-N.Gila 500 kV line

Page 1

SDGE	HAA_NGila_slo_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:27:42 2010

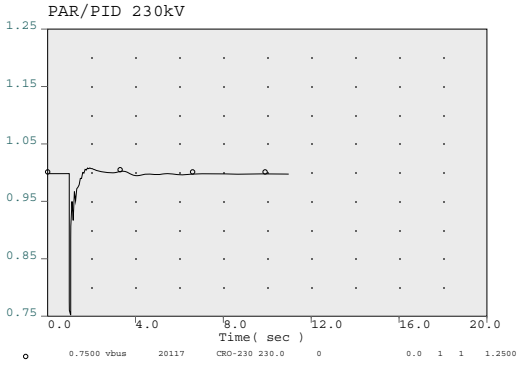
RELATIVE VOLTAGE



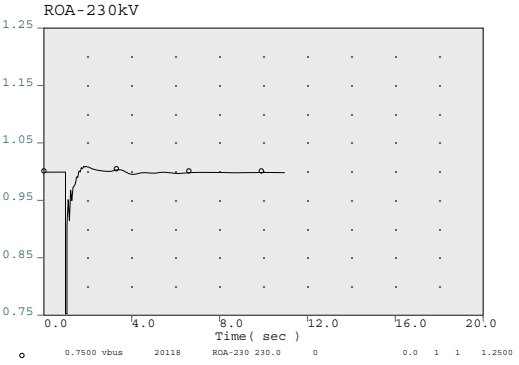
SDG&E Cluster 2 - pre
Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

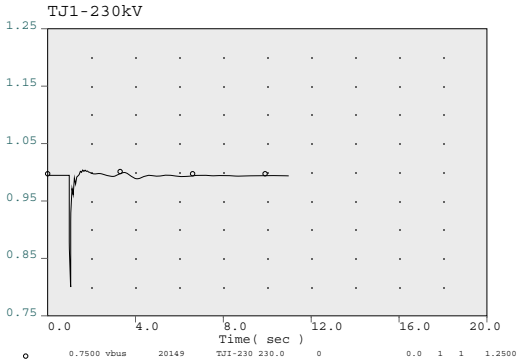
PAR/PID 230kV



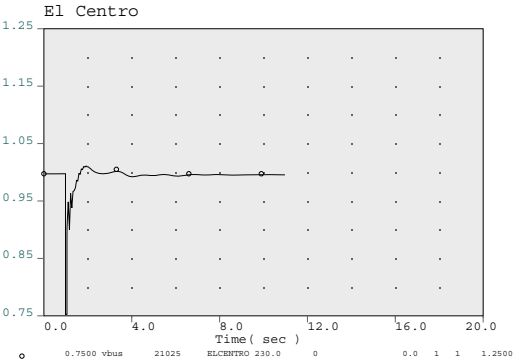
ROA-230kV



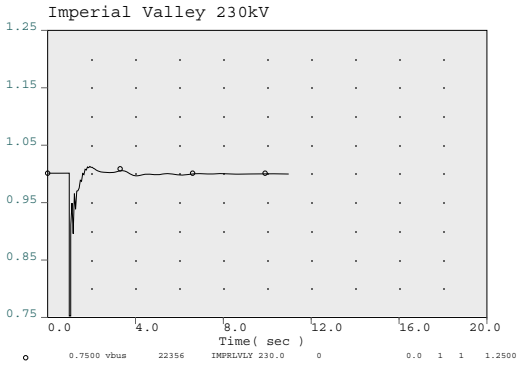
TJ1-230kV



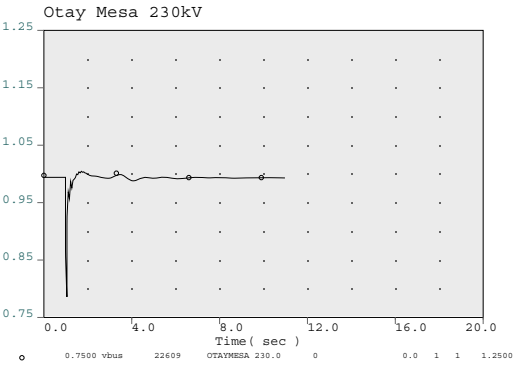
El Centro



Imperial Valley 230kV



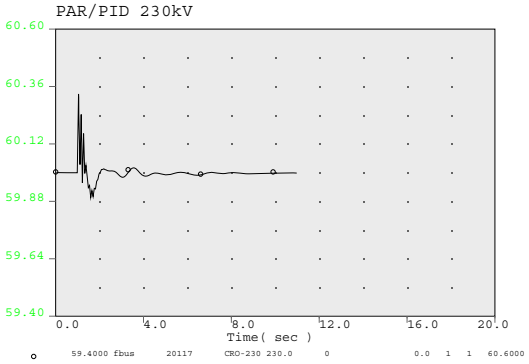
Otay Mesa 230kV



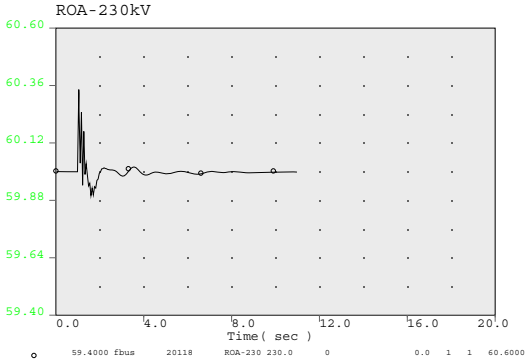
SDG&E Cluster 2 - pre
Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Frequency Check and Comparison

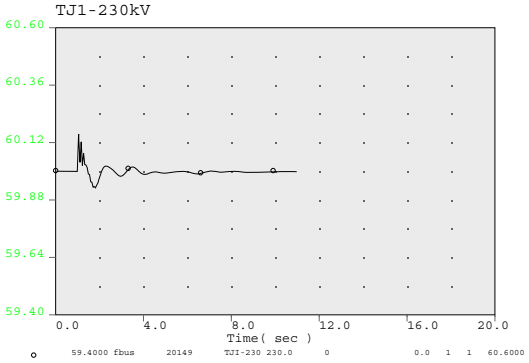
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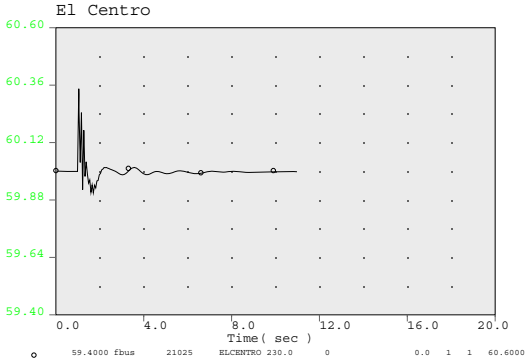
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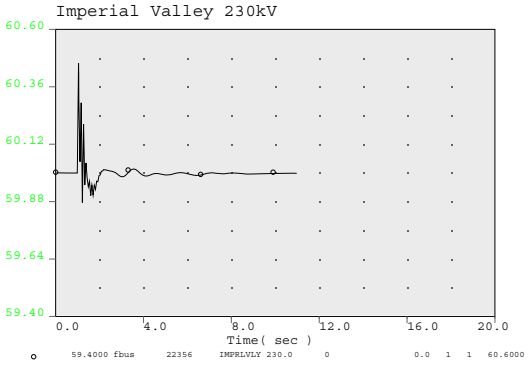
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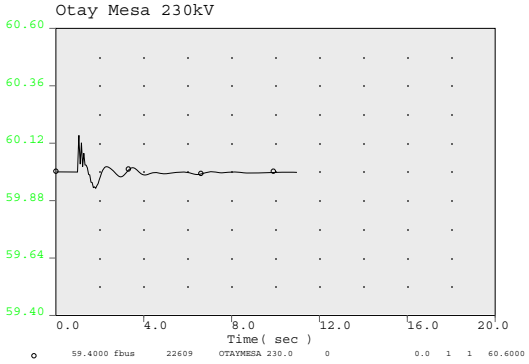
El Centro



Imperial Valley 230kV



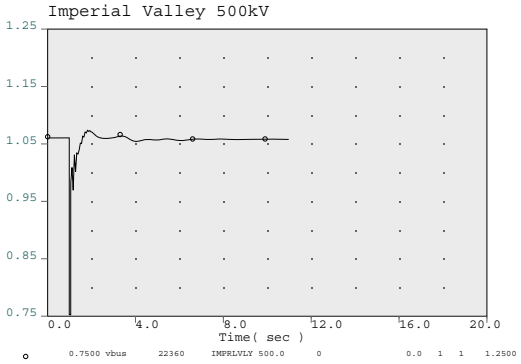
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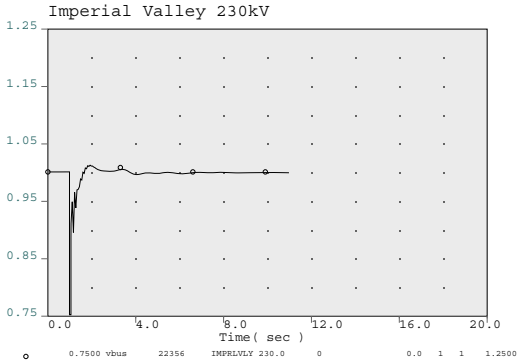
SDG&E Cluster 2 - pre
Light Autumn
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

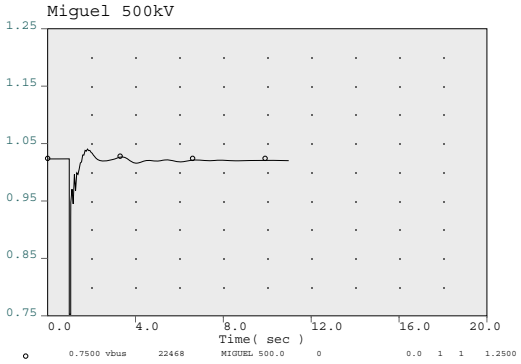
Imperial Valley 500kV



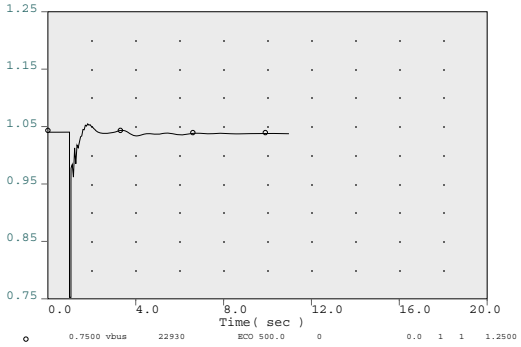
Imperial Valley 230kV



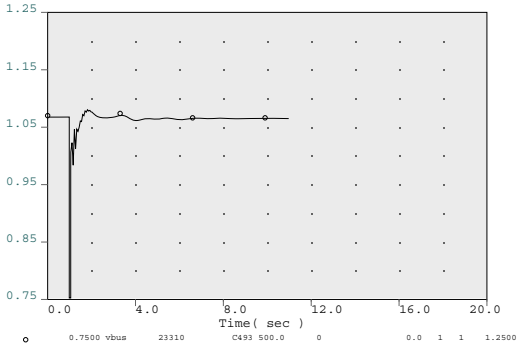
Miguel 500kV



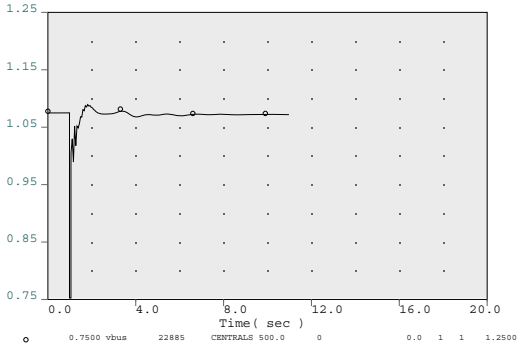
Windfarms 500



C493 500kV

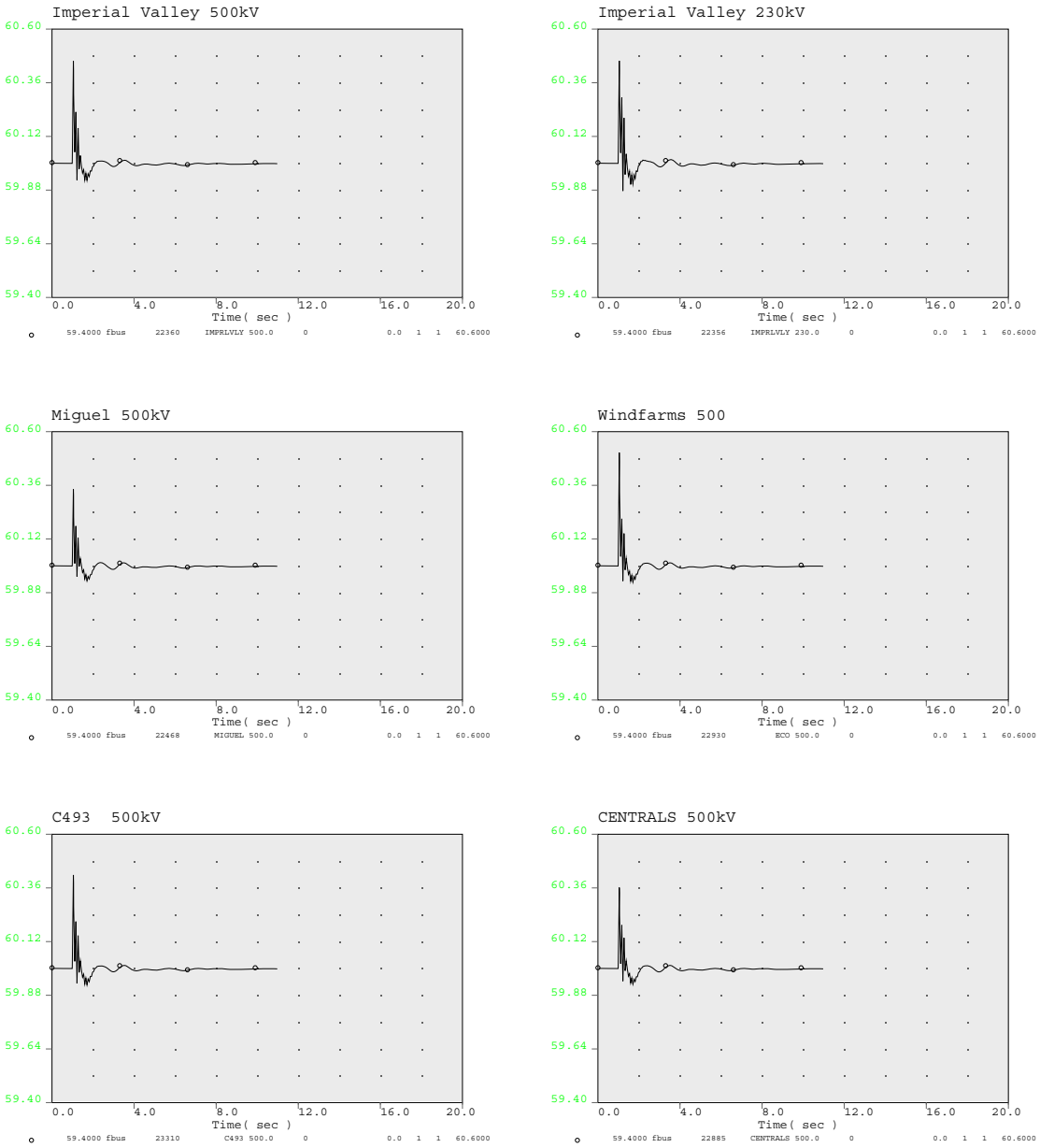


CENTRALS 500kV



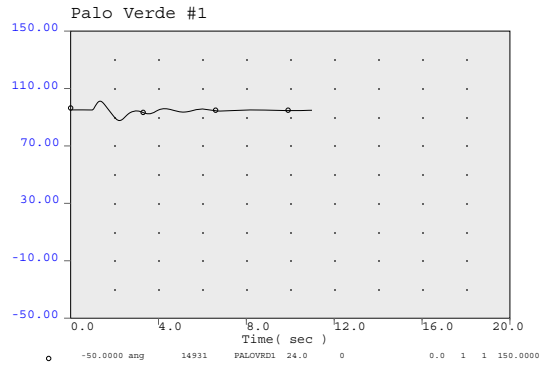
SDG&E Cluster 2 - pre
Light Autumn
Haasyampa-N.Gila 500 kV line

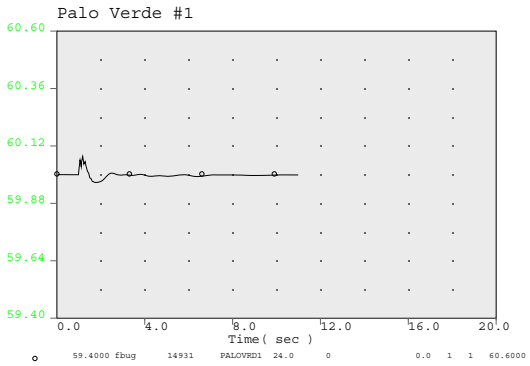
Imperial Valley Area - Frequency

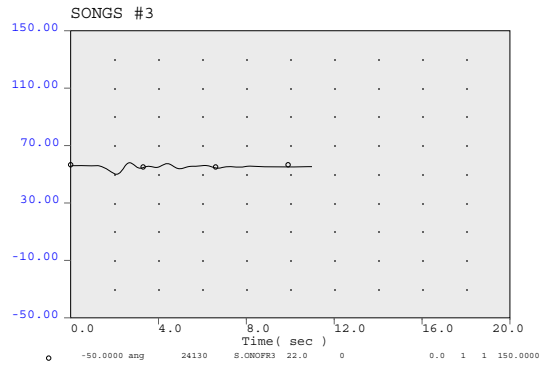


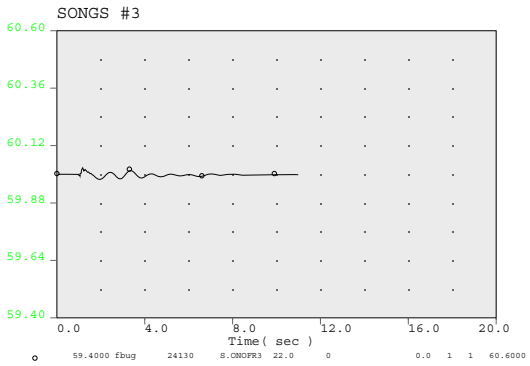
SDG&E Cluster 2 - pre
Light Autumn
Haasyampa-N.Gila 500 kV line

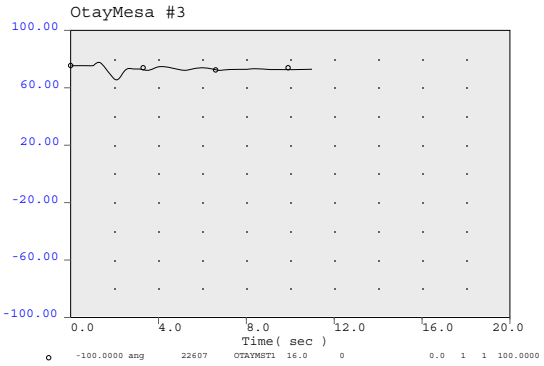
RELATIVE ROTOR ANGLE & FREQUENCY

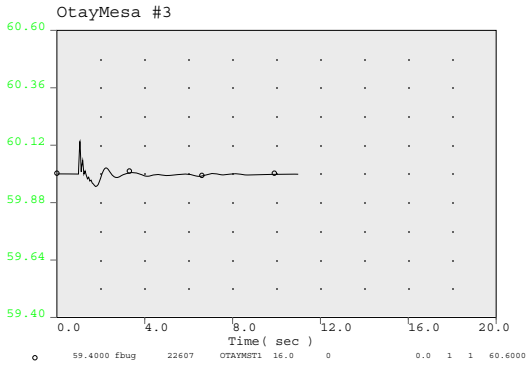










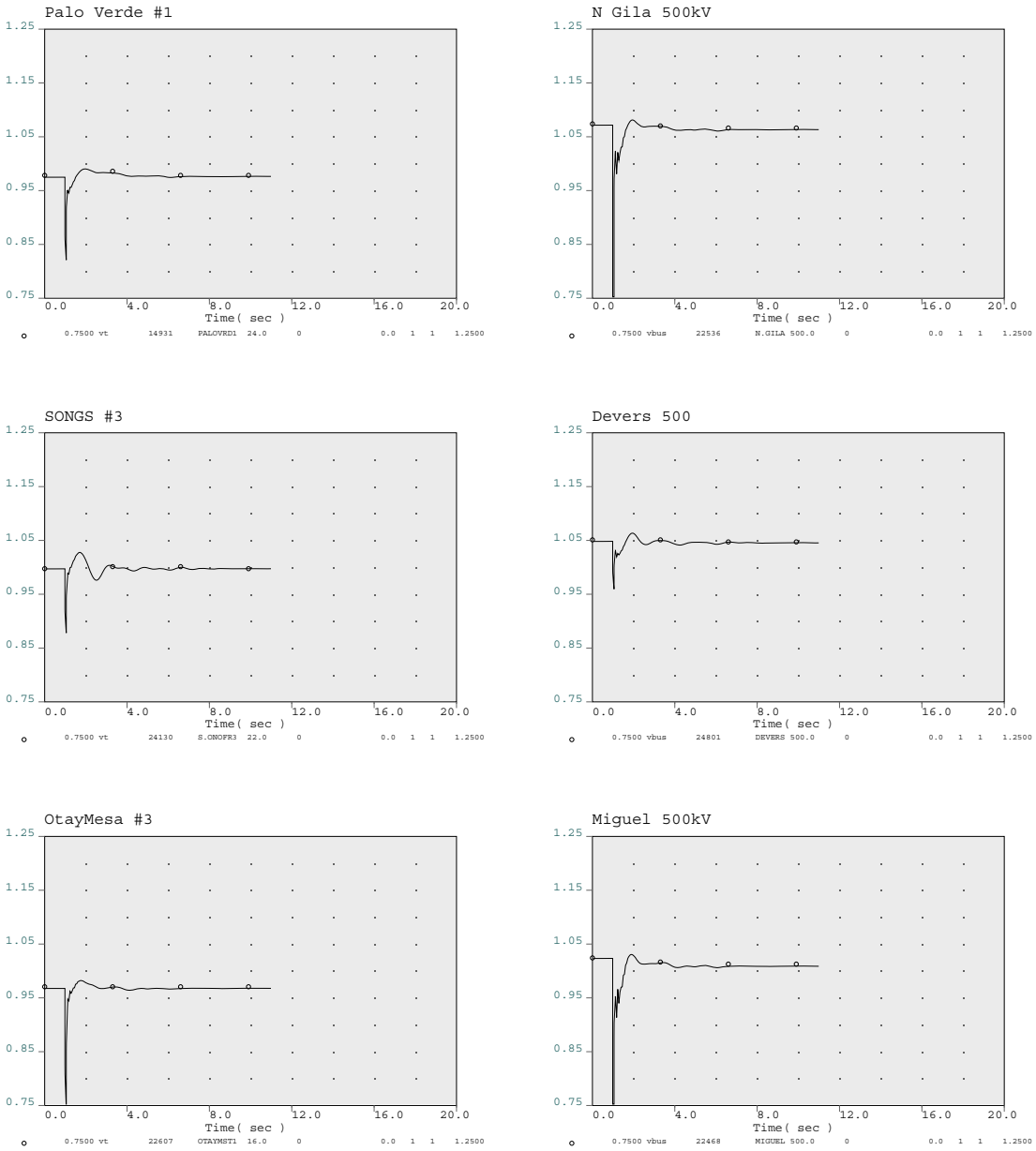


SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

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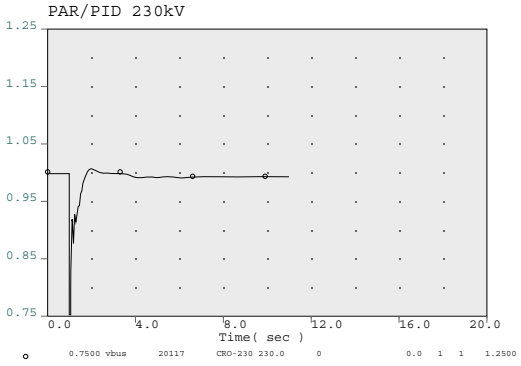
RELATIVE VOLTAGE



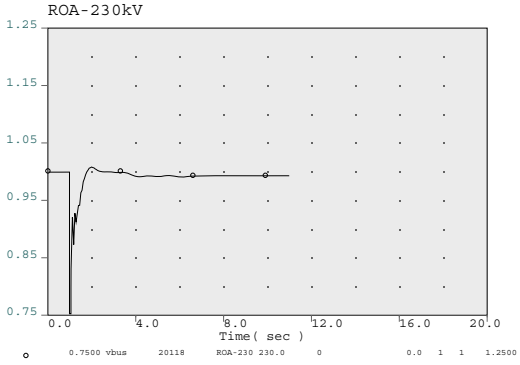
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

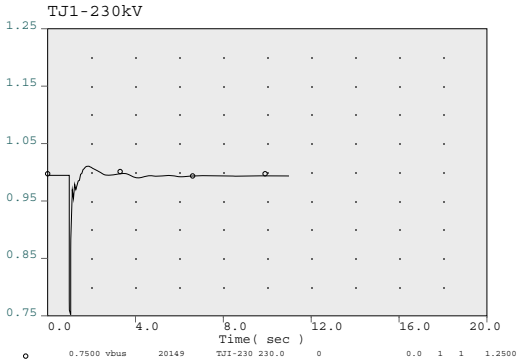
PAR/PID 230kV



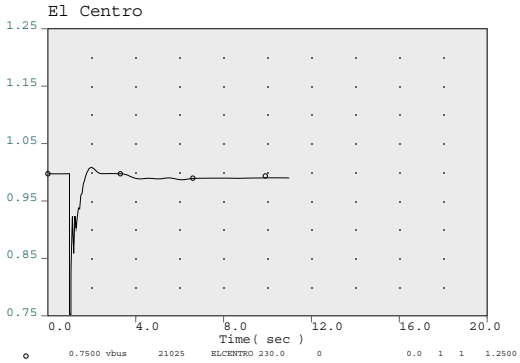
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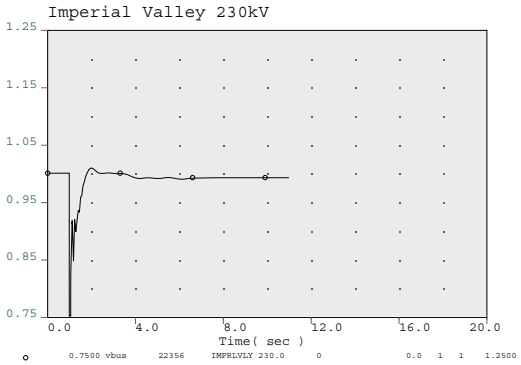
TJ1-230kV



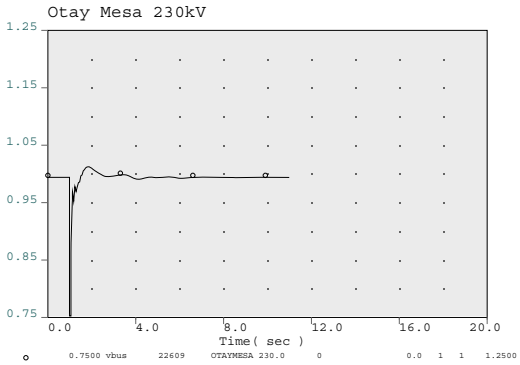
El Centro



Imperial Valley 230kV



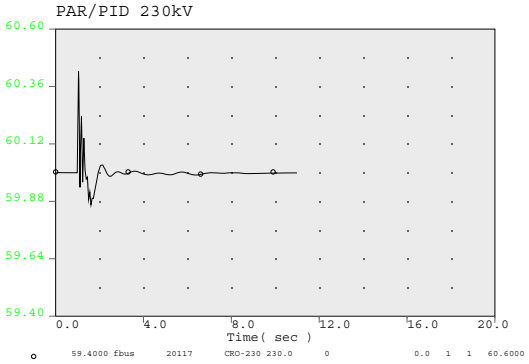
Otay Mesa 230kV



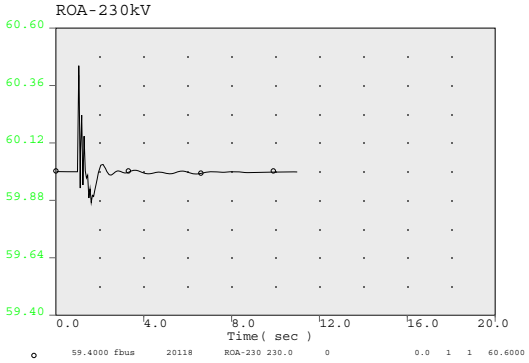
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

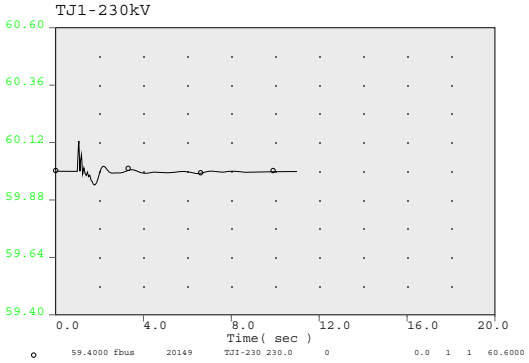
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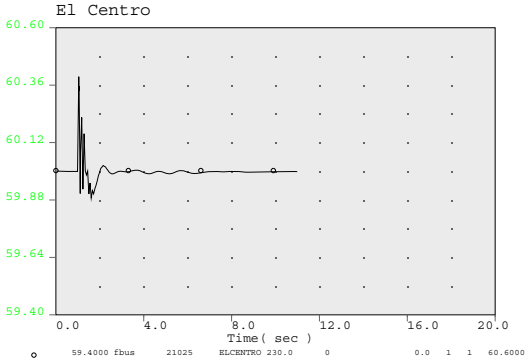
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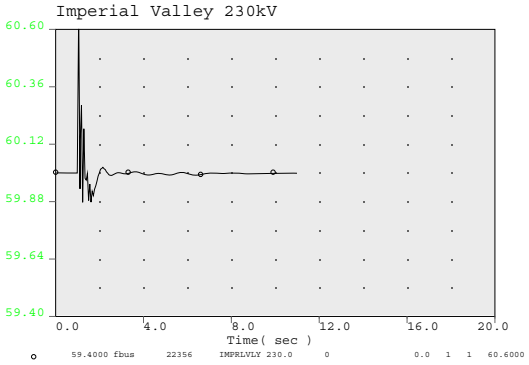
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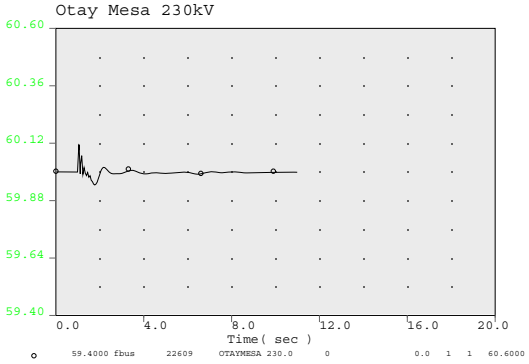
El Centro



Imperial Valley 230kV



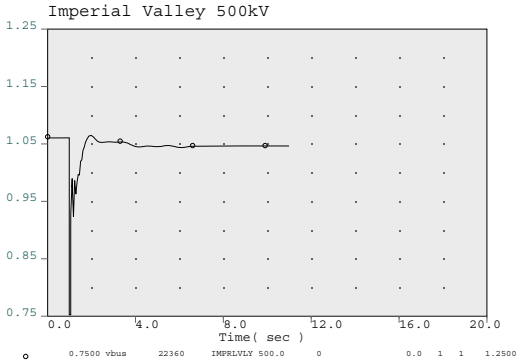
Otay Mesa 230kV



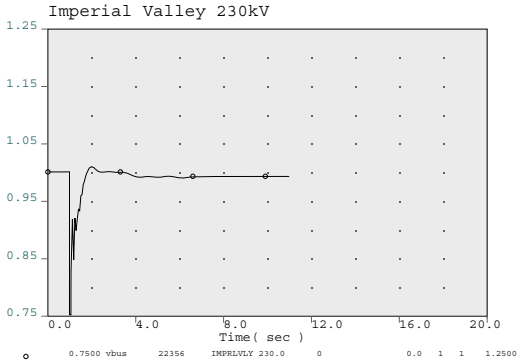
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

Imperial Valley Area - VOLTAGE

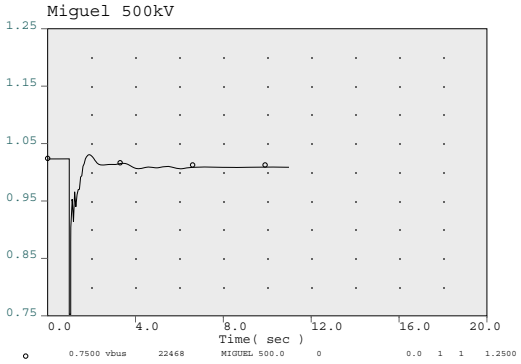
Imperial Valley 500kV



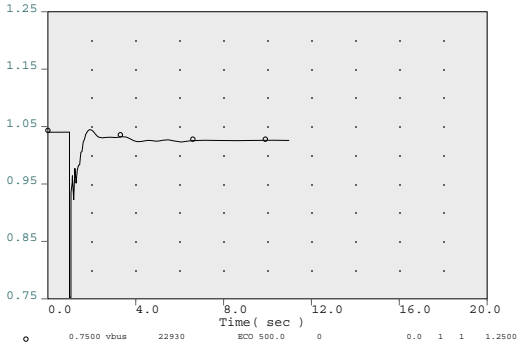
Imperial Valley 230kV



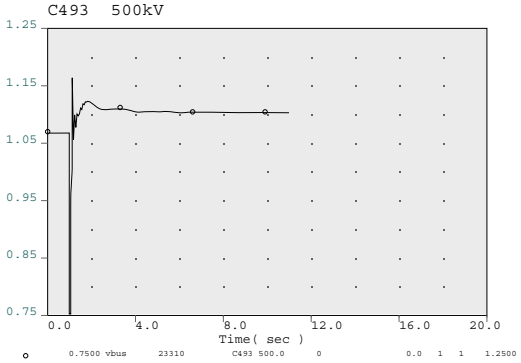
Miguel 500kV



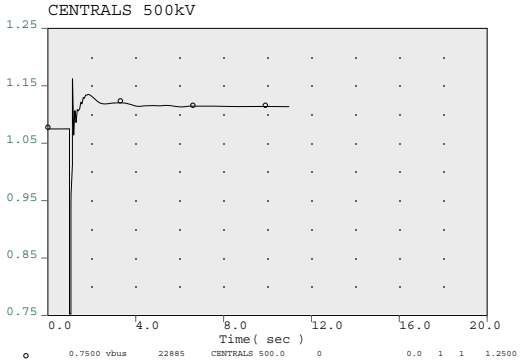
Windfarms 500



C493 500kV

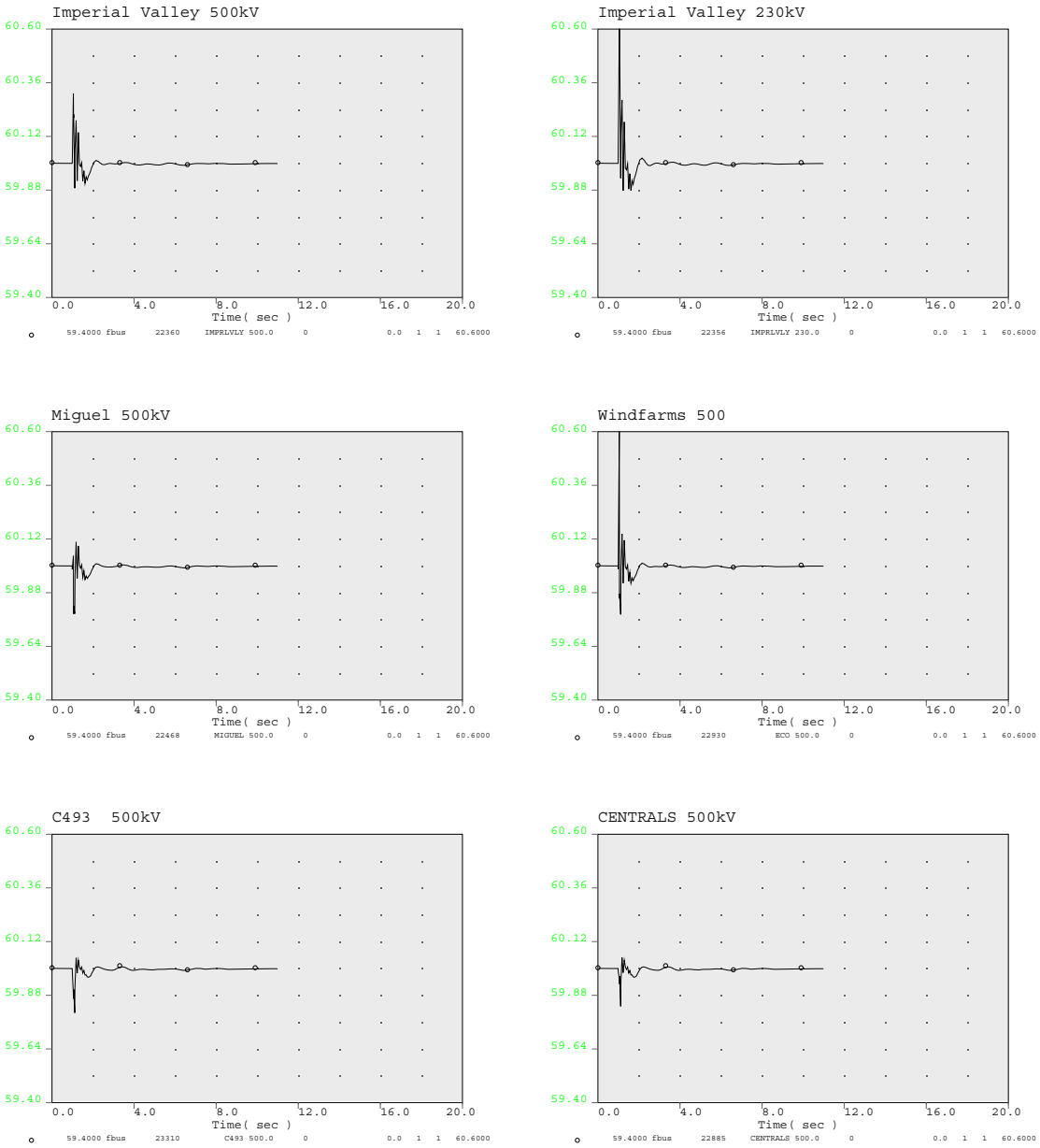


CENTRALS 500kV



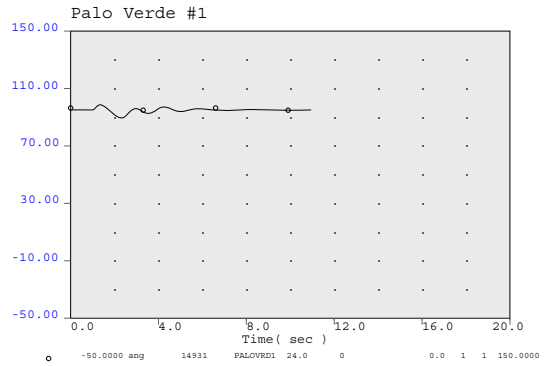
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

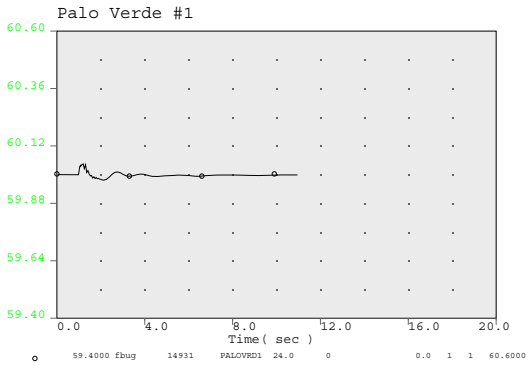
Imperial Valley Area - Frequency

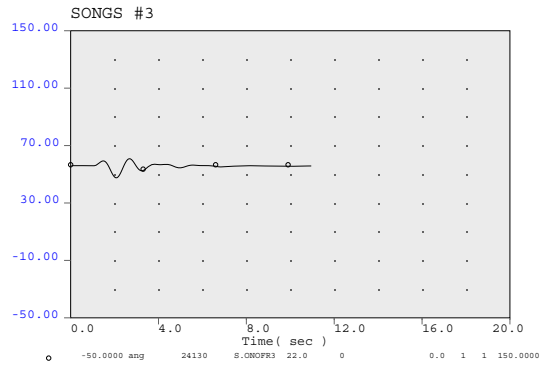


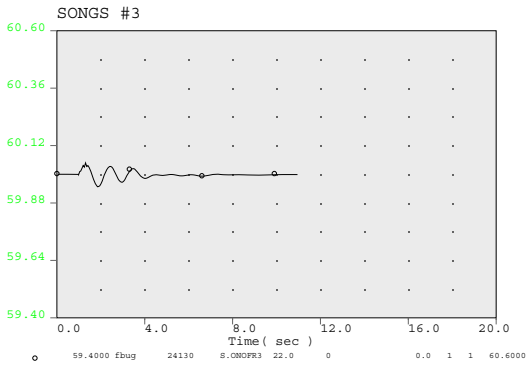
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

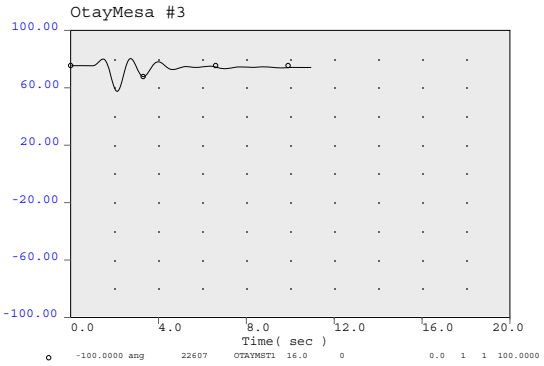
RELATIVE ROTOR ANGLE & FREQUENCY

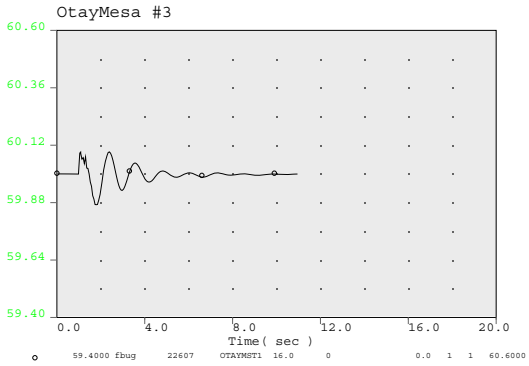










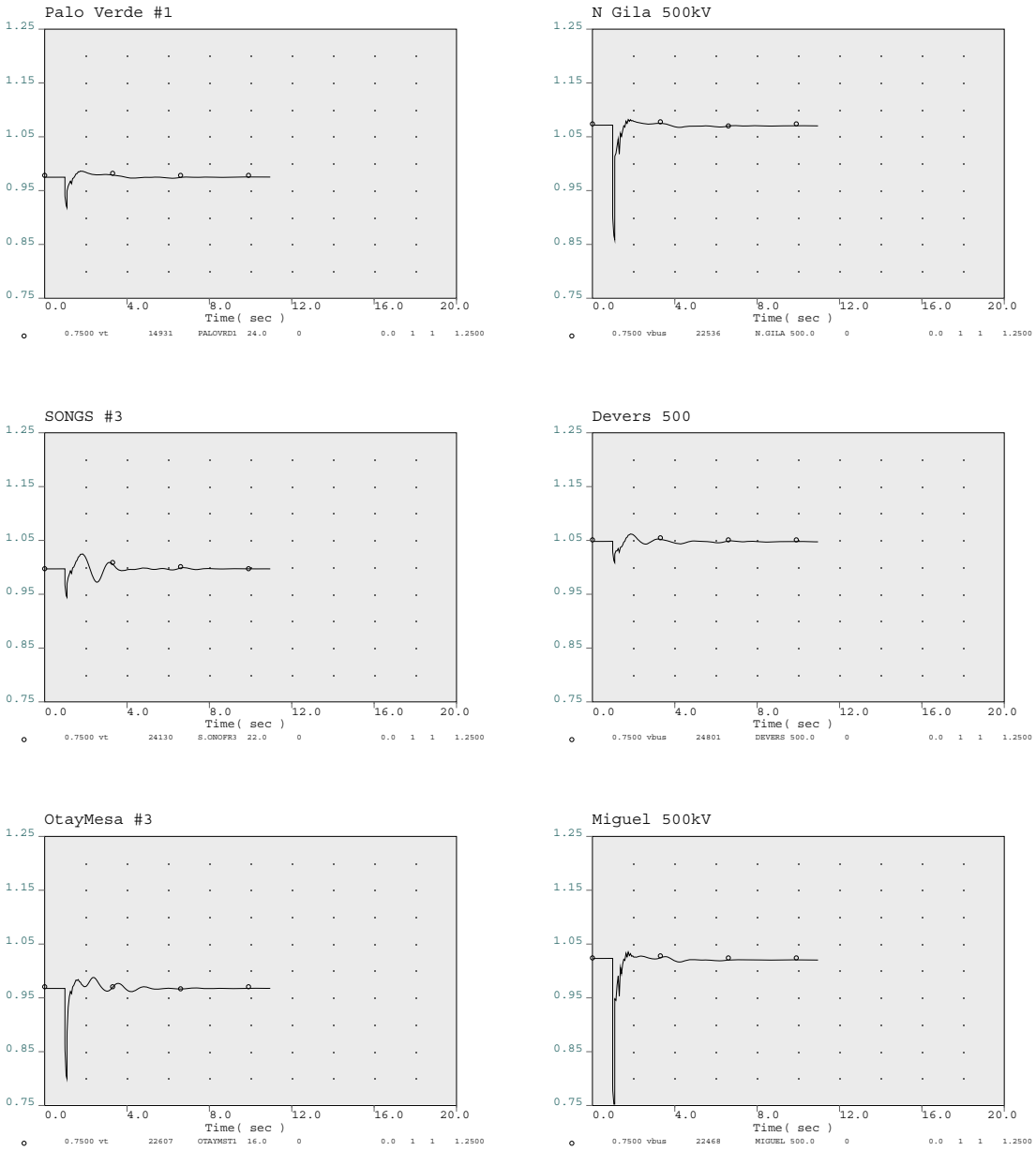


SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Page 1

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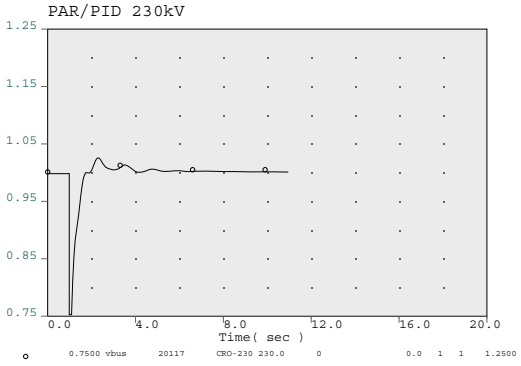
RELATIVE VOLTAGE



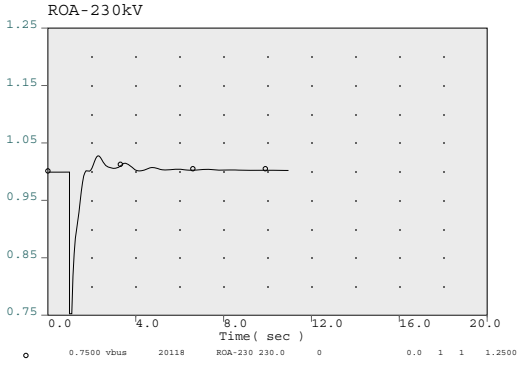
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

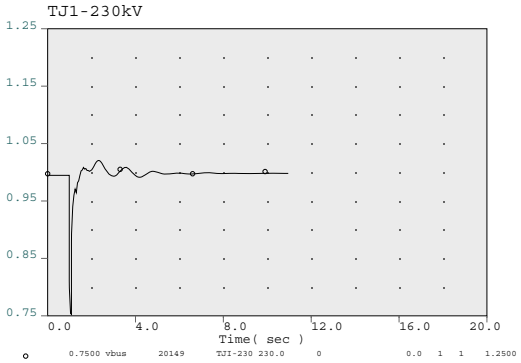
PAR/PID 230kV



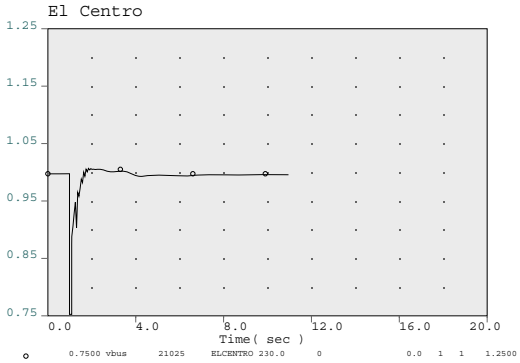
ROA-230kV



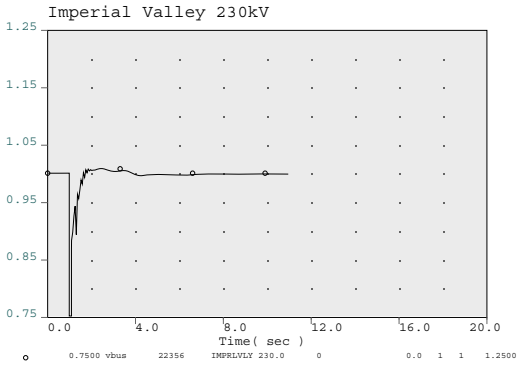
TJ1-230kV



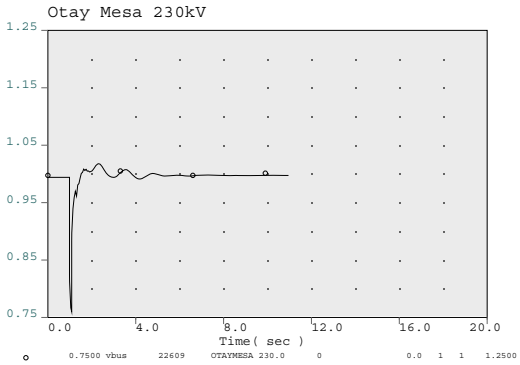
El Centro



Imperial Valley 230kV



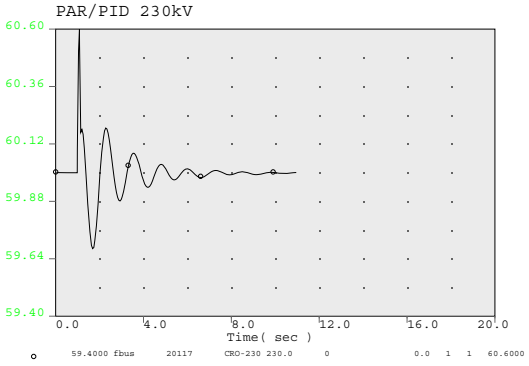
Otay Mesa 230kV



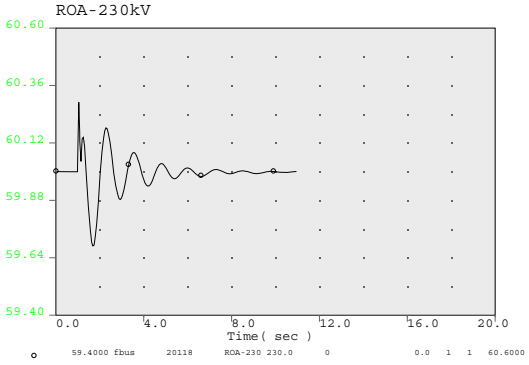
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Affected System Frequency Check and Comparison

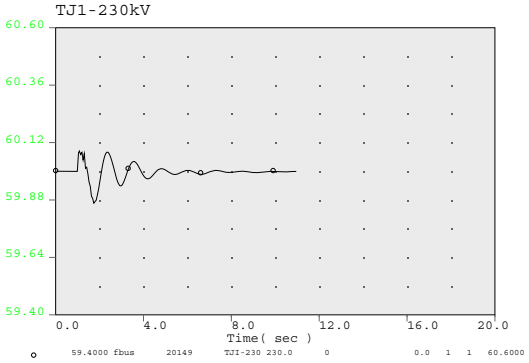
PAR/PID 230kV



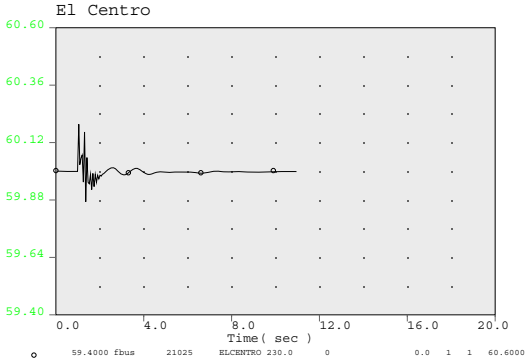
ROA-230kV



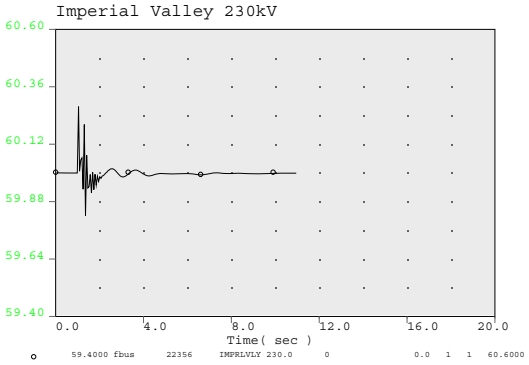
TJ1-230kV



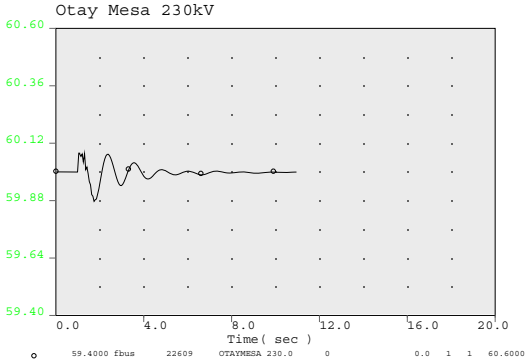
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



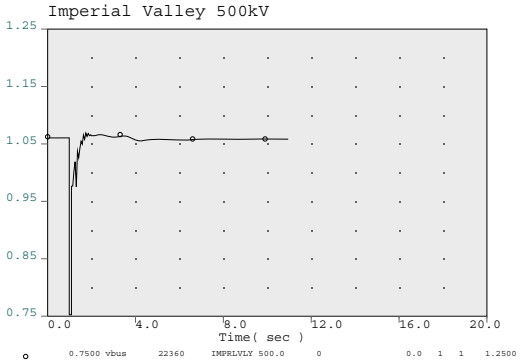
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Page 4

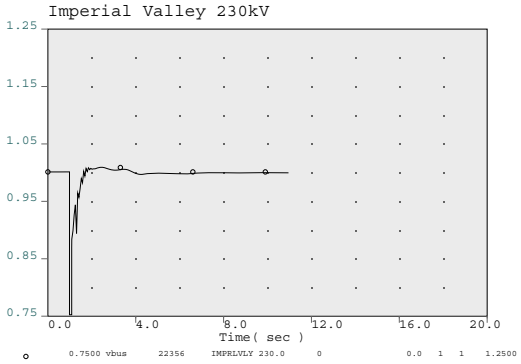
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Imperial Valley Area - VOLTAGE

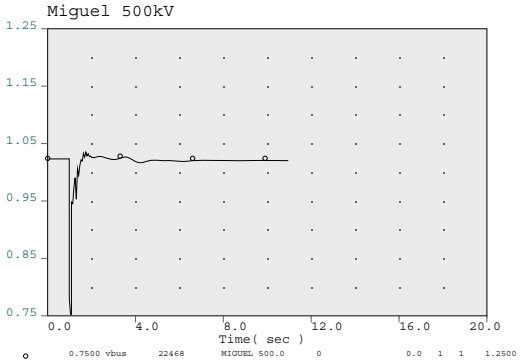
Imperial Valley 500kV



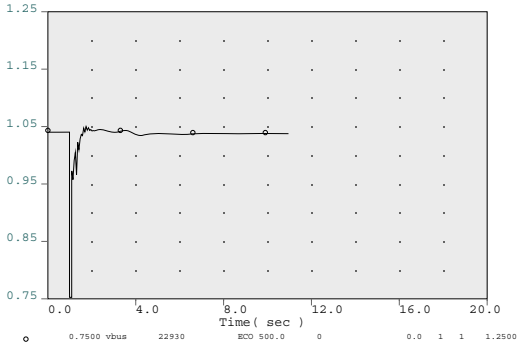
Imperial Valley 230kV



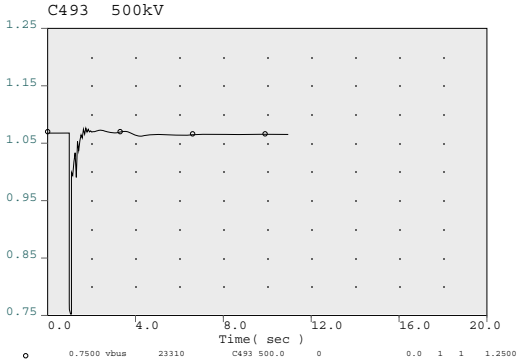
Miguel 500kV



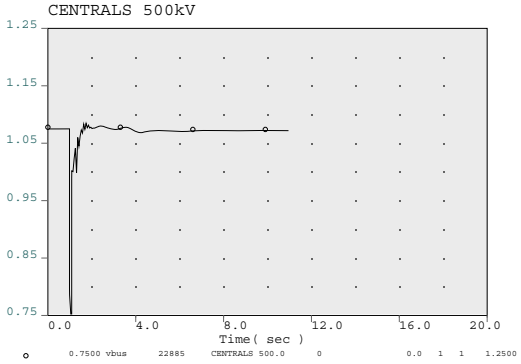
Windfarms 500



C493 500kV

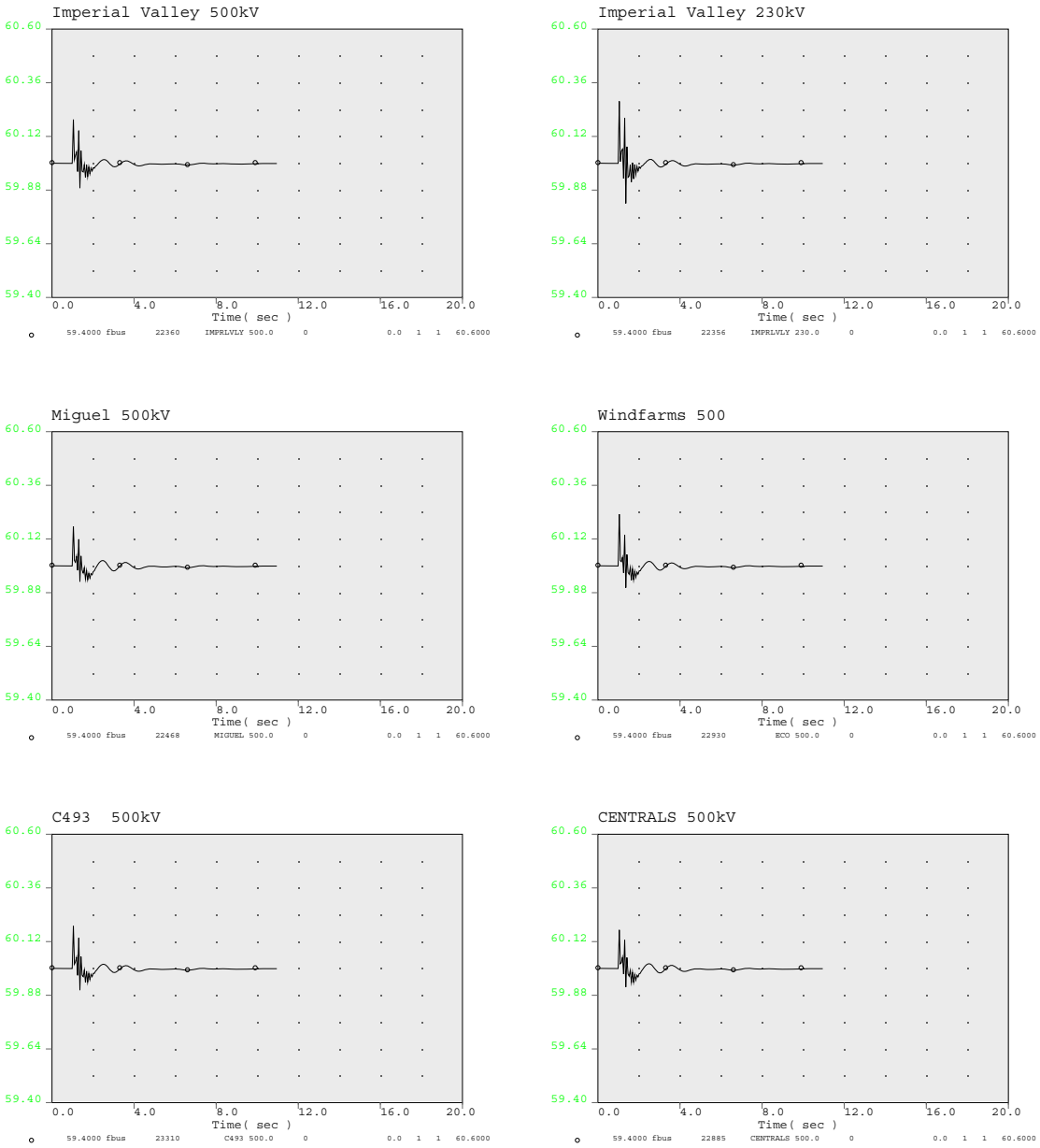


CENTRALS 500kV



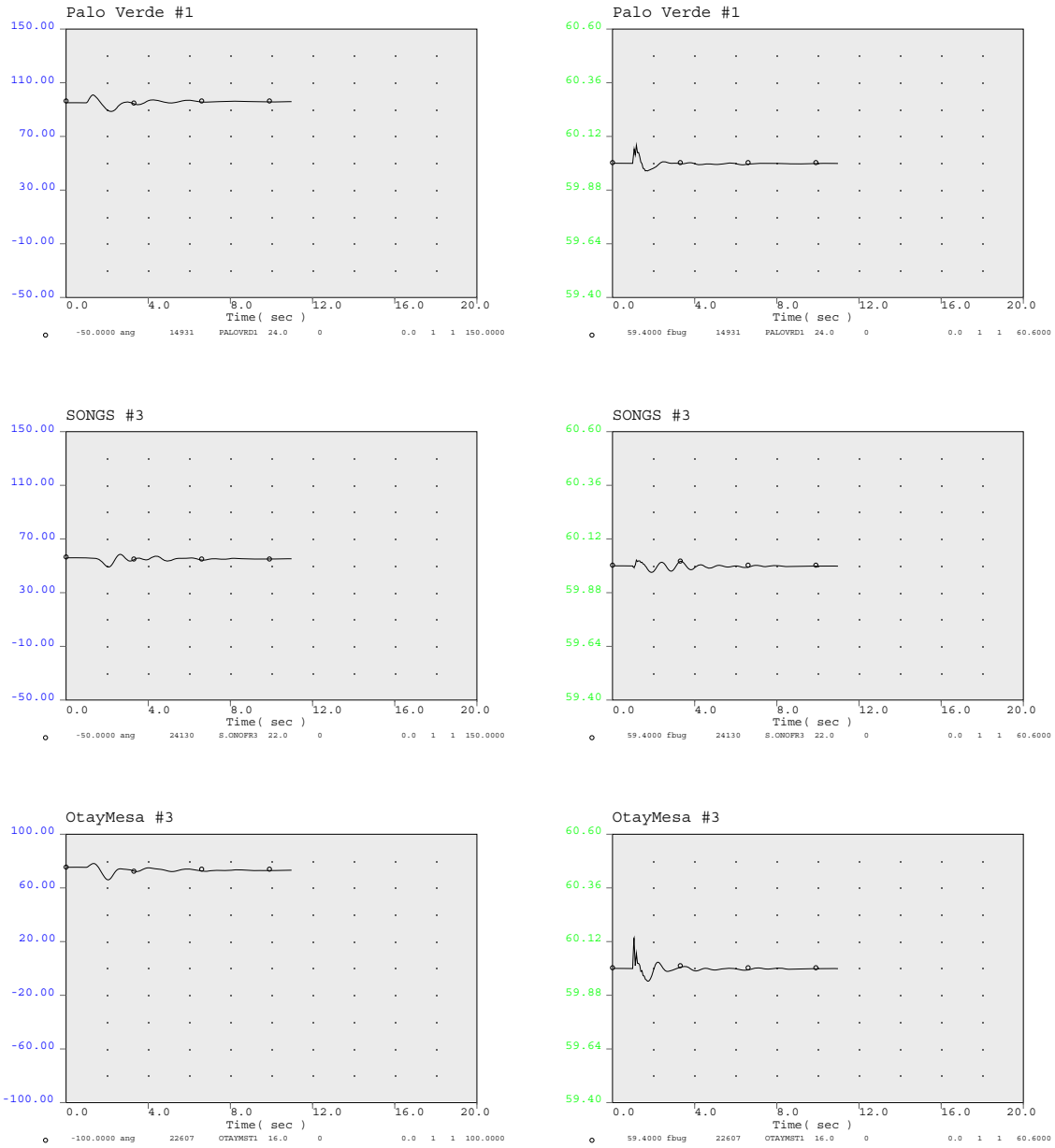
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

RELATIVE ROTOR ANGLE & FREQUENCY

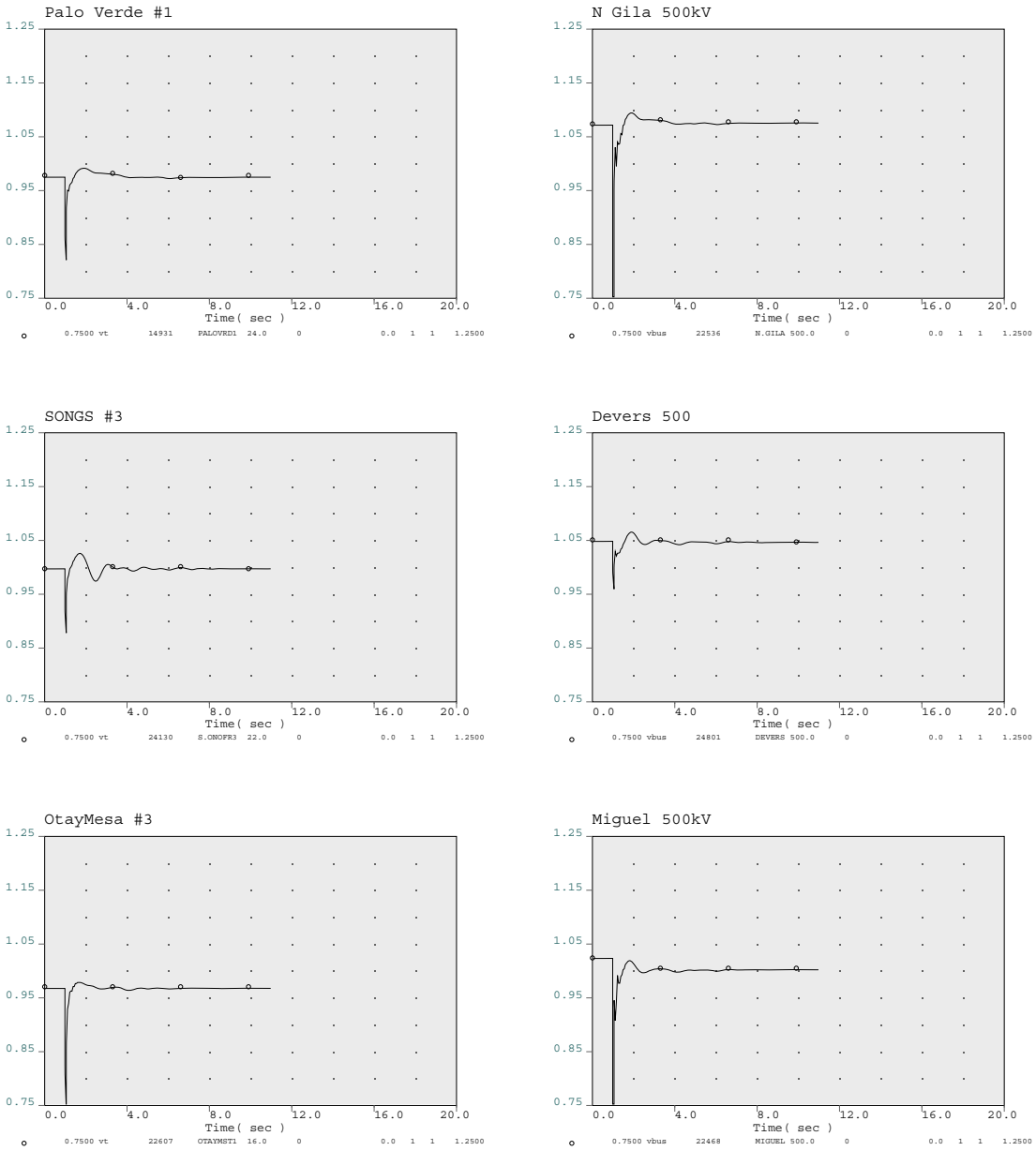


SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

SDGE	IV_Wnd1_noRAS_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:24:11 2010

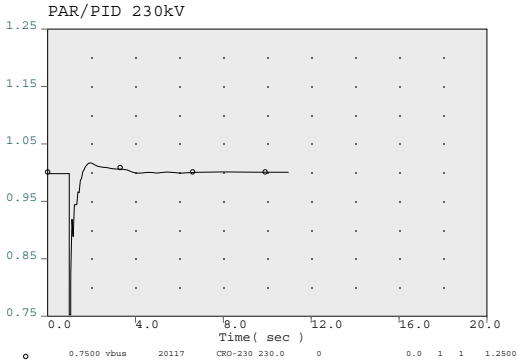
RELATIVE VOLTAGE



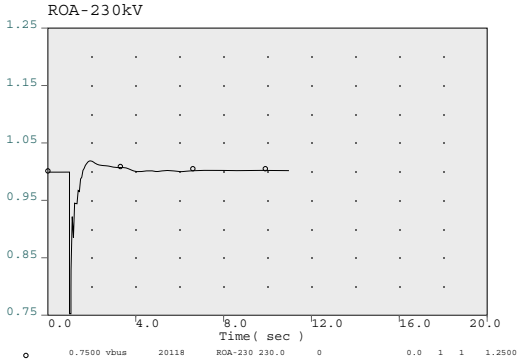
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

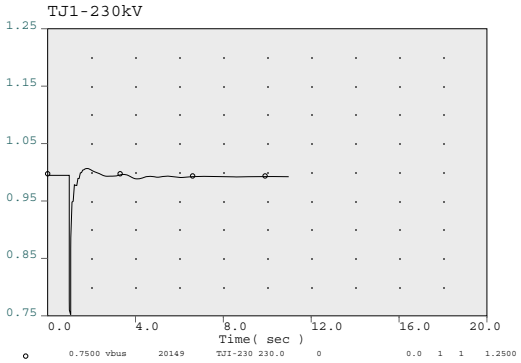
PAR/PID 230kV



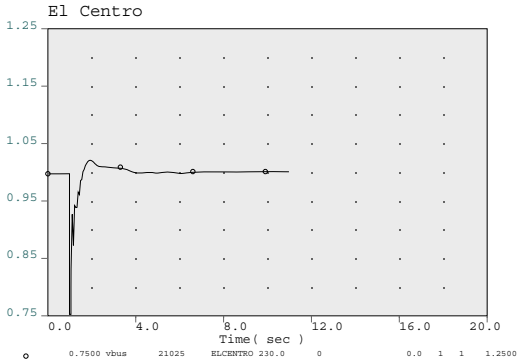
ROA-230kV



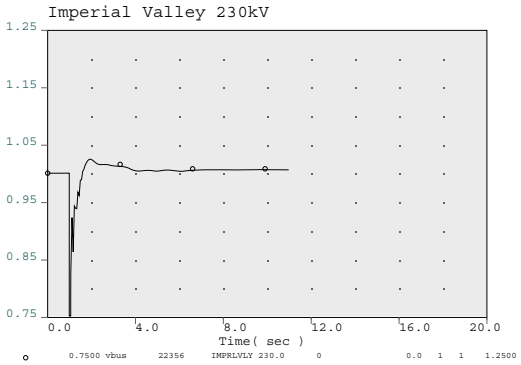
TJ1-230kV



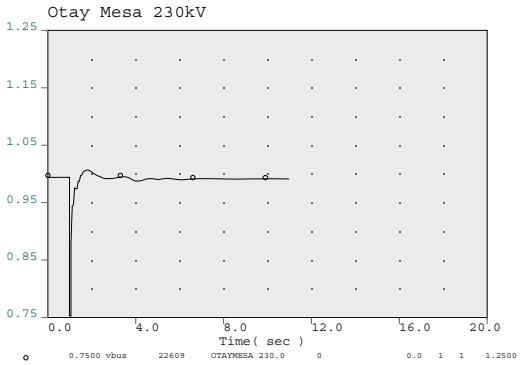
El Centro



Imperial Valley 230kV



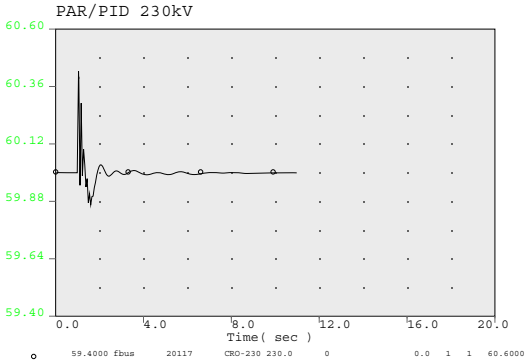
Otay Mesa 230kV



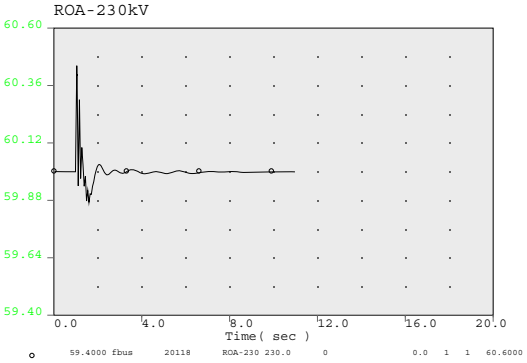
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

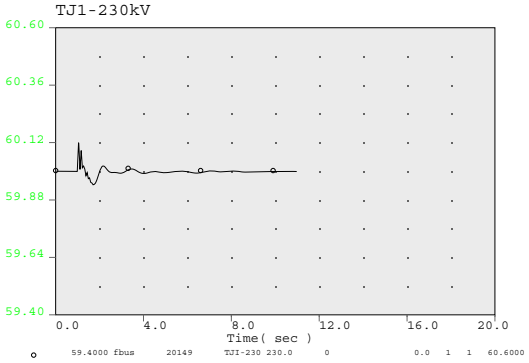
PAR/PID 230kV



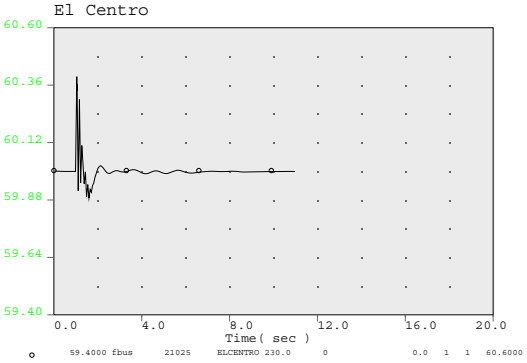
ROA-230kV



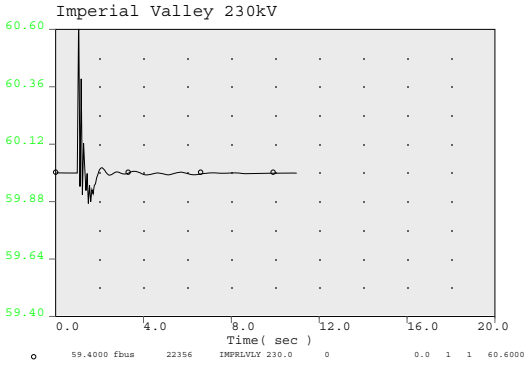
TJ1-230kV



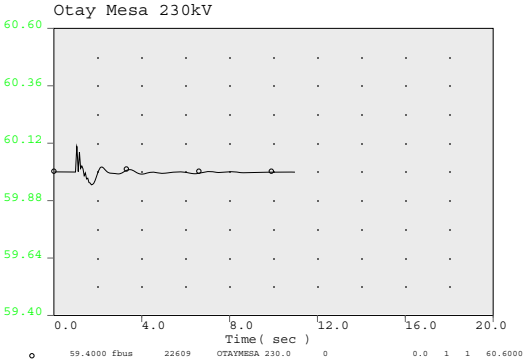
El Centro



Imperial Valley 230kV



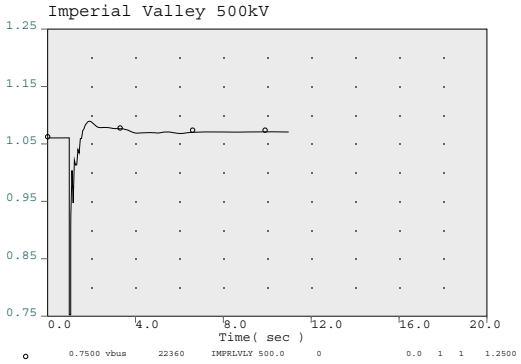
Otay Mesa 230kV



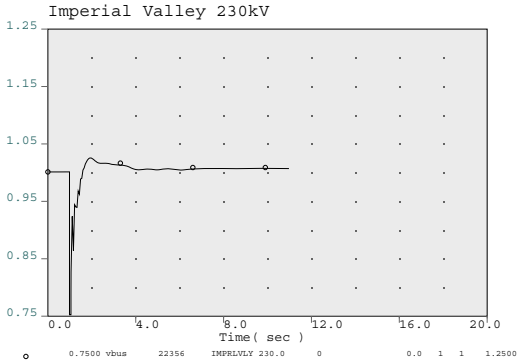
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

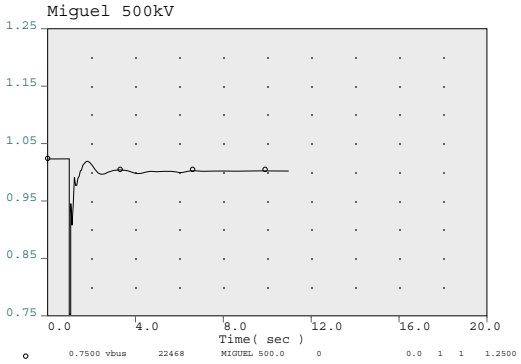
Imperial Valley 500kV



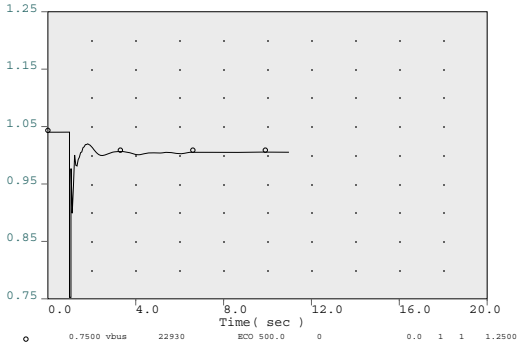
Imperial Valley 230kV



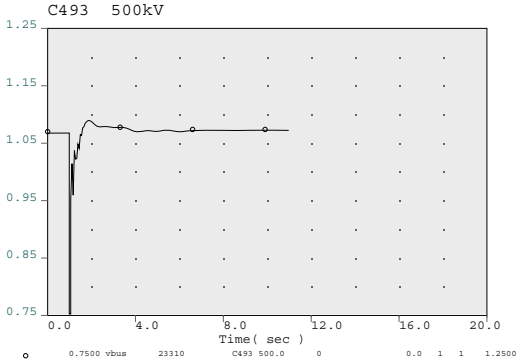
Miguel 500kV



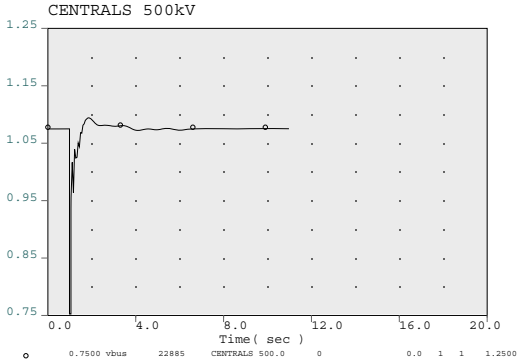
Windfarms 500



C493 500kV

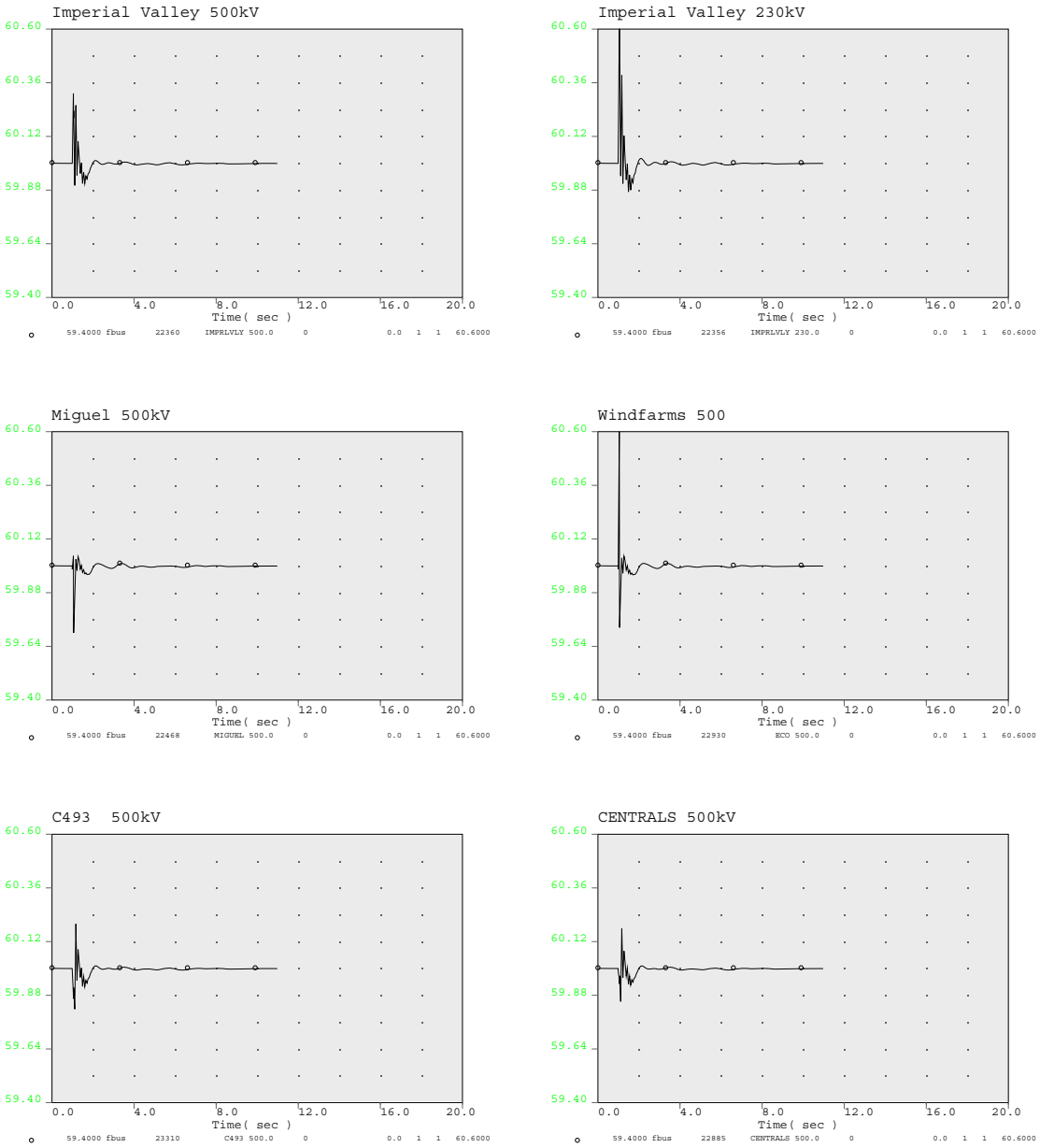


CENTRALS 500kV



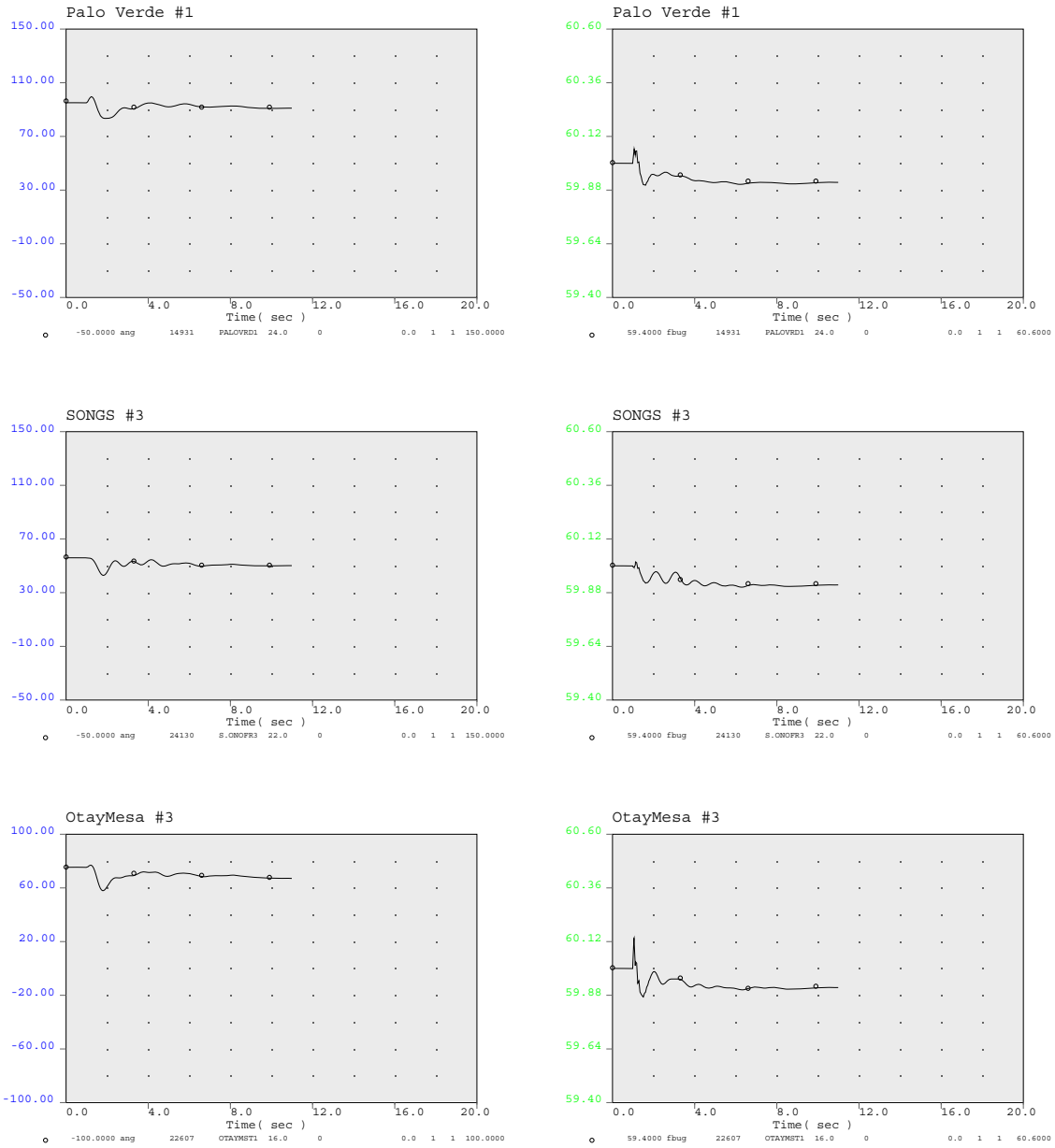
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

RELATIVE ROTOR ANGLE & FREQUENCY



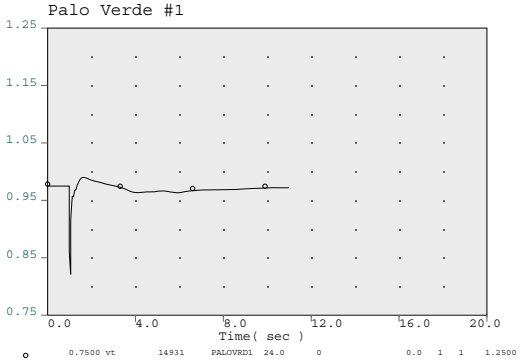
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

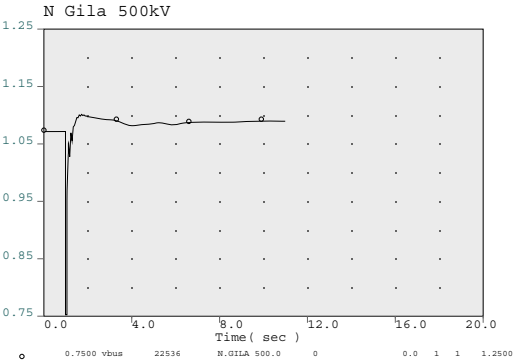
SDGE	IV_Wnd1_noXTrp_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:24:19 2010

RELATIVE VOLTAGE

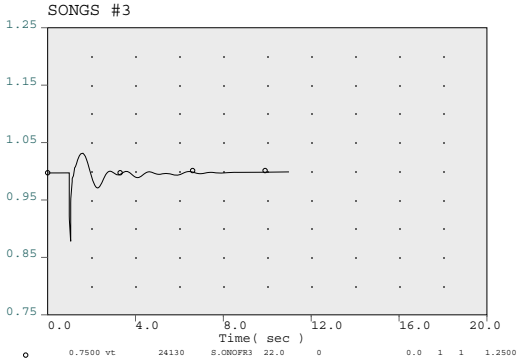
Palo Verde #1



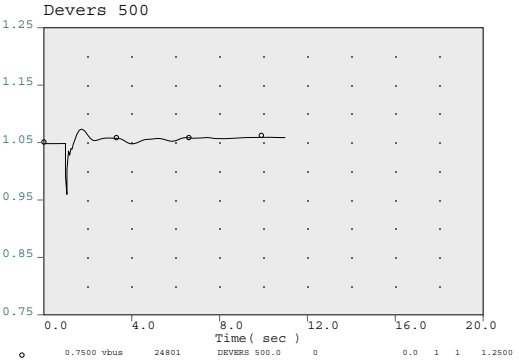
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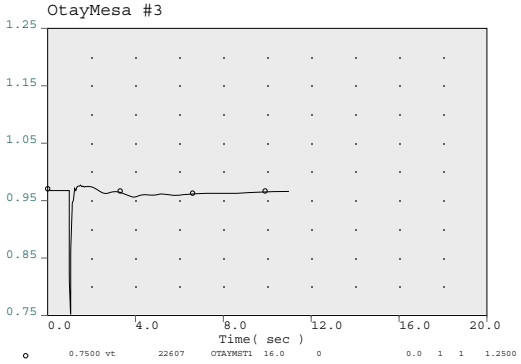
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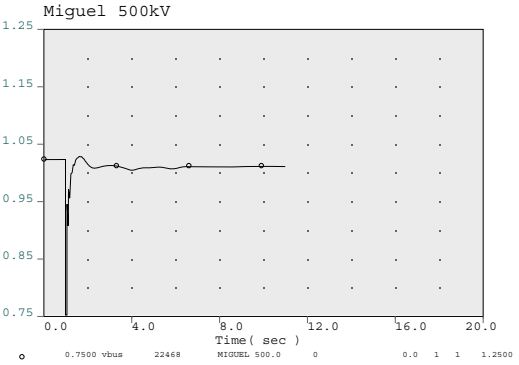
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OtayMesa #3



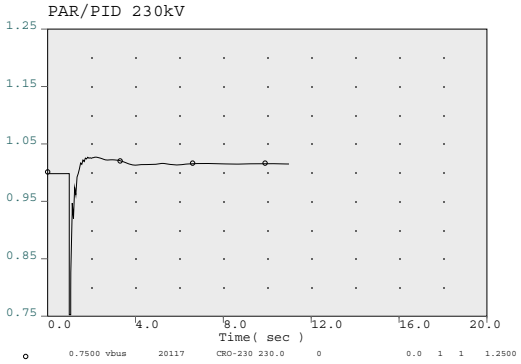
Miguel 500kV



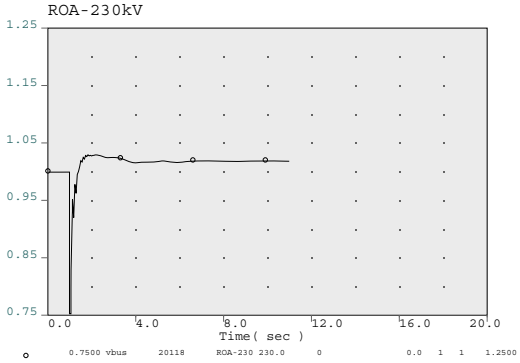
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

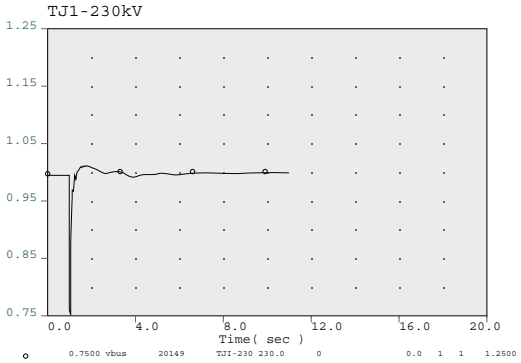
PAR/PID 230kV



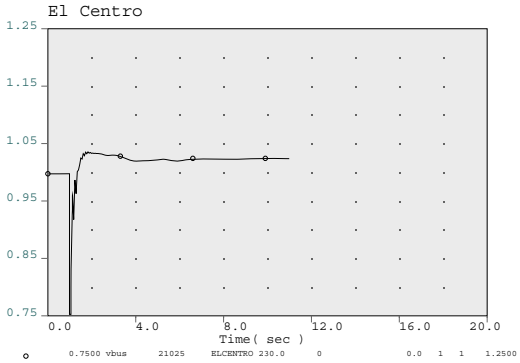
ROA-230kV



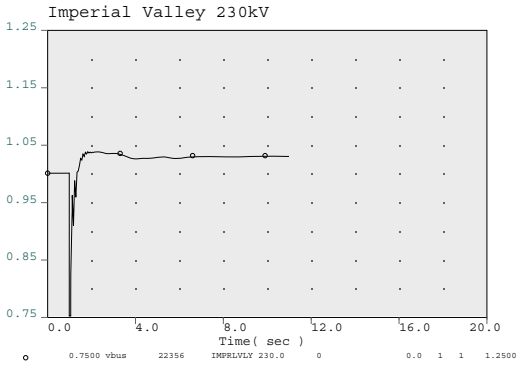
TJ1-230kV



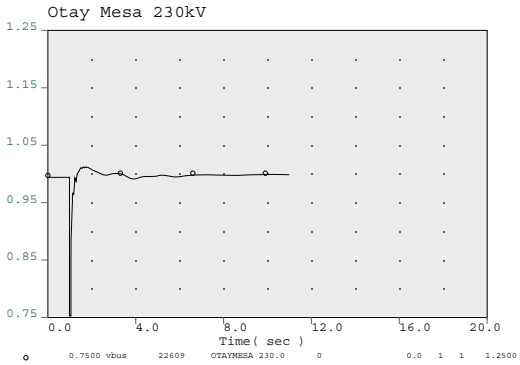
El Centro



Imperial Valley 230kV



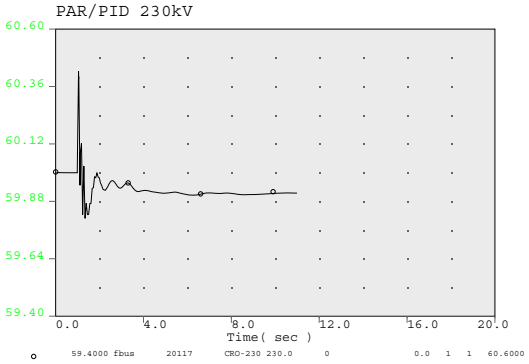
Otay Mesa 230kV



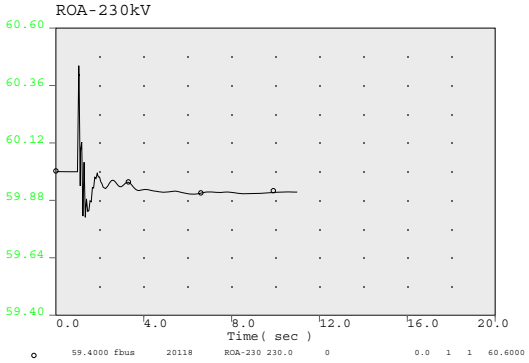
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

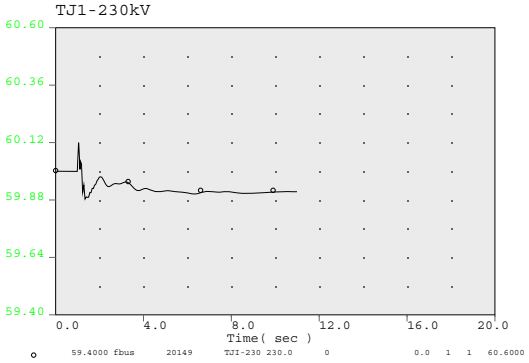
PAR/PID 230kV



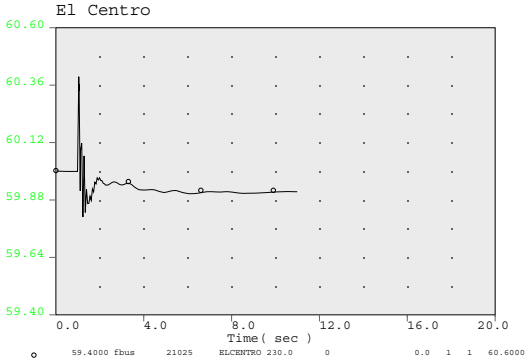
ROA-230kV



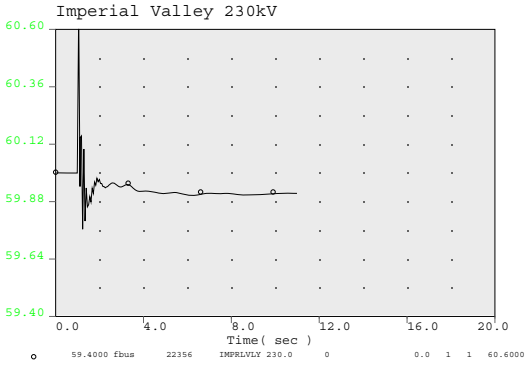
TJ1-230kV



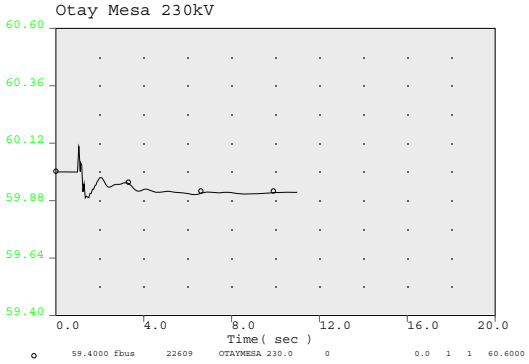
El Centro



Imperial Valley 230kV



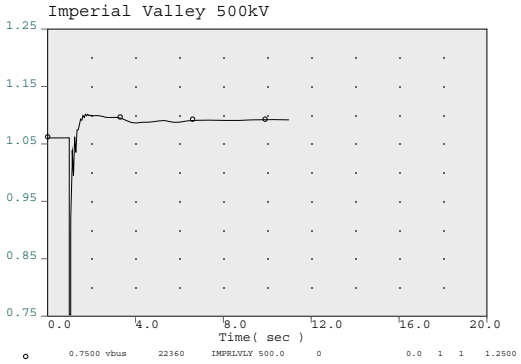
Otay Mesa 230kV



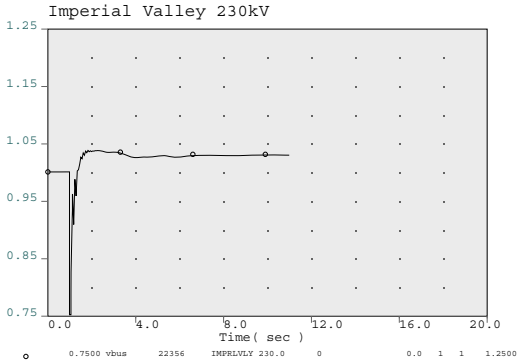
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

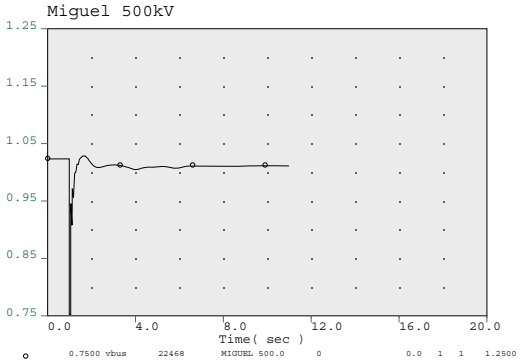
Imperial Valley 500kV



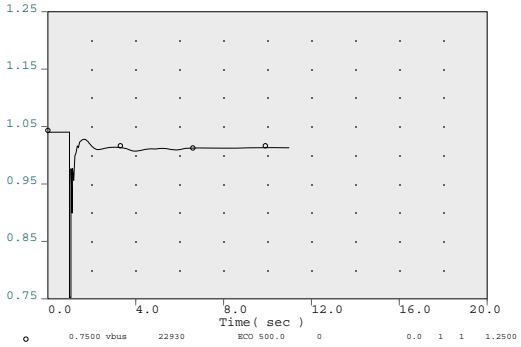
Imperial Valley 230kV



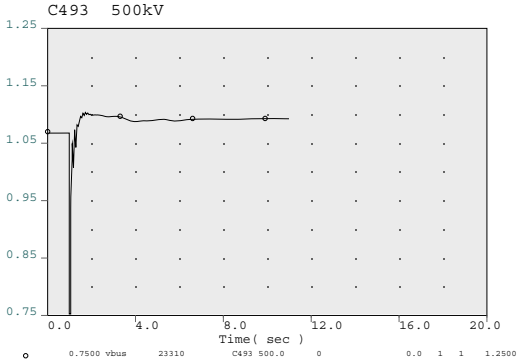
Miguel 500kV



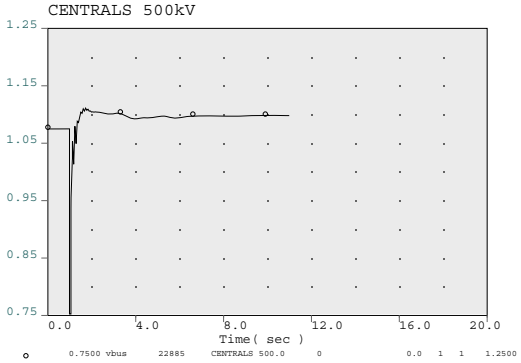
Windfarms 500



C493 500kV

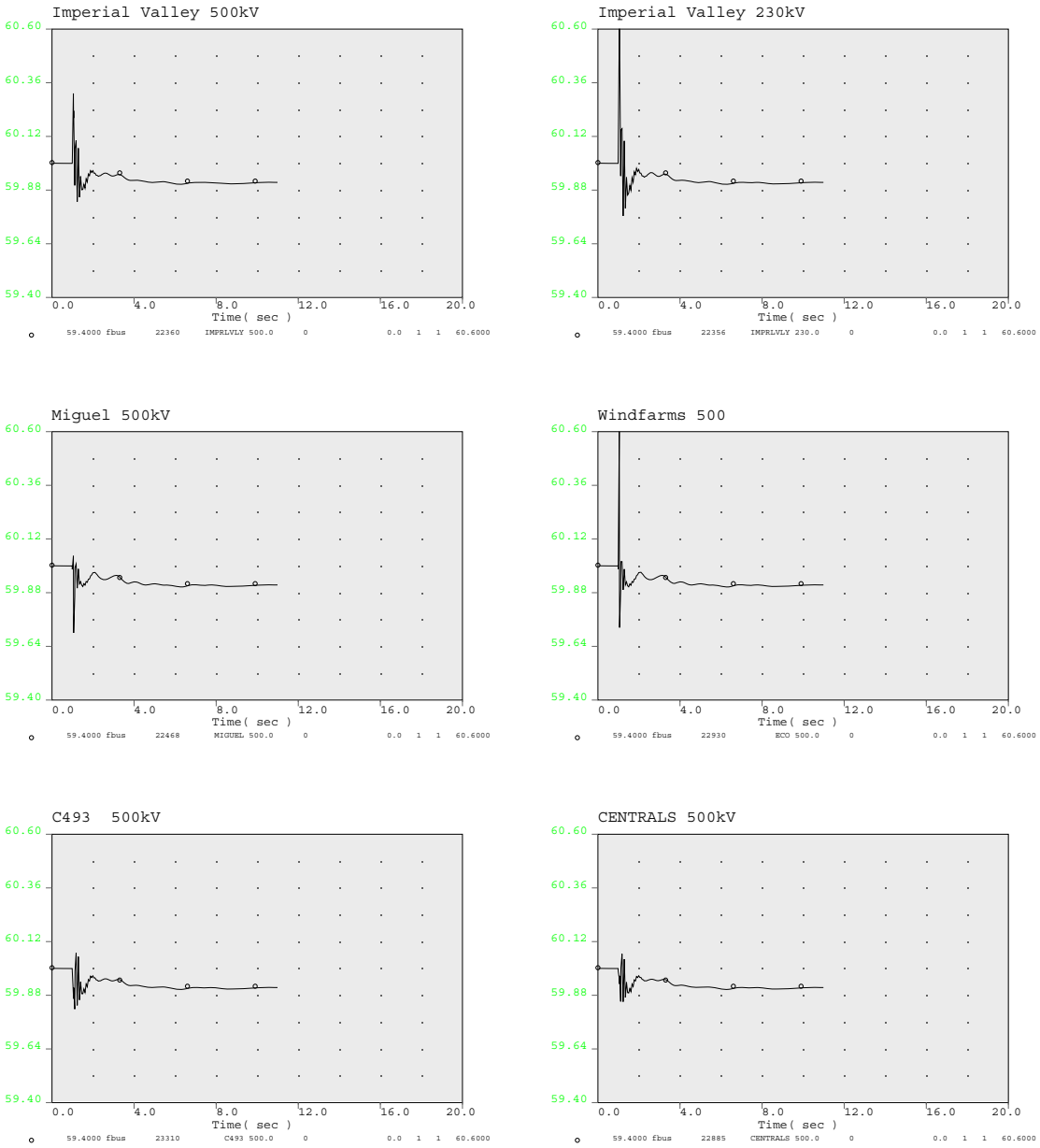


CENTRALS 500kV



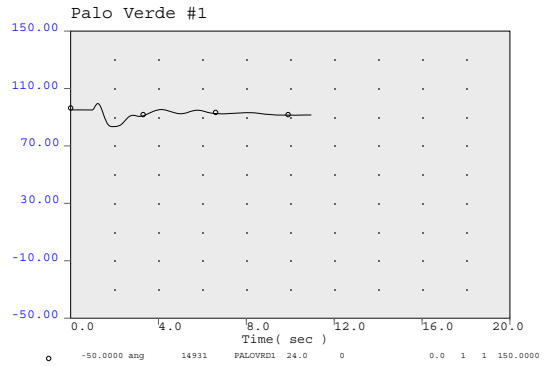
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

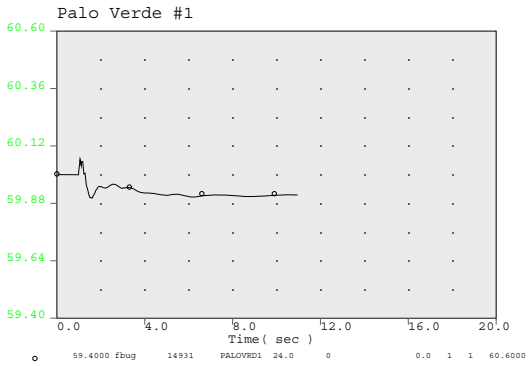
Imperial Valley Area - Frequency

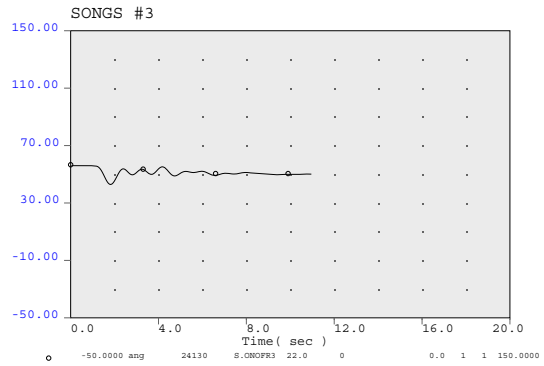


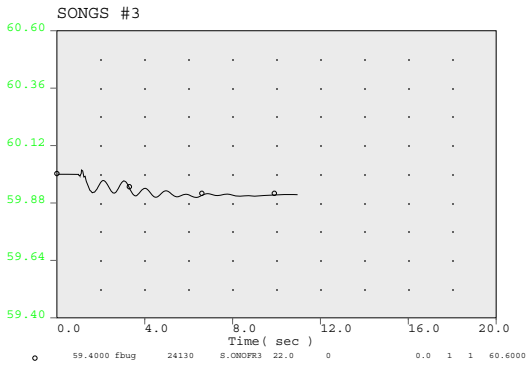
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

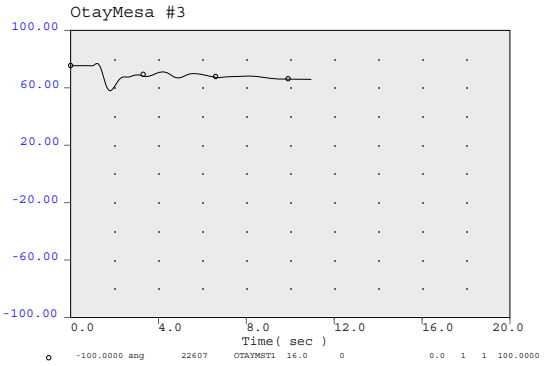
RELATIVE ROTOR ANGLE & FREQUENCY

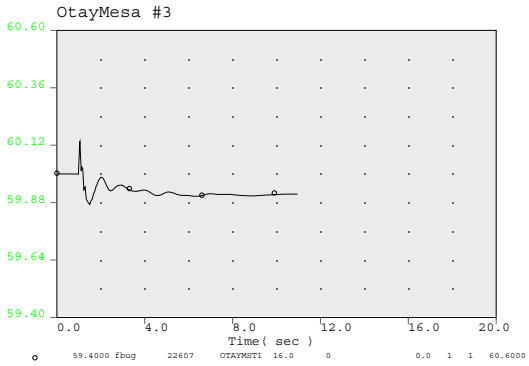










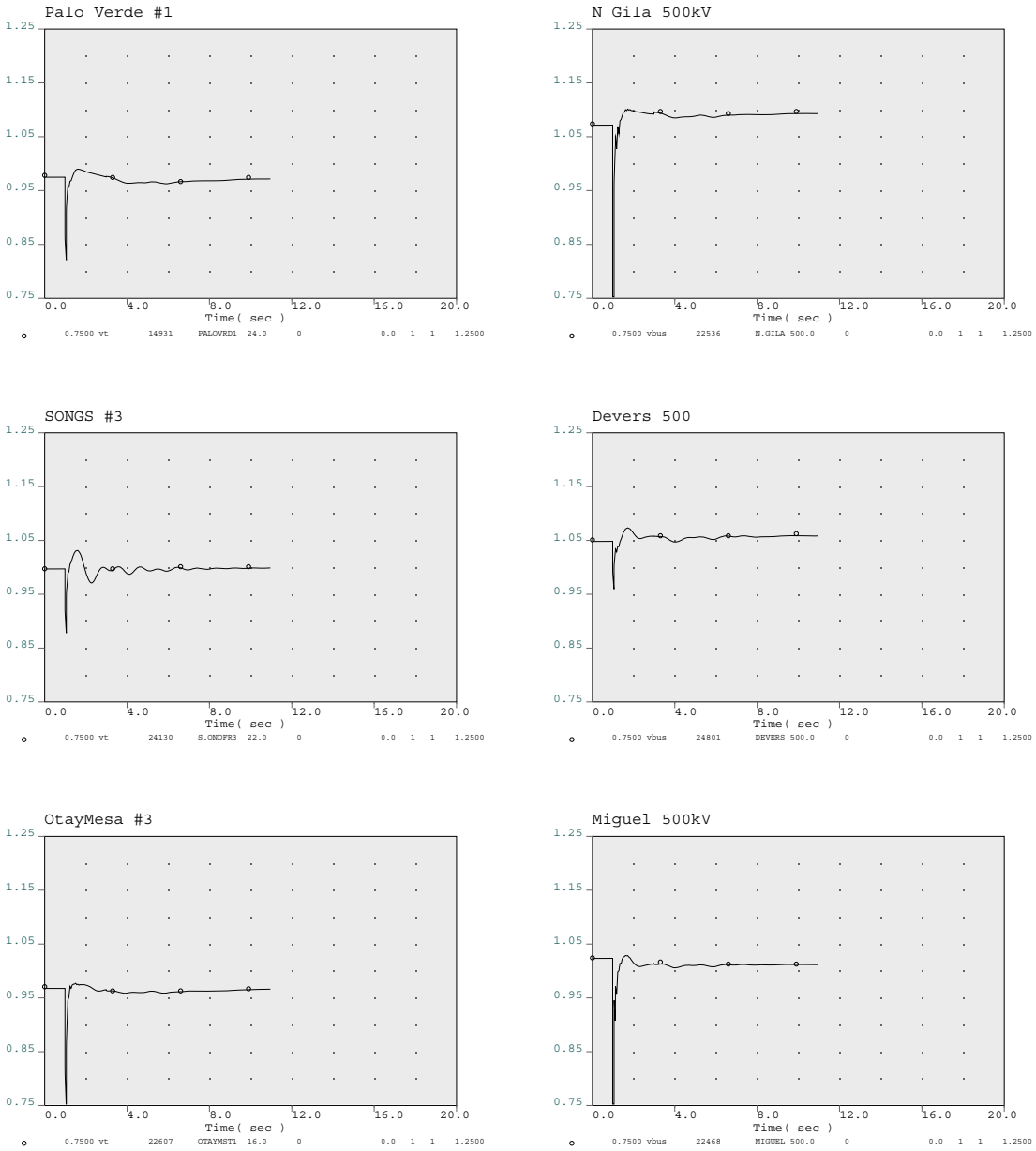


SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

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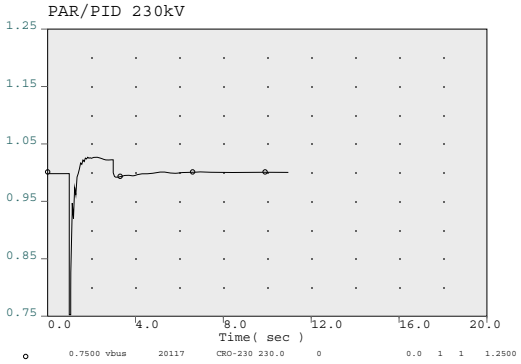
RELATIVE VOLTAGE



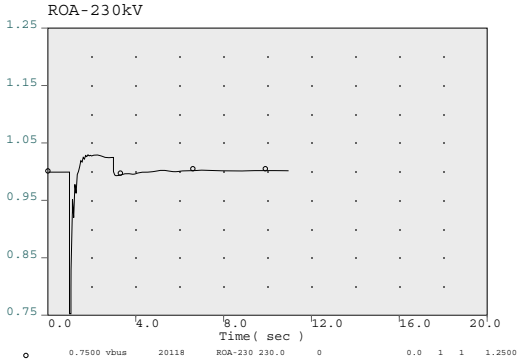
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

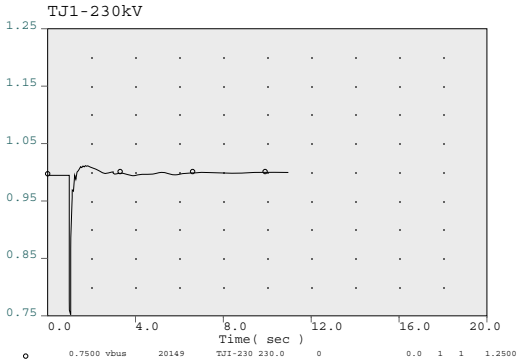
PAR/PID 230kV



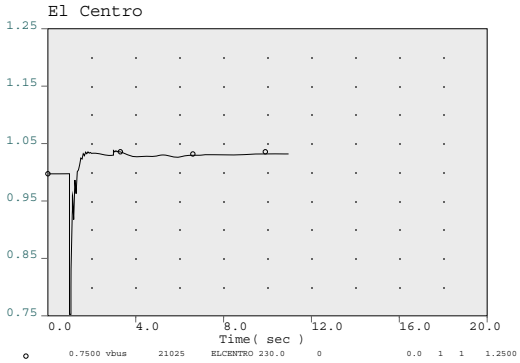
ROA-230kV



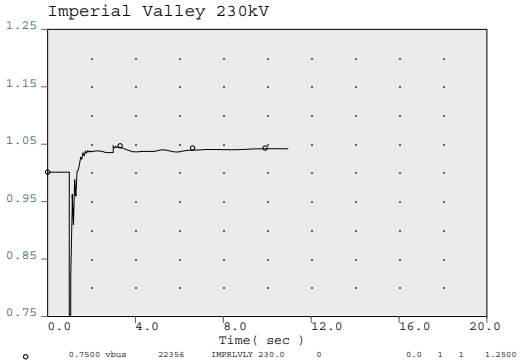
TJ1-230kV



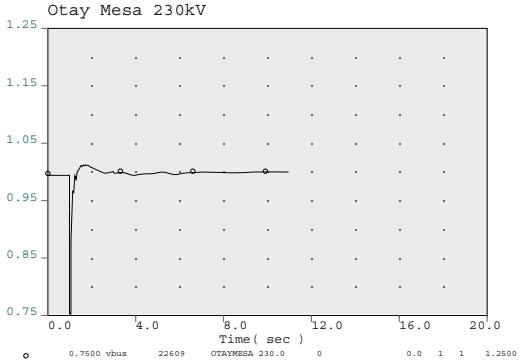
El Centro



Imperial Valley 230kV



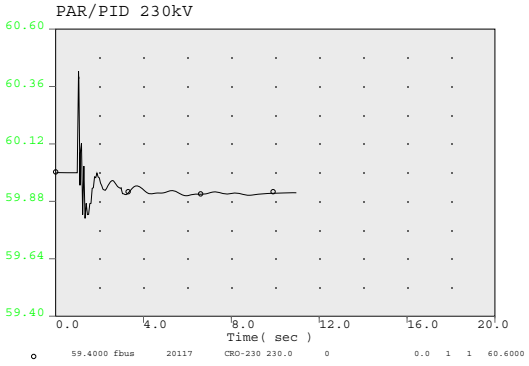
Otay Mesa 230kV



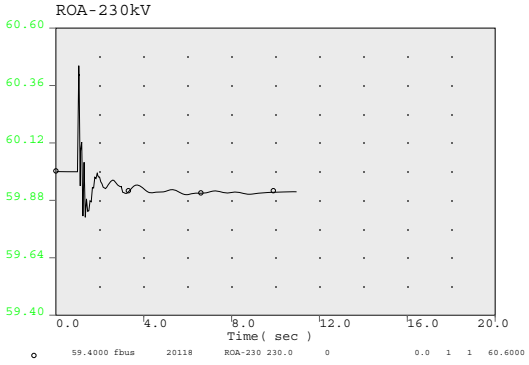
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

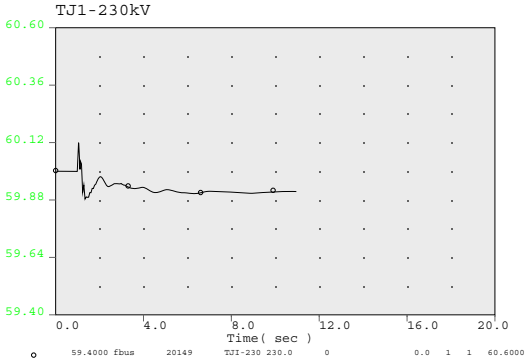
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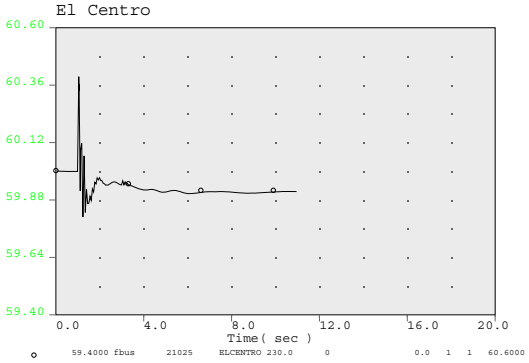
ROA-230kV



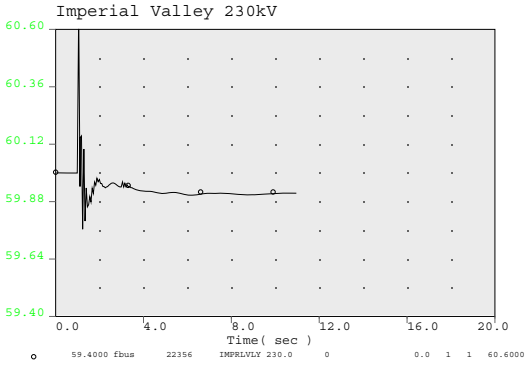
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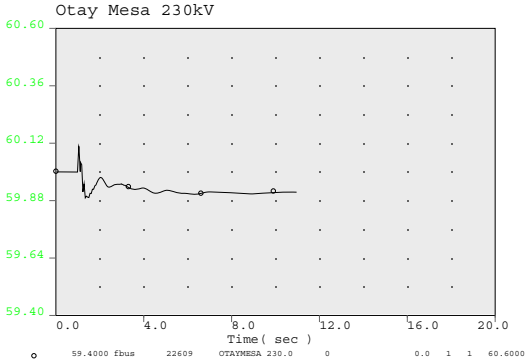
El Centro



Imperial Valley 230kV



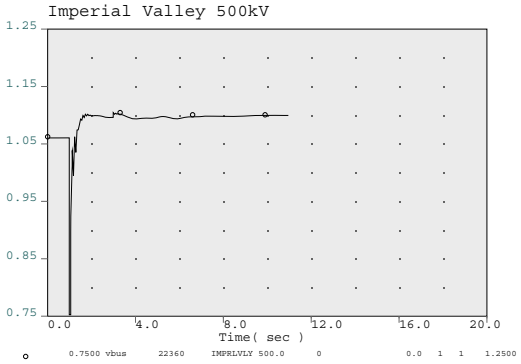
Otay Mesa 230kV



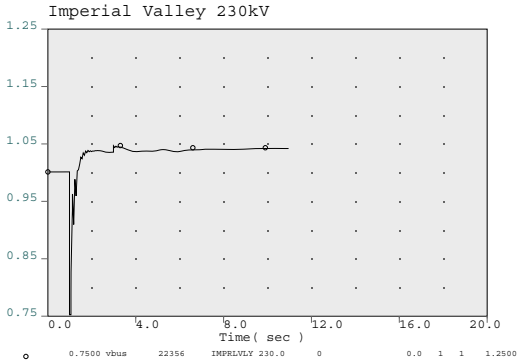
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

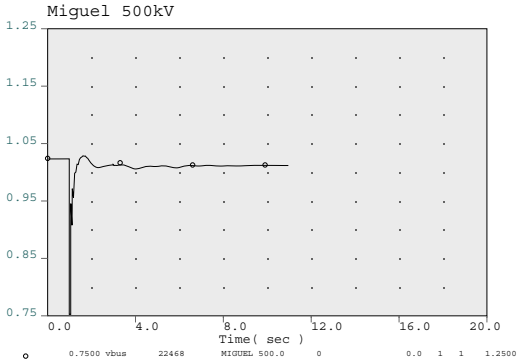
Imperial Valley 500kV



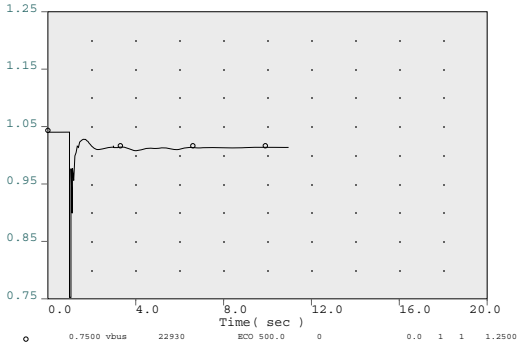
Imperial Valley 230kV



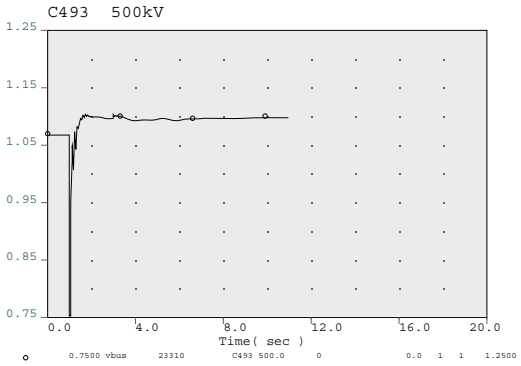
Miguel 500kV



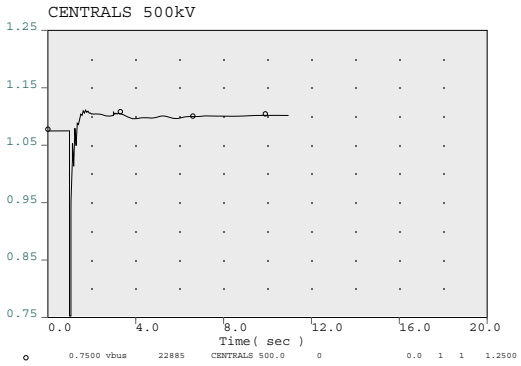
Windfarms 500



C493 500kV

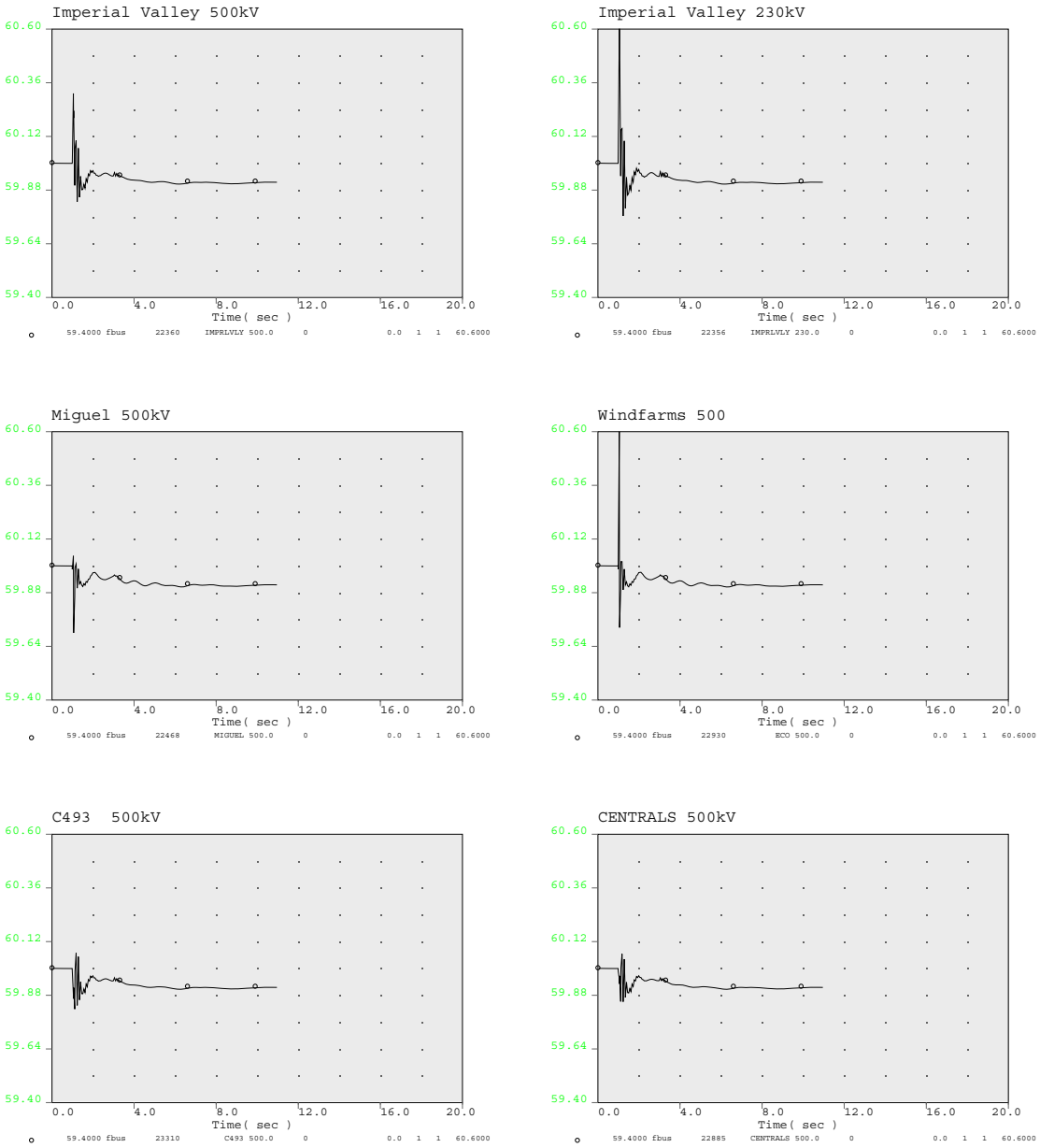


CENTRALS 500kV



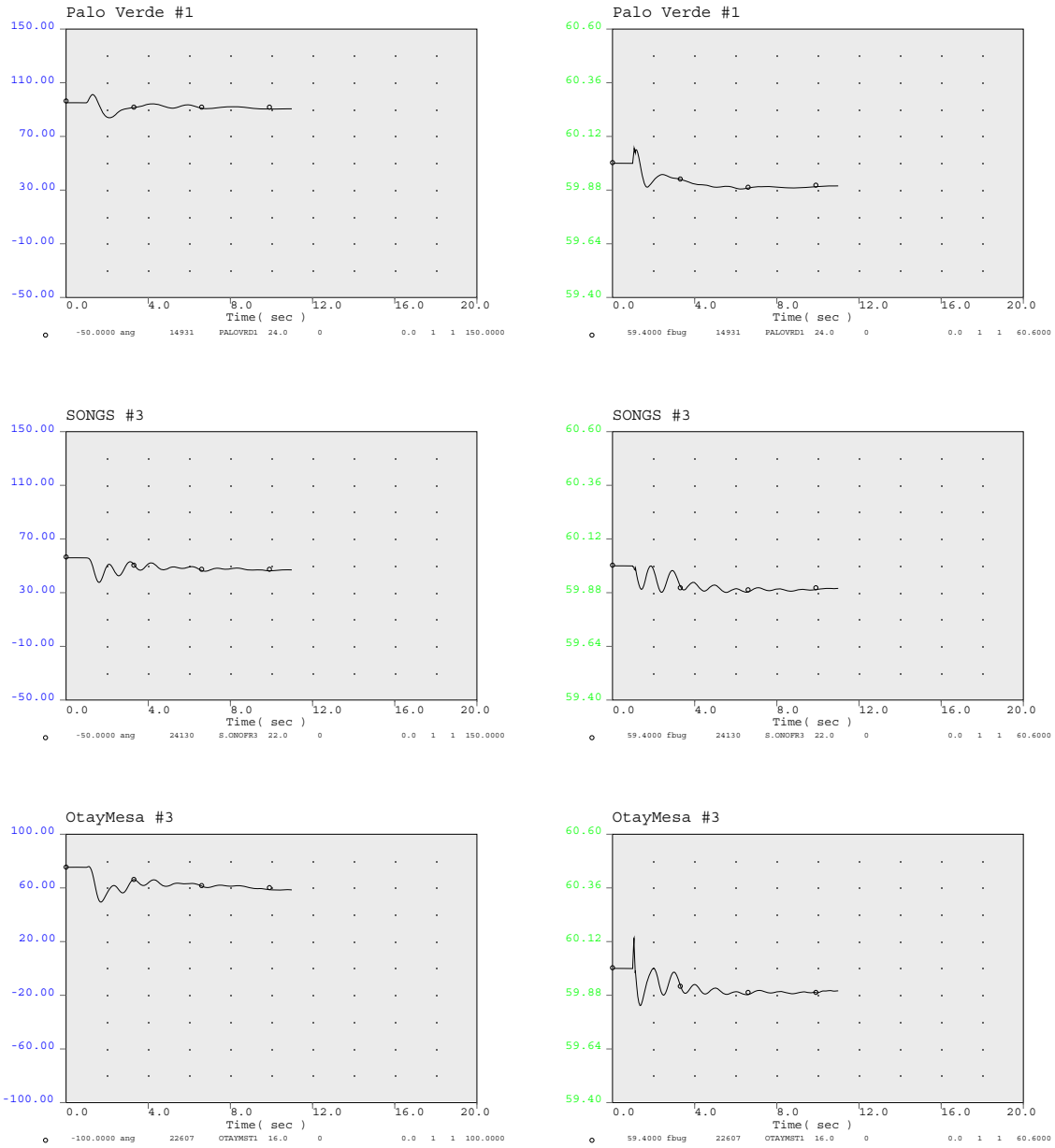
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - Frequency



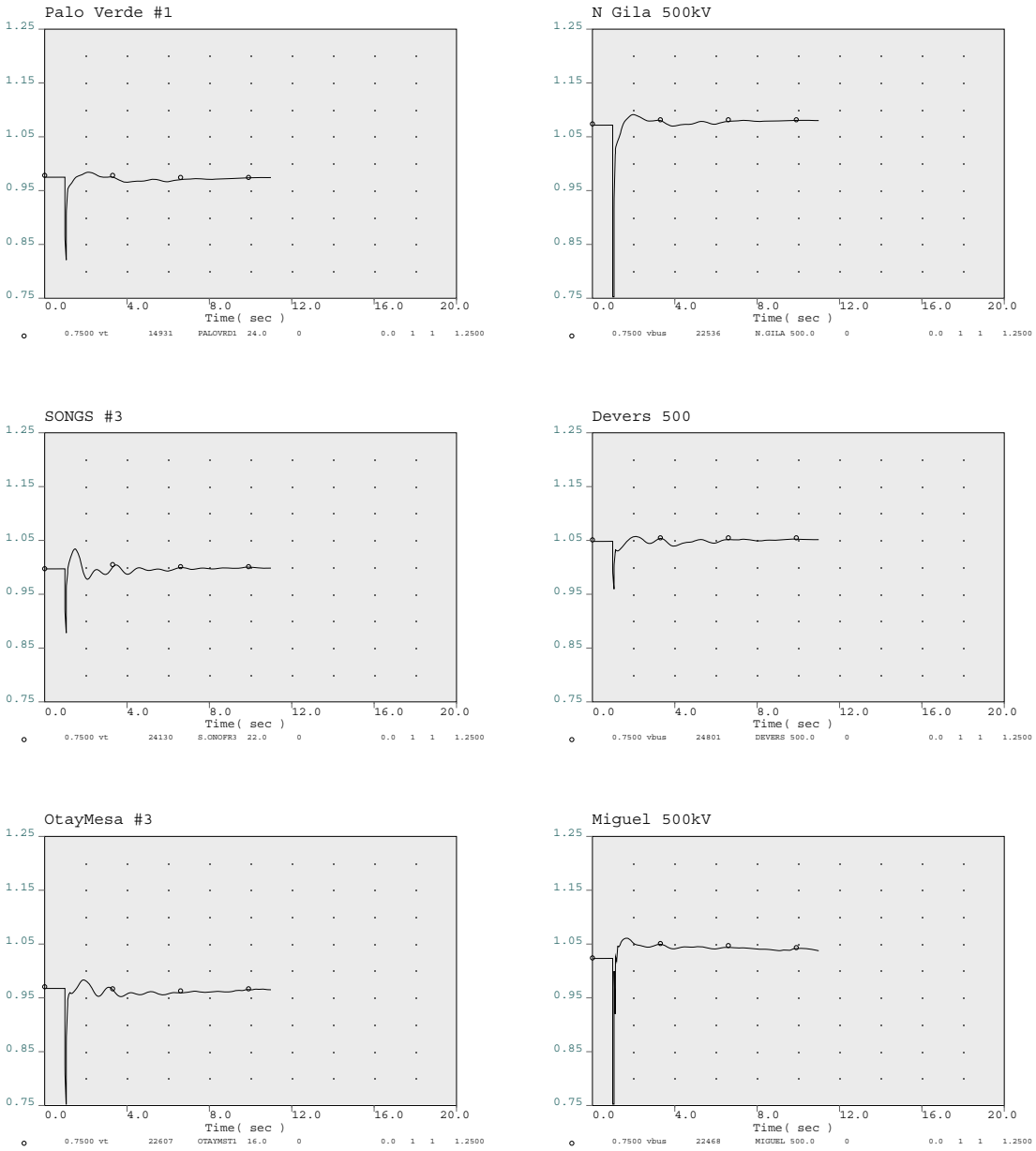
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

RELATIVE ROTOR ANGLE & FREQUENCY



SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

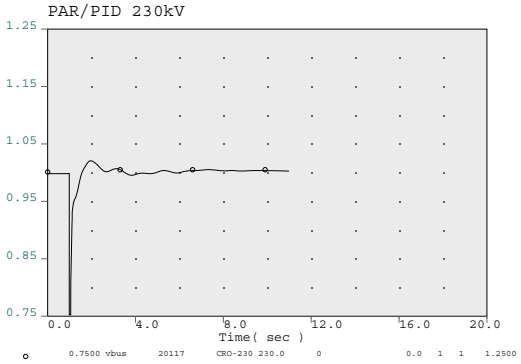
RELATIVE VOLTAGE



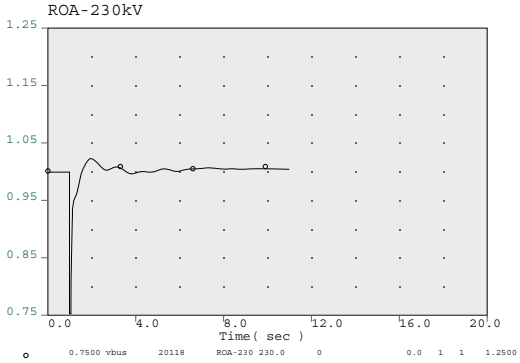
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

Affected System Voltage Check and Comparison

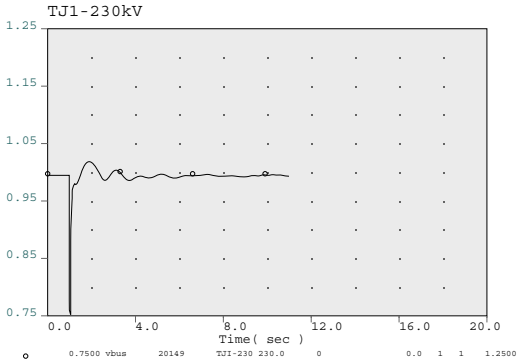
PAR/PID 230kV



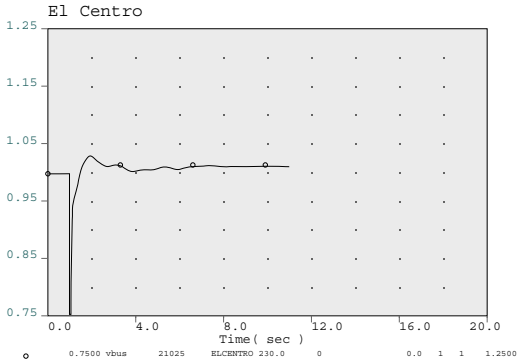
ROA-230kV



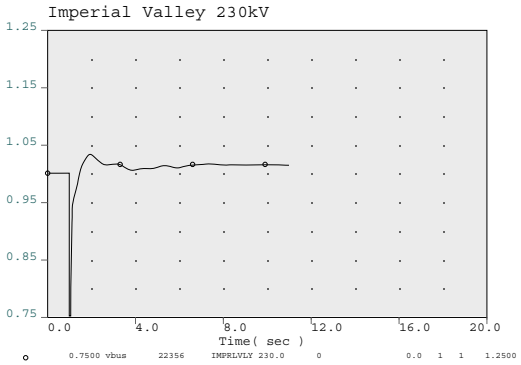
TJ1-230kV



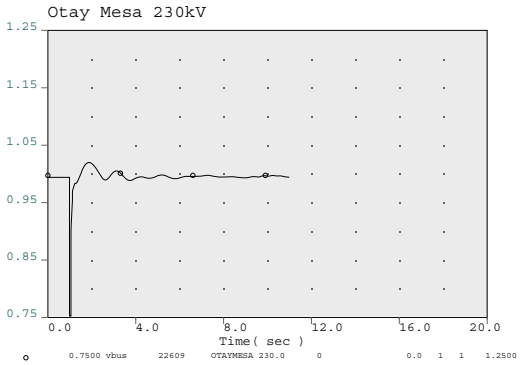
El Centro



Imperial Valley 230kV



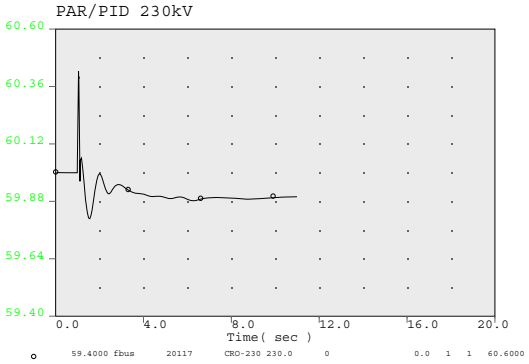
Otay Mesa 230kV



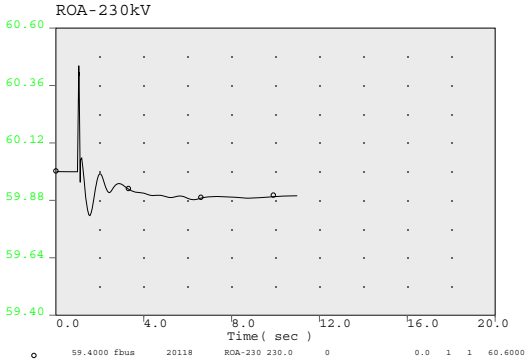
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

Affected System Frequency Check and Comparison

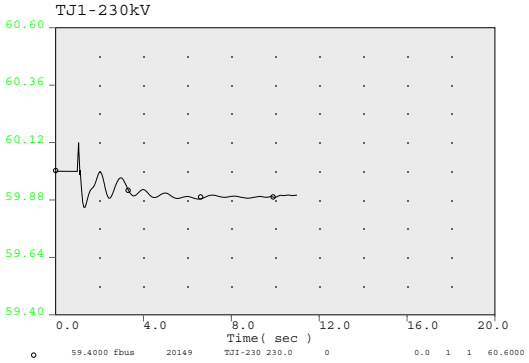
PAR/PID 230kV



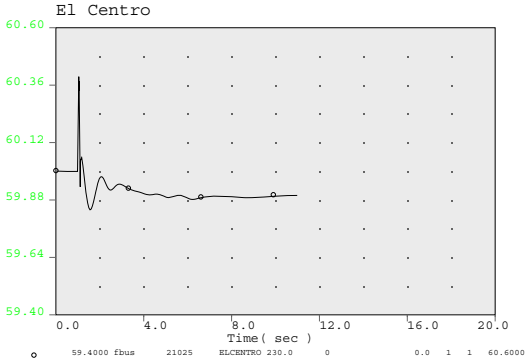
ROA-230kV



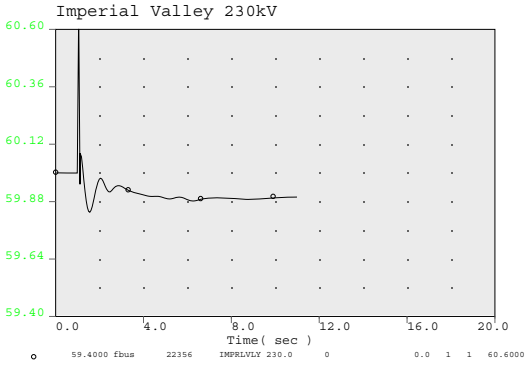
TJ1-230kV



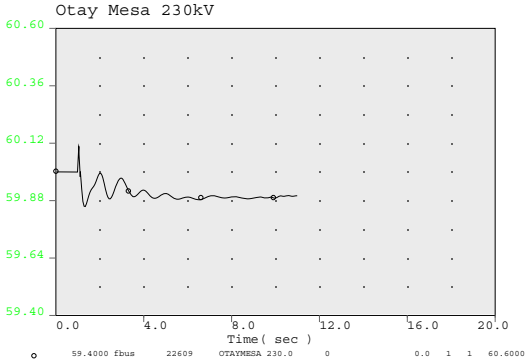
El Centro



Imperial Valley 230kV



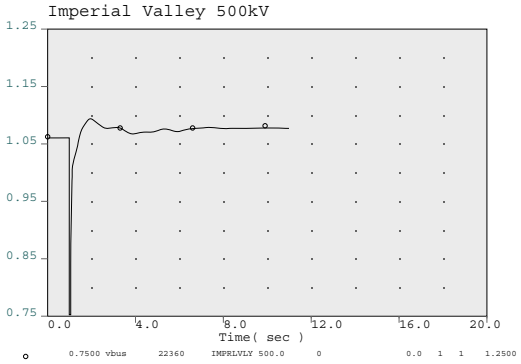
Otay Mesa 230kV



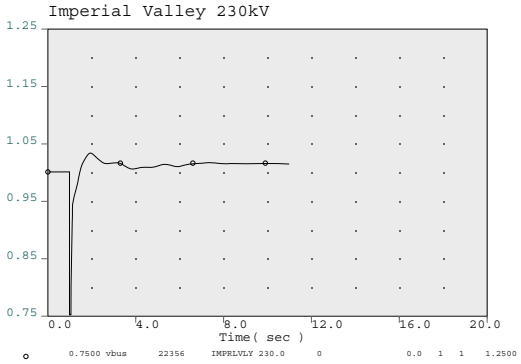
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

Imperial Valley Area - VOLTAGE

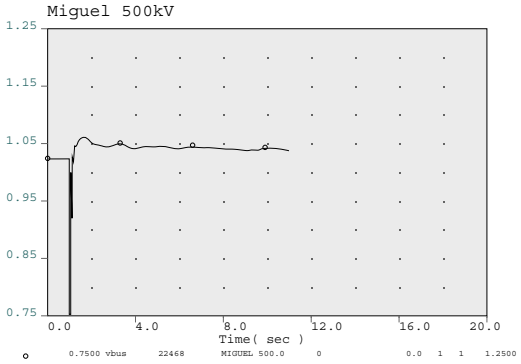
Imperial Valley 500kV



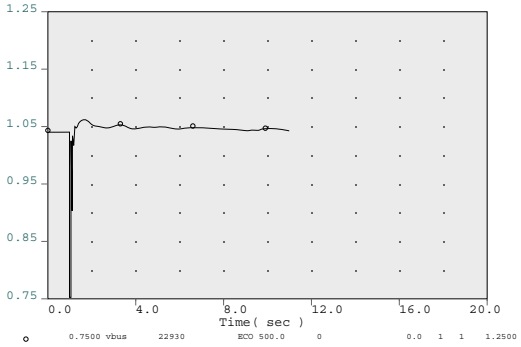
Imperial Valley 230kV



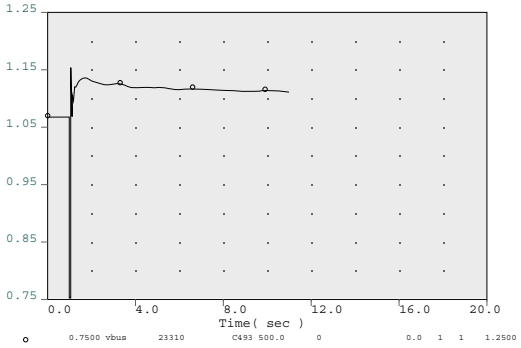
Miguel 500kV



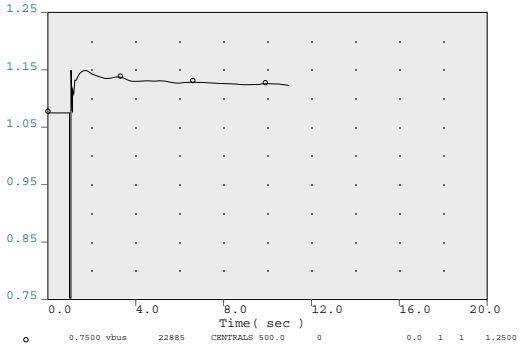
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C493 500kV

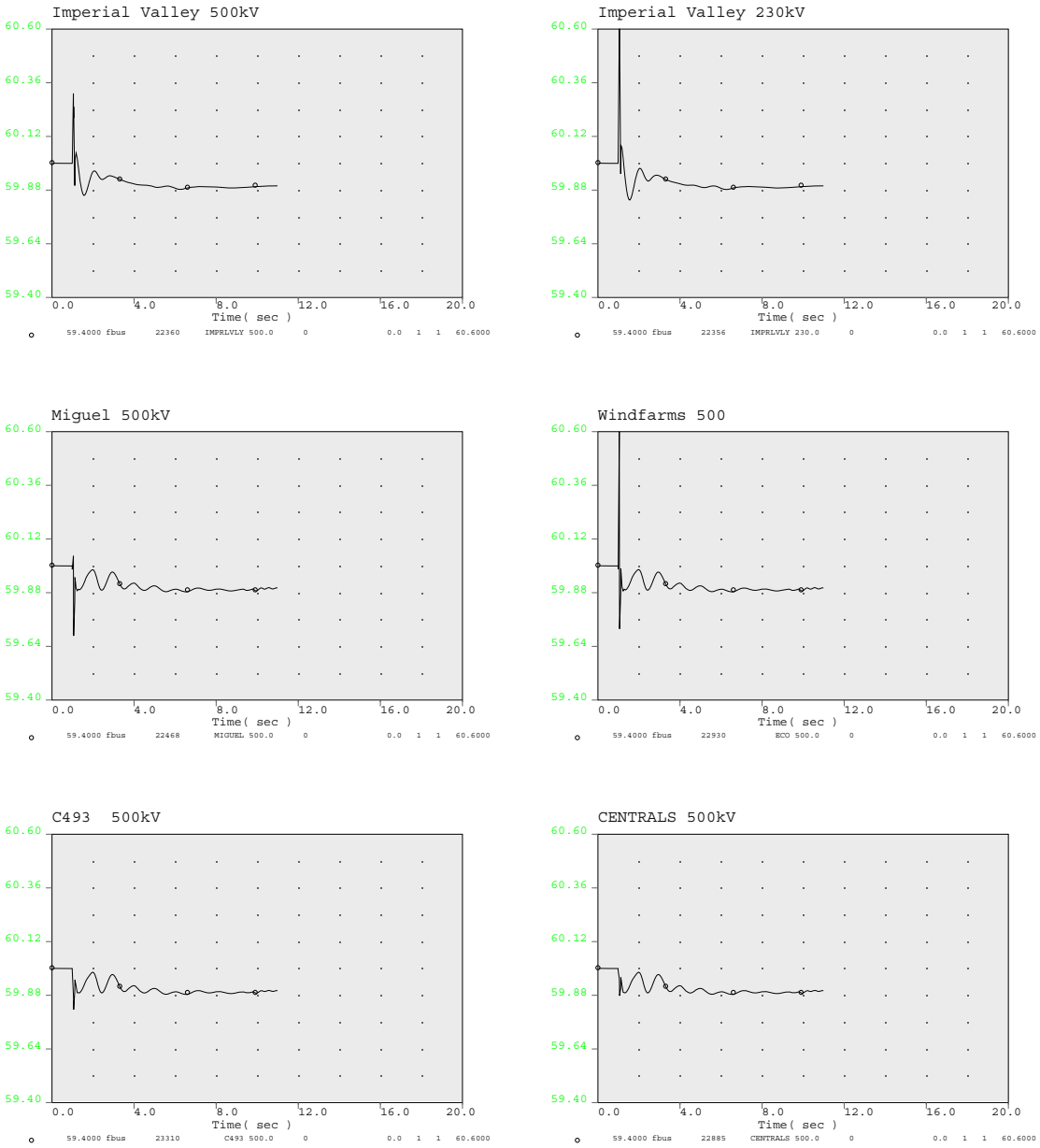


CENTRALS 500kV



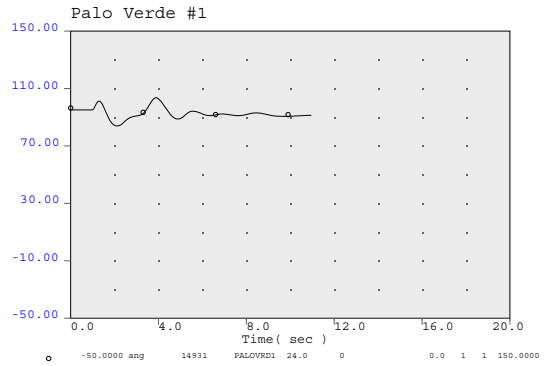
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

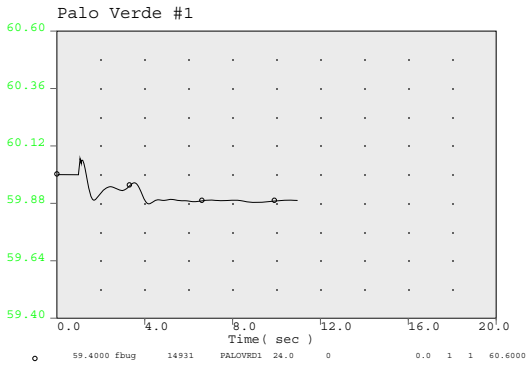
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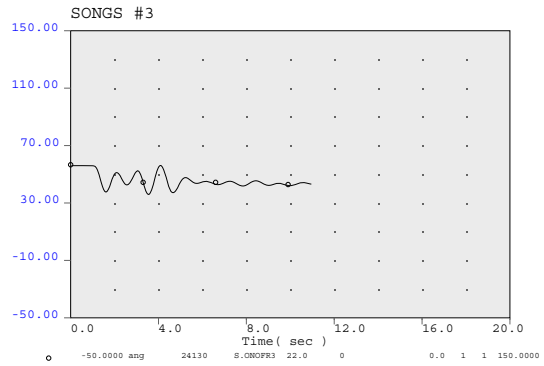


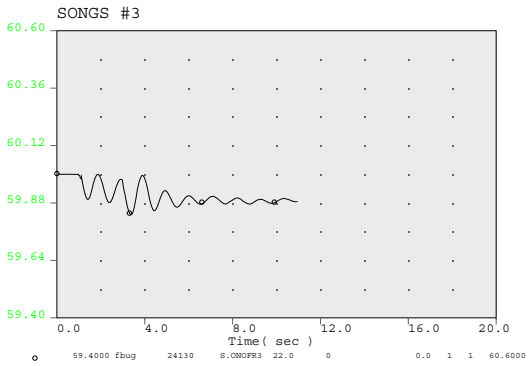
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

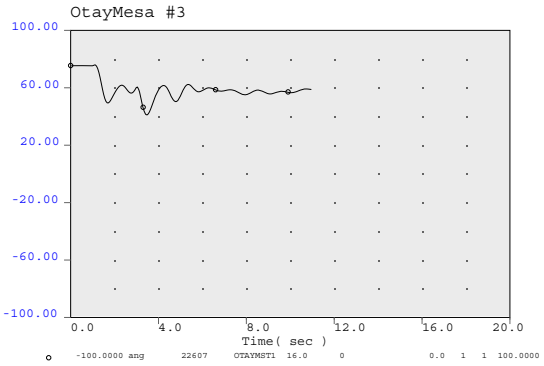
RELATIVE ROTOR ANGLE & FREQUENCY

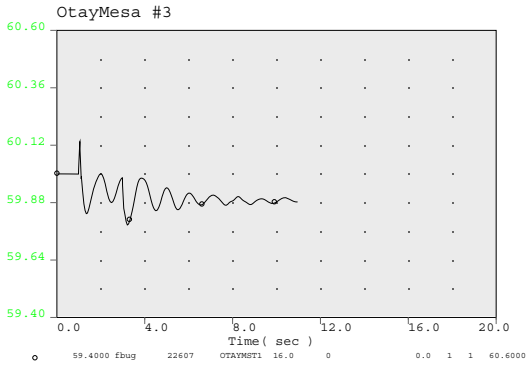










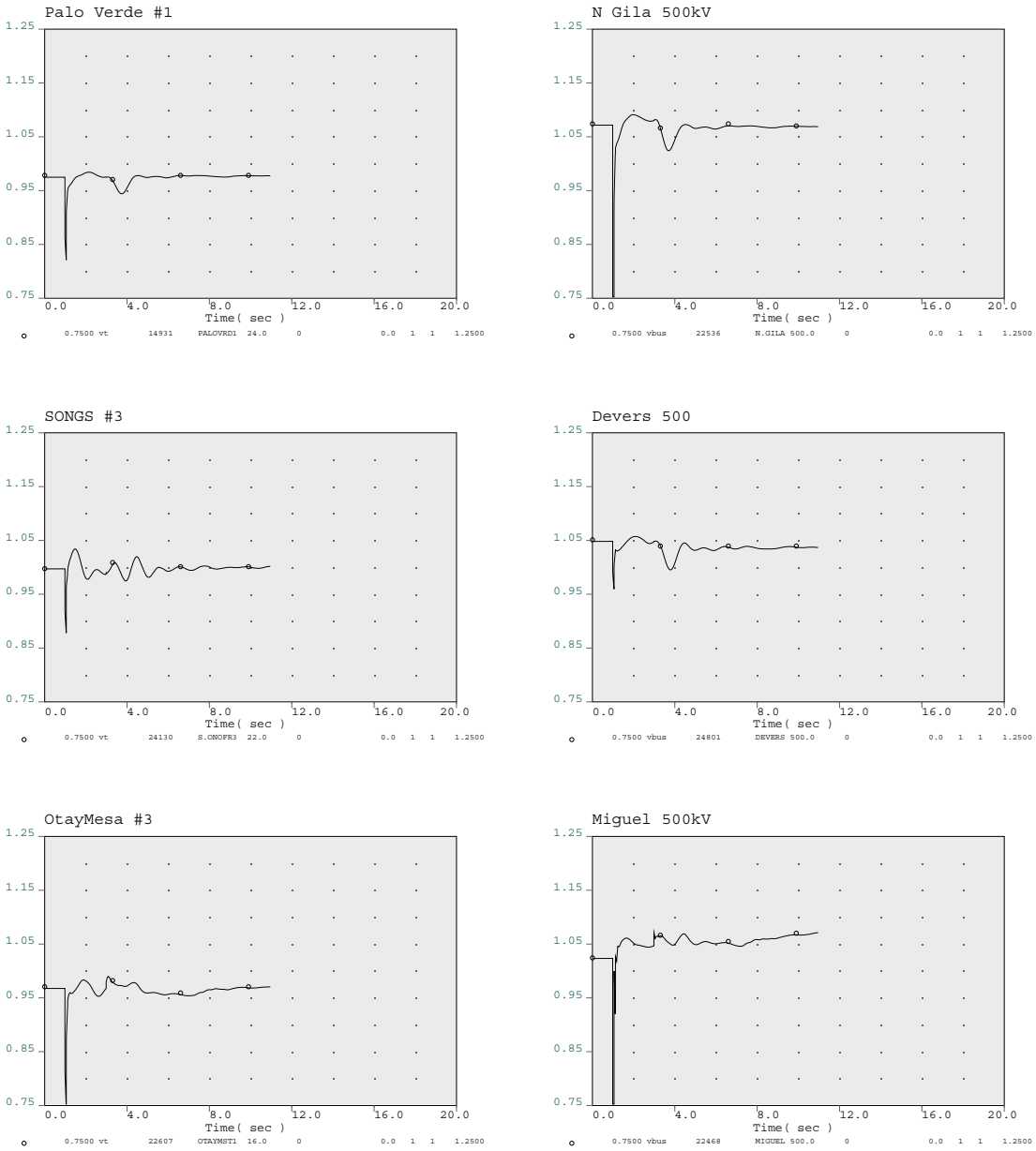


SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

Page 1

SDGE	IV_Wnd_dlo_RxR_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:25:05 2010

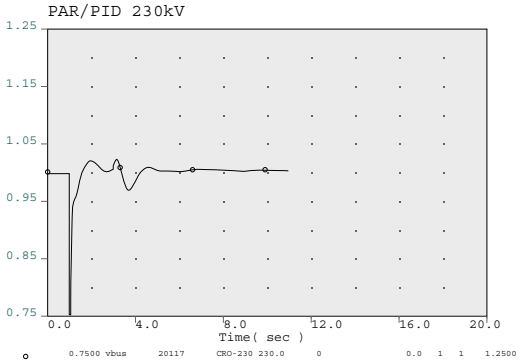
RELATIVE VOLTAGE



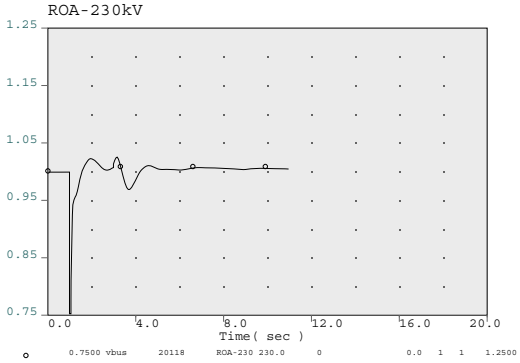
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

Affected System Voltage Check and Comparison

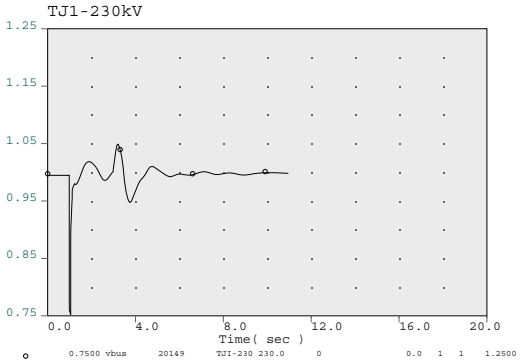
PAR/PID 230kV



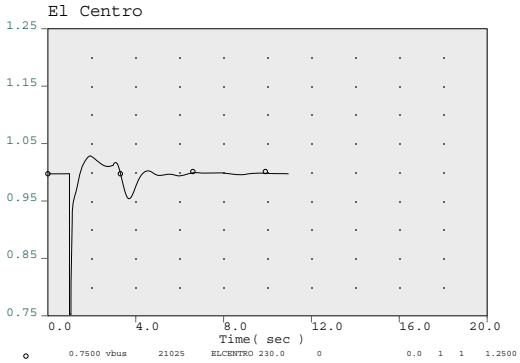
ROA-230kV



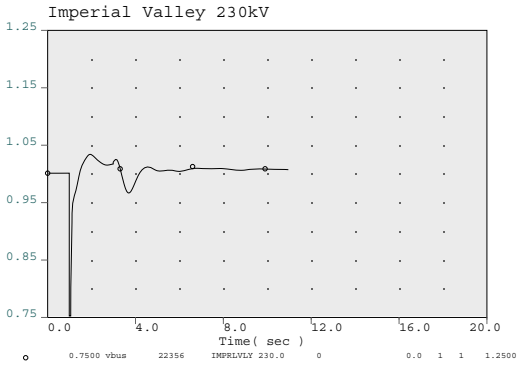
TJ1-230kV



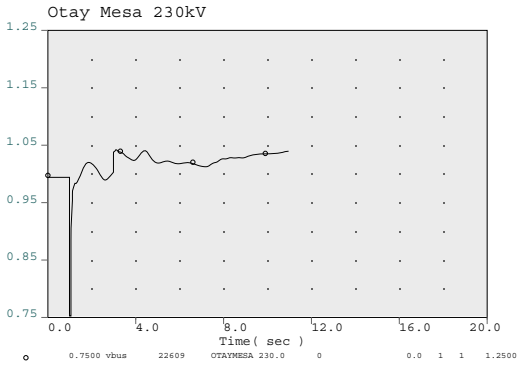
El Centro



Imperial Valley 230kV

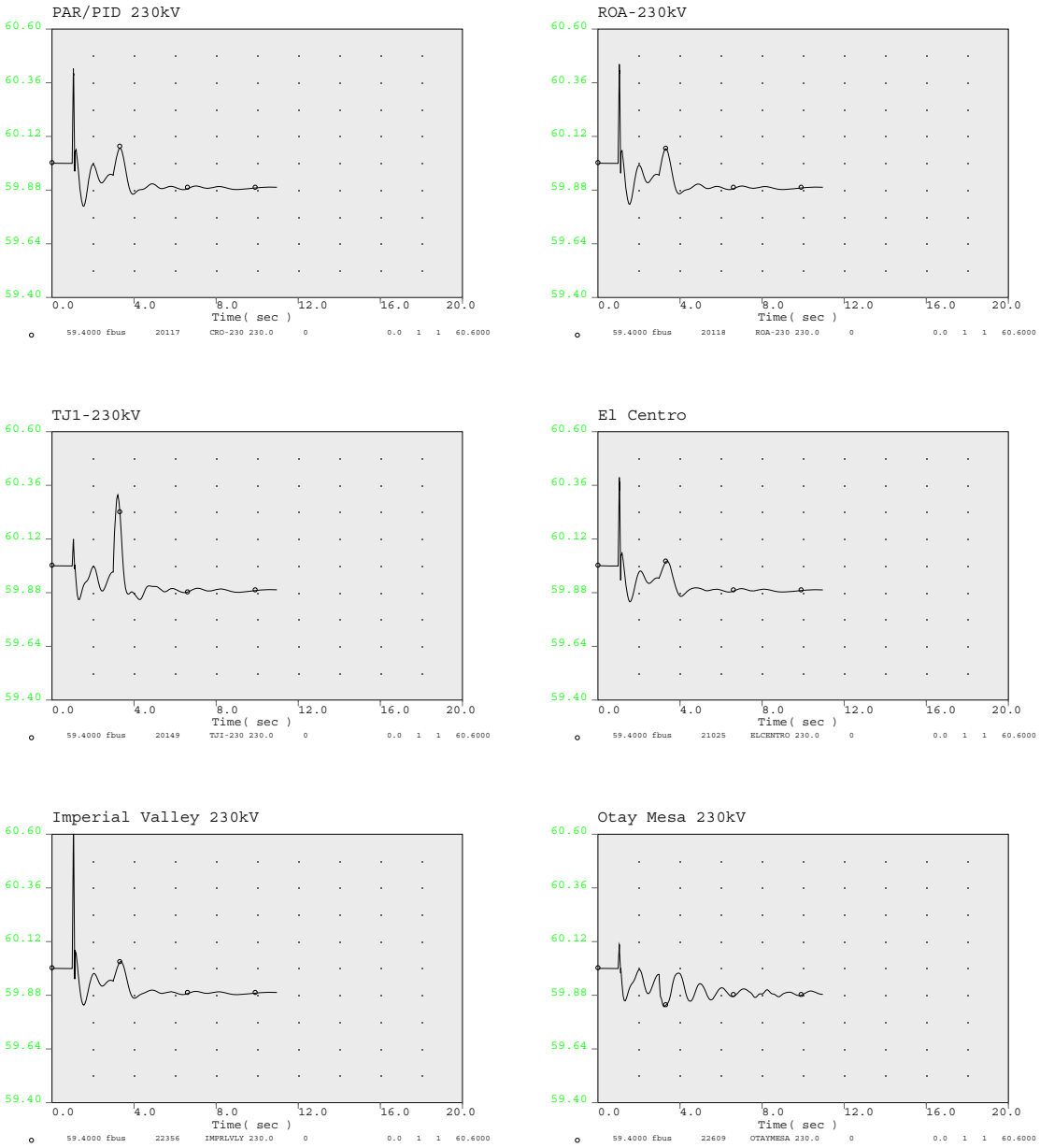


Otay Mesa 230kV



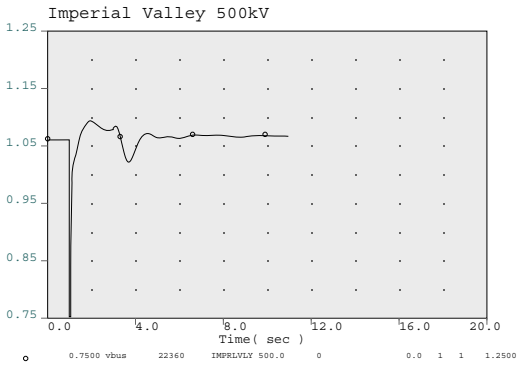
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

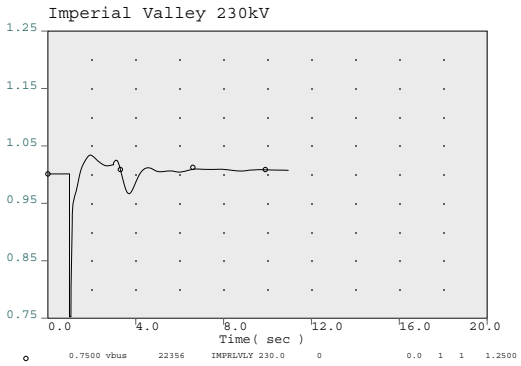
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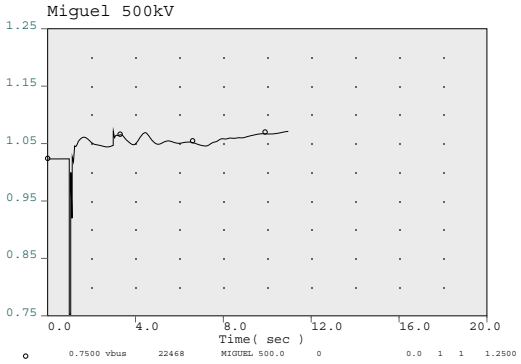


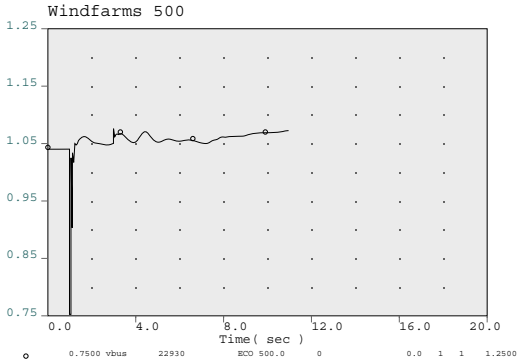
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

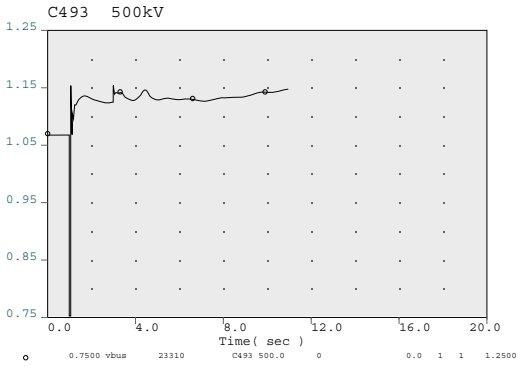
Imperial Valley Area - VOLTAGE

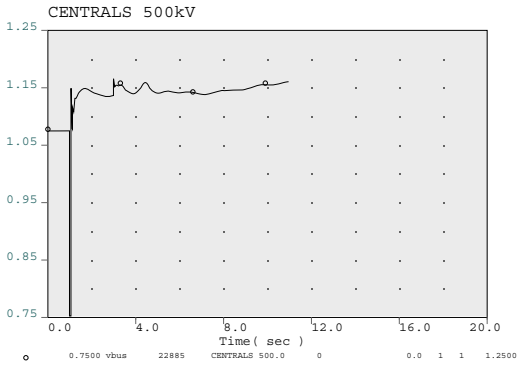






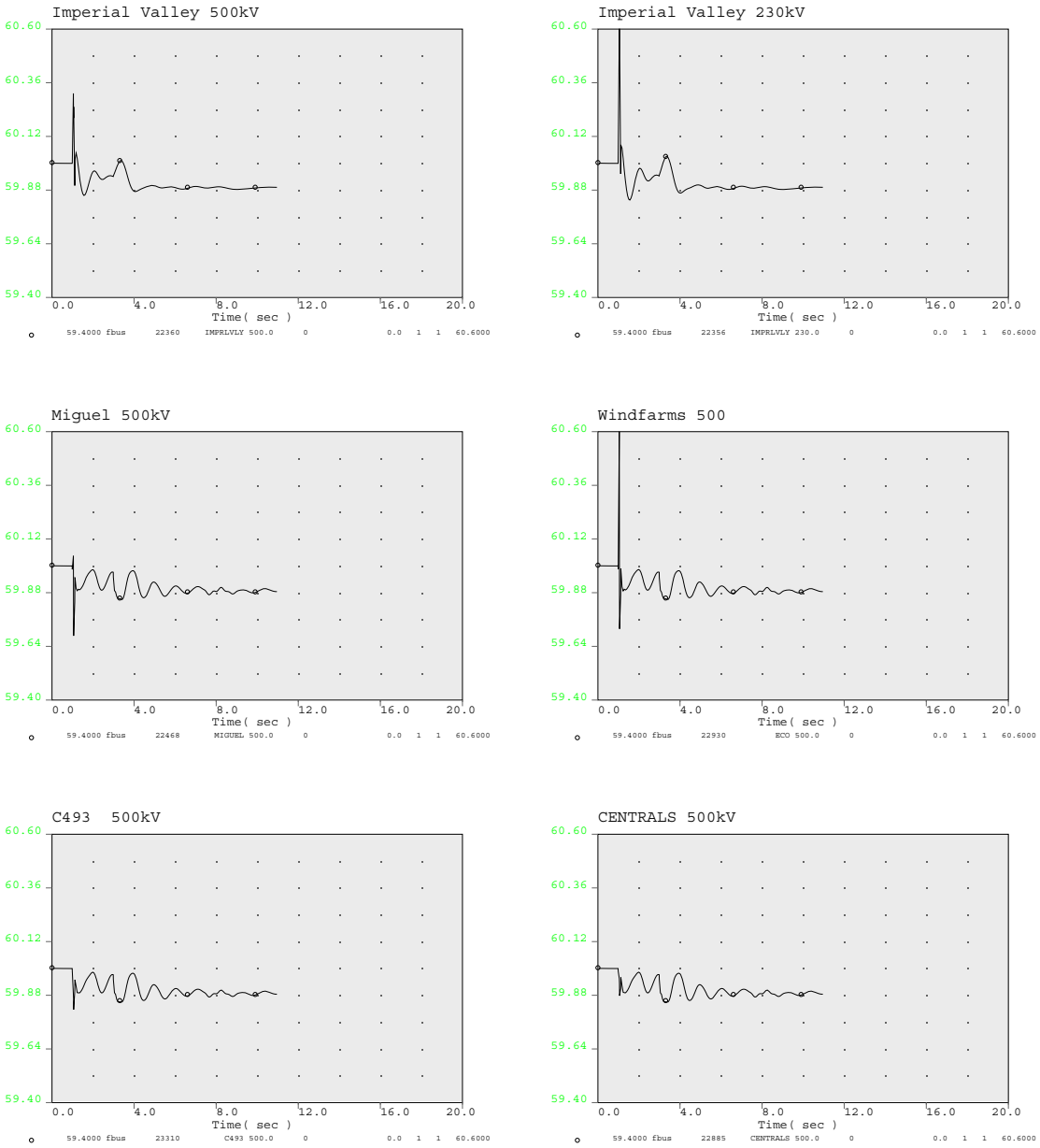






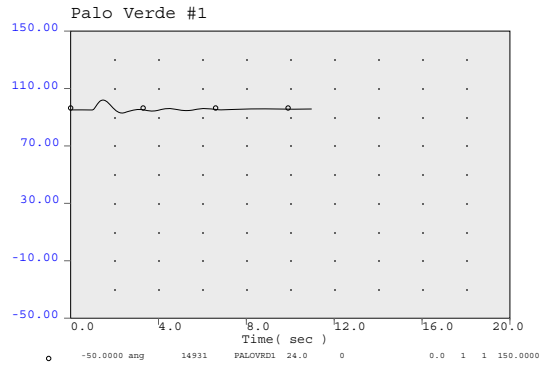
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

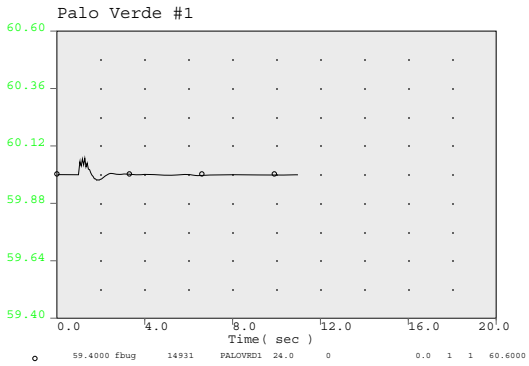
Imperial Valley Area - Frequency

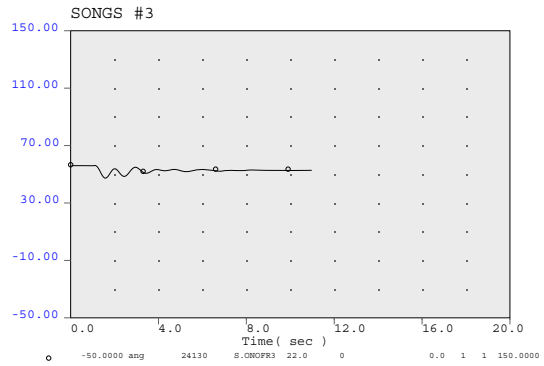


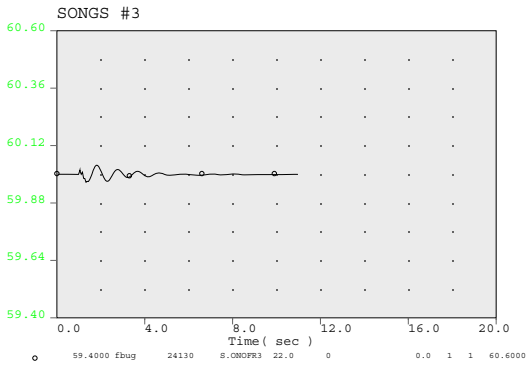
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-ECO & IV-C493 500 kV Double line outage

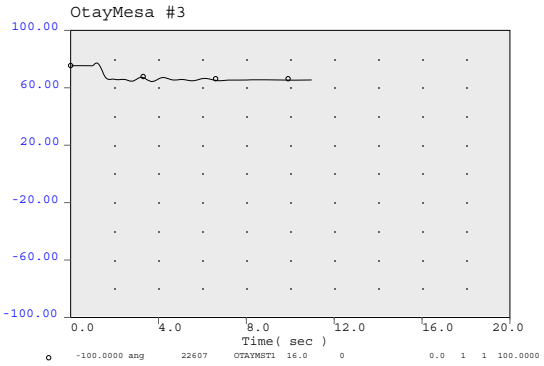
RELATIVE ROTOR ANGLE & FREQUENCY

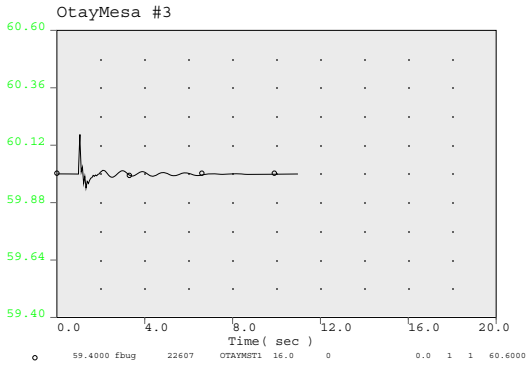










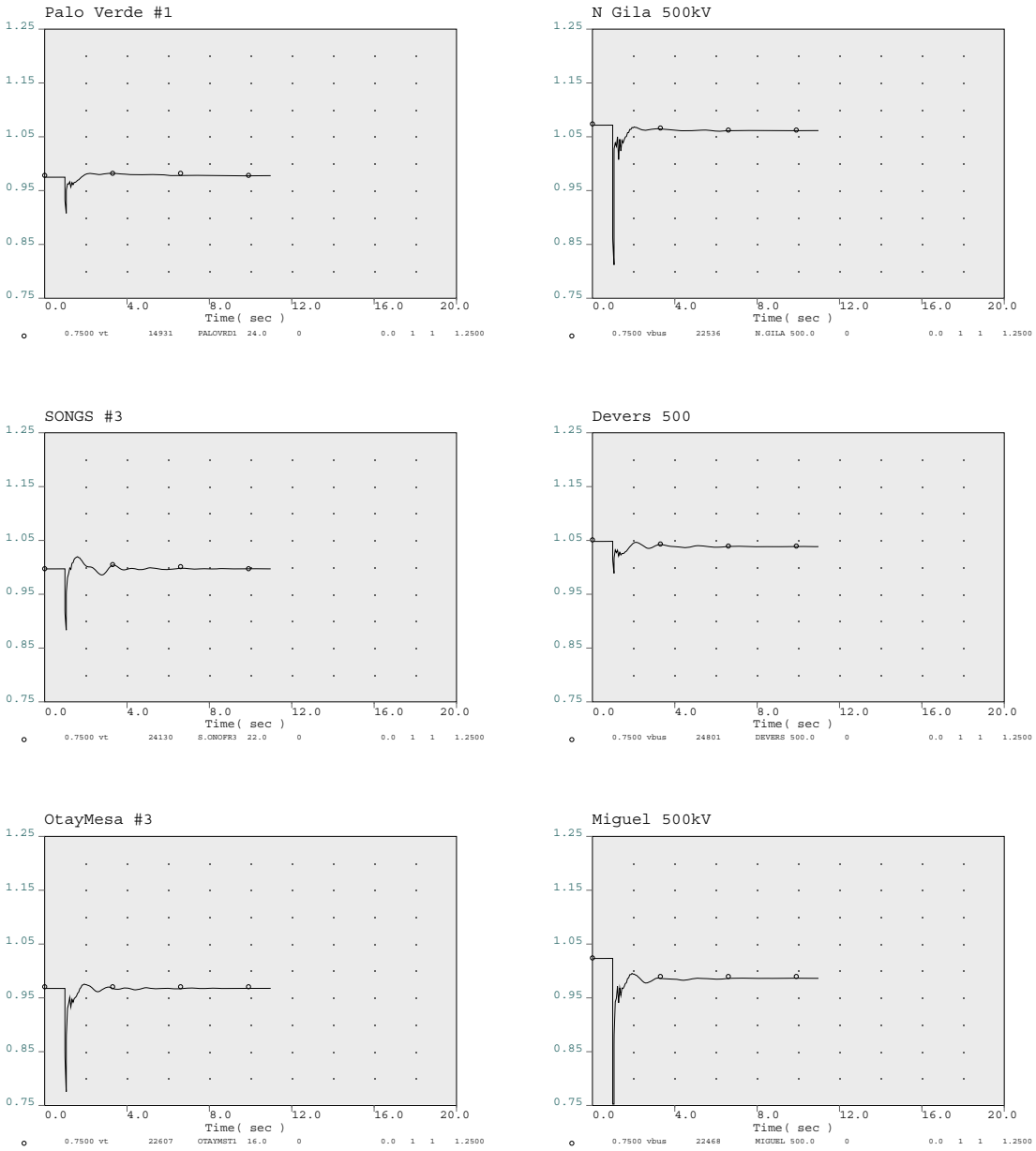


SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Page 1

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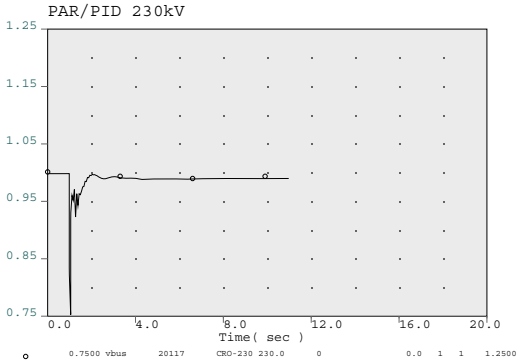
RELATIVE VOLTAGE



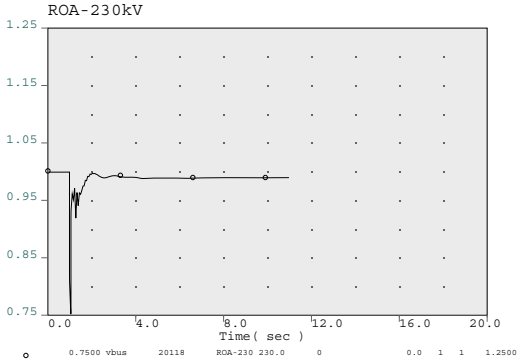
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

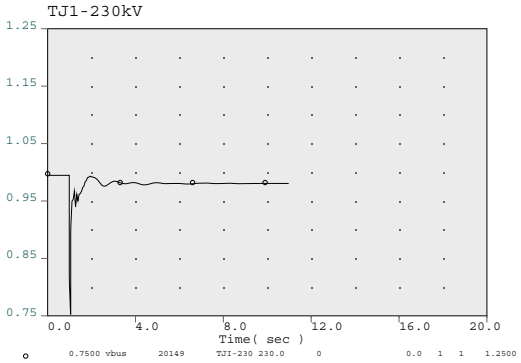
PAR/PID 230kV



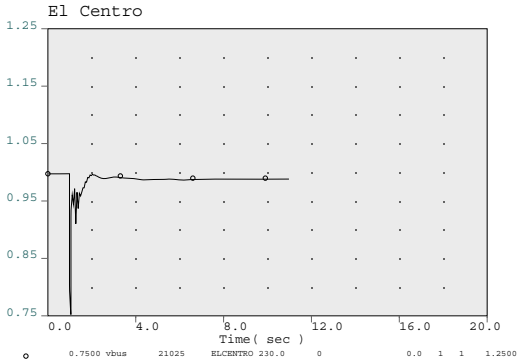
ROA-230kV



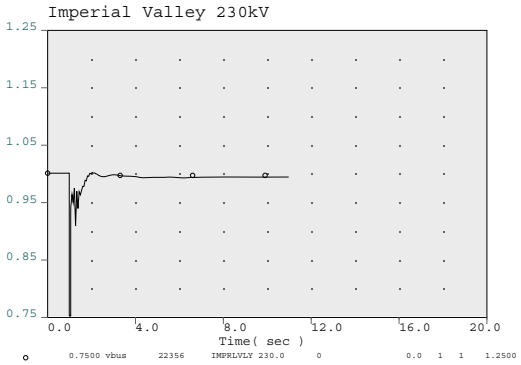
TJ1-230kV



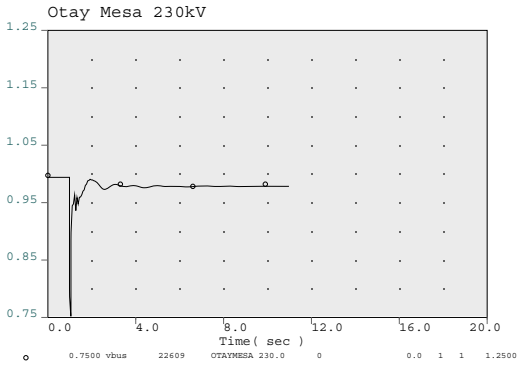
El Centro



Imperial Valley 230kV

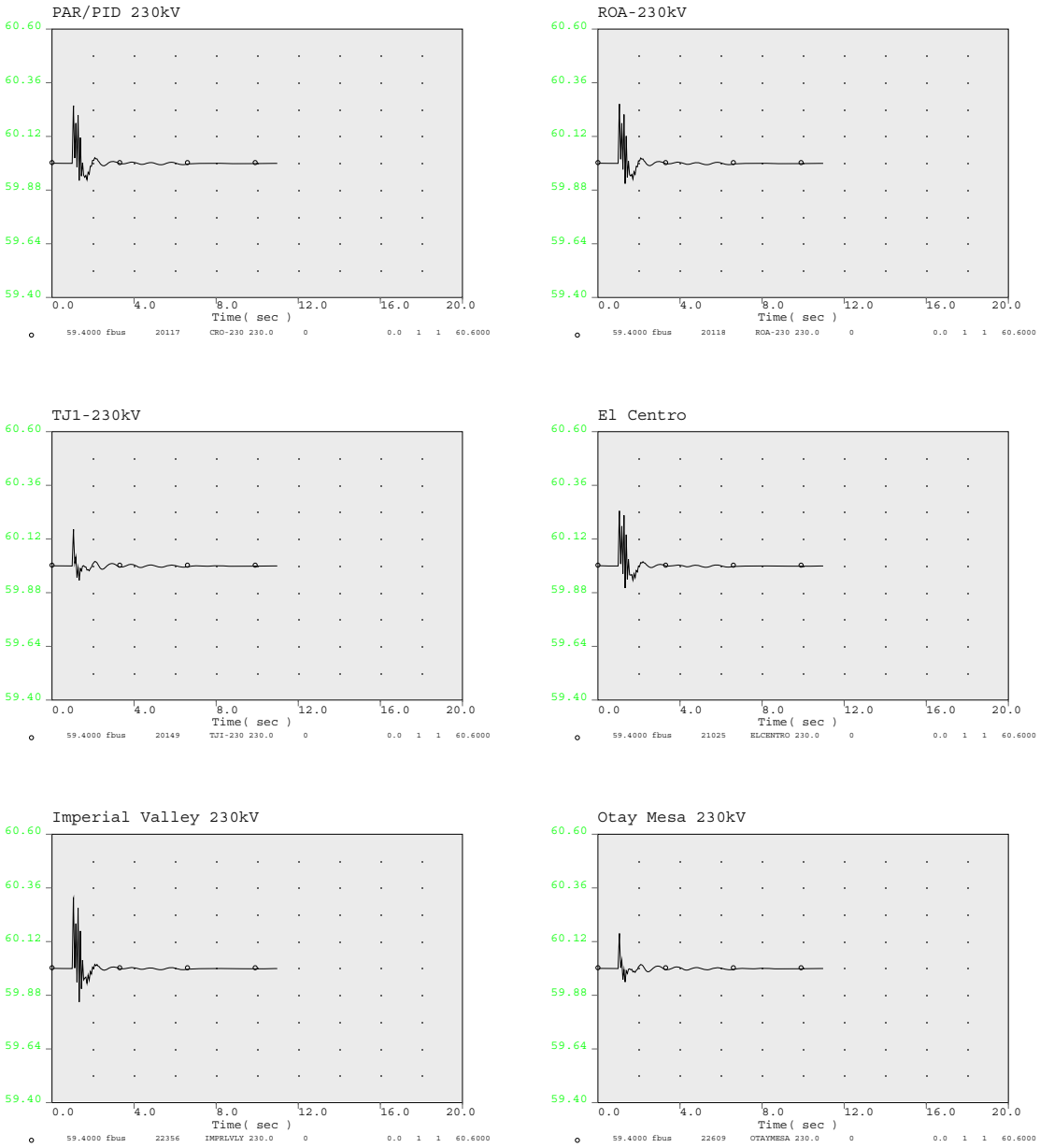


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

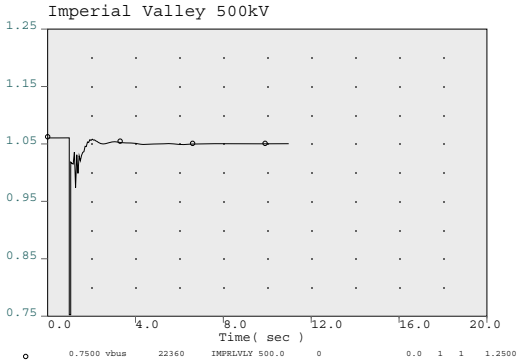
Affected System Frequency Check and Comparison



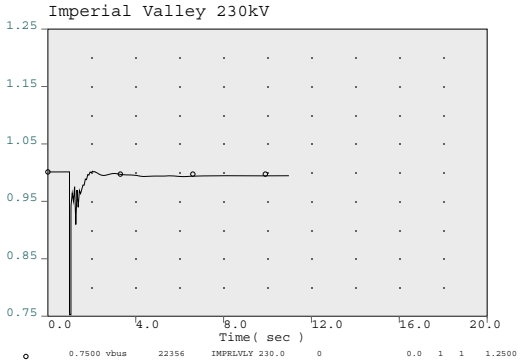
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

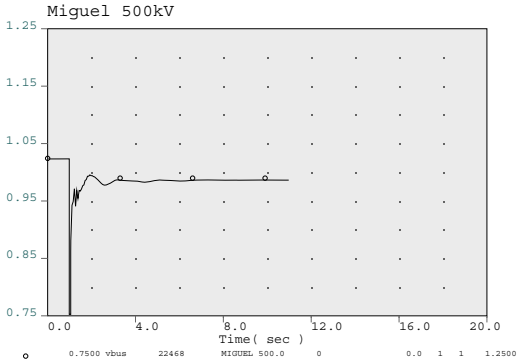
Imperial Valley 500kV



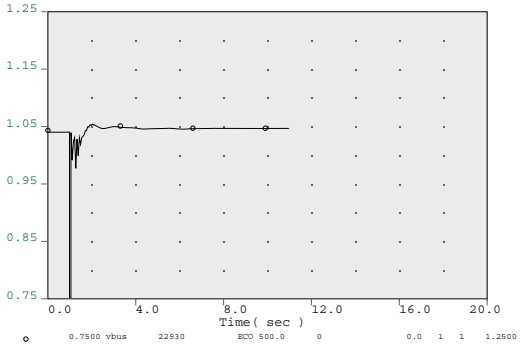
Imperial Valley 230kV



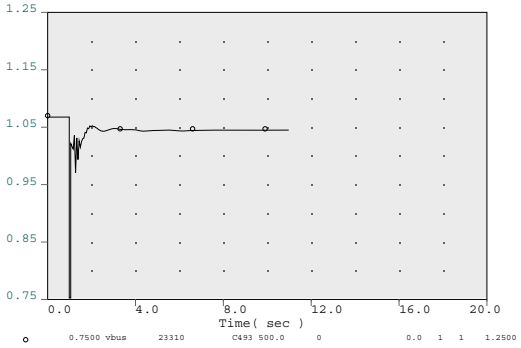
Miguel 500kV



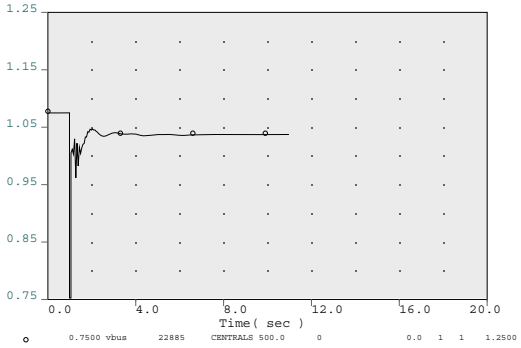
Windfarms 500



C493 500kV

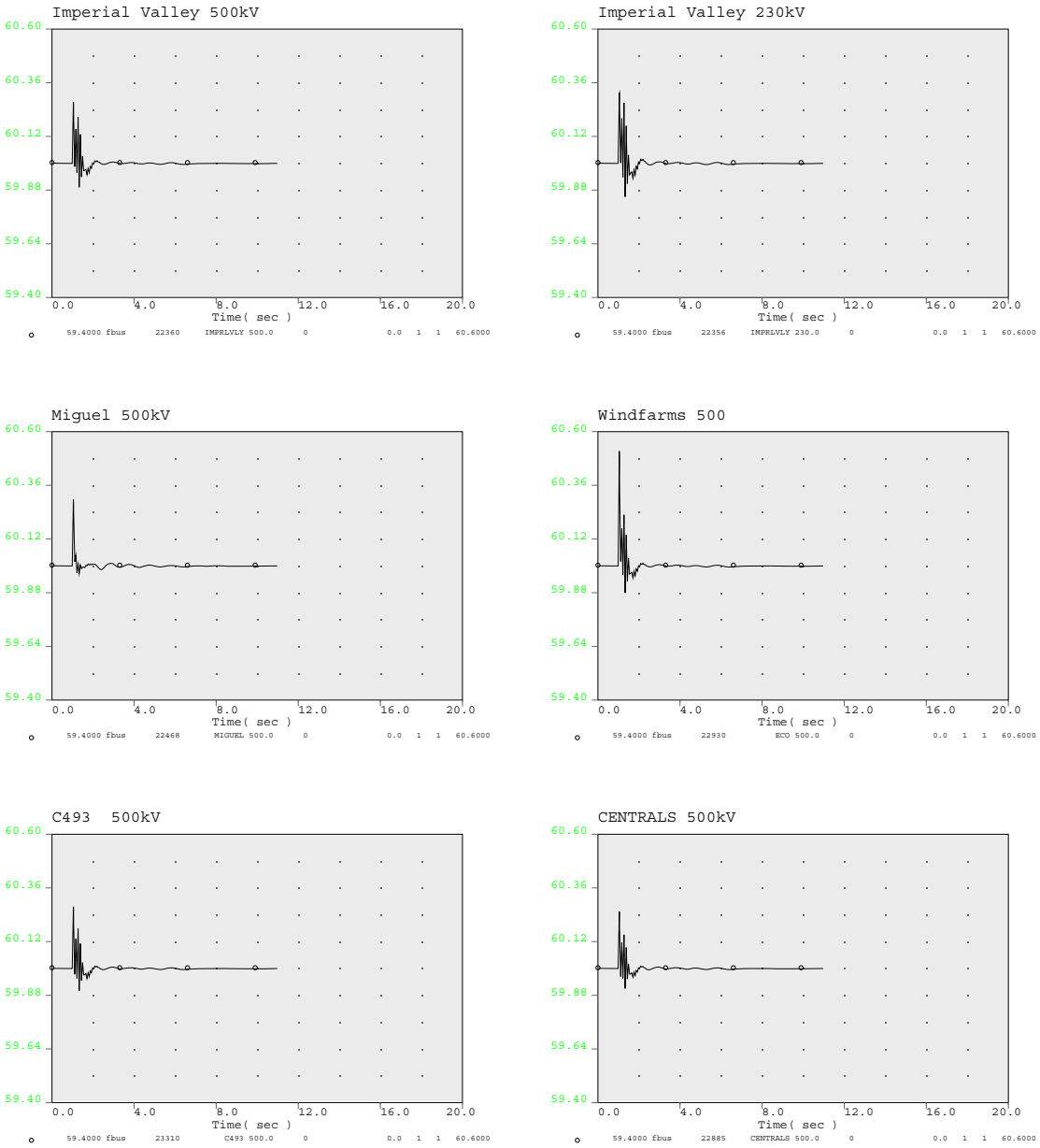


CENTRALS 500kV



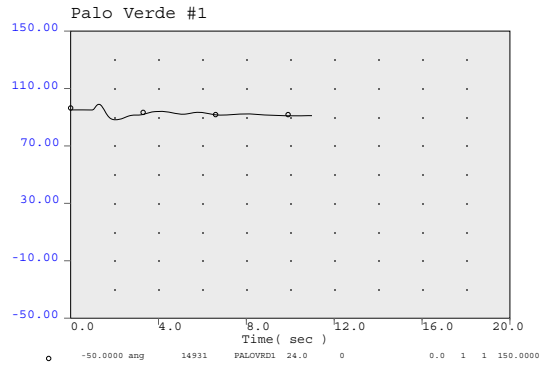
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

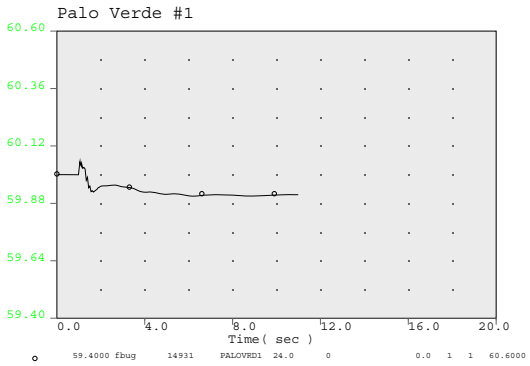
Imperial Valley Area - Frequency

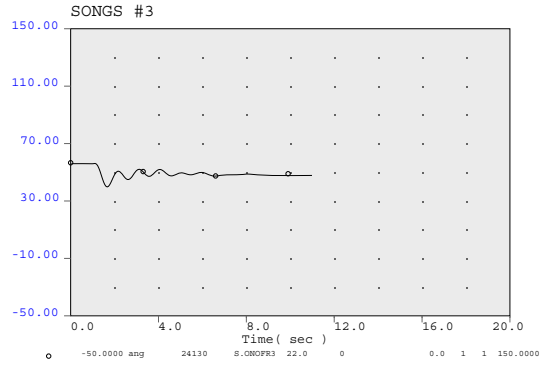


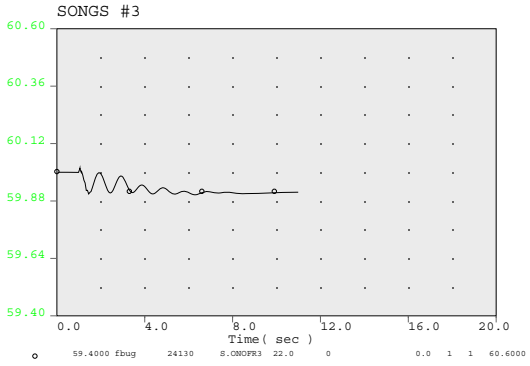
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

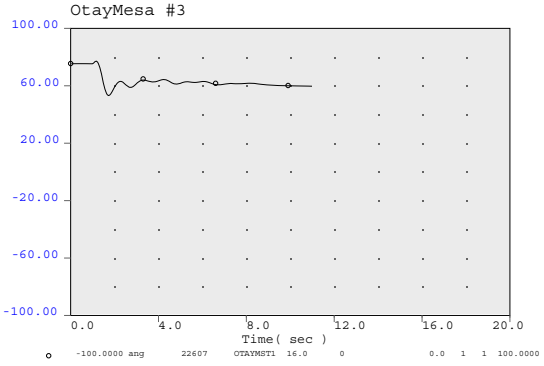
RELATIVE ROTOR ANGLE & FREQUENCY

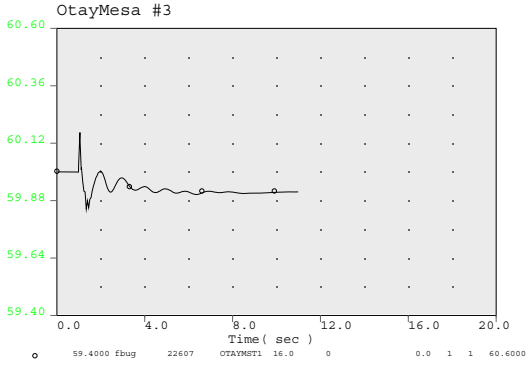






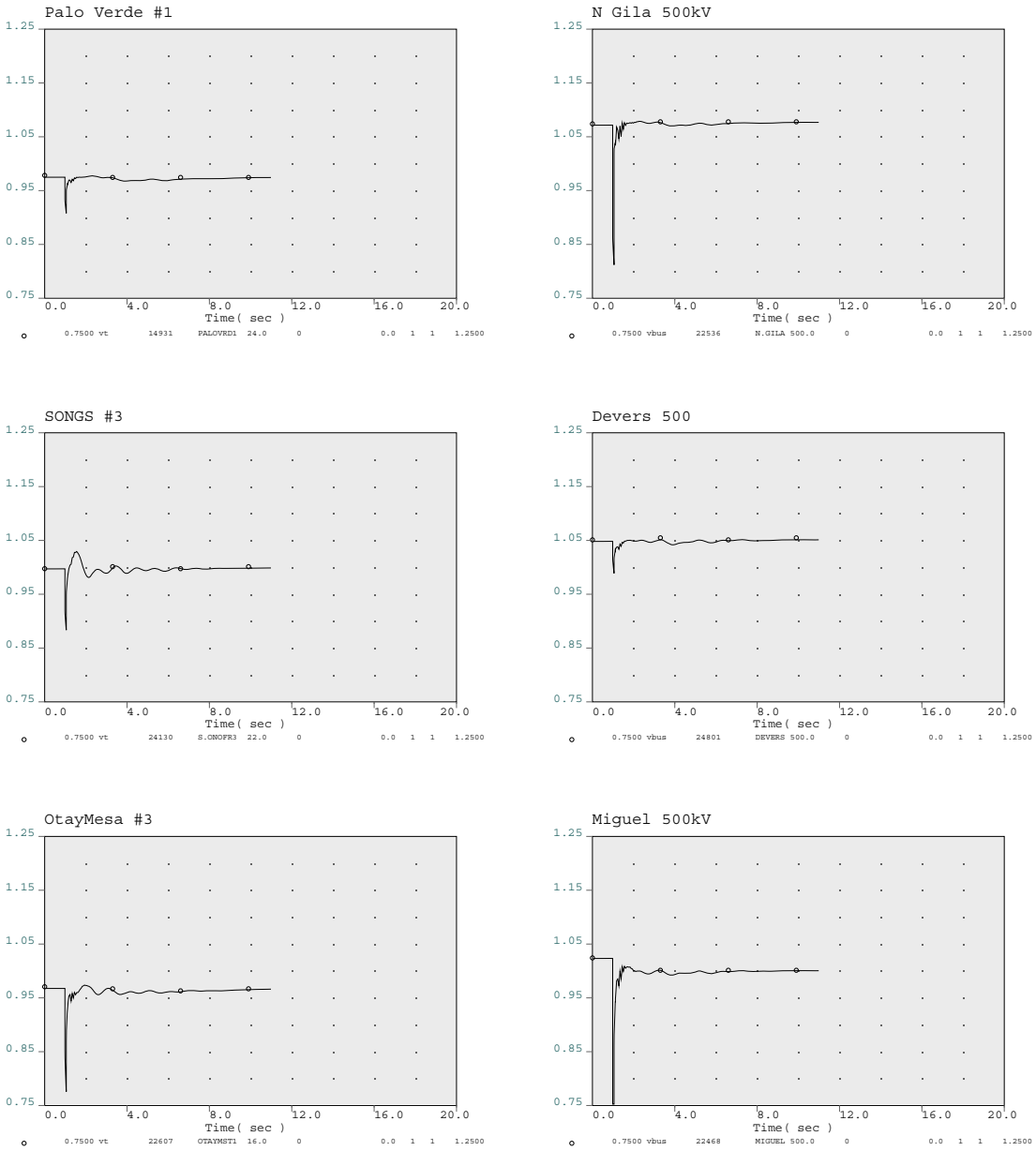






SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

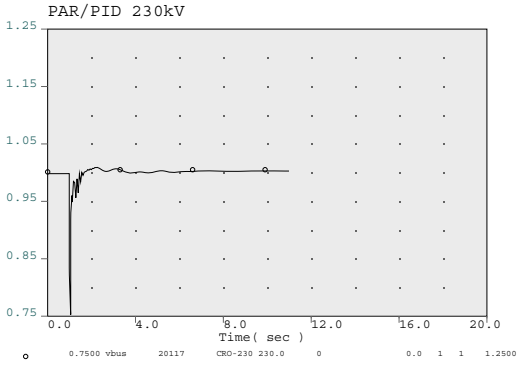
RELATIVE VOLTAGE



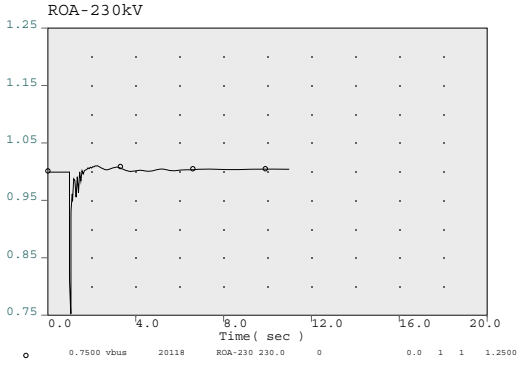
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

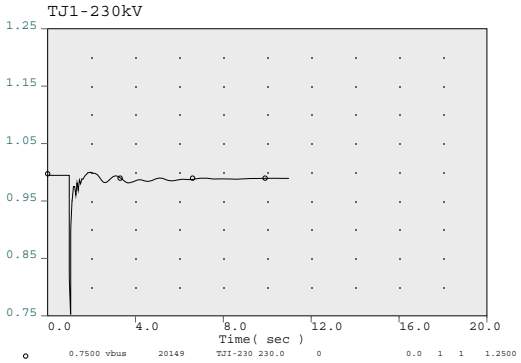
PAR/PID 230kV



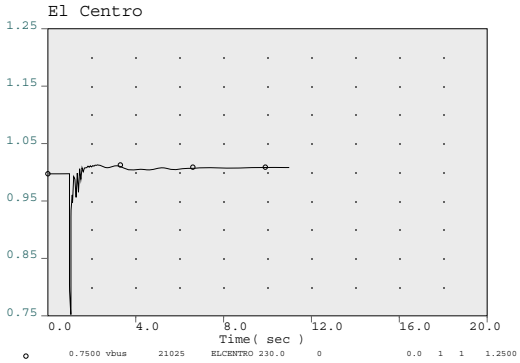
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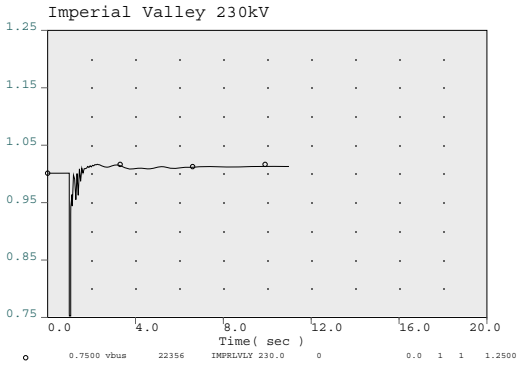
TJ1-230kV



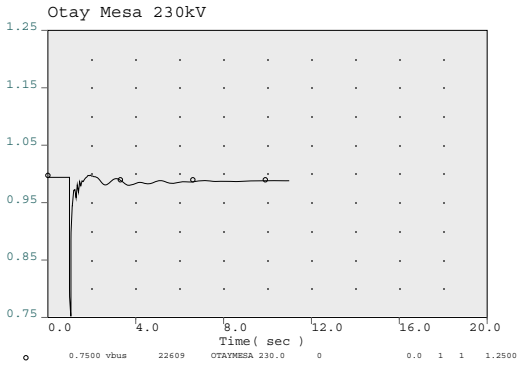
El Centro



Imperial Valley 230kV

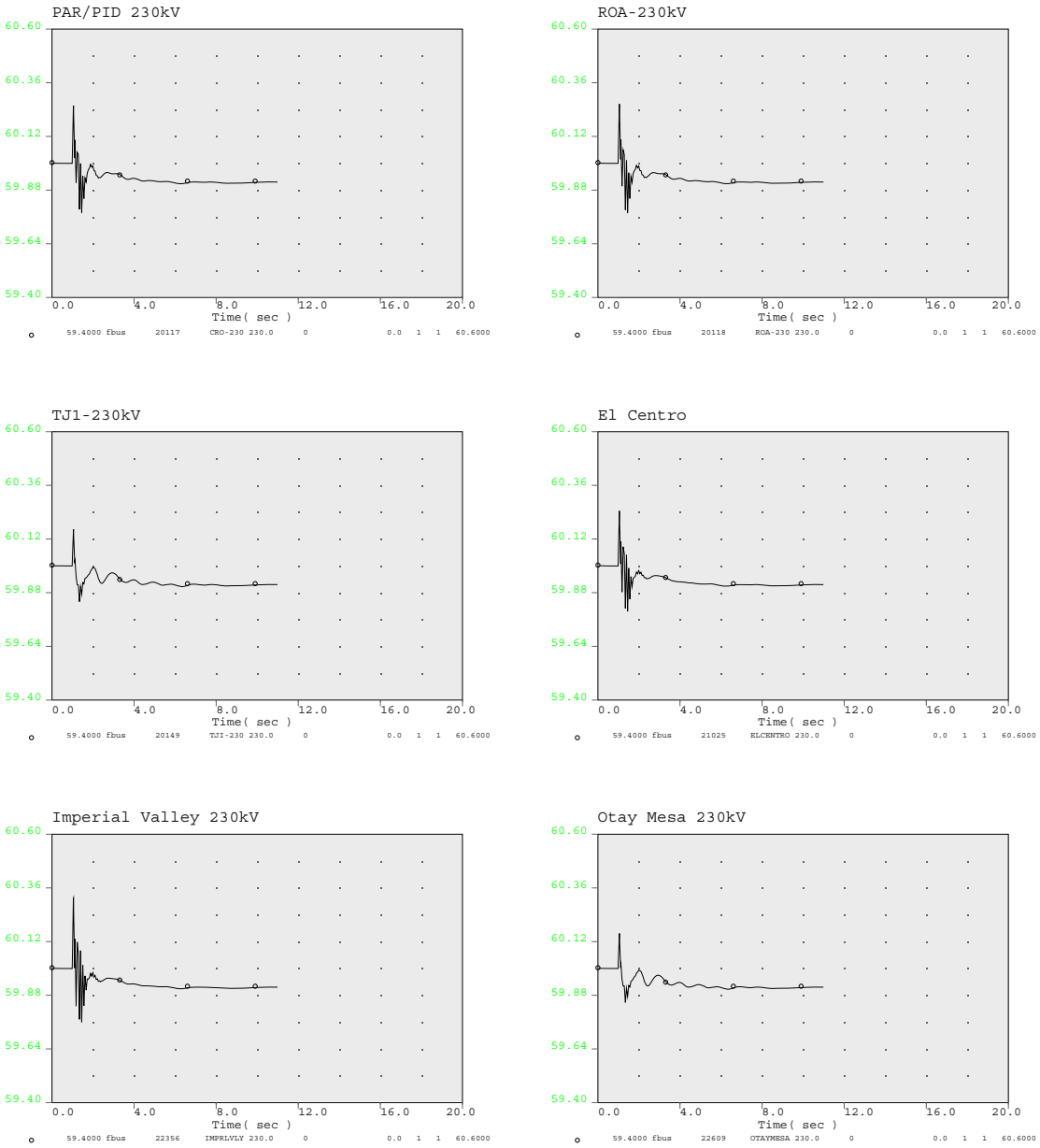


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

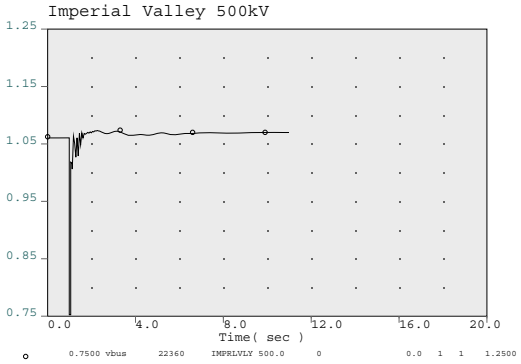
Affected System Frequency Check and Comparison



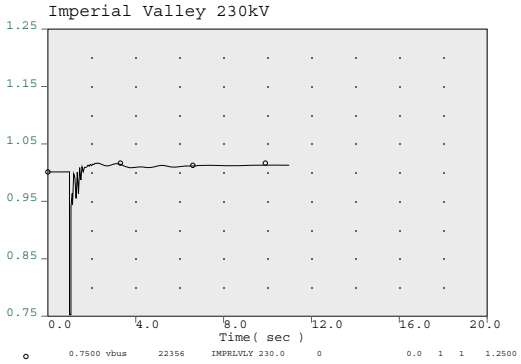
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

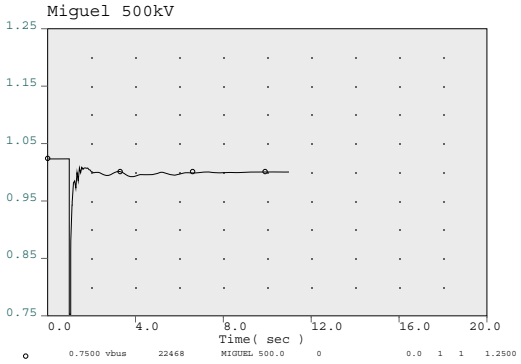
Imperial Valley 500kV



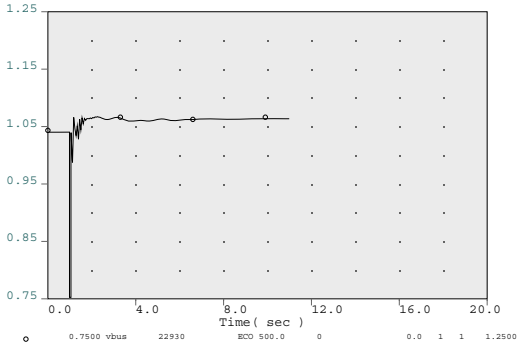
Imperial Valley 230kV



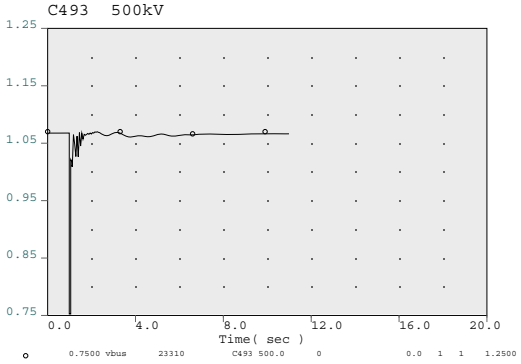
Miguel 500kV



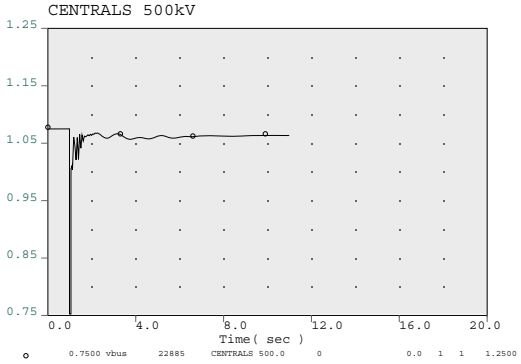
Windfarms 500



C493 500kV

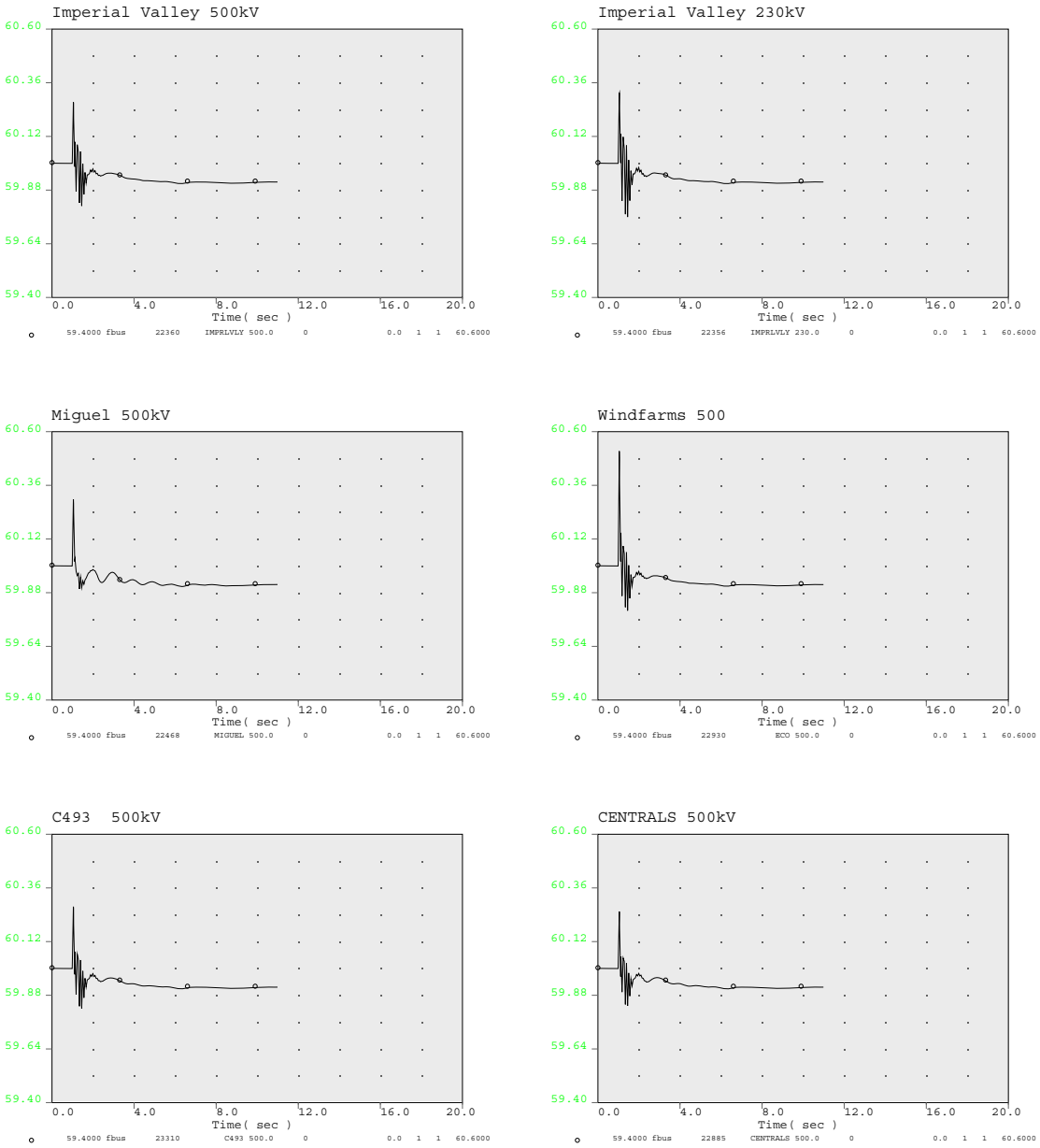


CENTRALS 500kV



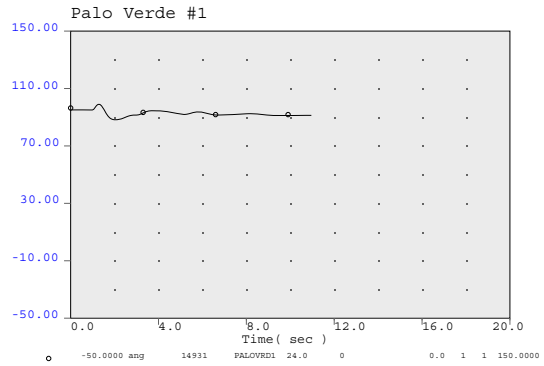
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

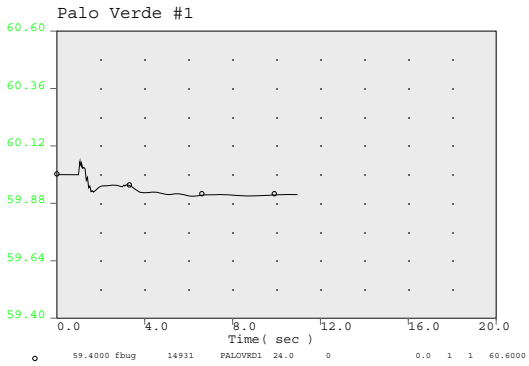
Imperial Valley Area - Frequency

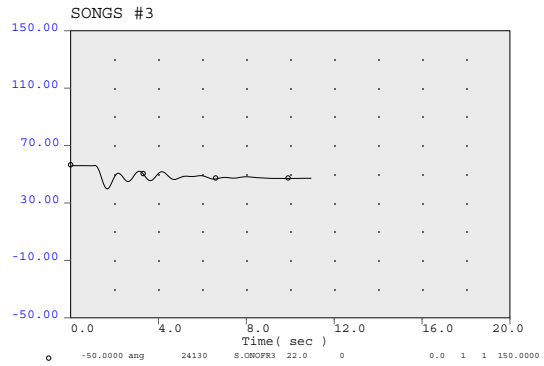


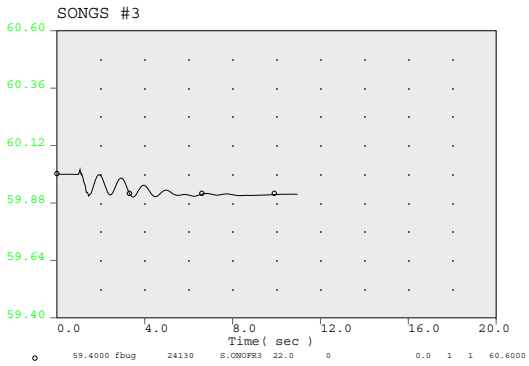
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

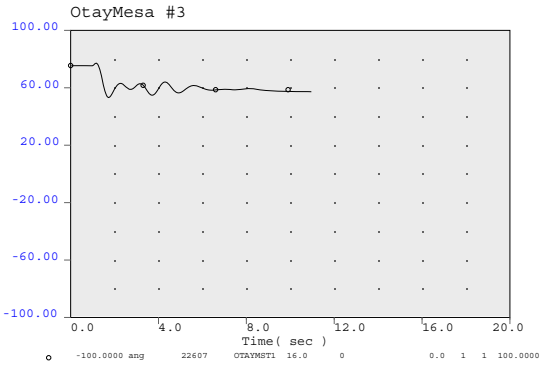
RELATIVE ROTOR ANGLE & FREQUENCY

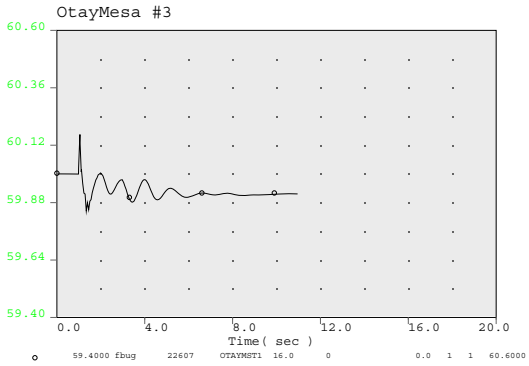






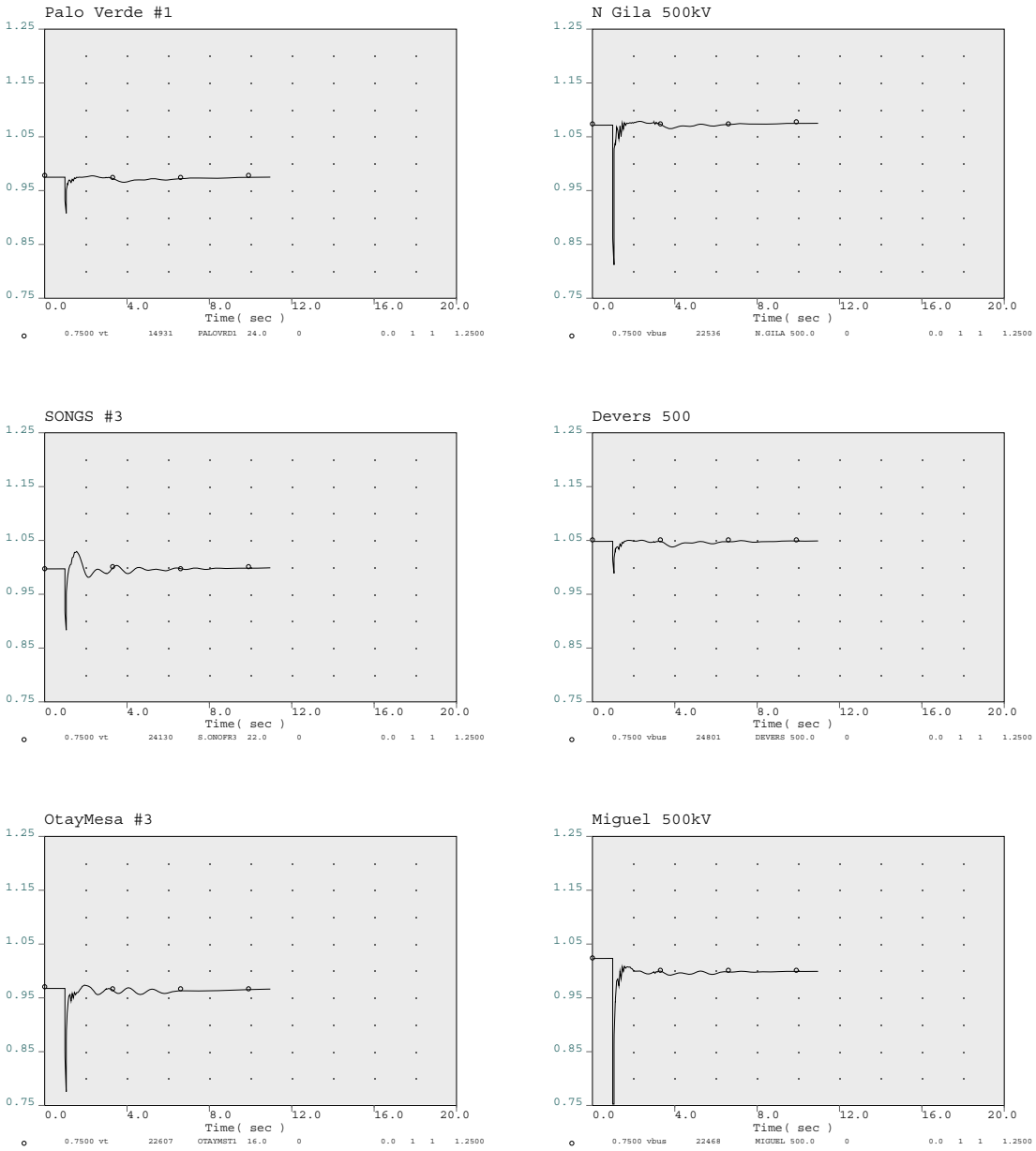






SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

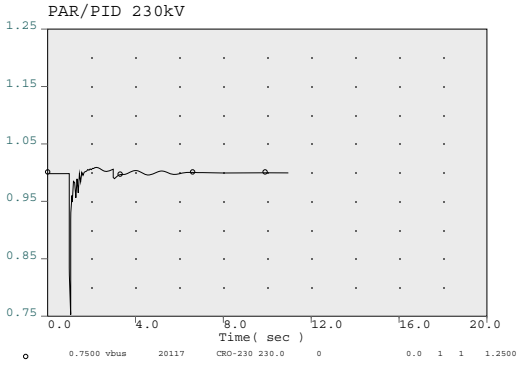
RELATIVE VOLTAGE



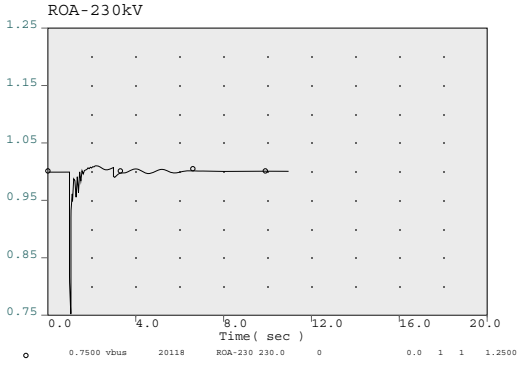
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

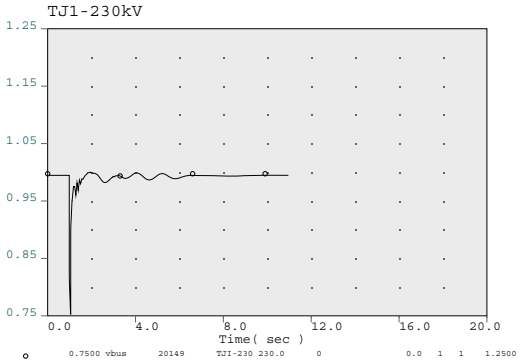
PAR/PID 230kV



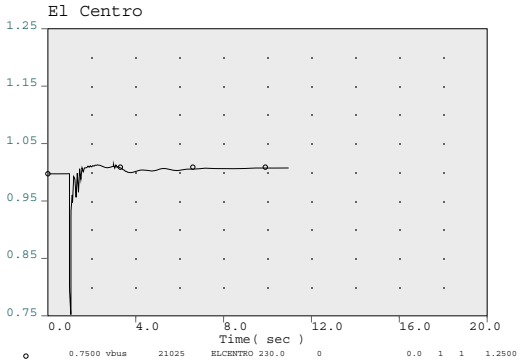
ROA-230kV



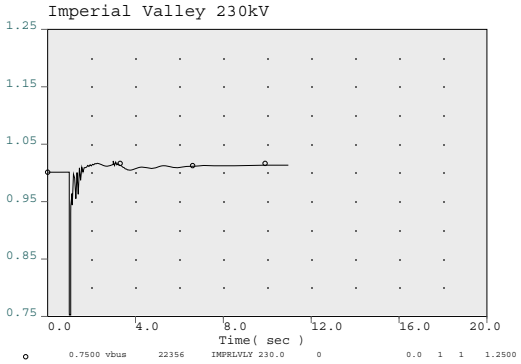
TJ1-230kV



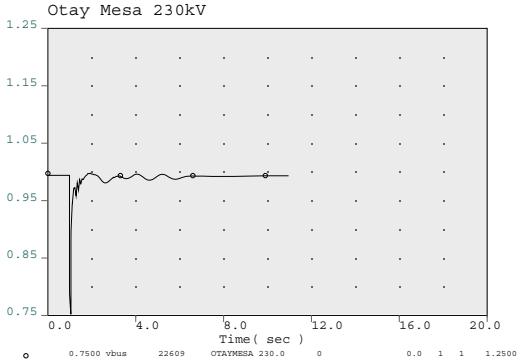
El Centro



Imperial Valley 230kV



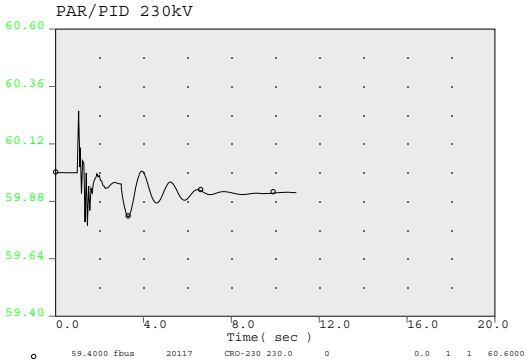
Otay Mesa 230kV



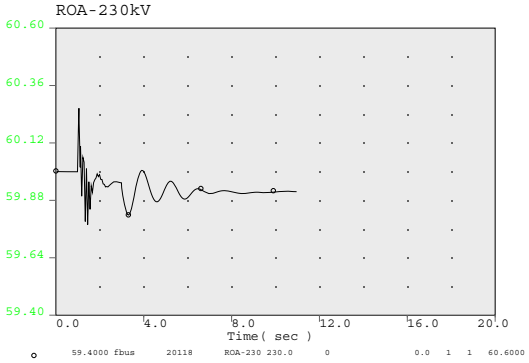
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

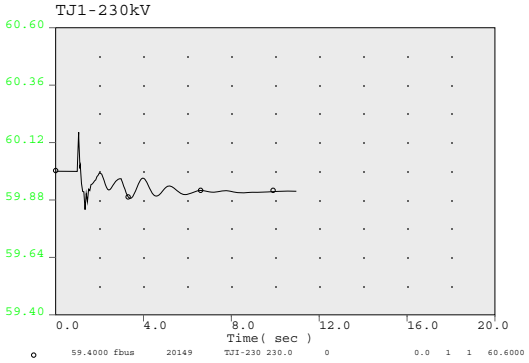
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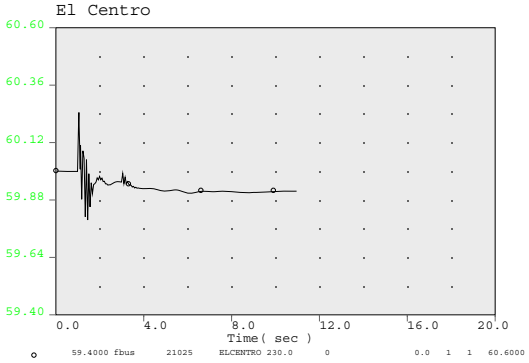
ROA-230kV



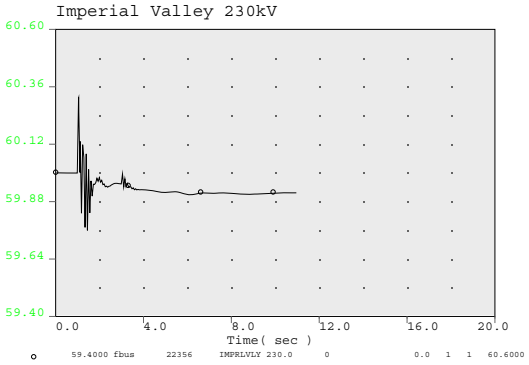
TJ1-230kV



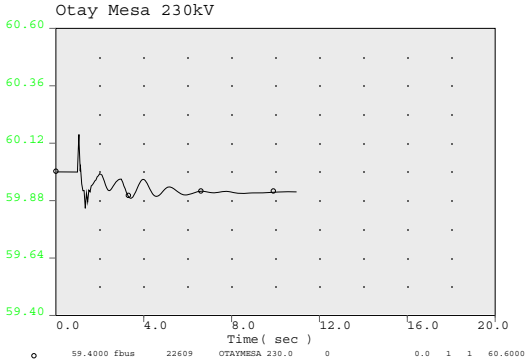
El Centro



Imperial Valley 230kV



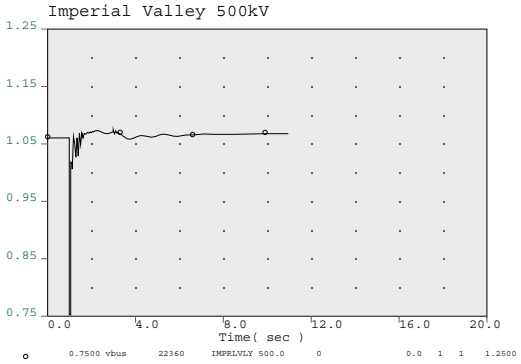
Otay Mesa 230kV



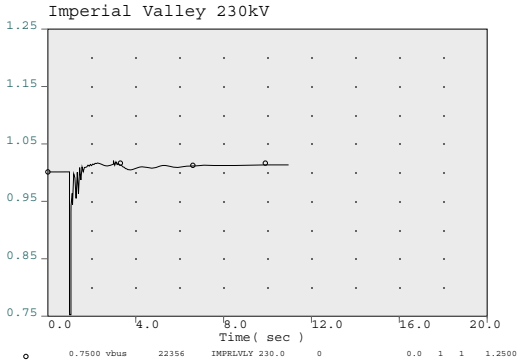
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

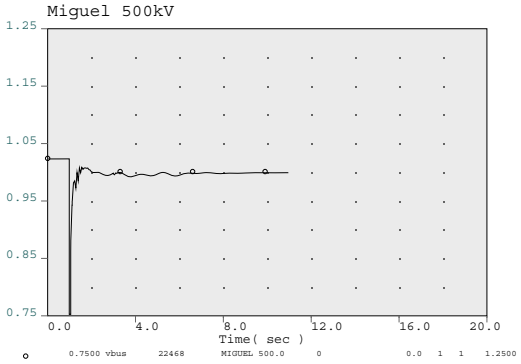
Imperial Valley 500kV



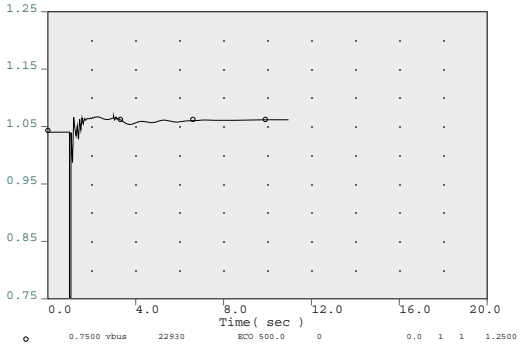
Imperial Valley 230kV



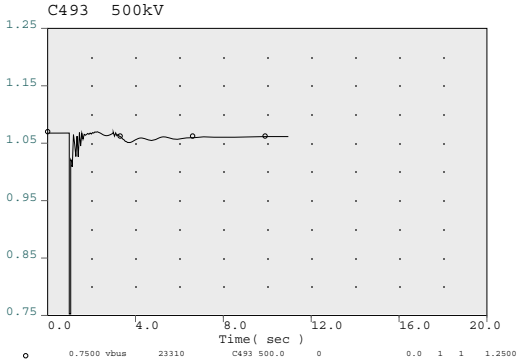
Miguel 500kV



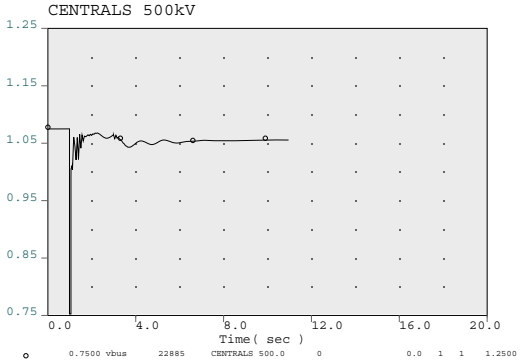
Windfarms 500



C493 500kV

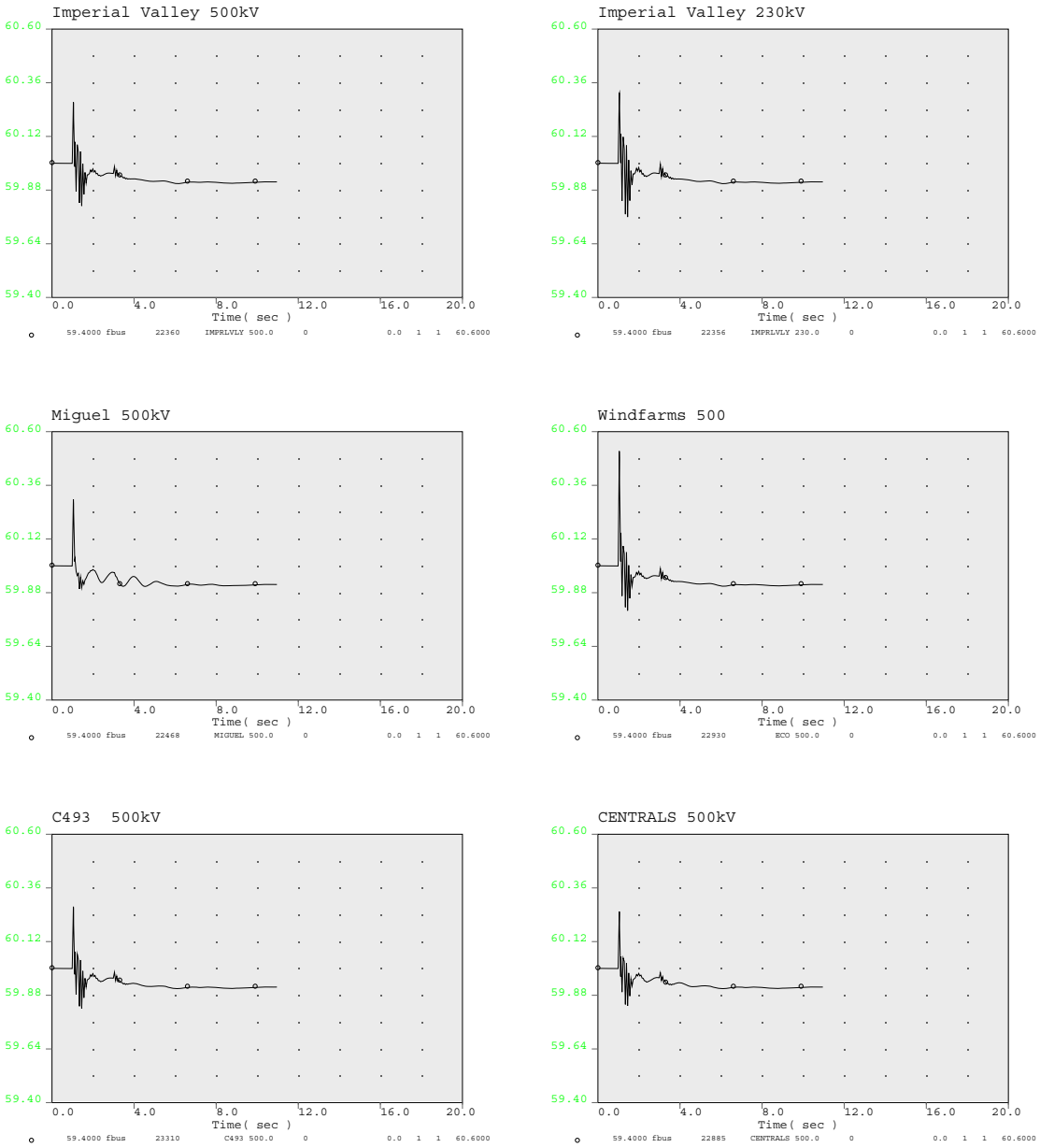


CENTRALS 500kV



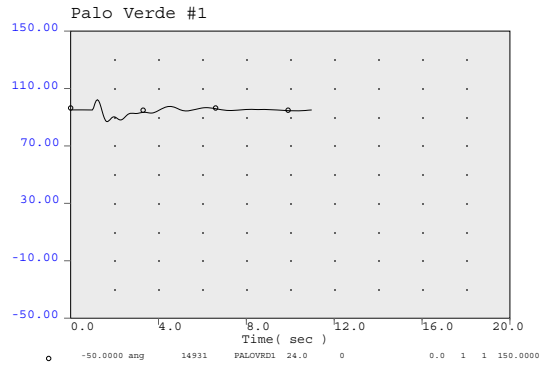
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

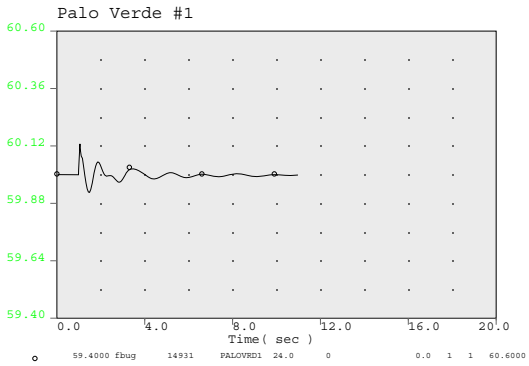
Imperial Valley Area - Frequency

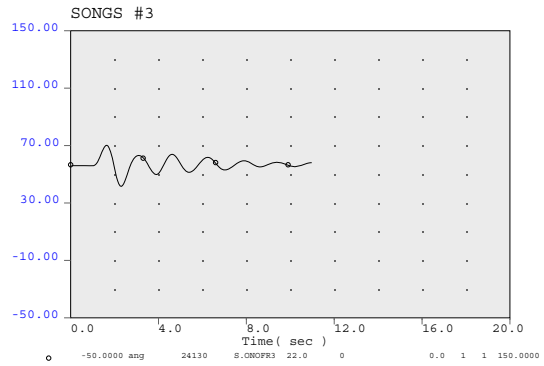


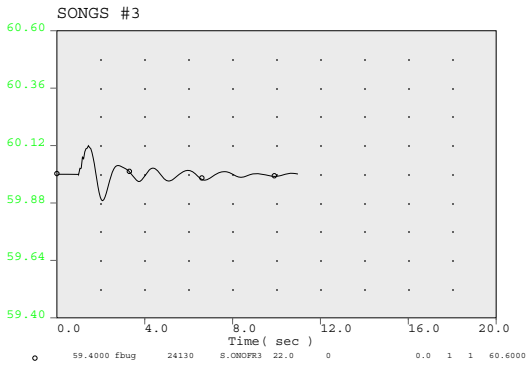
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-ECO 500 kV line

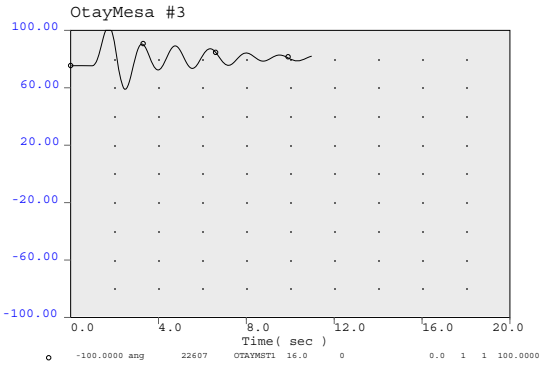
RELATIVE ROTOR ANGLE & FREQUENCY

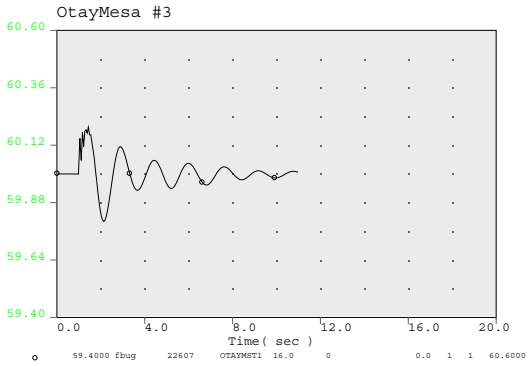










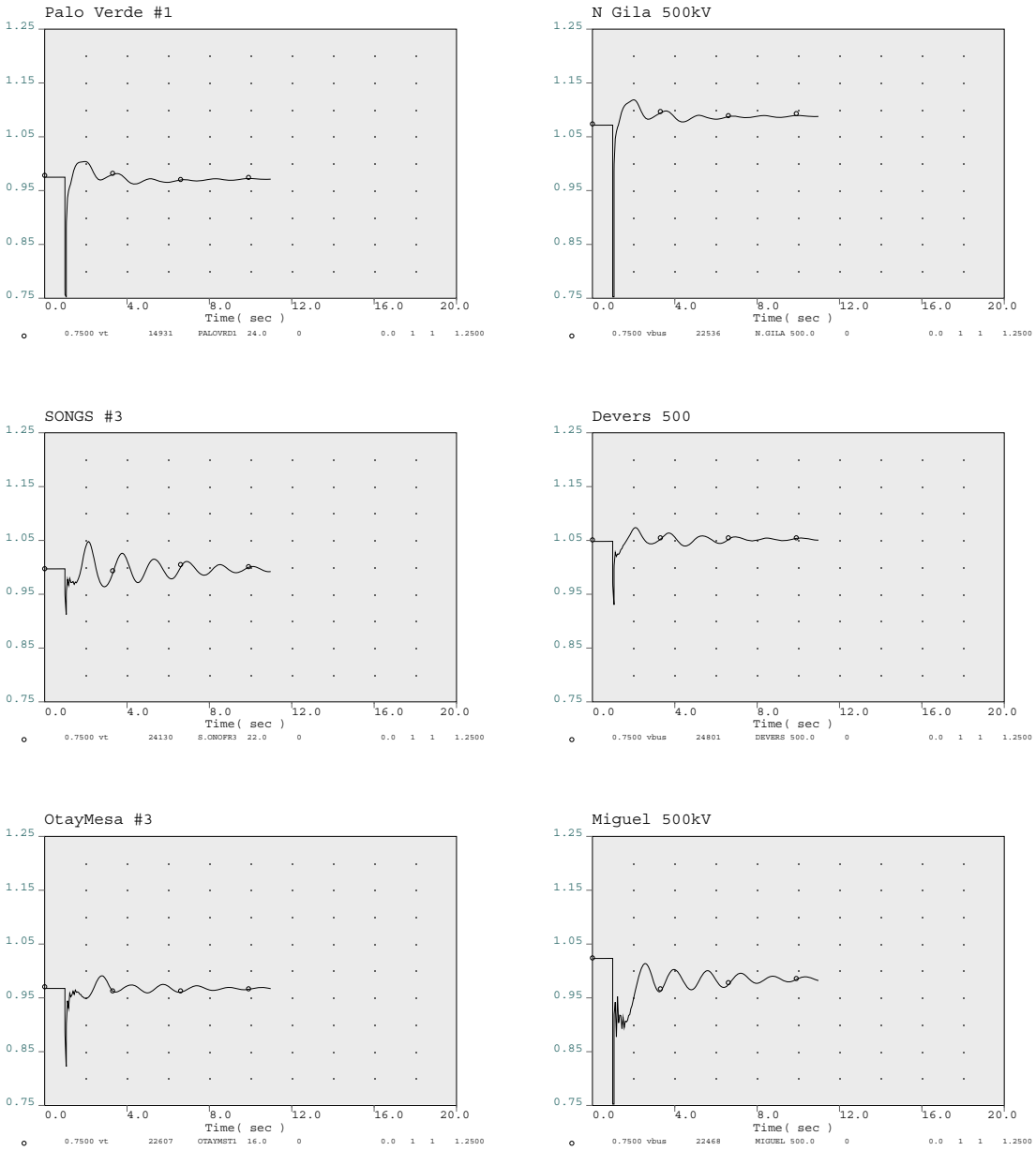


SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

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SDGE	NGila_IV_slo_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:29:02 2010

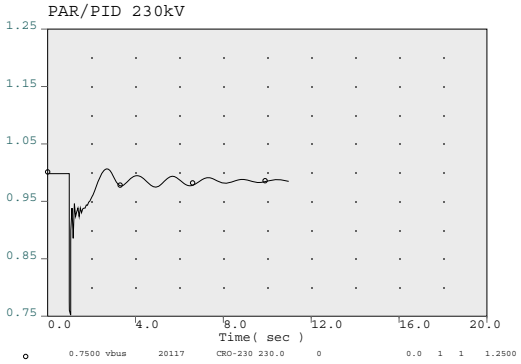
RELATIVE VOLTAGE



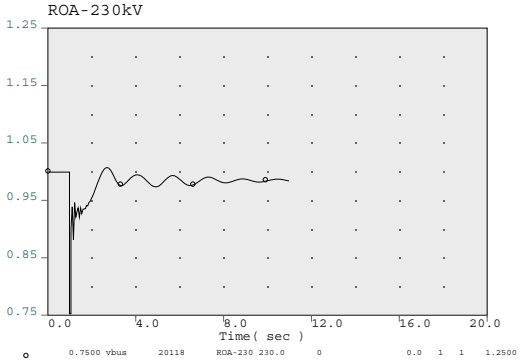
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

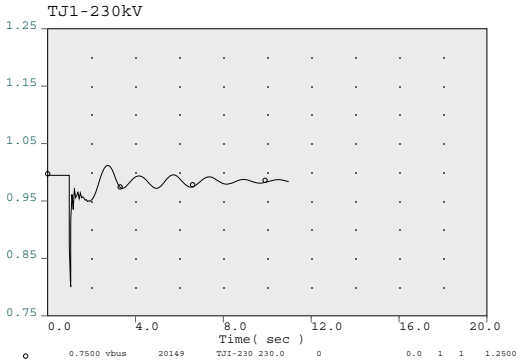
PAR/PID 230kV



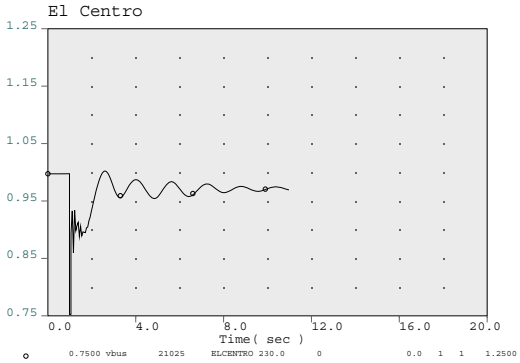
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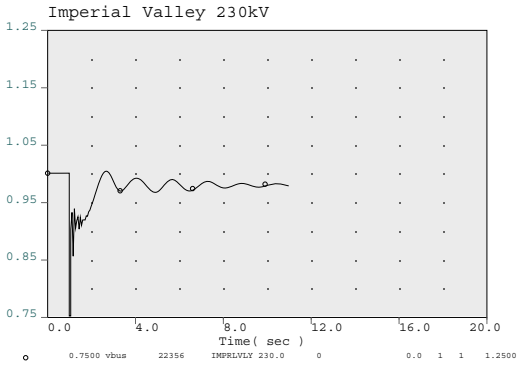
TJ1-230kV



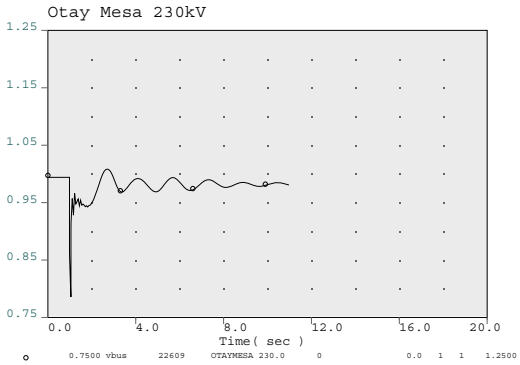
El Centro



Imperial Valley 230kV



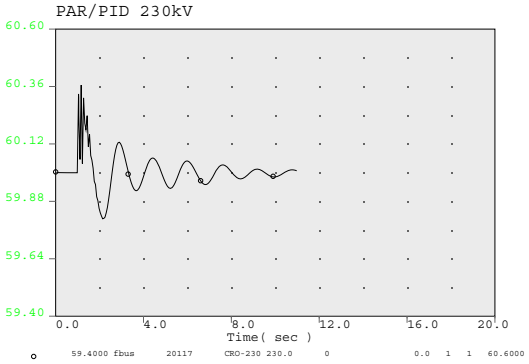
Otay Mesa 230kV



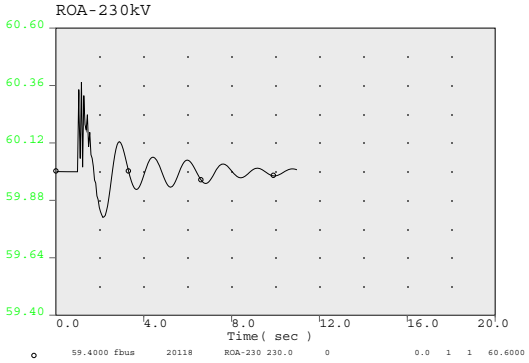
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

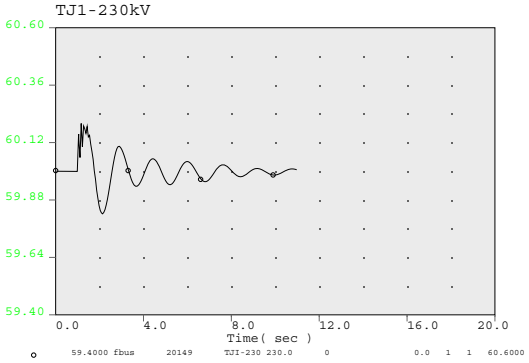
PAR/PID 230kV



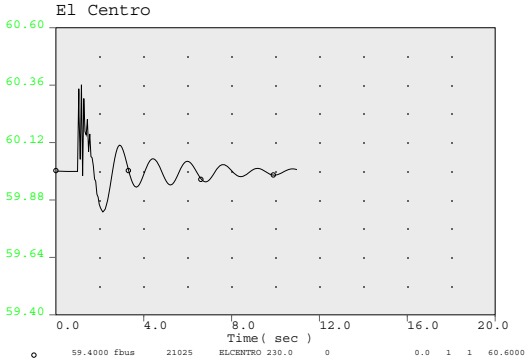
ROA-230kV



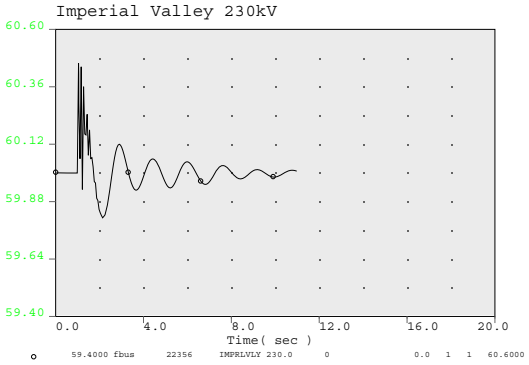
TJ1-230kV



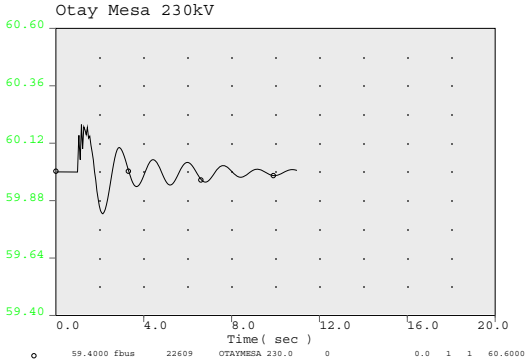
El Centro



Imperial Valley 230kV

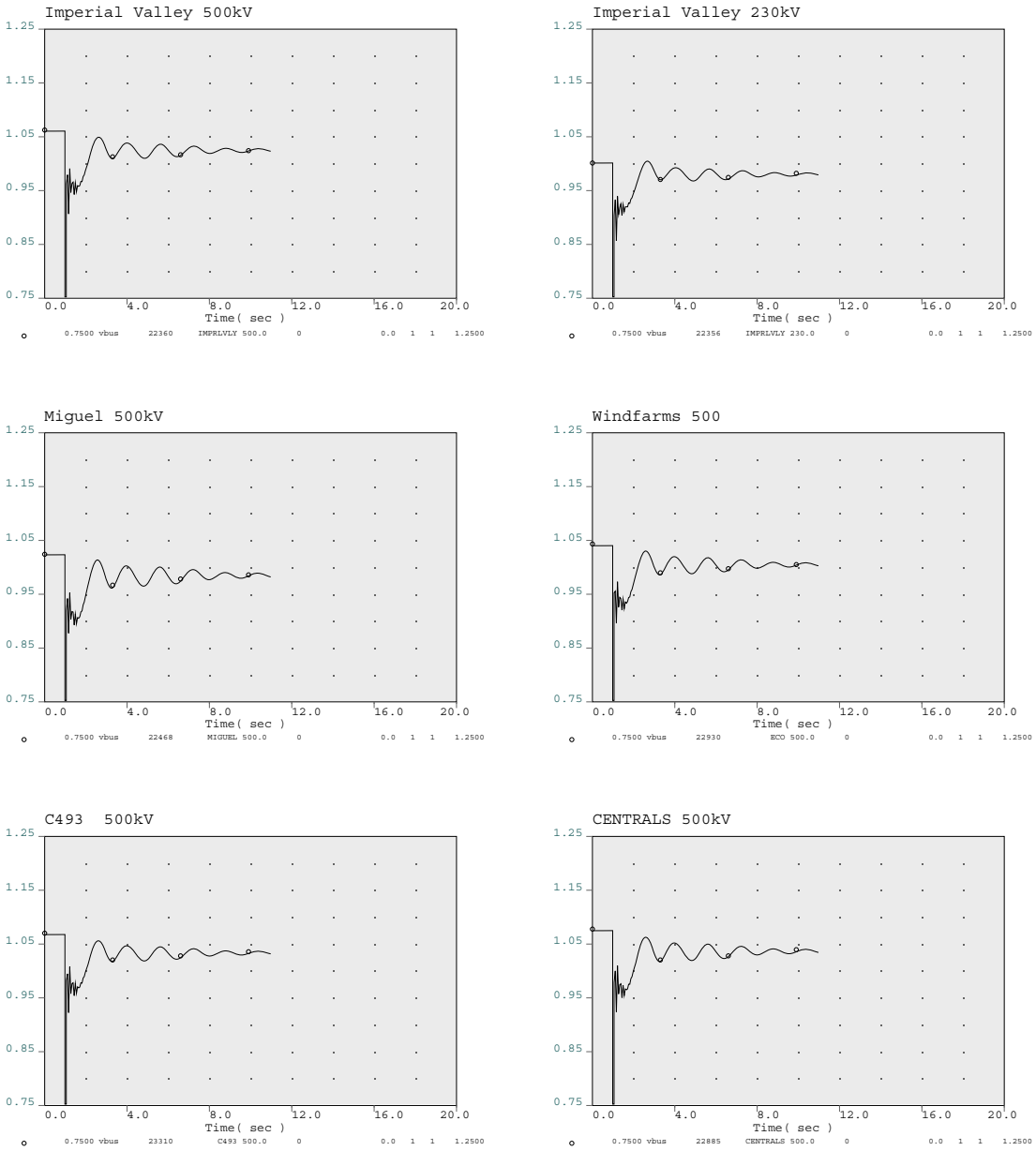


Otay Mesa 230kV



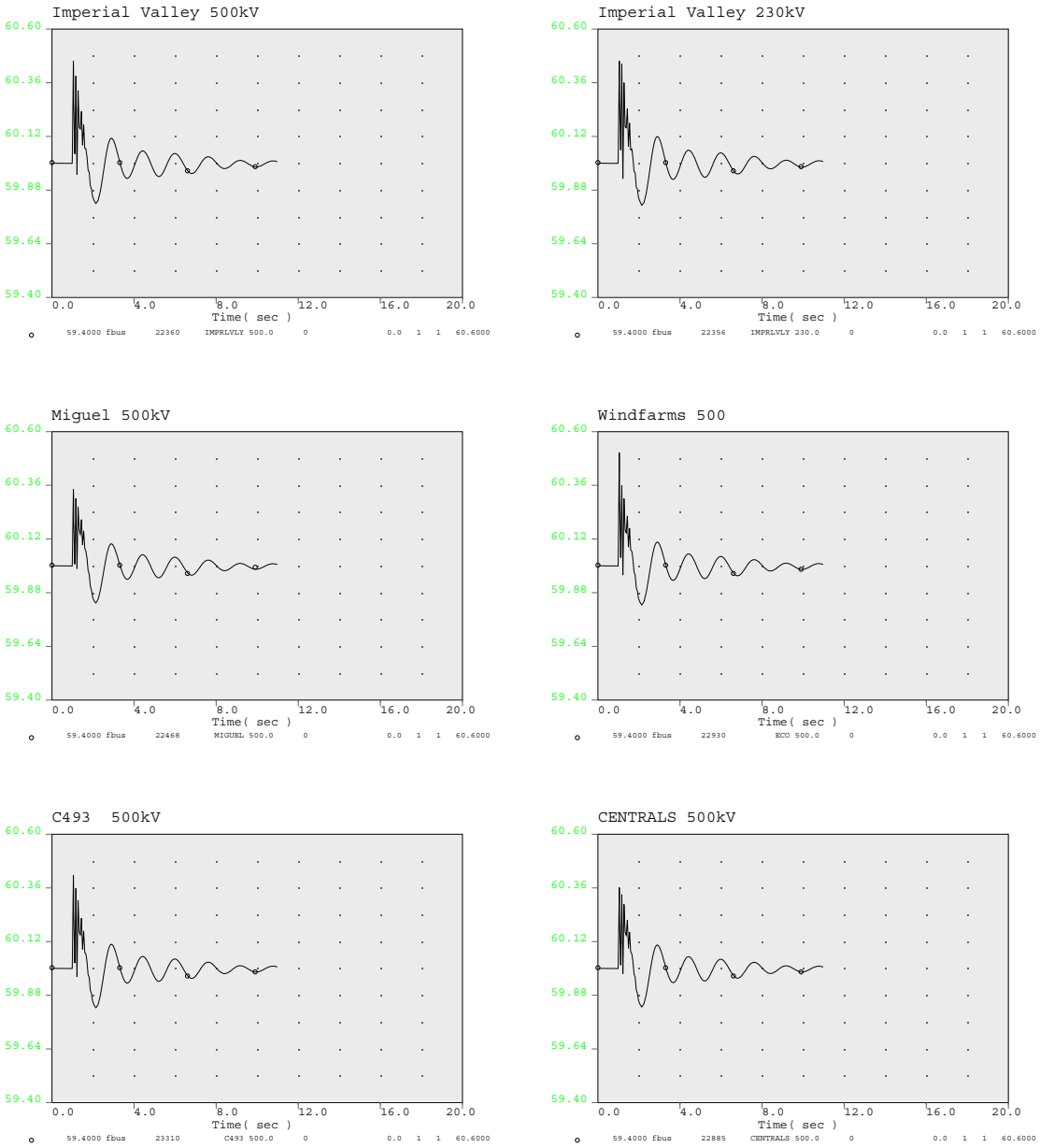
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE



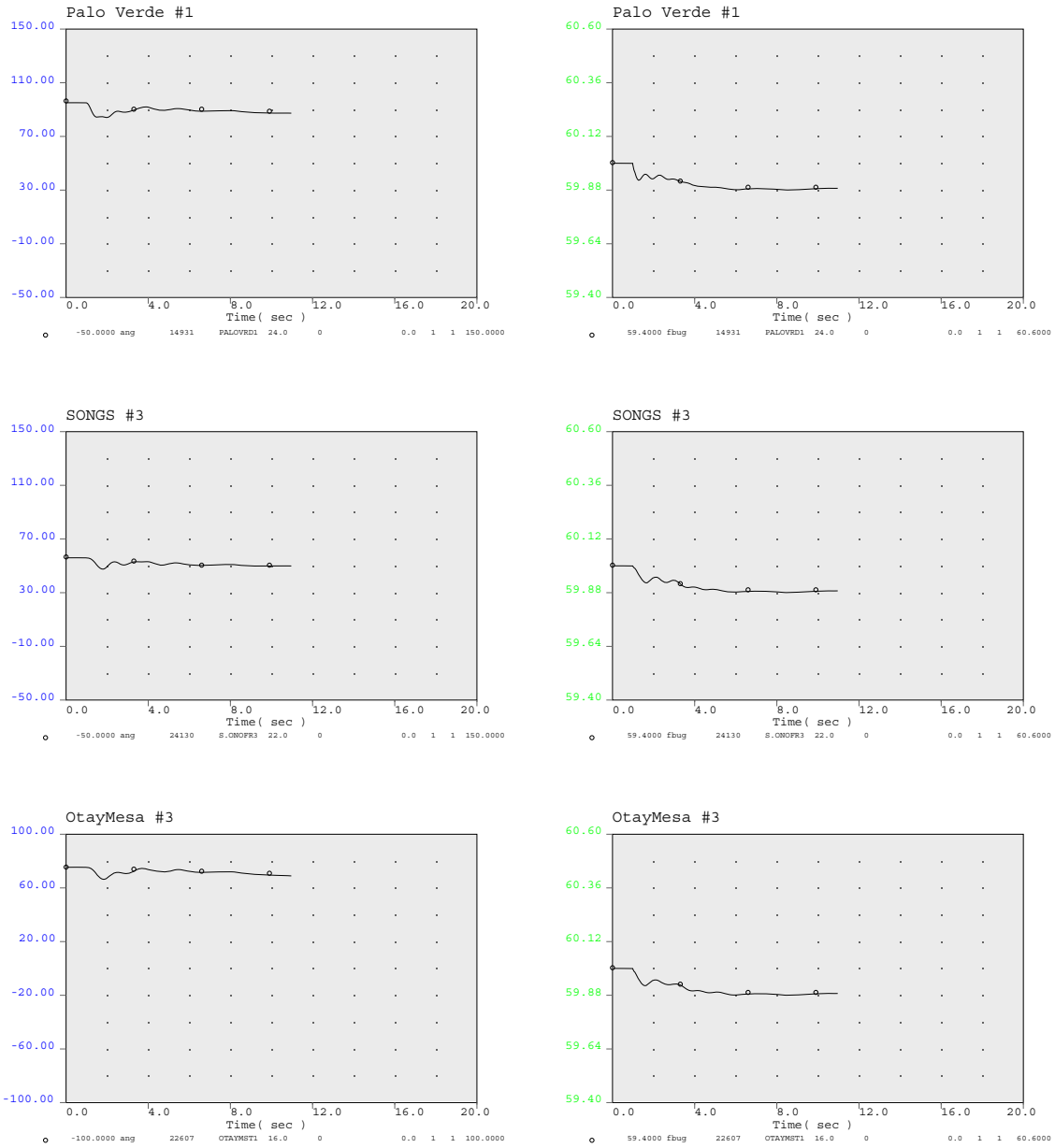
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

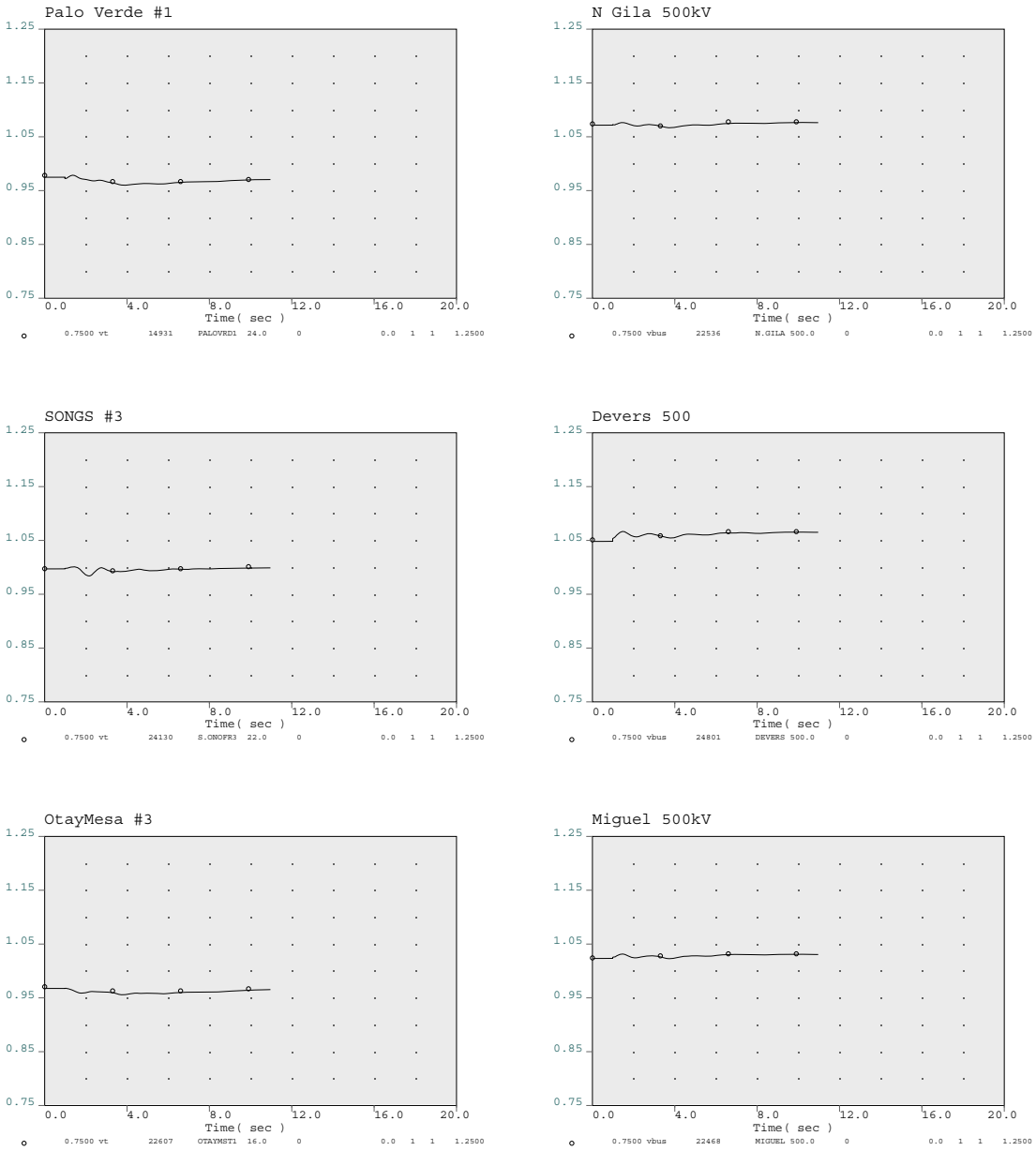


SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

Page 1

SDGE	PaloVerde-g1_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:26:30 2010

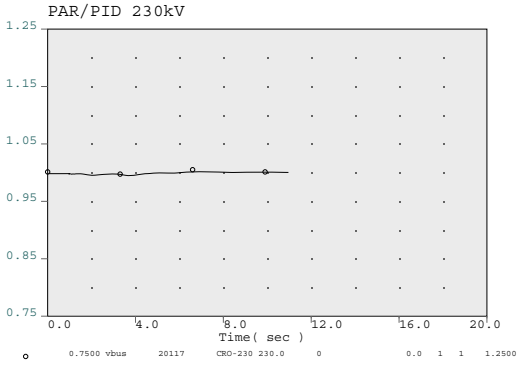
RELATIVE VOLTAGE



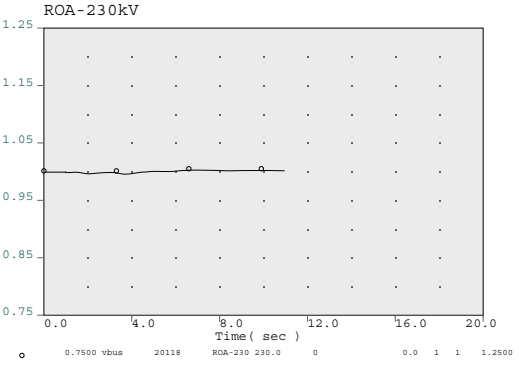
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

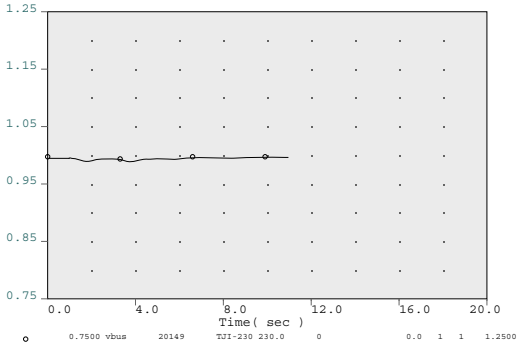
PAR/PID 230kV



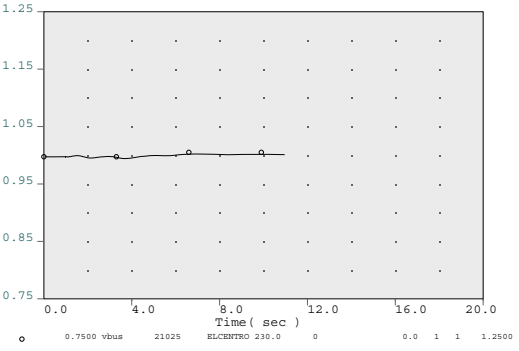
ROA-230kV



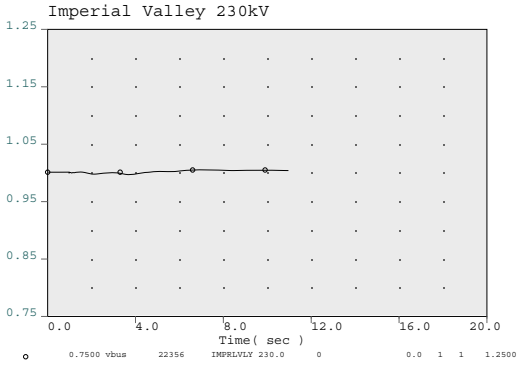
TJ1-230kV



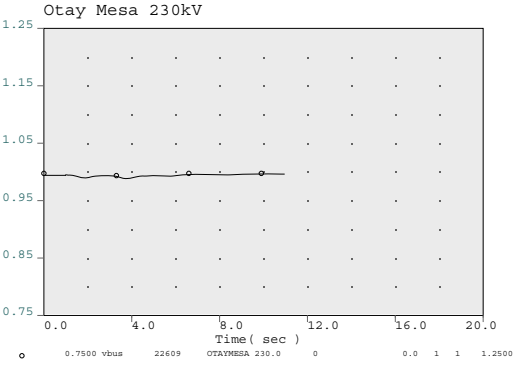
El Centro



Imperial Valley 230kV

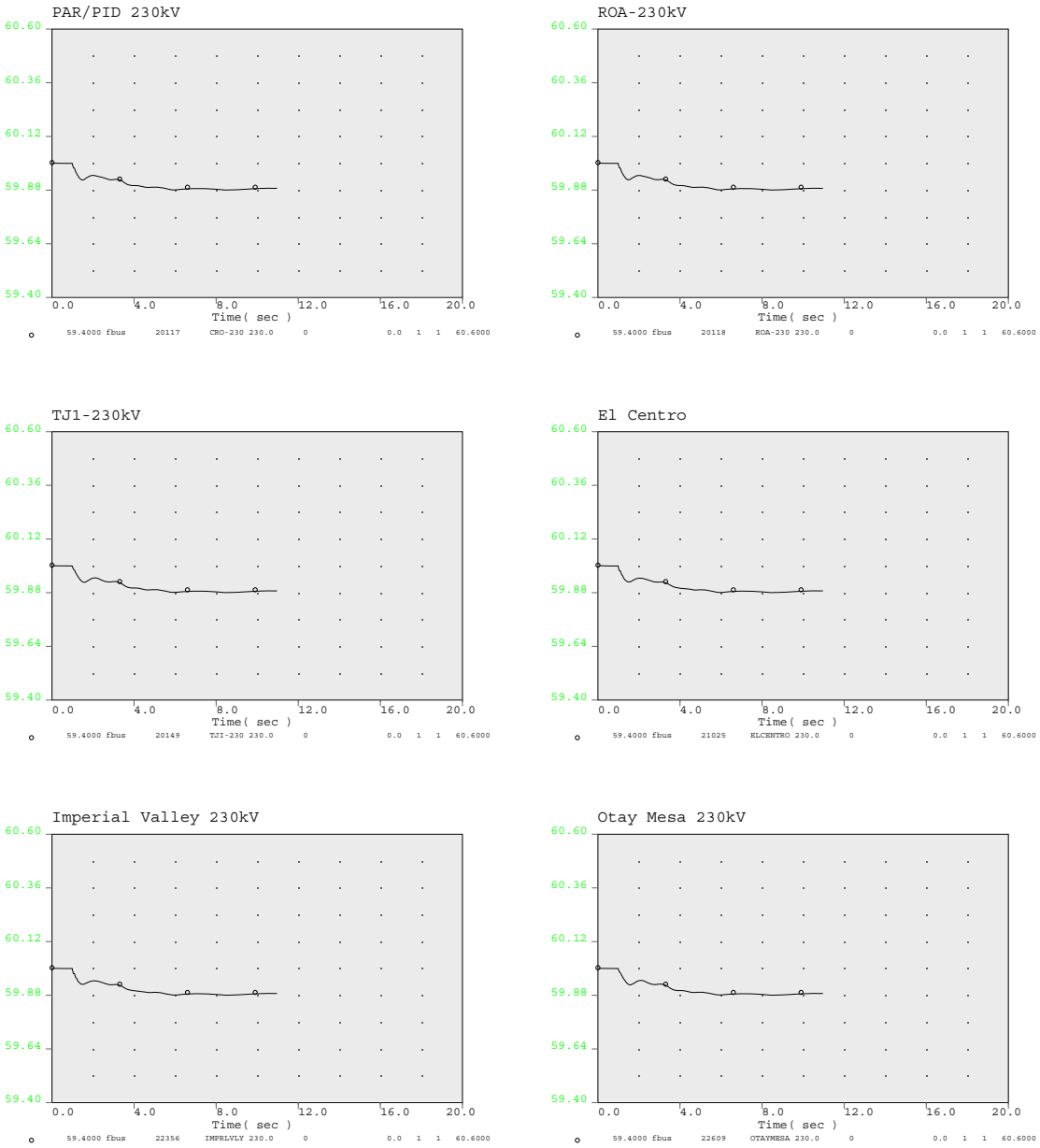


Otay Mesa 230kV



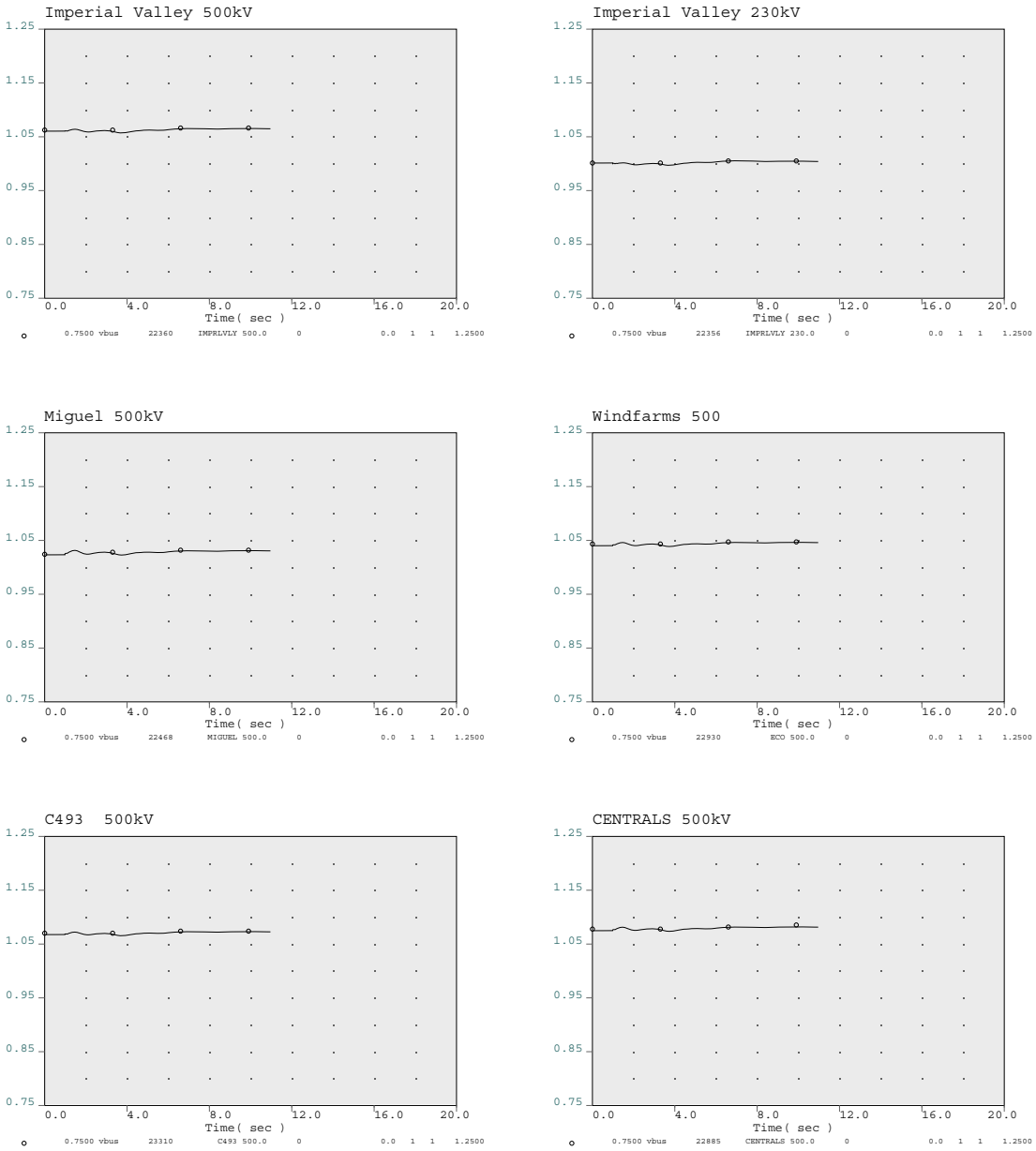
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison



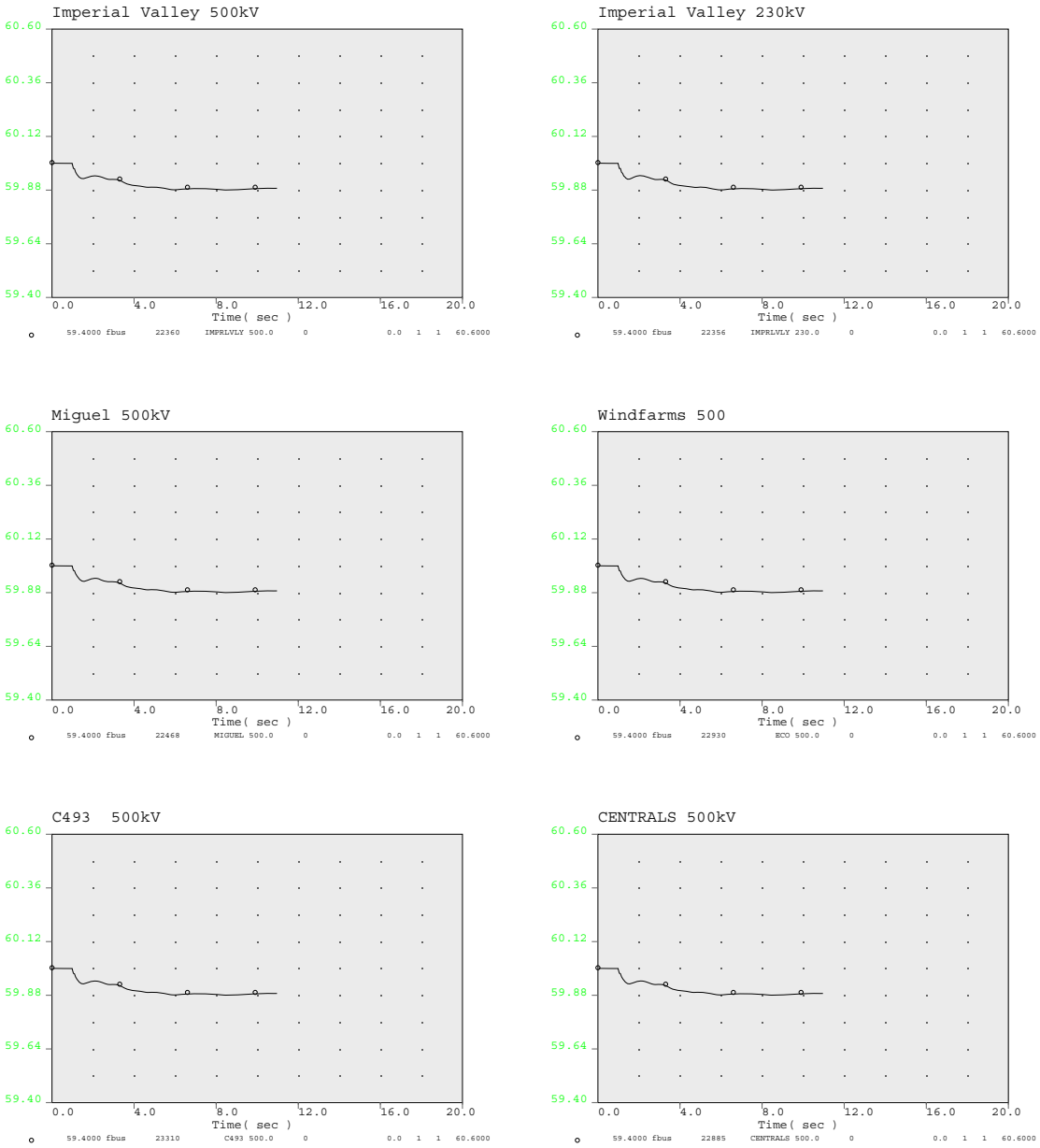
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

Imperial Valley Area - VOLTAGE



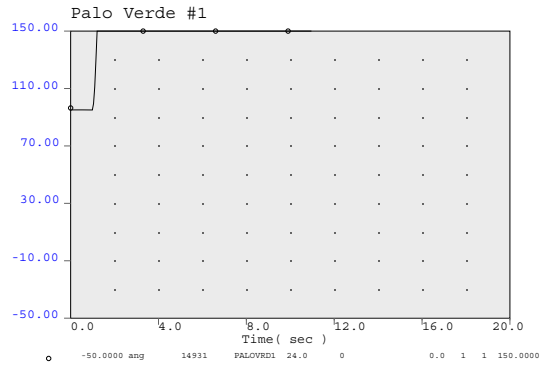
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

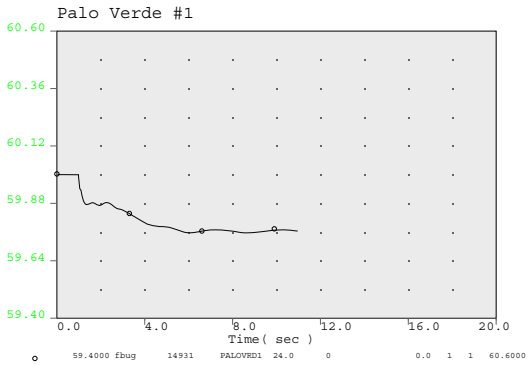
Imperial Valley Area - Frequency

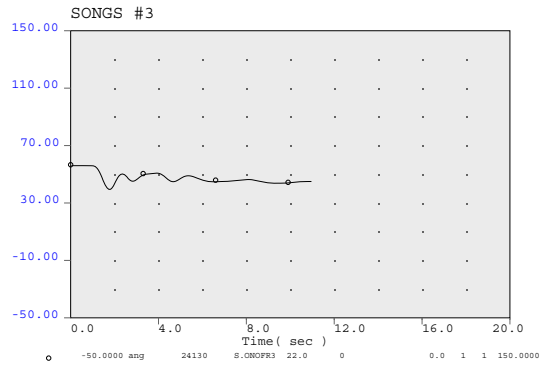


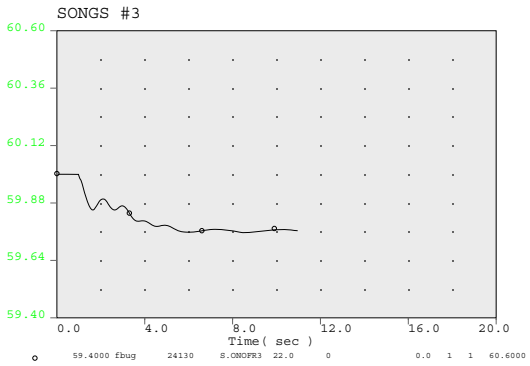
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

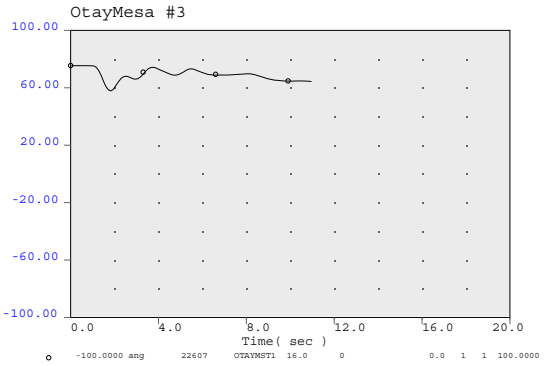
RELATIVE ROTOR ANGLE & FREQUENCY

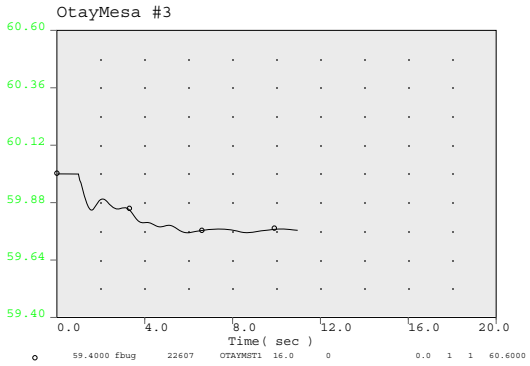










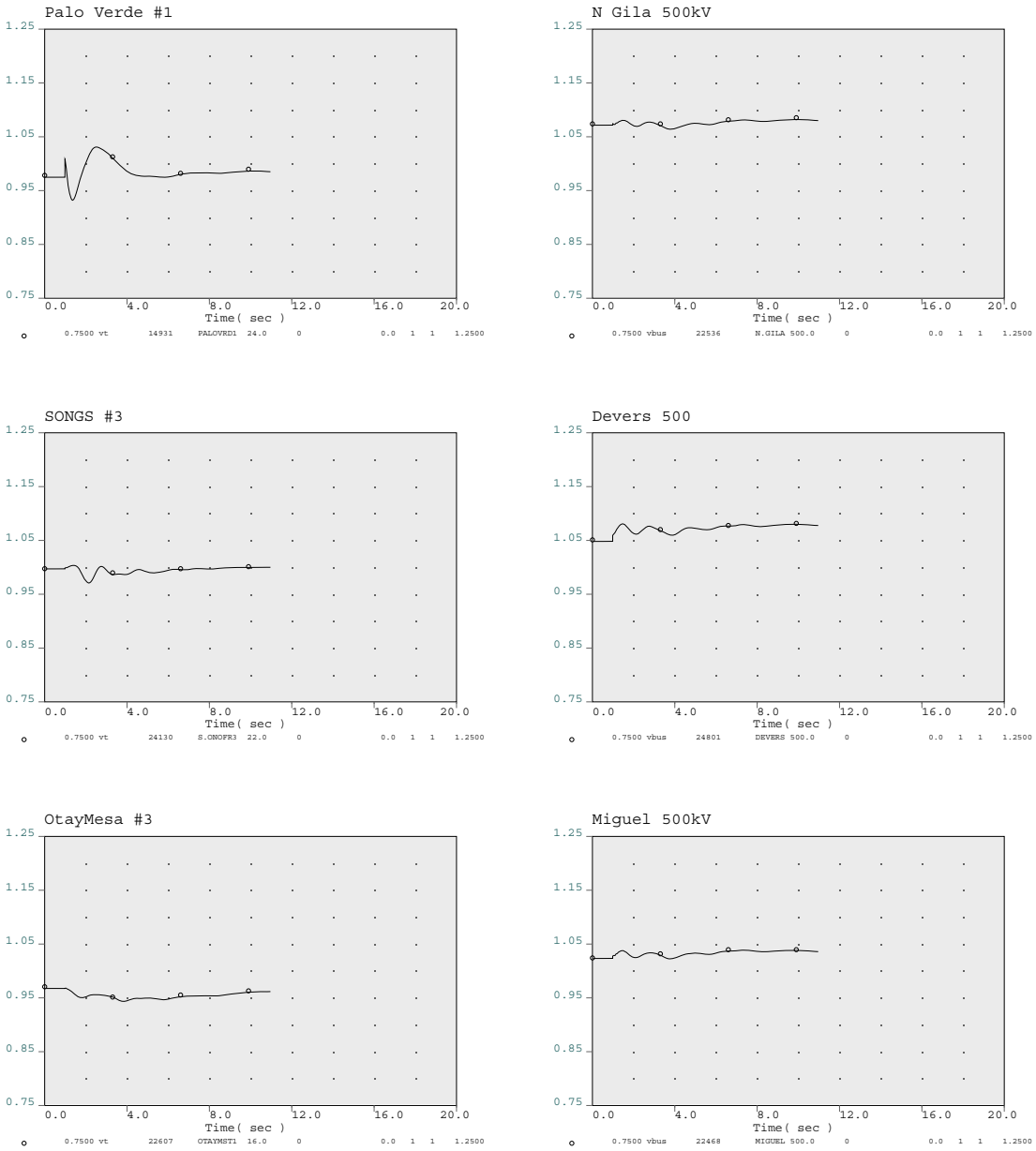


SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Page 1

SDGE	PaloVerde-g2_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:26:48 2010

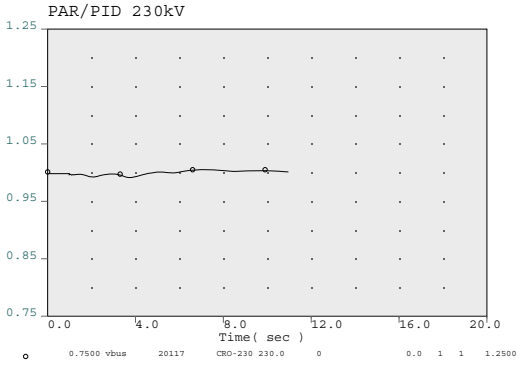
RELATIVE VOLTAGE



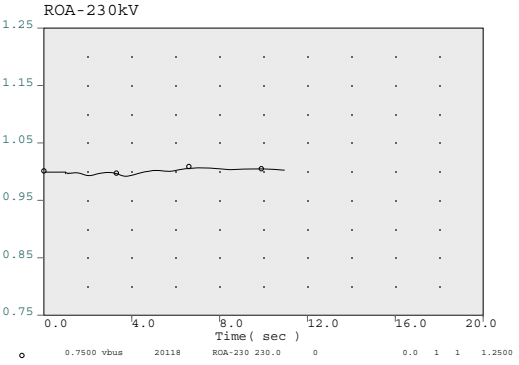
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

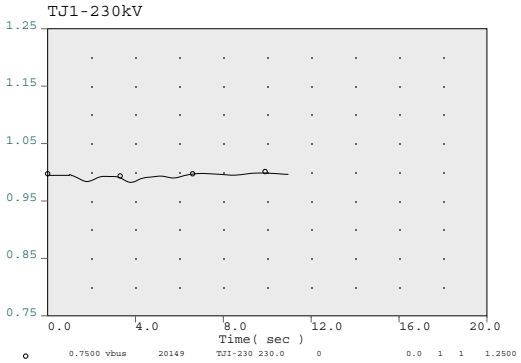
PAR/PID 230kV



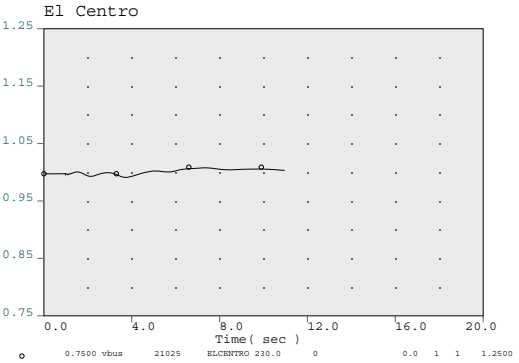
ROA-230kV



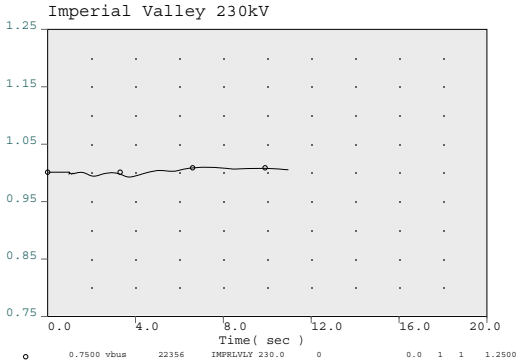
TJ1-230kV



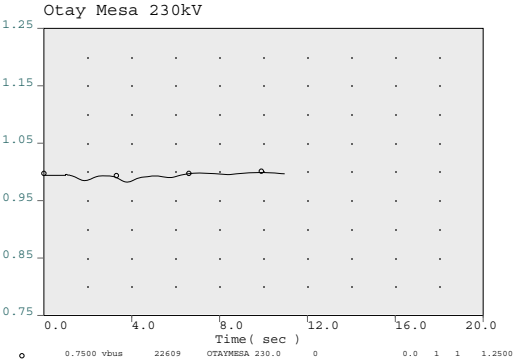
El Centro



Imperial Valley 230kV



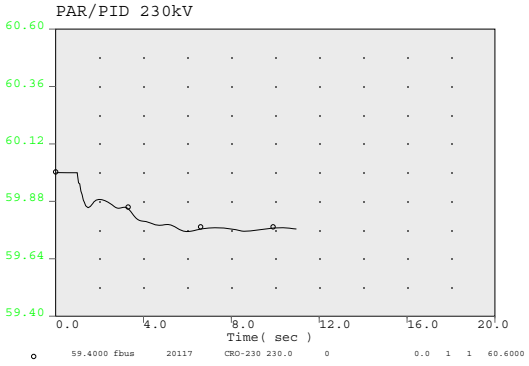
Otay Mesa 230kV



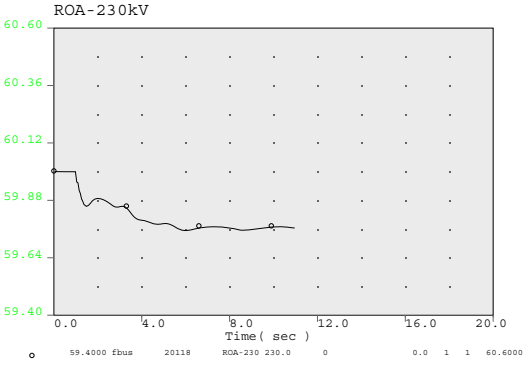
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

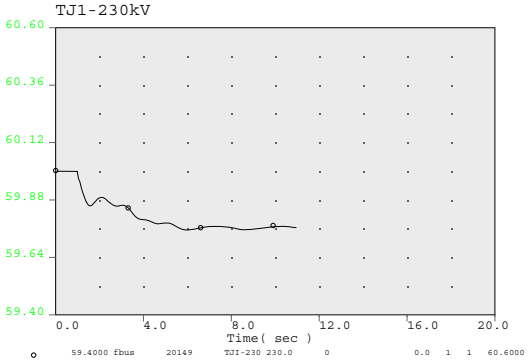
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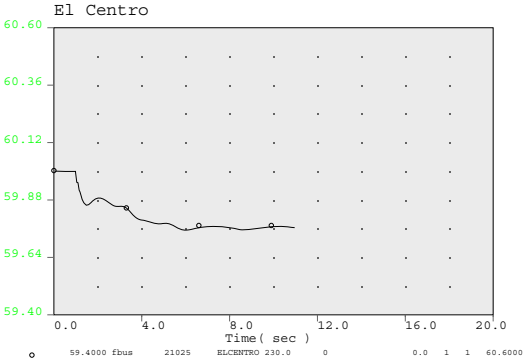
ROA-230kV



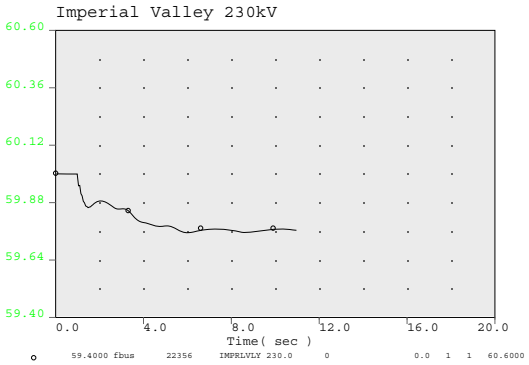
TJ1-230kV



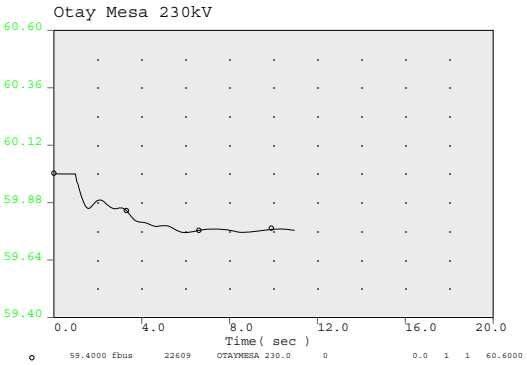
El Centro



Imperial Valley 230kV

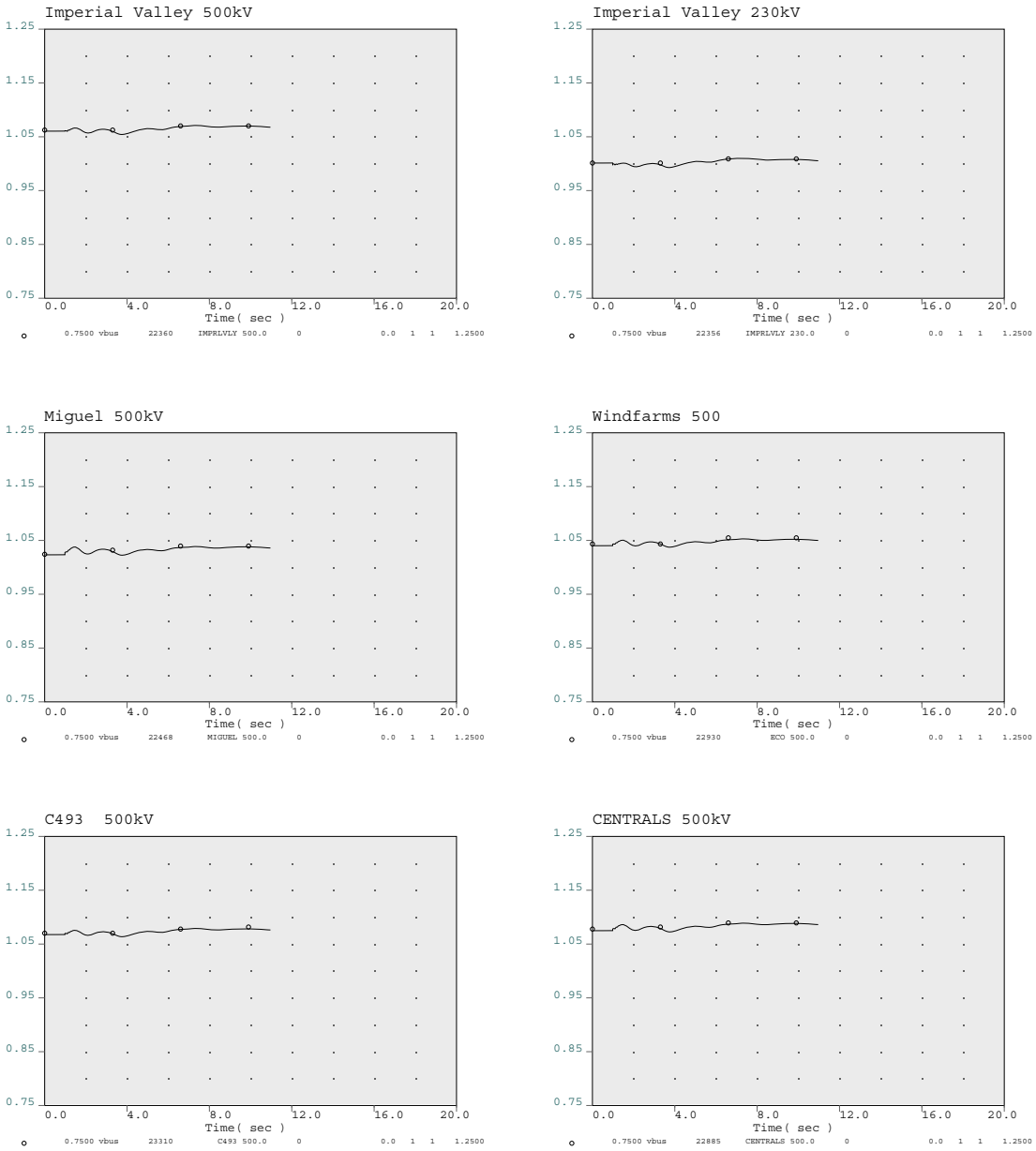


Otay Mesa 230kV



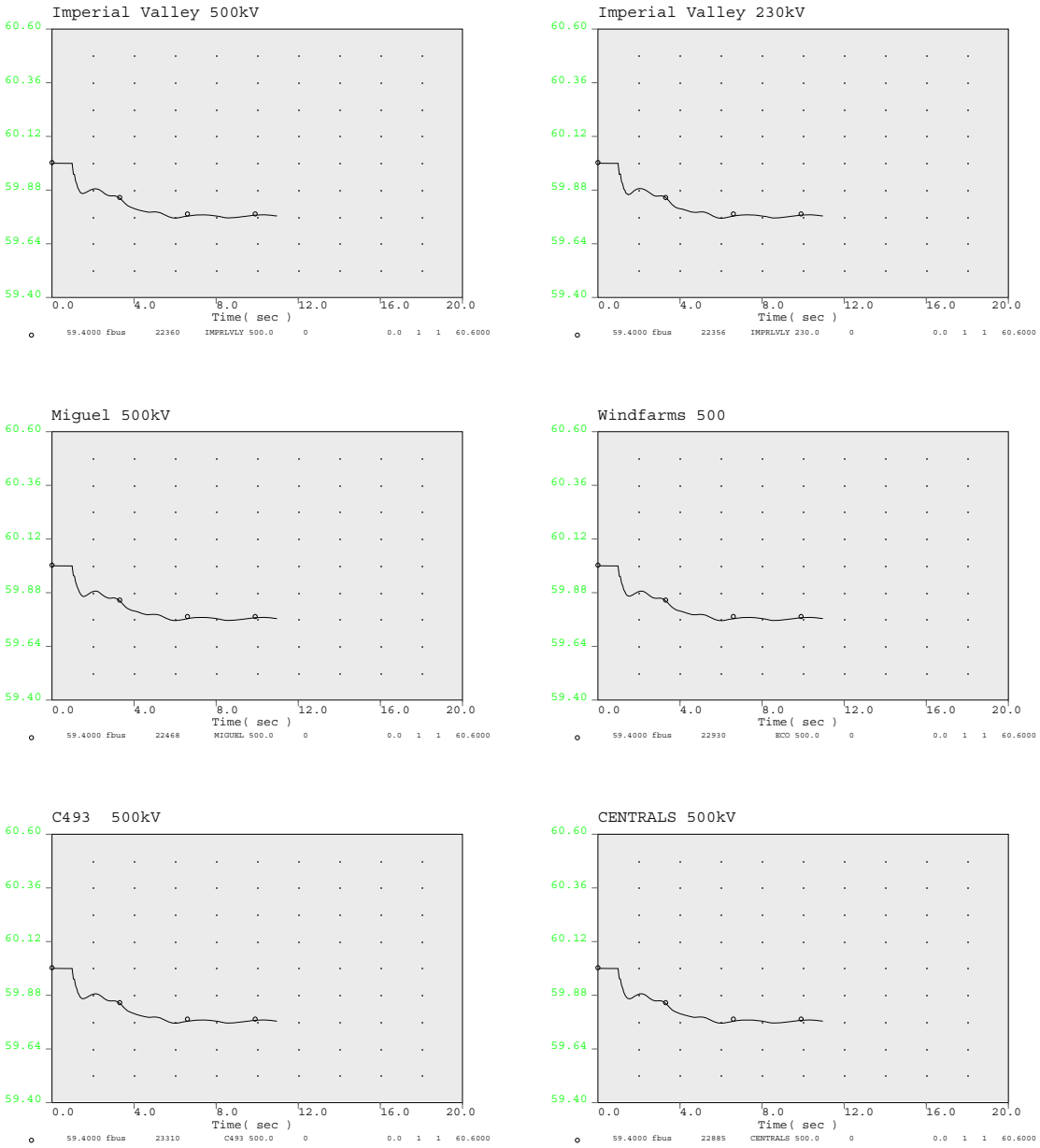
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - VOLTAGE



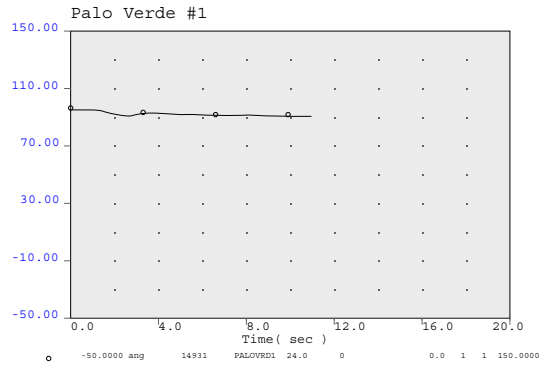
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

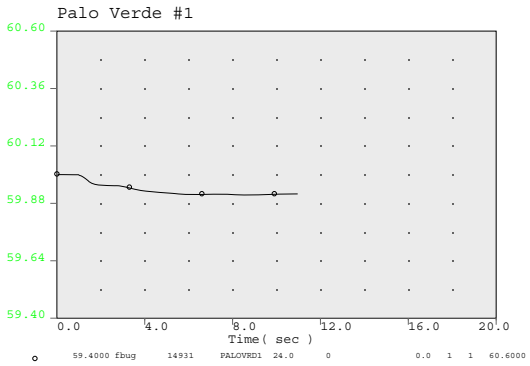
Imperial Valley Area - Frequency

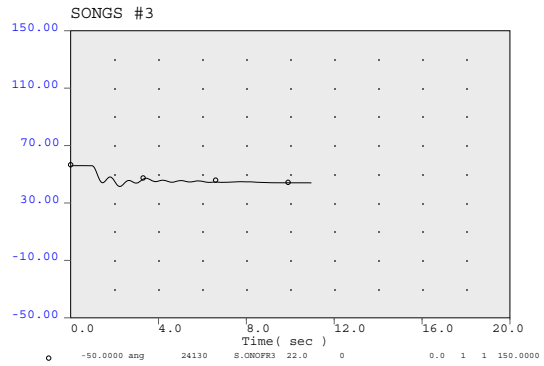


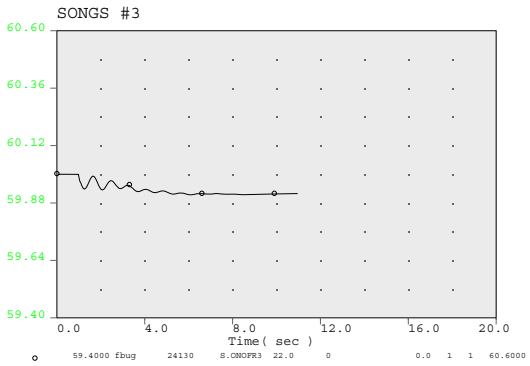
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

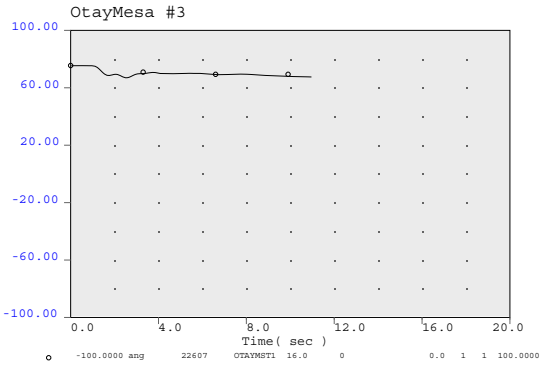
RELATIVE ROTOR ANGLE & FREQUENCY

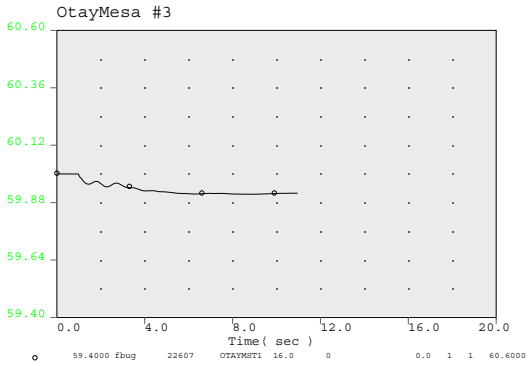










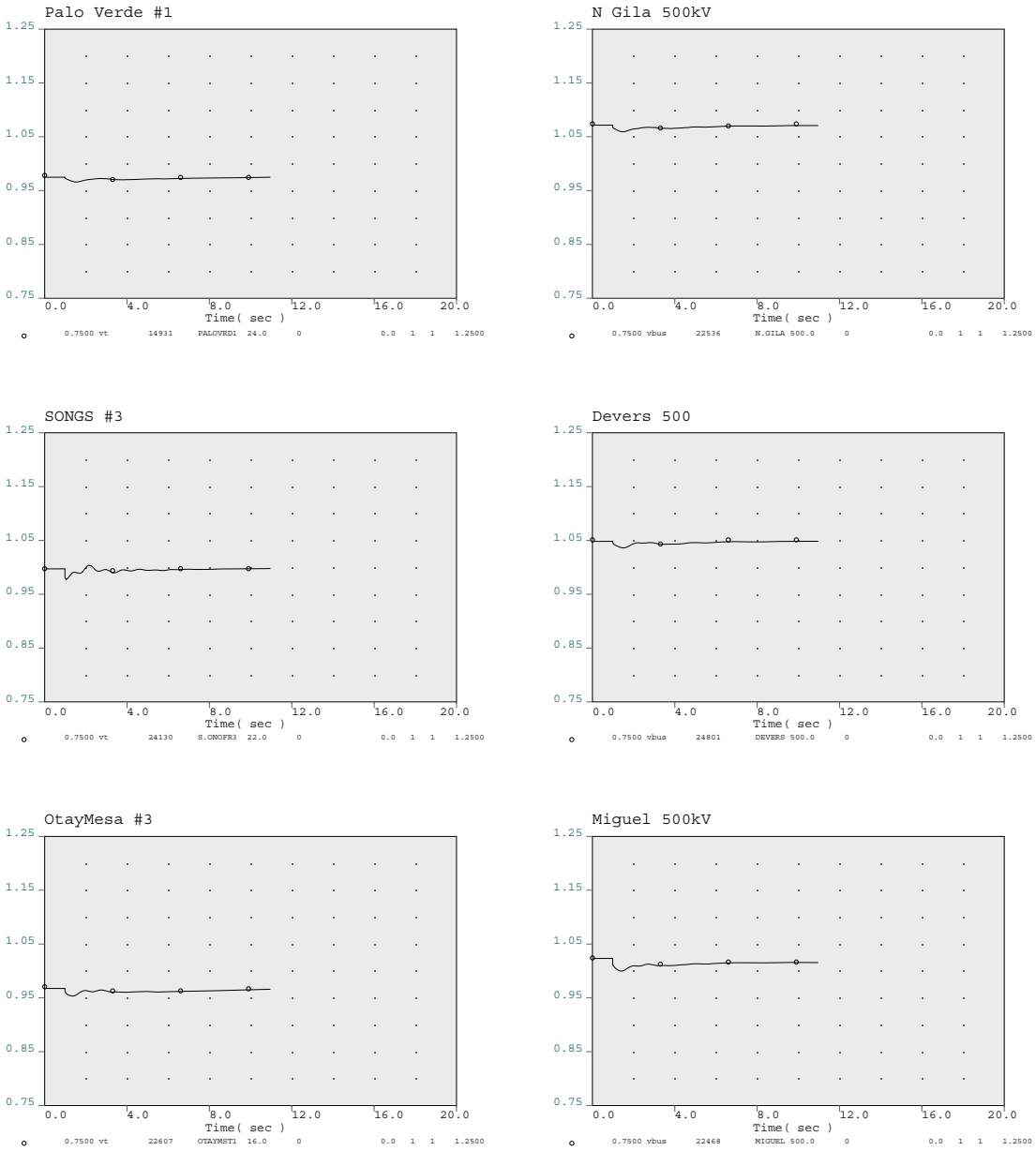


SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Page 1

SDGE	SONGS-g1_pre_iva_ll.chf	p_i\ll\pre_iva\ws_pre_iva Tue Nov 02 07:27:10 2010

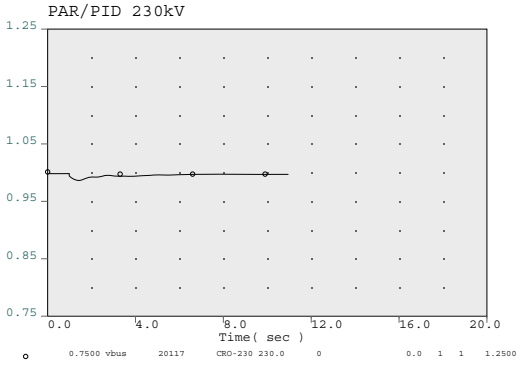
RELATIVE VOLTAGE



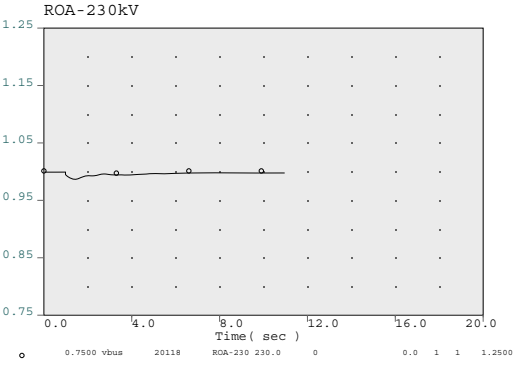
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

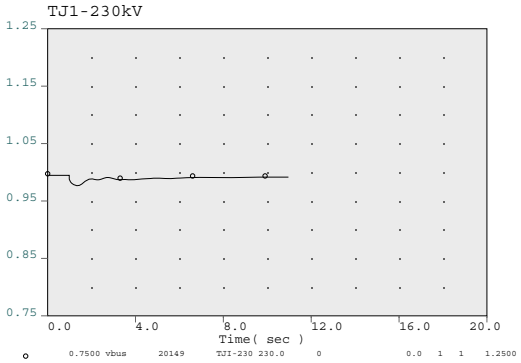
PAR/PID 230kV



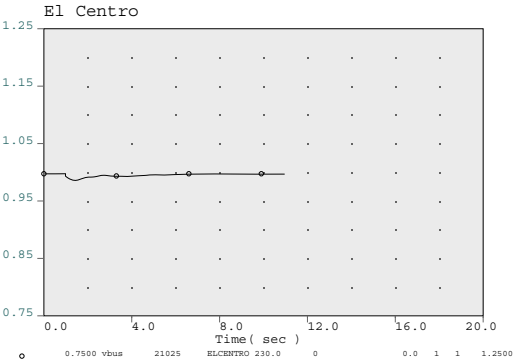
ROA-230kV



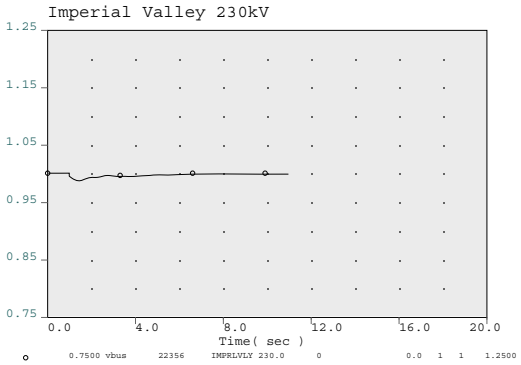
TJ1-230kV



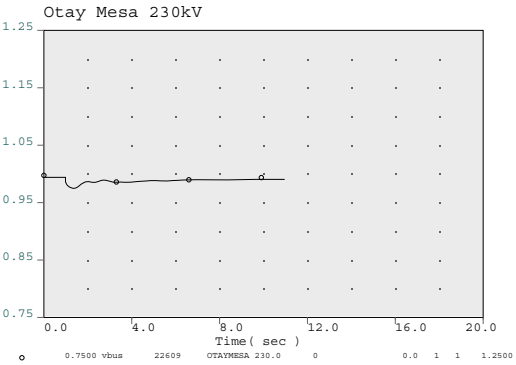
El Centro



Imperial Valley 230kV

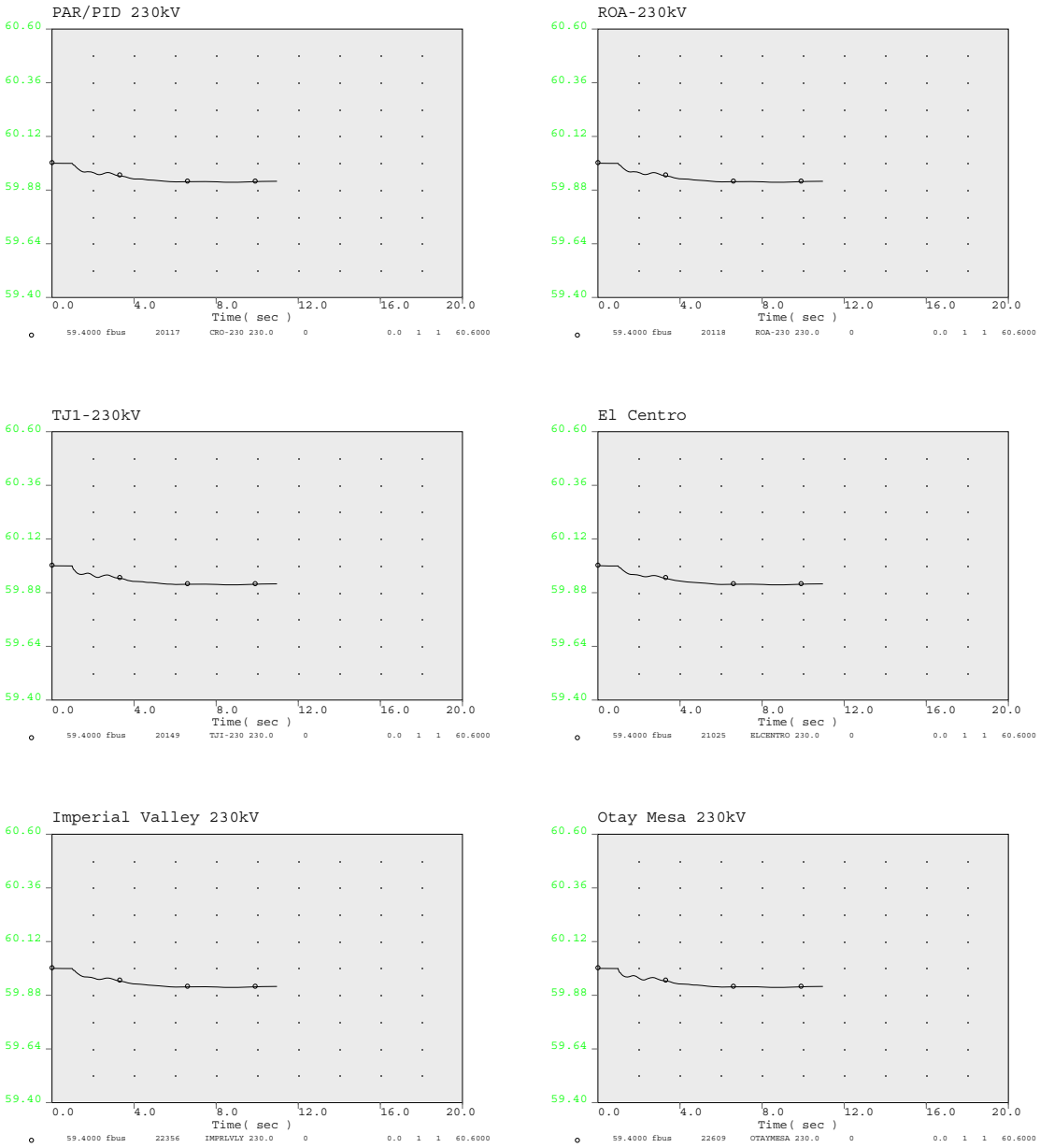


Otay Mesa 230kV



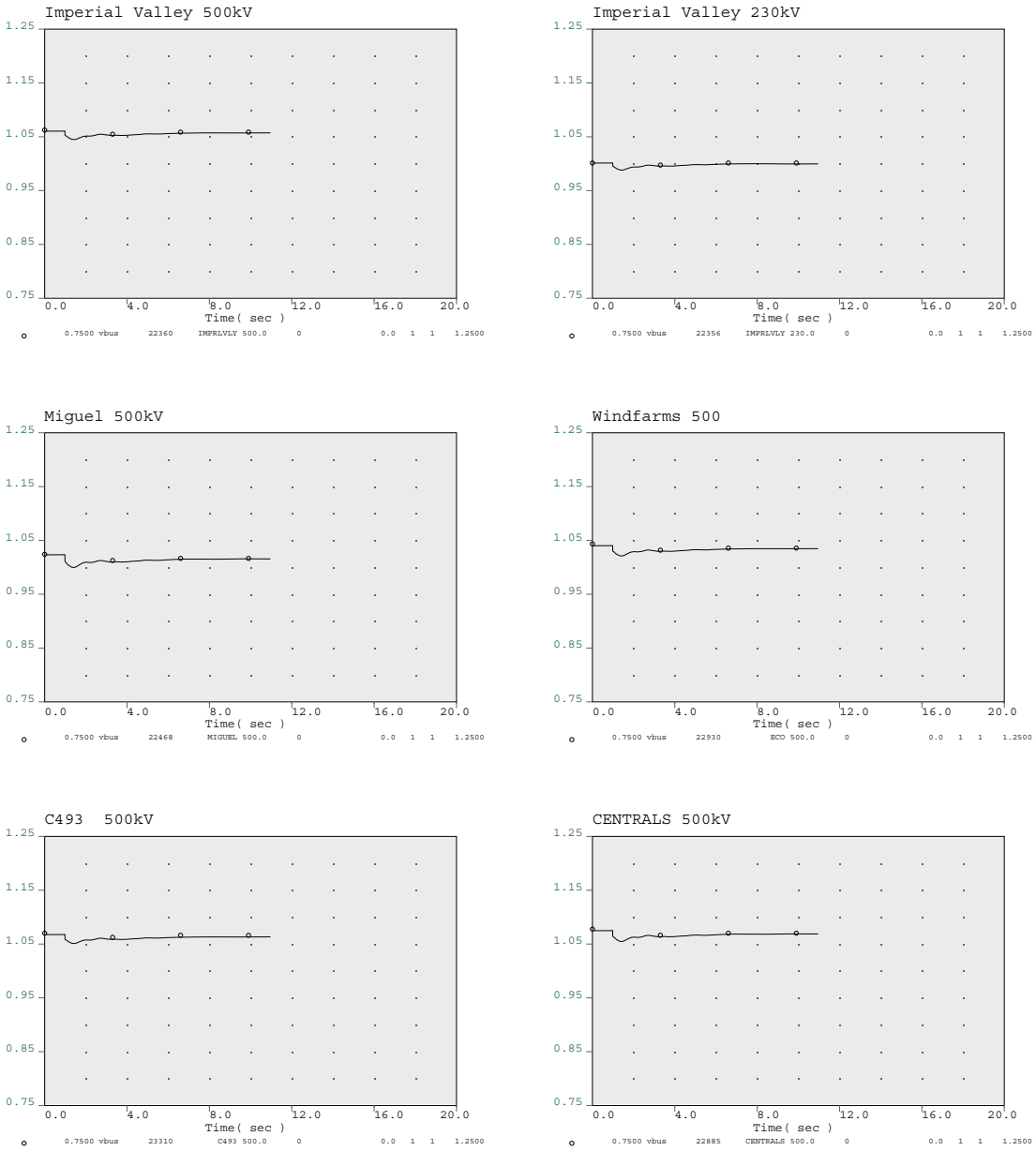
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison



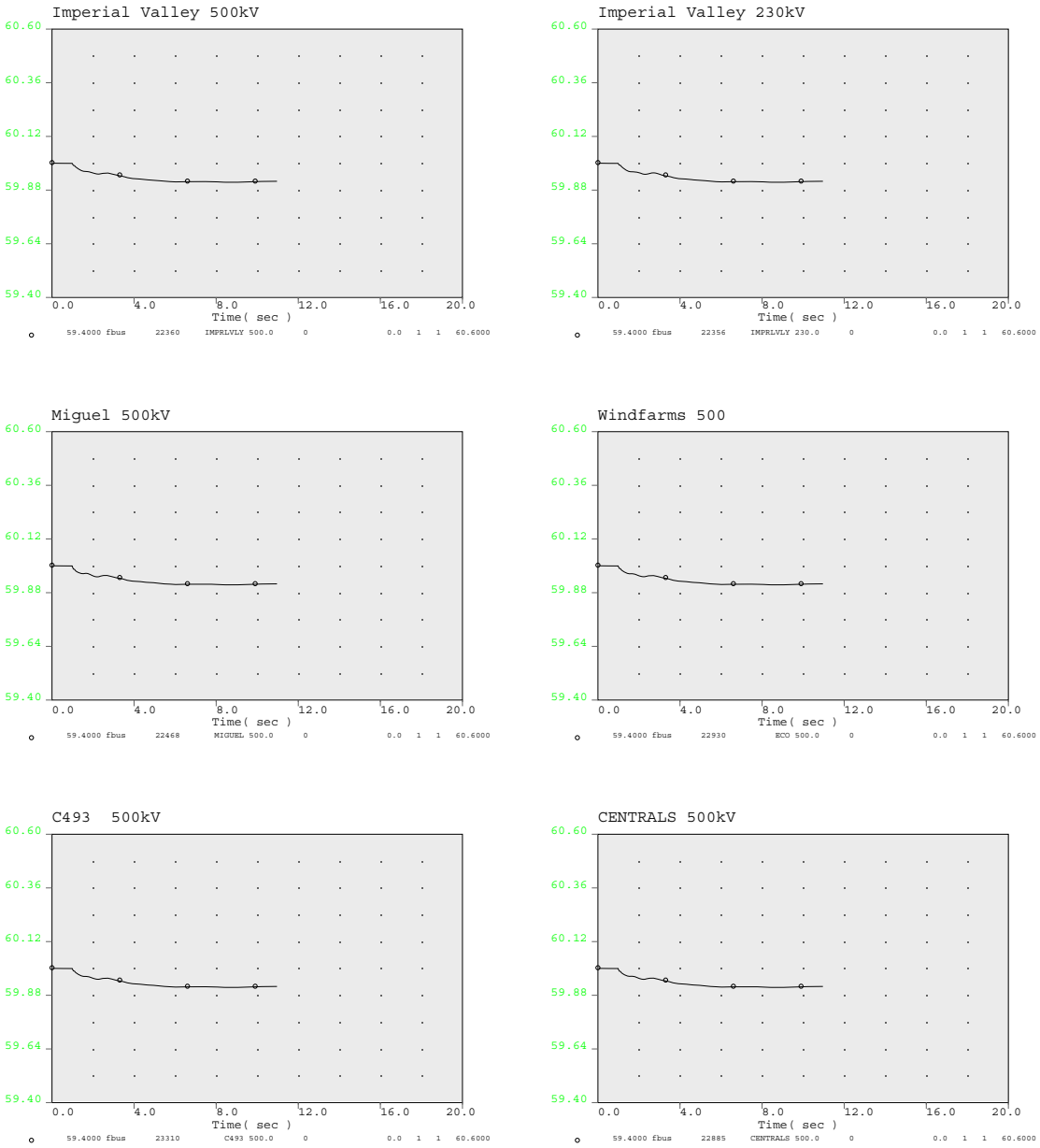
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Imperial Valley Area - VOLTAGE



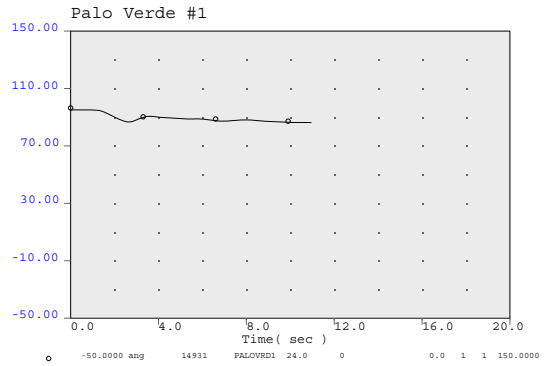
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

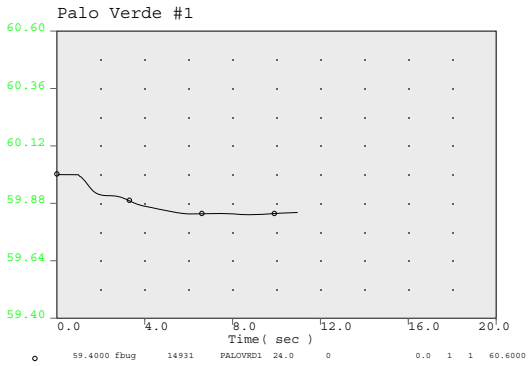
Imperial Valley Area - Frequency

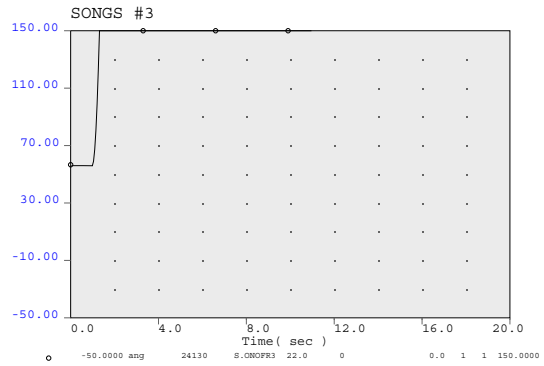


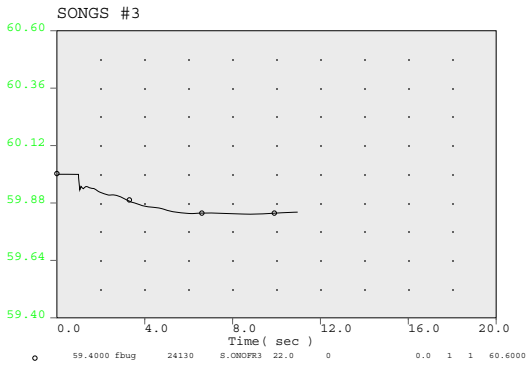
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

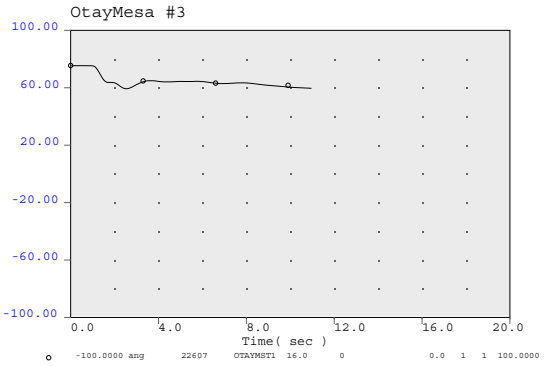
RELATIVE ROTOR ANGLE & FREQUENCY

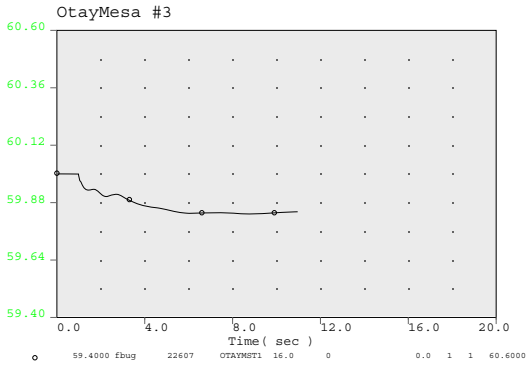






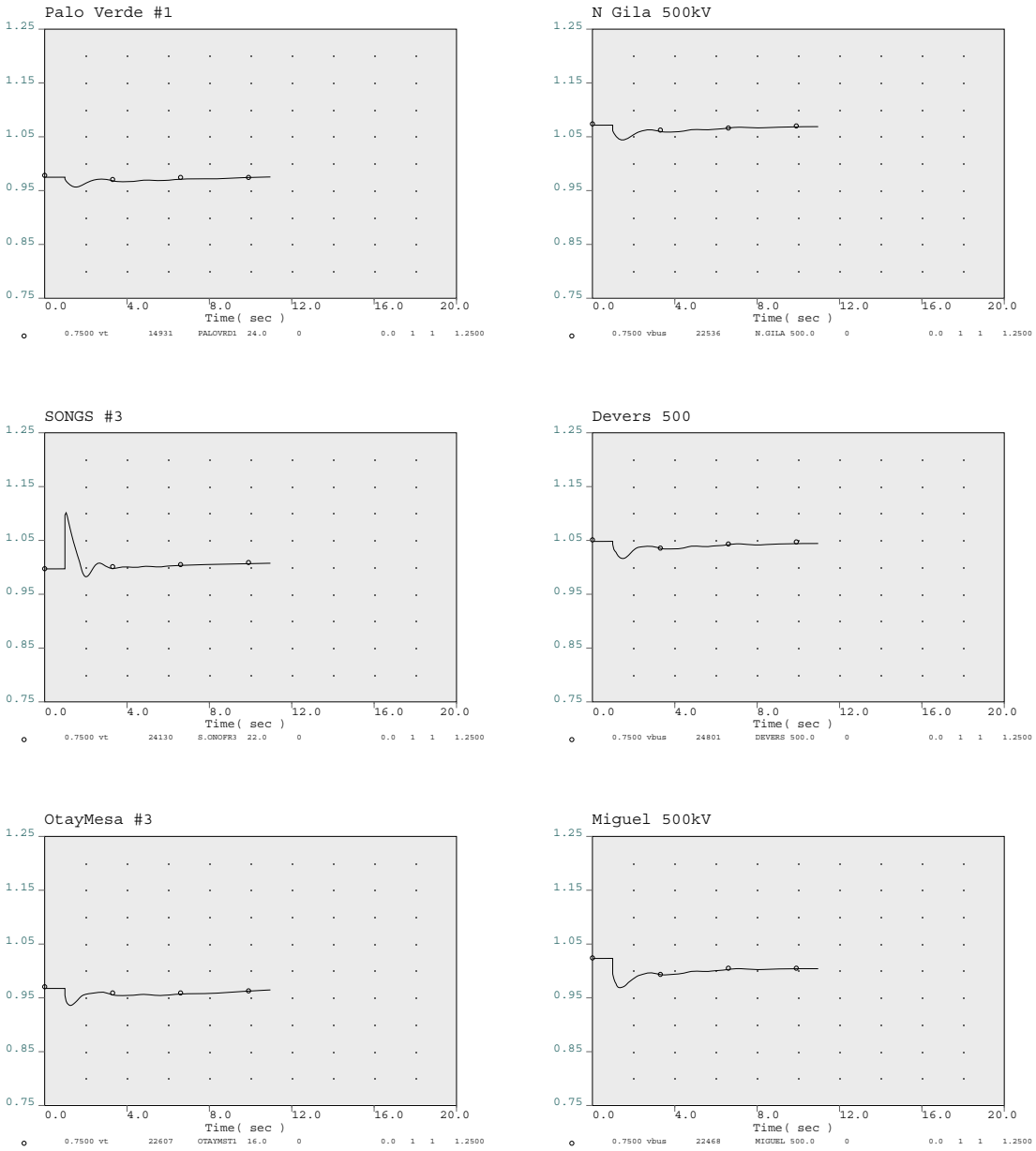






SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

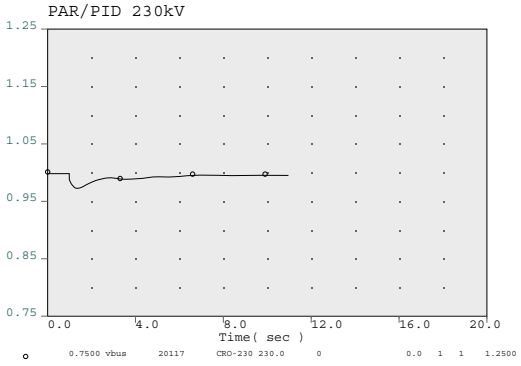
RELATIVE VOLTAGE



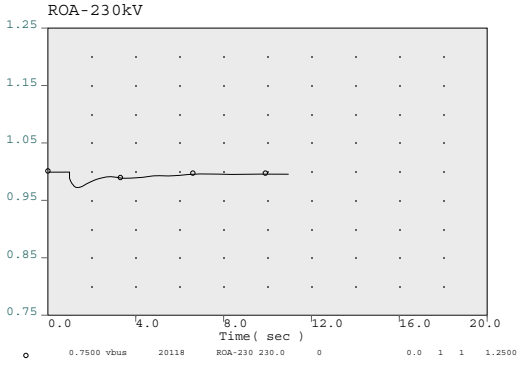
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

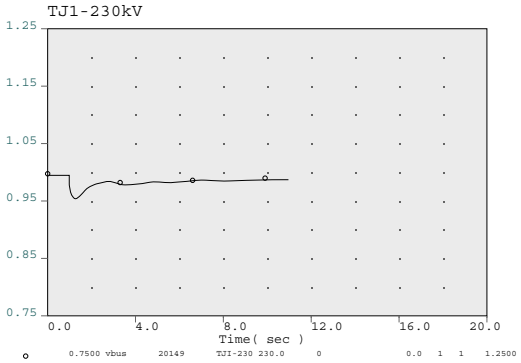
PAR/PID 230kV



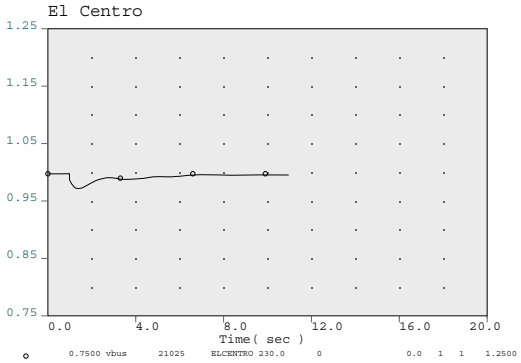
ROA-230kV



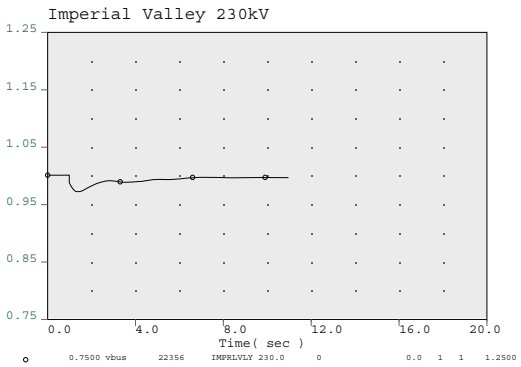
TJ1-230kV



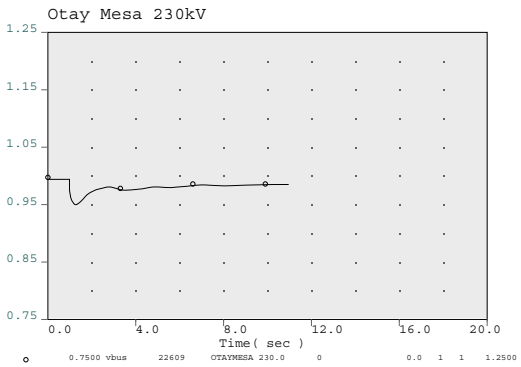
El Centro



Imperial Valley 230kV



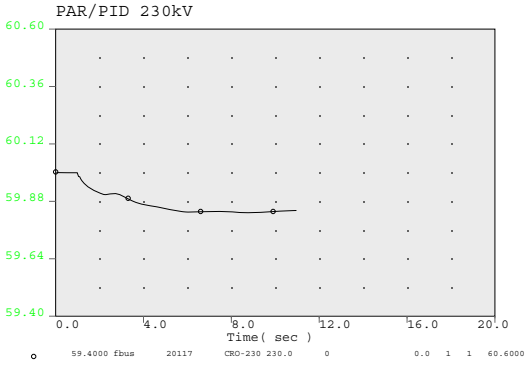
Otay Mesa 230kV



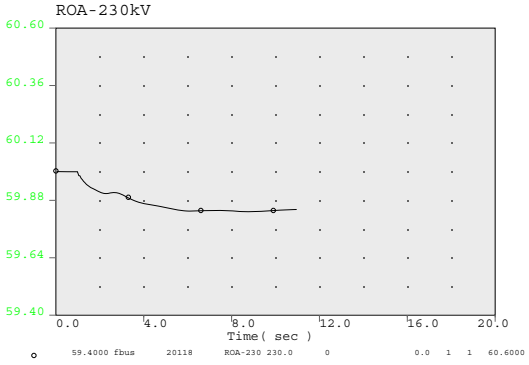
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Frequency Check and Comparison

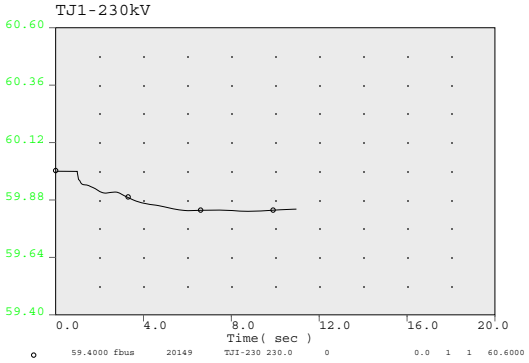
PAR/PID 230kV



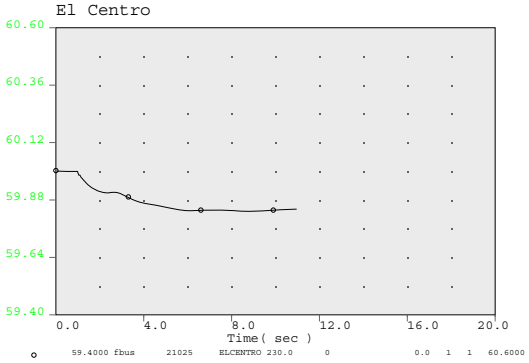
ROA-230kV



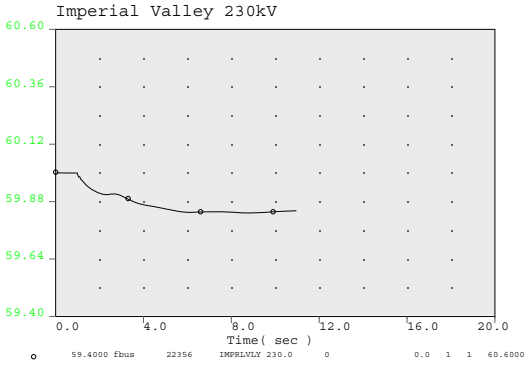
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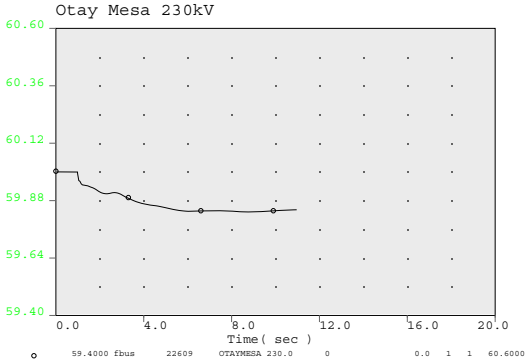
El Centro



Imperial Valley 230kV



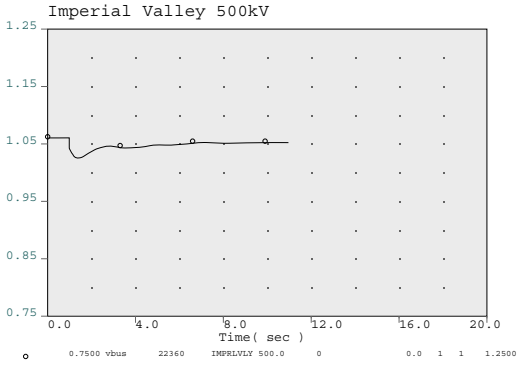
Otay Mesa 230kV



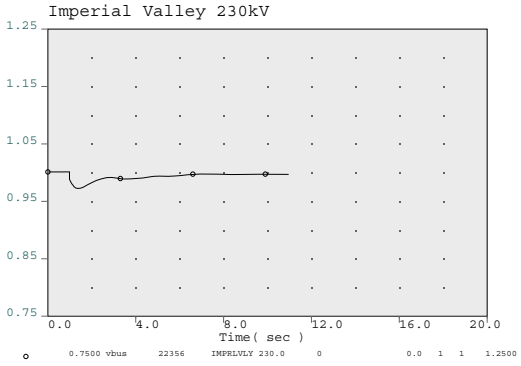
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

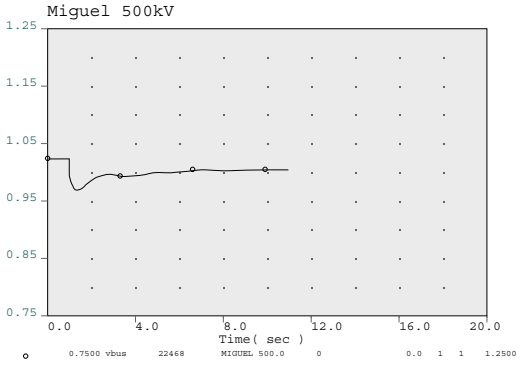
Imperial Valley 500kV



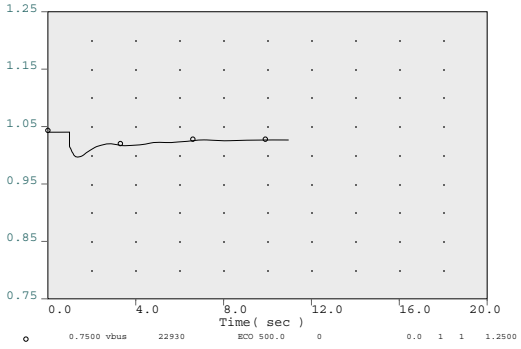
Imperial Valley 230kV



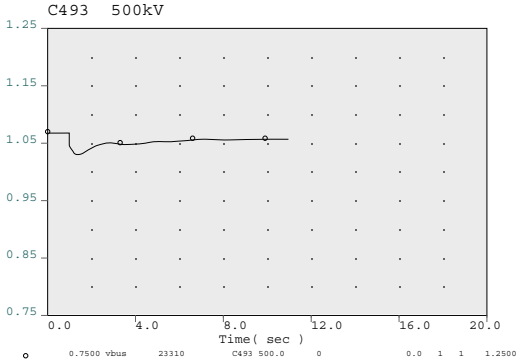
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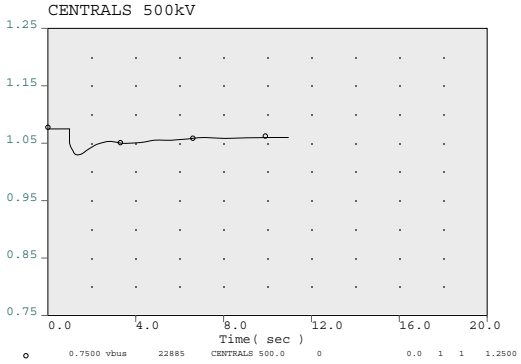
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C493 500kV

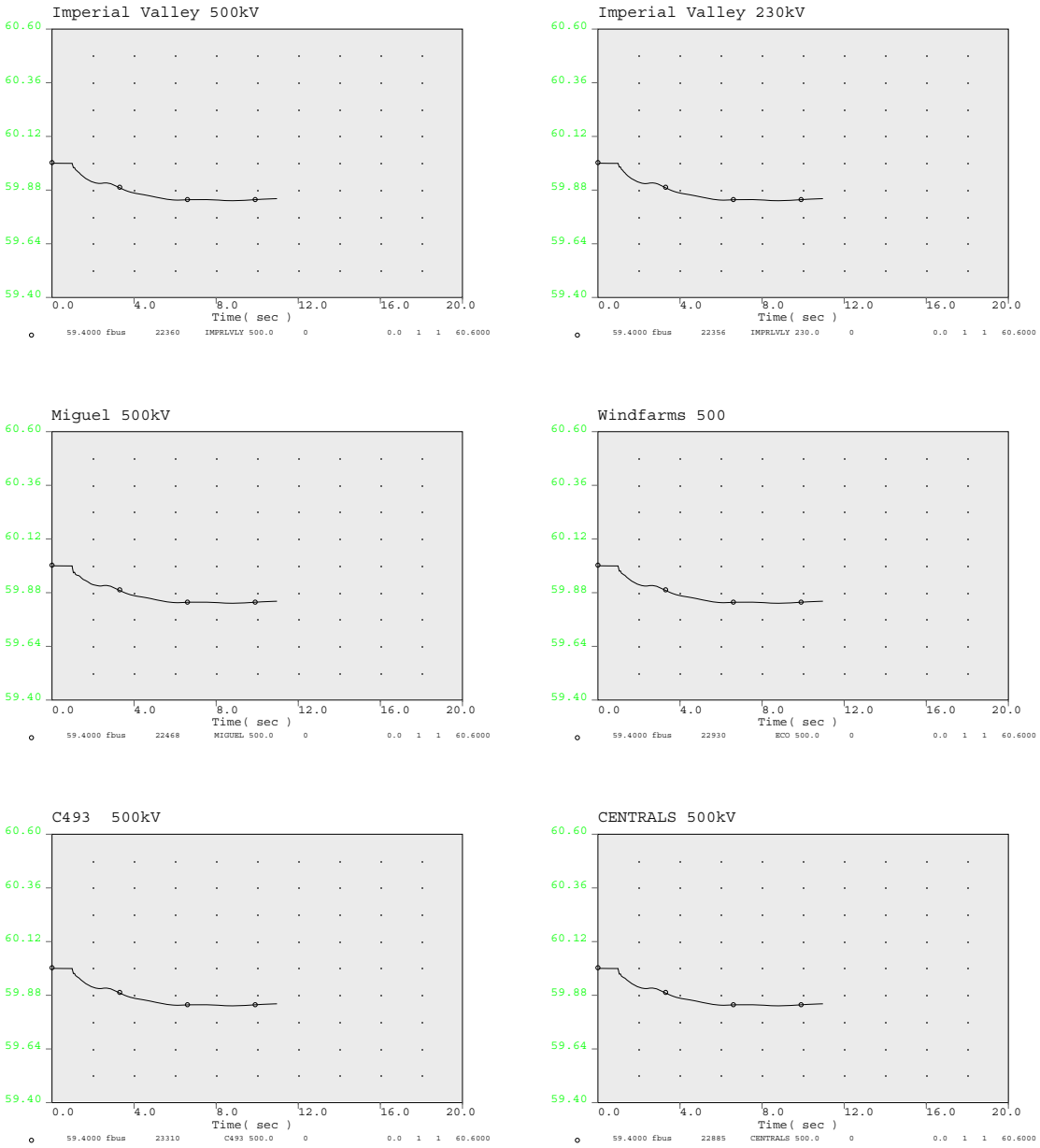


CENTRALS 500kV



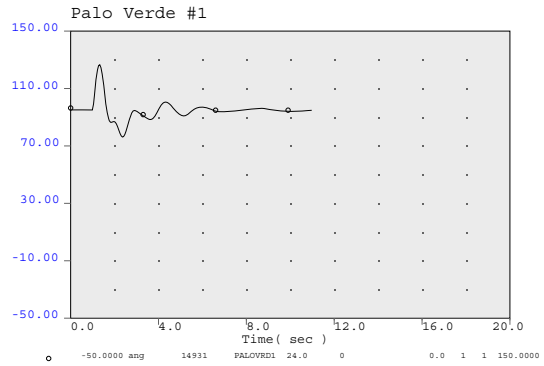
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

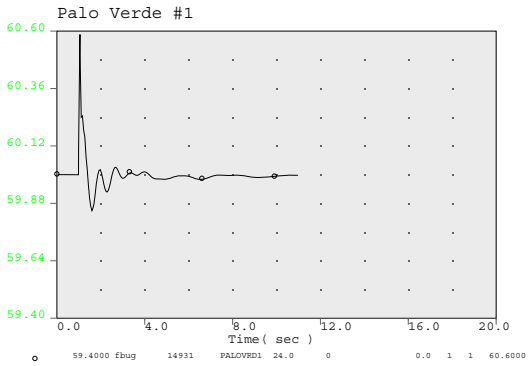
Imperial Valley Area - Frequency

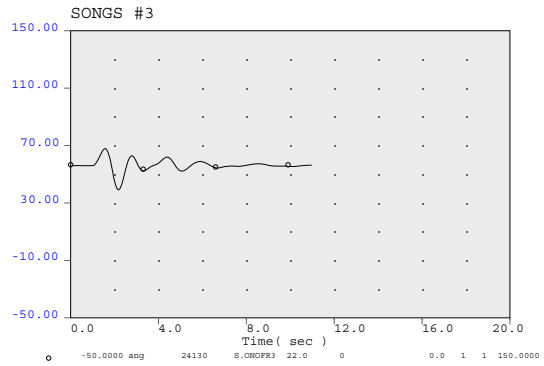


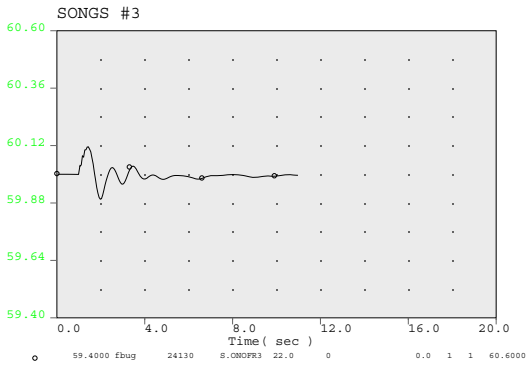
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

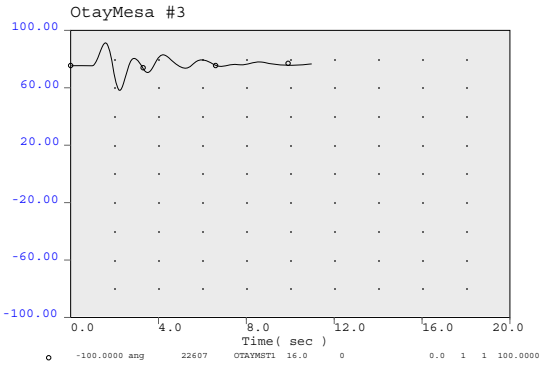
RELATIVE ROTOR ANGLE & FREQUENCY

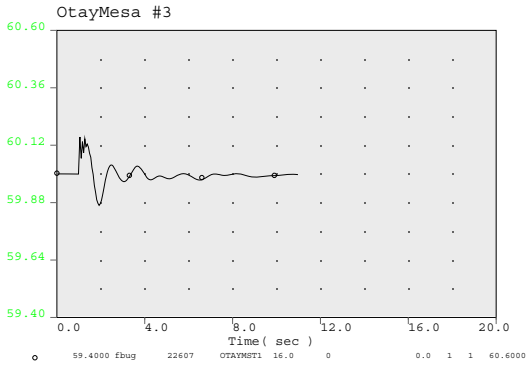










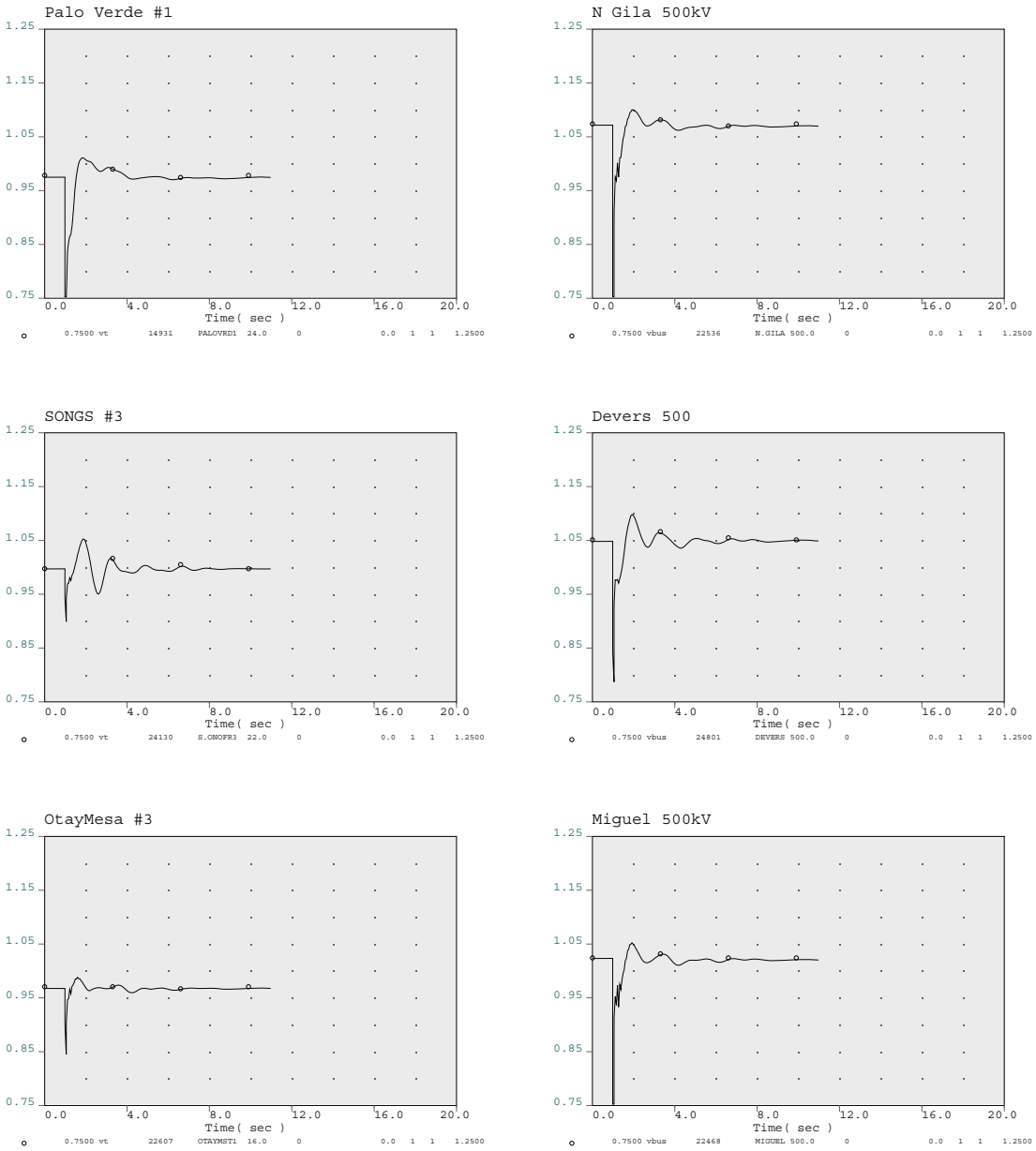


SDG&E Cluster 2 - pre
2014 Light Autumn
T468-Hassyampa 500 kV line

Page 1

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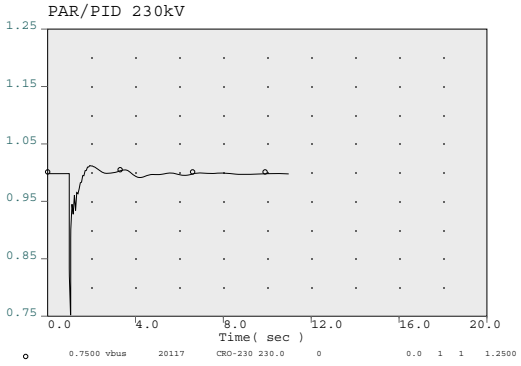
RELATIVE VOLTAGE



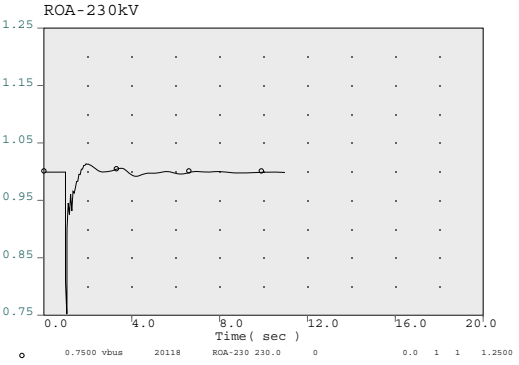
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

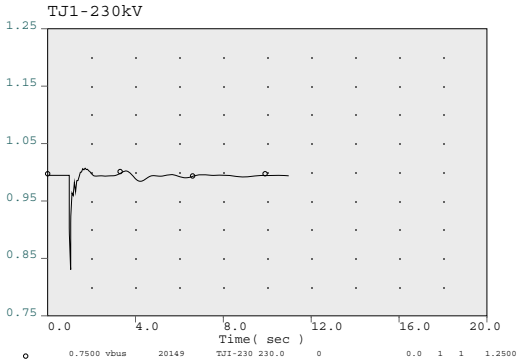
PAR/PID 230kV



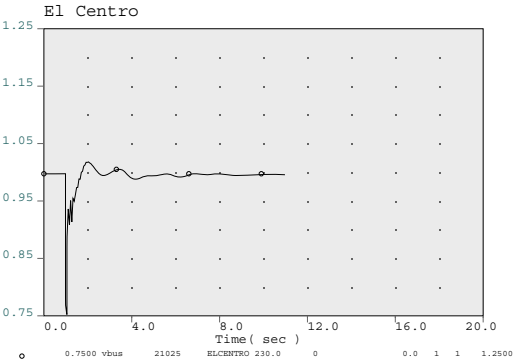
ROA-230kV



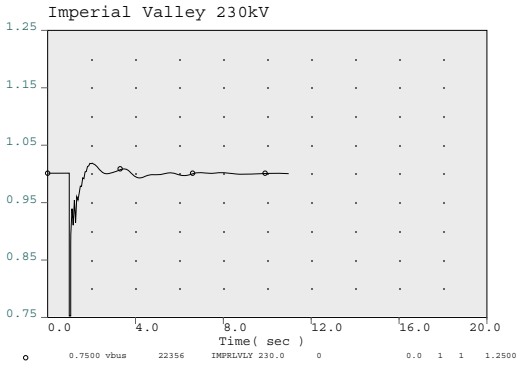
TJ1-230kV



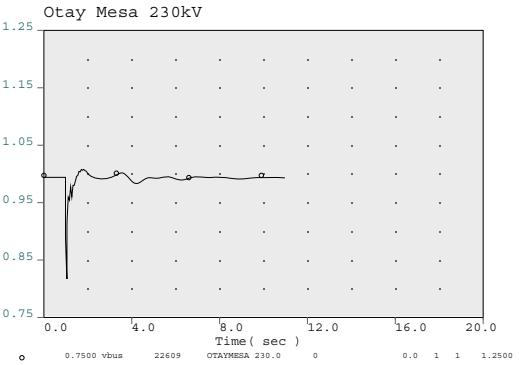
El Centro



Imperial Valley 230kV



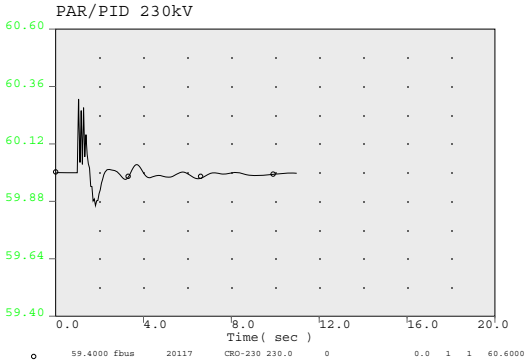
Otay Mesa 230kV



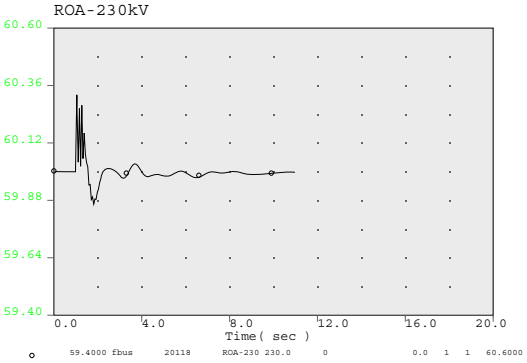
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-Hassyampa 500 kV line

Affected System Frequency Check and Comparison

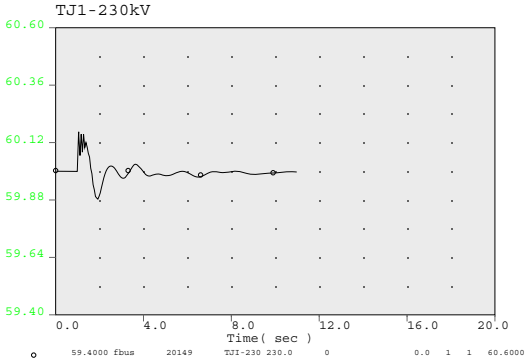
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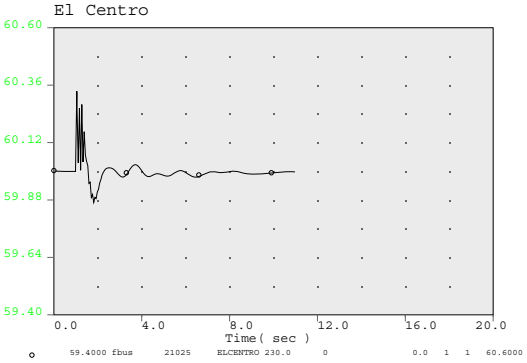
ROA-230kV



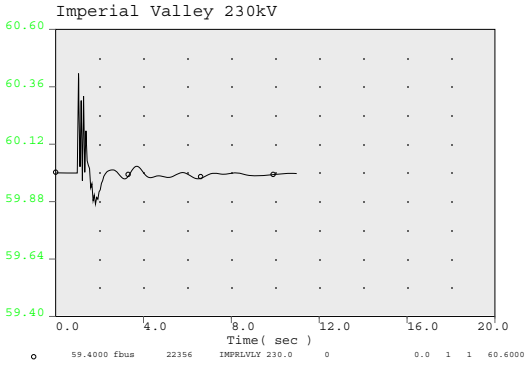
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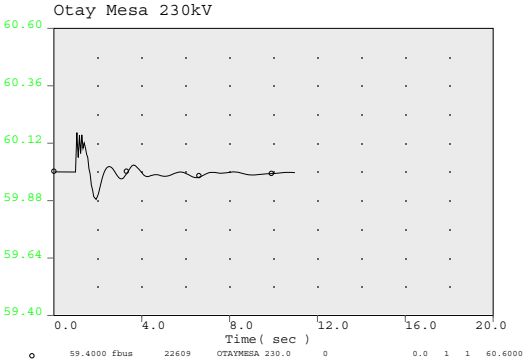
El Centro



Imperial Valley 230kV



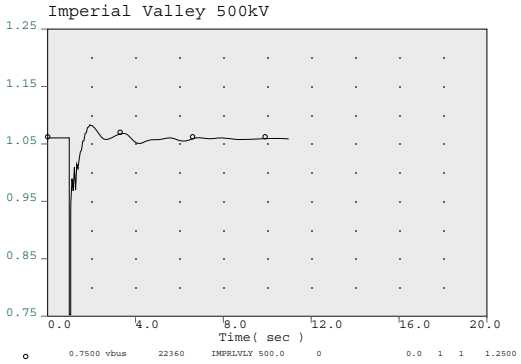
Otay Mesa 230kV



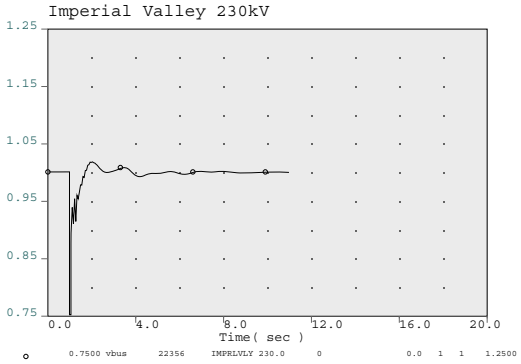
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-Hassyampa 500 kV line

Imperial Valley Area - VOLTAGE

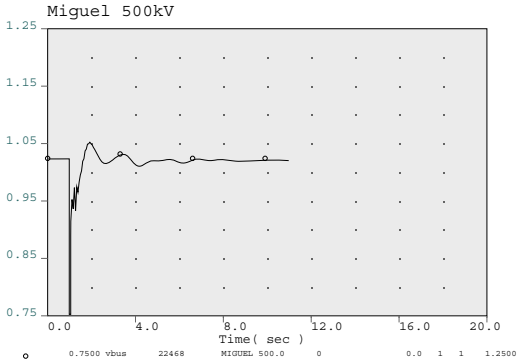
Imperial Valley 500kV



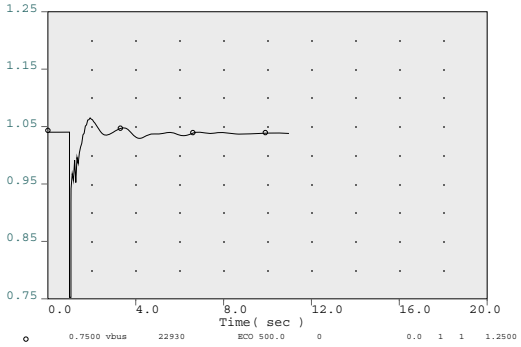
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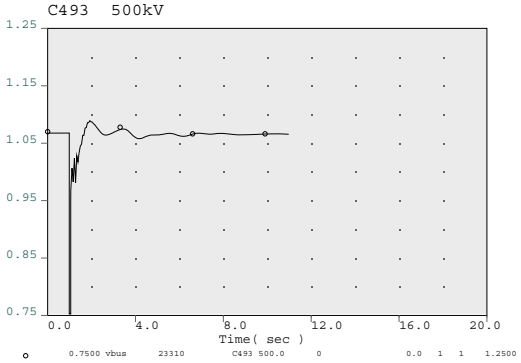
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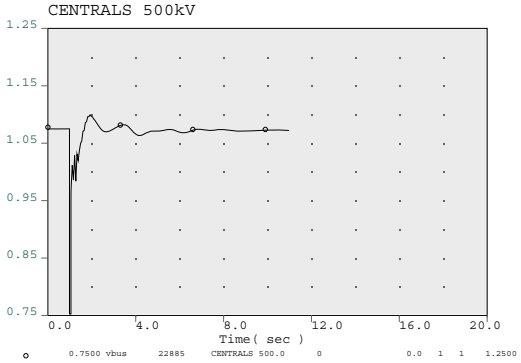
Windfarms 500



C493 500kV

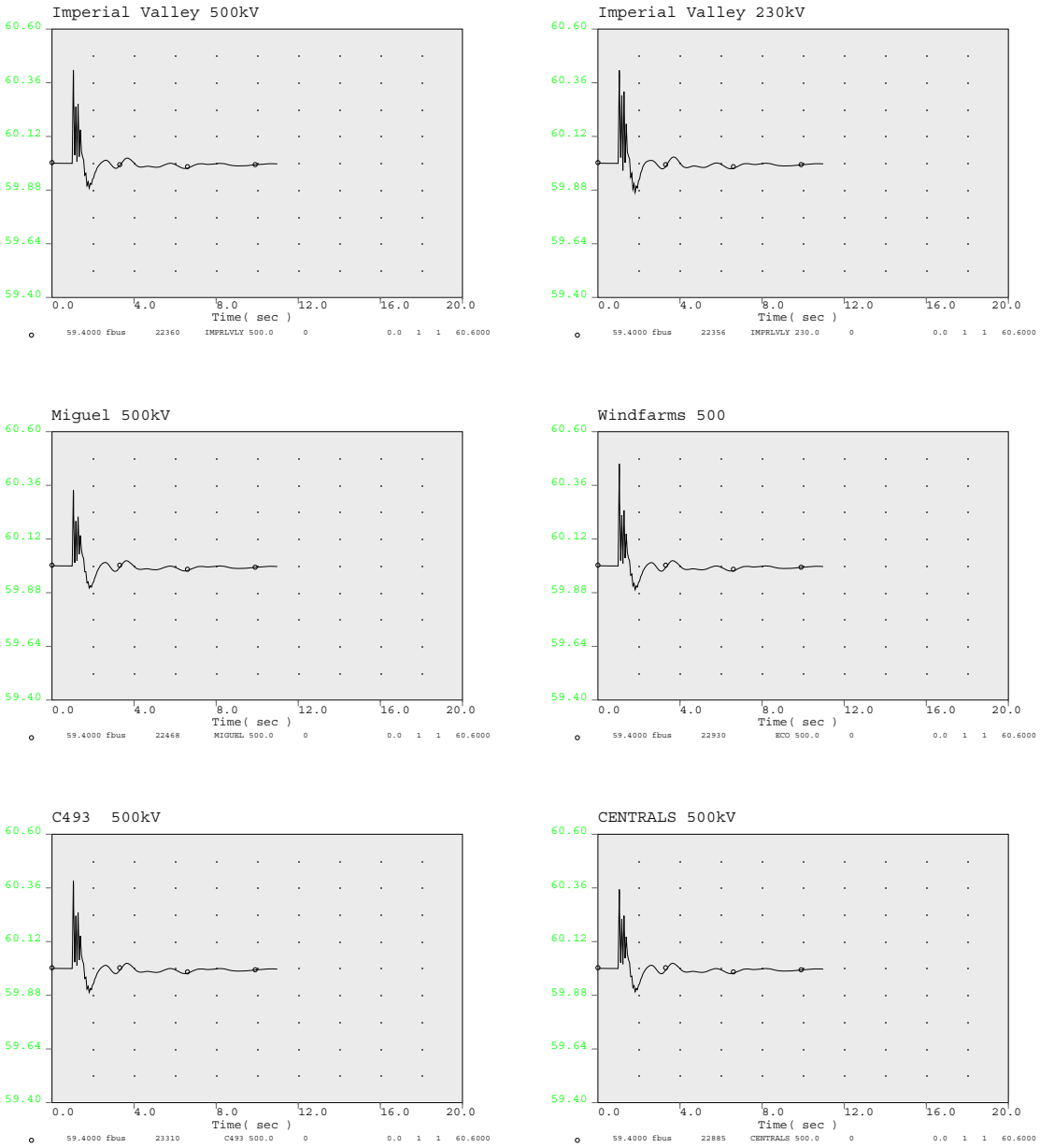


CENTRALS 500kV



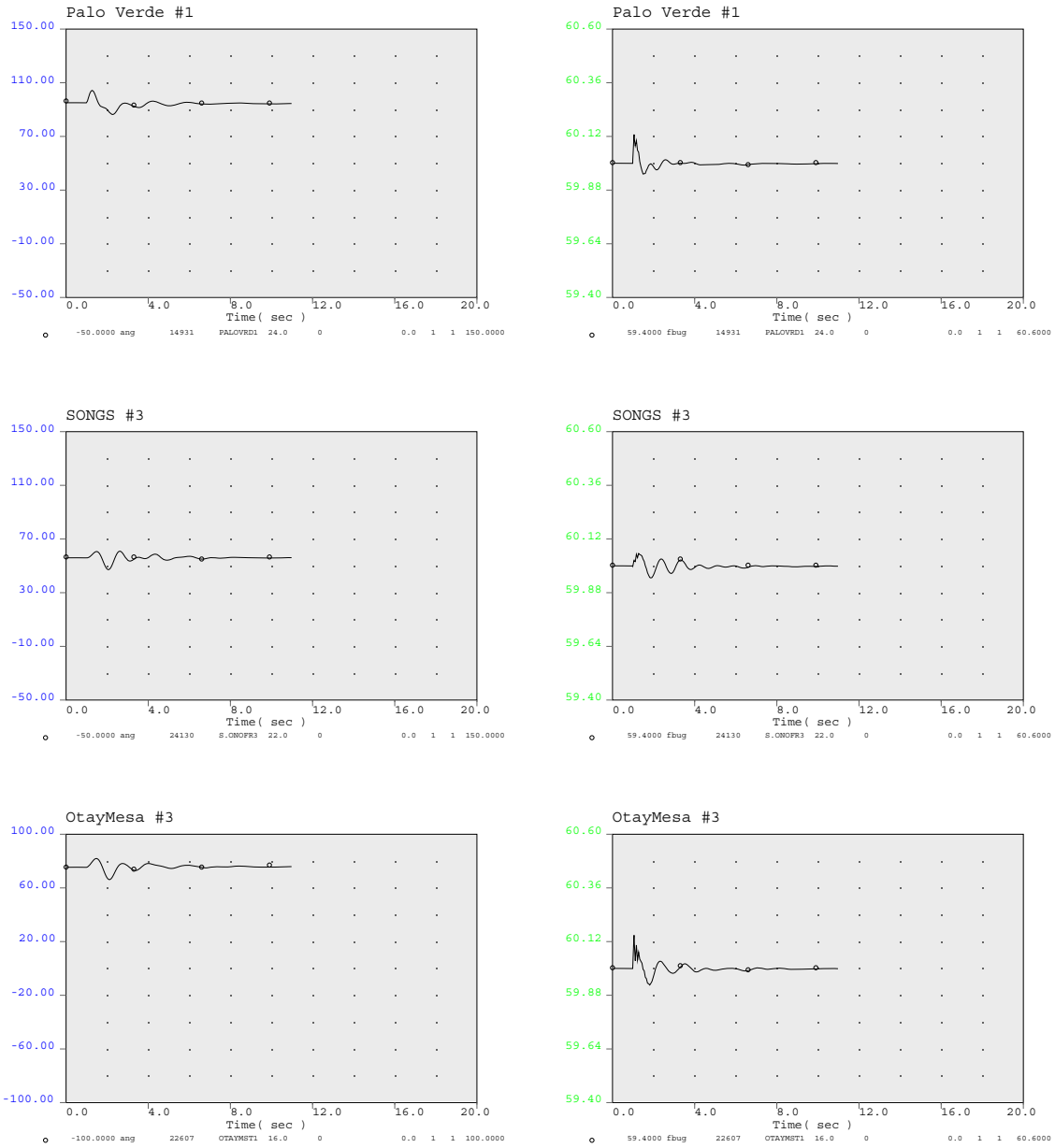
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-Hassyampa 500 kV line

Imperial Valley Area - Frequency



SDG&E Cluster 2 - pre
2014 Light Autumn
T468-Hassyampa 500 kV line

RELATIVE ROTOR ANGLE & FREQUENCY

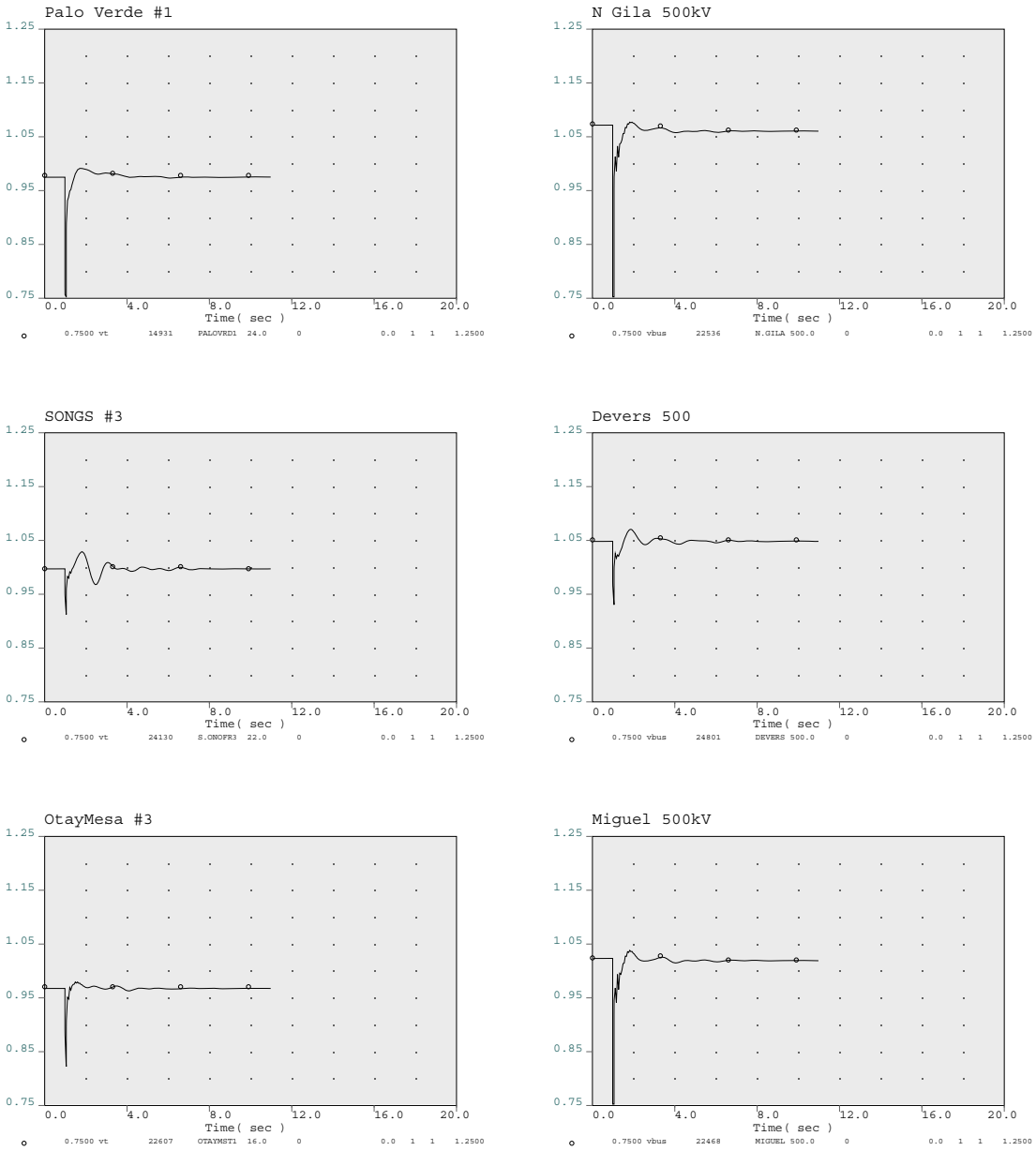


SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Page 1

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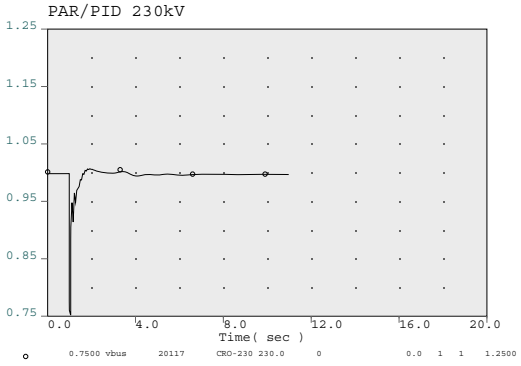
RELATIVE VOLTAGE



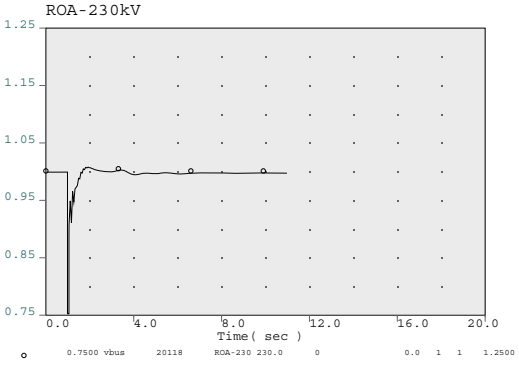
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

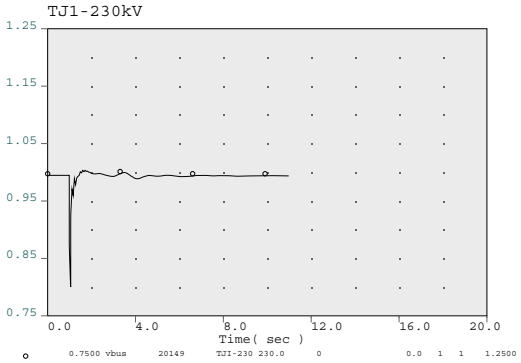
PAR/PID 230kV



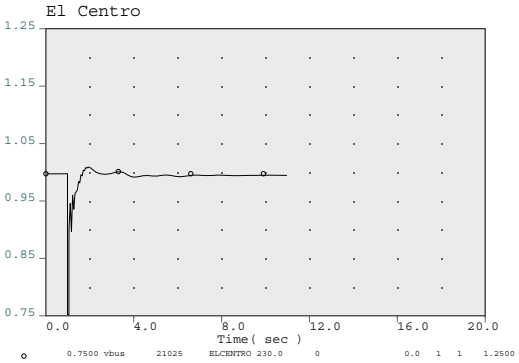
ROA-230kV



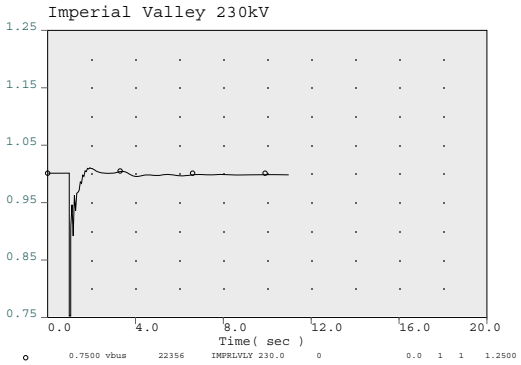
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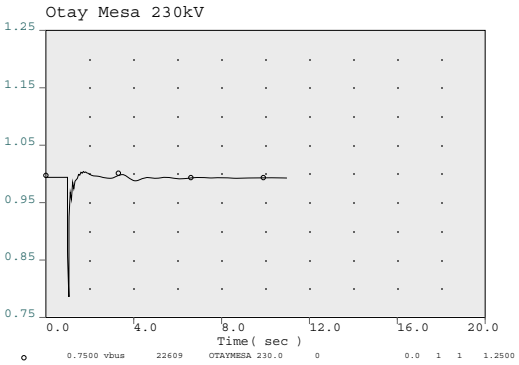
El Centro



Imperial Valley 230kV



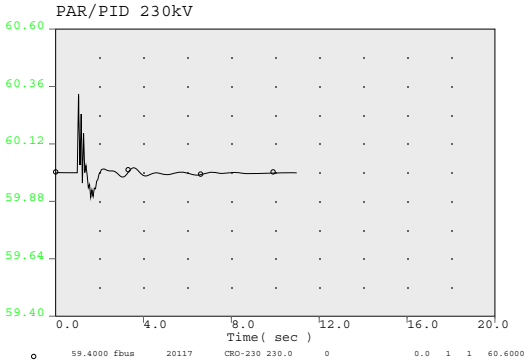
Otay Mesa 230kV



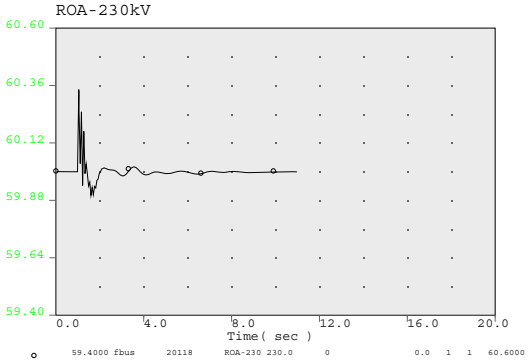
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

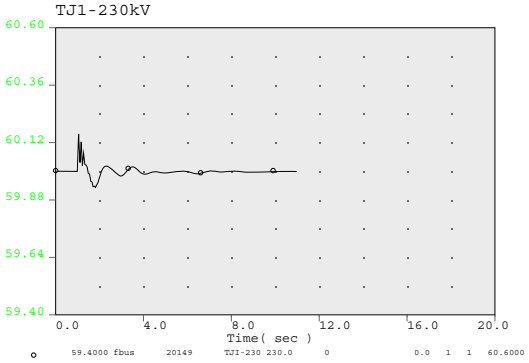
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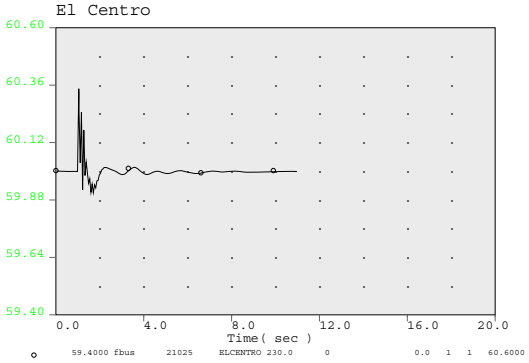
ROA-230kV



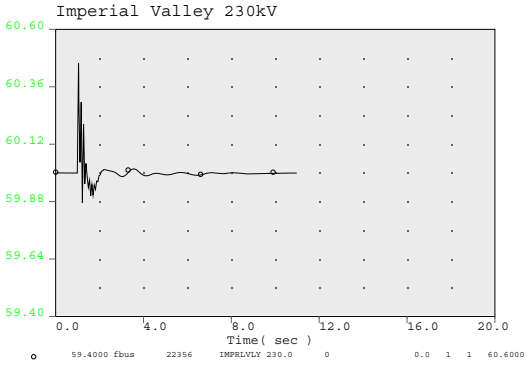
TJ1-230kV



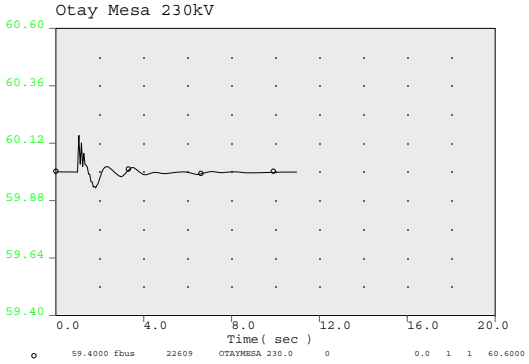
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



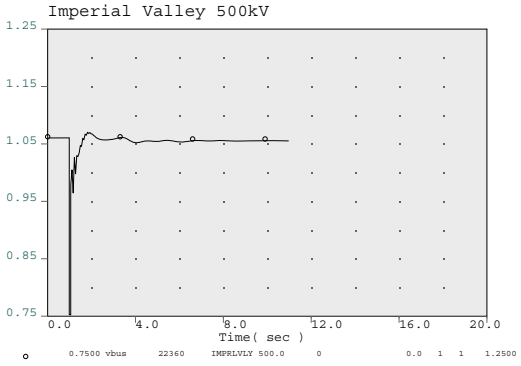
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Page 4

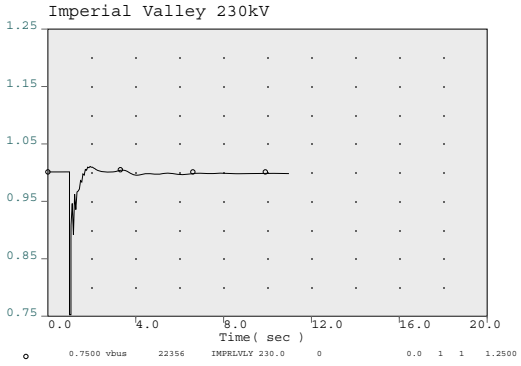
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Imperial Valley Area - VOLTAGE

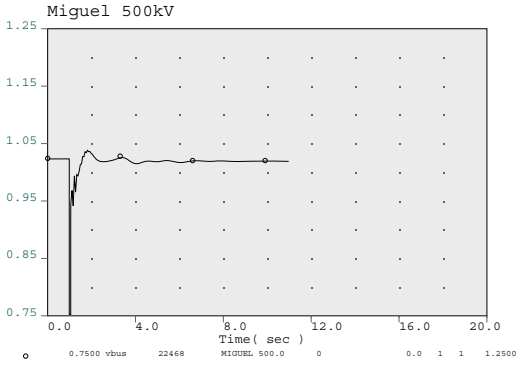
Imperial Valley 500kV



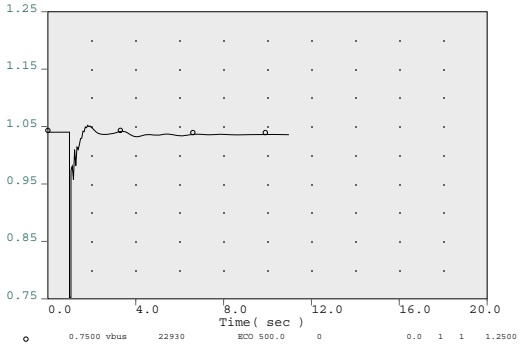
Imperial Valley 230kV



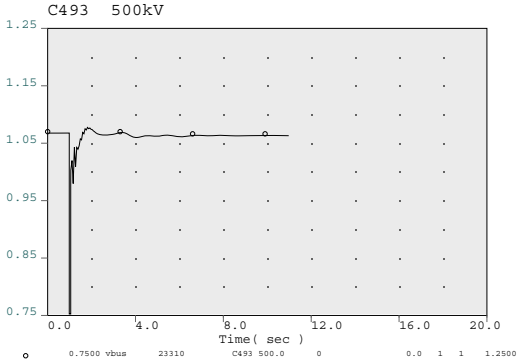
Miguel 500kV



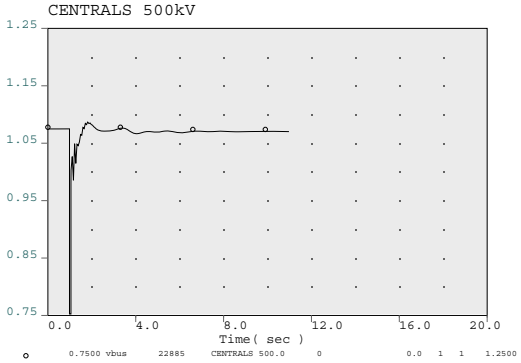
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Appendix J-3

Transient Stability Analysis Plots

Imperial Valley Area Cluster

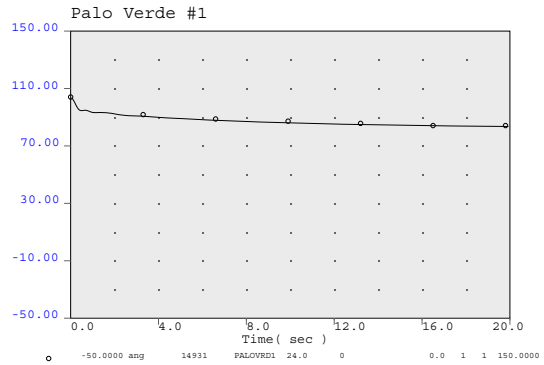
Heavy Summer Post

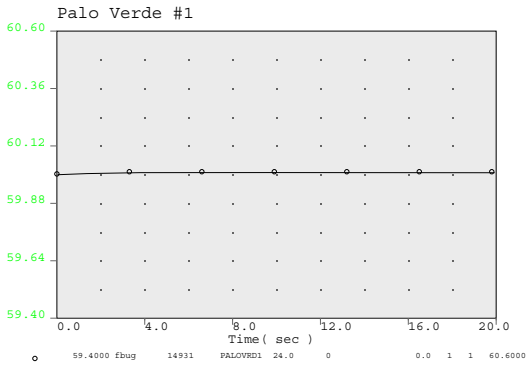
Imperial Valley Area - Frequency

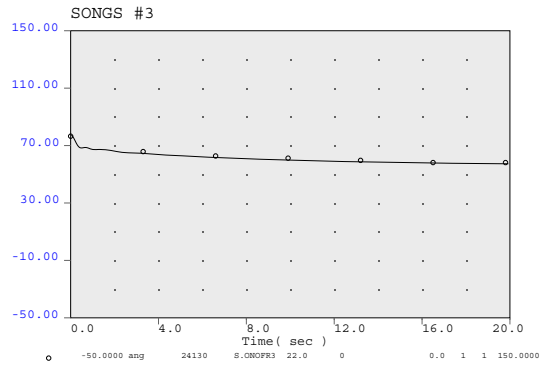


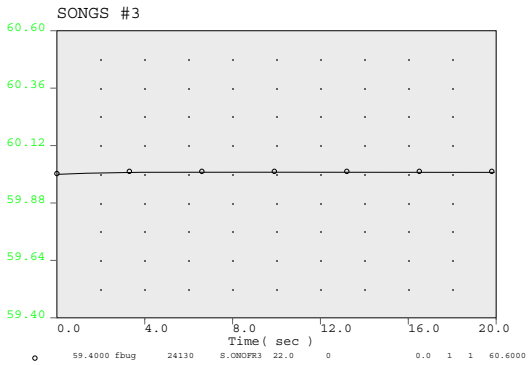
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

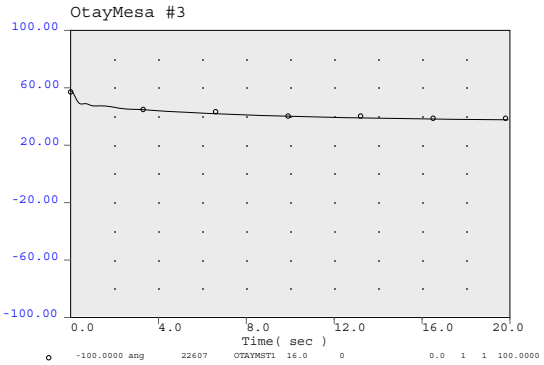
RELATIVE ROTOR ANGLE & FREQUENCY

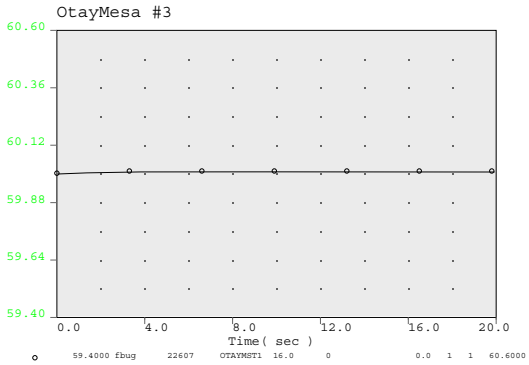










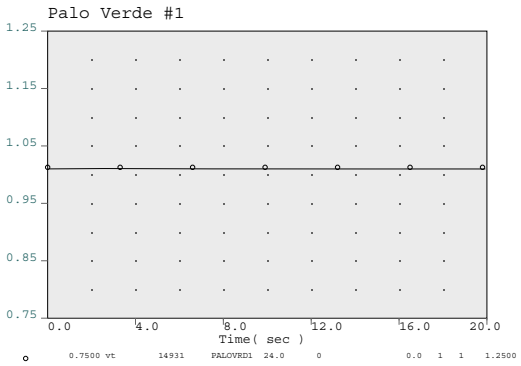


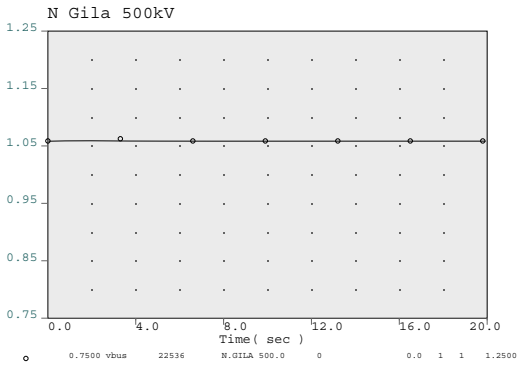
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

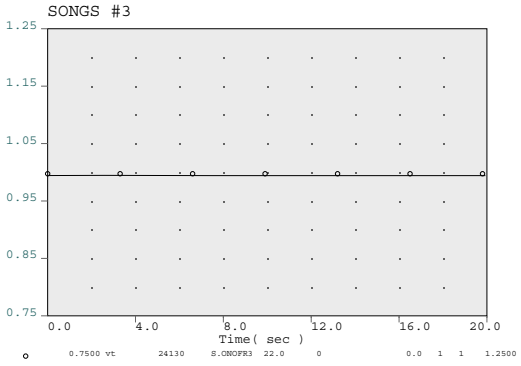
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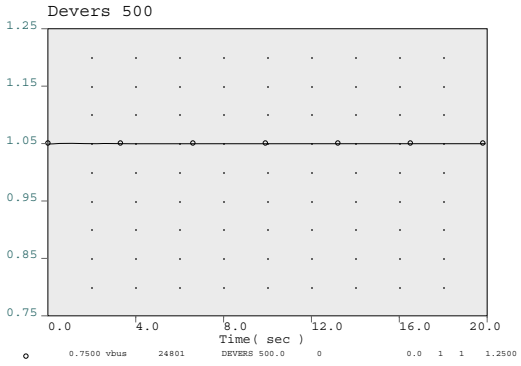
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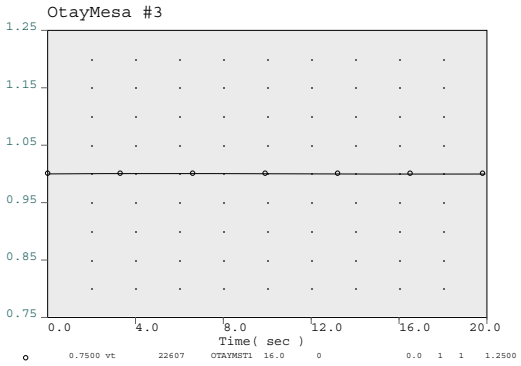
RELATIVE VOLTAGE

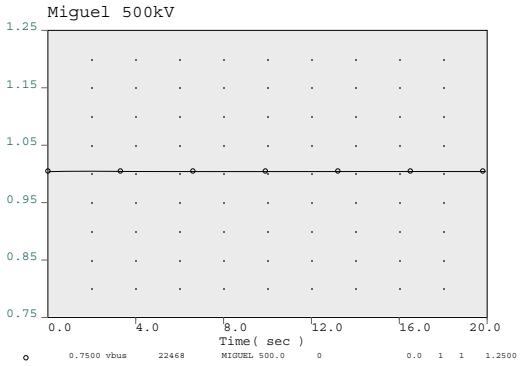








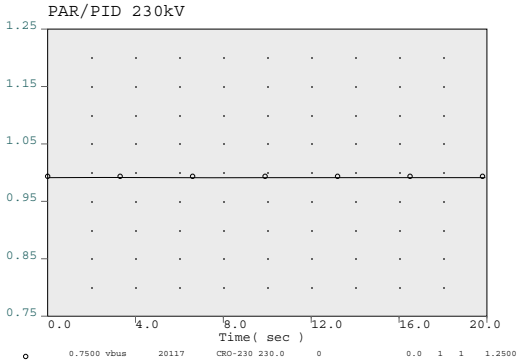




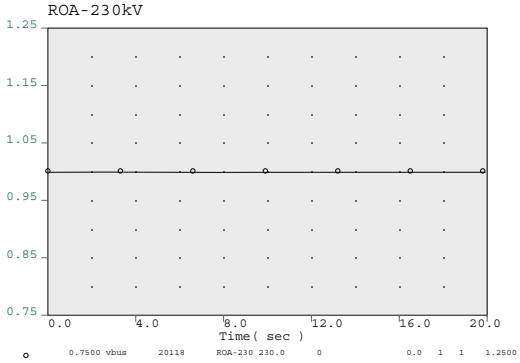
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Affected System Voltage Check and Comparison

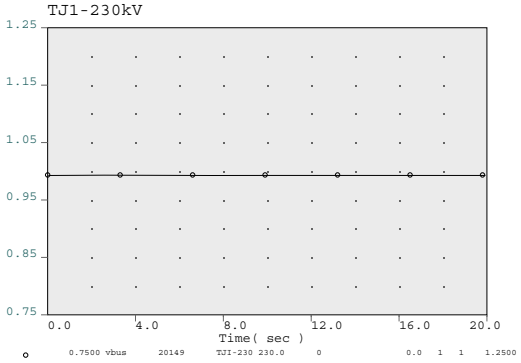
PAR/PID 230kV



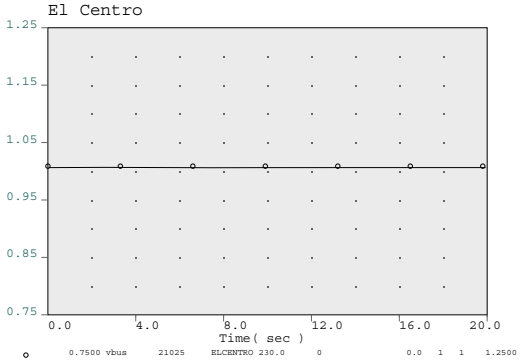
ROA-230kV



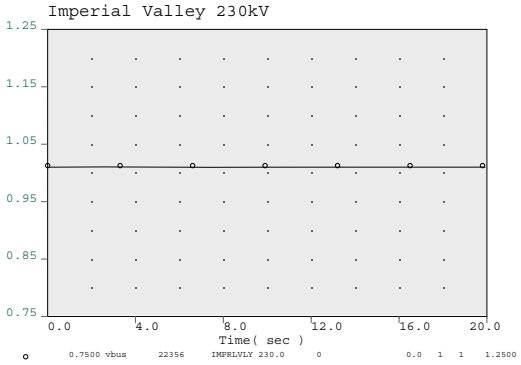
TJ1-230kV



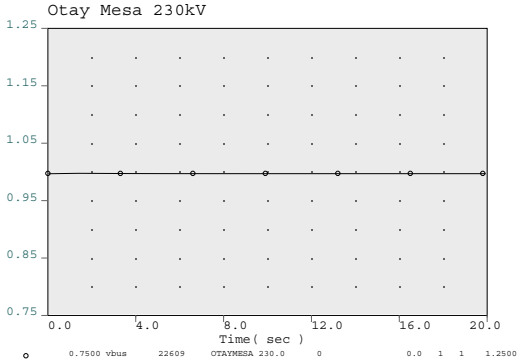
El Centro



Imperial Valley 230kV



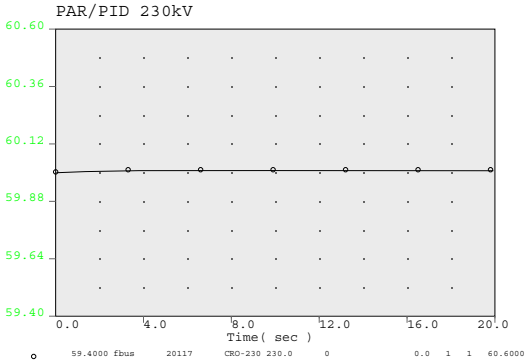
Otay Mesa 230kV



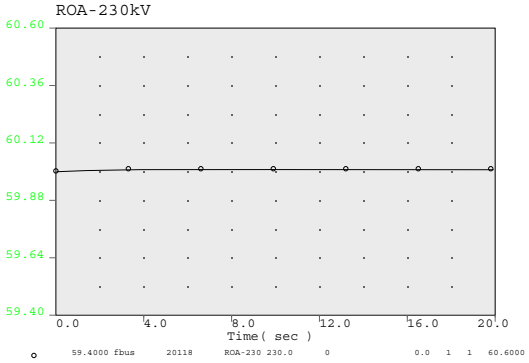
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Affected System Frequency Check and Comparison

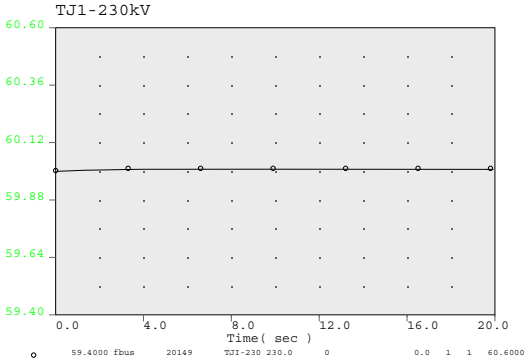
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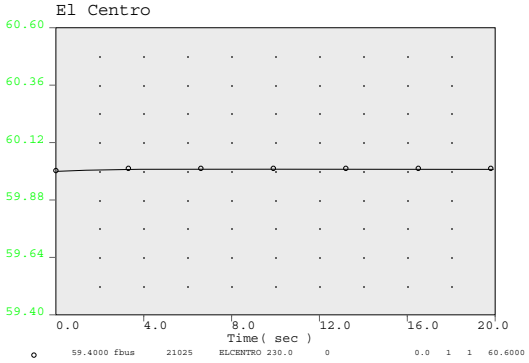
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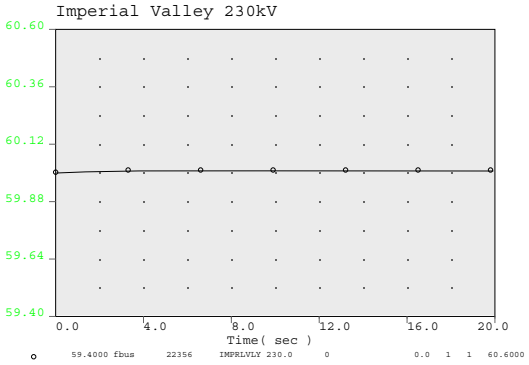
TJ1-230kV



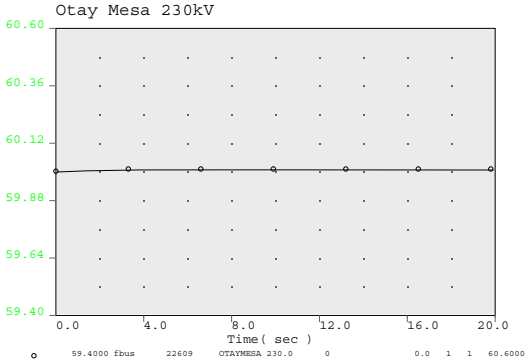
El Centro



Imperial Valley 230kV

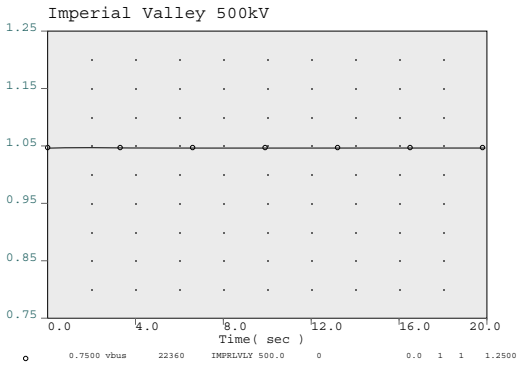


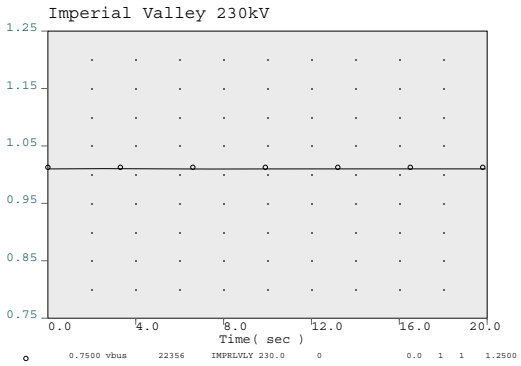
Otay Mesa 230kV

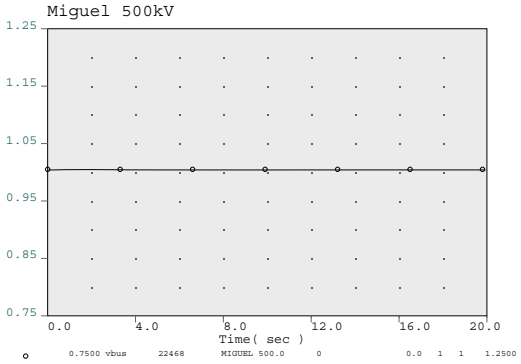


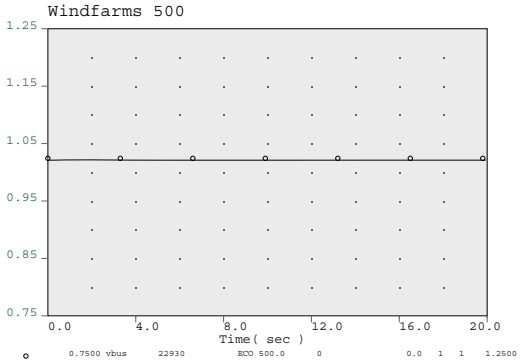
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

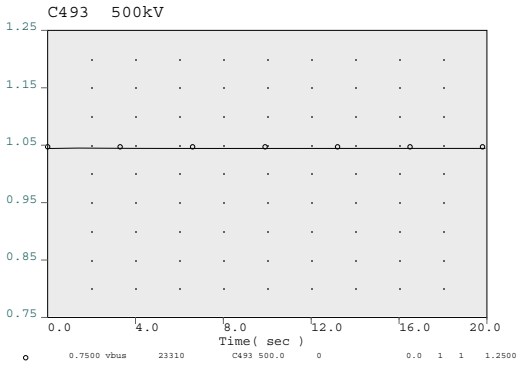
Imperial Valley Area - VOLTAGE

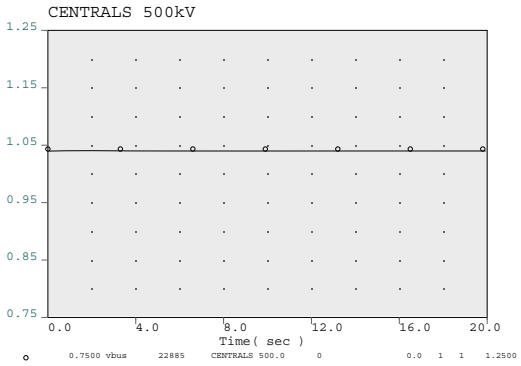












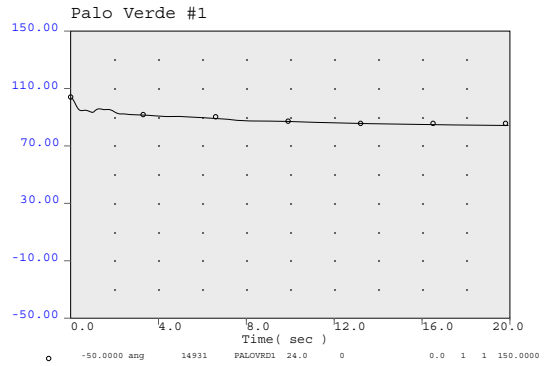
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

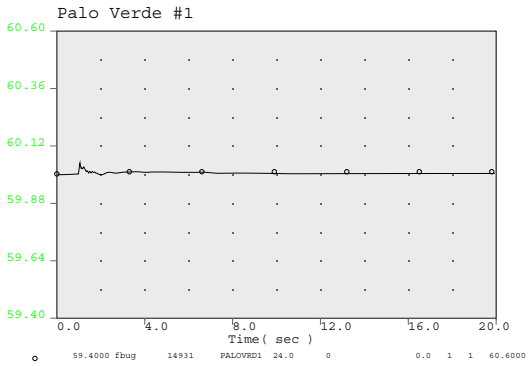
Imperial Valley Area - Frequency

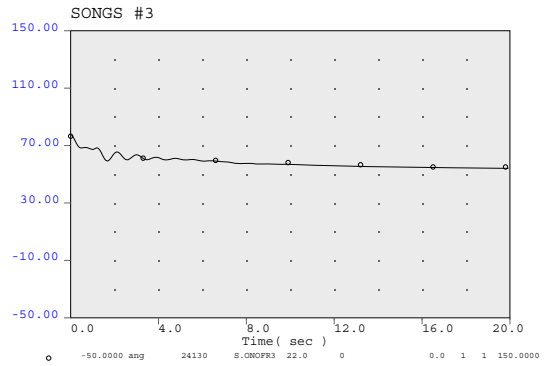


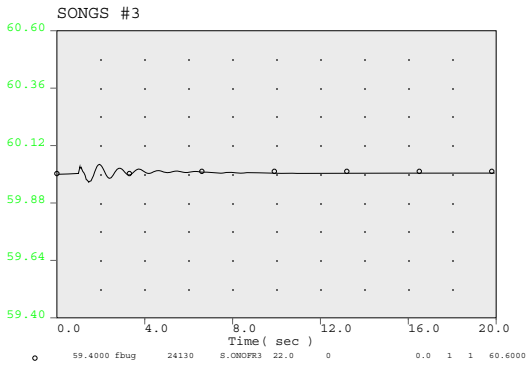
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

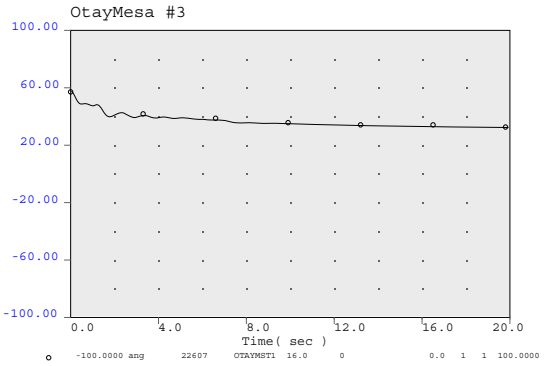
RELATIVE ROTOR ANGLE & FREQUENCY

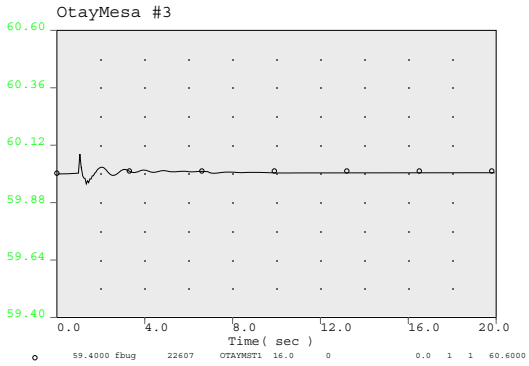








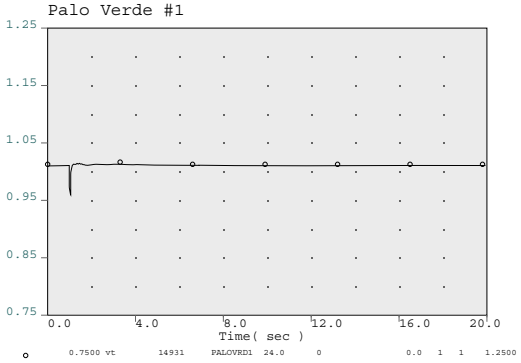




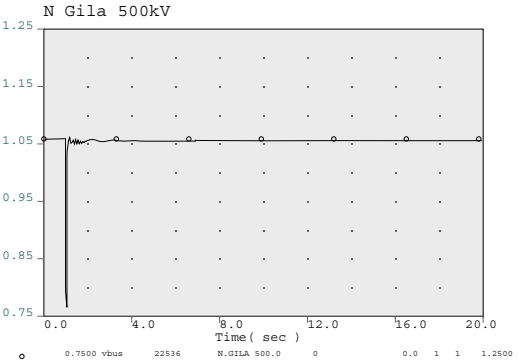
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

RELATIVE VOLTAGE

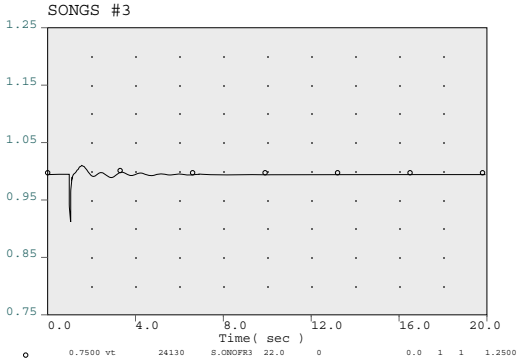
Palo Verde #1



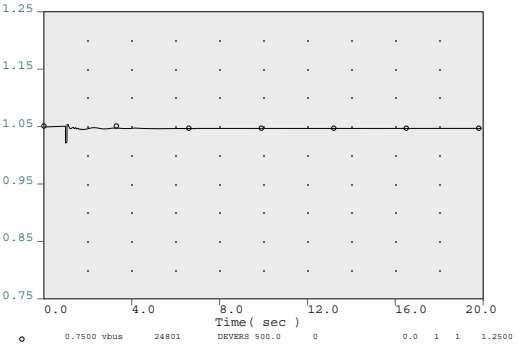
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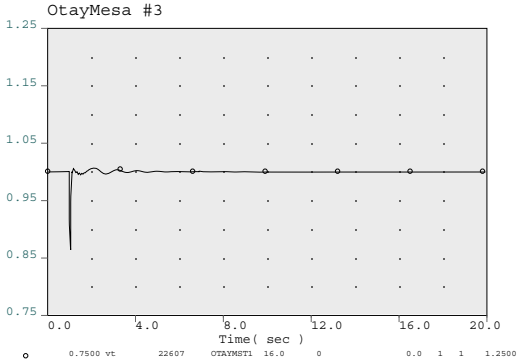
SONGS #3



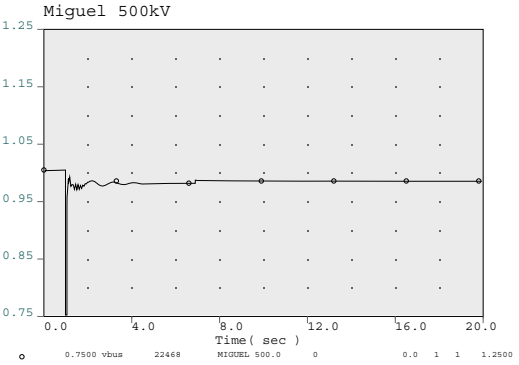
Devers 500



OtayMesa #3



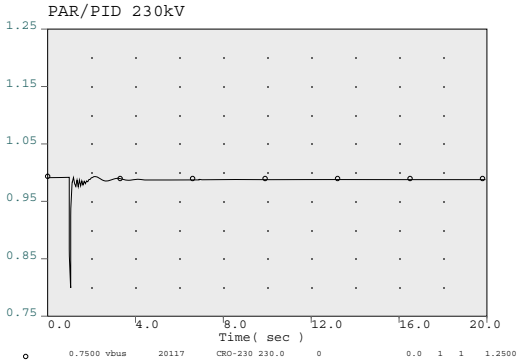
Miguel 500kV



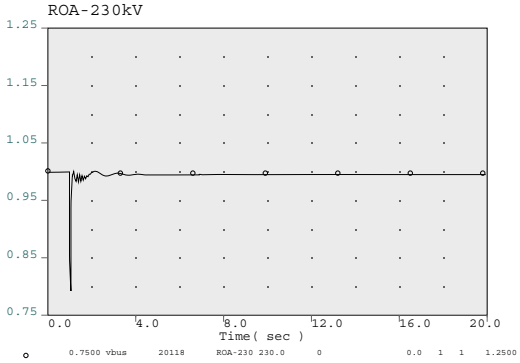
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

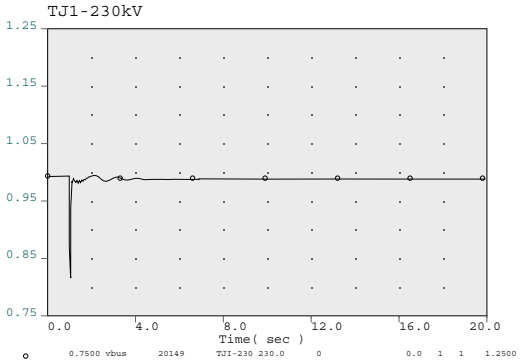
PAR/PID 230kV



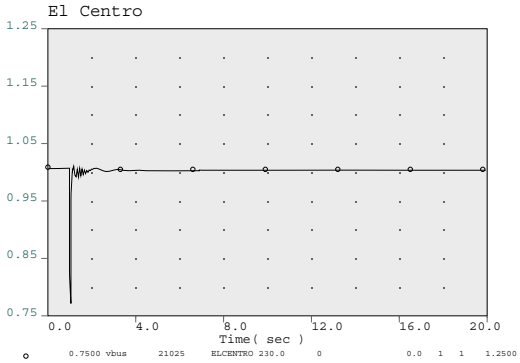
ROA-230kV



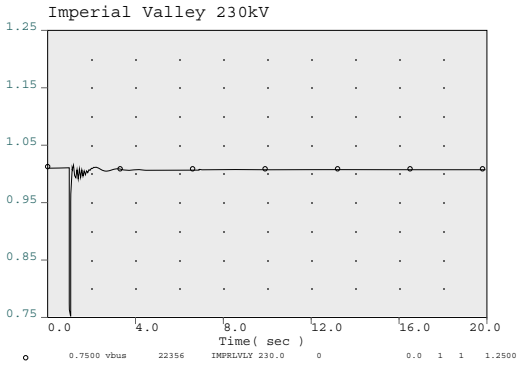
TJ1-230kV



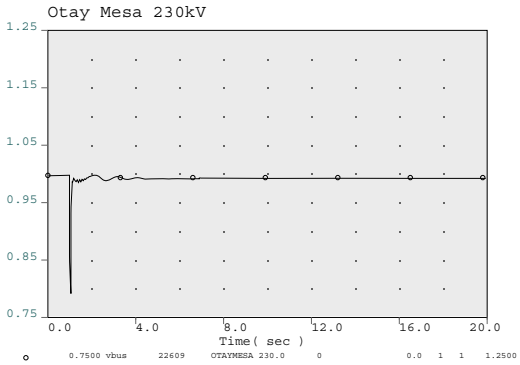
El Centro



Imperial Valley 230kV



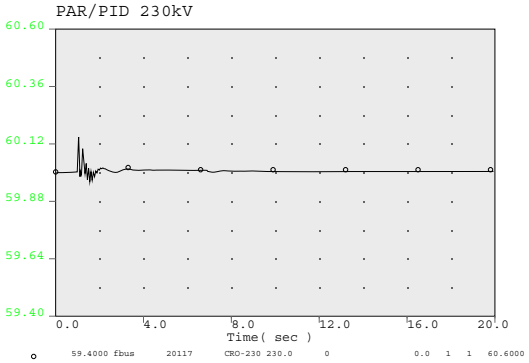
Otay Mesa 230kV



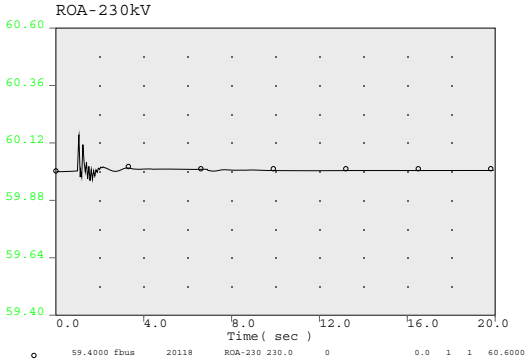
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Frequency Check and Comparison

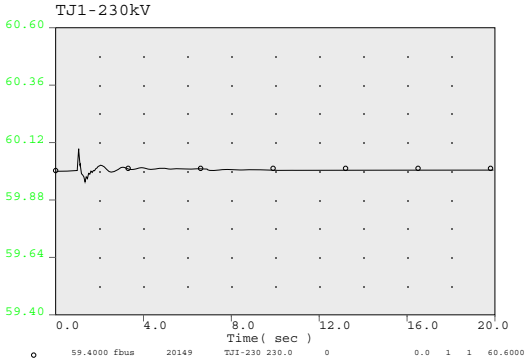
PAR/PID 230kV



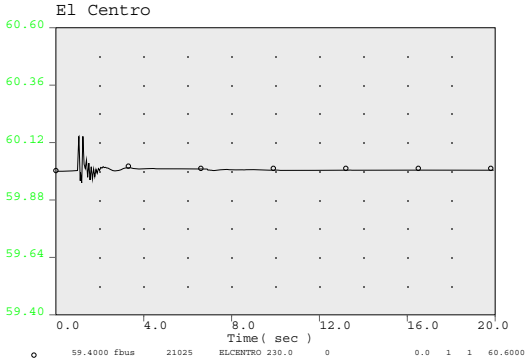
ROA-230kV



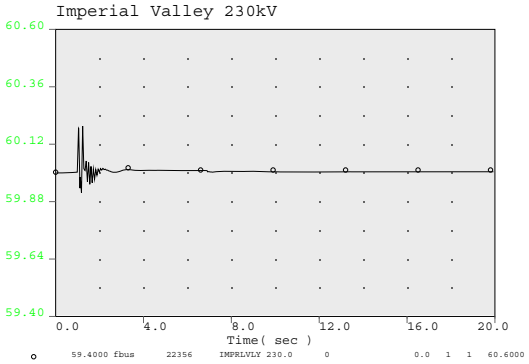
TJ1-230kV



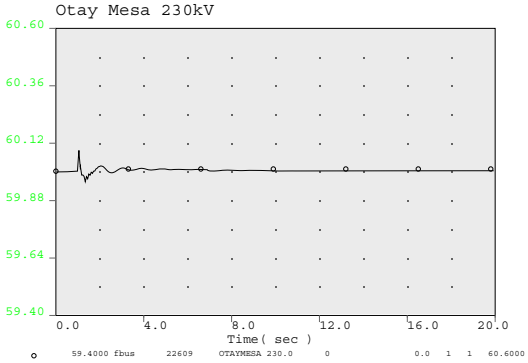
El Centro



Imperial Valley 230kV

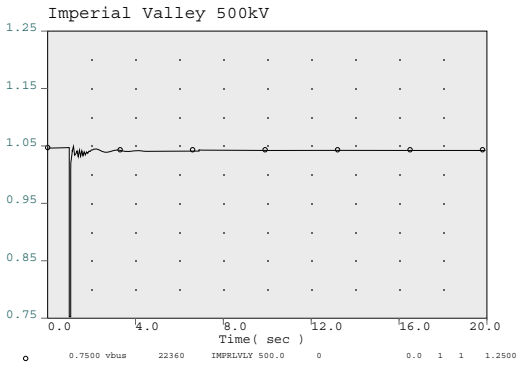


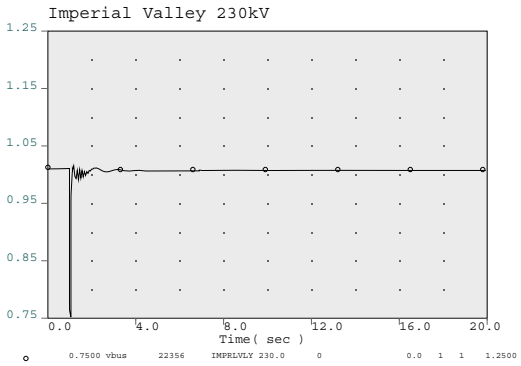
Otay Mesa 230kV

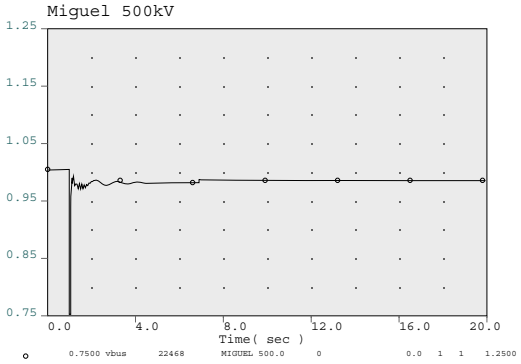


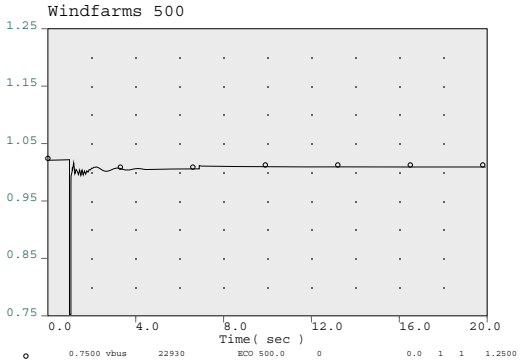
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

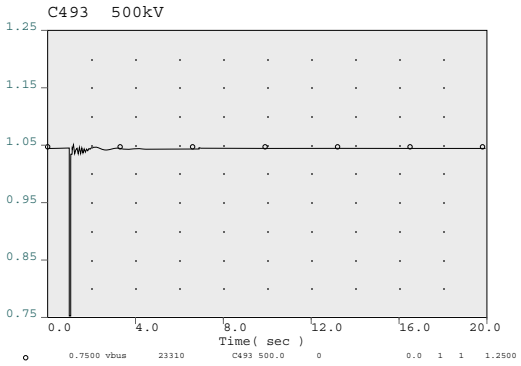
Imperial Valley Area - VOLTAGE

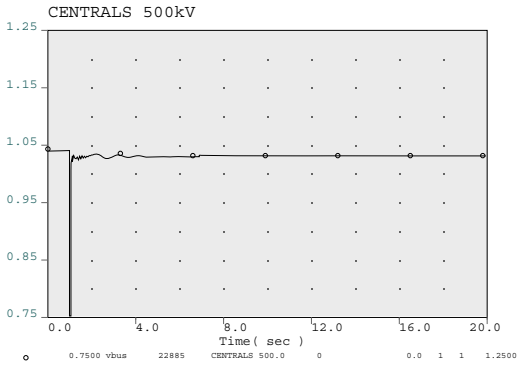






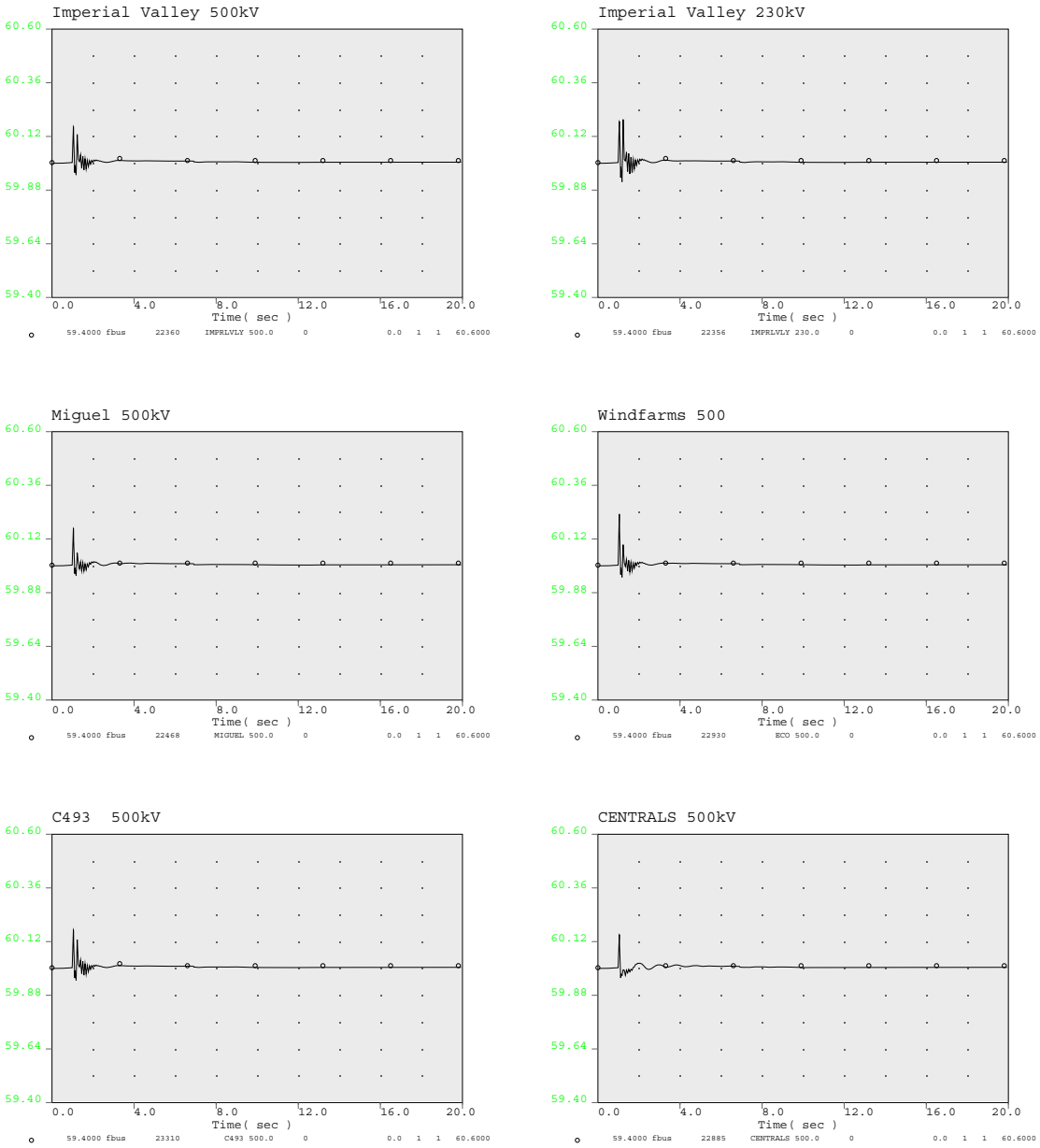






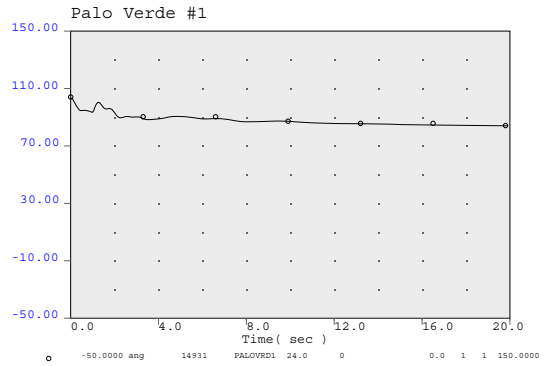
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

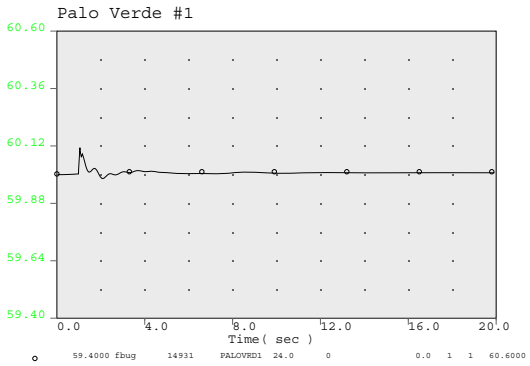
Imperial Valley Area - Frequency

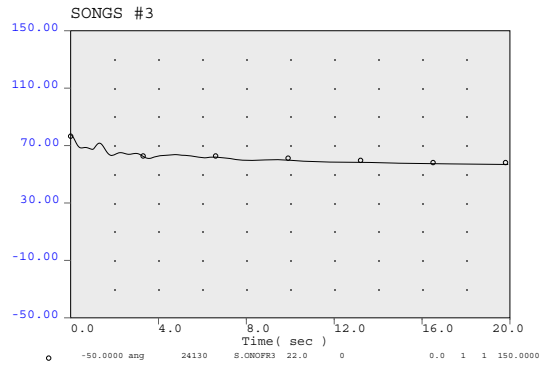


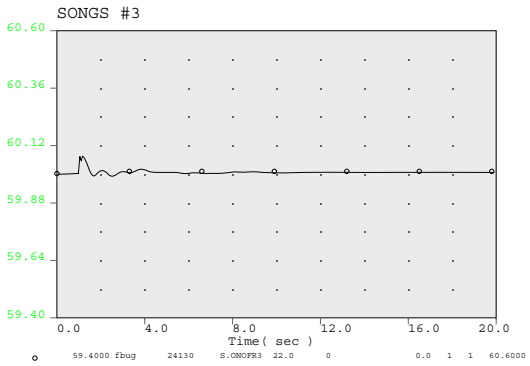
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

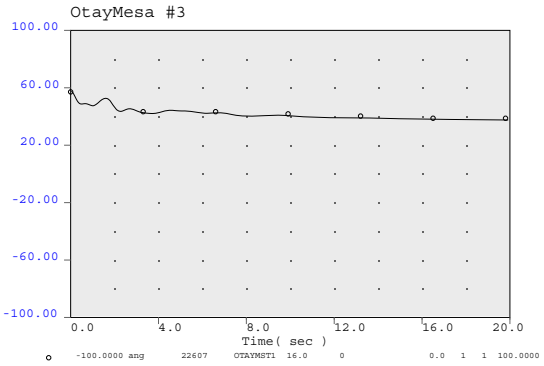
RELATIVE ROTOR ANGLE & FREQUENCY

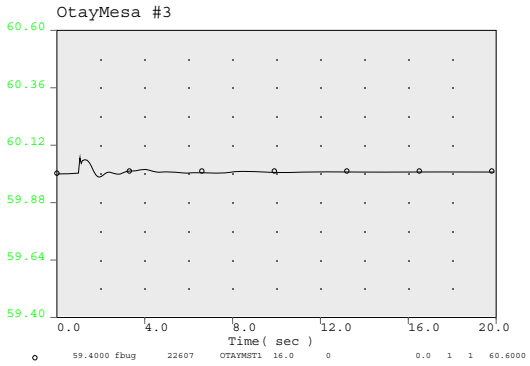










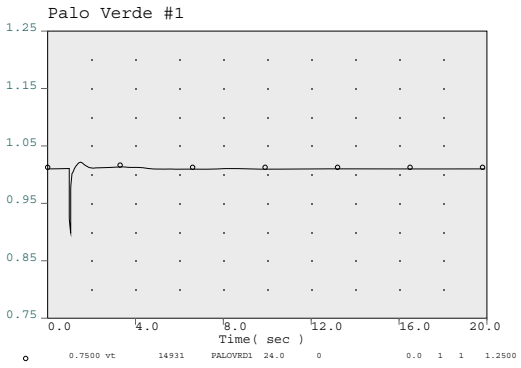


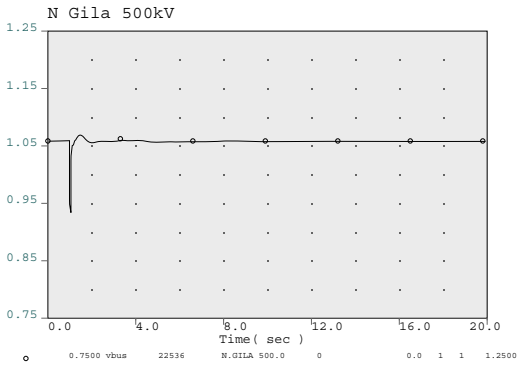
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

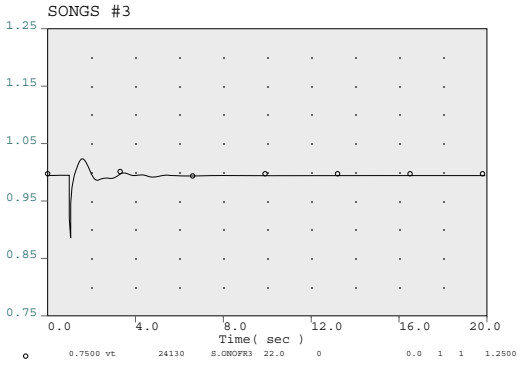
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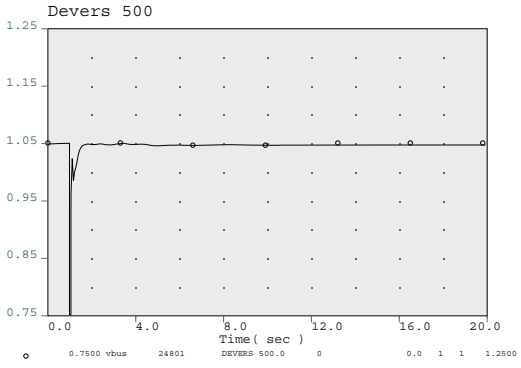
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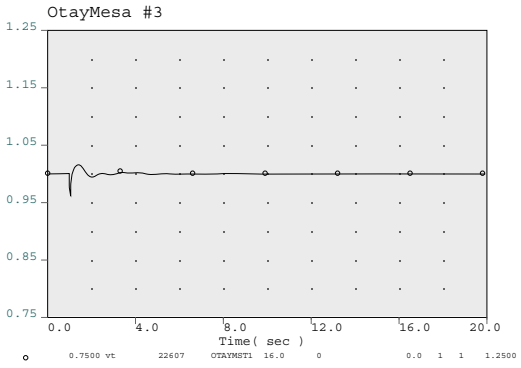
RELATIVE VOLTAGE

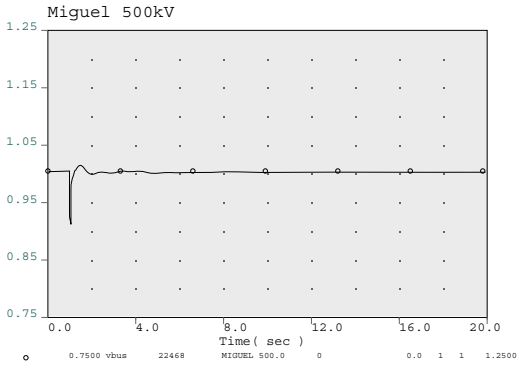








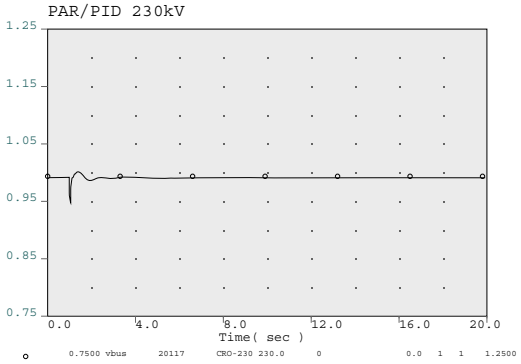




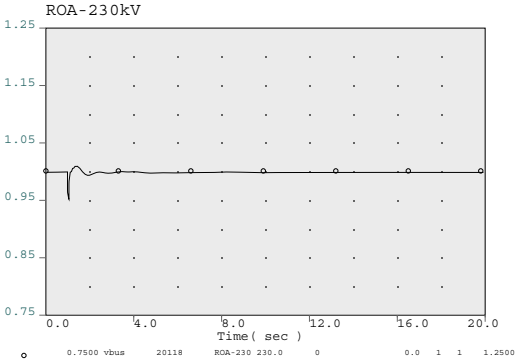
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Affected System Voltage Check and Comparison

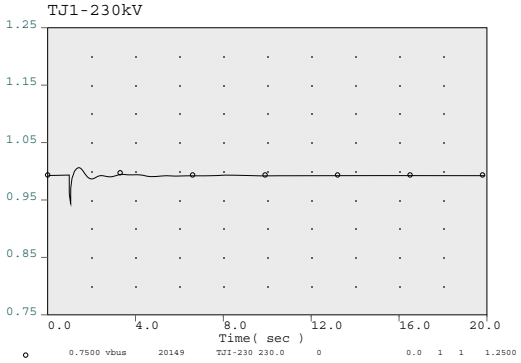
PAR/PID 230kV



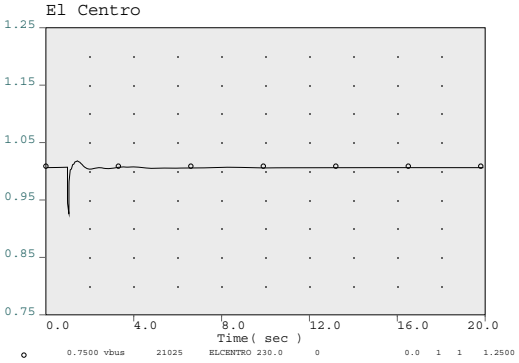
ROA-230kV



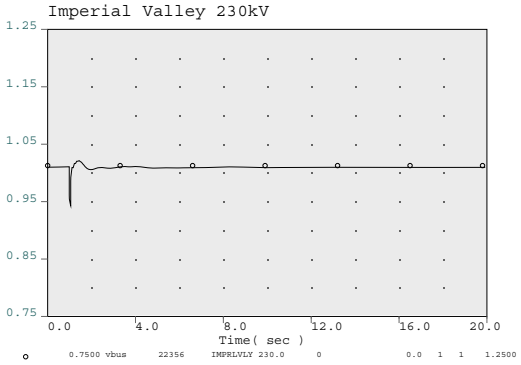
TJ1-230kV



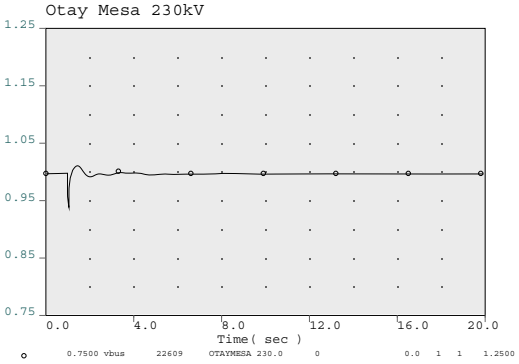
El Centro



Imperial Valley 230kV



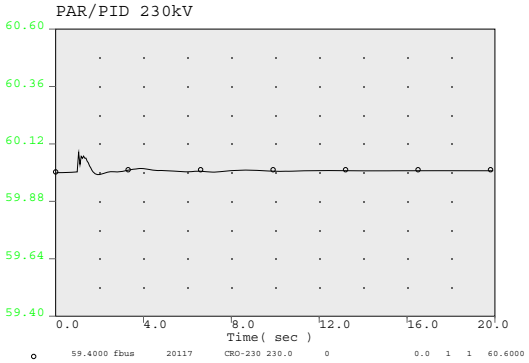
Otay Mesa 230kV



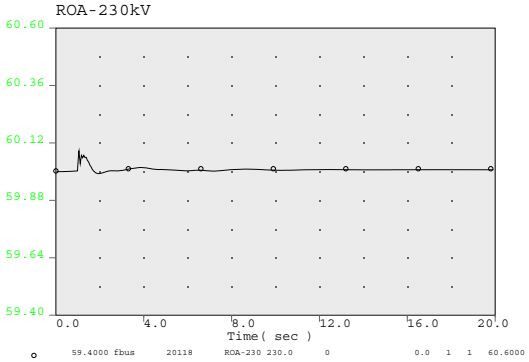
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Affected System Frequency Check and Comparison

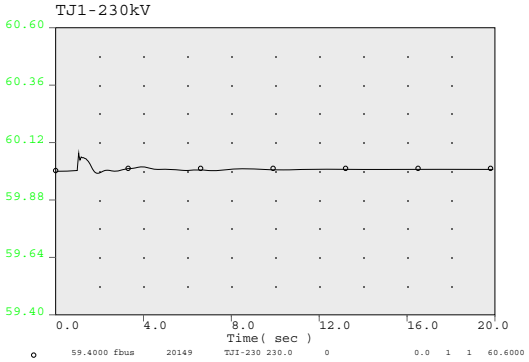
PAR/PID 230kV



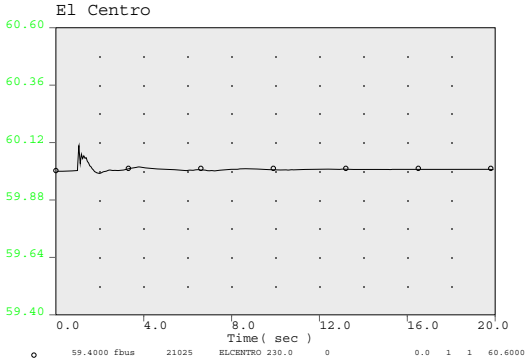
ROA-230kV



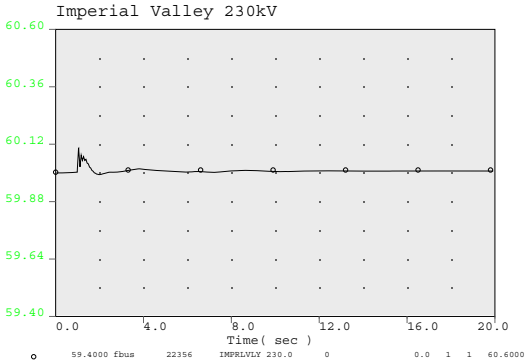
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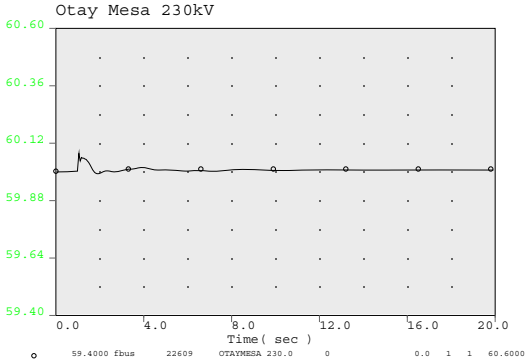
El Centro



Imperial Valley 230kV



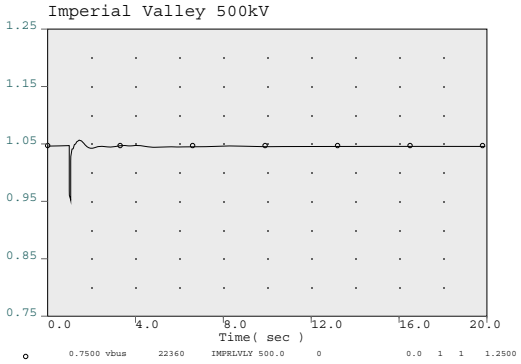
Otay Mesa 230kV



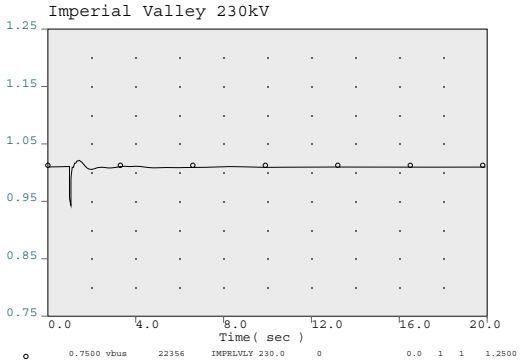
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Imperial Valley Area - VOLTAGE

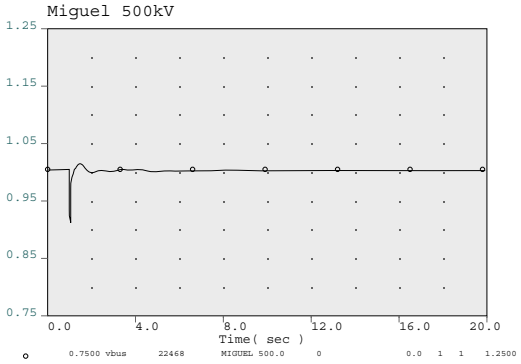
Imperial Valley 500kV



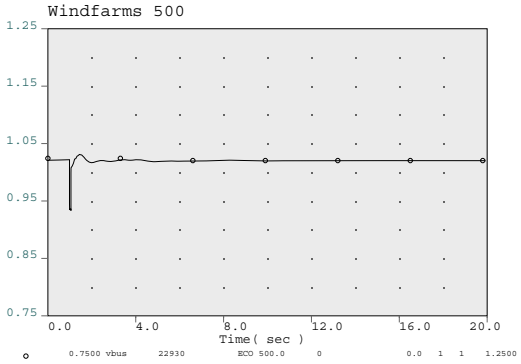
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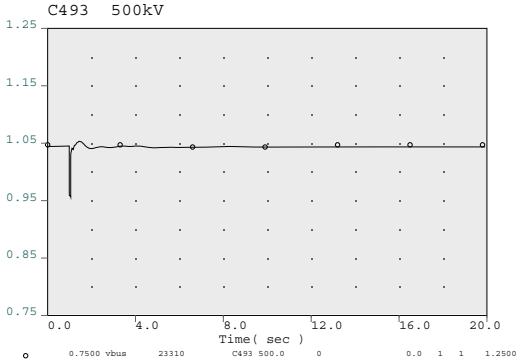
Miguel 500kV



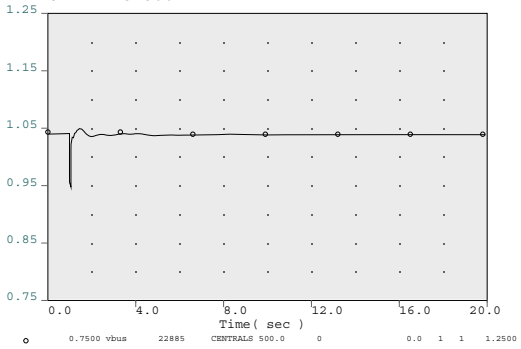
Windfarms 500



C493 500kV

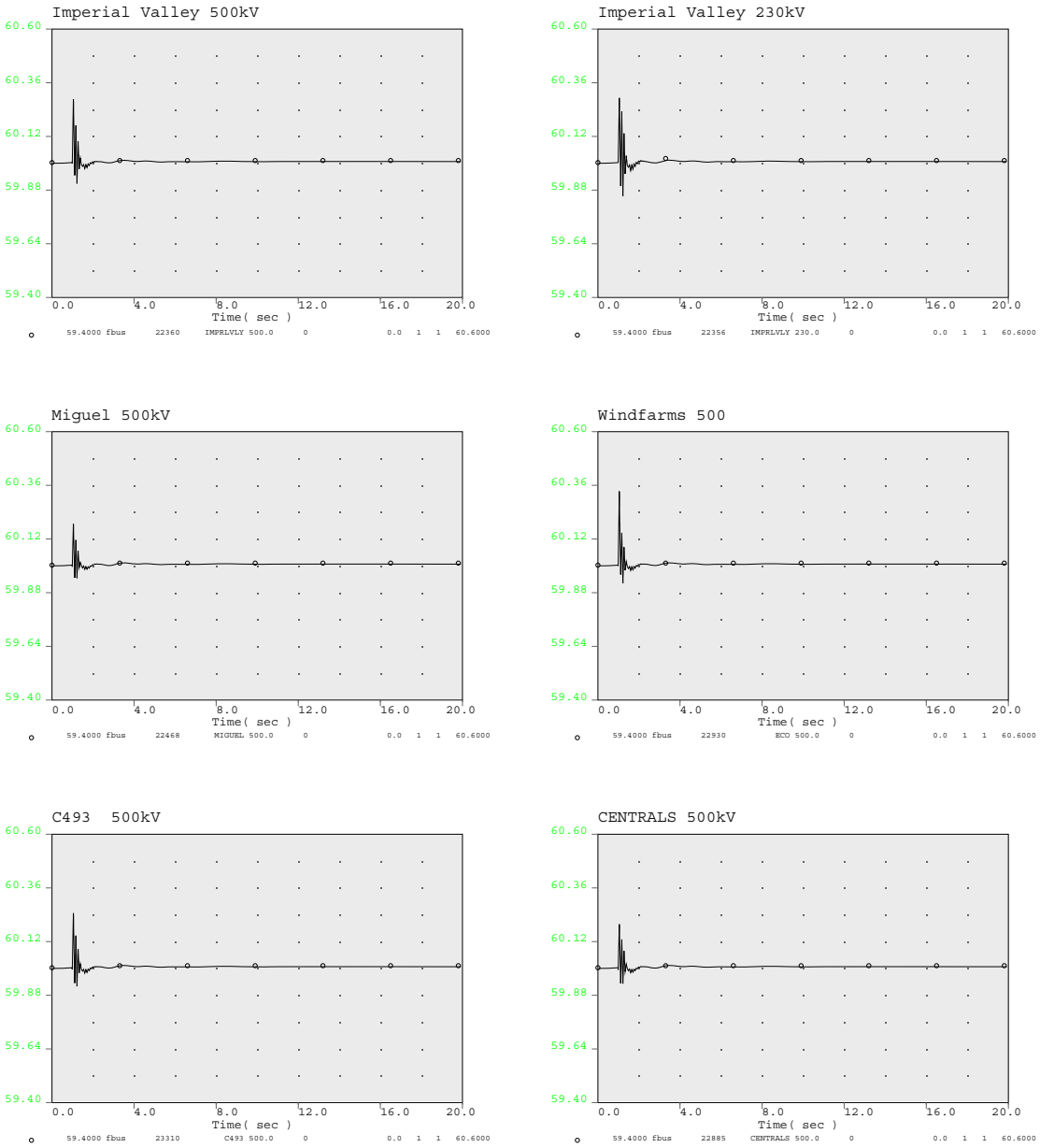


CENTRALS 500kV



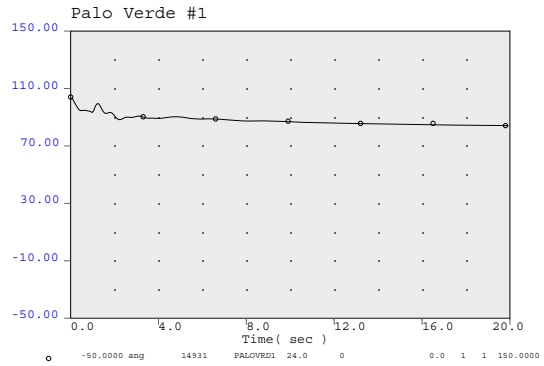
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

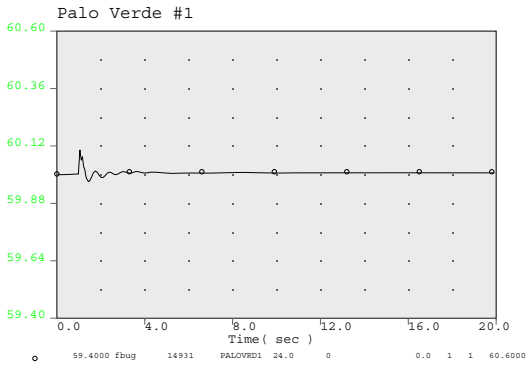
Imperial Valley Area - Frequency

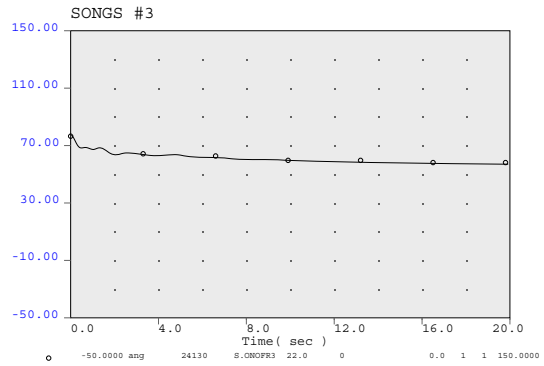


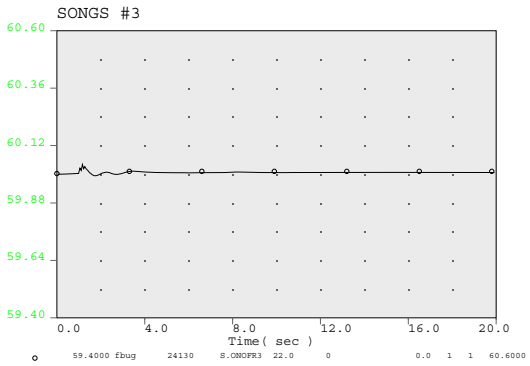
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

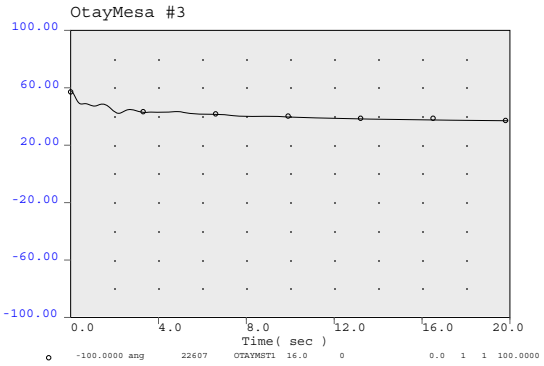
RELATIVE ROTOR ANGLE & FREQUENCY

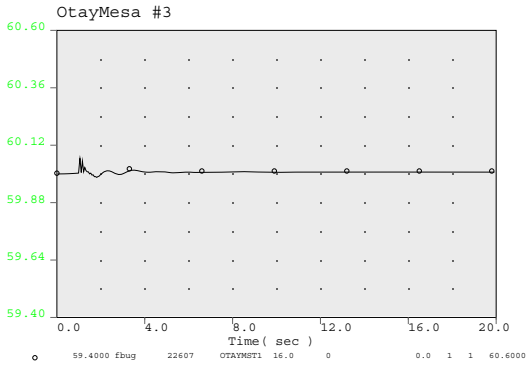












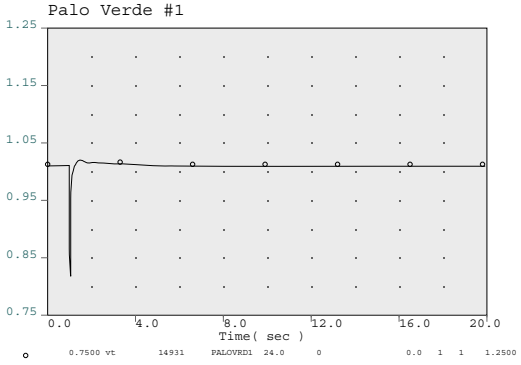
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Page 1

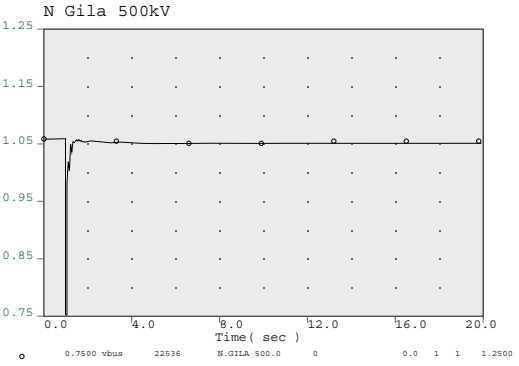
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RELATIVE VOLTAGE

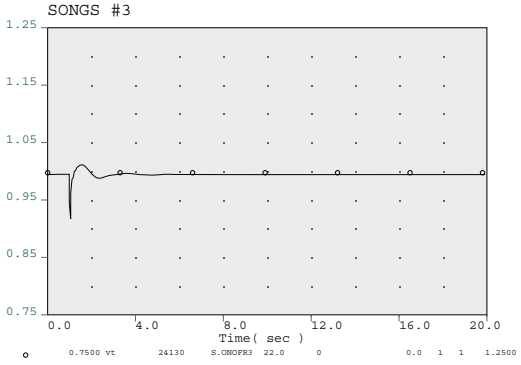
Palo Verde #1



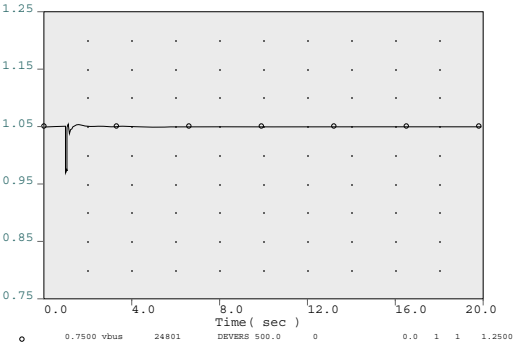
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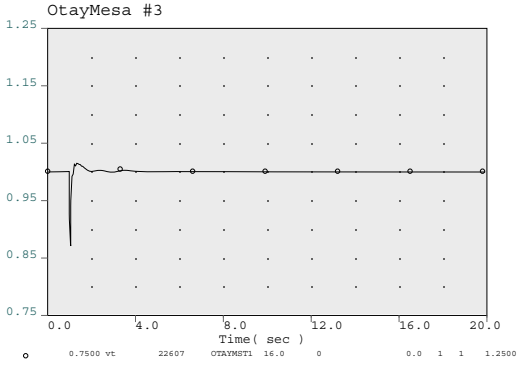
SONGS #3



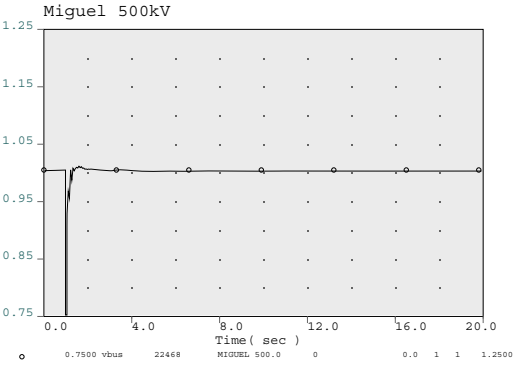
Devers 500



OtayMesa #3



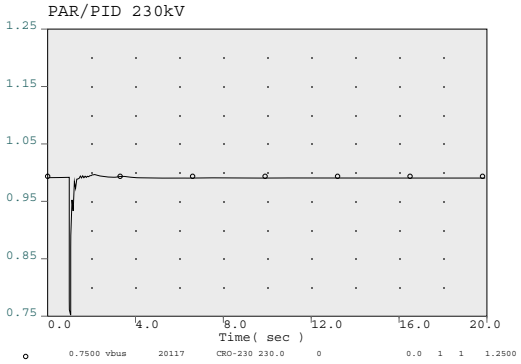
Miguel 500kV



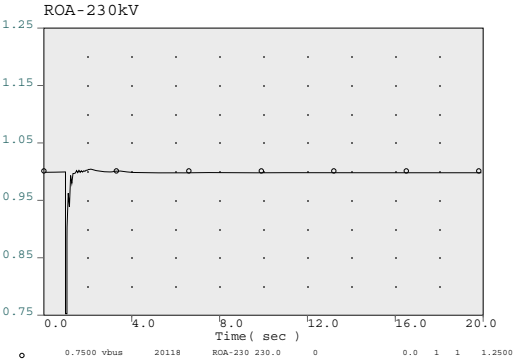
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

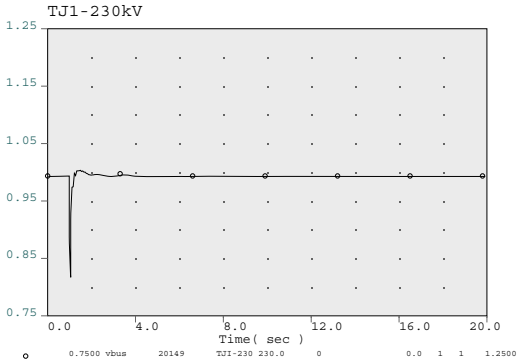
PAR/PID 230kV



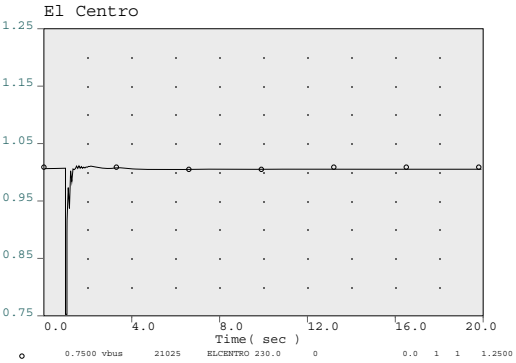
ROA-230kV



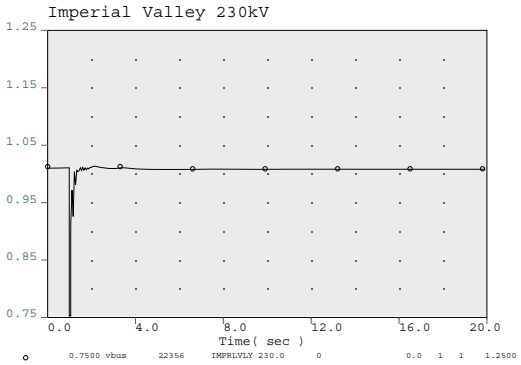
TJ1-230kV



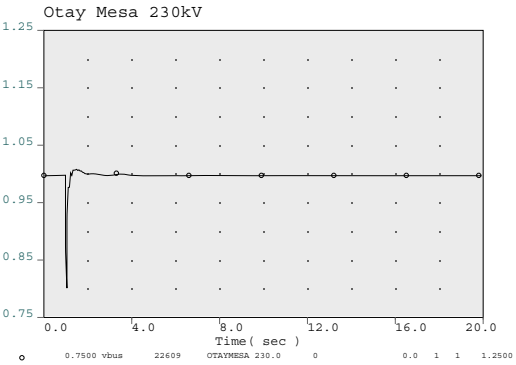
El Centro



Imperial Valley 230kV



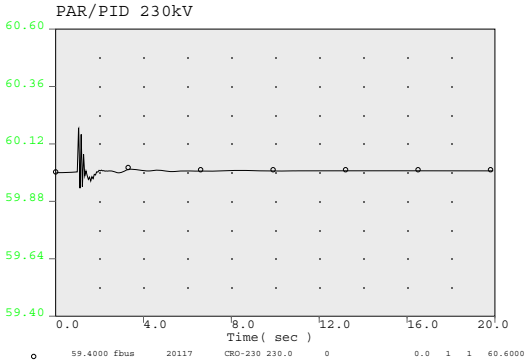
Otay Mesa 230kV



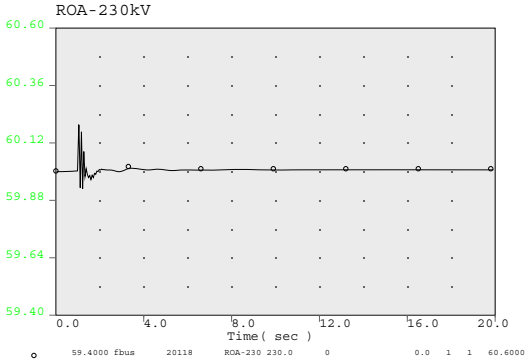
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Affected System Frequency Check and Comparison

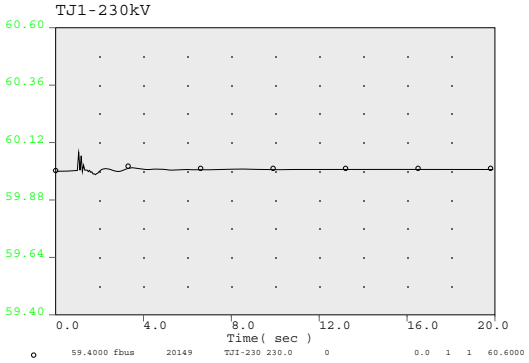
PAR/PID 230kV



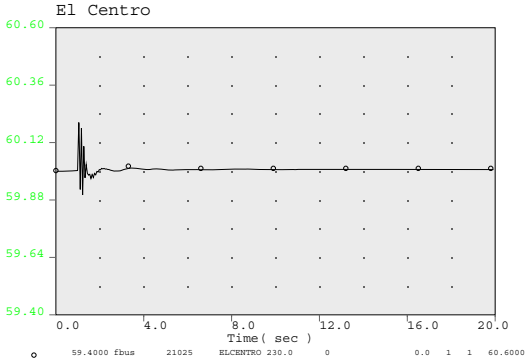
ROA-230kV



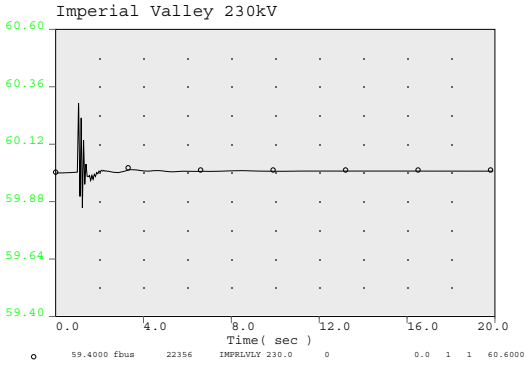
TJ1-230kV



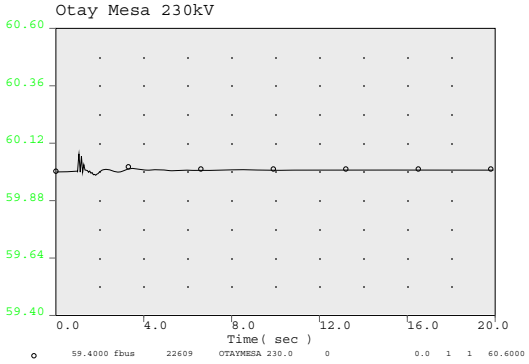
El Centro



Imperial Valley 230kV



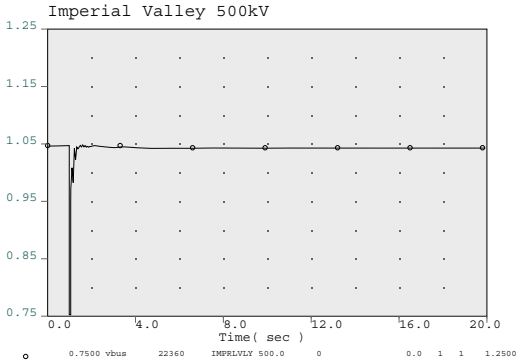
Otay Mesa 230kV



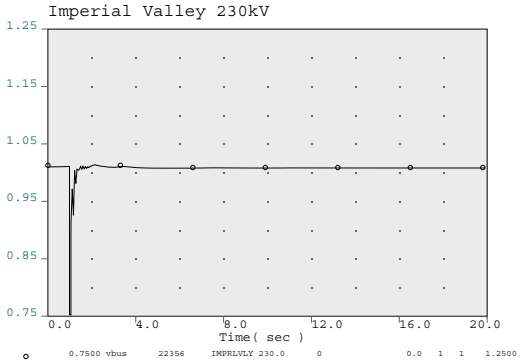
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

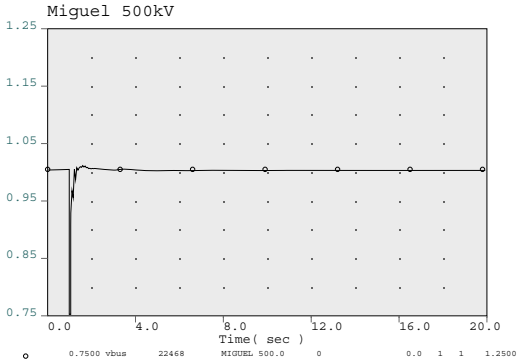
Imperial Valley 500kV



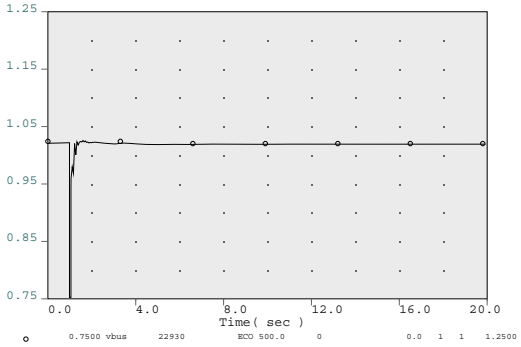
Imperial Valley 230kV



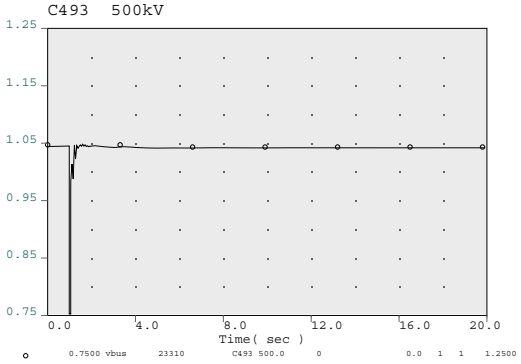
Miguel 500kV



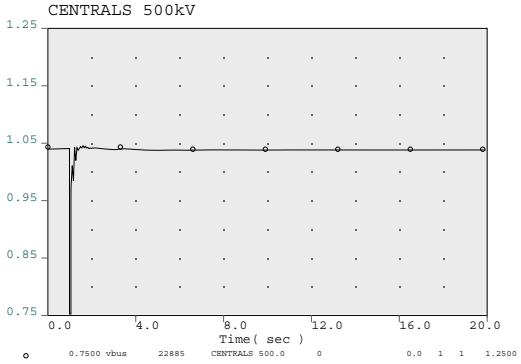
Windfarms 500



C493 500kV

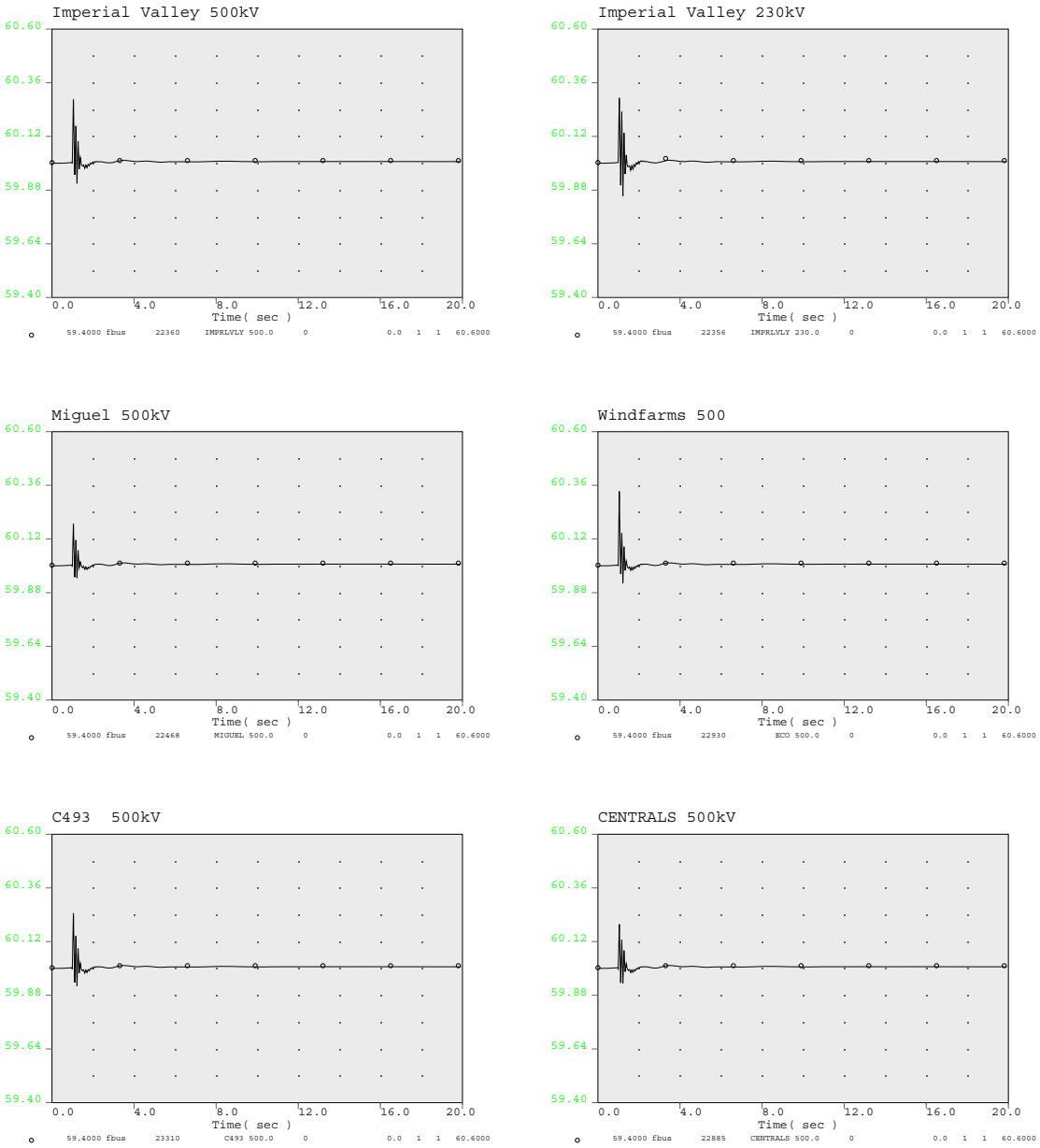


CENTRALS 500kV



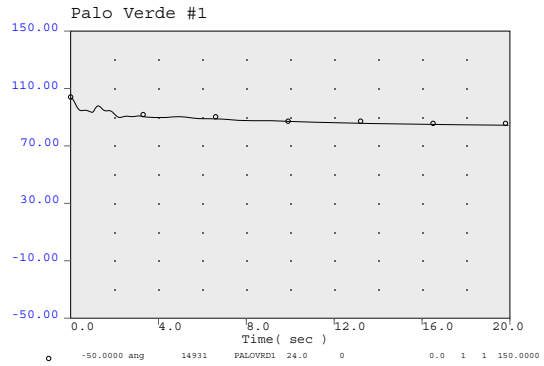
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

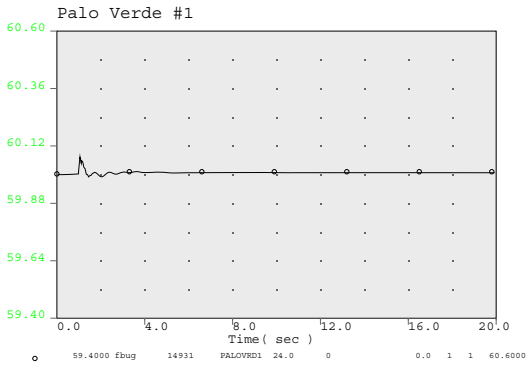
Imperial Valley Area - Frequency

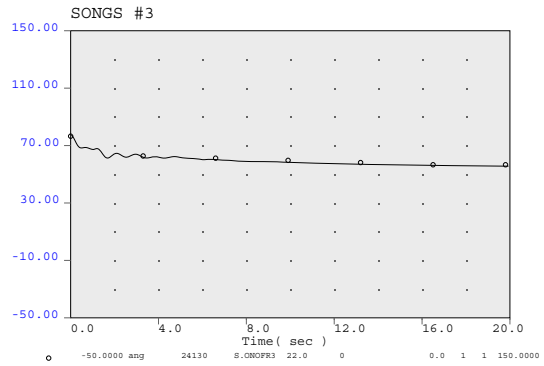


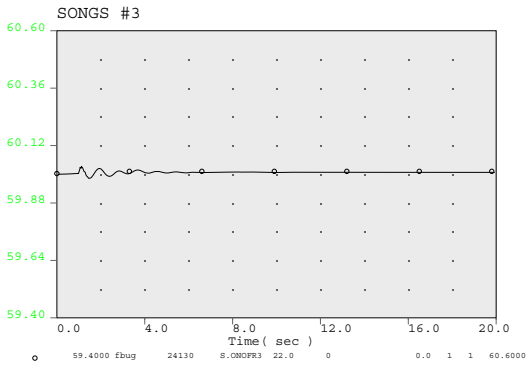
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

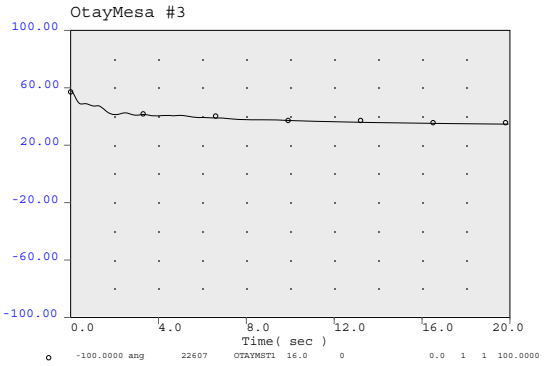
RELATIVE ROTOR ANGLE & FREQUENCY

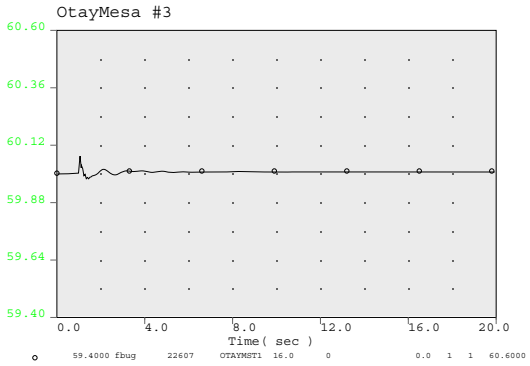












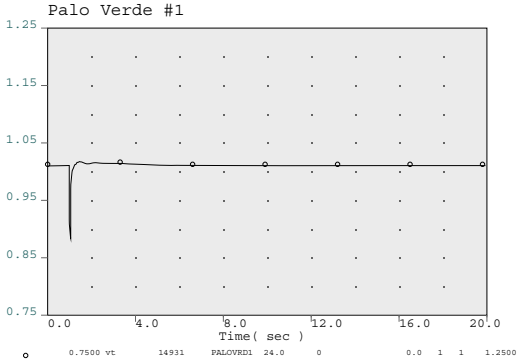
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Page 1

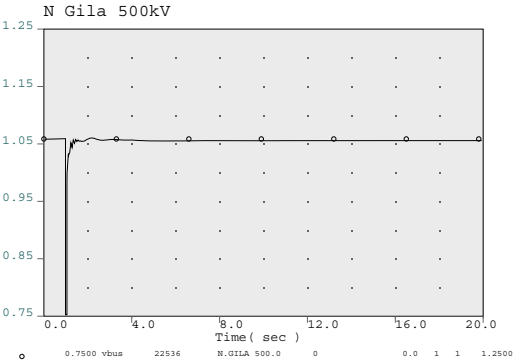
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RELATIVE VOLTAGE

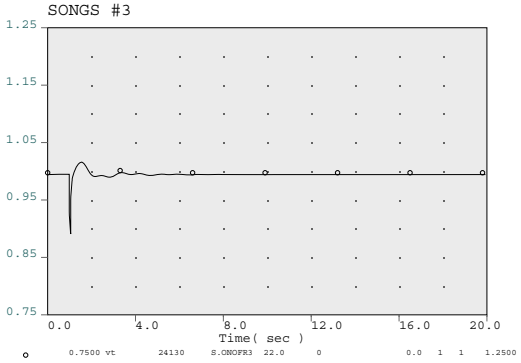
Palo Verde #1



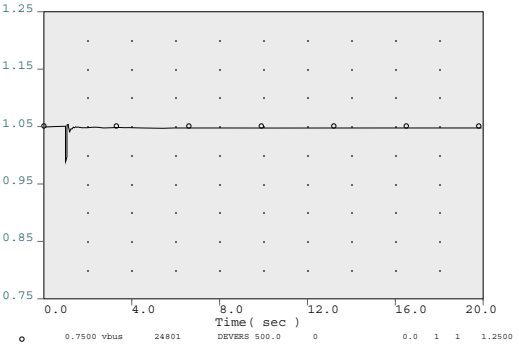
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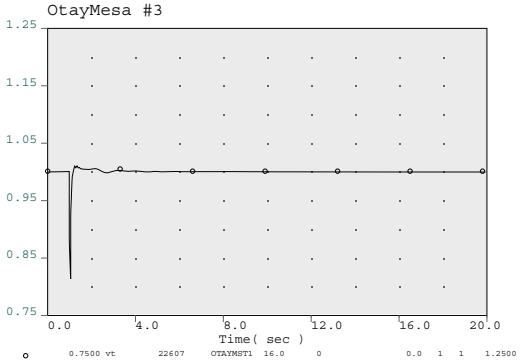
SONGS #3



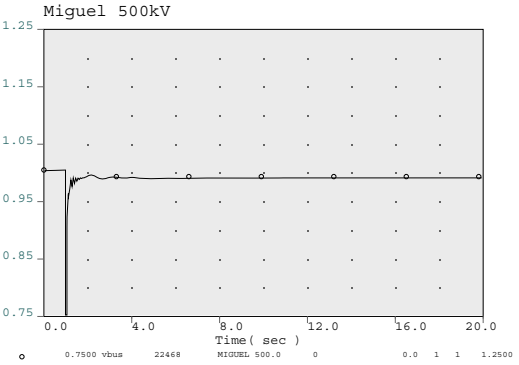
Devers 500



OtayMesa #3



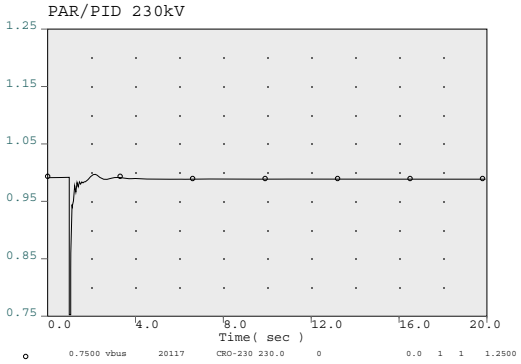
Miguel 500kV



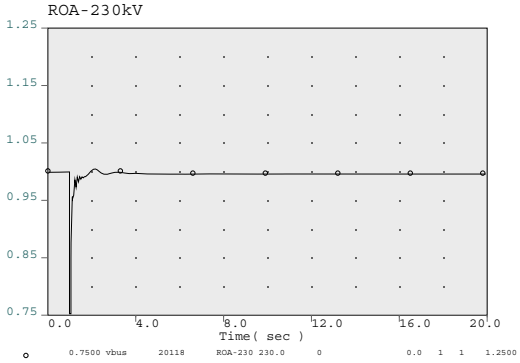
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

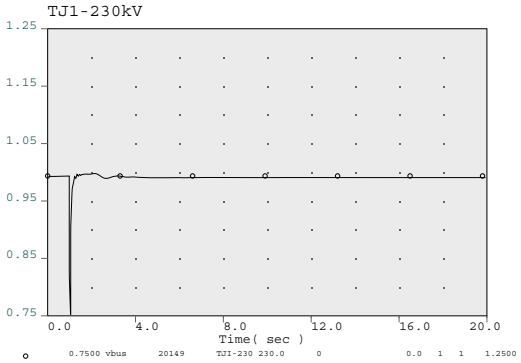
PAR/PID 230kV



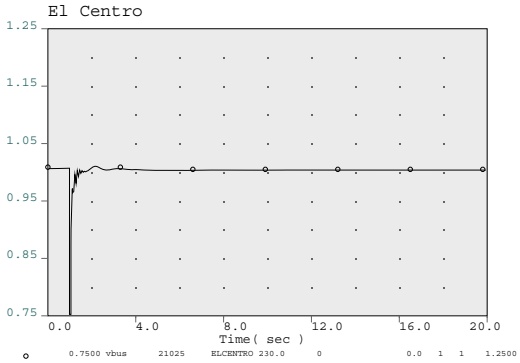
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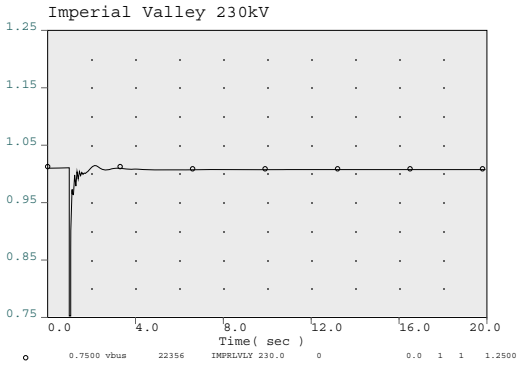
TJ1-230kV



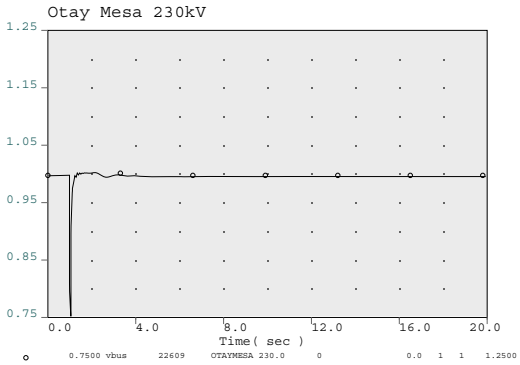
El Centro



Imperial Valley 230kV



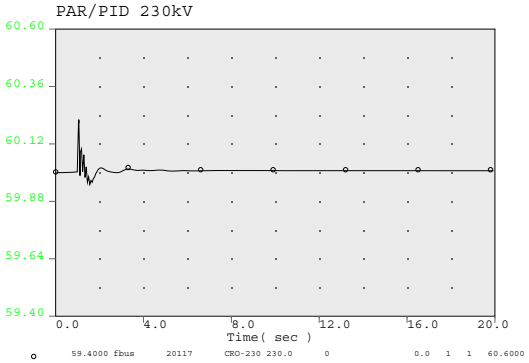
Otay Mesa 230kV



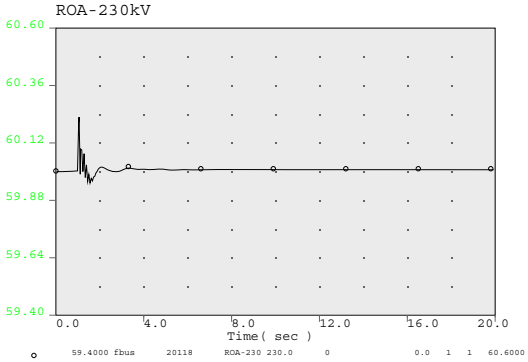
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

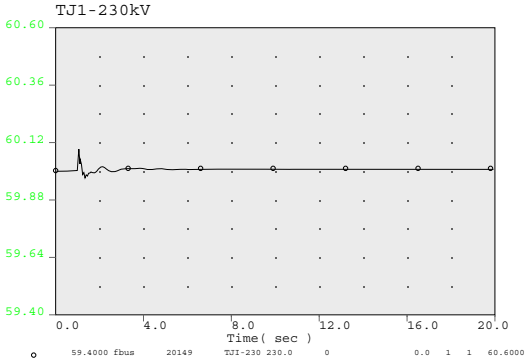
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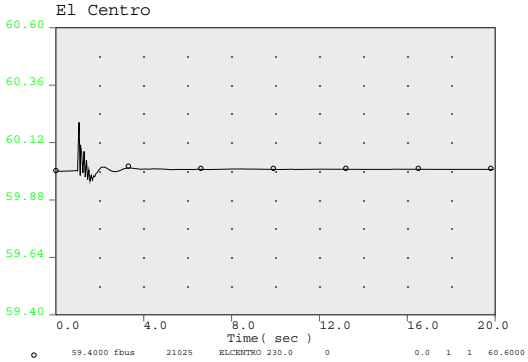
ROA-230kV



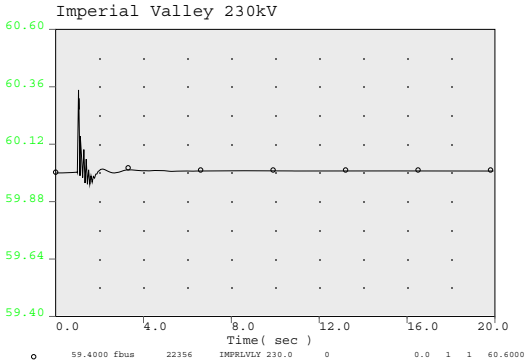
TJ1-230kV



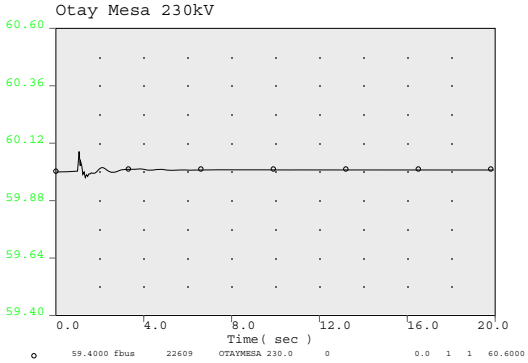
El Centro



Imperial Valley 230kV



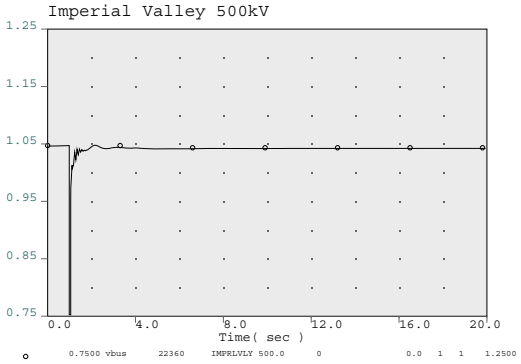
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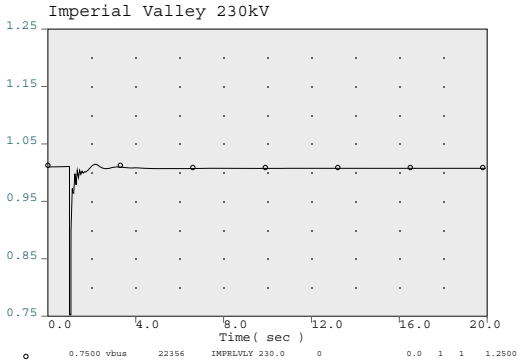
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Imperial Valley Area - VOLTAGE

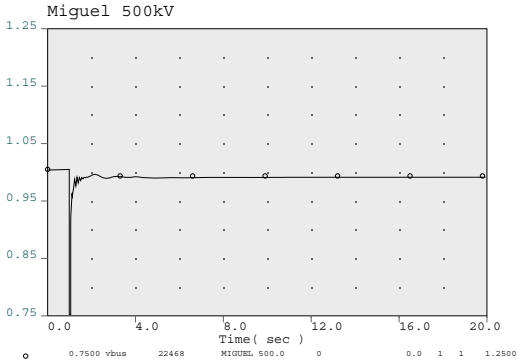
Imperial Valley 500kV



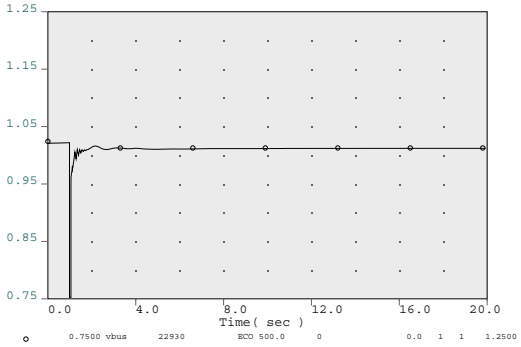
Imperial Valley 230kV



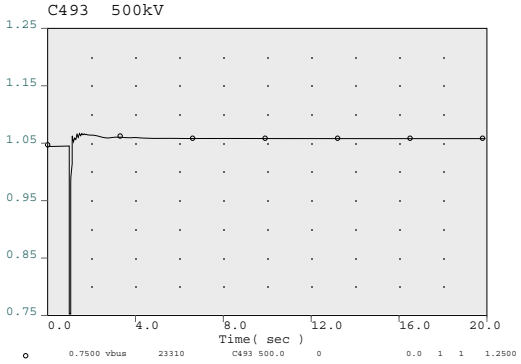
Miguel 500kV



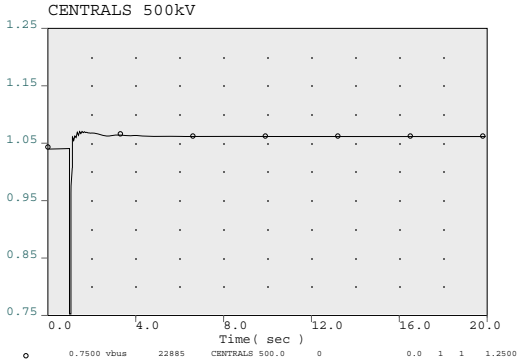
Windfarms 500



C493 500kV

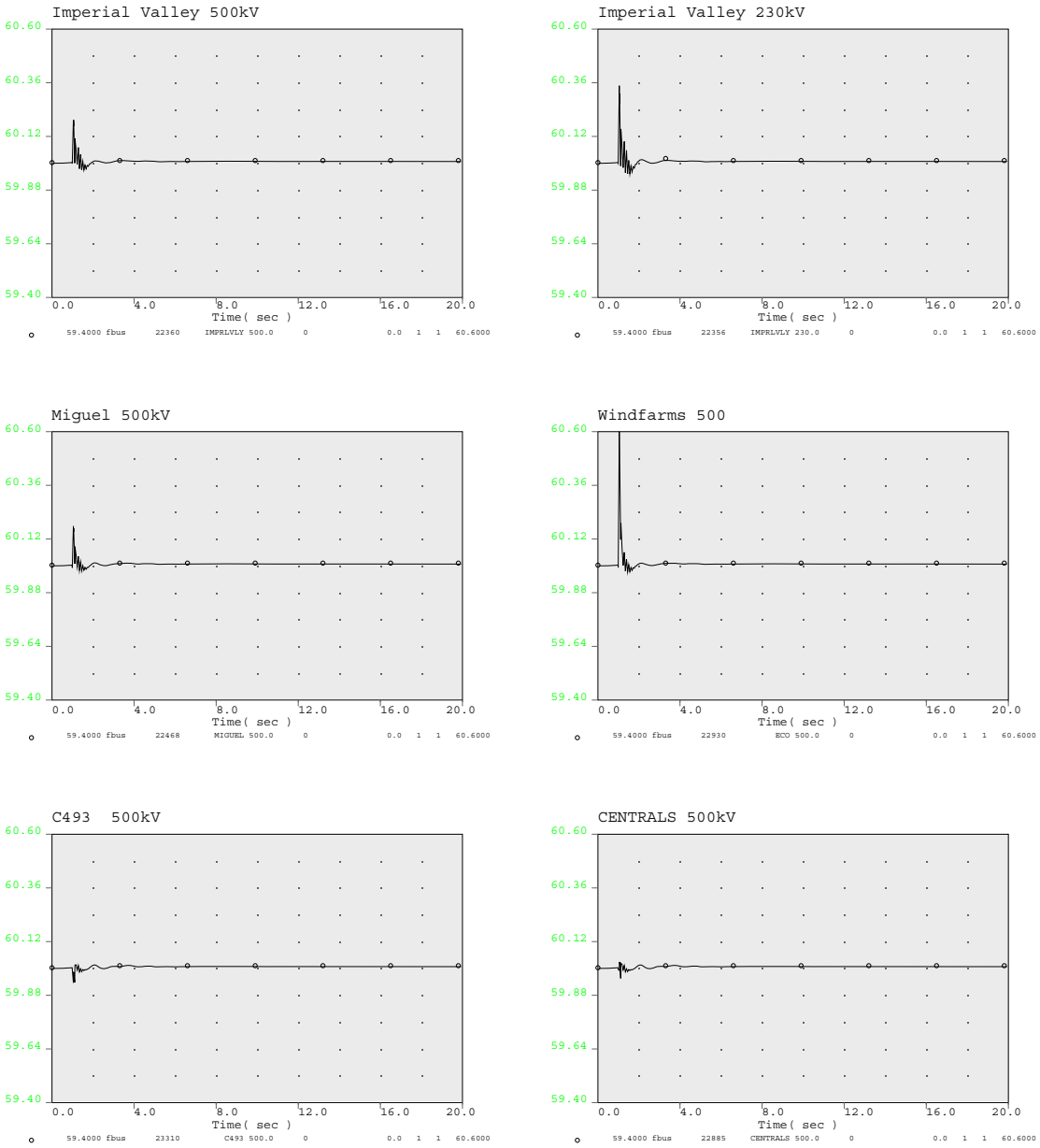


CENTRALS 500kV



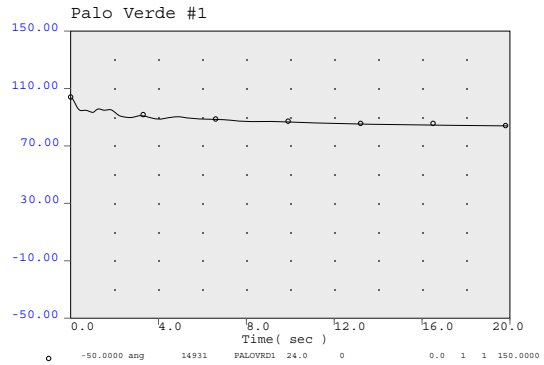
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

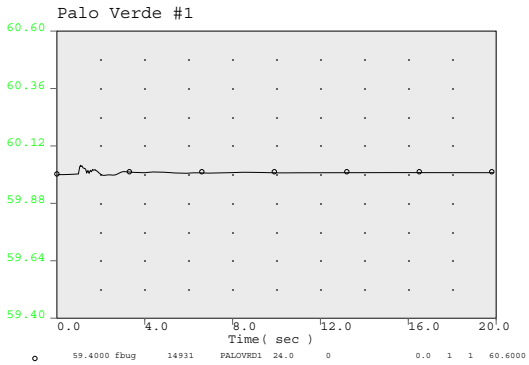
Imperial Valley Area - Frequency

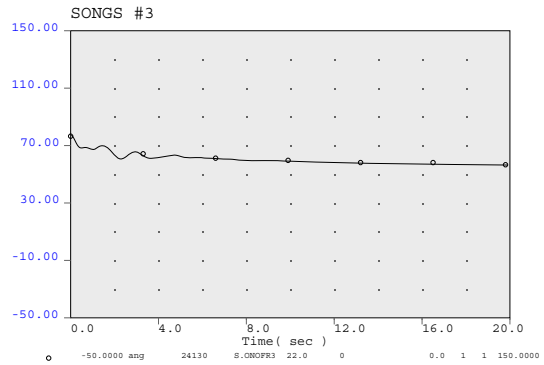


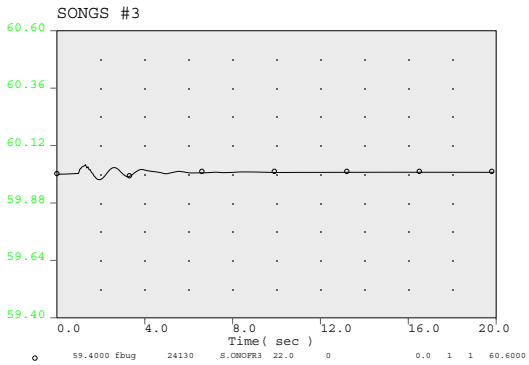
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

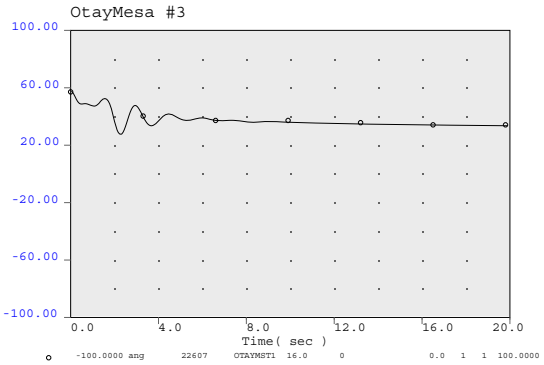
RELATIVE ROTOR ANGLE & FREQUENCY

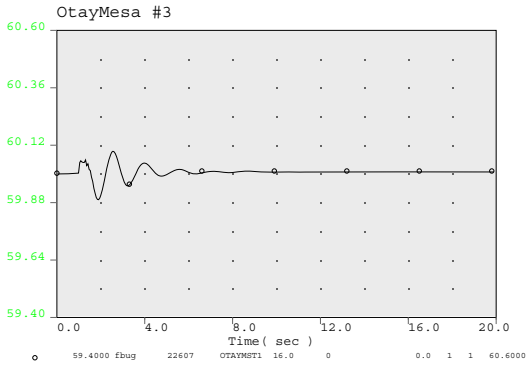










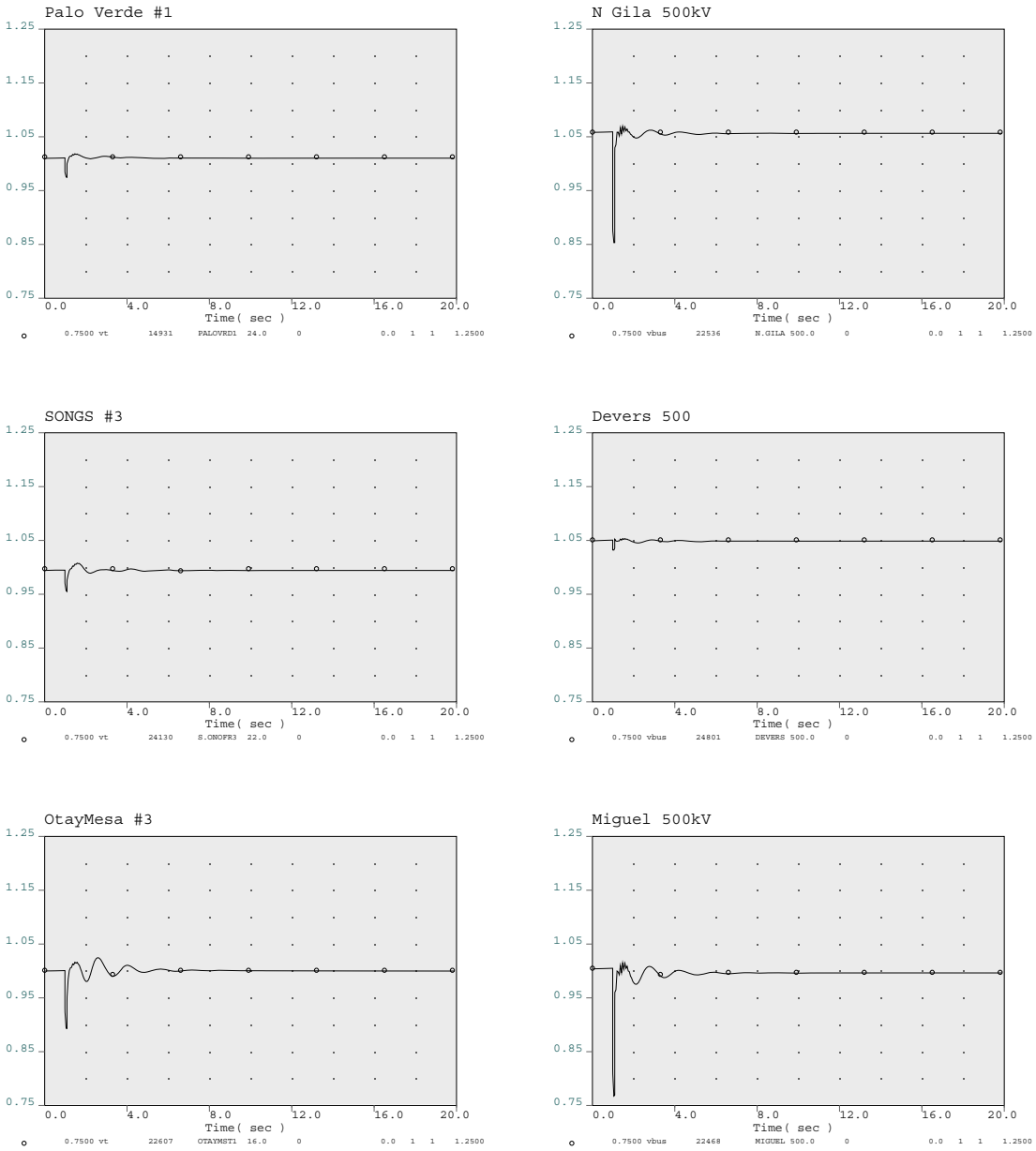


SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Page 1

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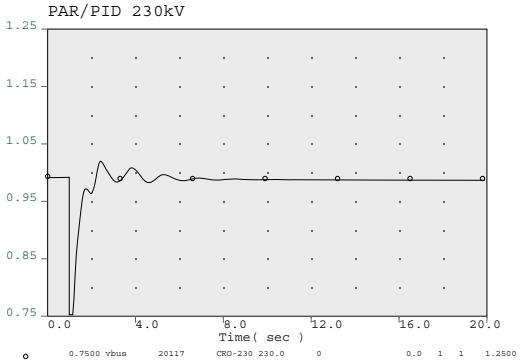
RELATIVE VOLTAGE



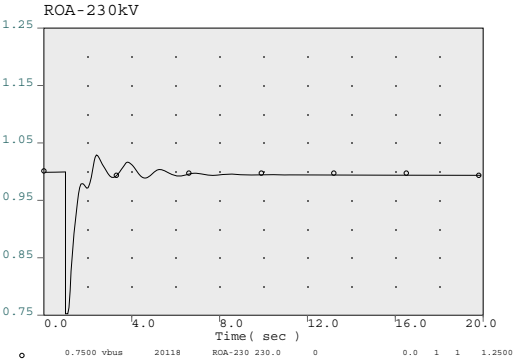
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

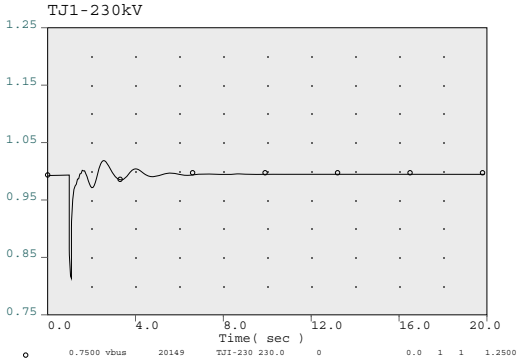
PAR/PID 230kV



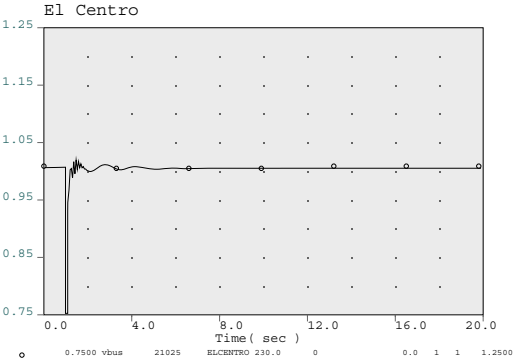
ROA-230kV



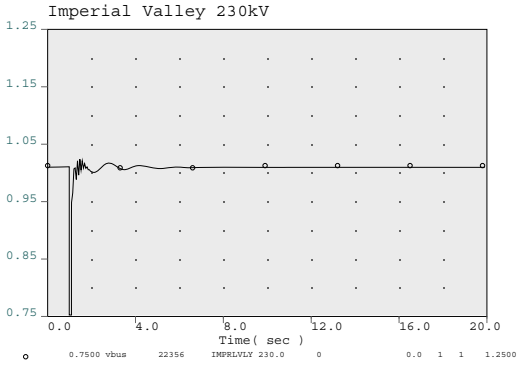
TJ1-230kV



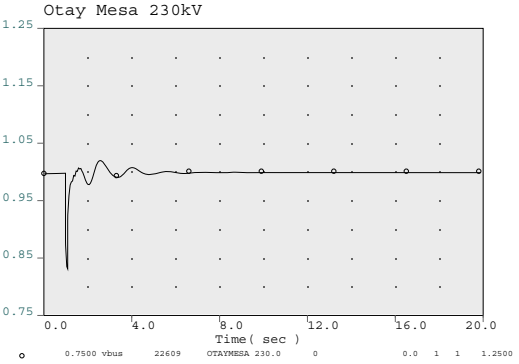
El Centro



Imperial Valley 230kV



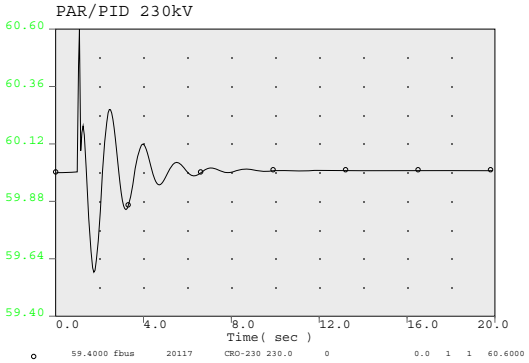
Otay Mesa 230kV



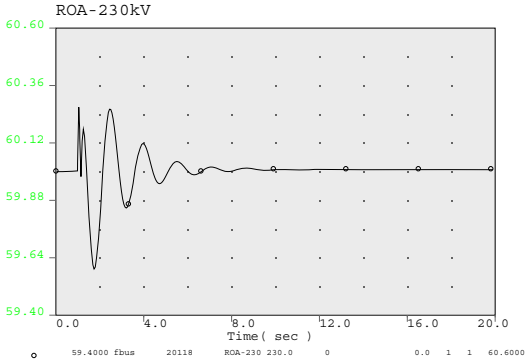
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Frequency Check and Comparison

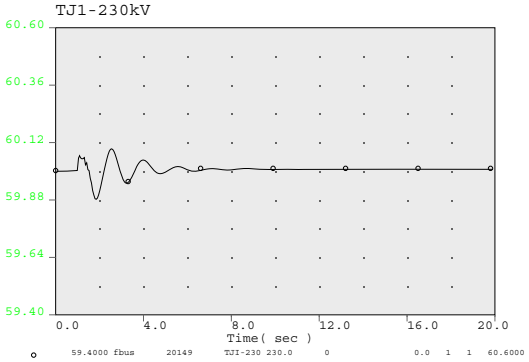
PAR/PID 230kV



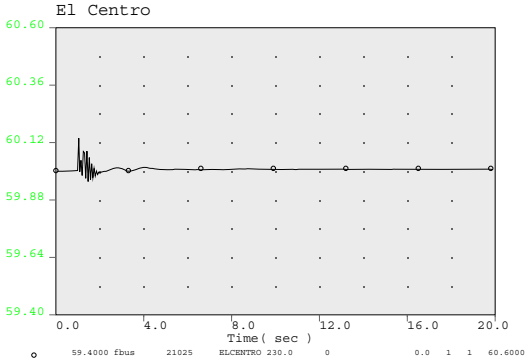
ROA-230kV



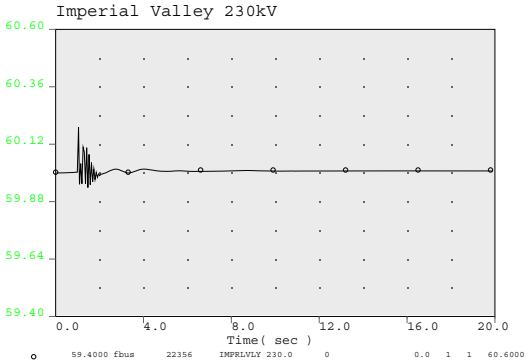
TJ1-230kV



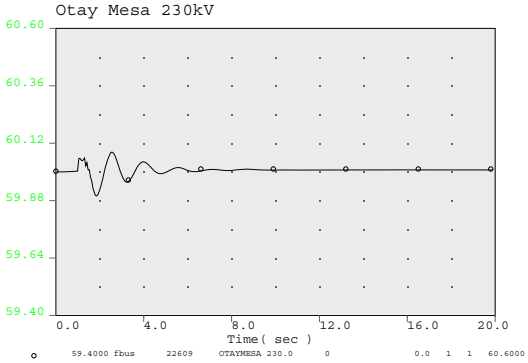
El Centro



Imperial Valley 230kV



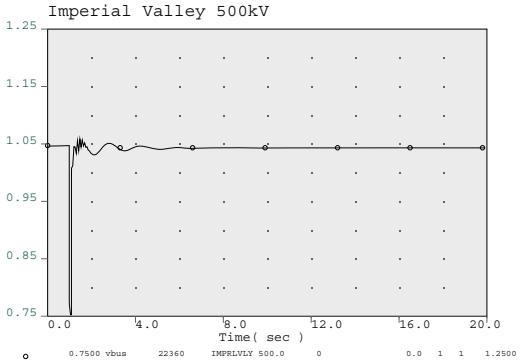
Otay Mesa 230kV



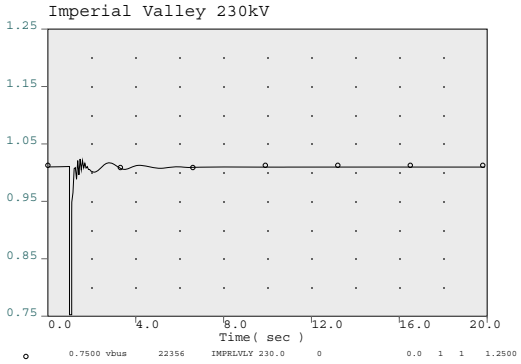
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

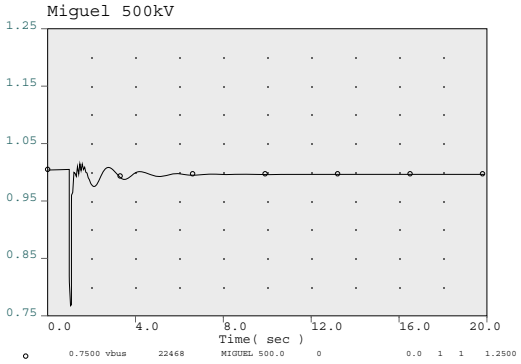
Imperial Valley 500kV



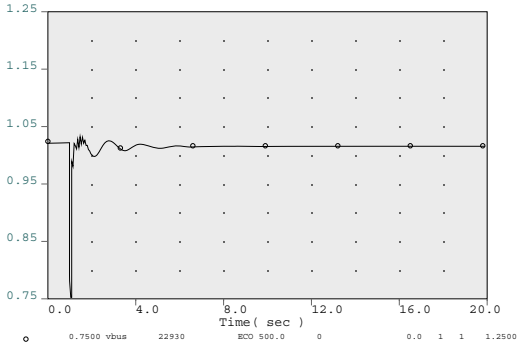
Imperial Valley 230kV



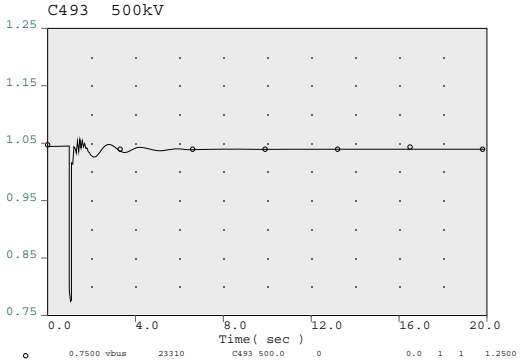
Miguel 500kV



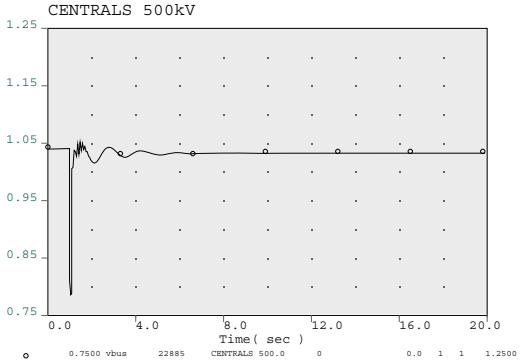
Windfarms 500



C493 500kV

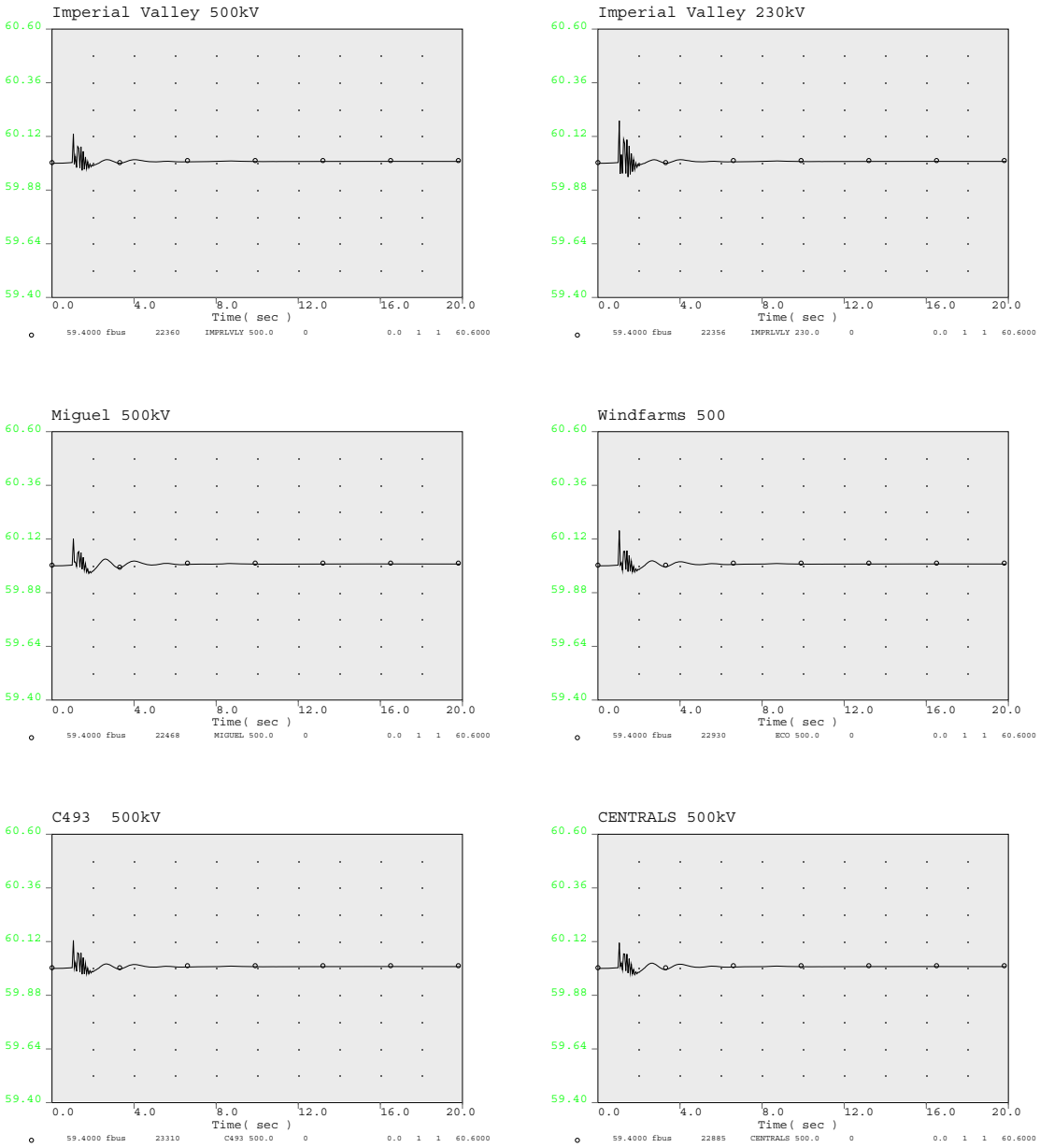


CENTRALS 500kV



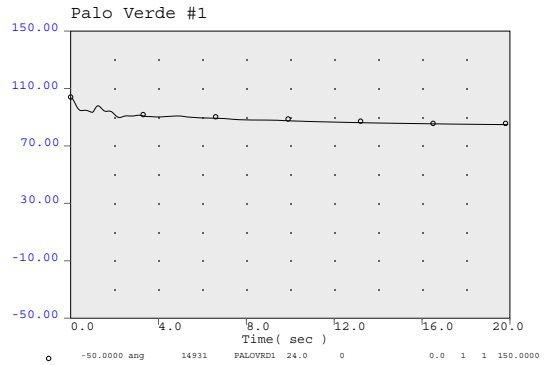
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

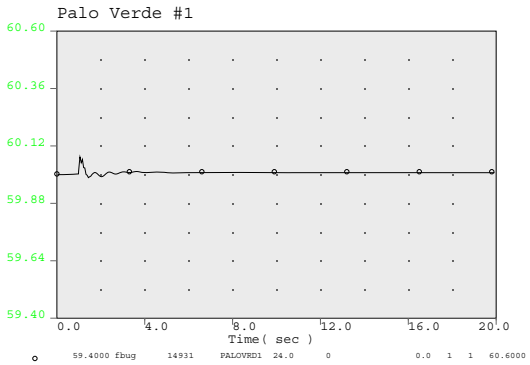
Imperial Valley Area - Frequency

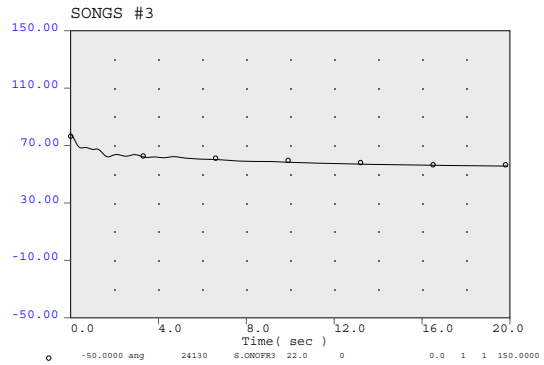


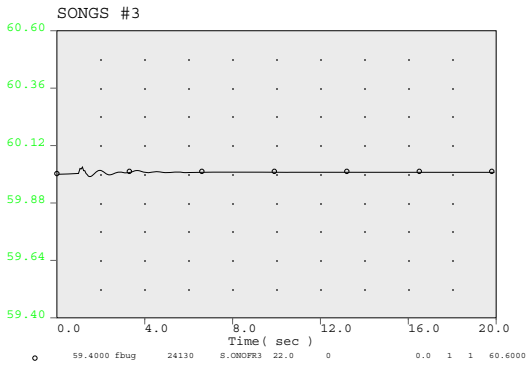
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

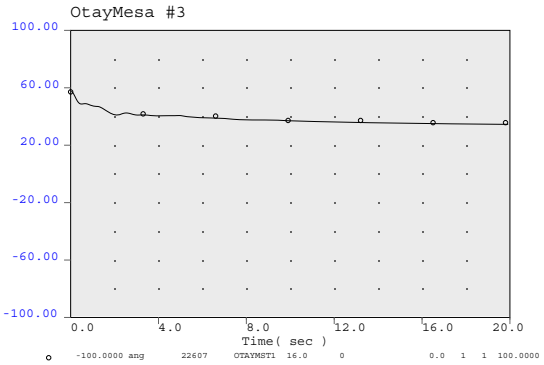
RELATIVE ROTOR ANGLE & FREQUENCY

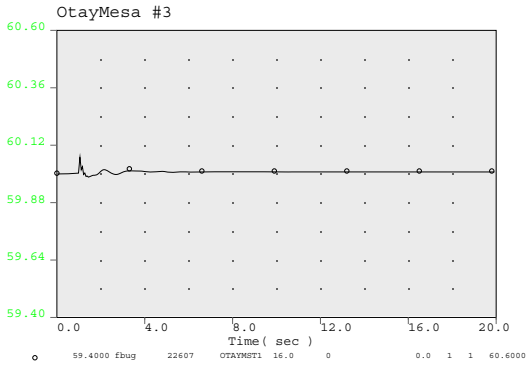












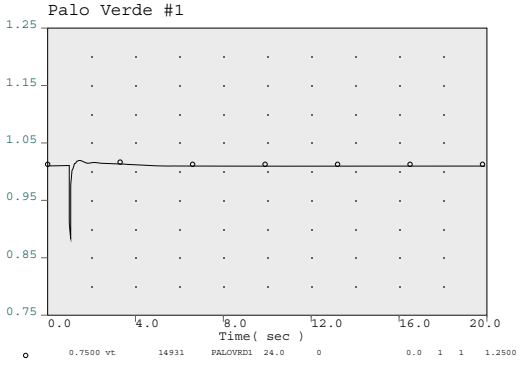
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

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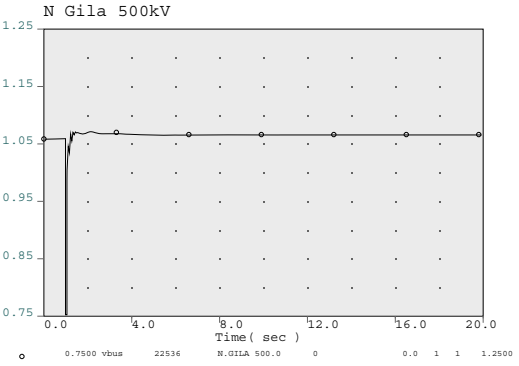
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RELATIVE VOLTAGE

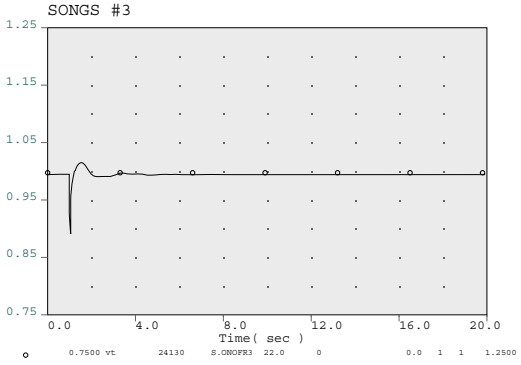
Palo Verde #1



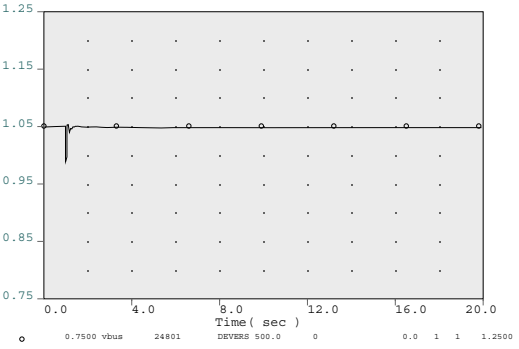
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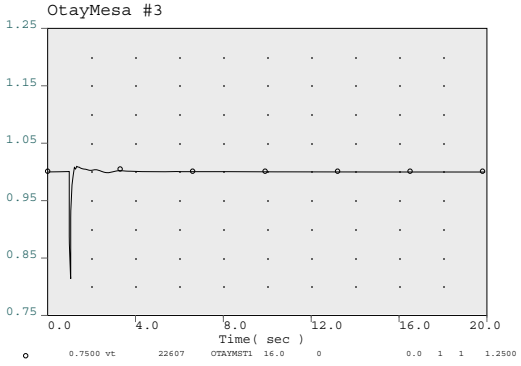
SONGS #3



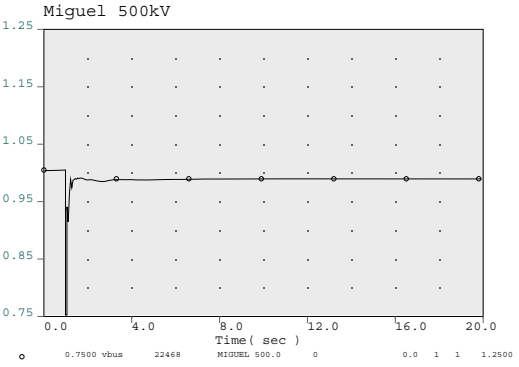
Devers 500



OtayMesa #3



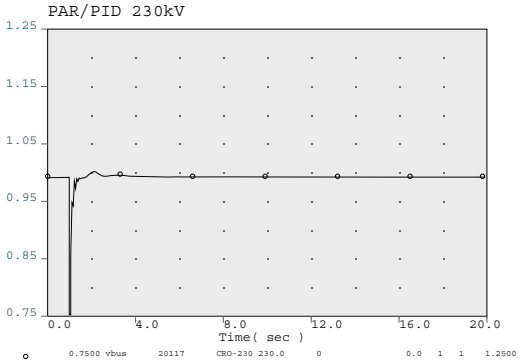
Miguel 500kV



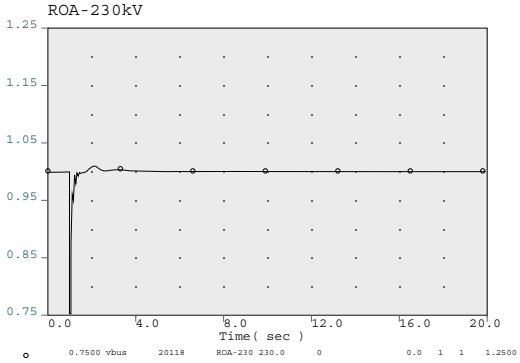
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

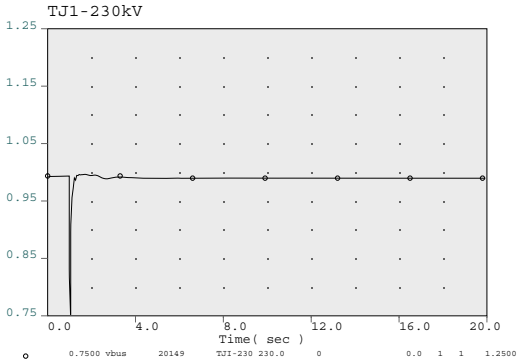
PAR/PID 230kV



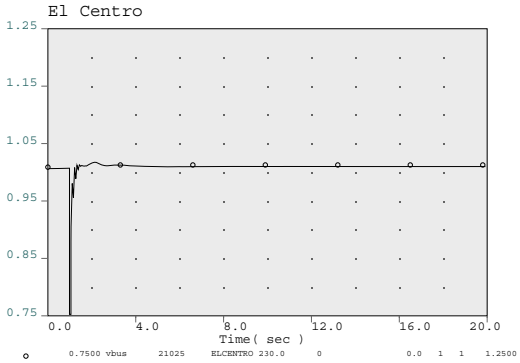
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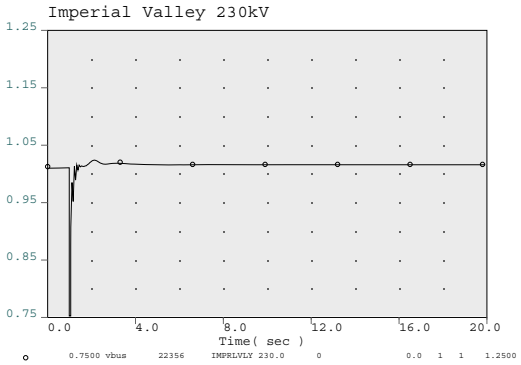
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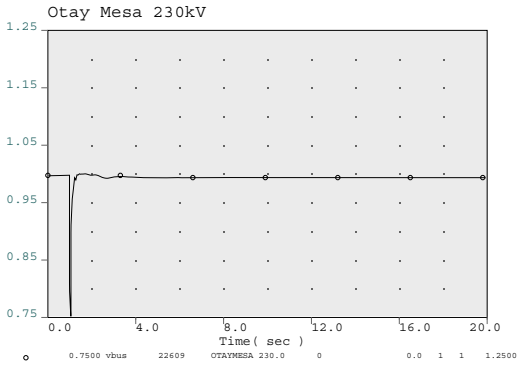
El Centro



Imperial Valley 230kV



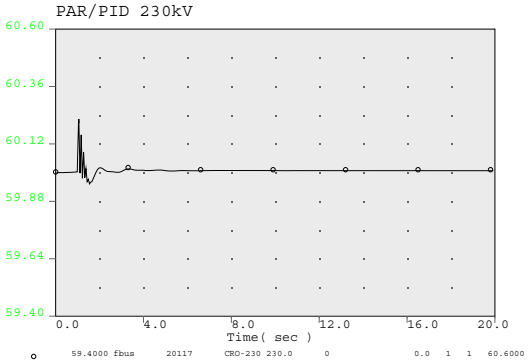
Otay Mesa 230kV



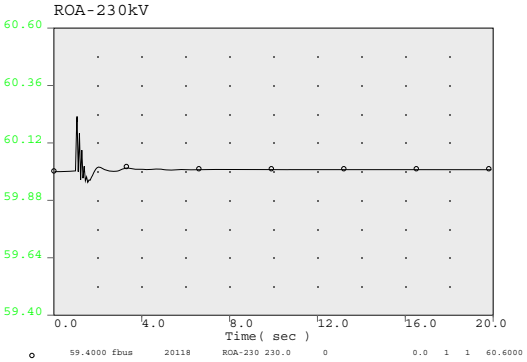
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

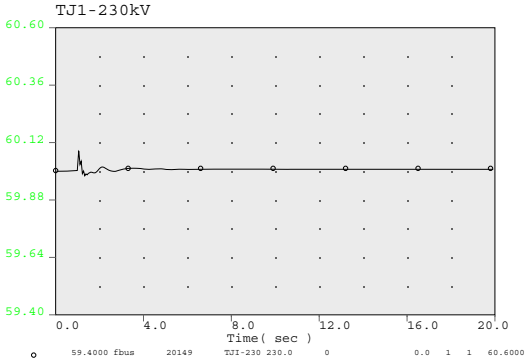
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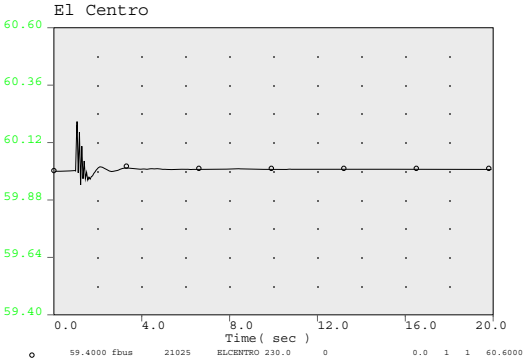
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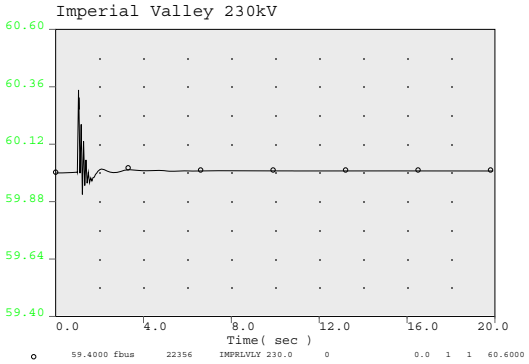
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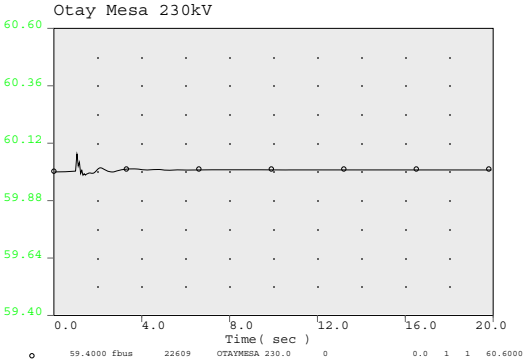
El Centro



Imperial Valley 230kV



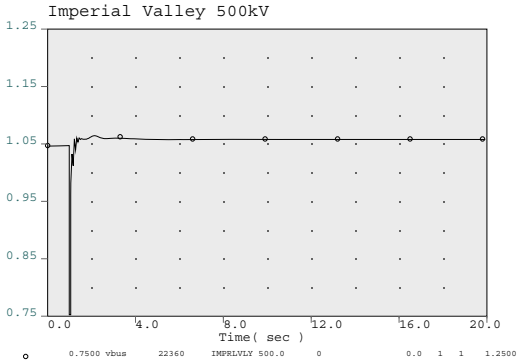
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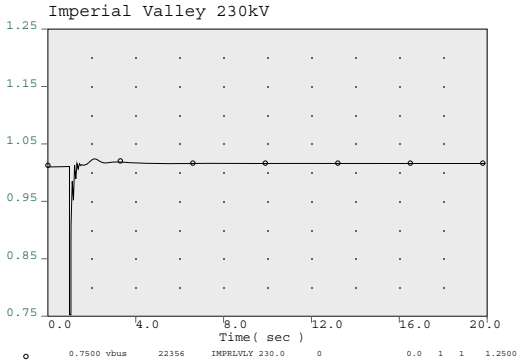
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

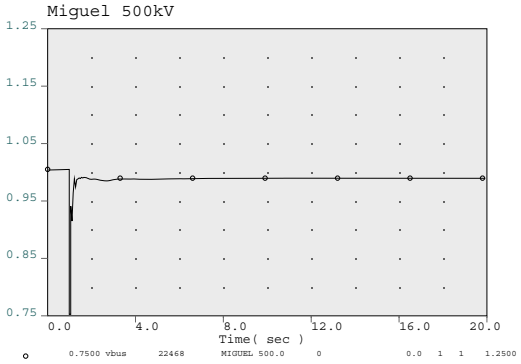
Imperial Valley 500kV



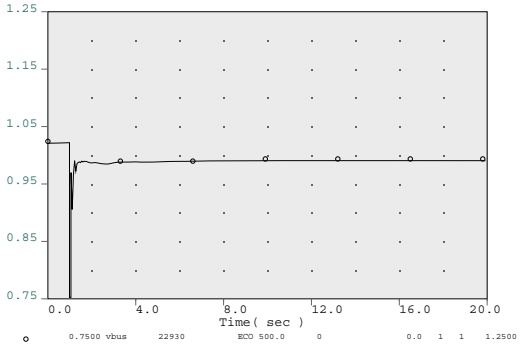
Imperial Valley 230kV



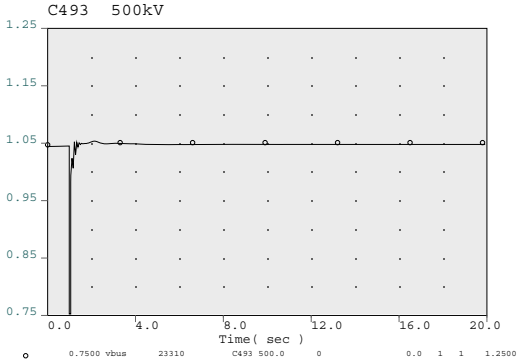
Miguel 500kV



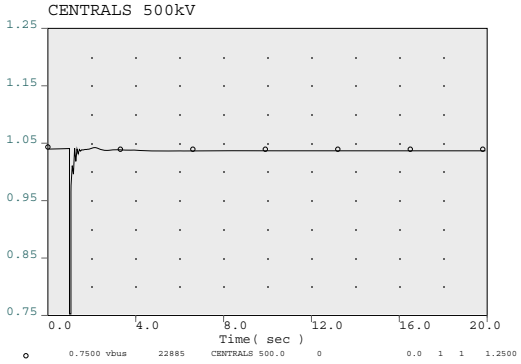
Windfarms 500



C493 500kV

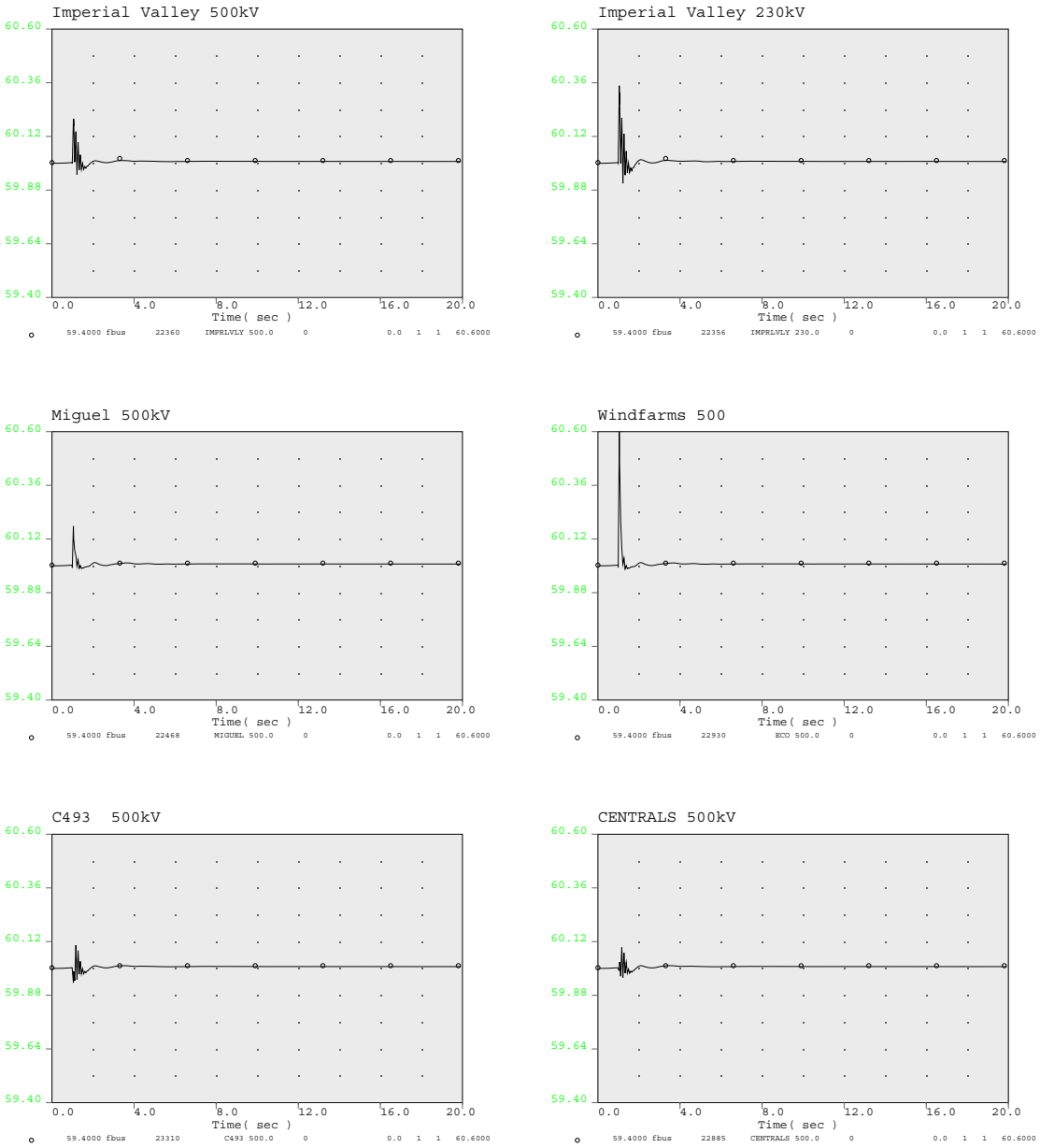


CENTRALS 500kV



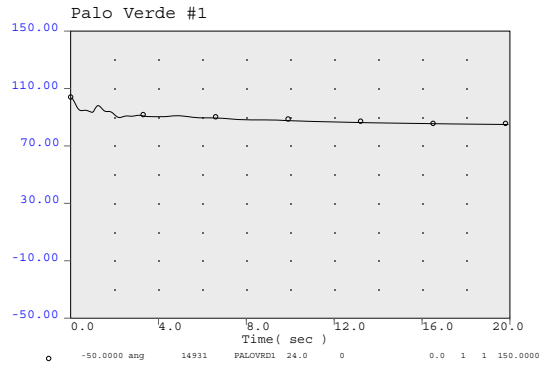
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

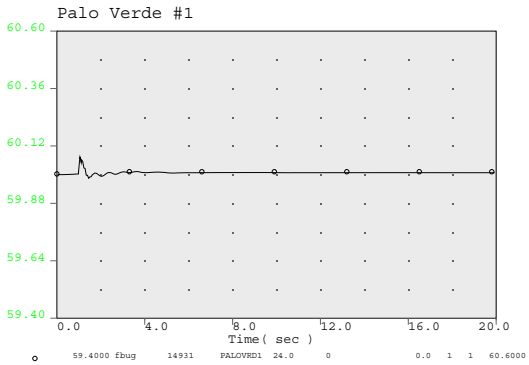
Imperial Valley Area - Frequency

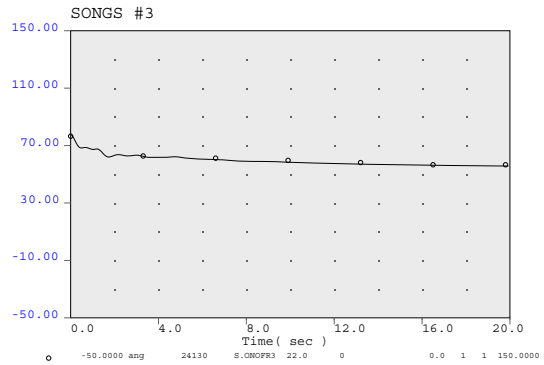


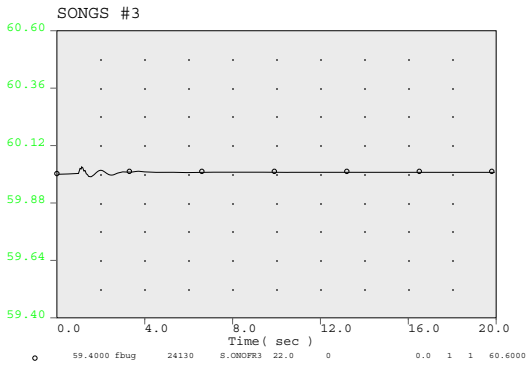
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

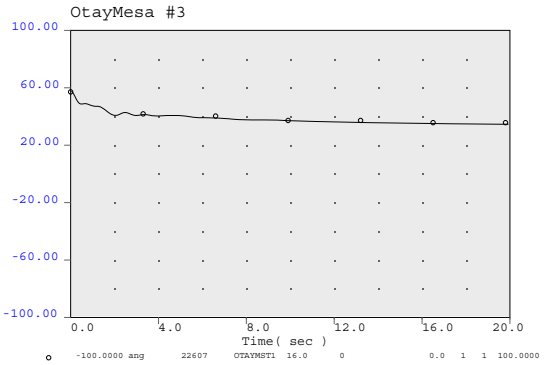
RELATIVE ROTOR ANGLE & FREQUENCY

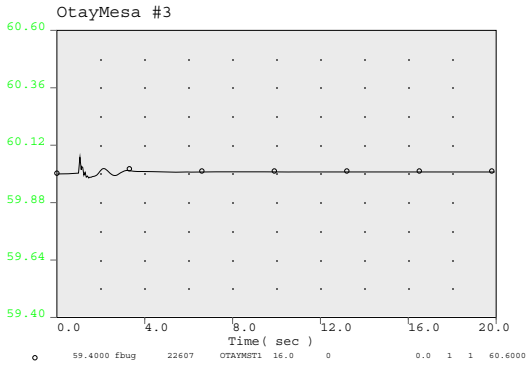












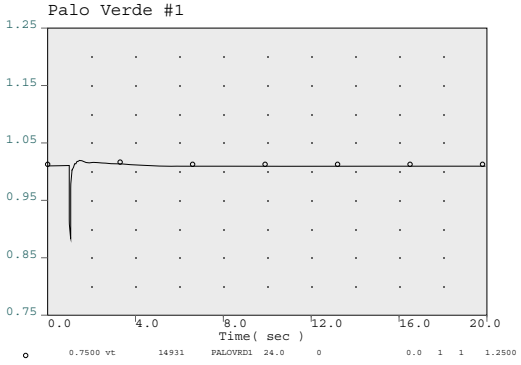
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

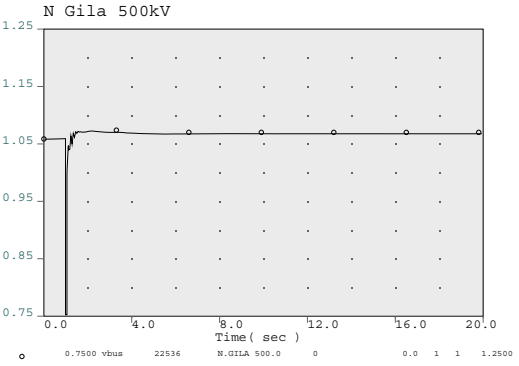
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RELATIVE VOLTAGE

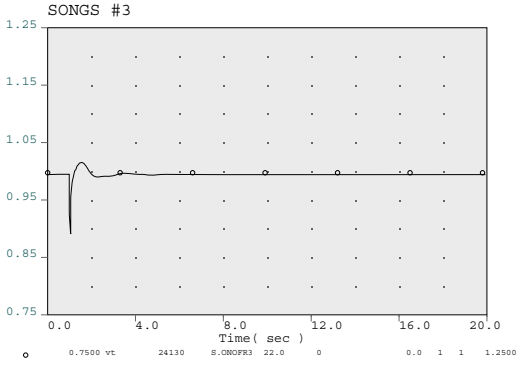
Palo Verde #1



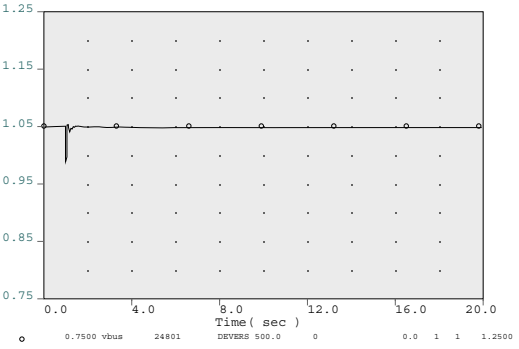
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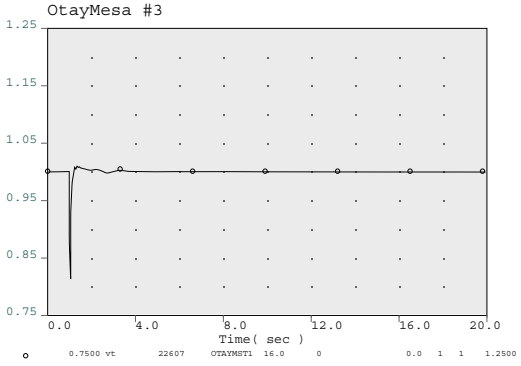
SONGS #3



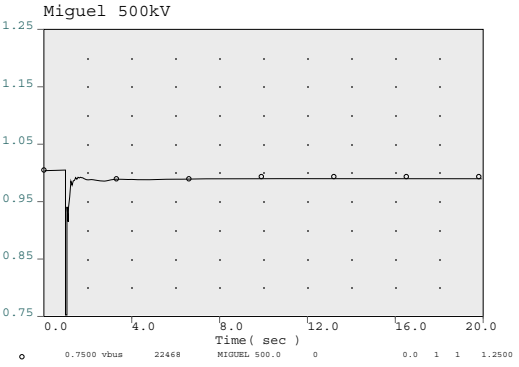
Devers 500



OtayMesa #3



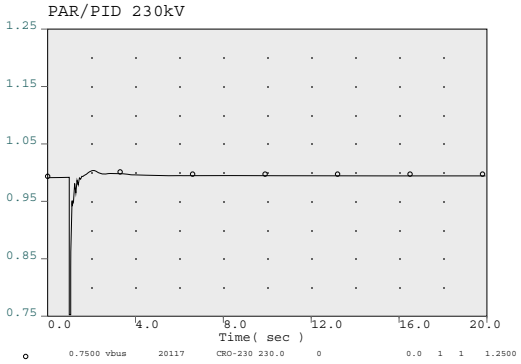
Miguel 500kV



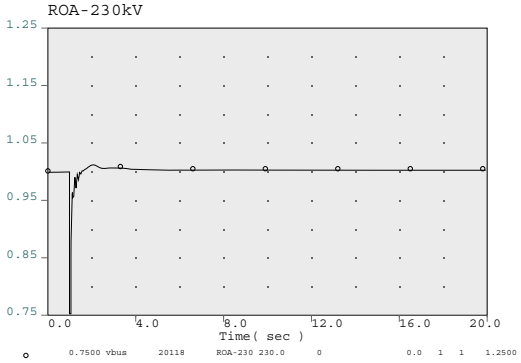
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

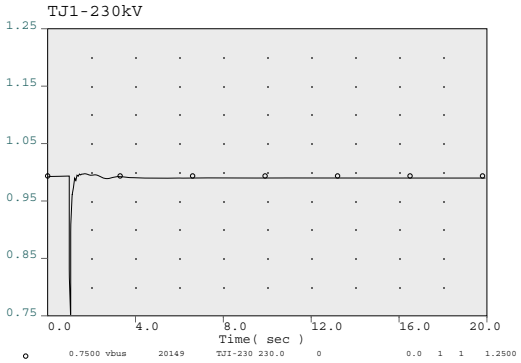
PAR/PID 230kV



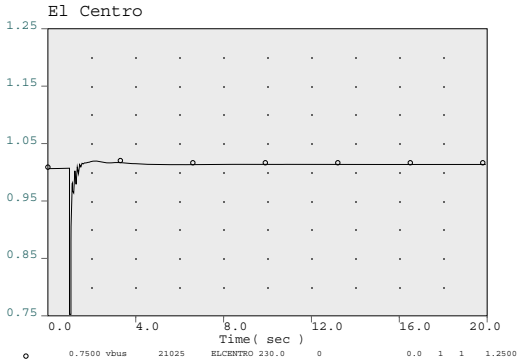
ROA-230kV



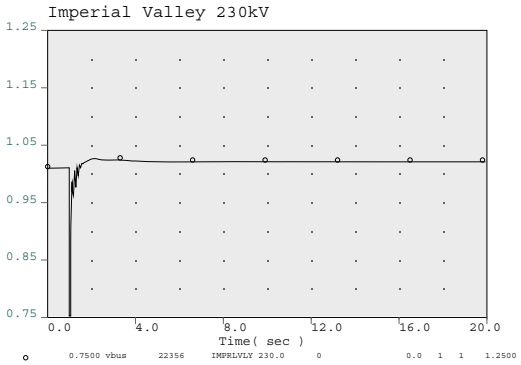
TJ1-230kV



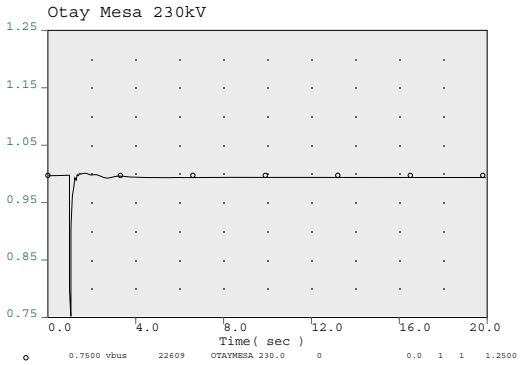
El Centro



Imperial Valley 230kV



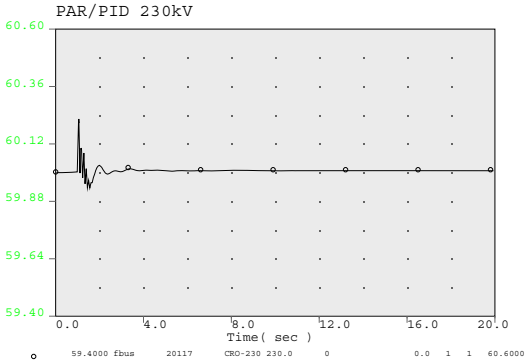
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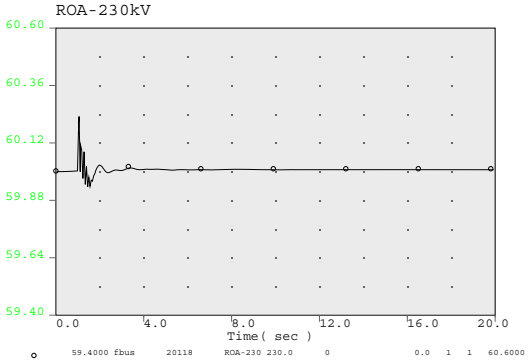
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

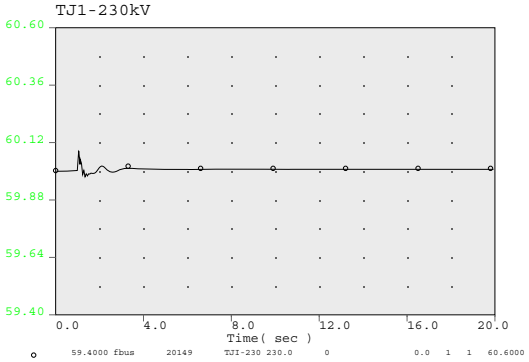
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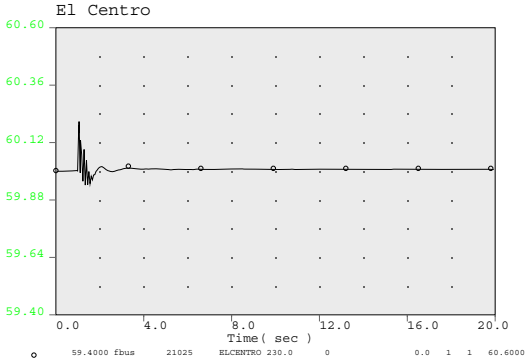
ROA-230kV



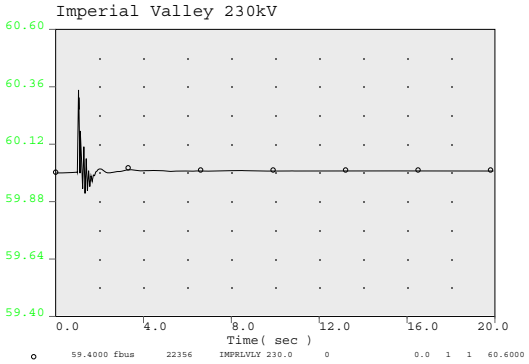
TJ1-230kV



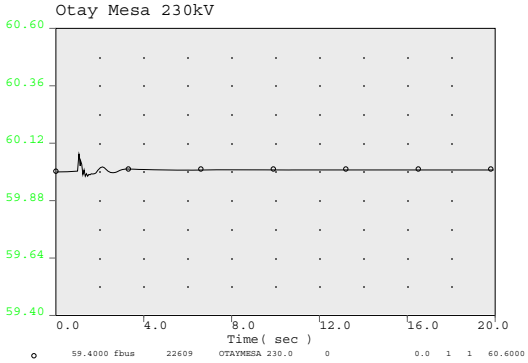
El Centro



Imperial Valley 230kV



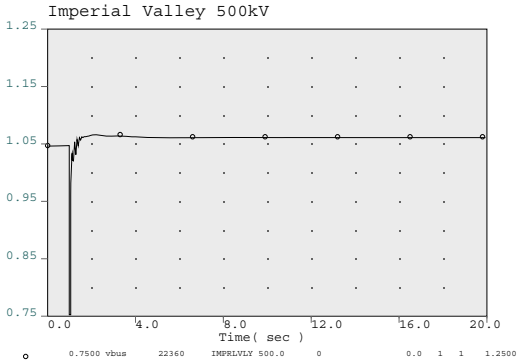
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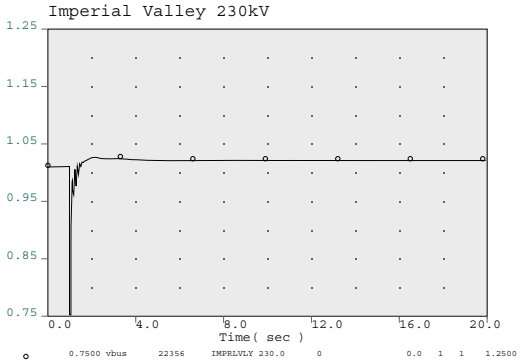
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

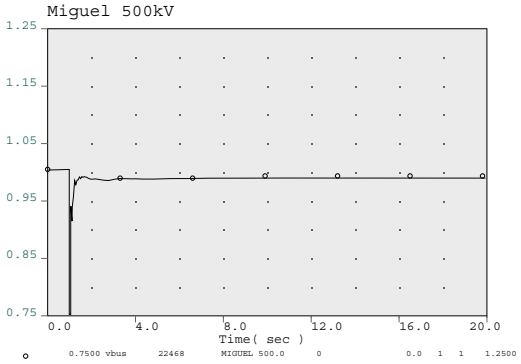
Imperial Valley 500kV



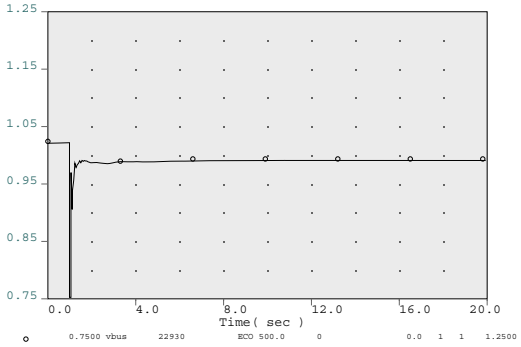
Imperial Valley 230kV



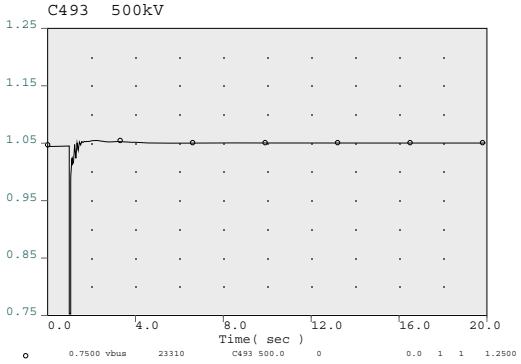
Miguel 500kV



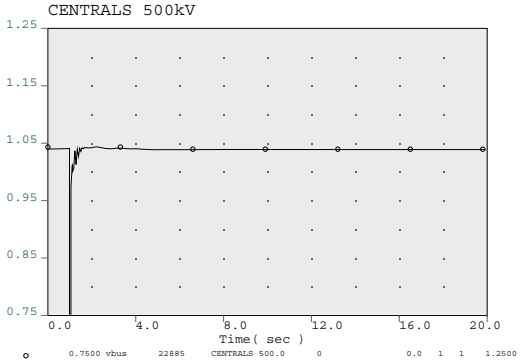
Windfarms 500



C493 500kV

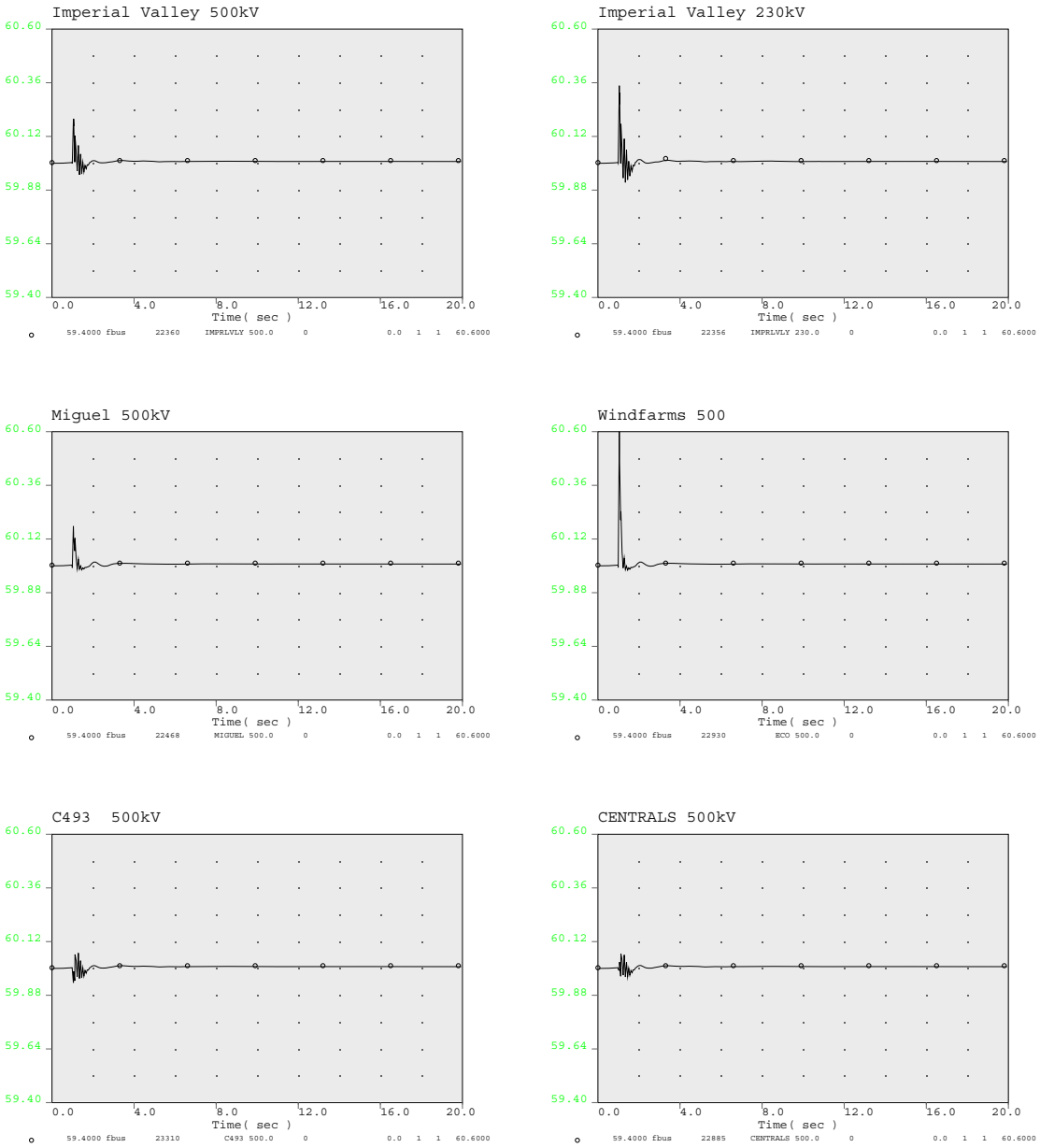


CENTRALS 500kV



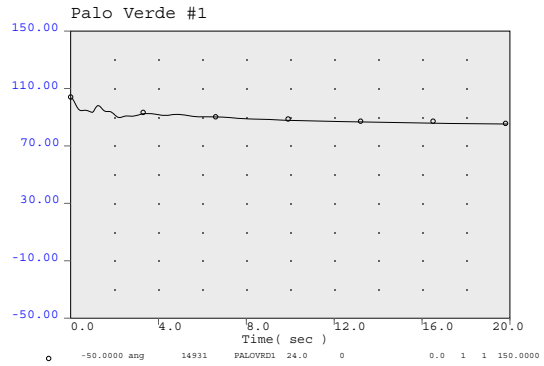
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

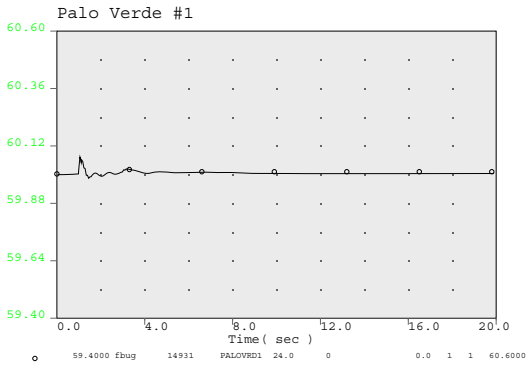
Imperial Valley Area - Frequency

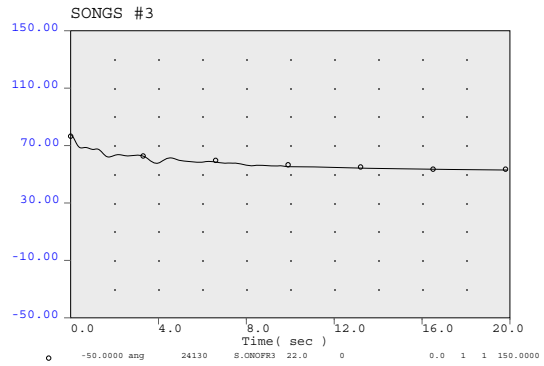


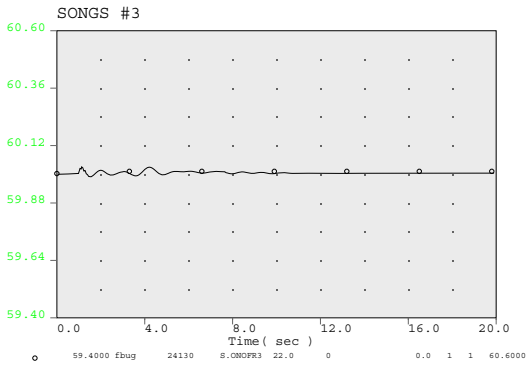
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

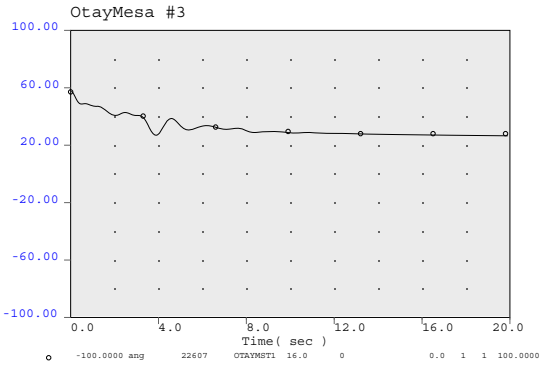
RELATIVE ROTOR ANGLE & FREQUENCY

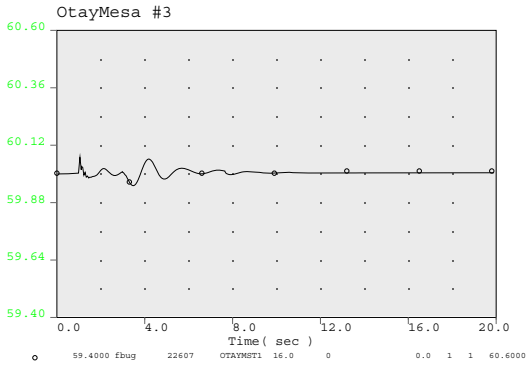












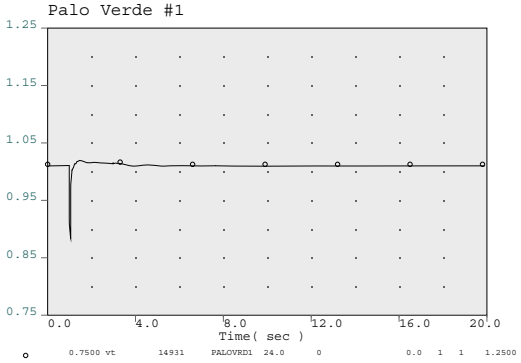
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

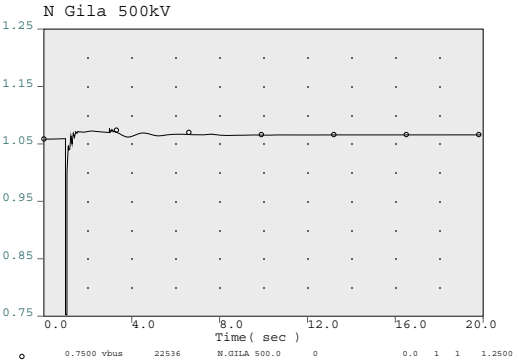
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RELATIVE VOLTAGE

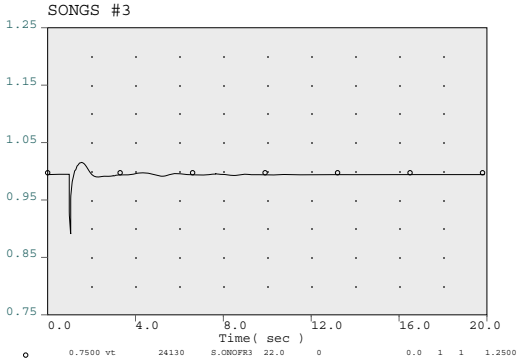
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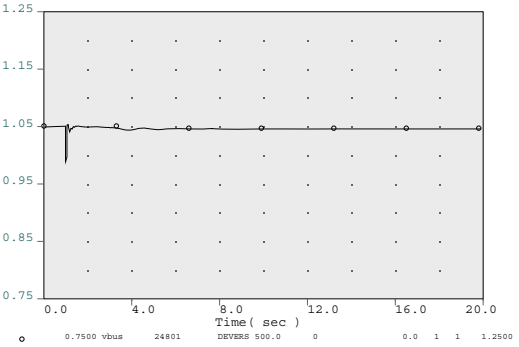
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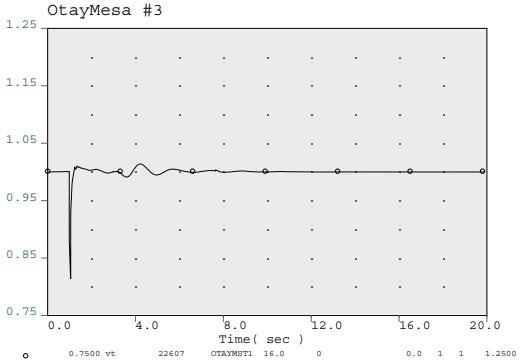
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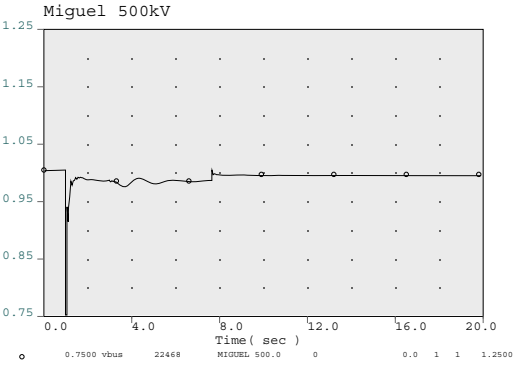
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OtayMesa #3



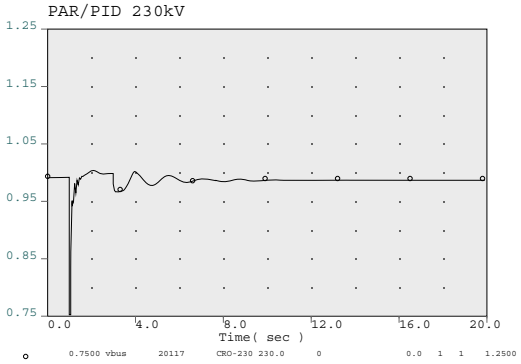
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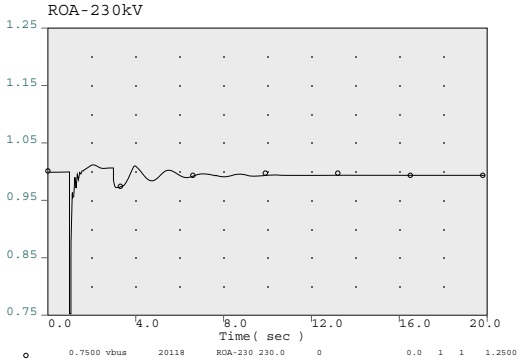
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

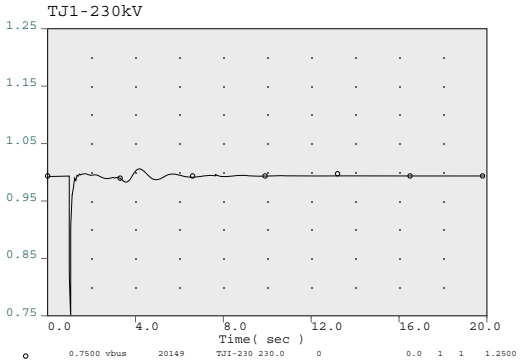
PAR/PID 230kV



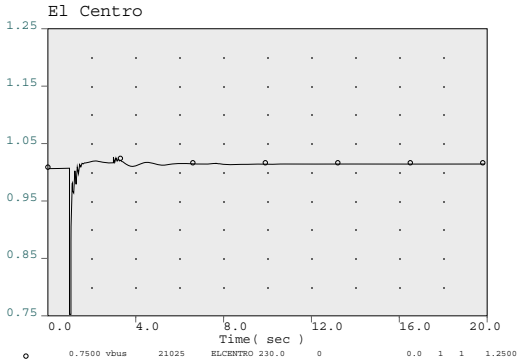
ROA-230kV



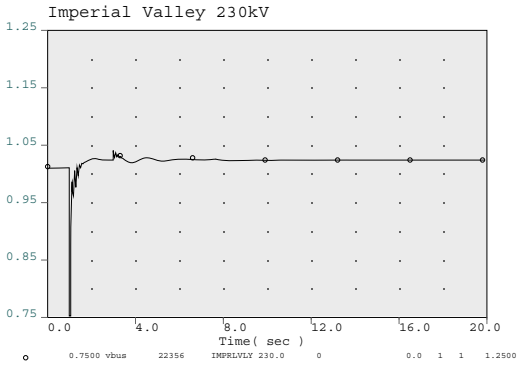
TJ1-230kV



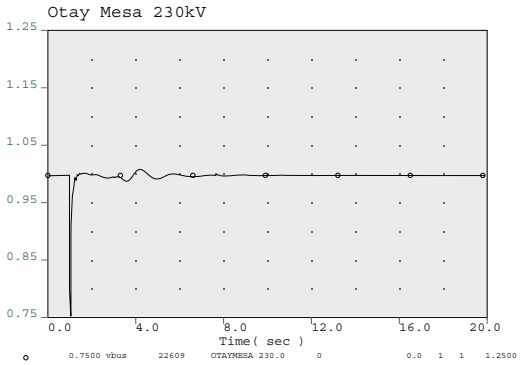
El Centro



Imperial Valley 230kV



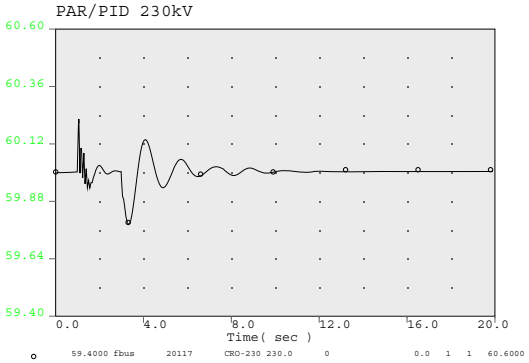
Otay Mesa 230kV



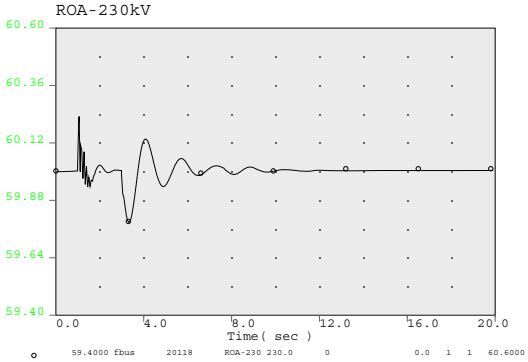
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

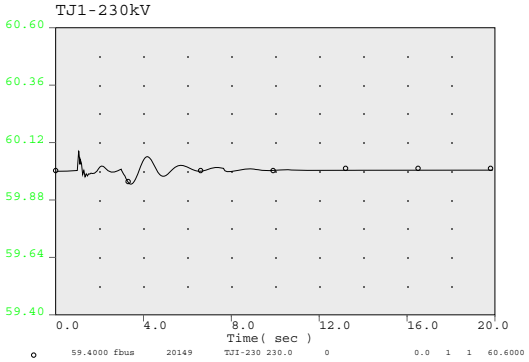
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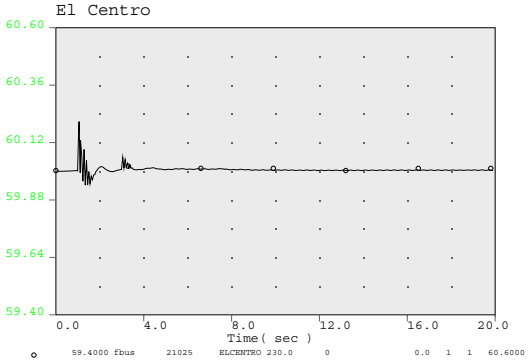
ROA-230kV



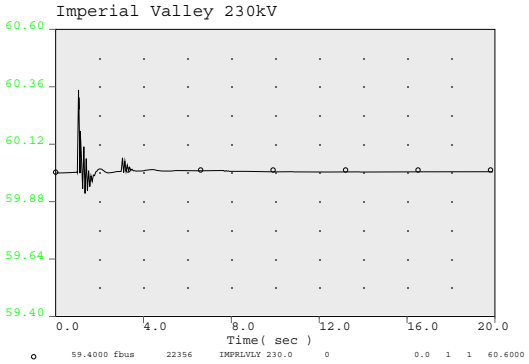
TJ1-230kV



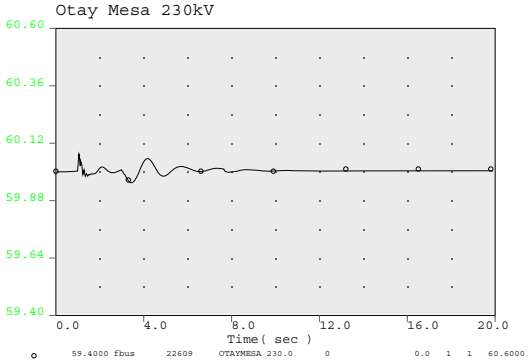
El Centro



Imperial Valley 230kV

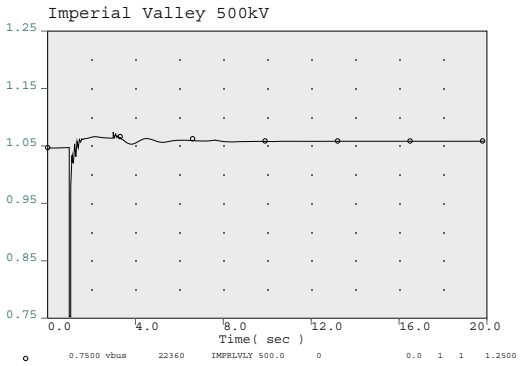


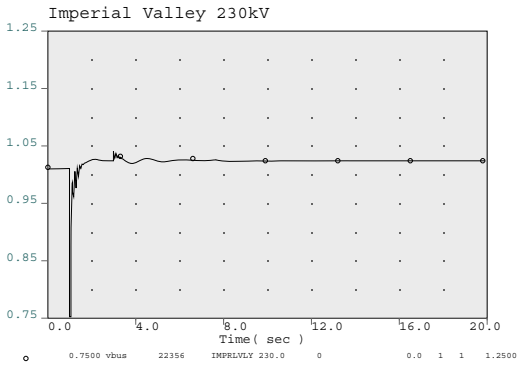
Otay Mesa 230kV

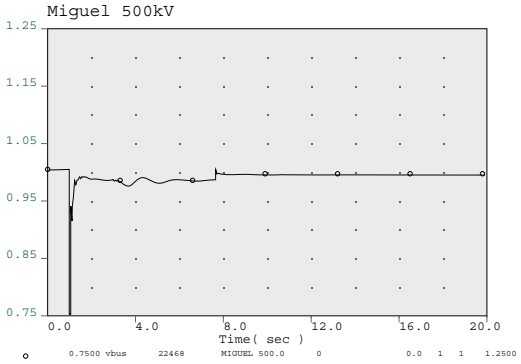


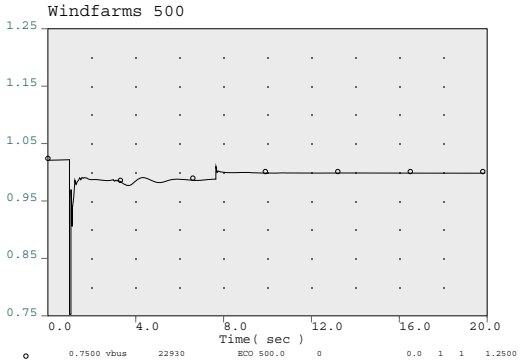
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

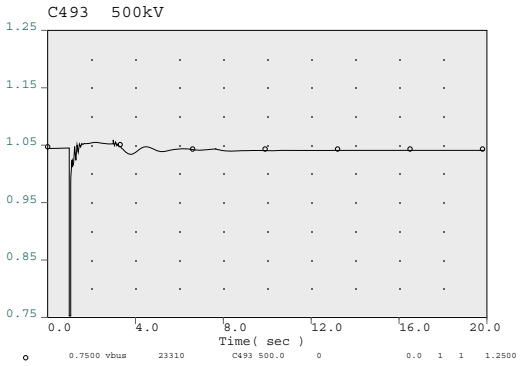
Imperial Valley Area - VOLTAGE

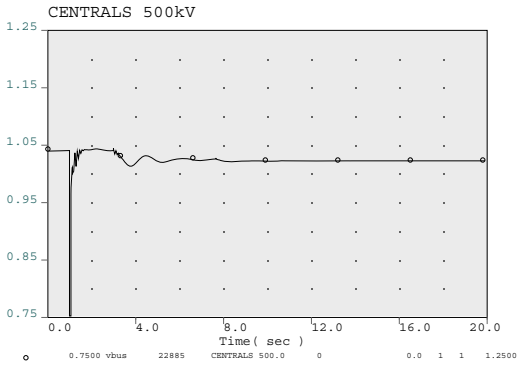






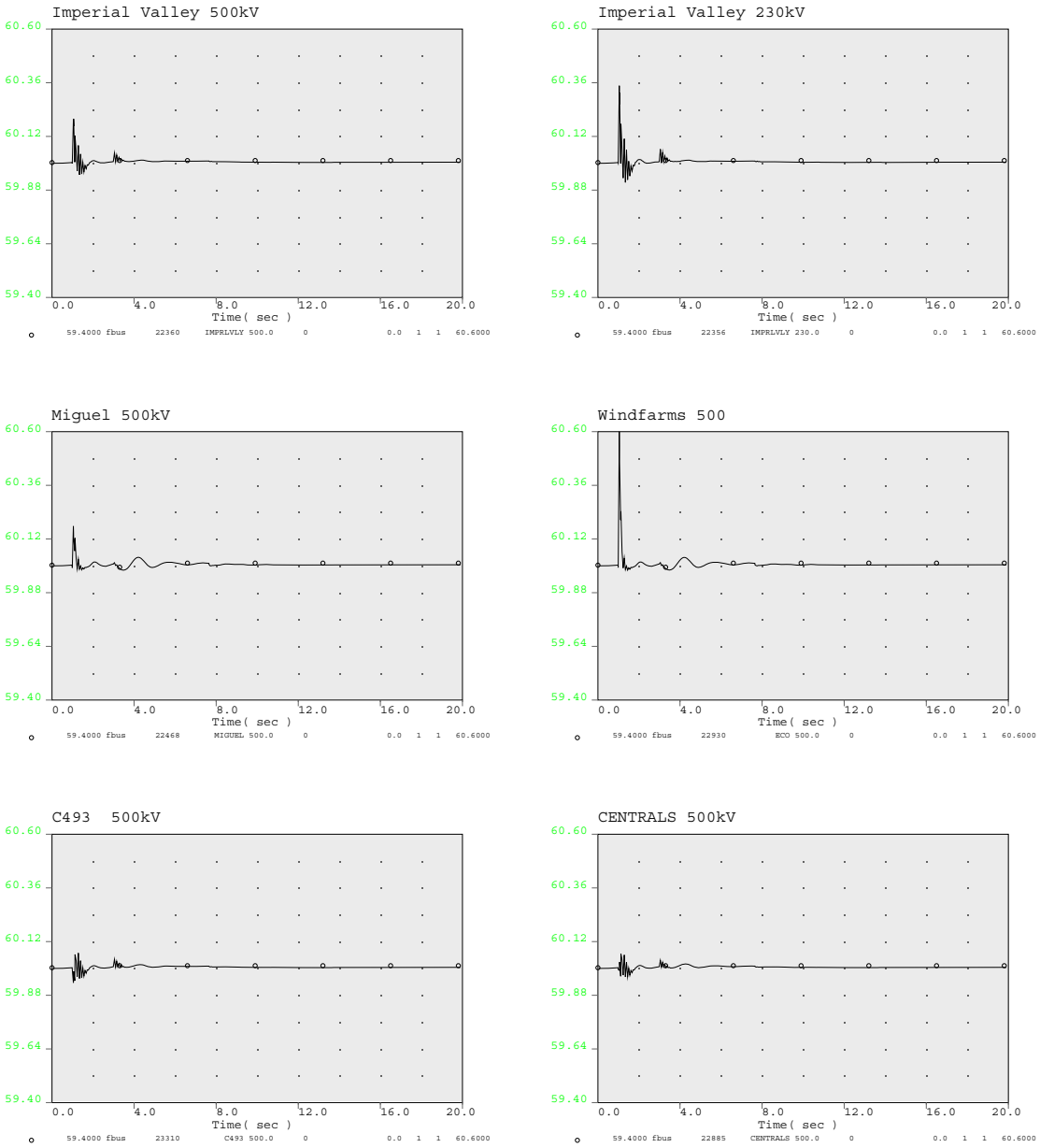






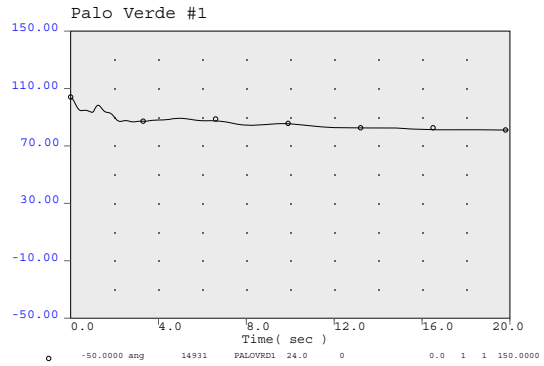
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

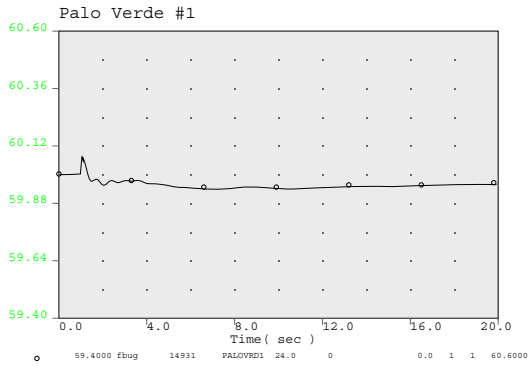
Imperial Valley Area - Frequency

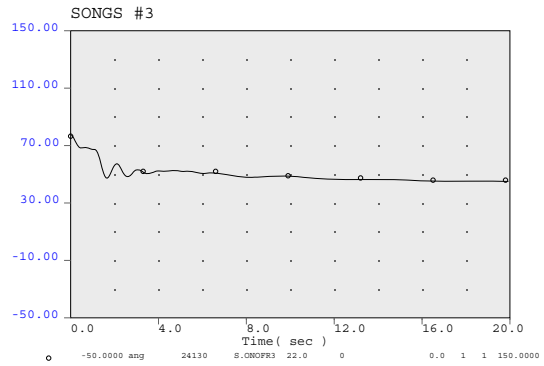


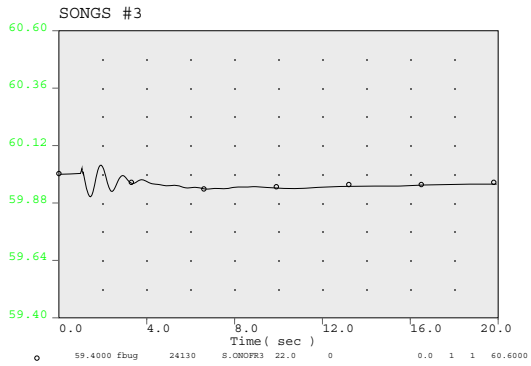
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

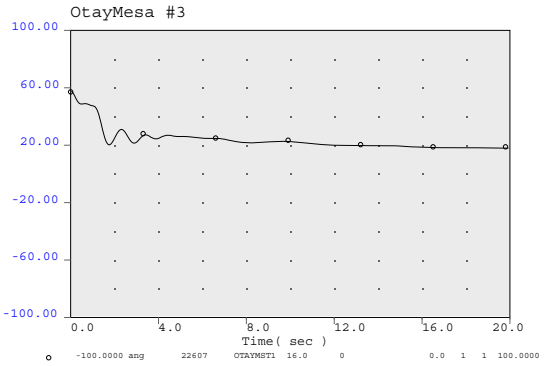
RELATIVE ROTOR ANGLE & FREQUENCY

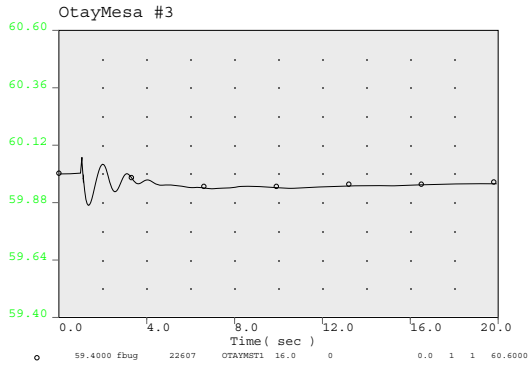










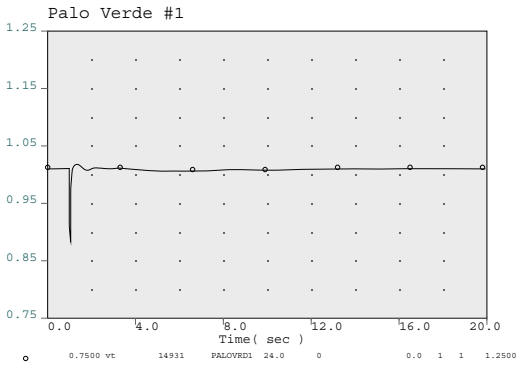


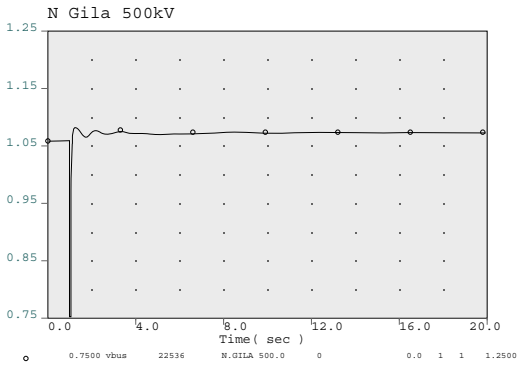
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

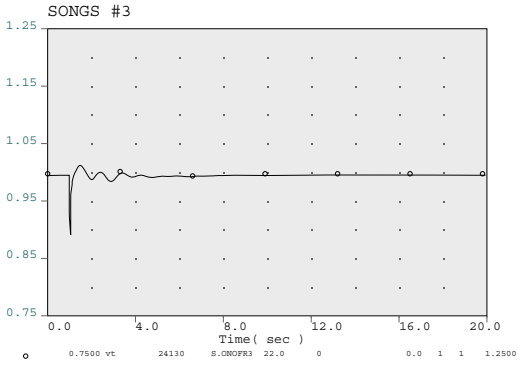
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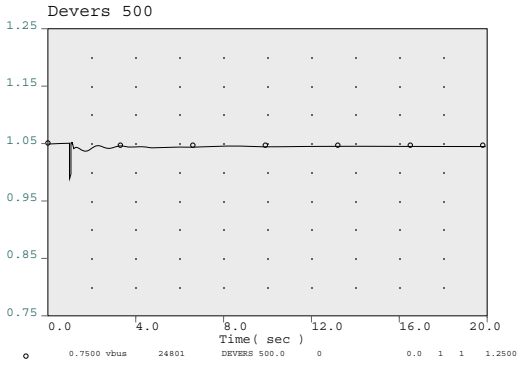
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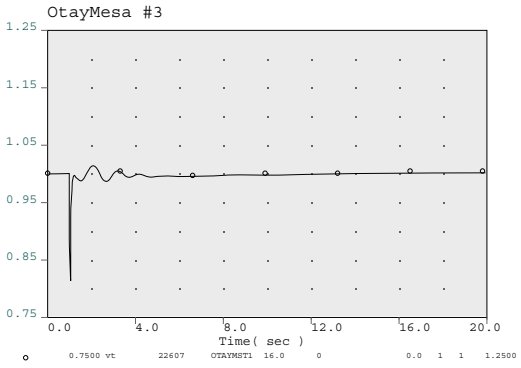
RELATIVE VOLTAGE

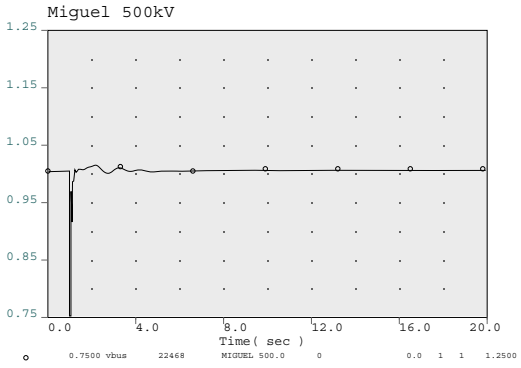








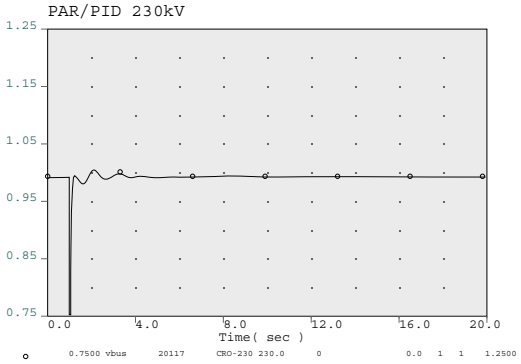




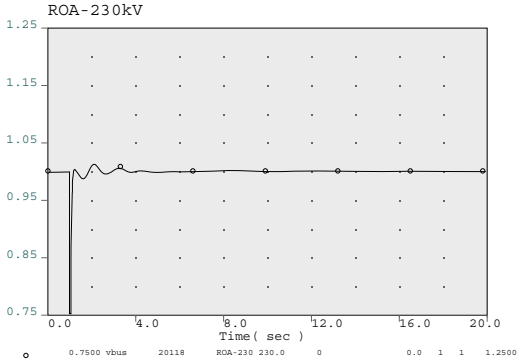
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Affected System Voltage Check and Comparison

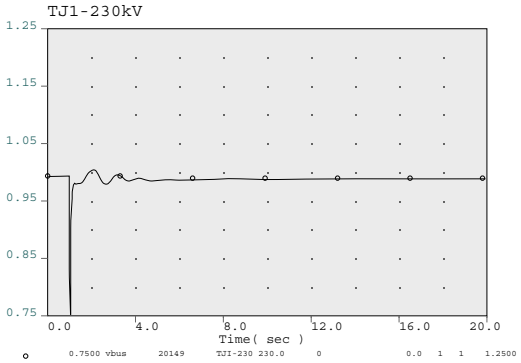
PAR/PID 230kV



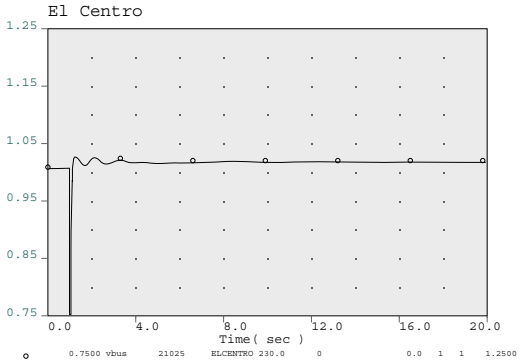
ROA-230kV



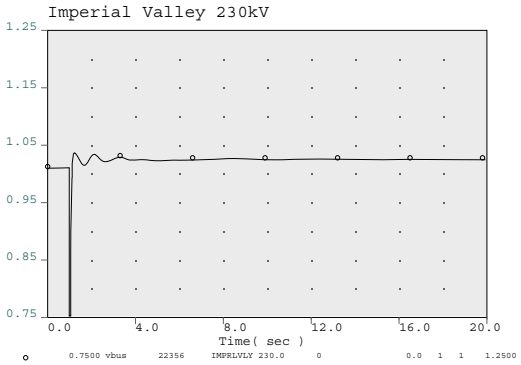
TJ1-230kV



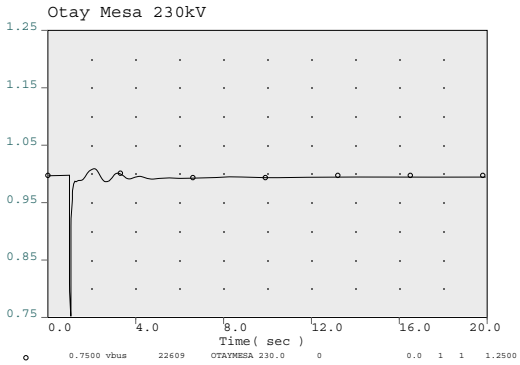
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



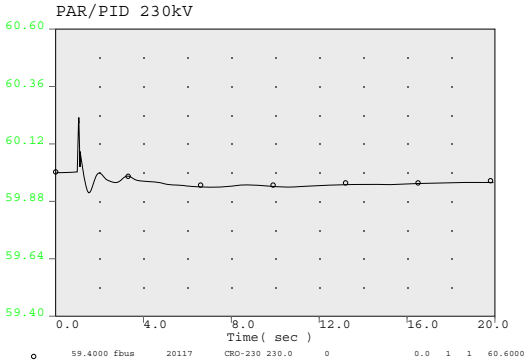
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Page 3

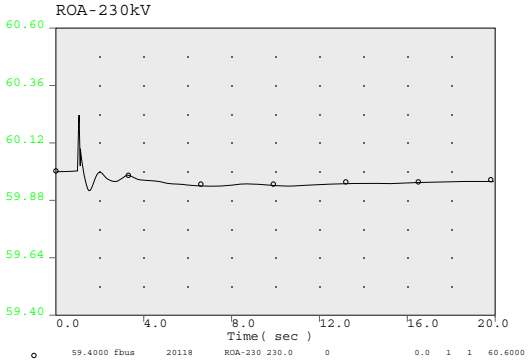
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Affected System Frequency Check and Comparison

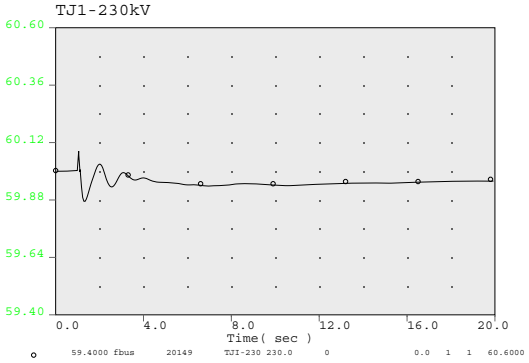
PAR/PID 230kV



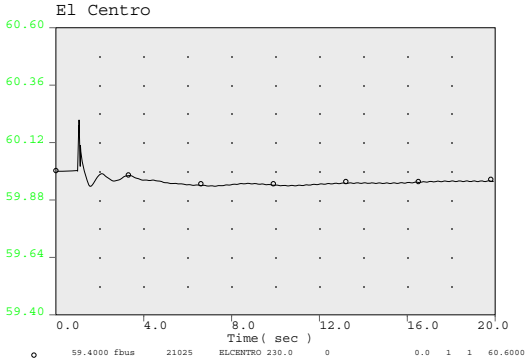
ROA-230kV



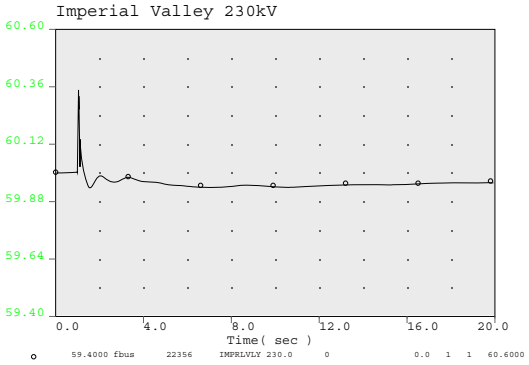
TJ1-230kV



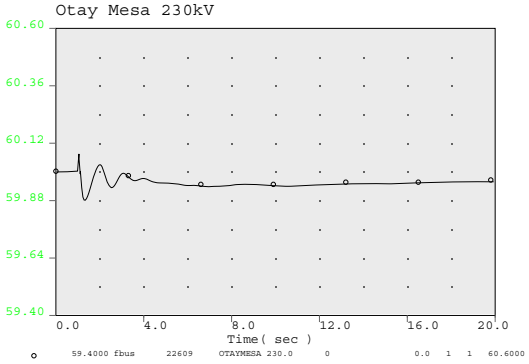
El Centro



Imperial Valley 230kV



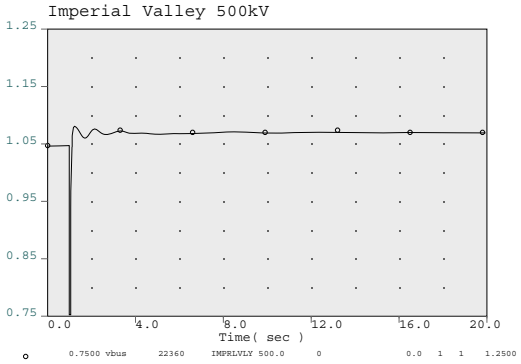
Otay Mesa 230kV



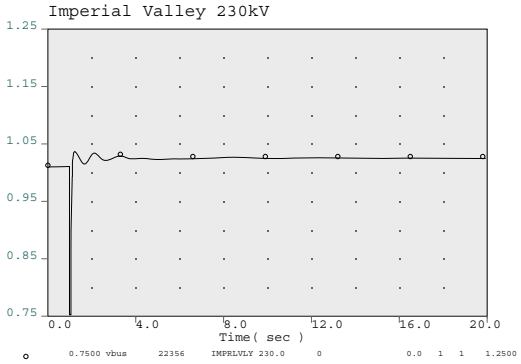
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Imperial Valley Area - VOLTAGE

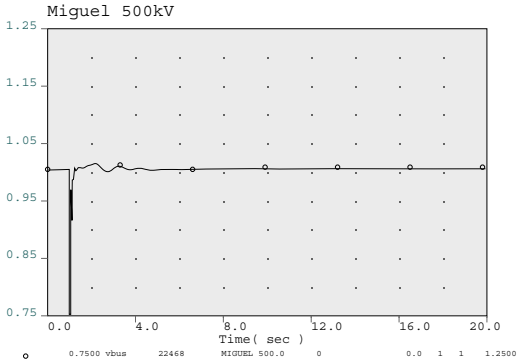
Imperial Valley 500kV



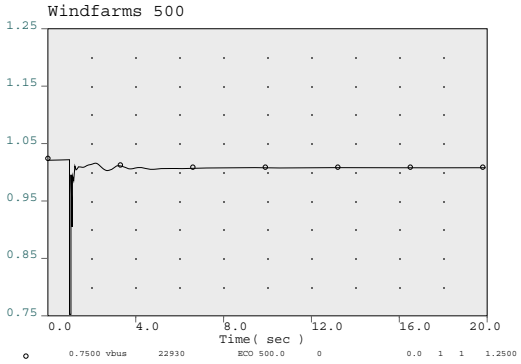
Imperial Valley 230kV



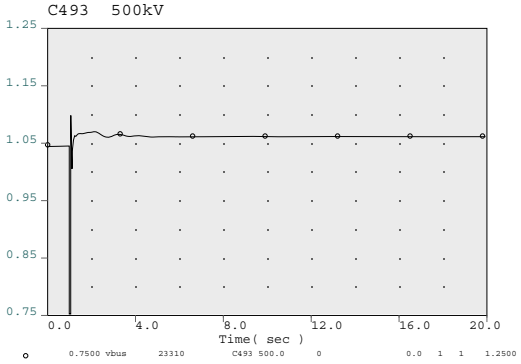
Miguel 500kV



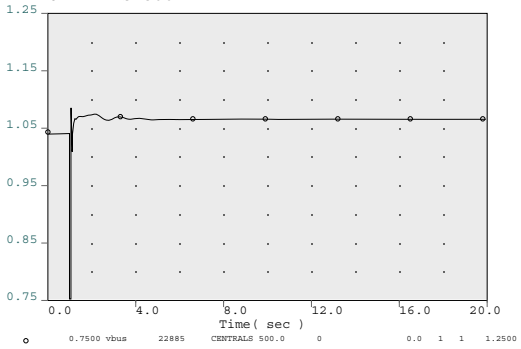
Windfarms 500



C493 500kV

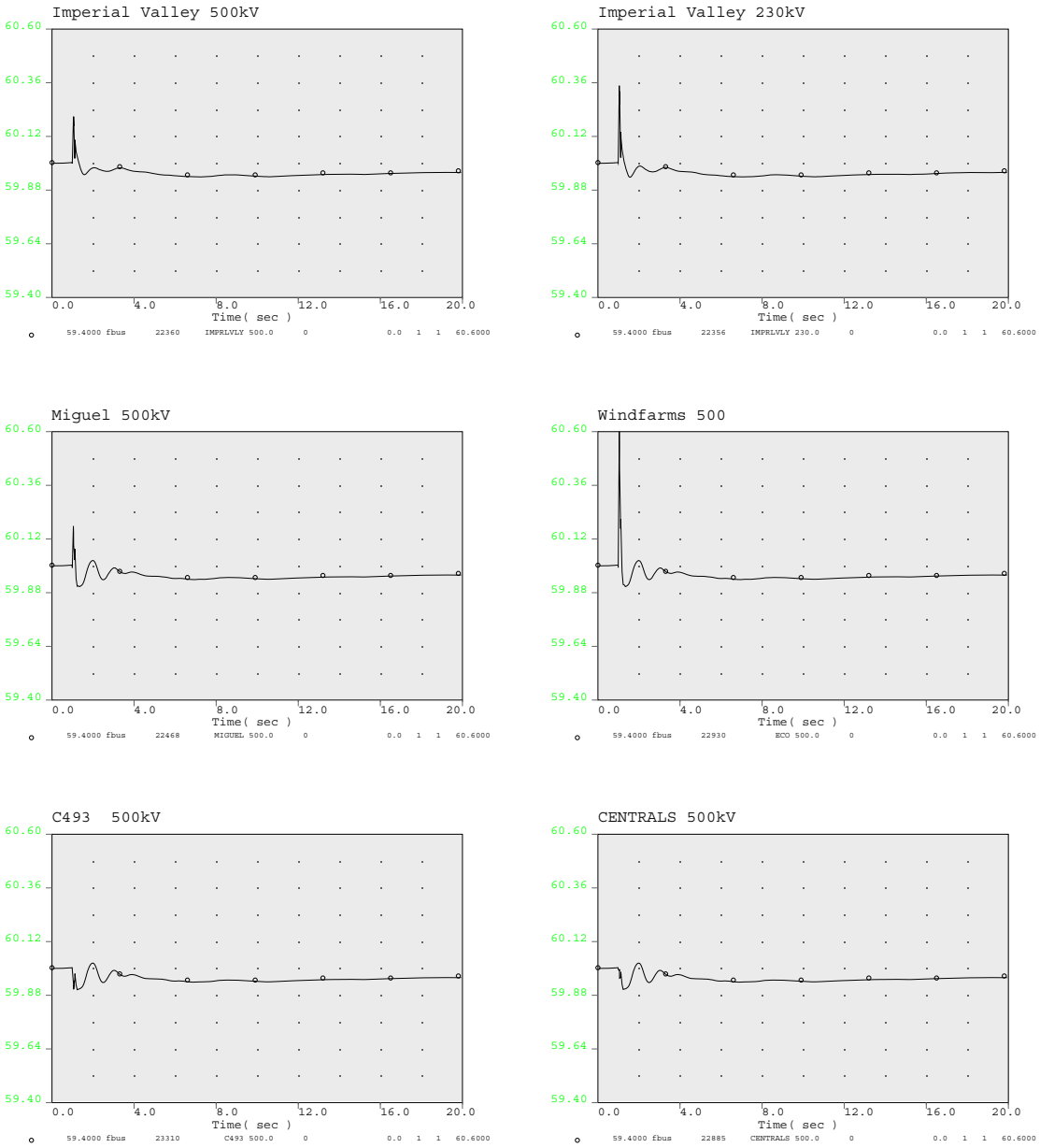


CENTRALS 500kV



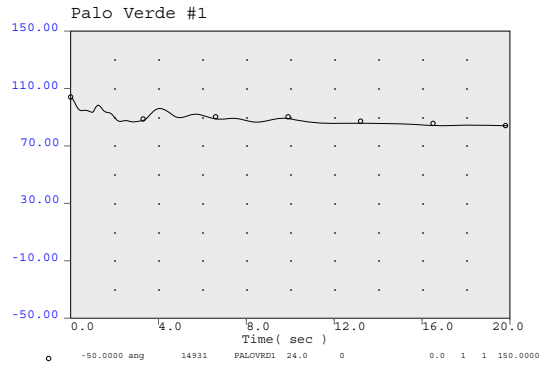
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

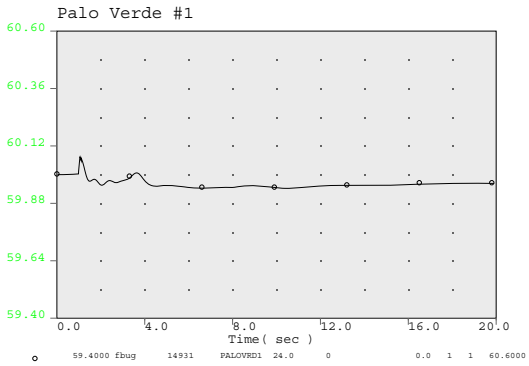
Imperial Valley Area - Frequency

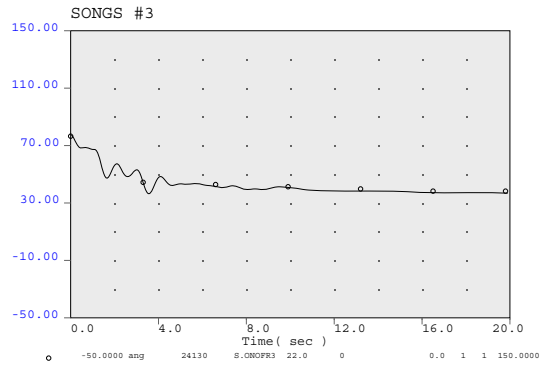


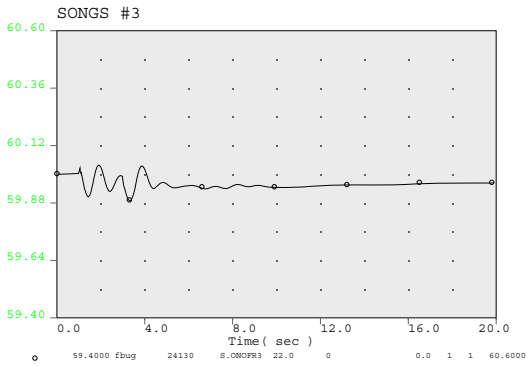
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

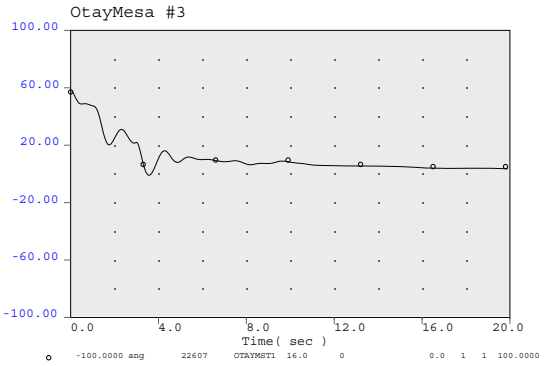
RELATIVE ROTOR ANGLE & FREQUENCY

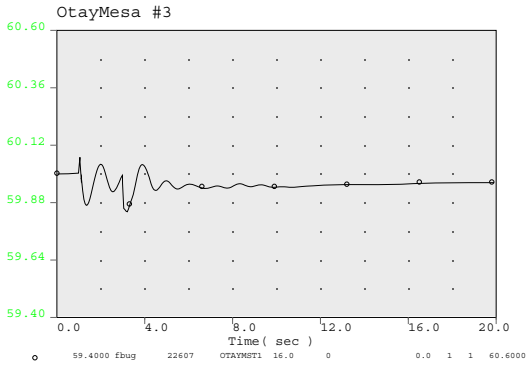










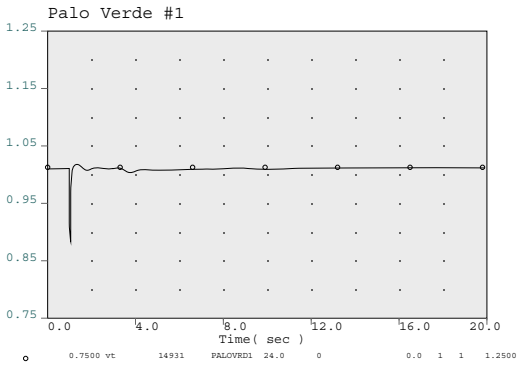


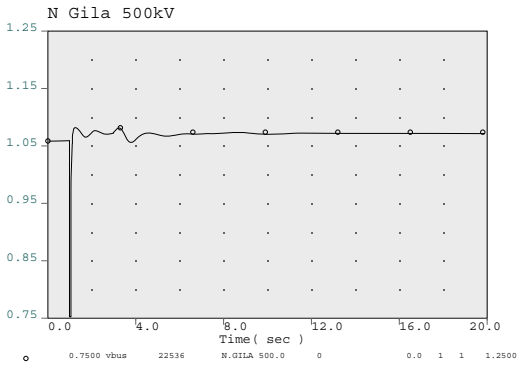
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

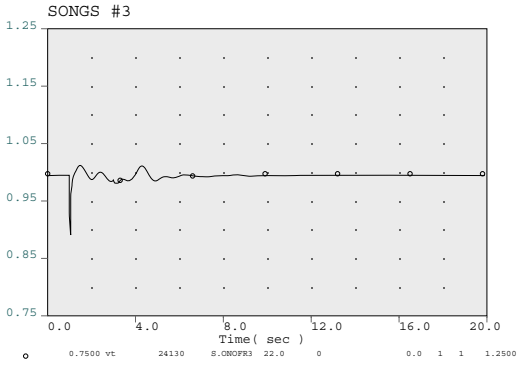
Page 1

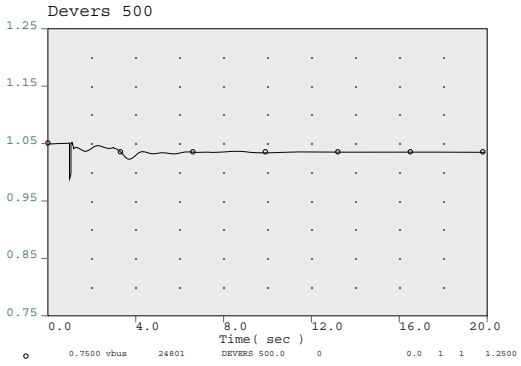
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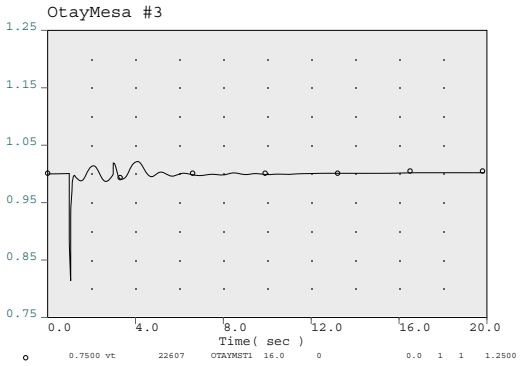
RELATIVE VOLTAGE

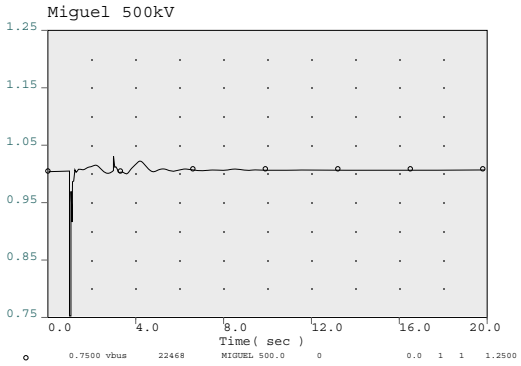








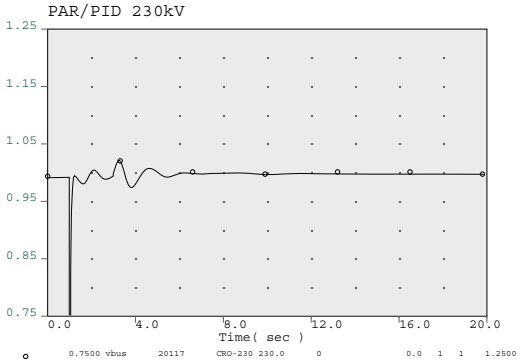




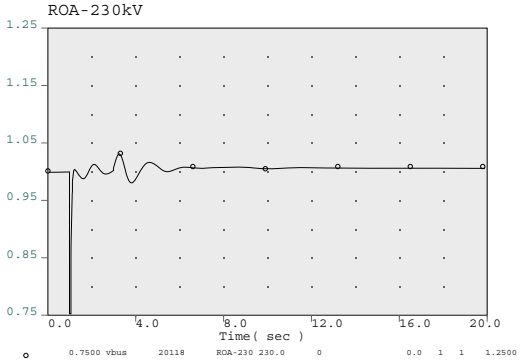
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Voltage Check and Comparison

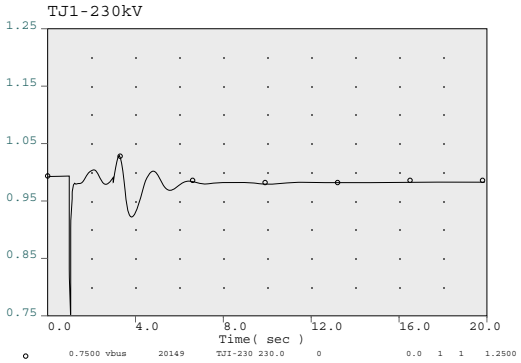
PAR/PID 230kV



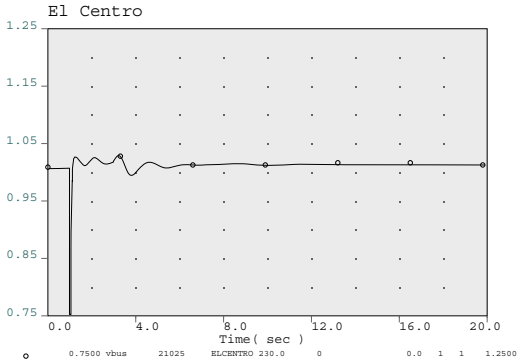
ROA-230kV



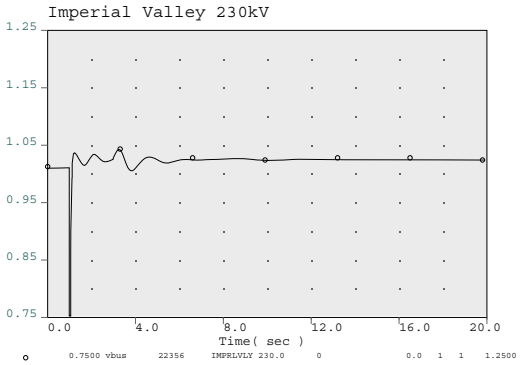
TJ1-230kV



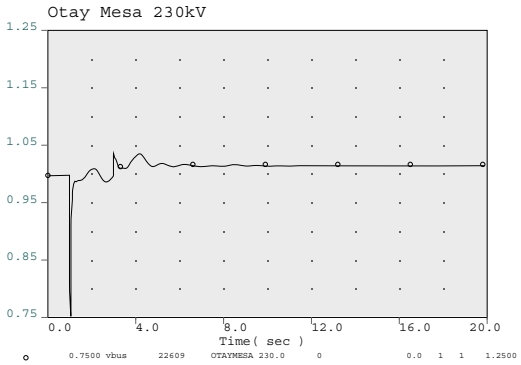
El Centro



Imperial Valley 230kV



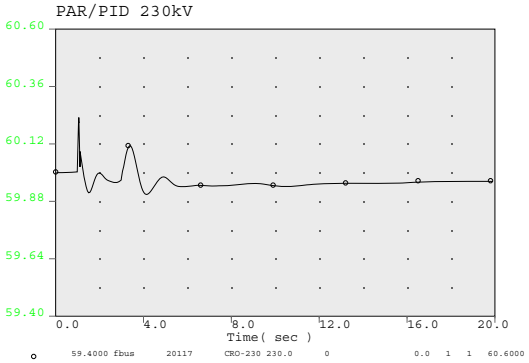
Otay Mesa 230kV



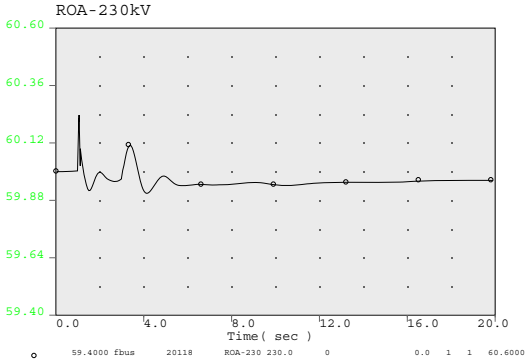
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Frequency Check and Comparison

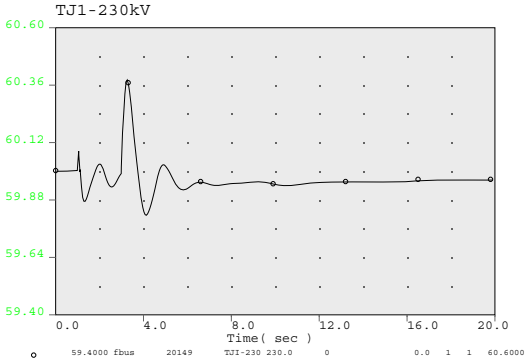
PAR/PID 230kV



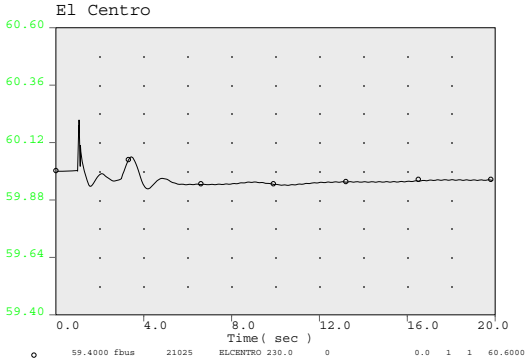
ROA-230kV



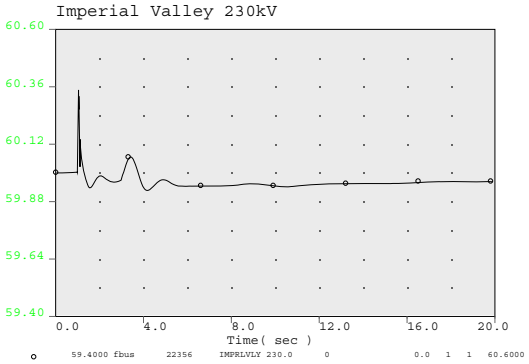
TJ1-230kV



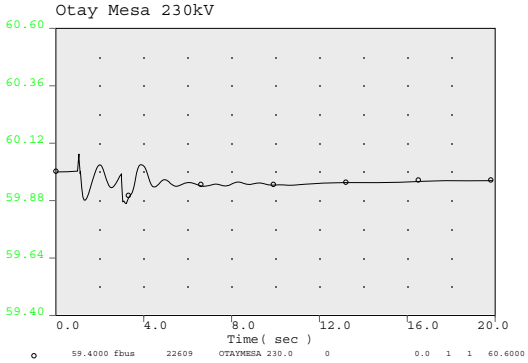
El Centro



Imperial Valley 230kV



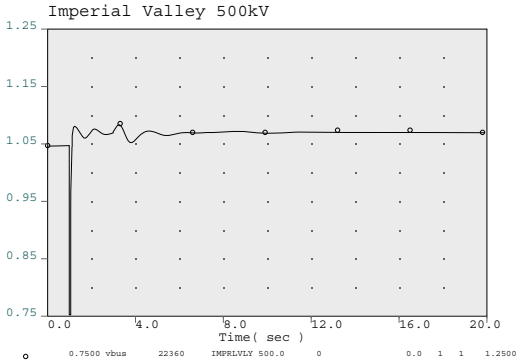
Otay Mesa 230kV



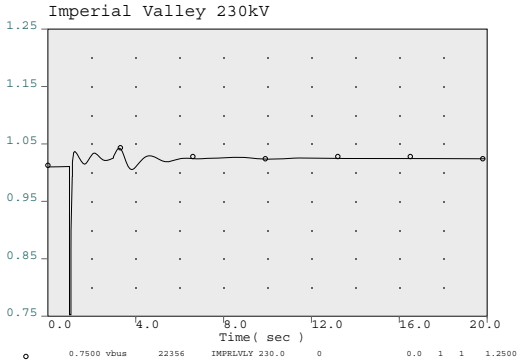
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Imperial Valley Area - VOLTAGE

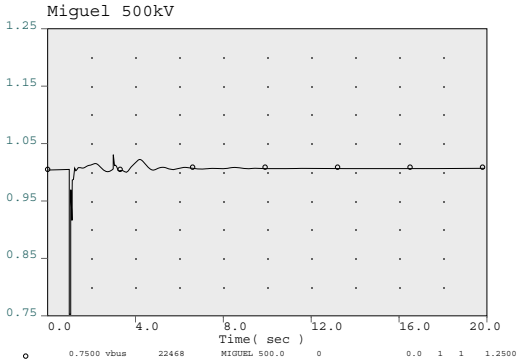
Imperial Valley 500kV



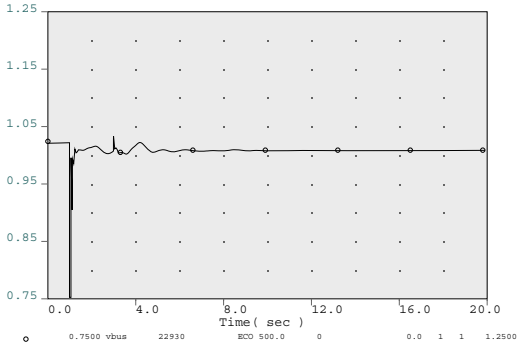
Imperial Valley 230kV



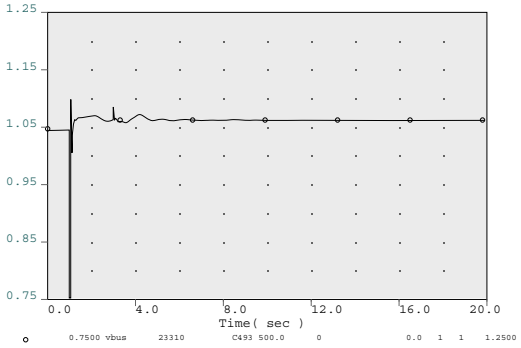
Miguel 500kV



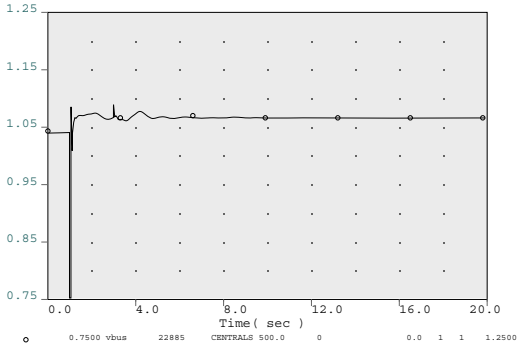
Windfarms 500



C493 500kV

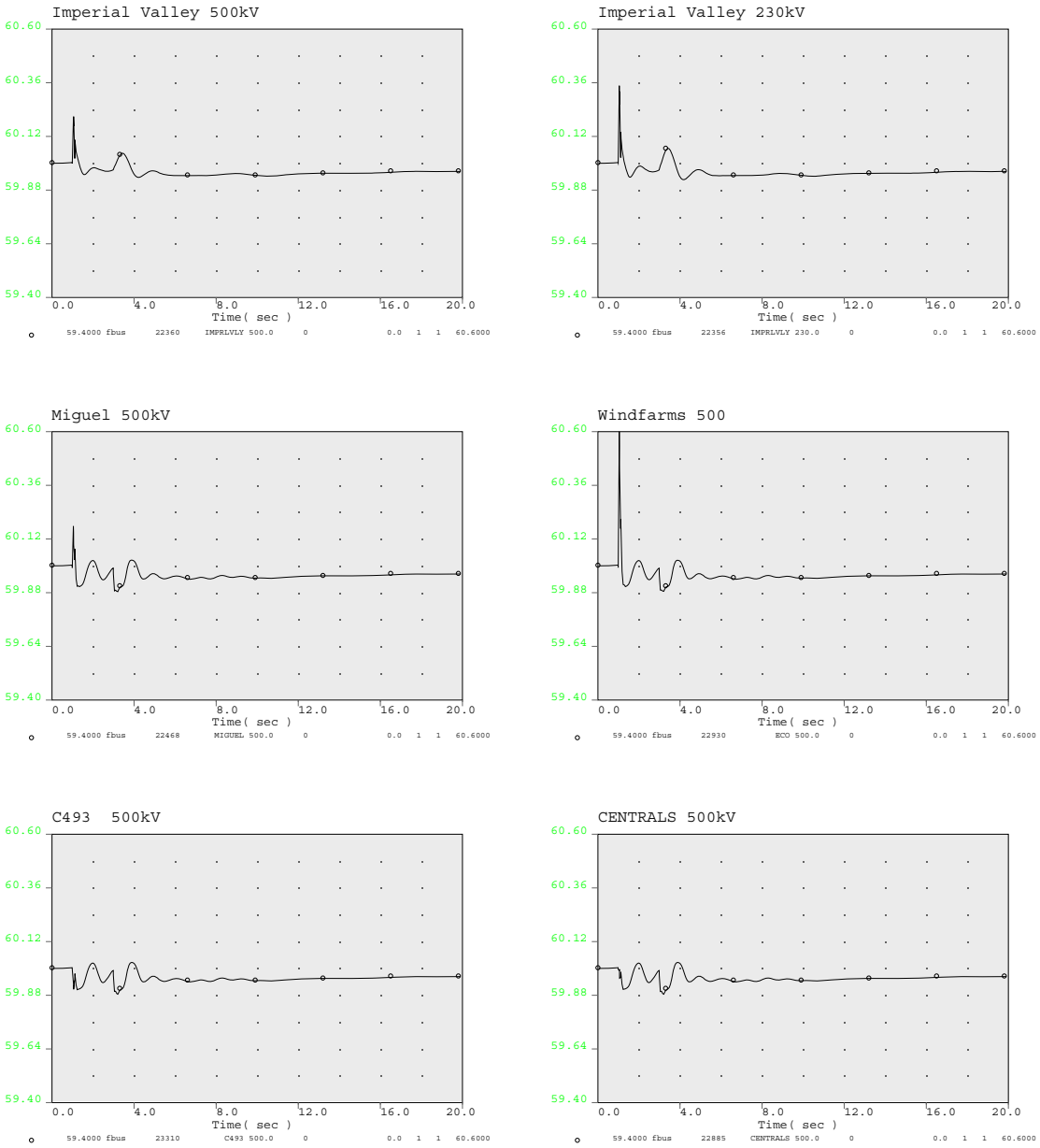


CENTRALS 500kV



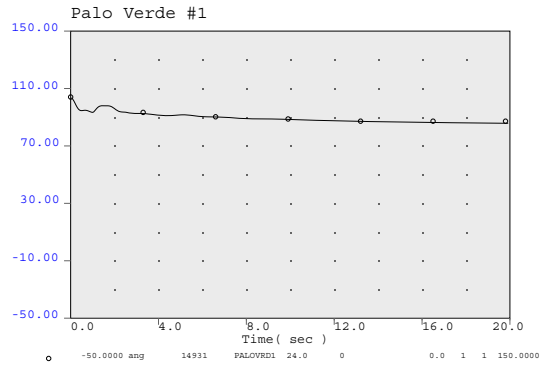
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

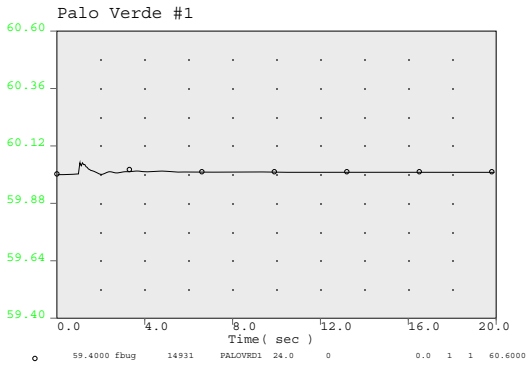
Imperial Valley Area - Frequency

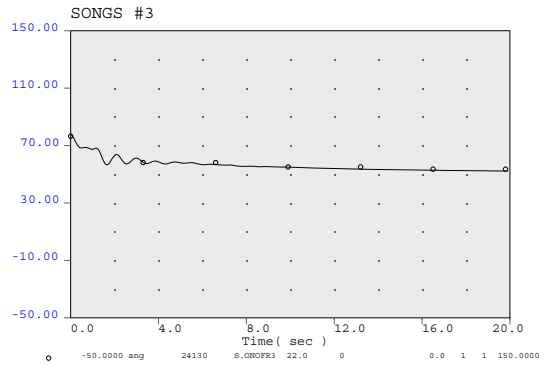


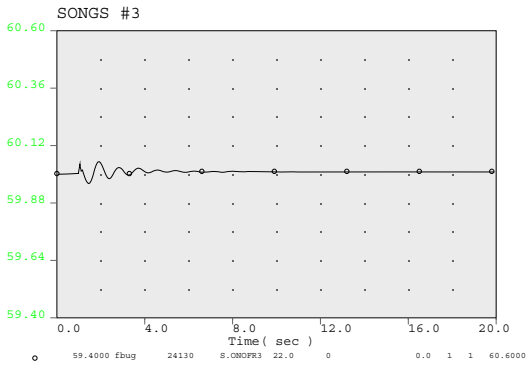
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

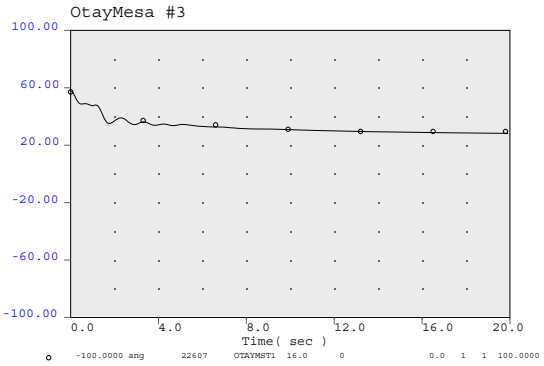
RELATIVE ROTOR ANGLE & FREQUENCY

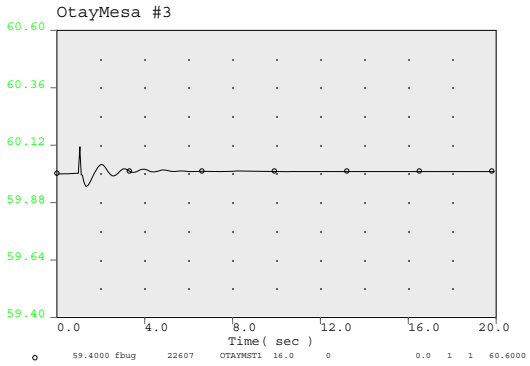












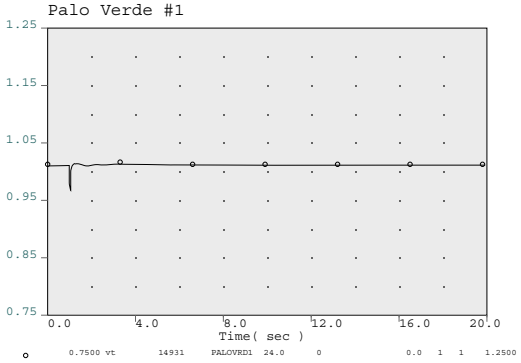
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

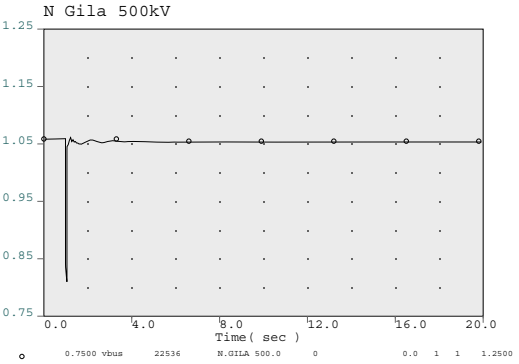
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RELATIVE VOLTAGE

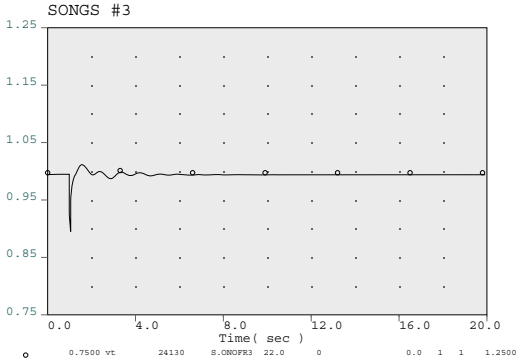
Palo Verde #1



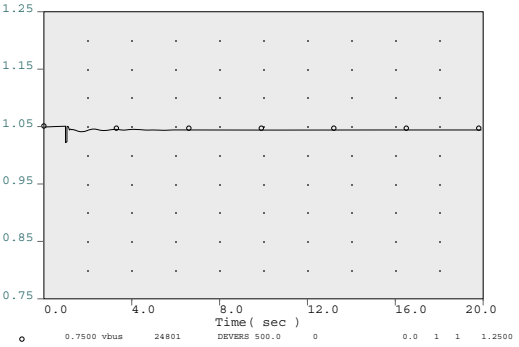
N Gila 500kV



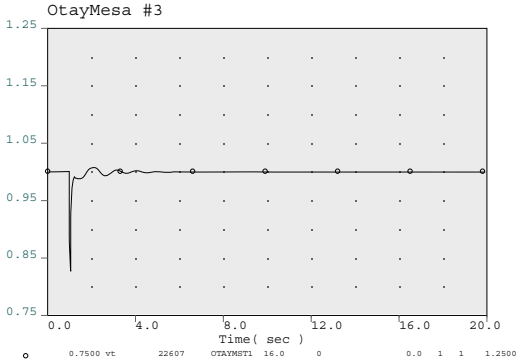
SONGS #3



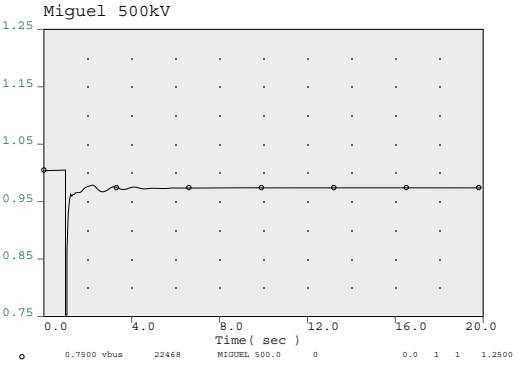
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OtayMesa #3



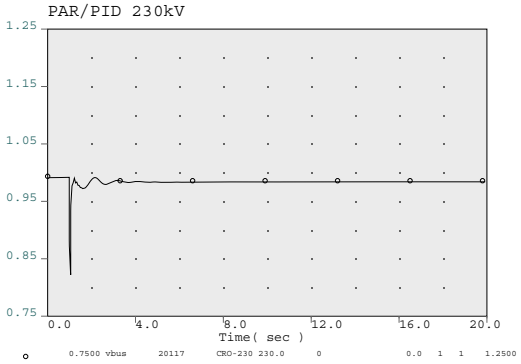
Miguel 500kV



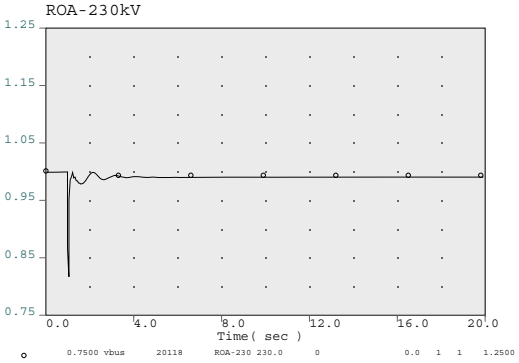
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

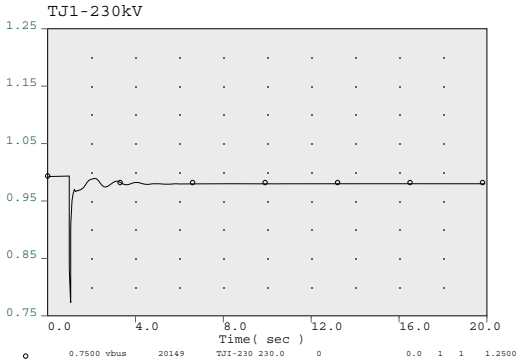
PAR/PID 230kV



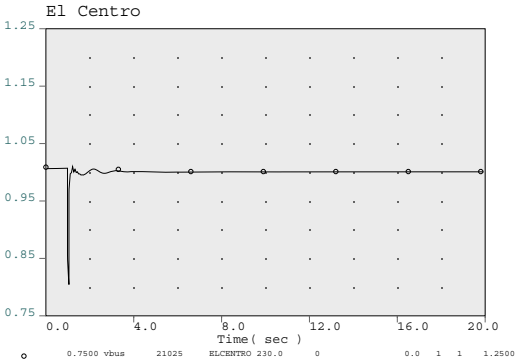
ROA-230kV



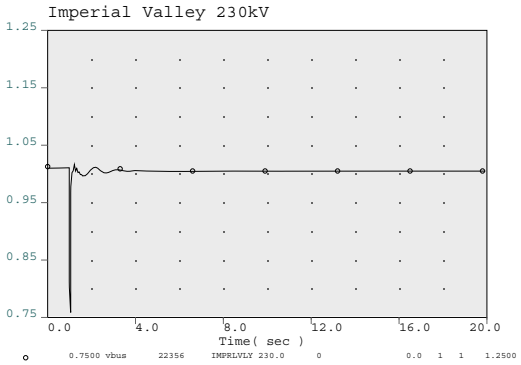
TJ1-230kV



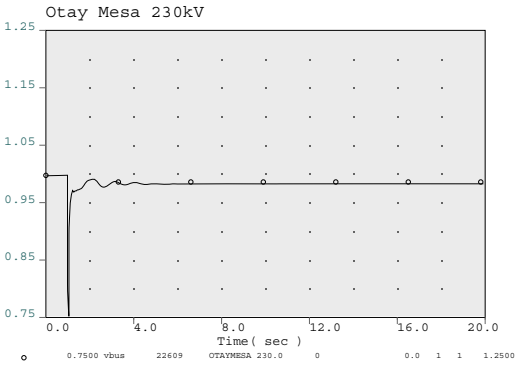
El Centro



Imperial Valley 230kV



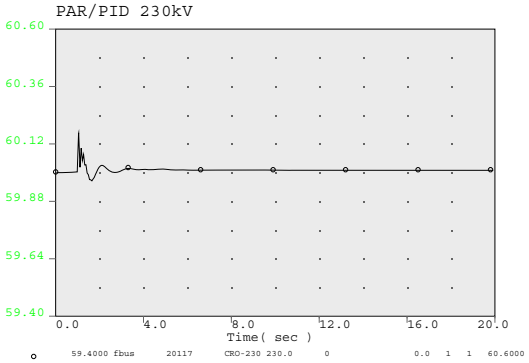
Otay Mesa 230kV



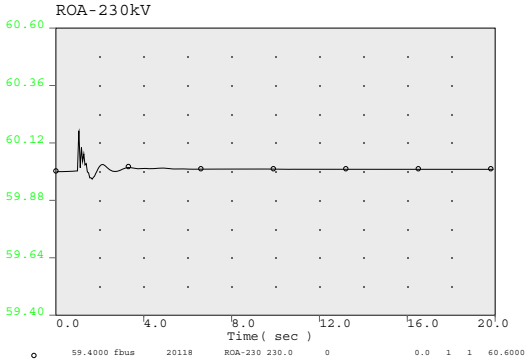
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

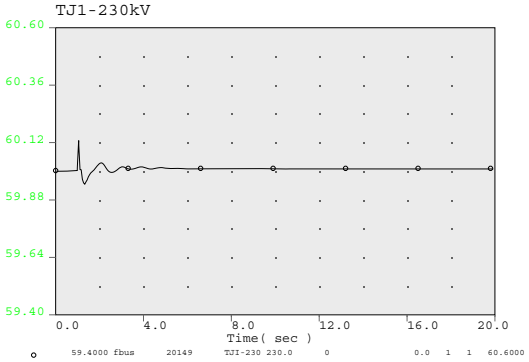
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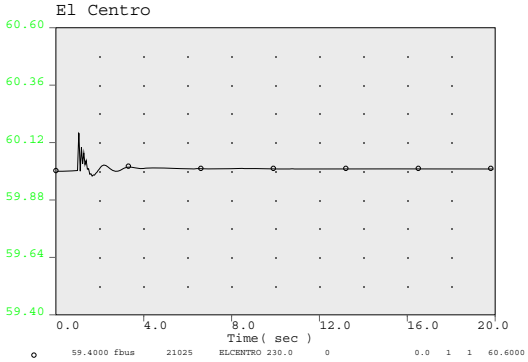
ROA-230kV



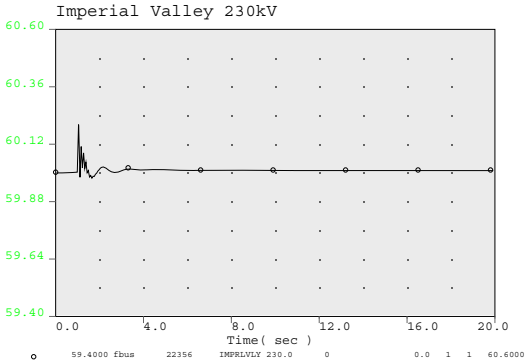
TJ1-230kV



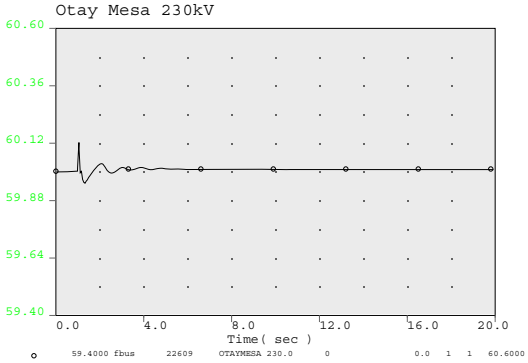
El Centro



Imperial Valley 230kV



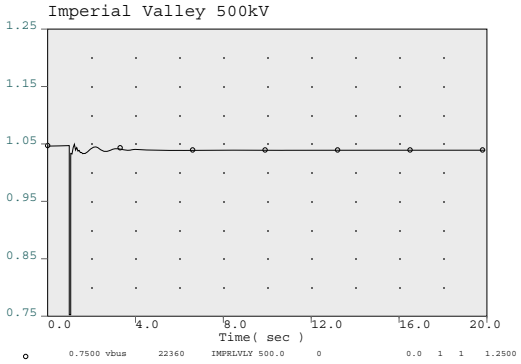
Otay Mesa 230kV



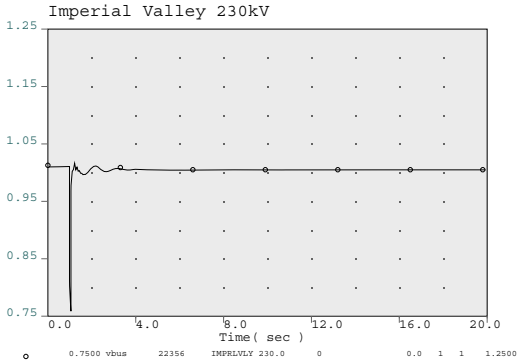
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

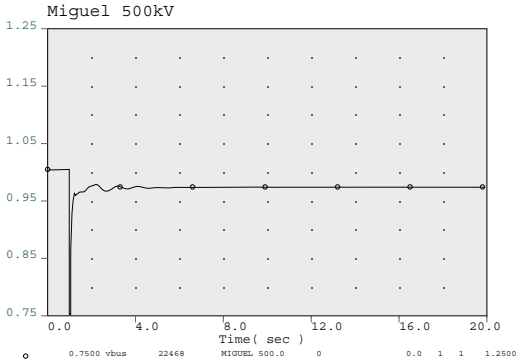
Imperial Valley 500kV



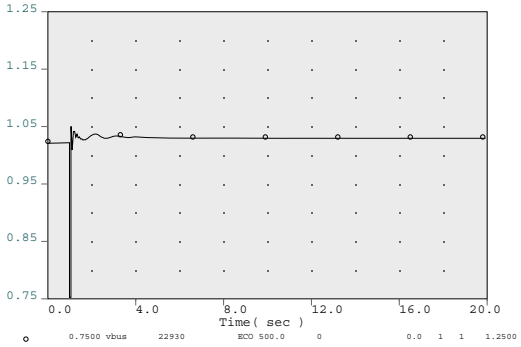
Imperial Valley 230kV



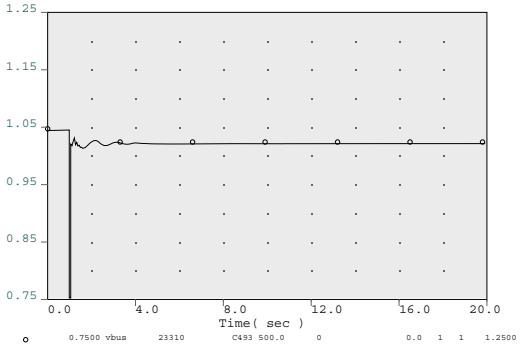
Miguel 500kV



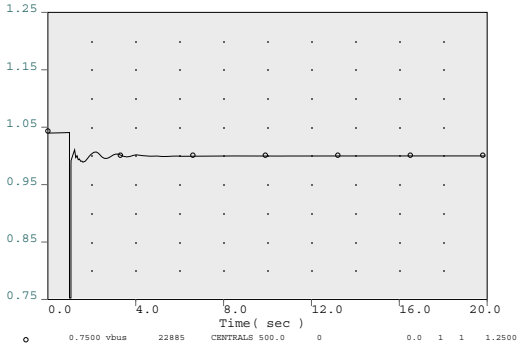
Windfarms 500



C493 500kV

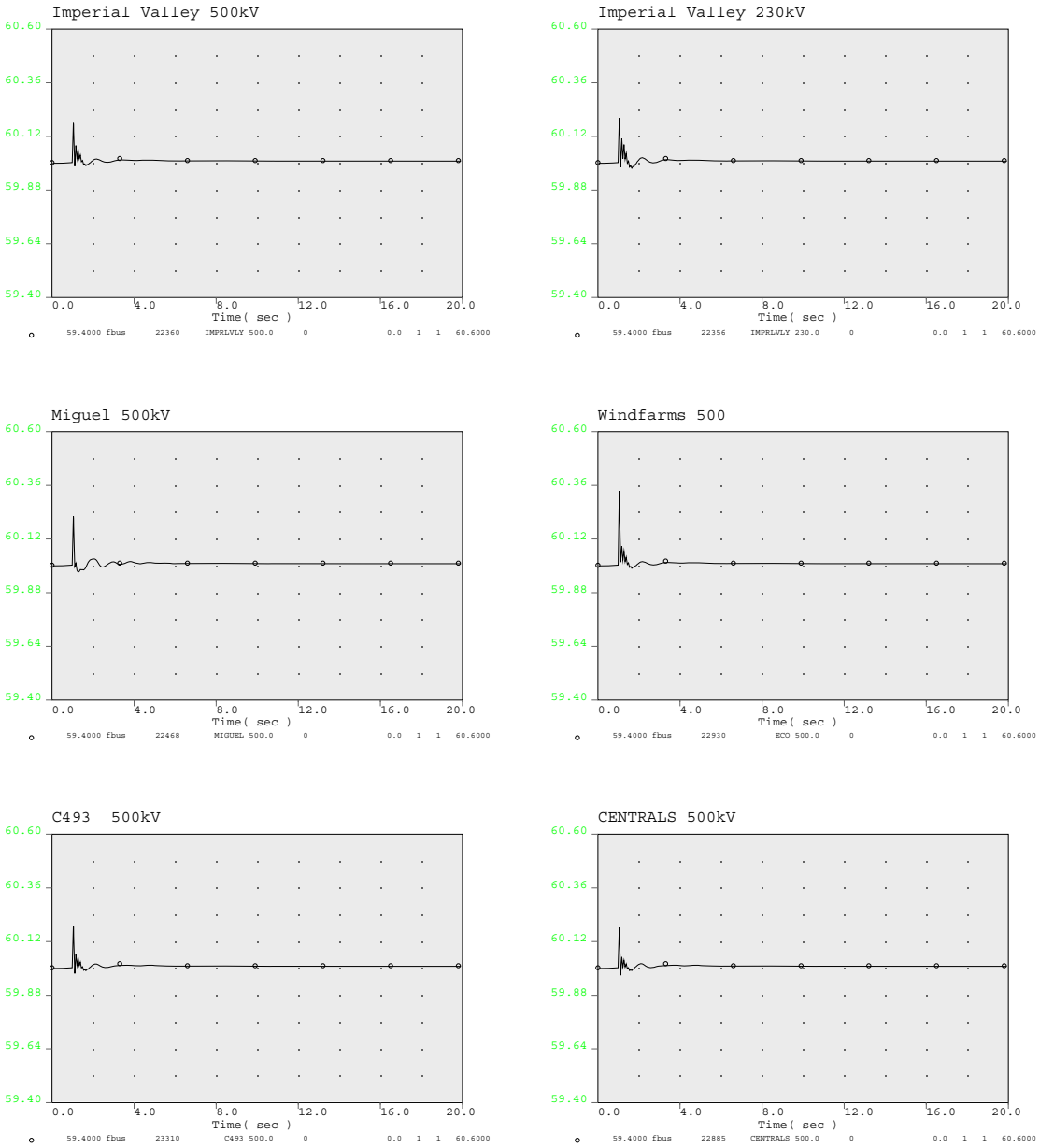


CENTRALS 500kV



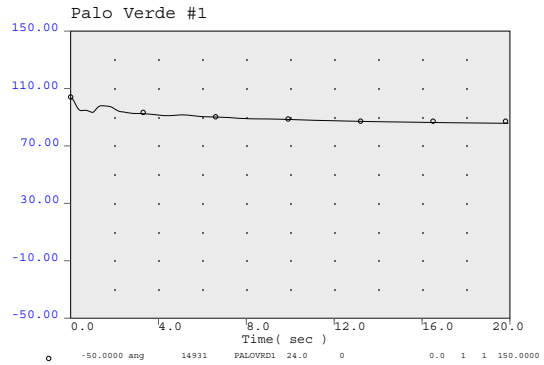
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

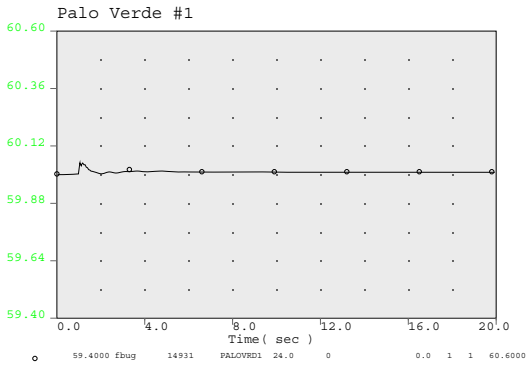
Imperial Valley Area - Frequency

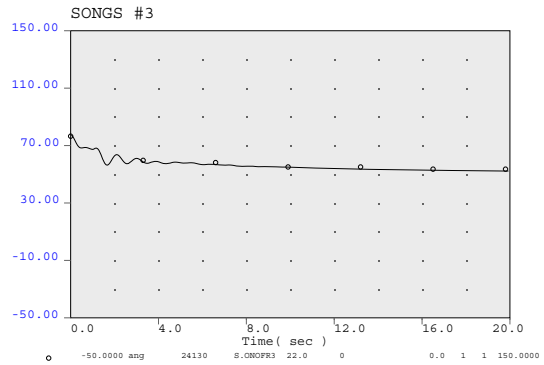


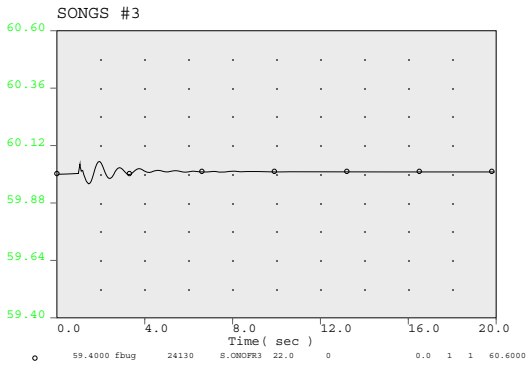
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

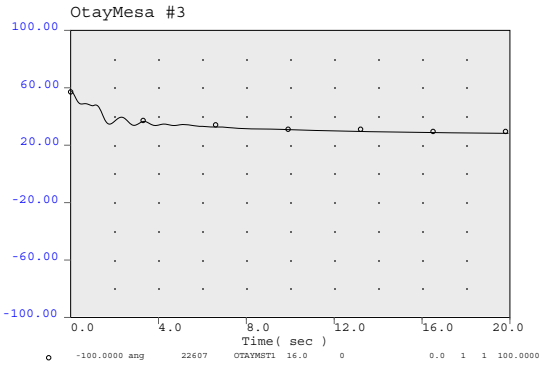
RELATIVE ROTOR ANGLE & FREQUENCY

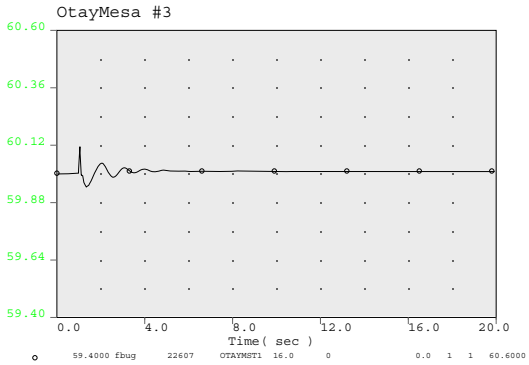






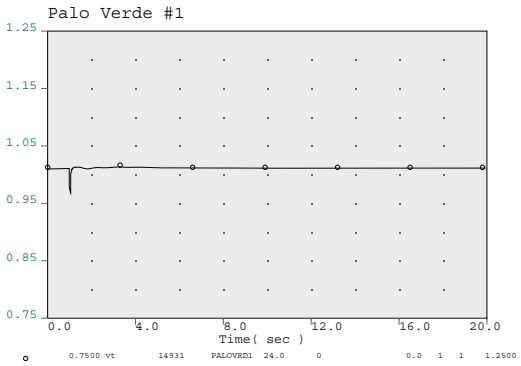


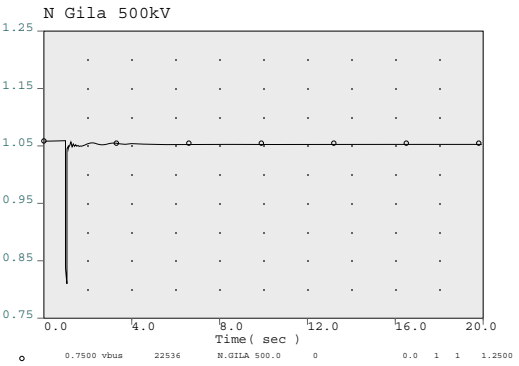


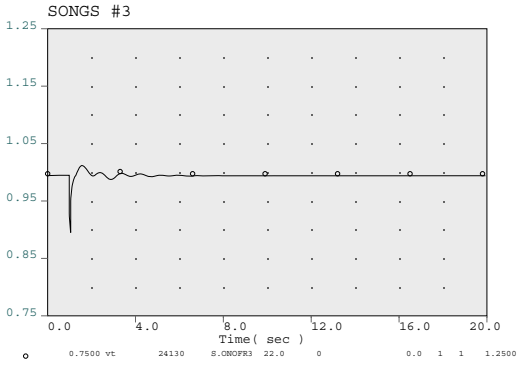


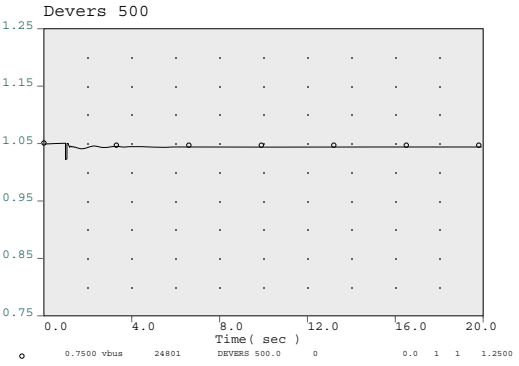
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

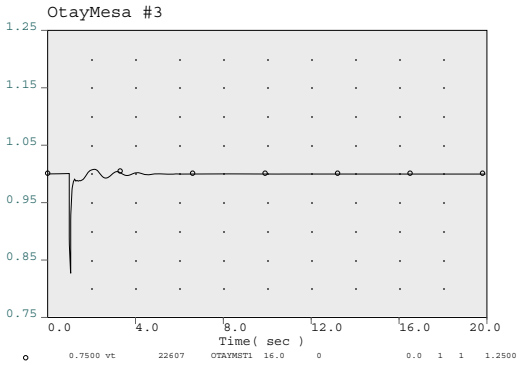
RELATIVE VOLTAGE

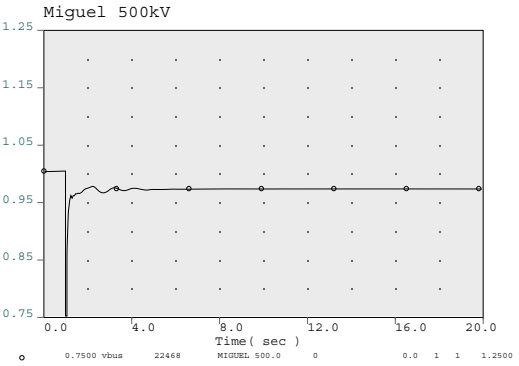








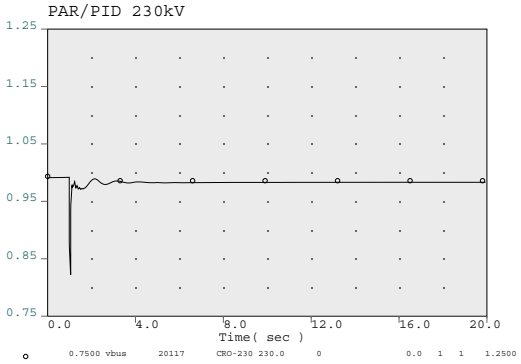




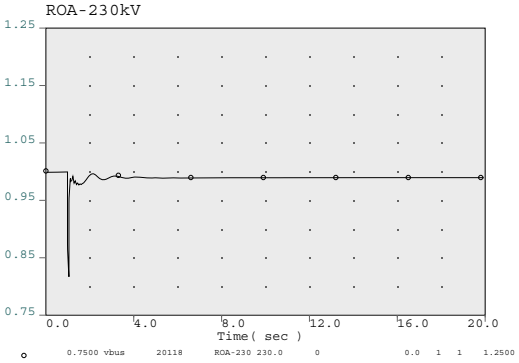
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

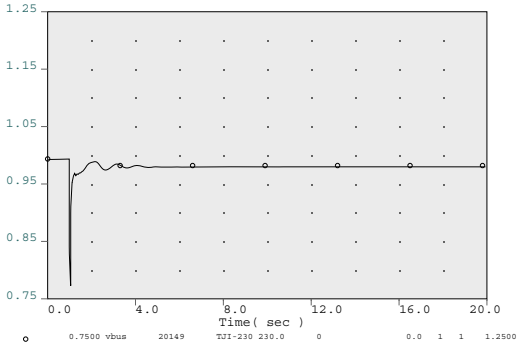
PAR/PID 230kV



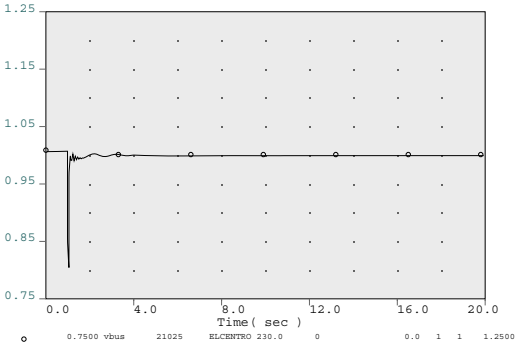
ROA-230kV



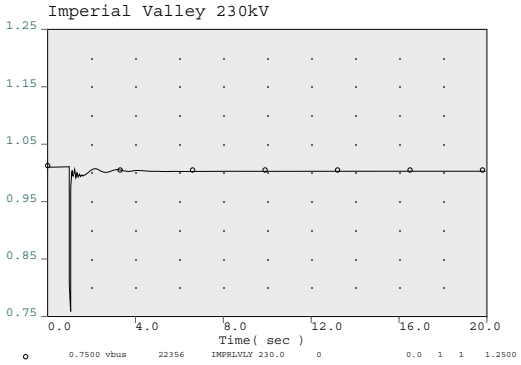
TJ1-230kV



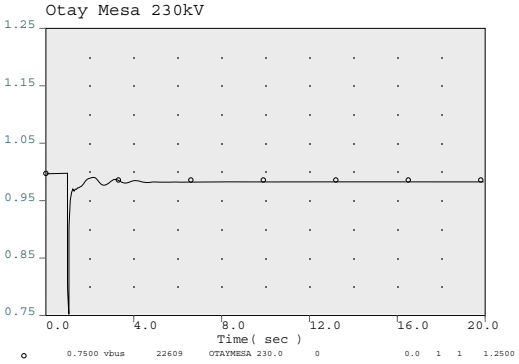
El Centro



Imperial Valley 230kV



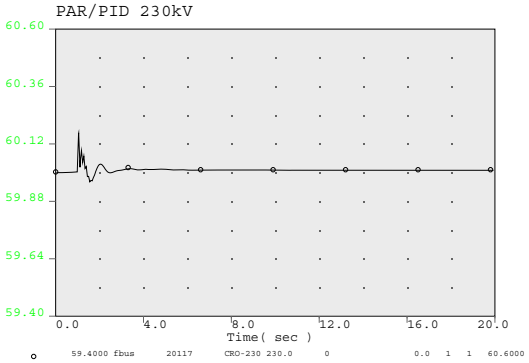
Otay Mesa 230kV



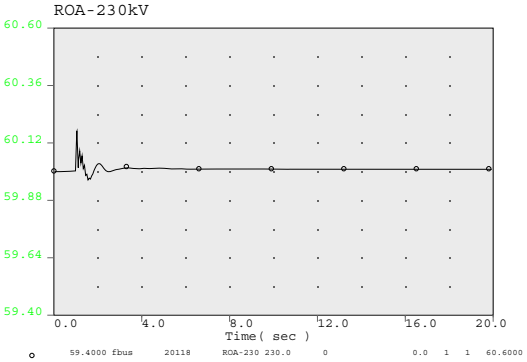
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

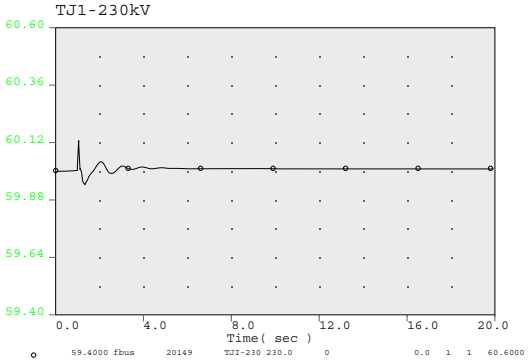
PAR/PID 230kV



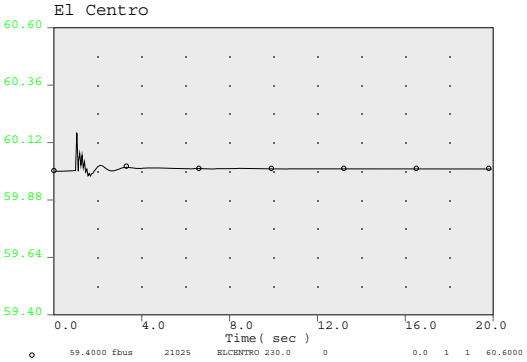
ROA-230kV



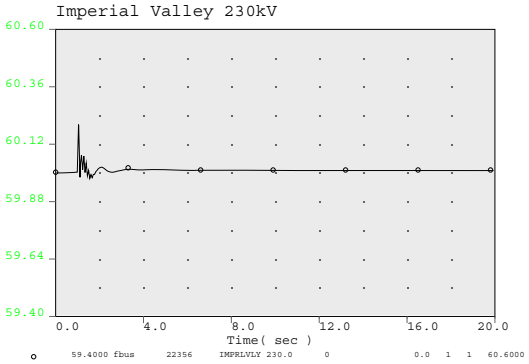
TJ1-230kV



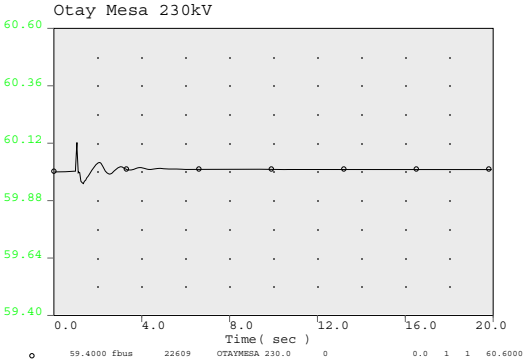
El Centro



Imperial Valley 230kV



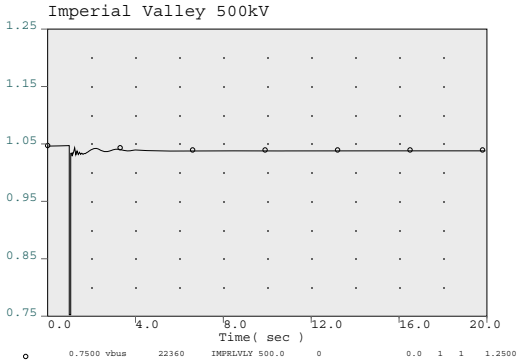
Otay Mesa 230kV



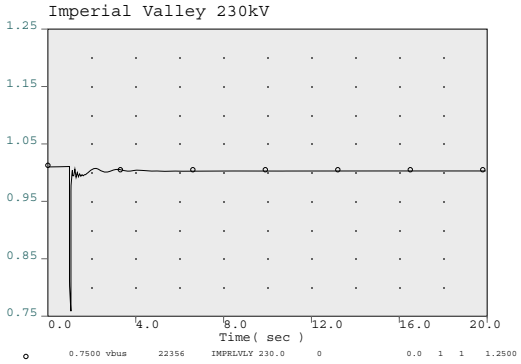
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

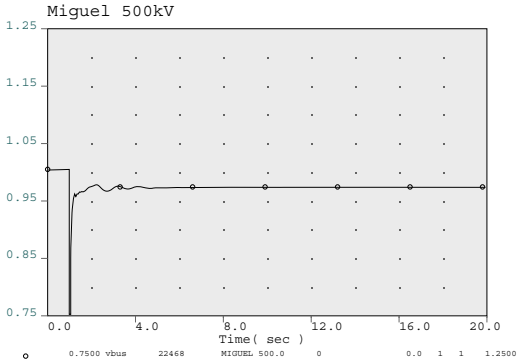
Imperial Valley 500kV



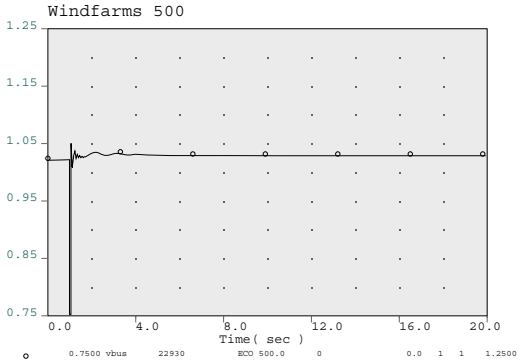
Imperial Valley 230kV



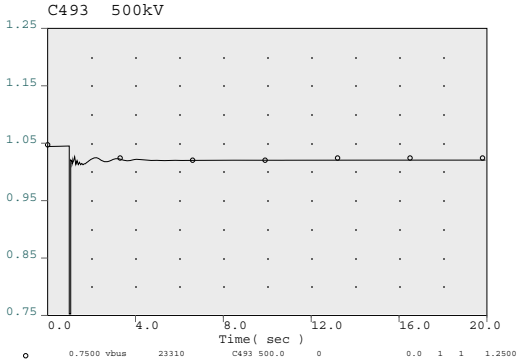
Miguel 500kV



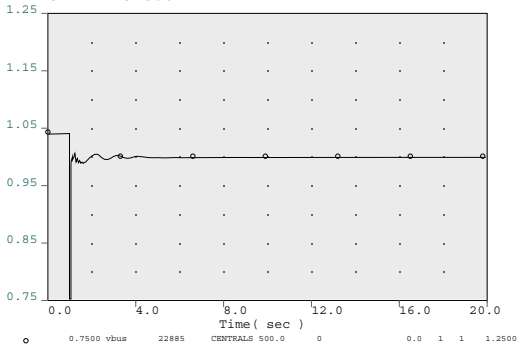
Windfarms 500



C493 500kV

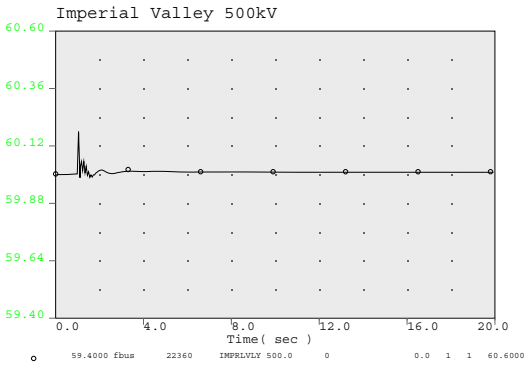


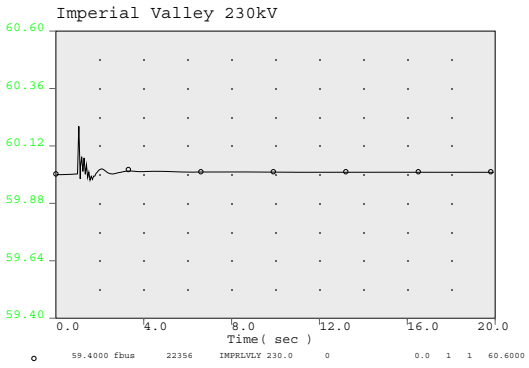
CENTRALS 500kV

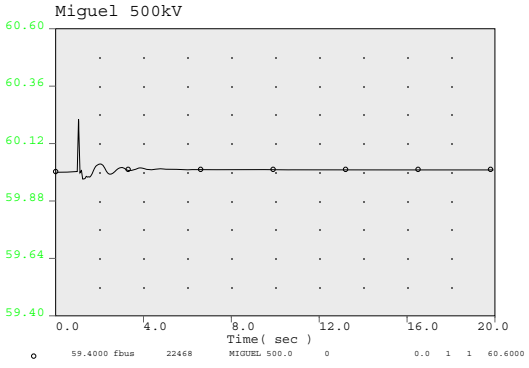


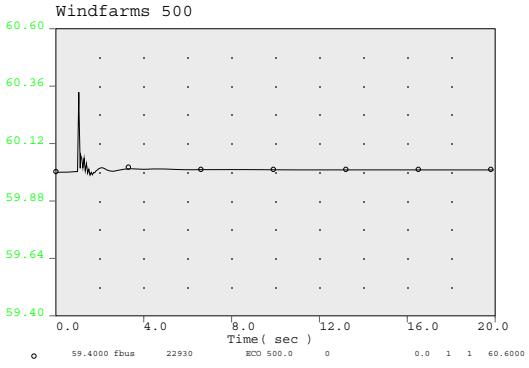
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

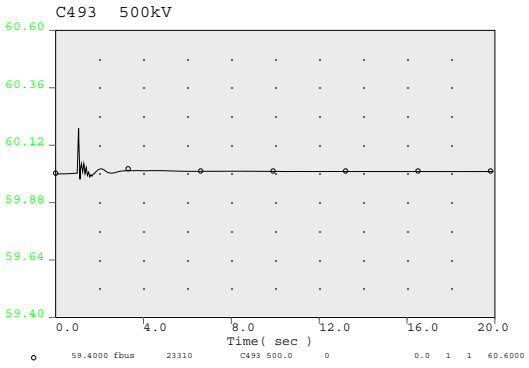
Imperial Valley Area - Frequency

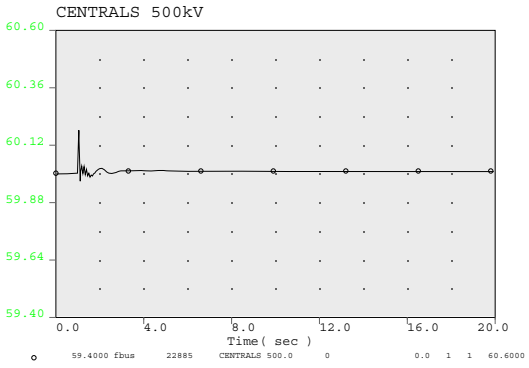






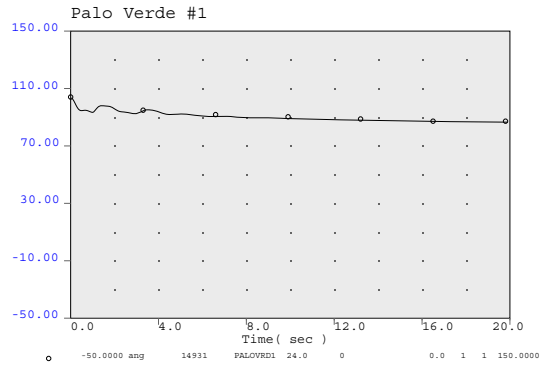


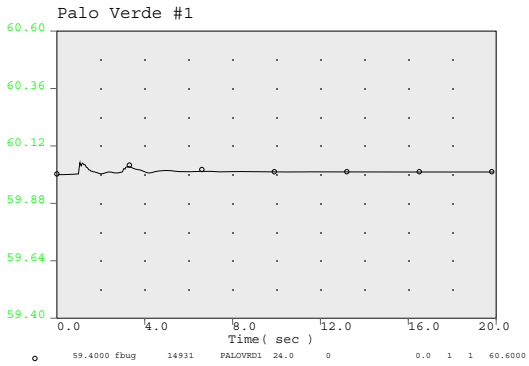


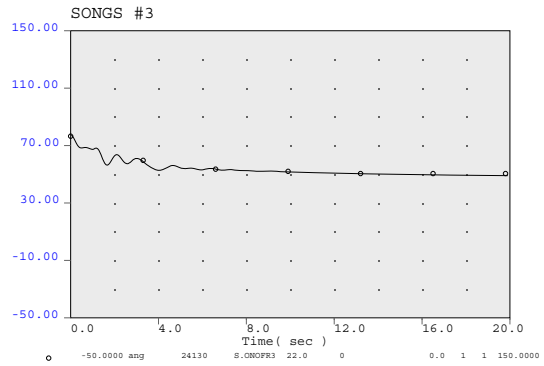


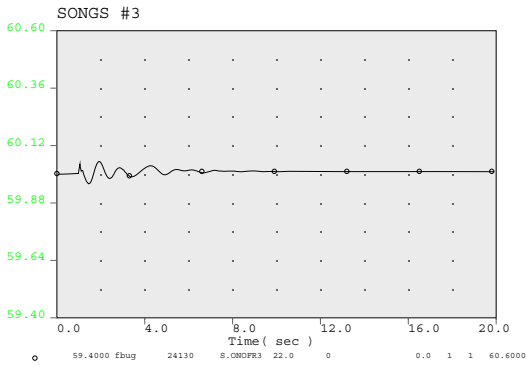
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

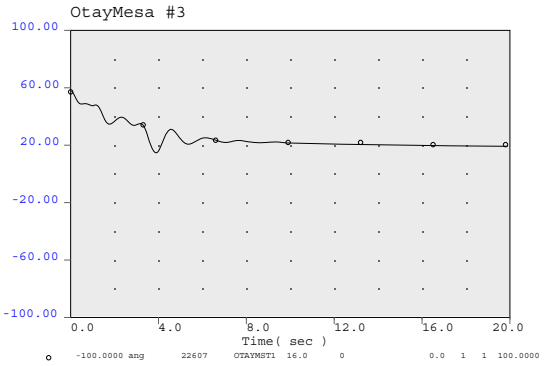
RELATIVE ROTOR ANGLE & FREQUENCY

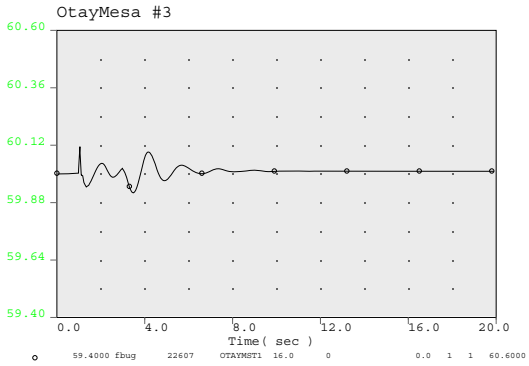












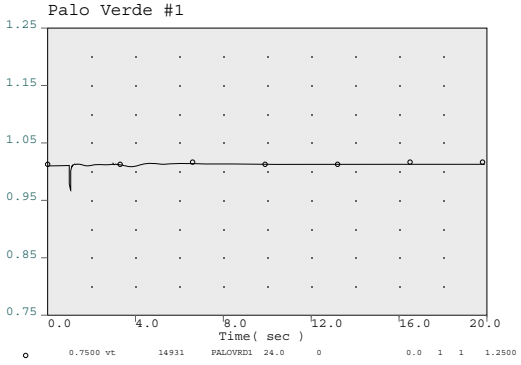
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

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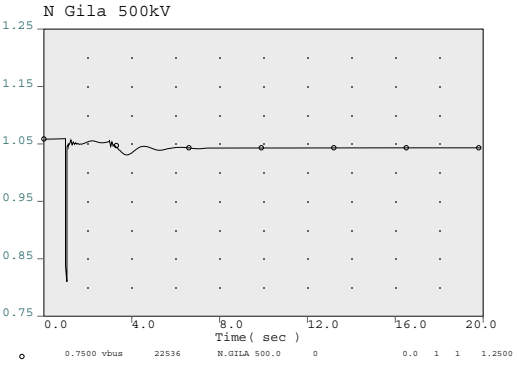
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RELATIVE VOLTAGE

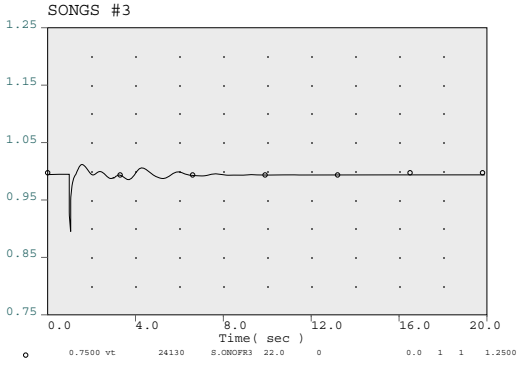
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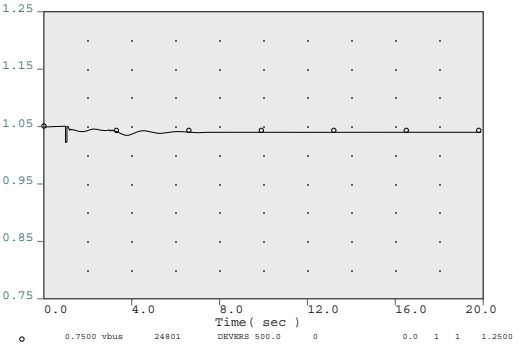
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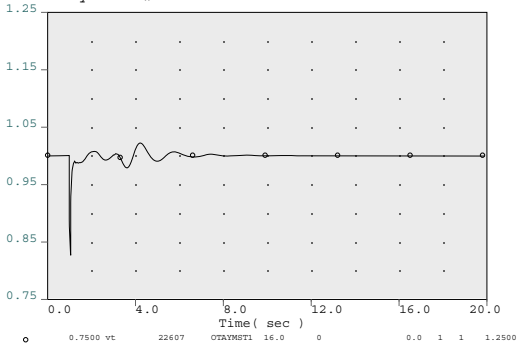
SONGS #3



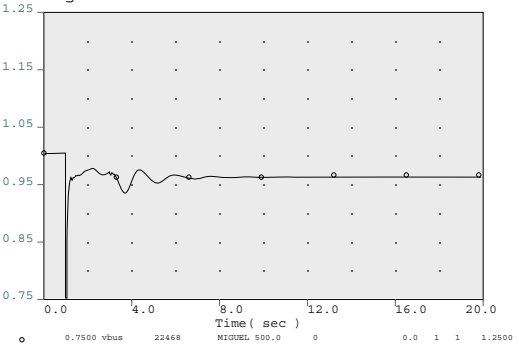
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OtayMesa #3



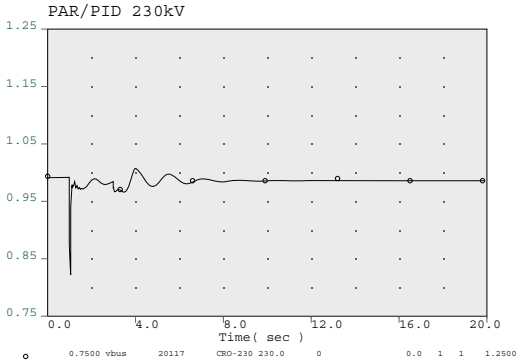
Miguel 500kV



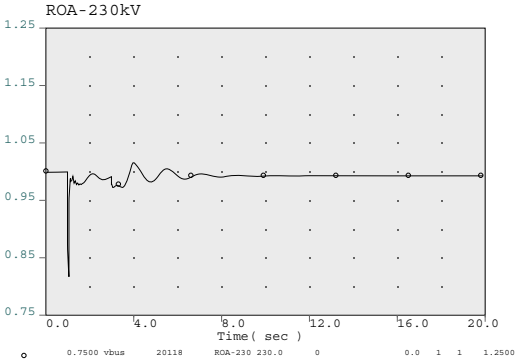
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

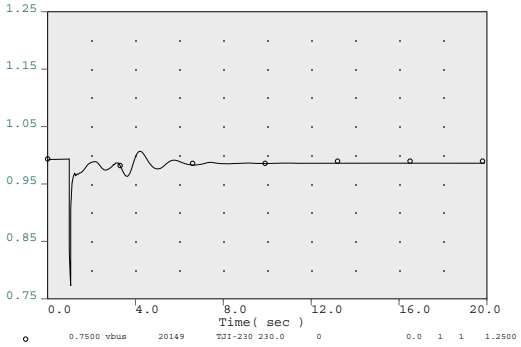
PAR/PID 230kV



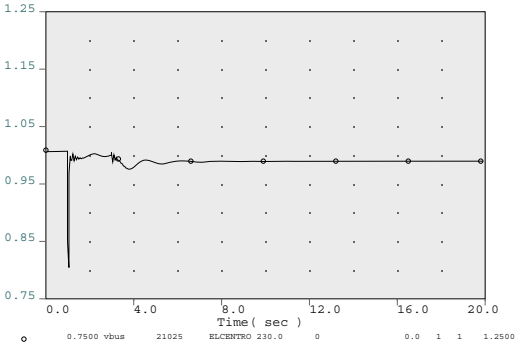
ROA-230kV



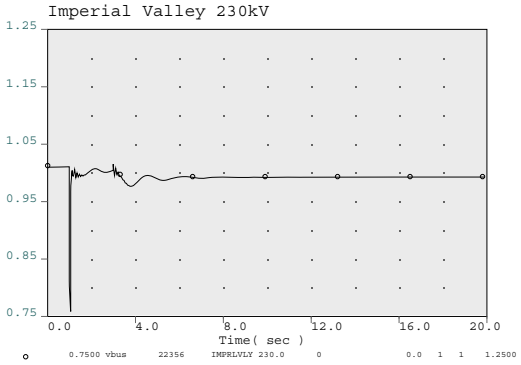
TJ1-230kV



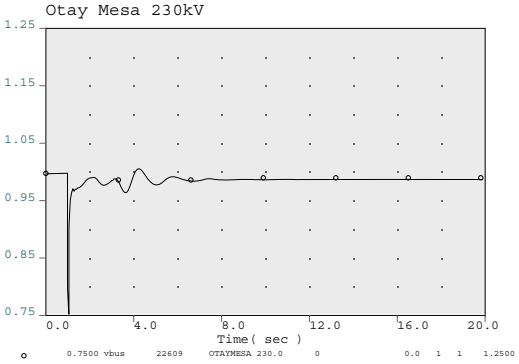
El Centro



Imperial Valley 230kV



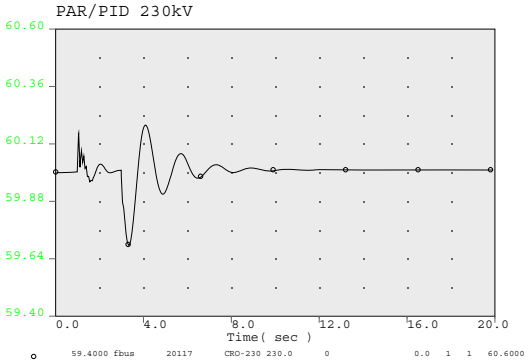
Otay Mesa 230kV



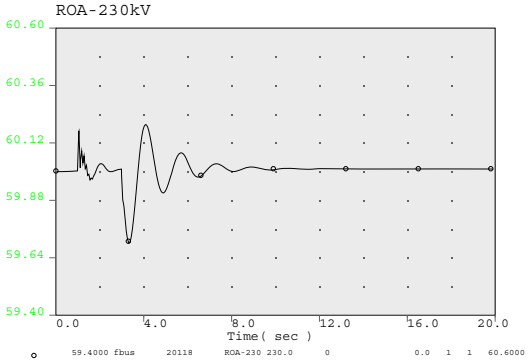
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

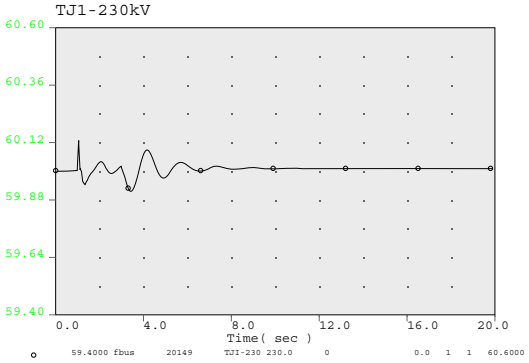
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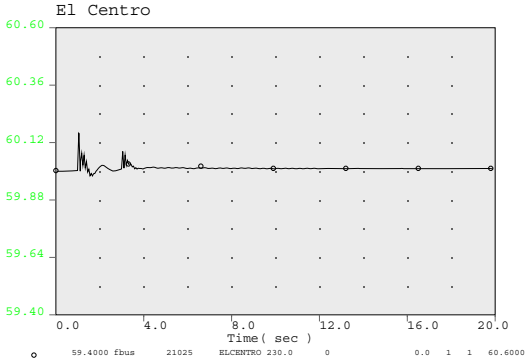
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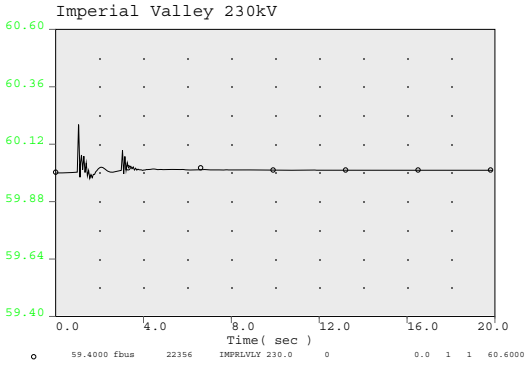
TJ1-230kV



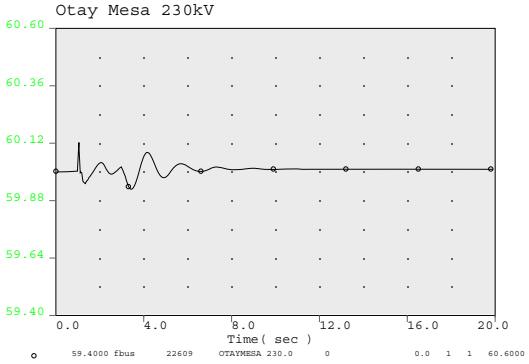
El Centro



Imperial Valley 230kV



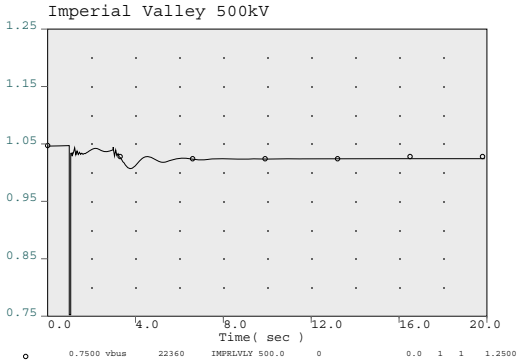
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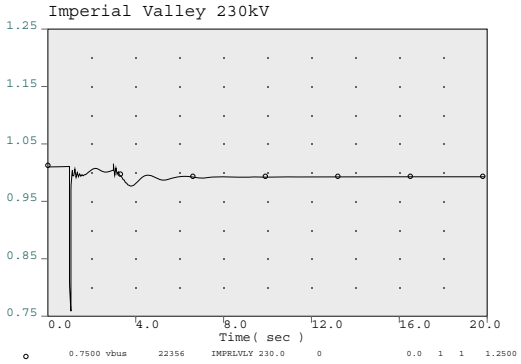
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

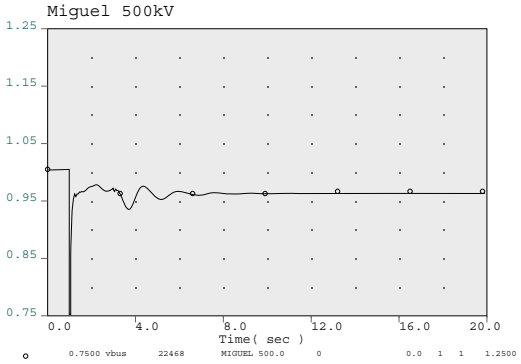
Imperial Valley 500kV



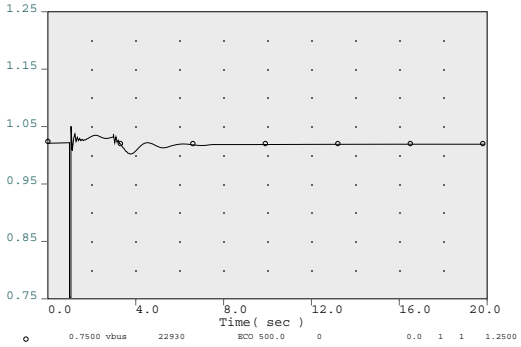
Imperial Valley 230kV



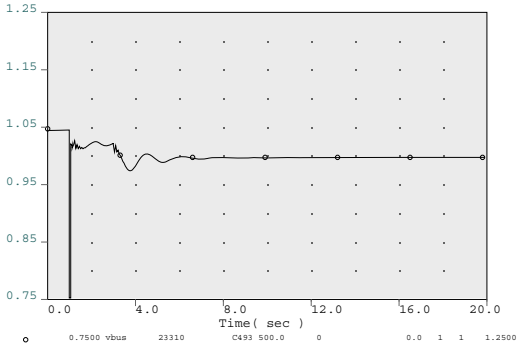
Miguel 500kV



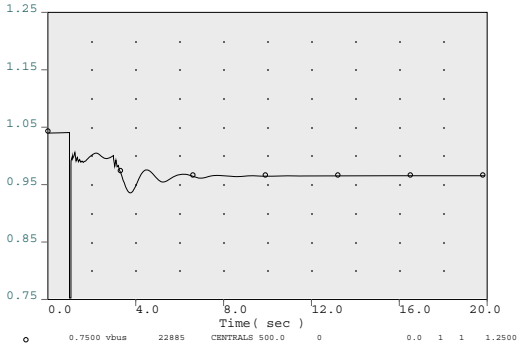
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C493 500kV

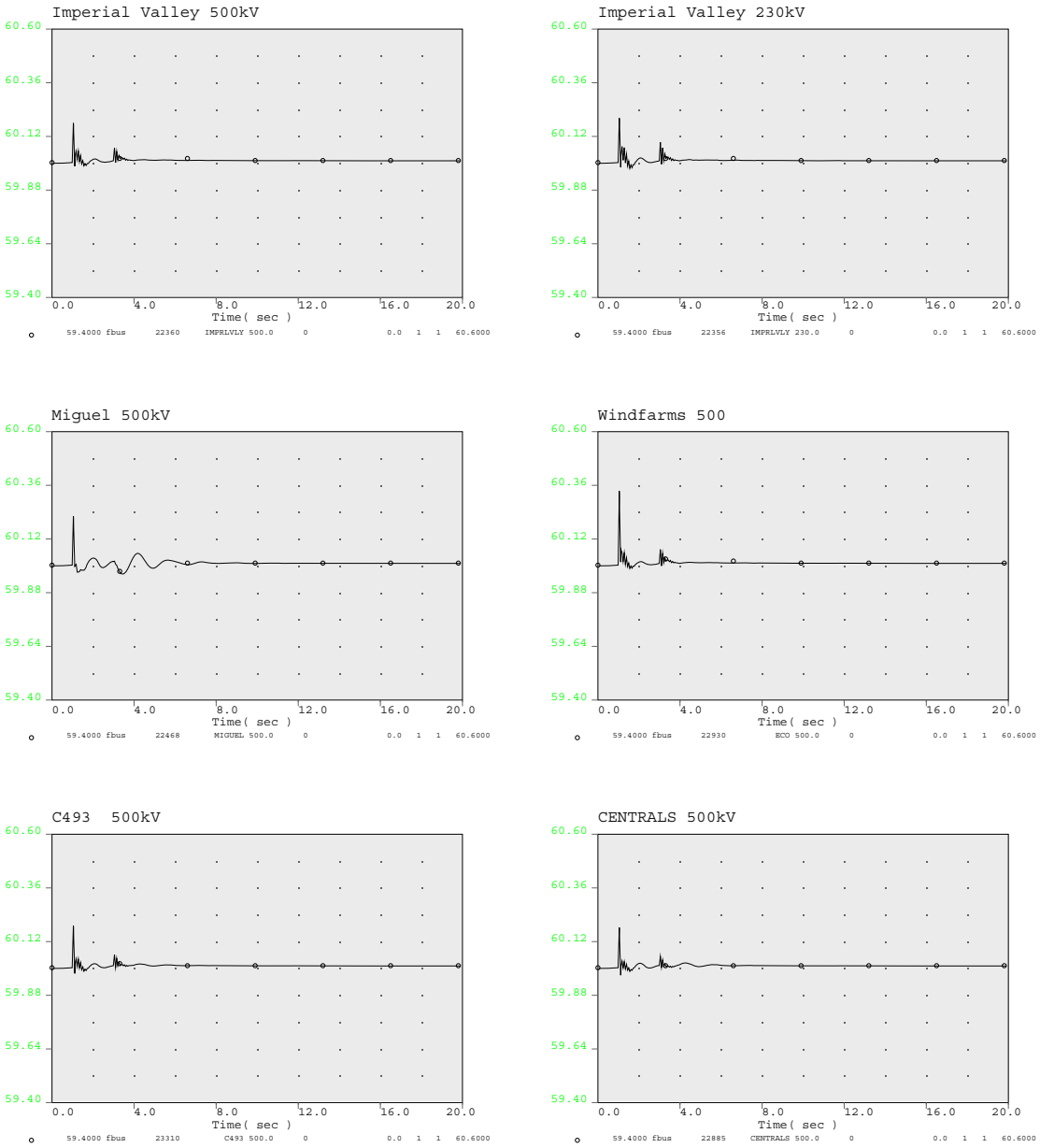


CENTRALS 500kV



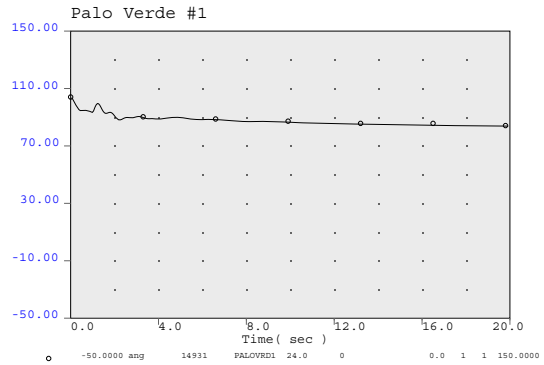
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

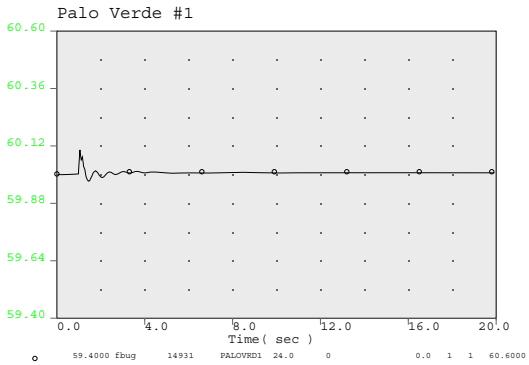
Imperial Valley Area - Frequency

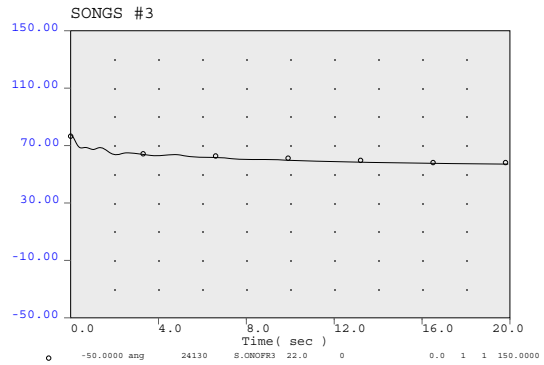


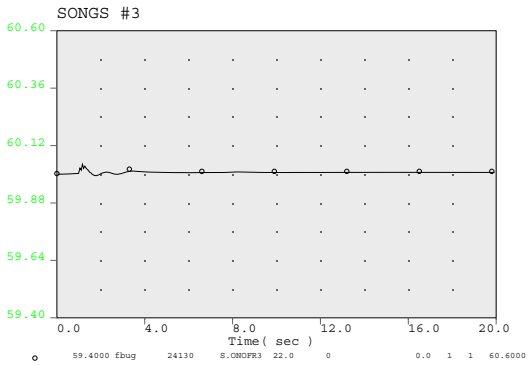
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

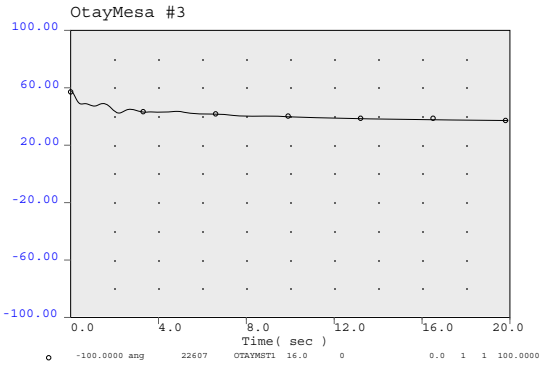
RELATIVE ROTOR ANGLE & FREQUENCY

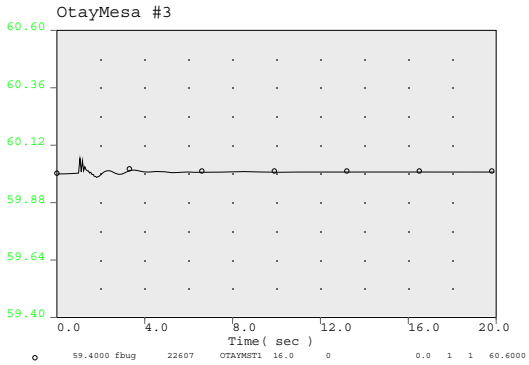










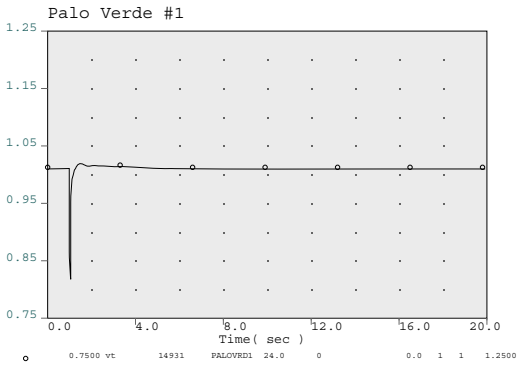


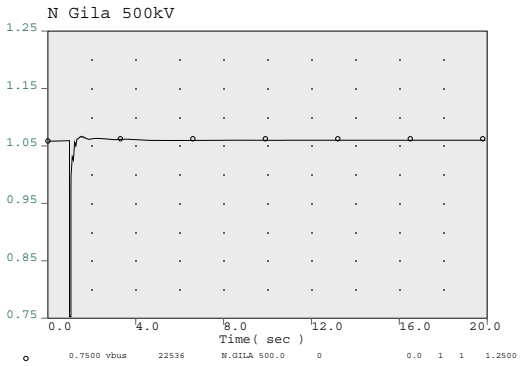
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

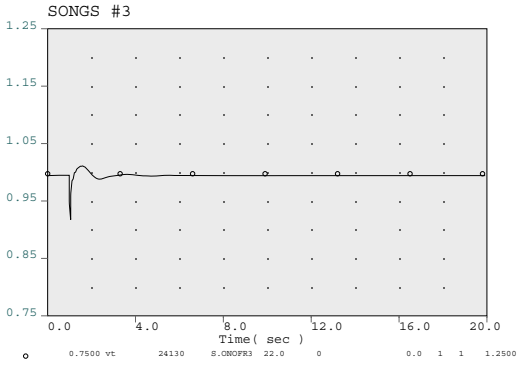
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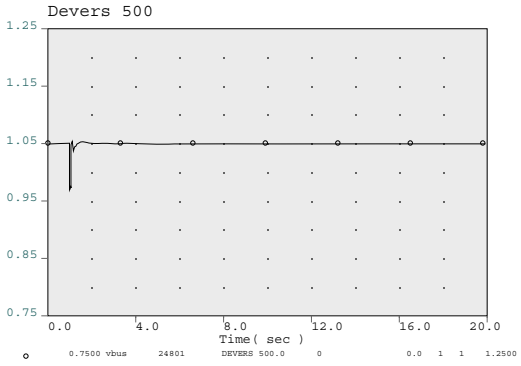
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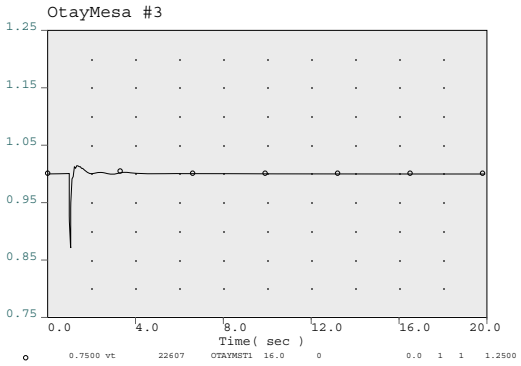
RELATIVE VOLTAGE

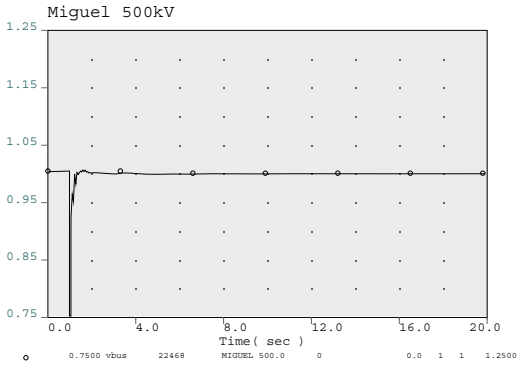








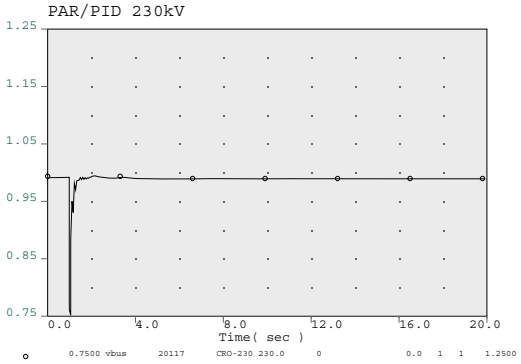




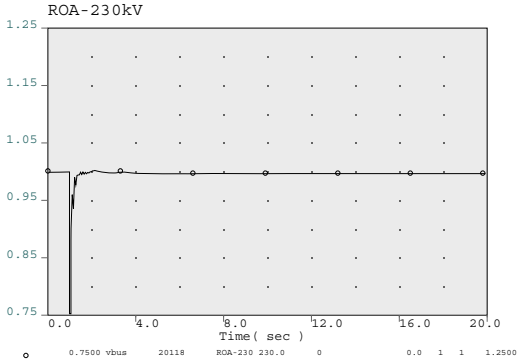
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

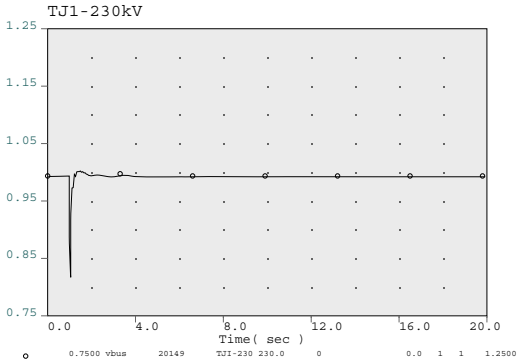
PAR/PID 230kV



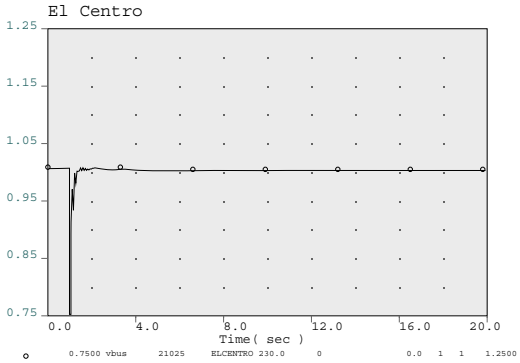
ROA-230kV



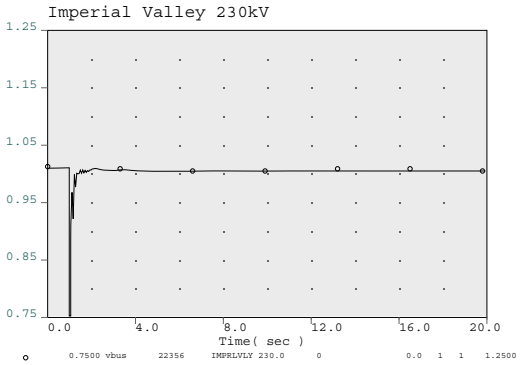
TJ1-230kV



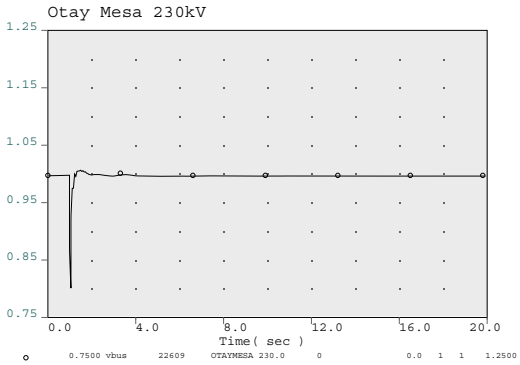
El Centro



Imperial Valley 230kV



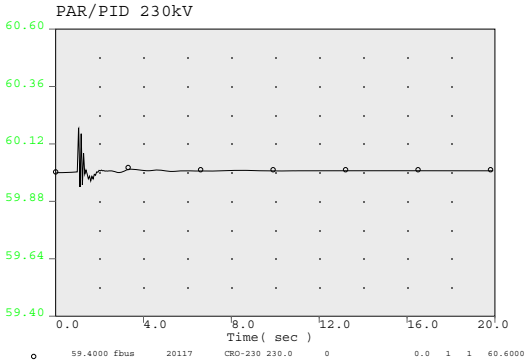
Otay Mesa 230kV



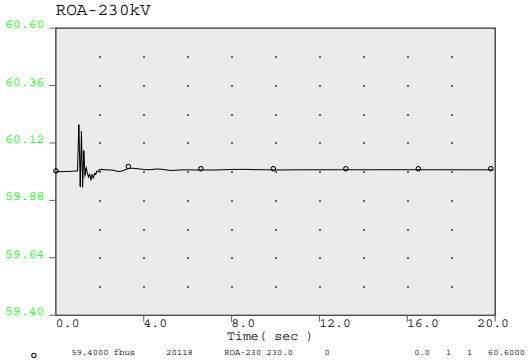
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

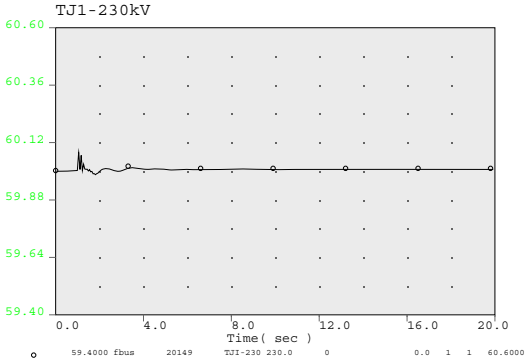
PAR/PID 230kV



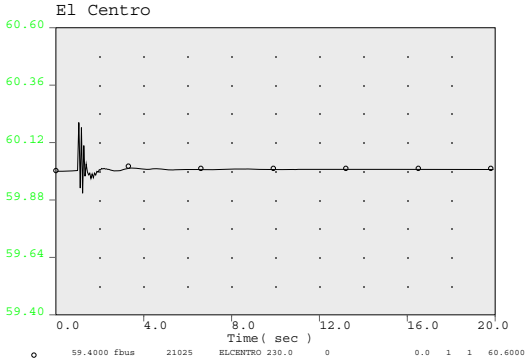
ROA-230kV



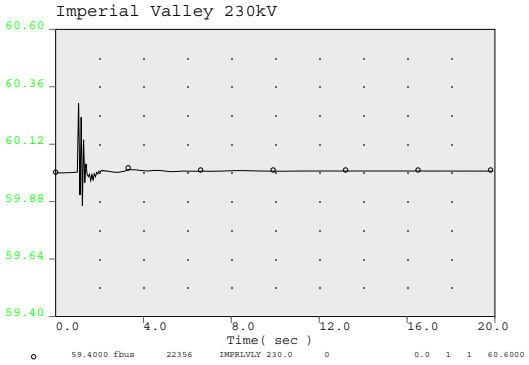
TJ1-230kV



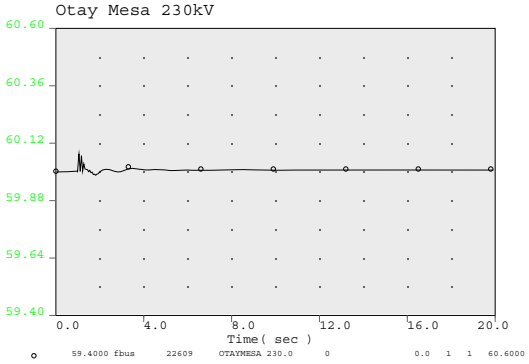
El Centro



Imperial Valley 230kV



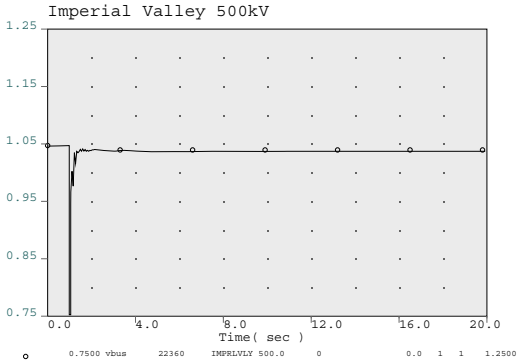
Otay Mesa 230kV



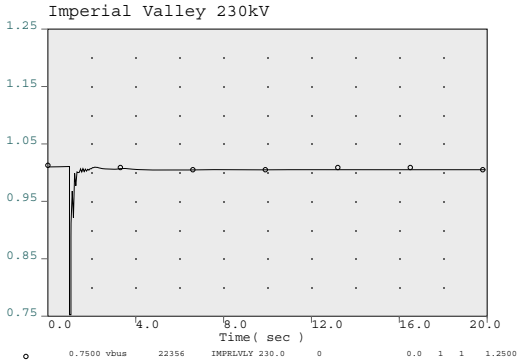
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

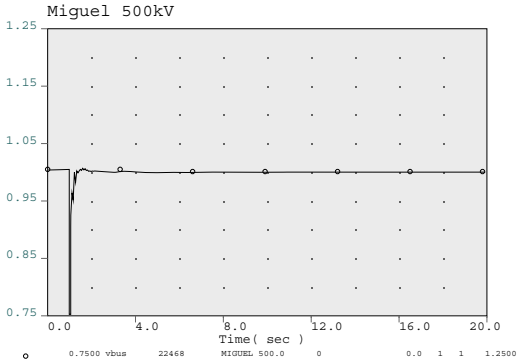
Imperial Valley 500kV



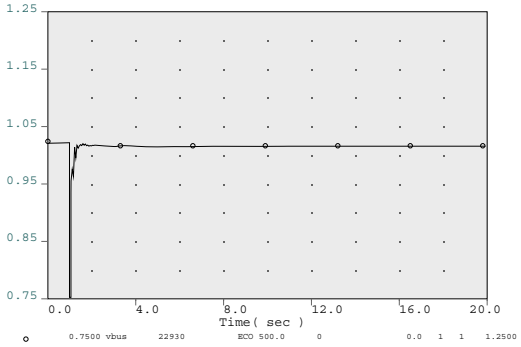
Imperial Valley 230kV



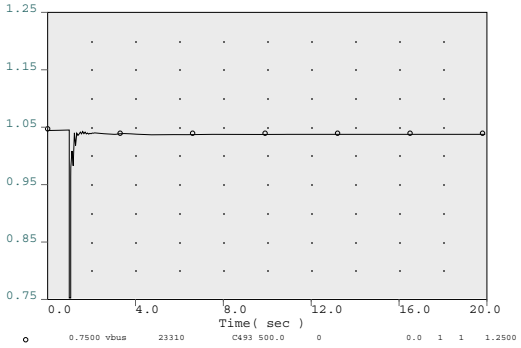
Miguel 500kV



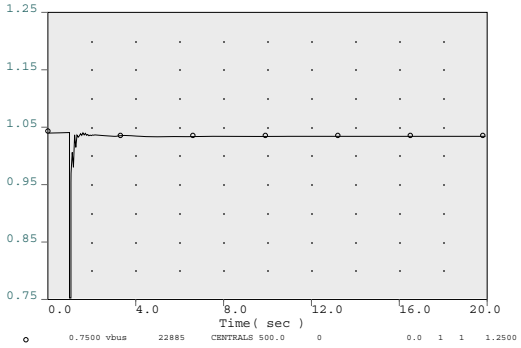
Windfarms 500



C493 500kV

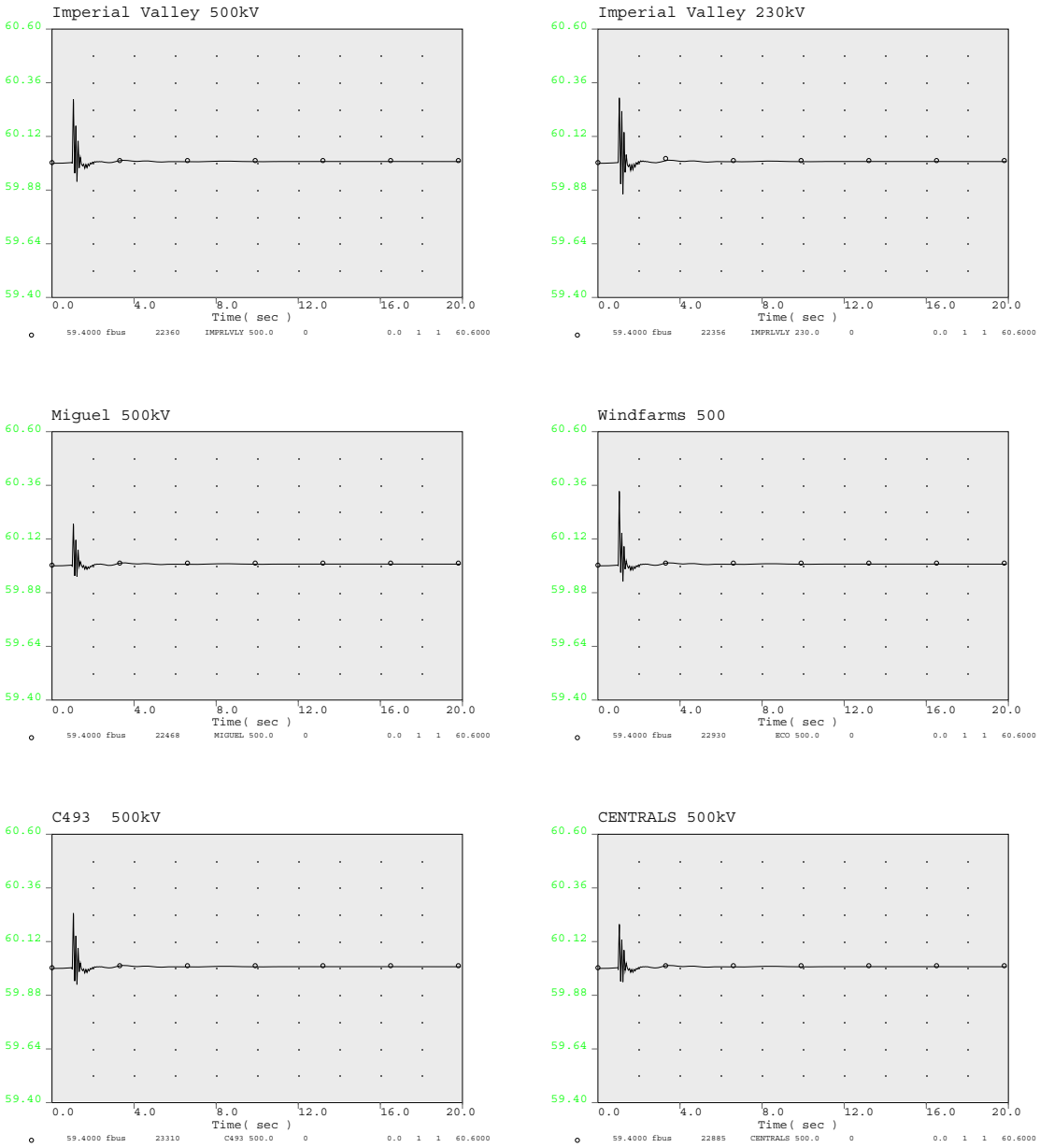


CENTRALS 500kV



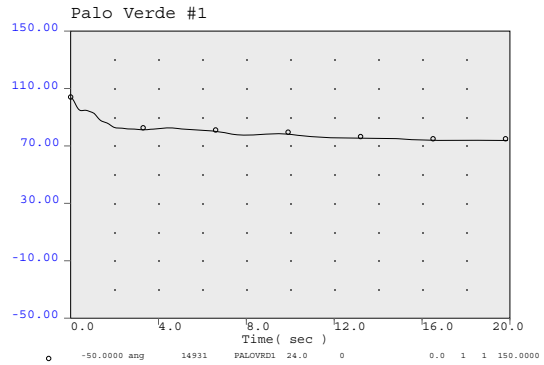
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

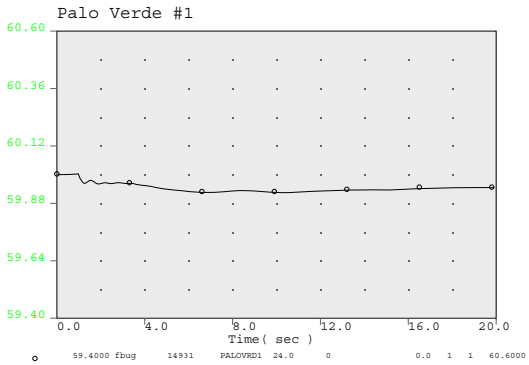
Imperial Valley Area - Frequency

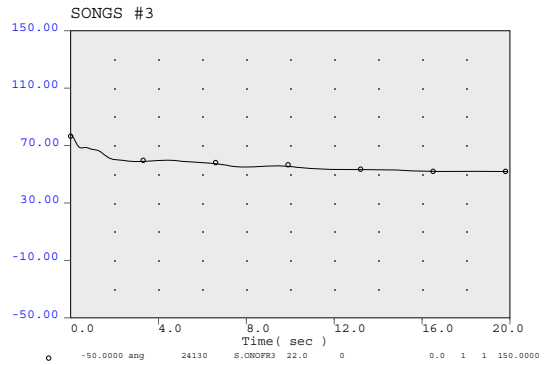


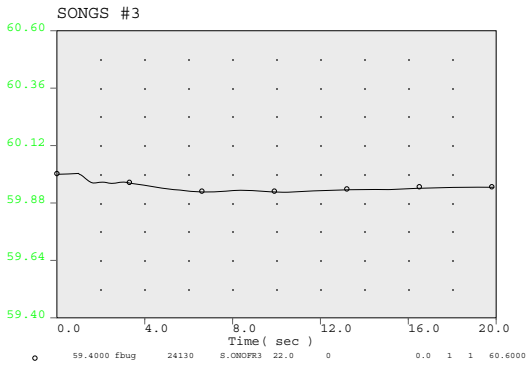
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

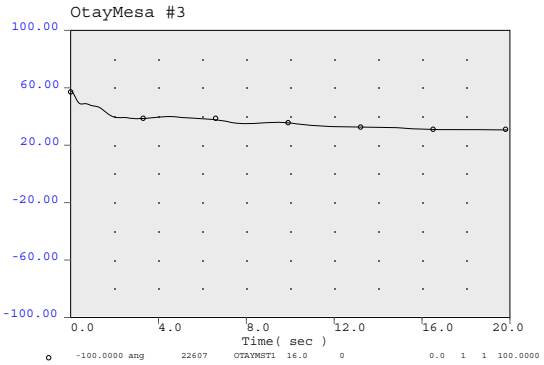
RELATIVE ROTOR ANGLE & FREQUENCY

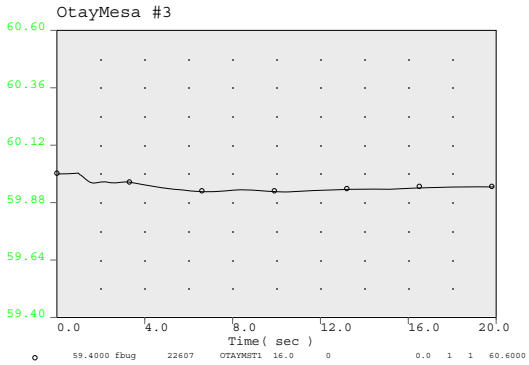






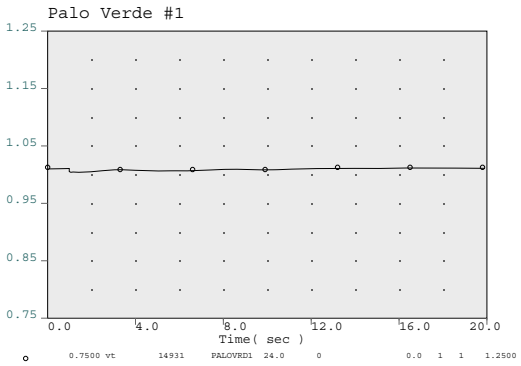


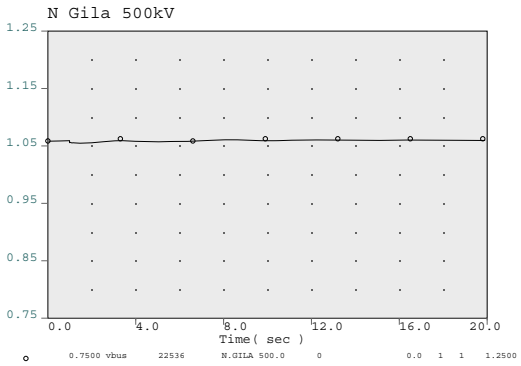


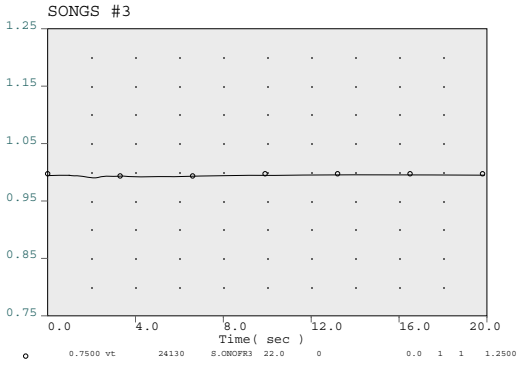


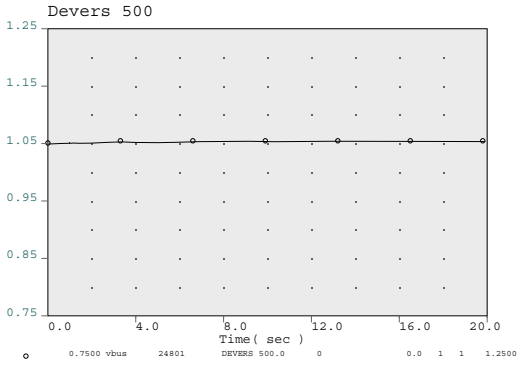
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

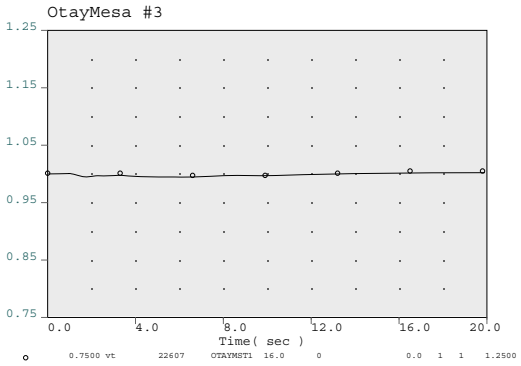
RELATIVE VOLTAGE

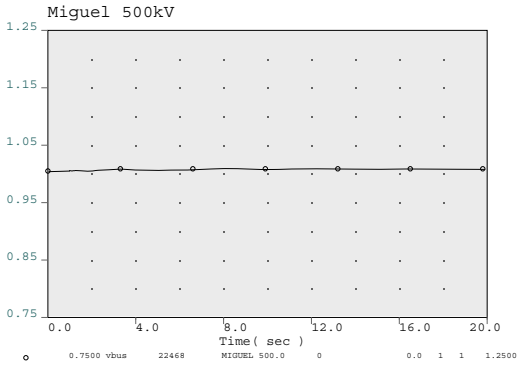








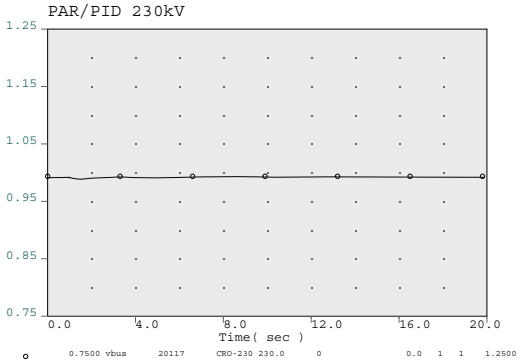




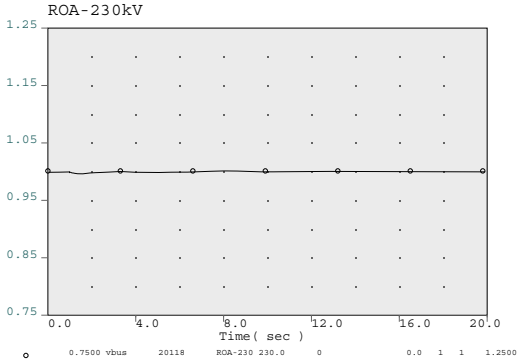
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

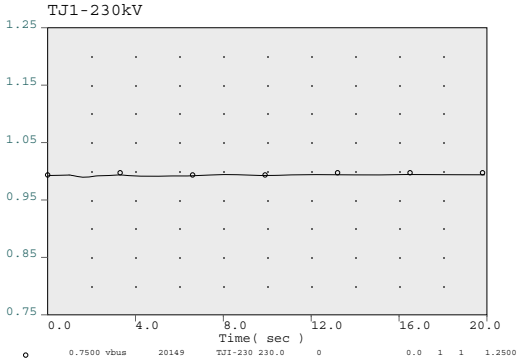
PAR/PID 230kV



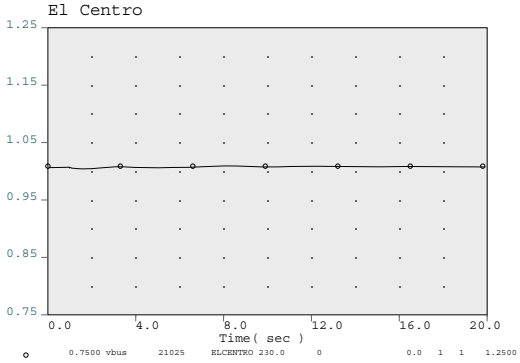
ROA-230kV



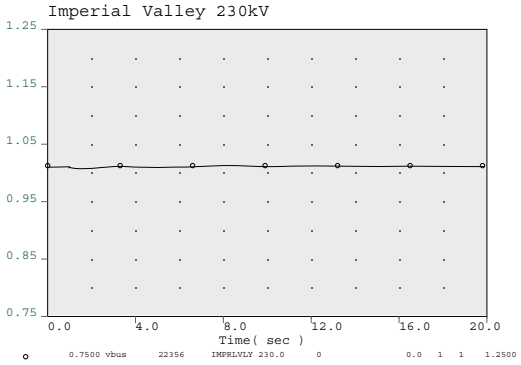
TJ1-230kV



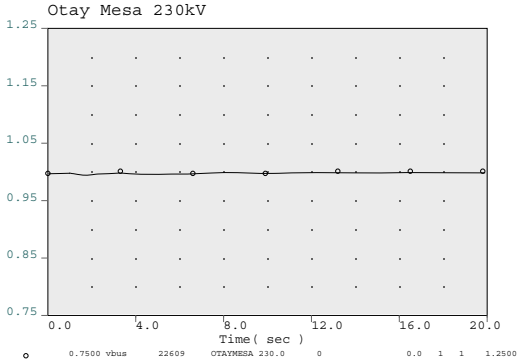
El Centro



Imperial Valley 230kV



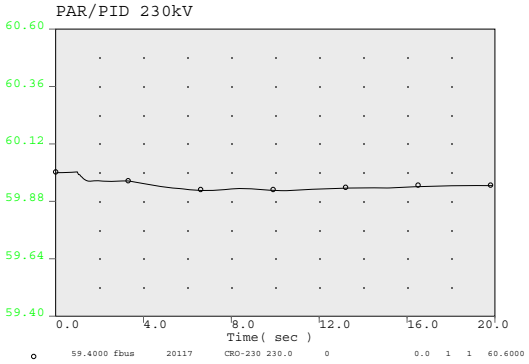
Otay Mesa 230kV



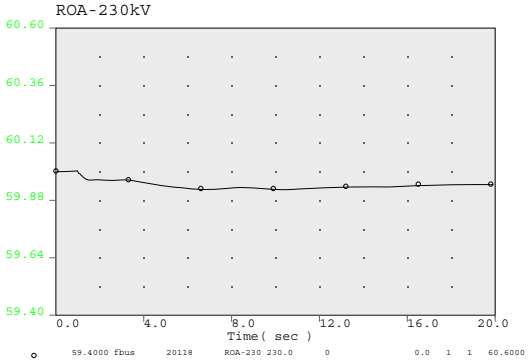
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

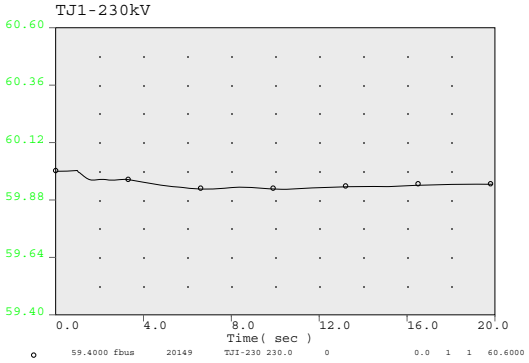
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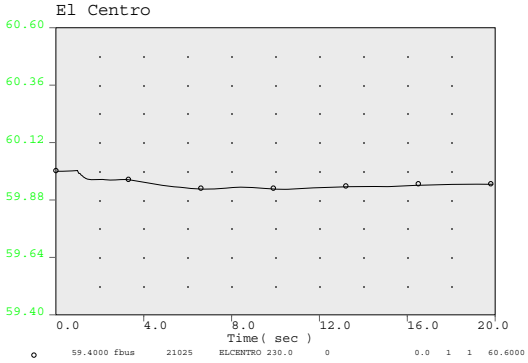
ROA-230kV



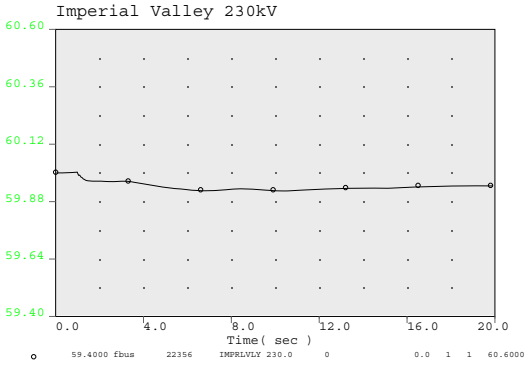
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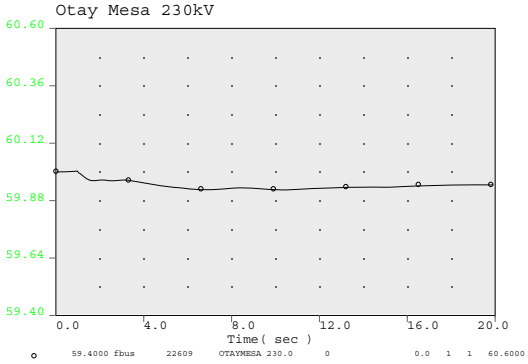
El Centro



Imperial Valley 230kV

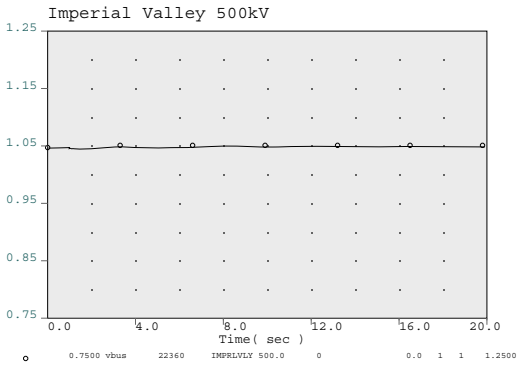


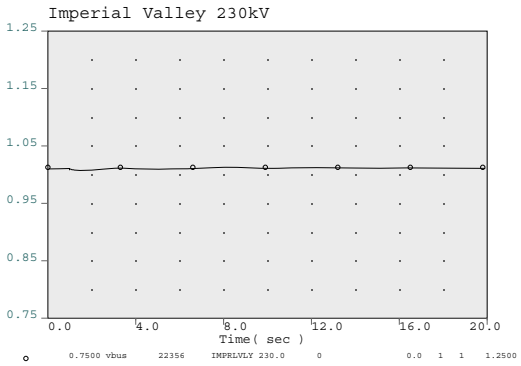
Otay Mesa 230kV

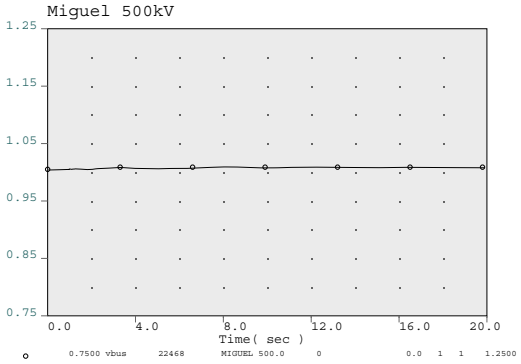


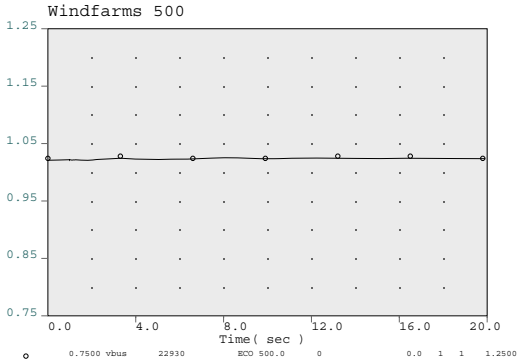
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

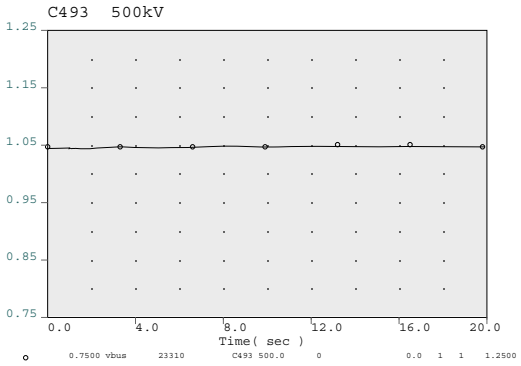
Imperial Valley Area - VOLTAGE

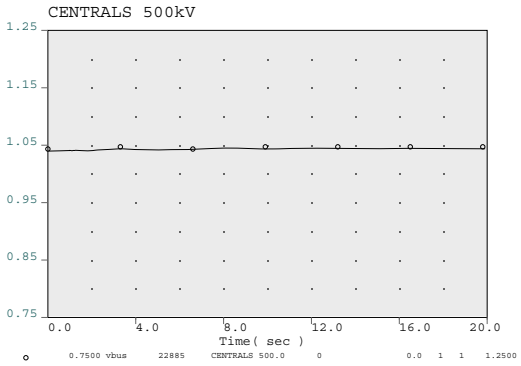






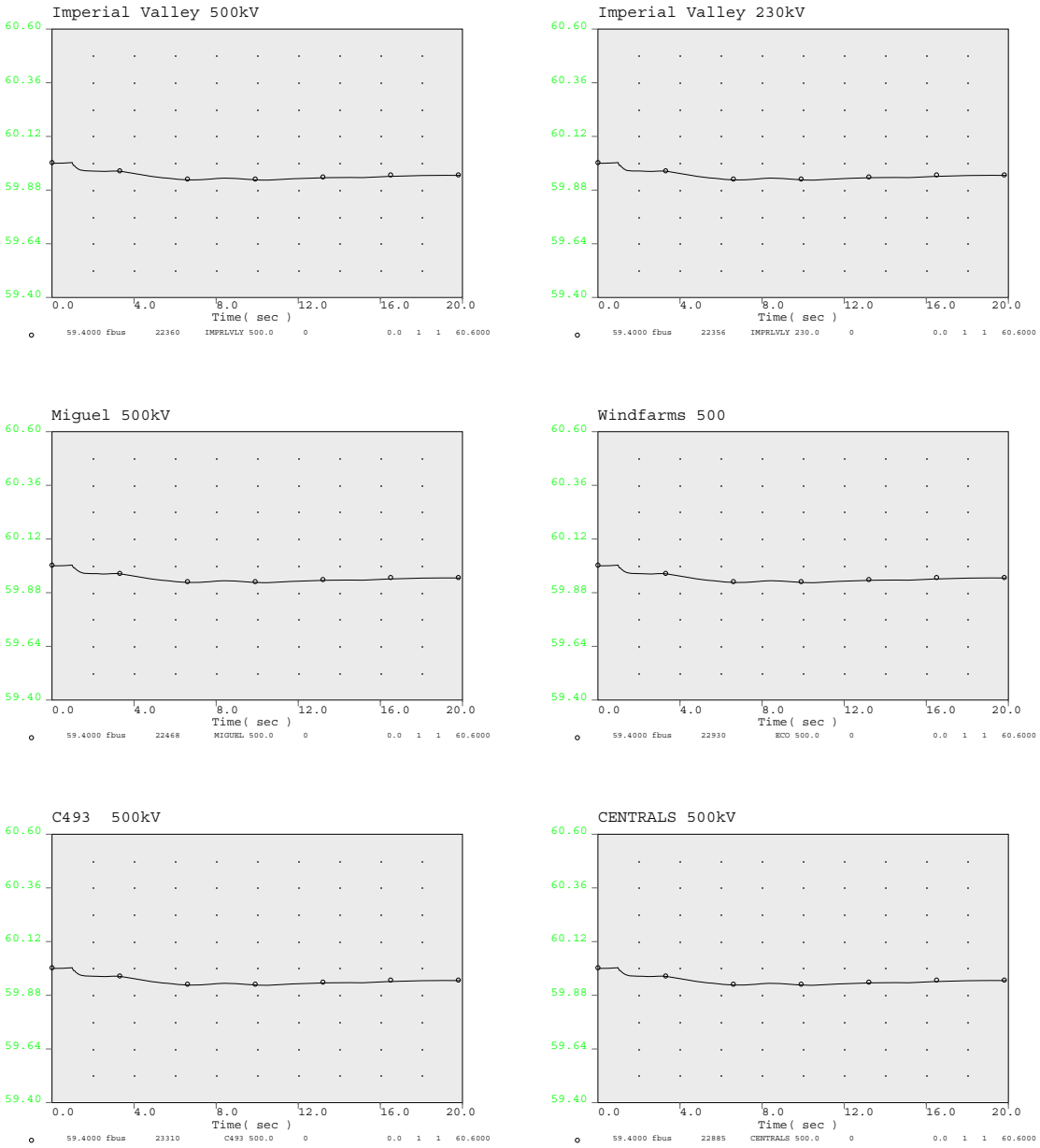






SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Imperial Valley Area - Frequency

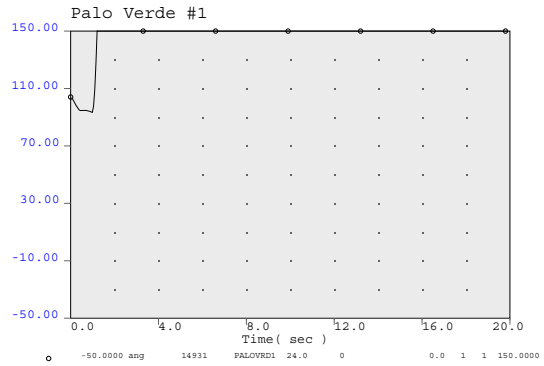


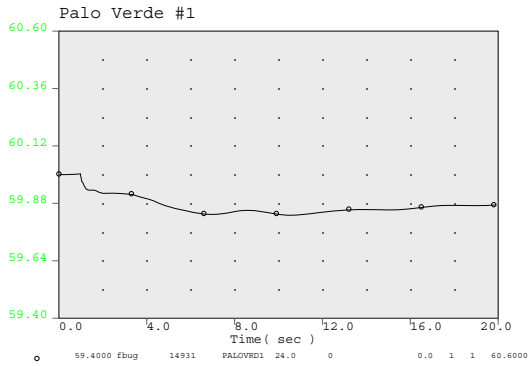
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

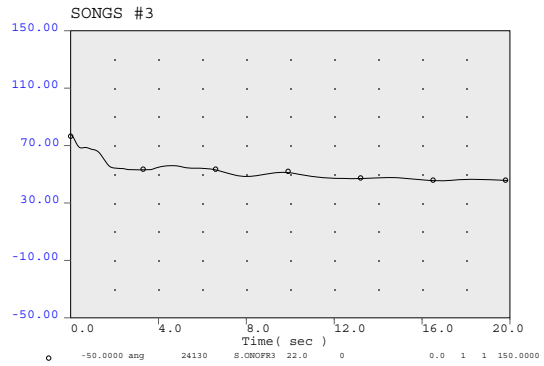
Page 6

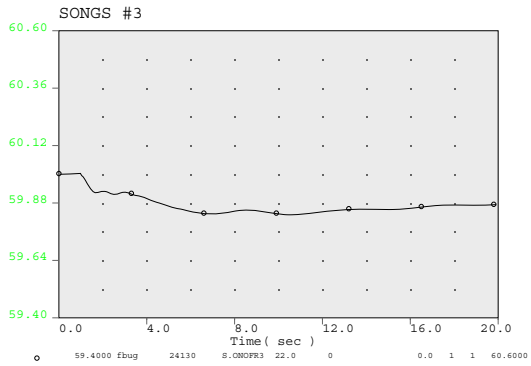
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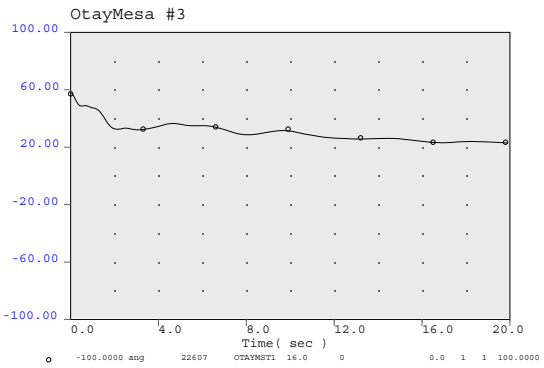
RELATIVE ROTOR ANGLE & FREQUENCY

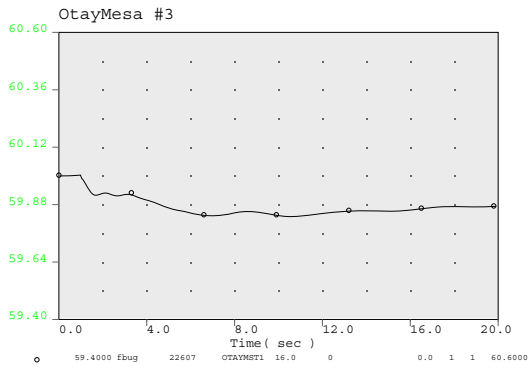












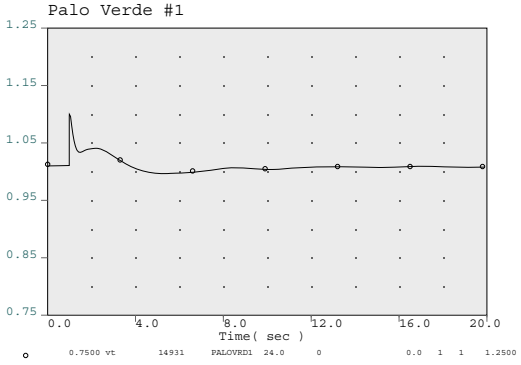
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Page 1

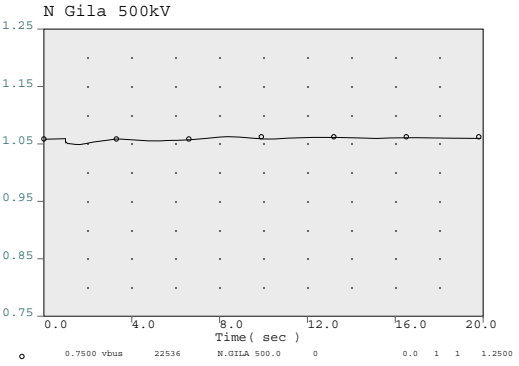
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RELATIVE VOLTAGE

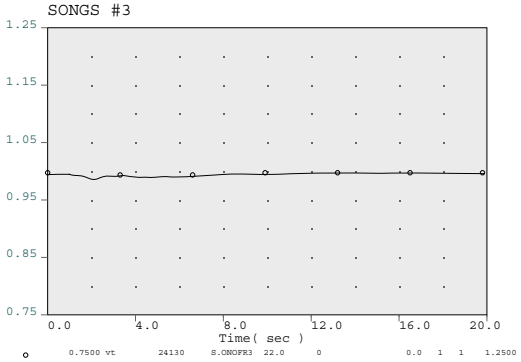
Palo Verde #1



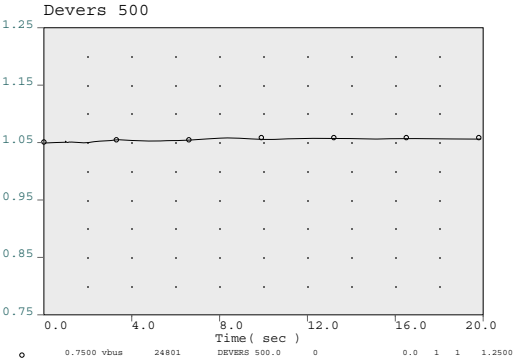
N Gila 500kV



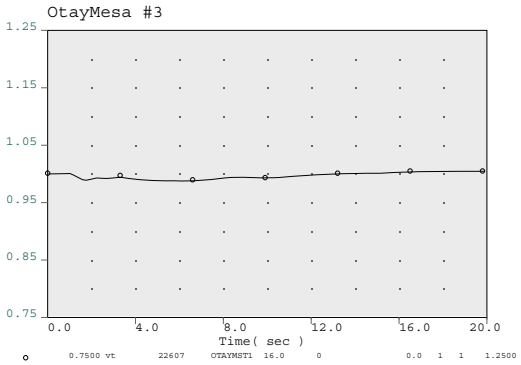
SONGS #3



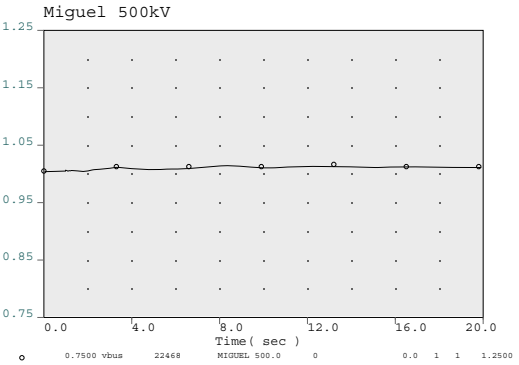
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OtayMesa #3



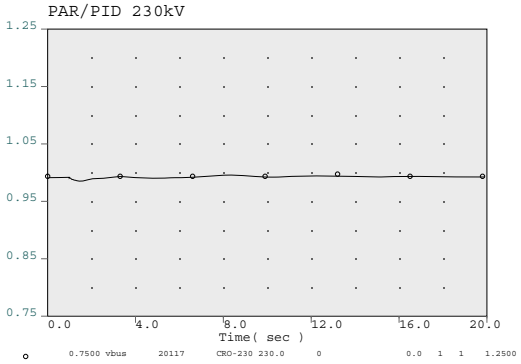
Miguel 500kV



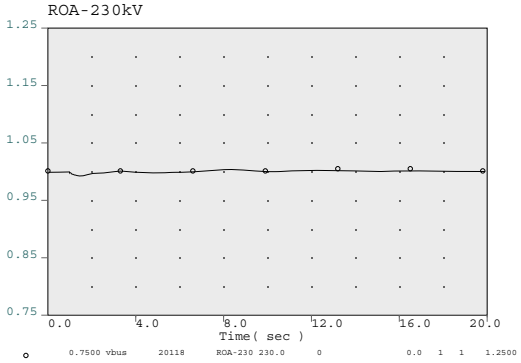
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

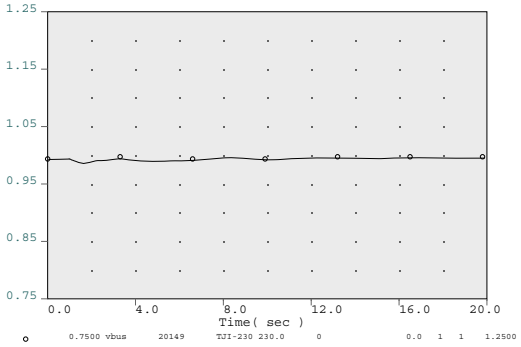
PAR/PID 230kV



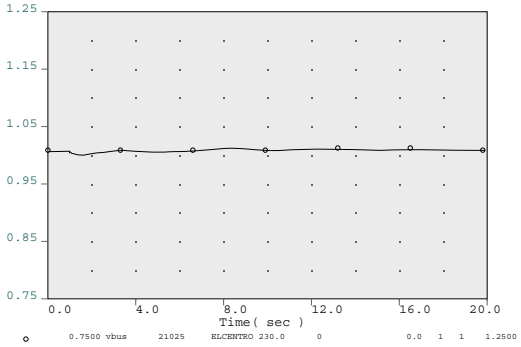
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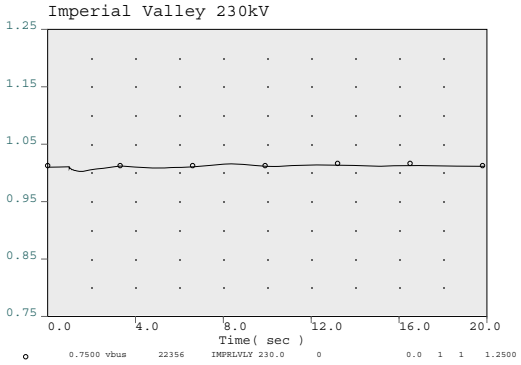
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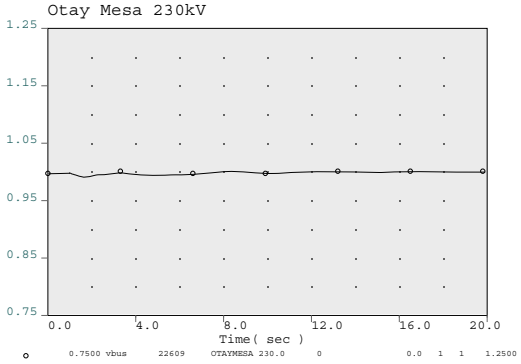
El Centro



Imperial Valley 230kV



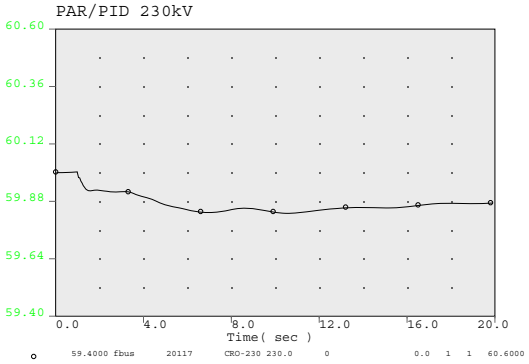
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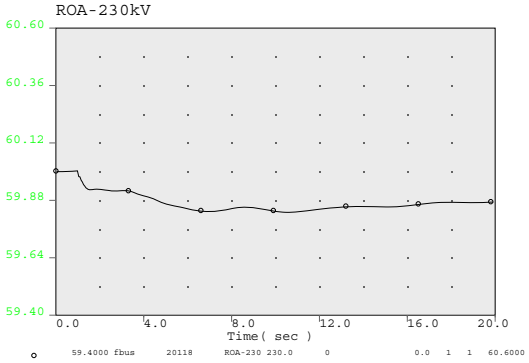
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

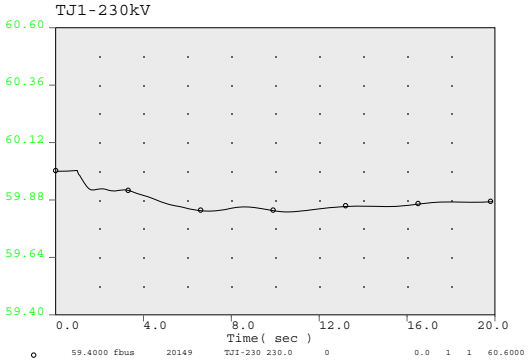
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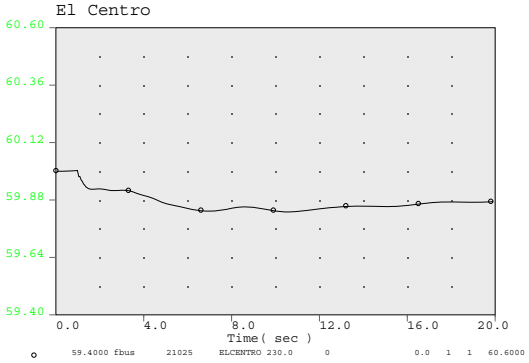
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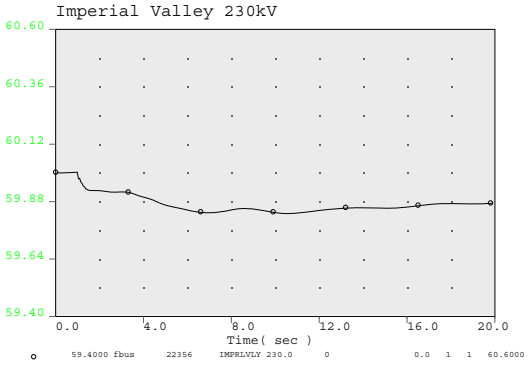
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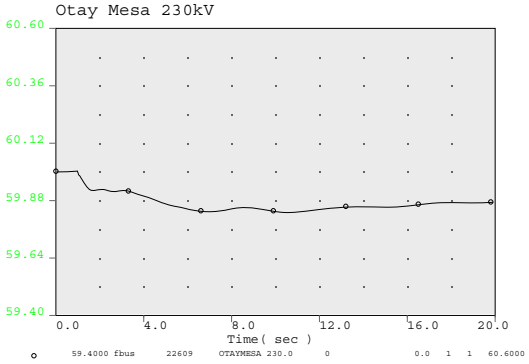
El Centro



Imperial Valley 230kV



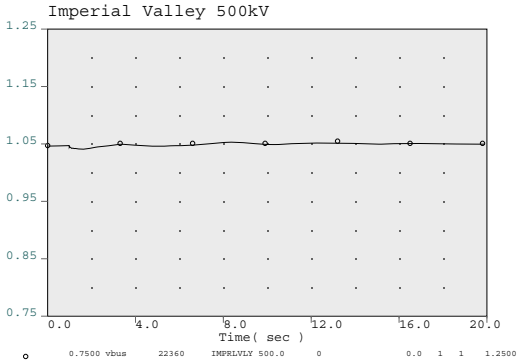
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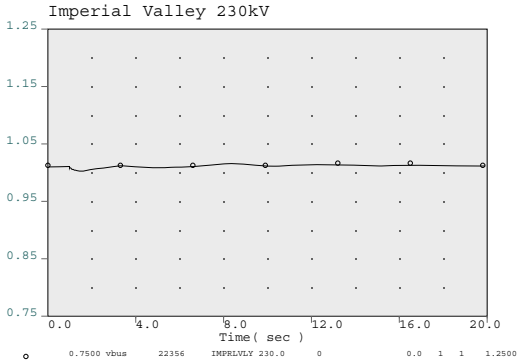
SDG&E Cluster 2 - post
2014 Heavy Summer
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Imperial Valley Area - VOLTAGE

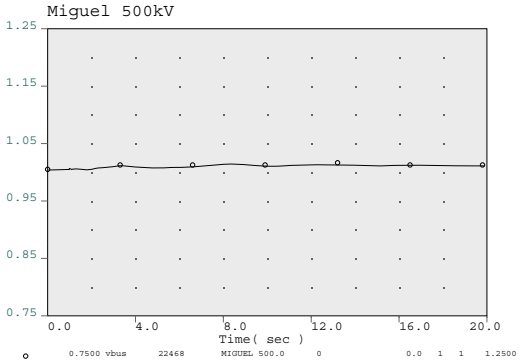
Imperial Valley 500kV



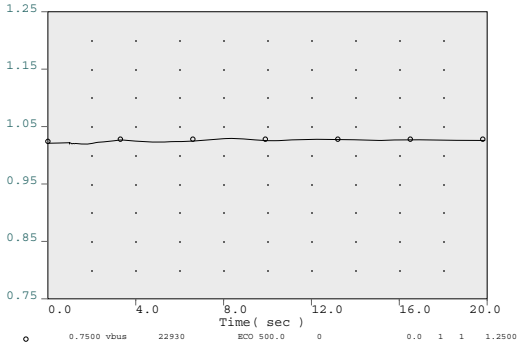
Imperial Valley 230kV



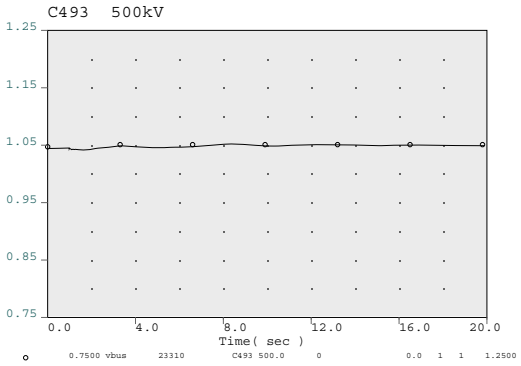
Miguel 500kV



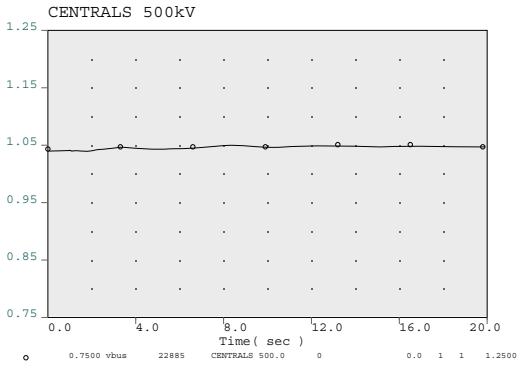
Windfarms 500



C493 500kV



CENTRALS 500kV

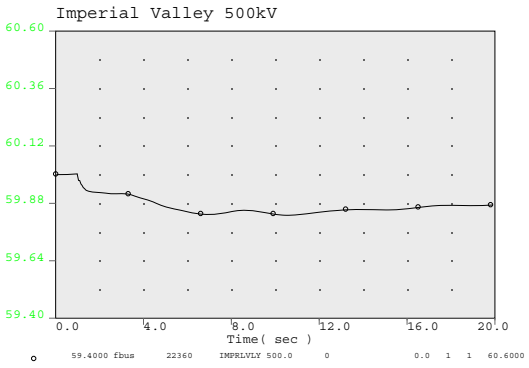


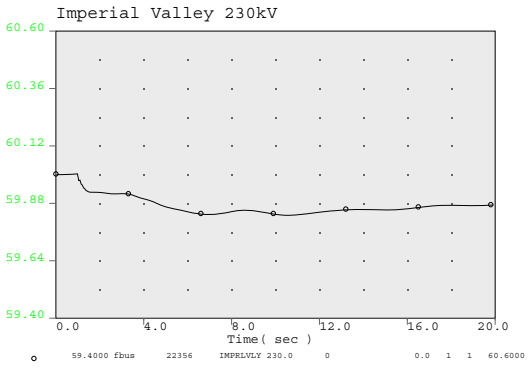
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

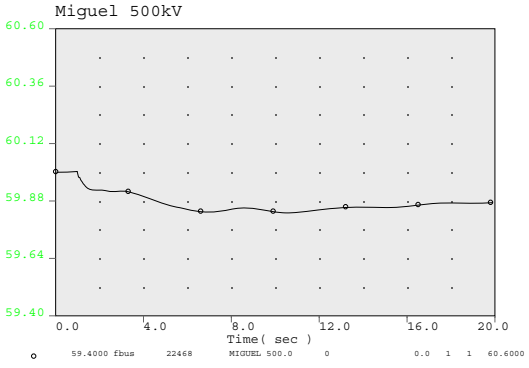
Page 5

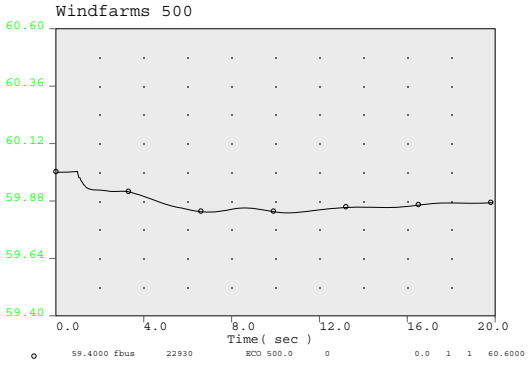
PaloVerde-g2_pst_iv4_hs.chf | tab\hs\pst_iv4\ws_pst_iv4 | Wed Oct 13 16:39:24 2010

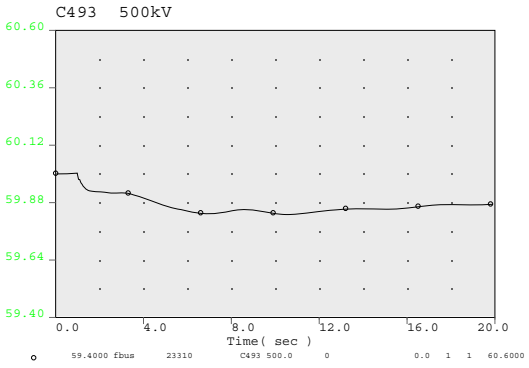
Imperial Valley Area - Frequency

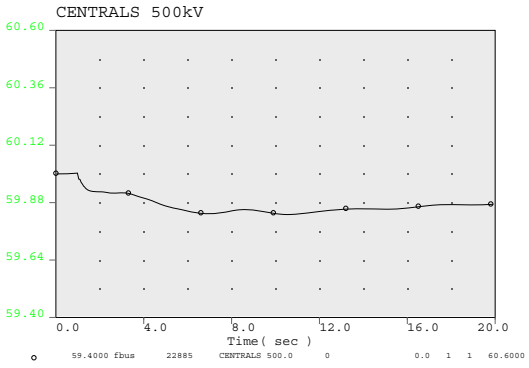






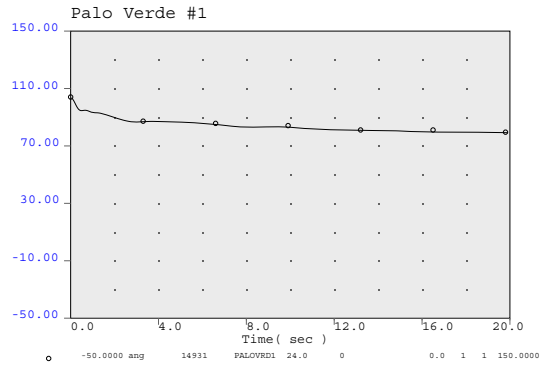


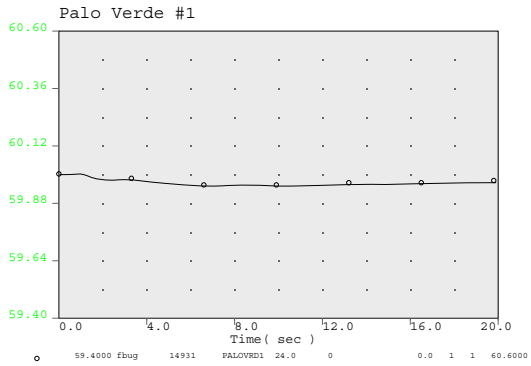


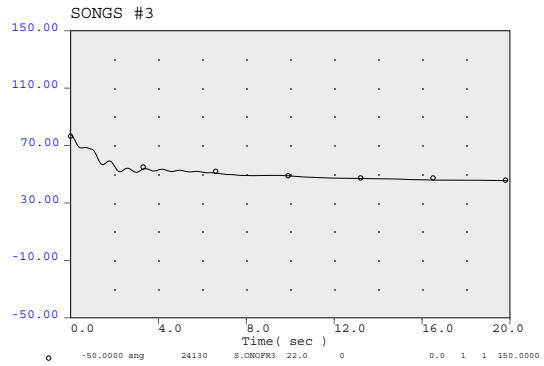


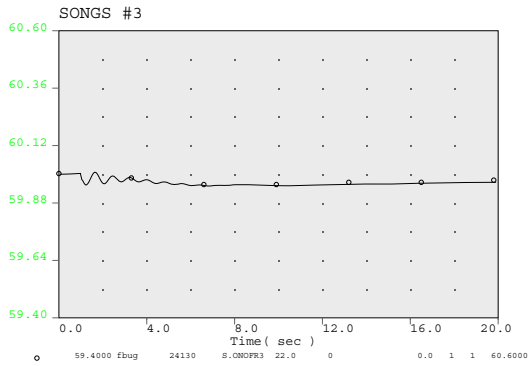
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

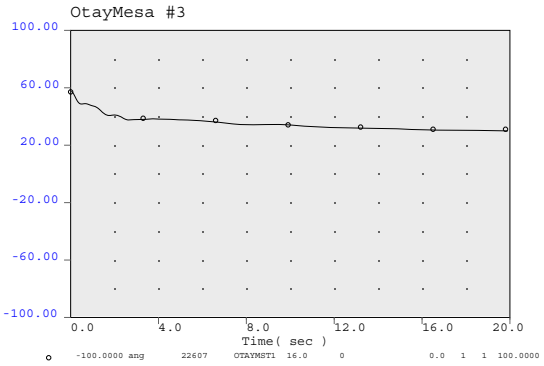
RELATIVE ROTOR ANGLE & FREQUENCY

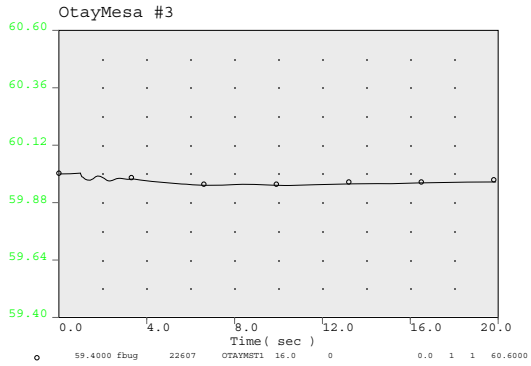












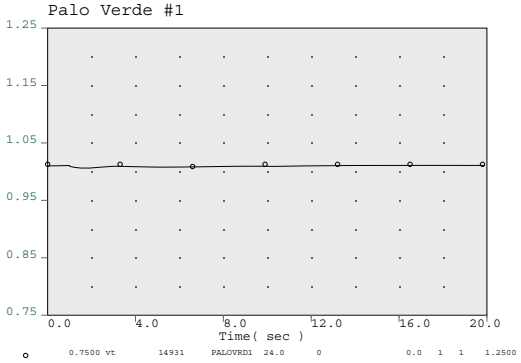
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

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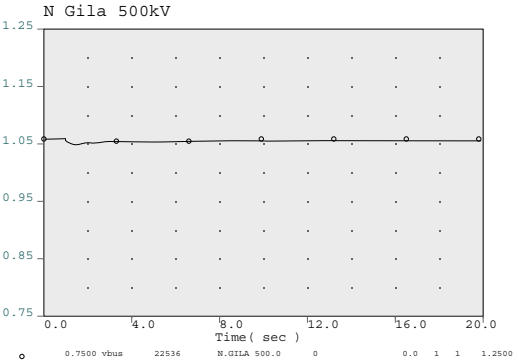
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RELATIVE VOLTAGE

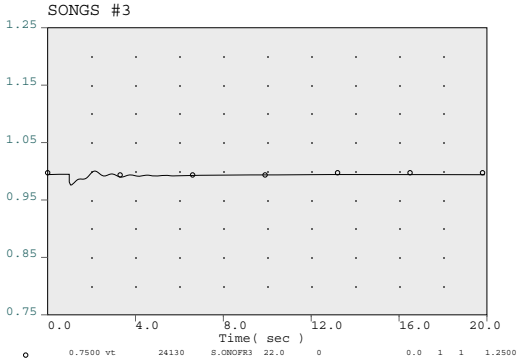
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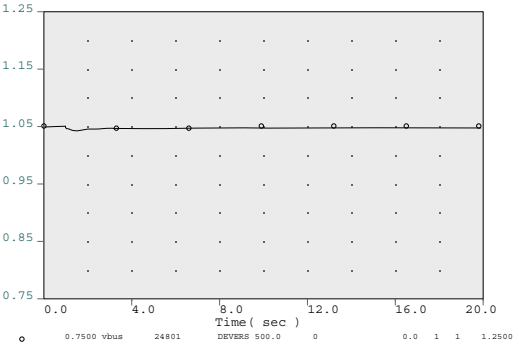
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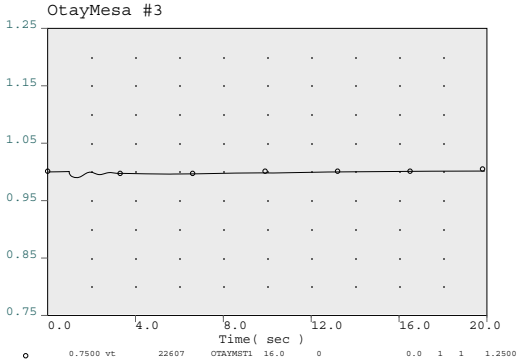
SONGS #3



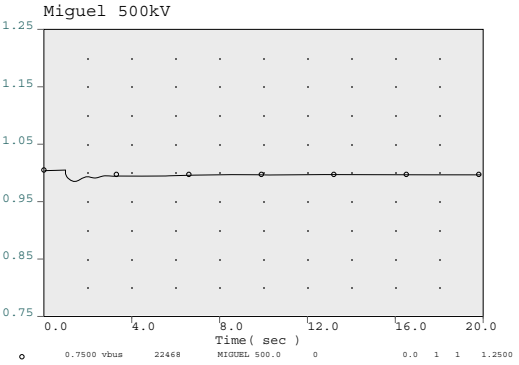
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OtayMesa #3



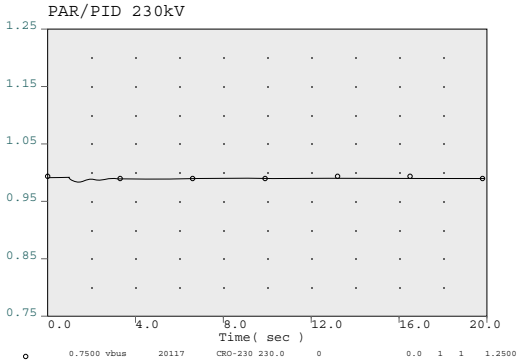
Miguel 500kV



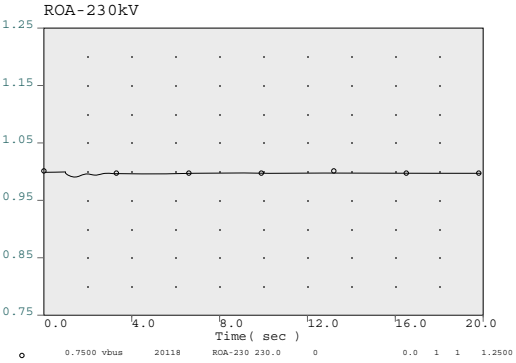
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

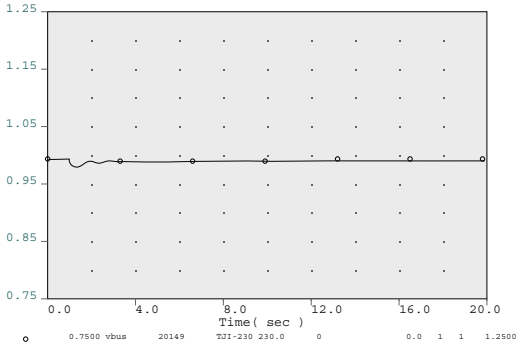
PAR/PID 230kV



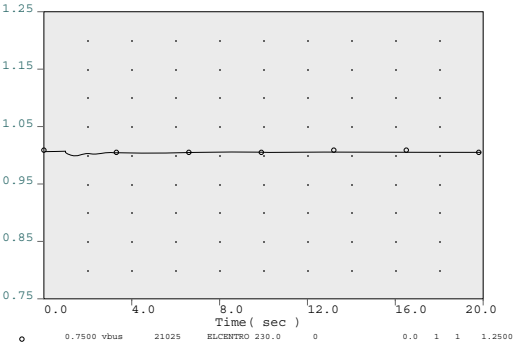
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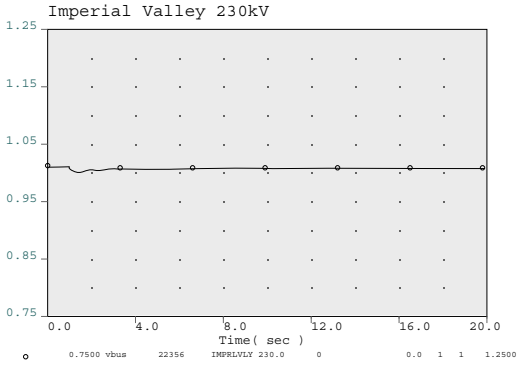
TJ1-230kV



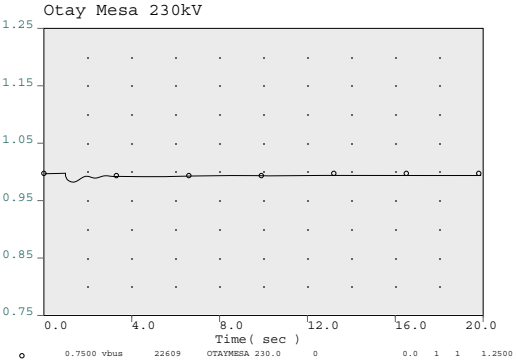
El Centro



Imperial Valley 230kV



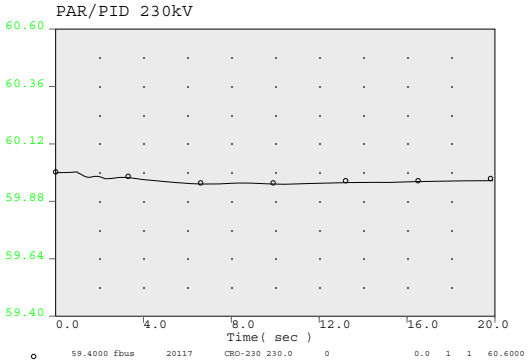
Otay Mesa 230kV



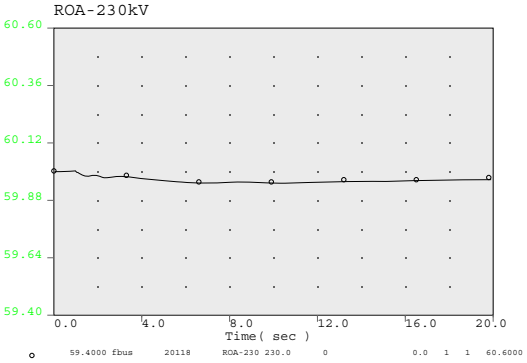
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison

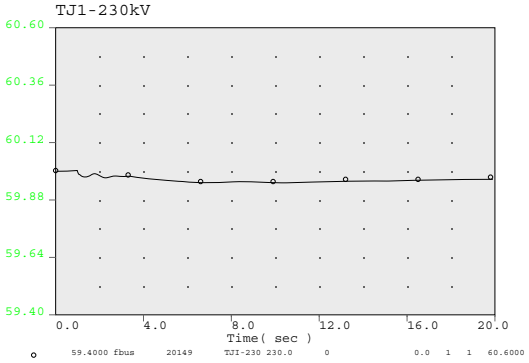
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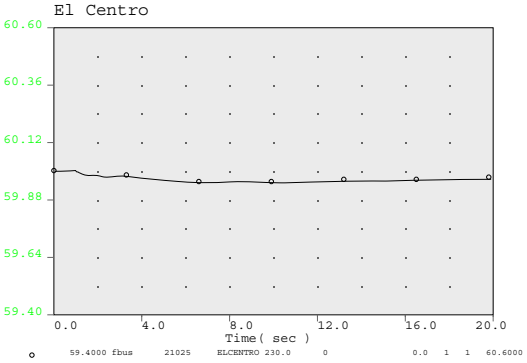
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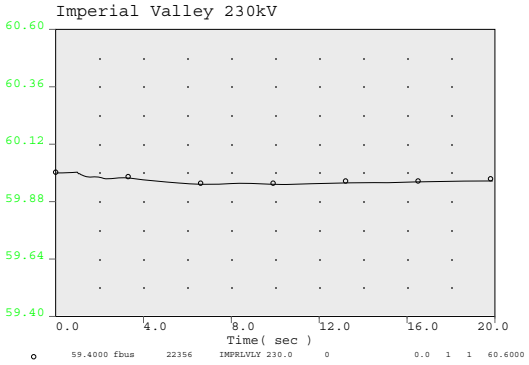
TJ1-230kV



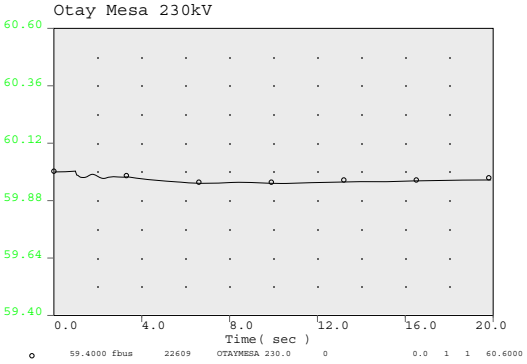
El Centro



Imperial Valley 230kV

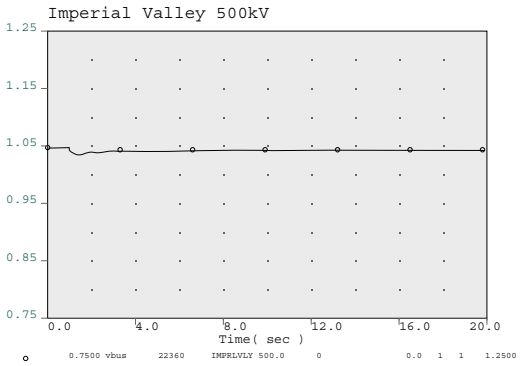


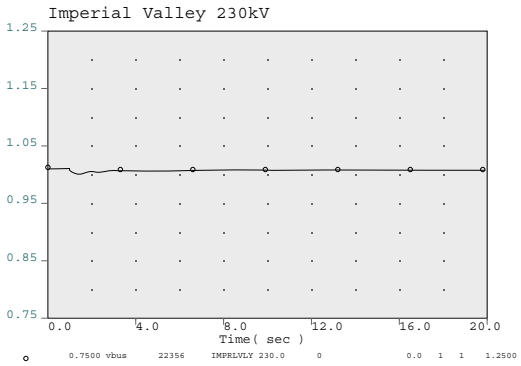
Otay Mesa 230kV

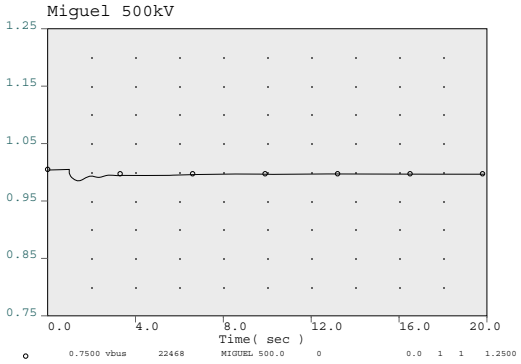


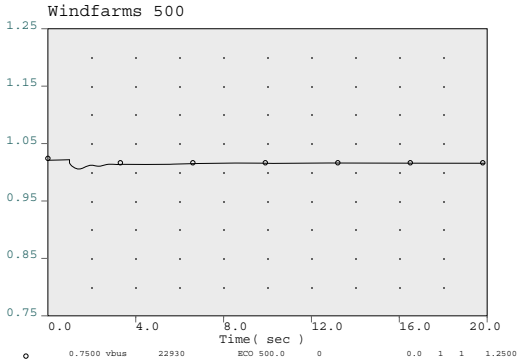
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

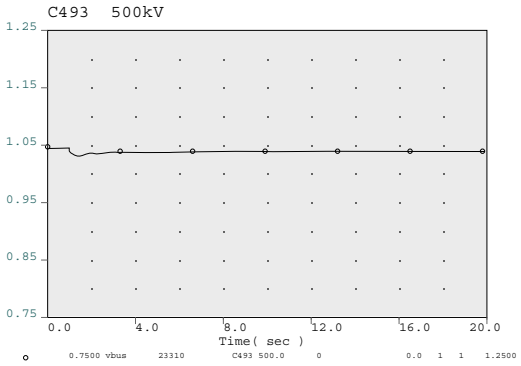
Imperial Valley Area - VOLTAGE

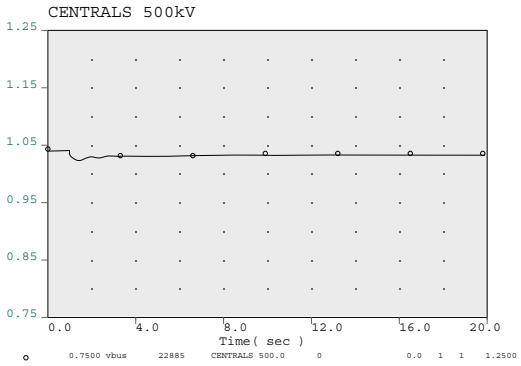






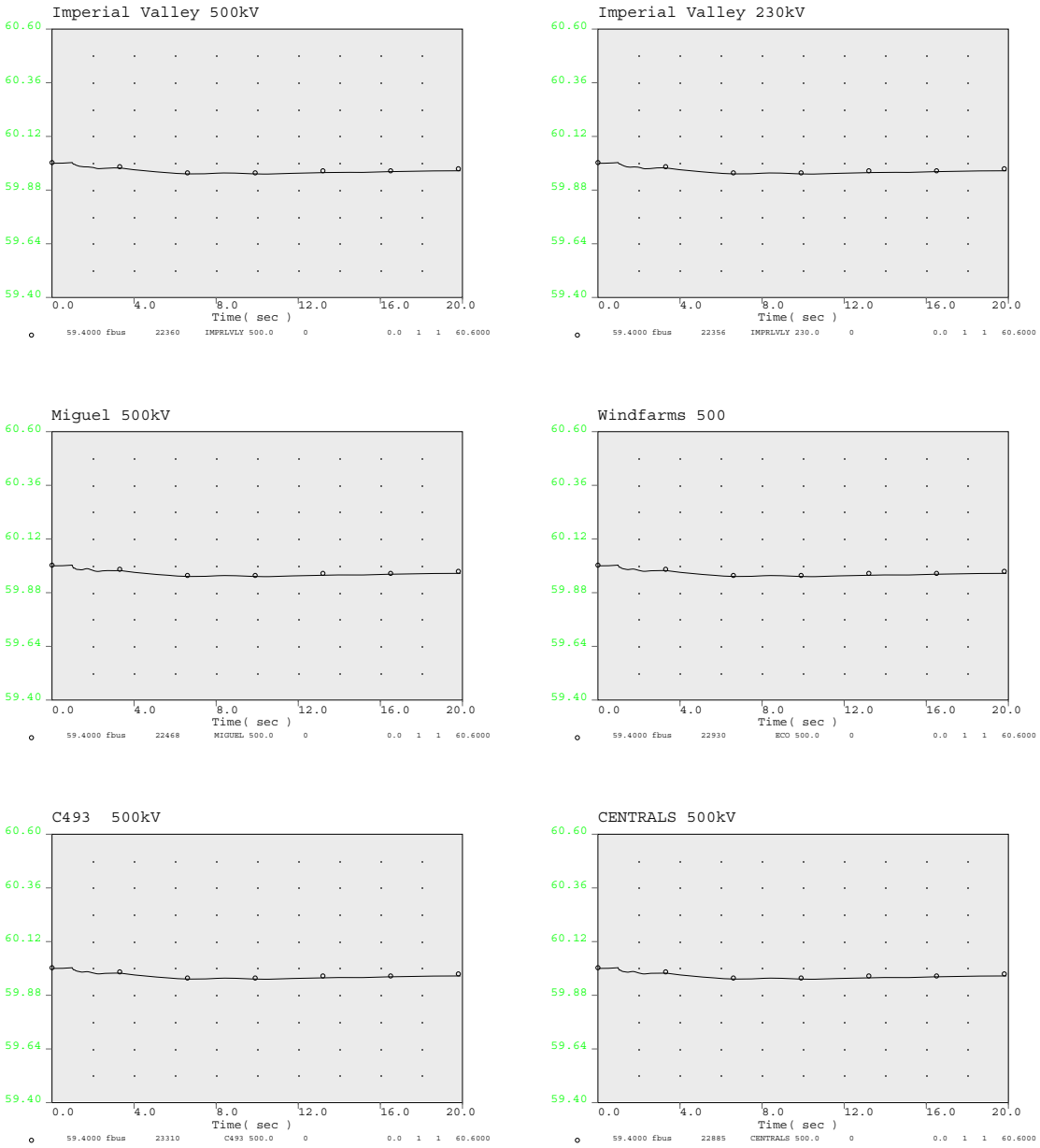






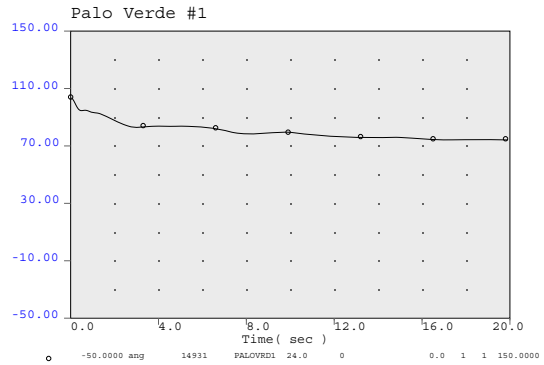
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

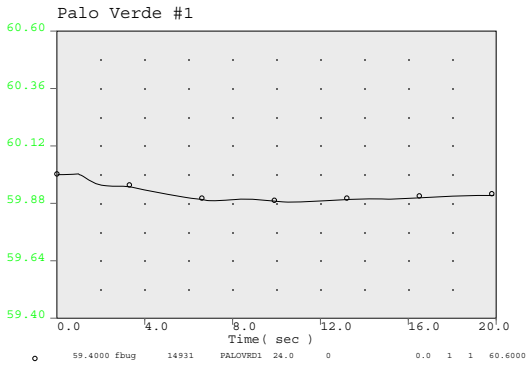
Imperial Valley Area - Frequency

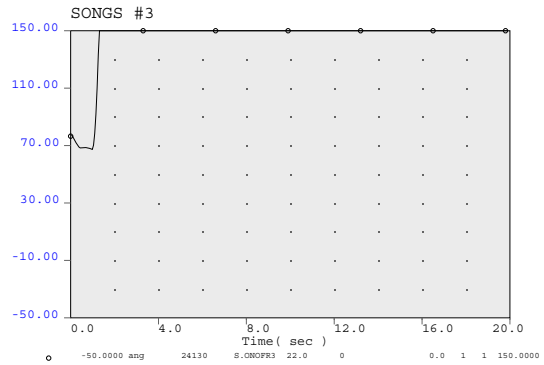


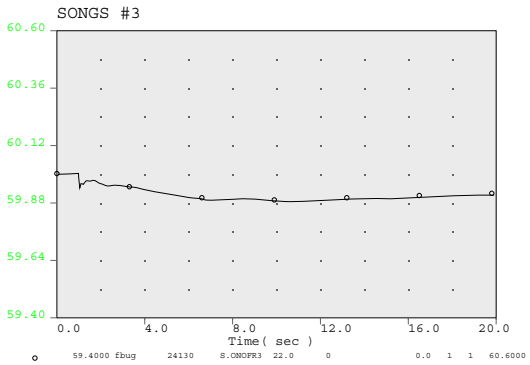
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

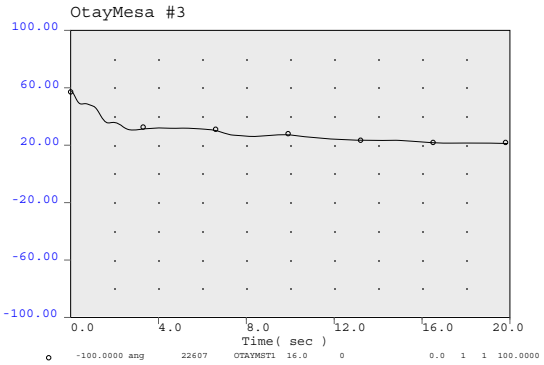
RELATIVE ROTOR ANGLE & FREQUENCY

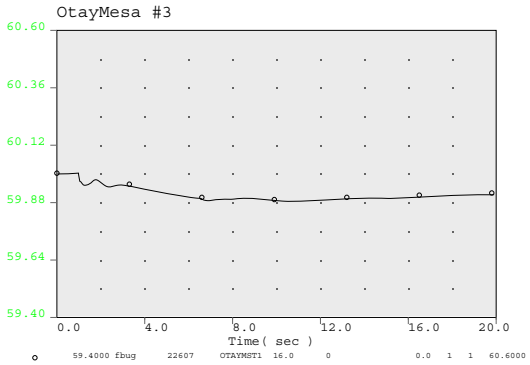












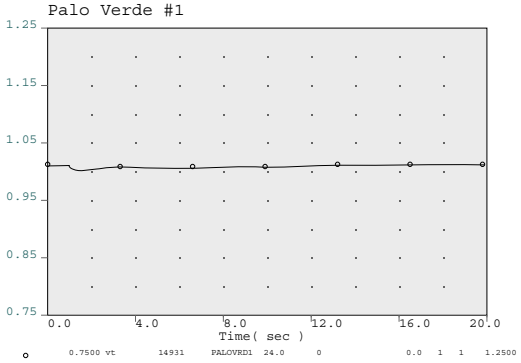
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 1

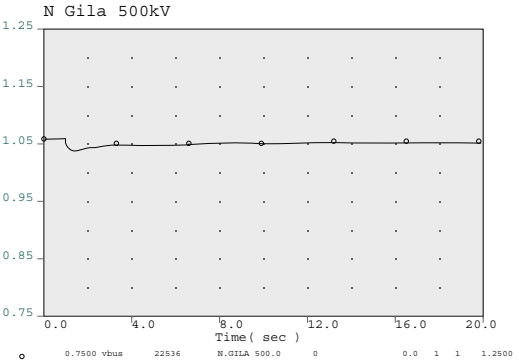
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RELATIVE VOLTAGE

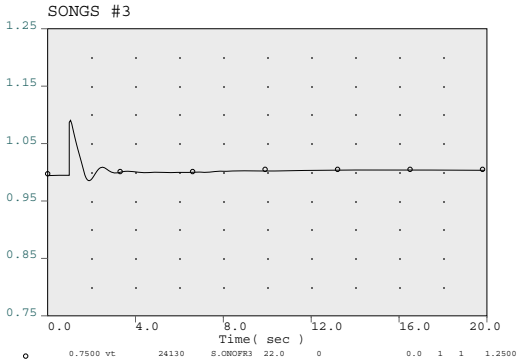
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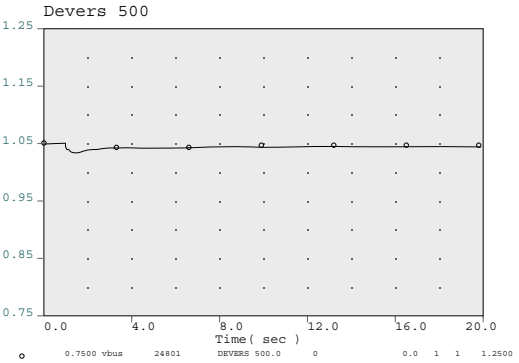
N Gila 500kV



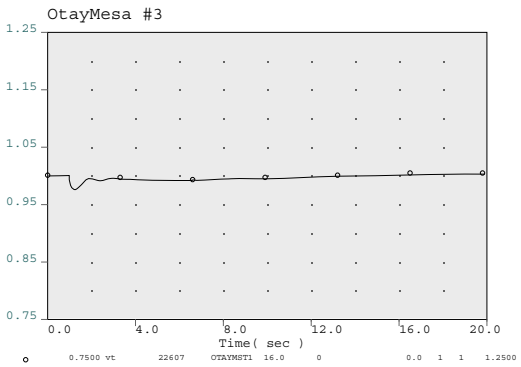
SONGS #3



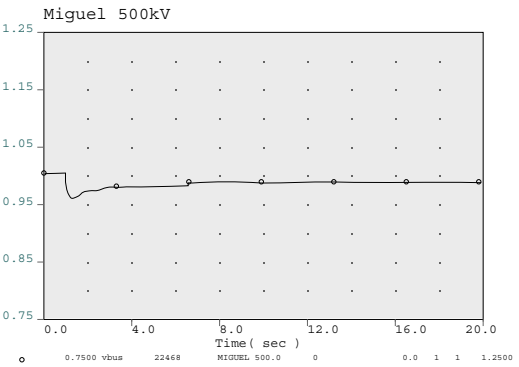
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OtayMesa #3



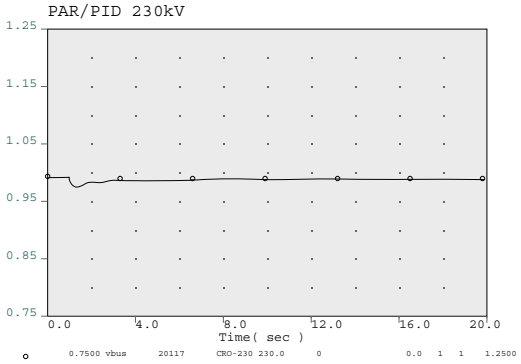
Miguel 500kV



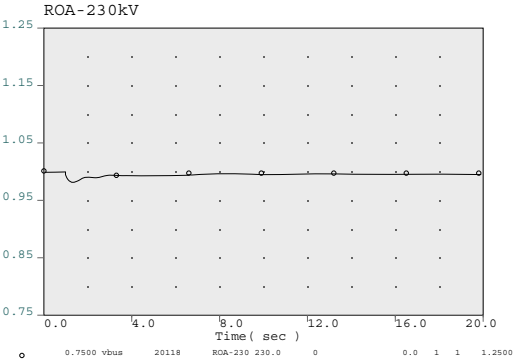
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

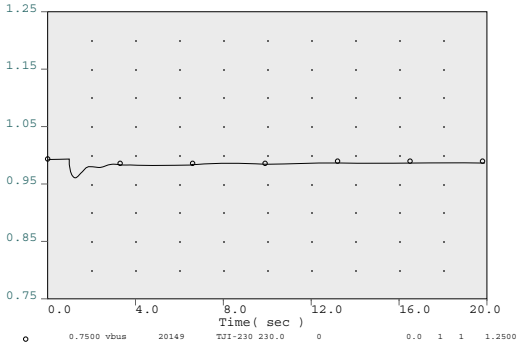
PAR/PID 230kV



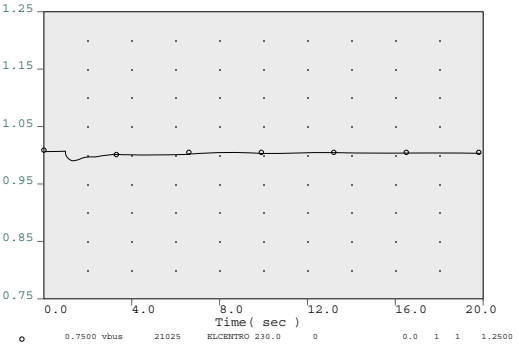
ROA-230kV



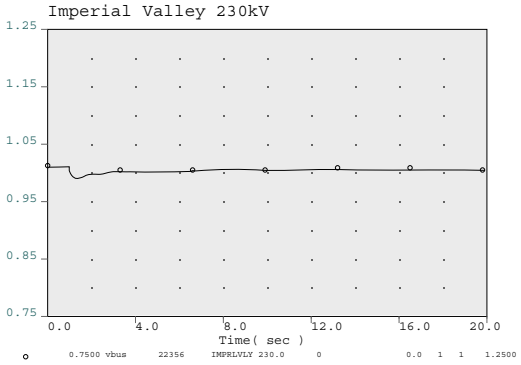
TJ1-230kV



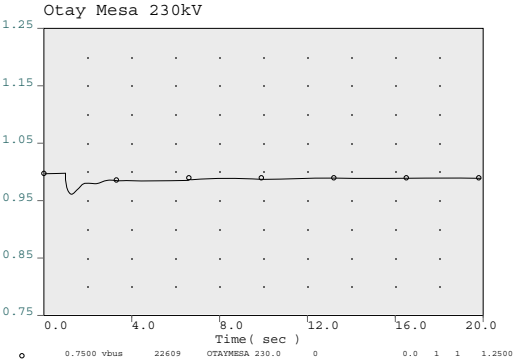
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



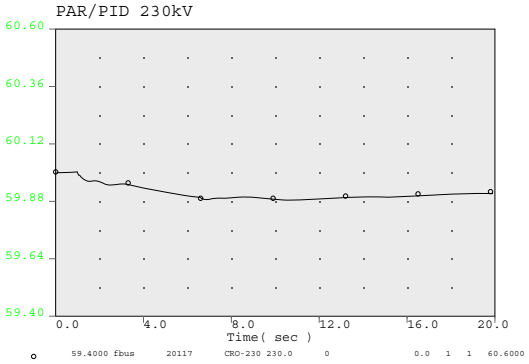
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 3

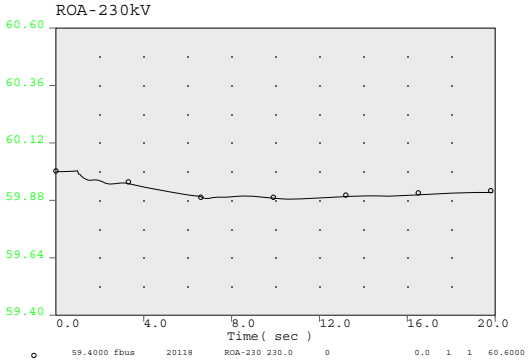
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Affected System Frequency Check and Comparison

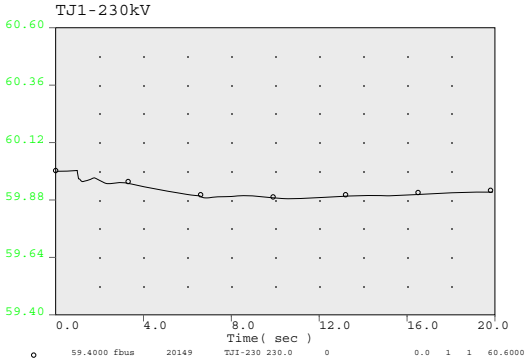
PAR/PID 230kV



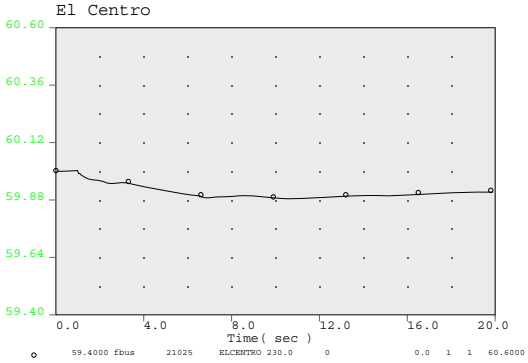
ROA-230kV



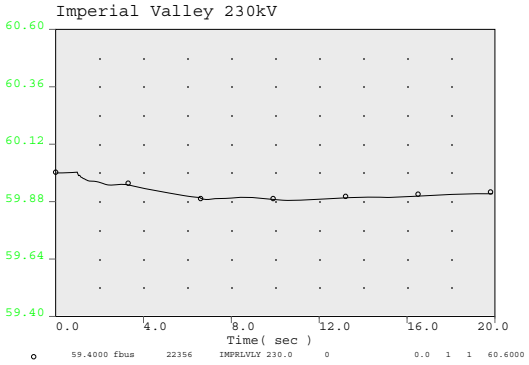
TJ1-230kV



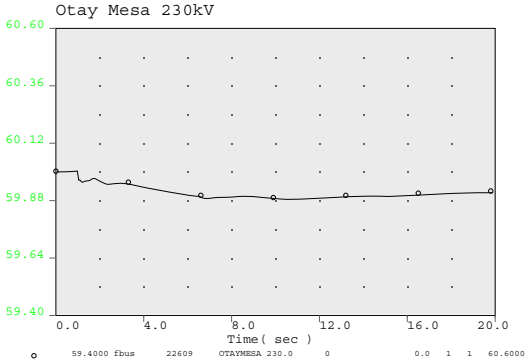
El Centro



Imperial Valley 230kV



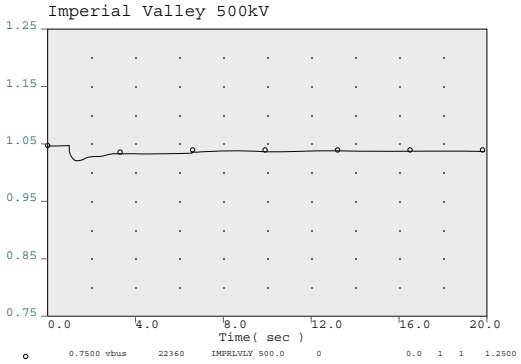
Otay Mesa 230kV



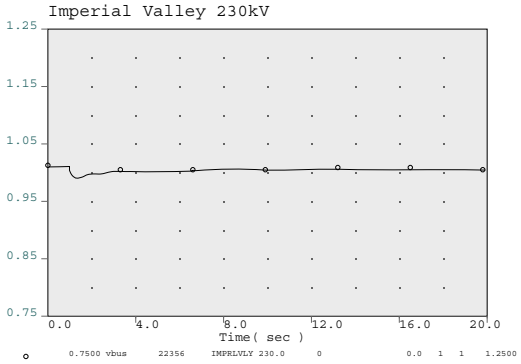
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

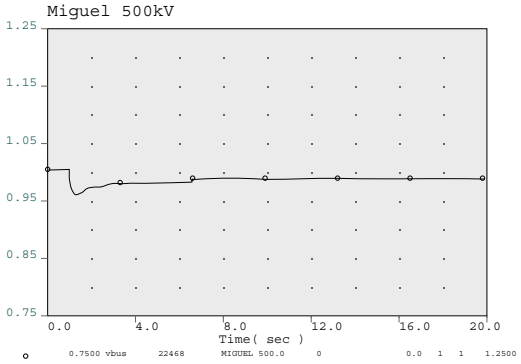
Imperial Valley 500kV



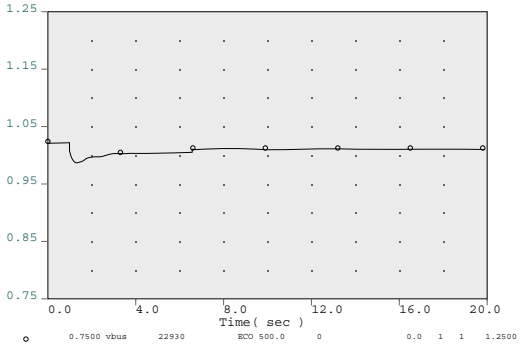
Imperial Valley 230kV



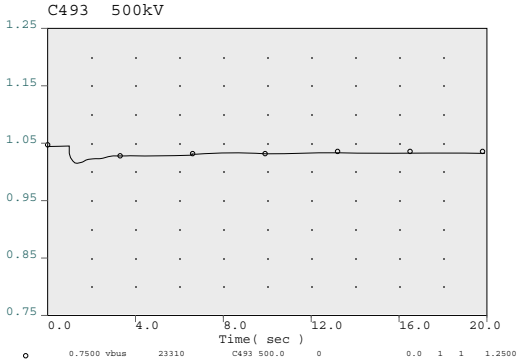
Miguel 500kV



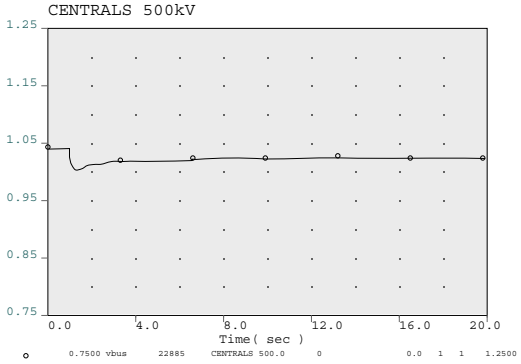
Windfarms 500



C493 500kV

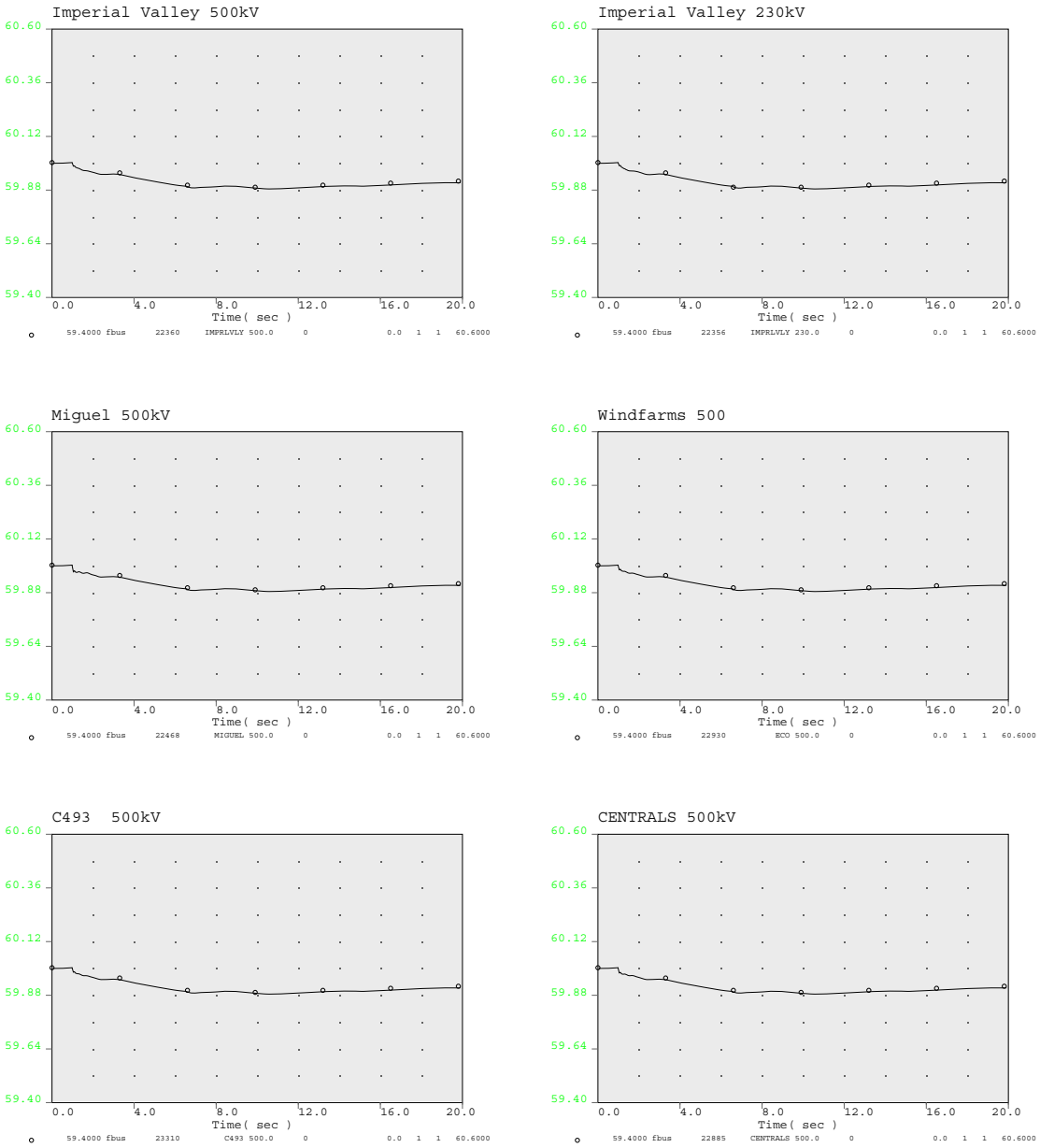


CENTRALS 500kV



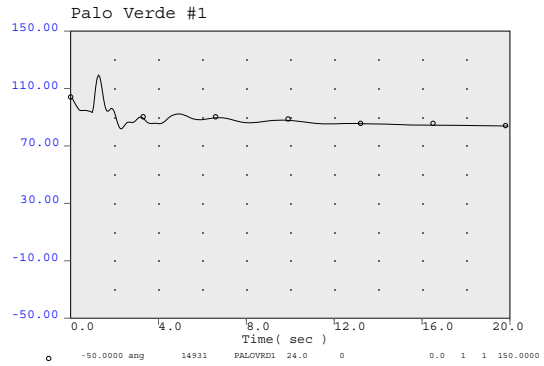
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

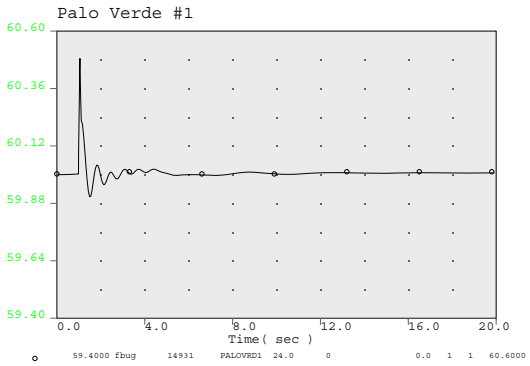
Imperial Valley Area - Frequency

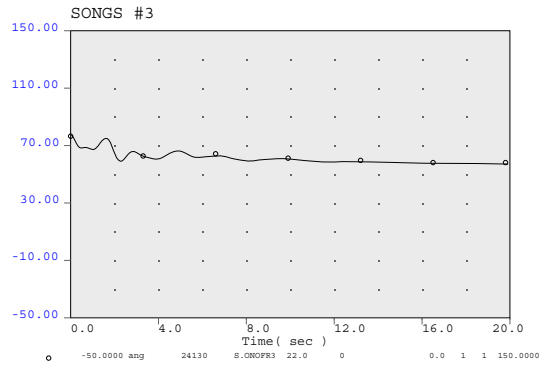


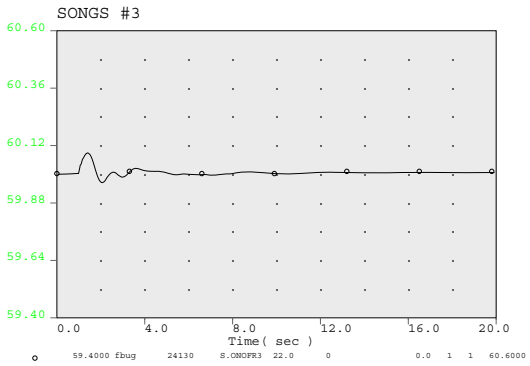
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

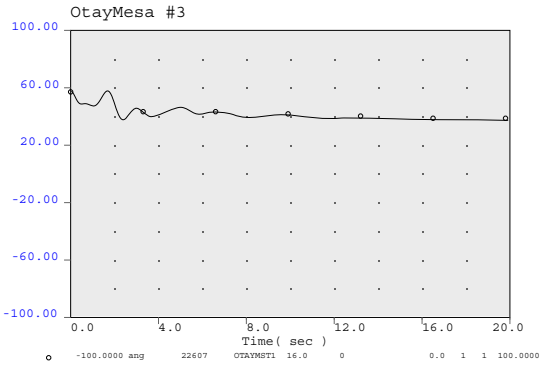
RELATIVE ROTOR ANGLE & FREQUENCY

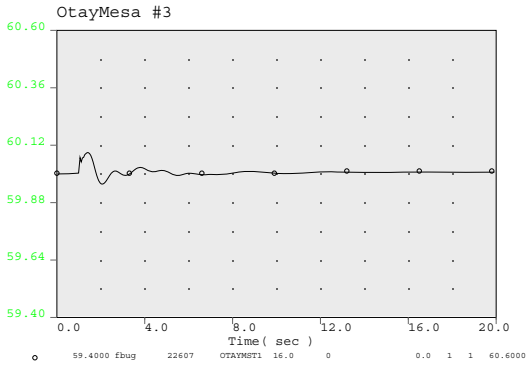










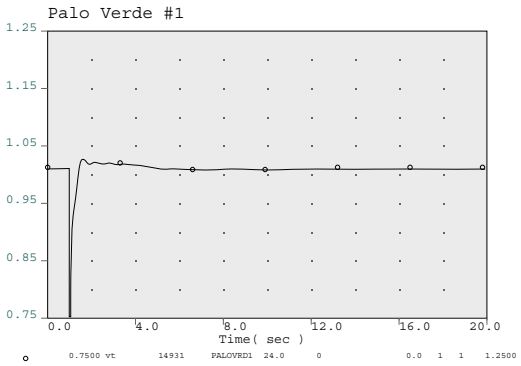


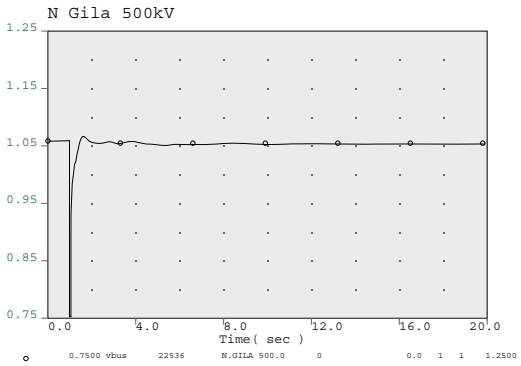
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

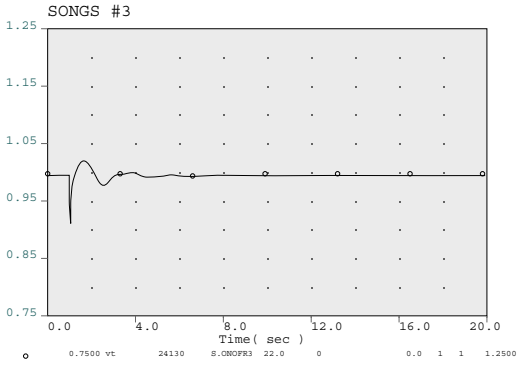
Page 1

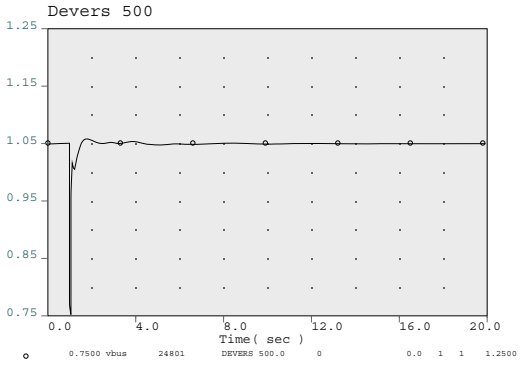
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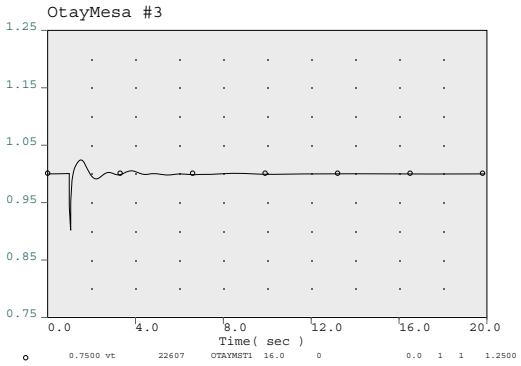
RELATIVE VOLTAGE

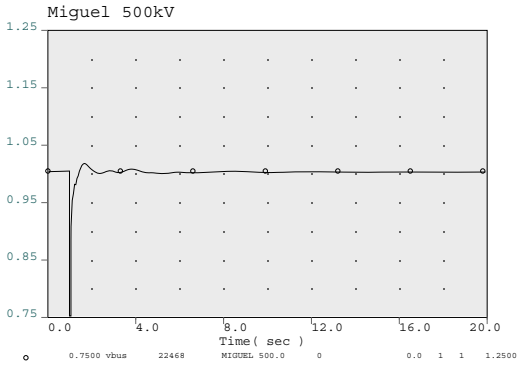








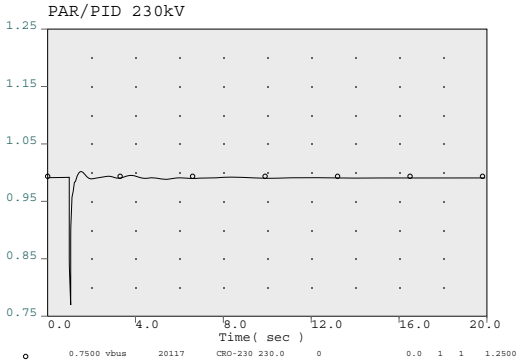




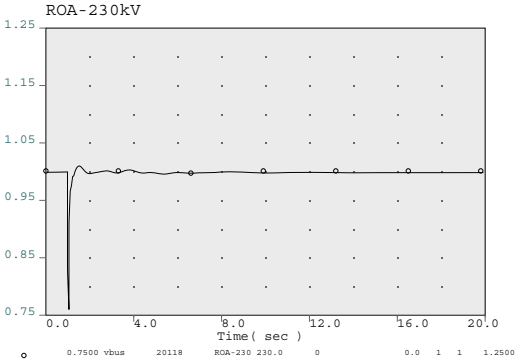
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

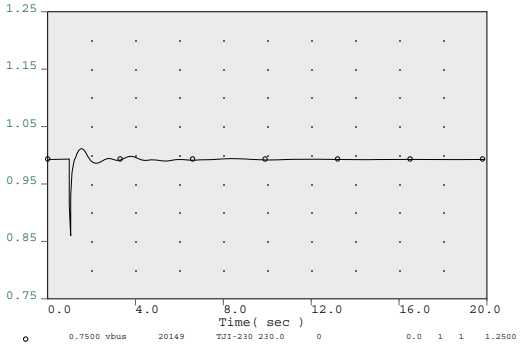
PAR/PID 230kV



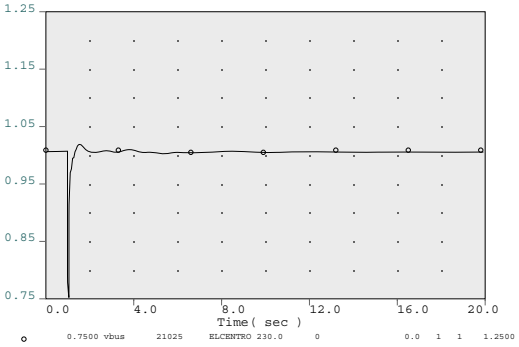
ROA-230kV



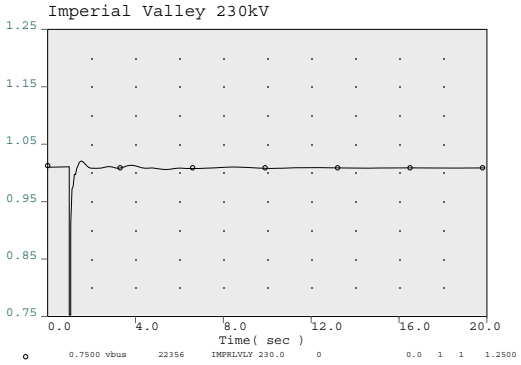
TJ1-230kV



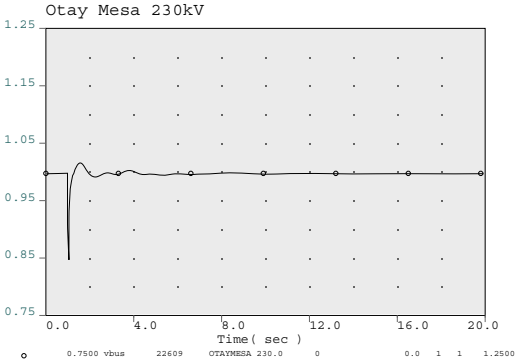
El Centro



Imperial Valley 230kV



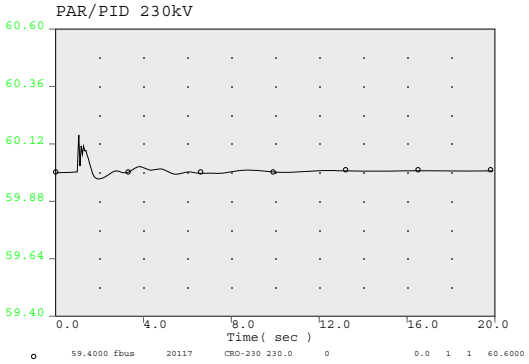
Otay Mesa 230kV



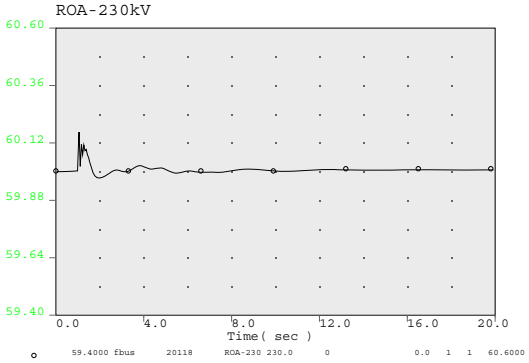
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Frequency Check and Comparison

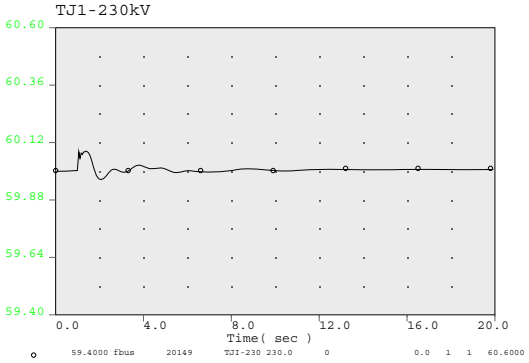
PAR/PID 230kV



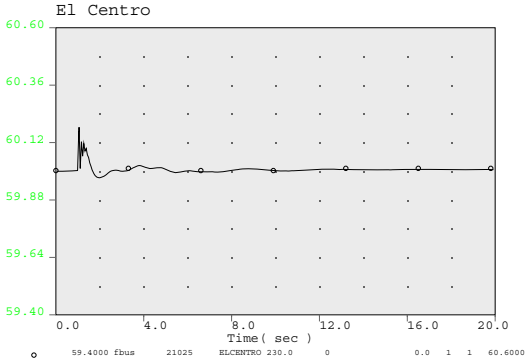
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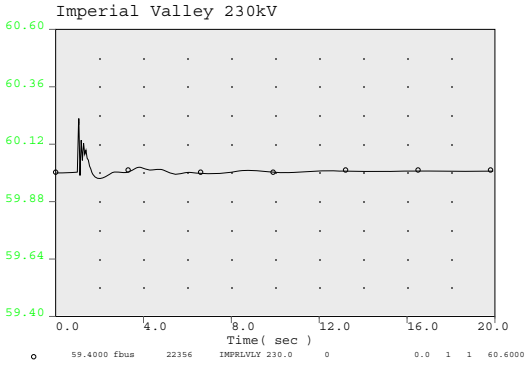
TJ1-230kV



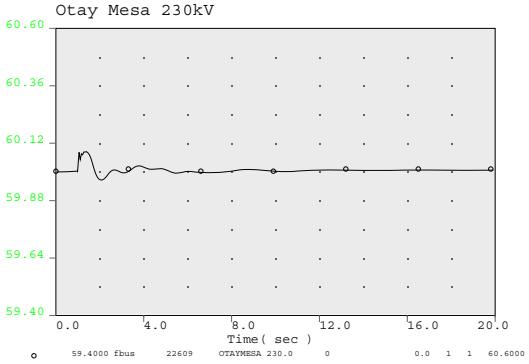
El Centro



Imperial Valley 230kV

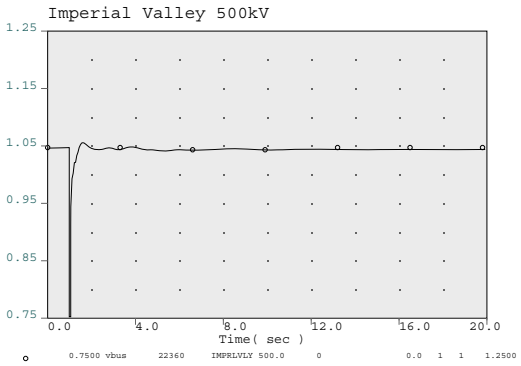


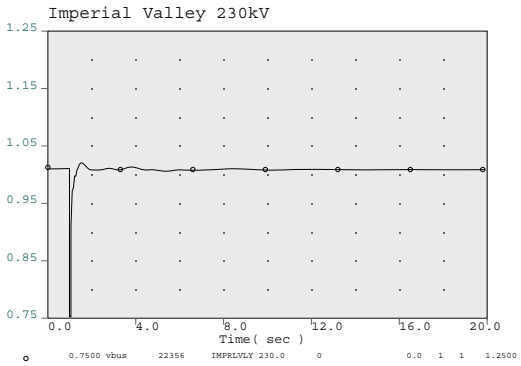
Otay Mesa 230kV

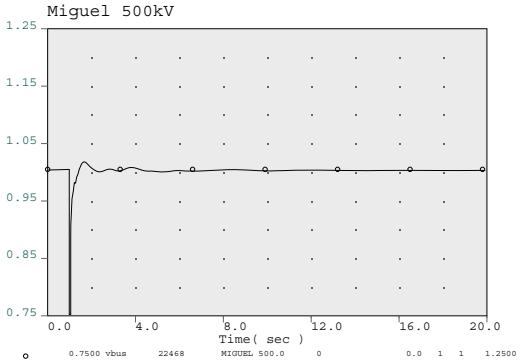


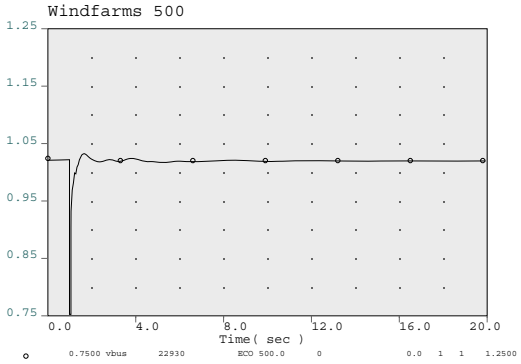
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

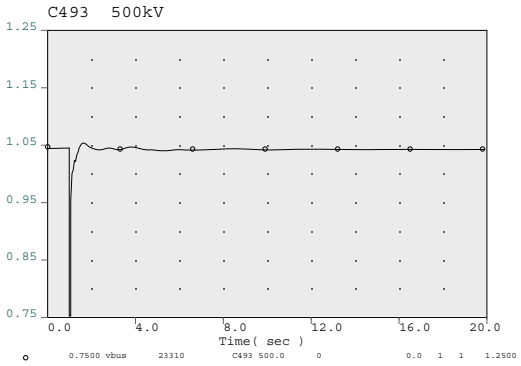
Imperial Valley Area - VOLTAGE

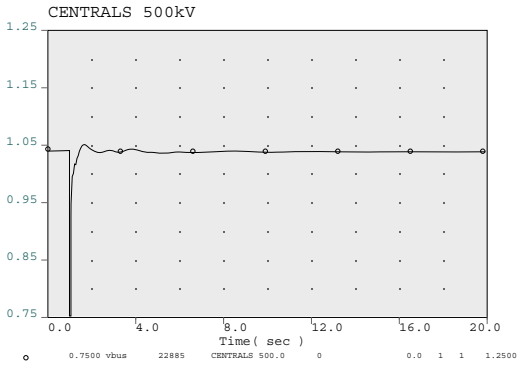






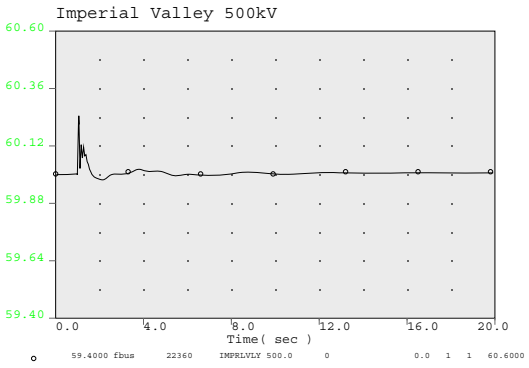


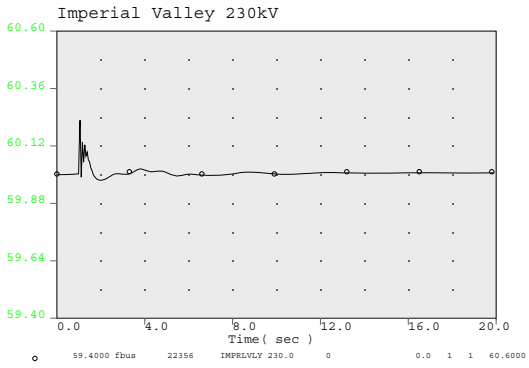


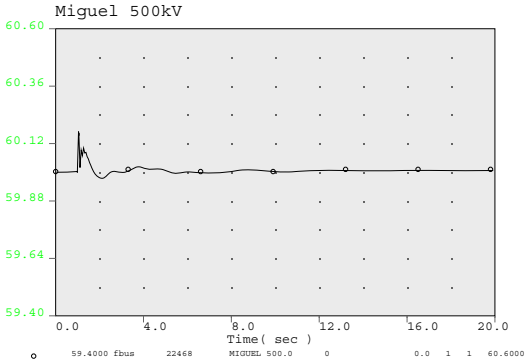


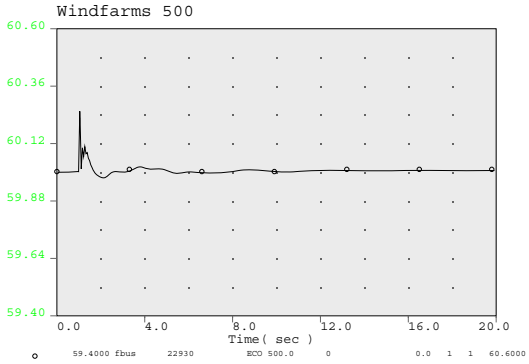
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

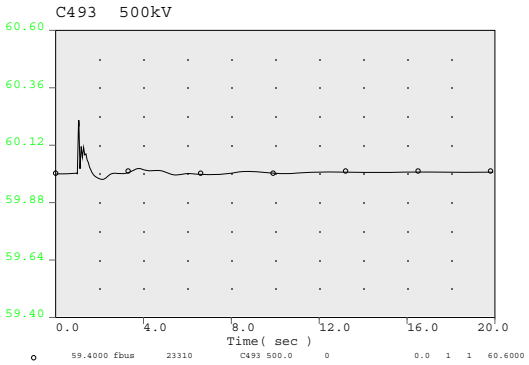
Imperial Valley Area - Frequency

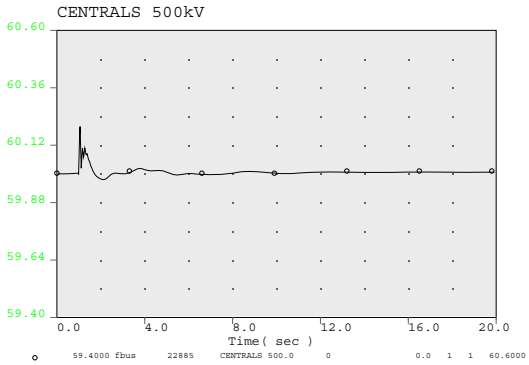






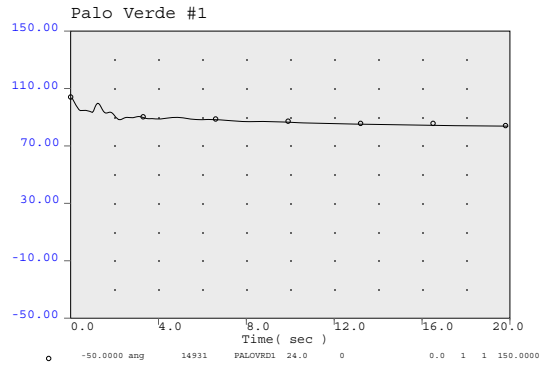


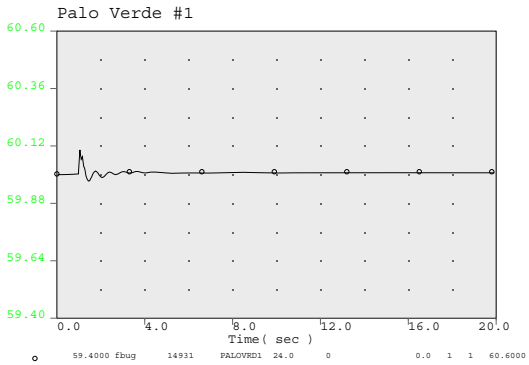


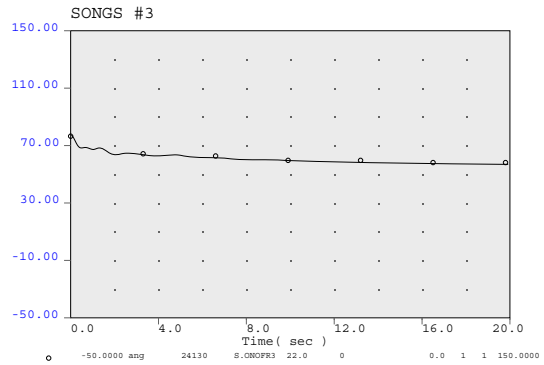


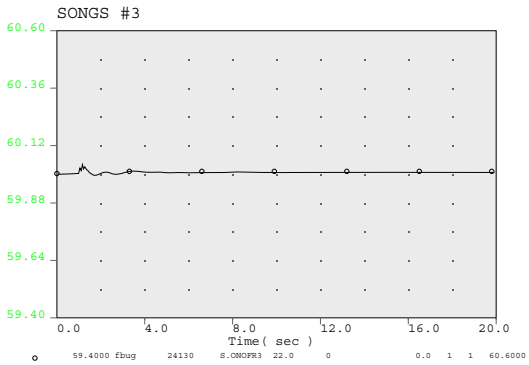
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

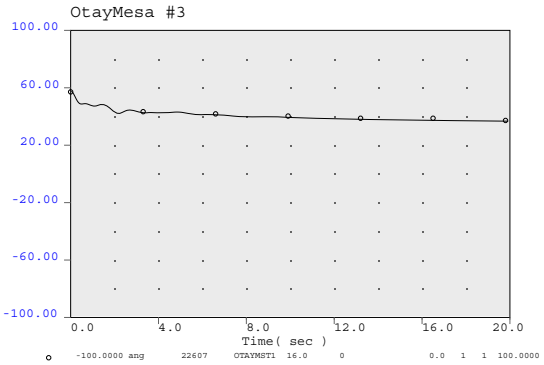
RELATIVE ROTOR ANGLE & FREQUENCY

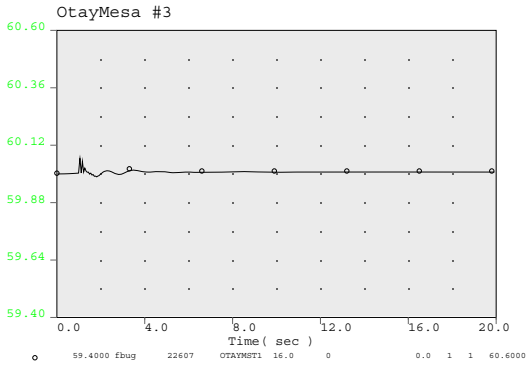










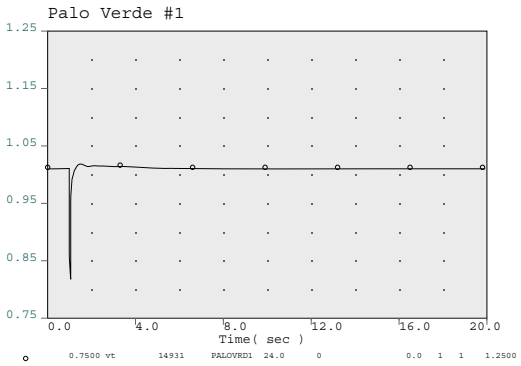


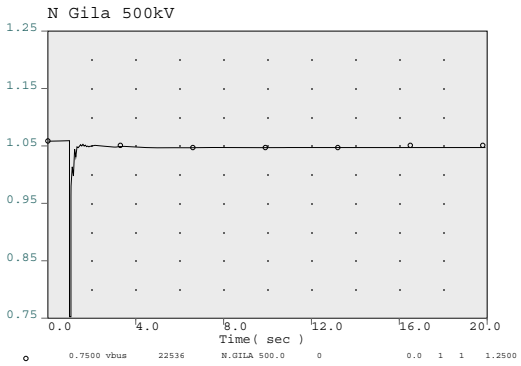
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

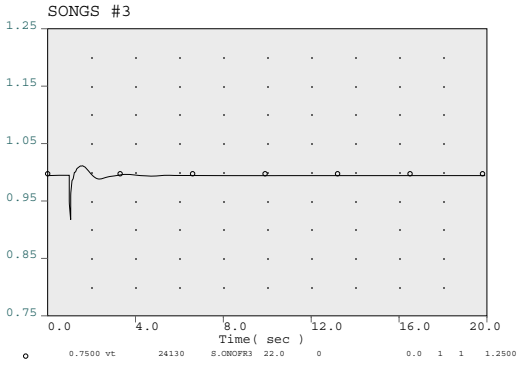
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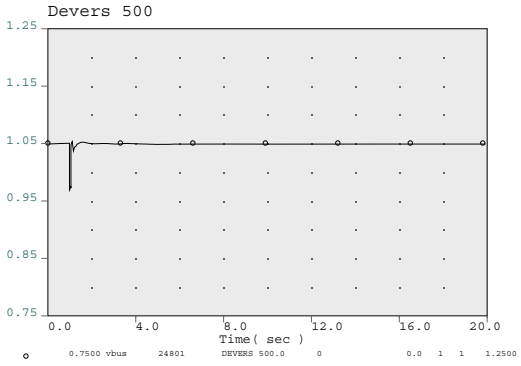
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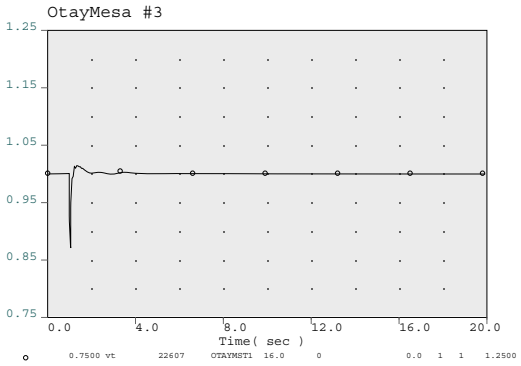
RELATIVE VOLTAGE

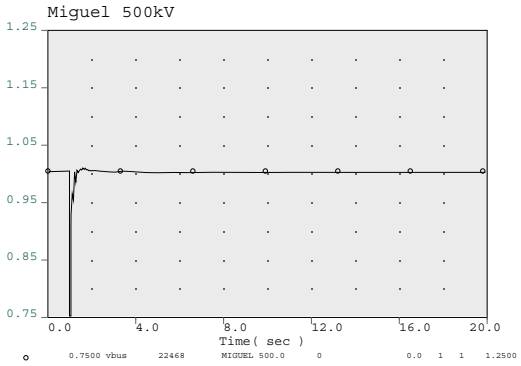








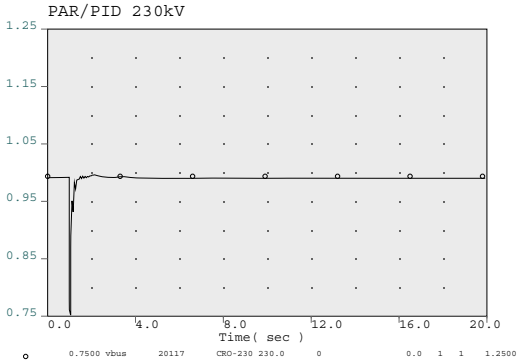




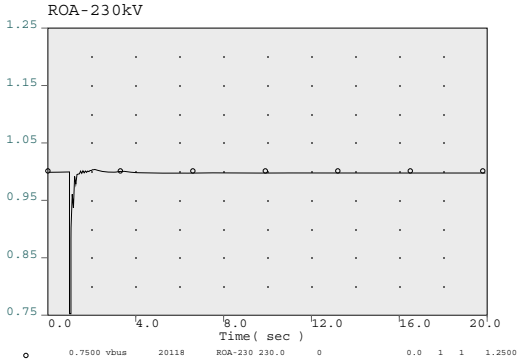
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

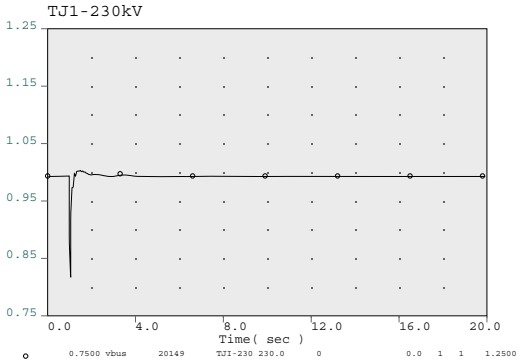
PAR/PID 230kV



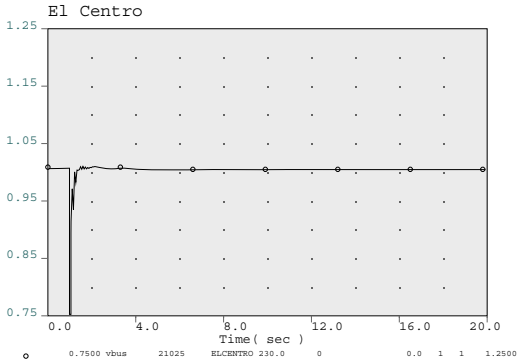
ROA-230kV



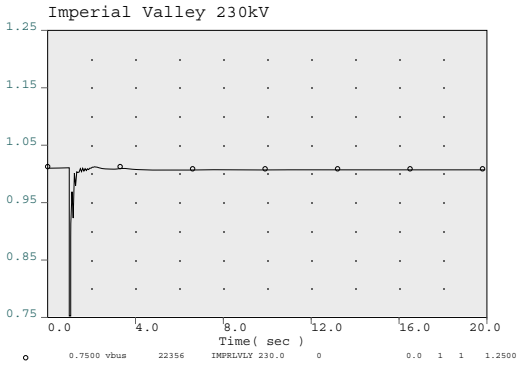
TJ1-230kV



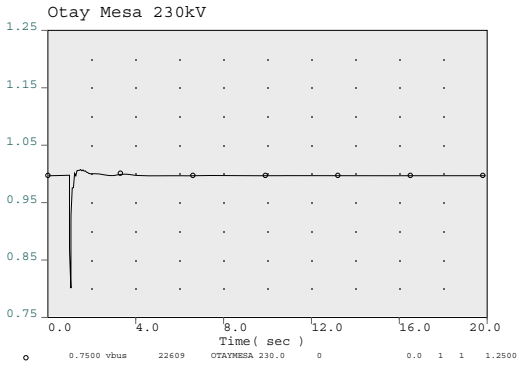
El Centro



Imperial Valley 230kV



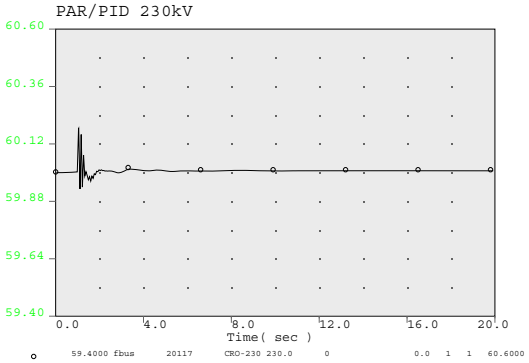
Otay Mesa 230kV



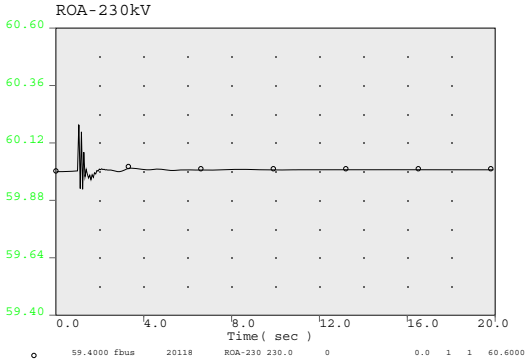
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

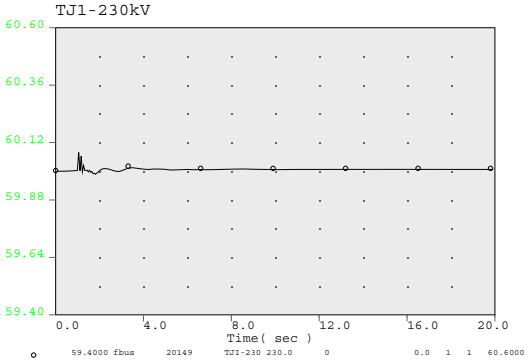
PAR/PID 230kV



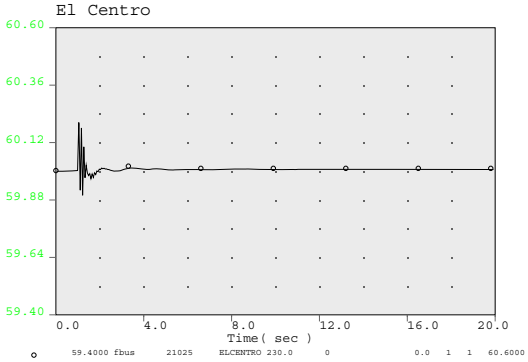
ROA-230kV



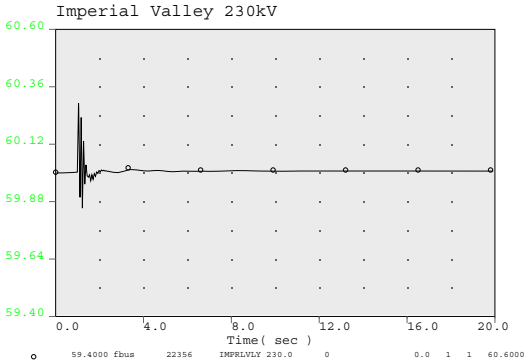
TJ1-230kV



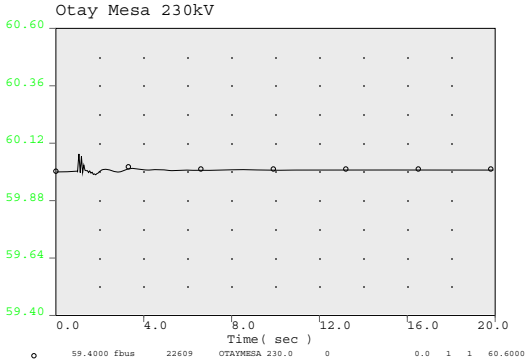
El Centro



Imperial Valley 230kV

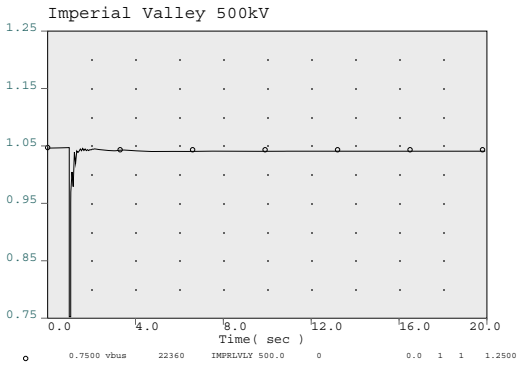


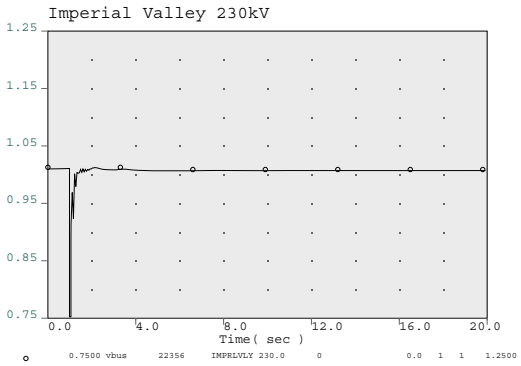
Otay Mesa 230kV

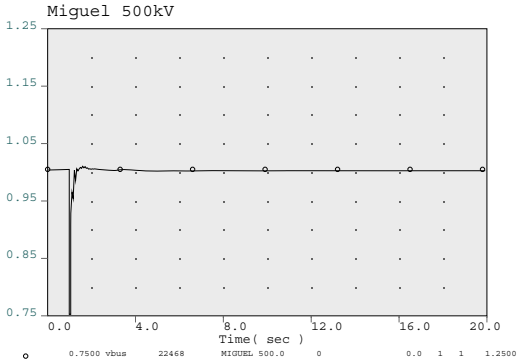


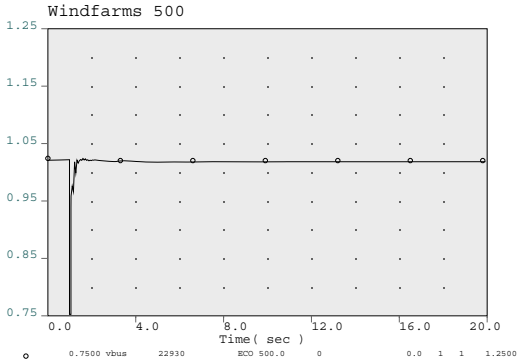
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

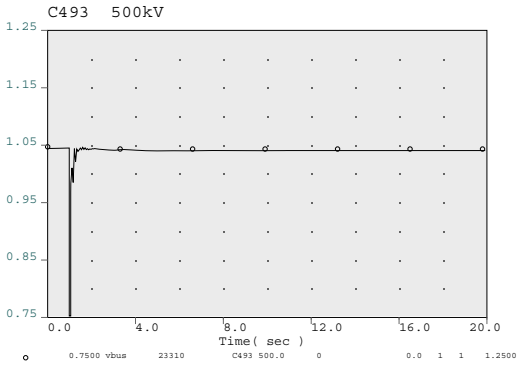
Imperial Valley Area - VOLTAGE

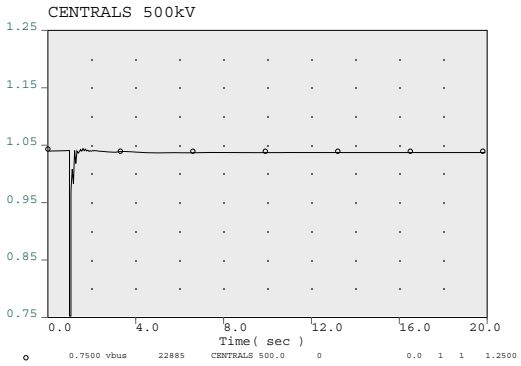












SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Appendix J-4

Transient Stability Analysis Plots

Imperial Valley Area Cluster

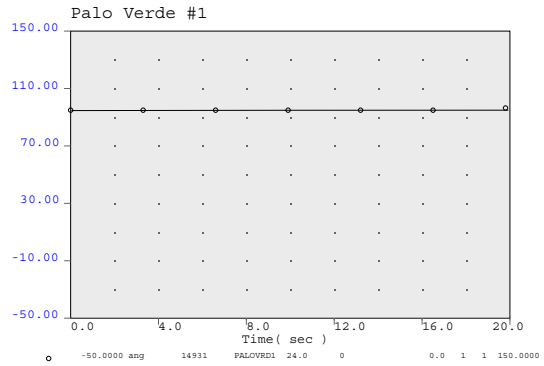
Light Load (Spring or Light Autumn) Post

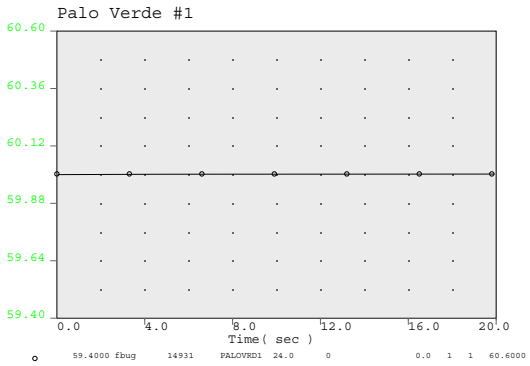
Imperial Valley Area - Frequency

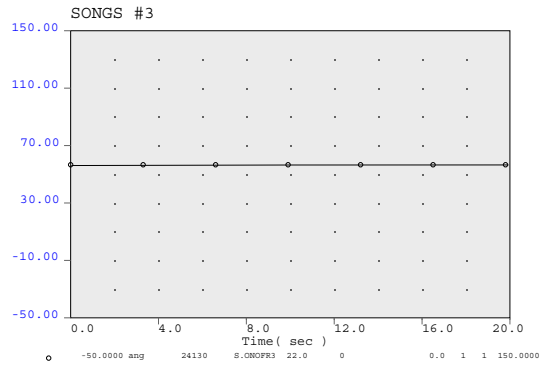


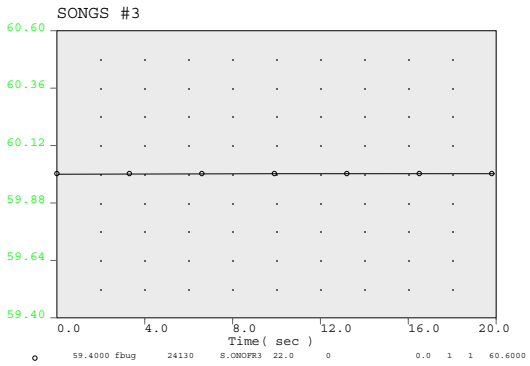
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

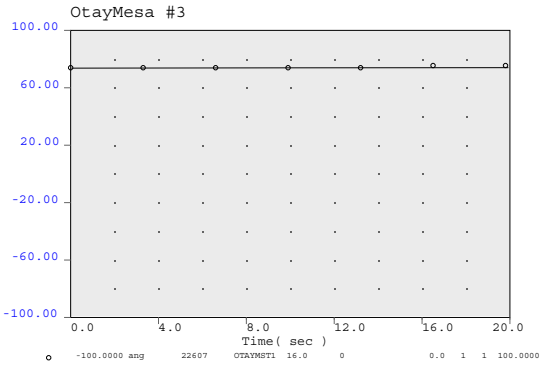
RELATIVE ROTOR ANGLE & FREQUENCY

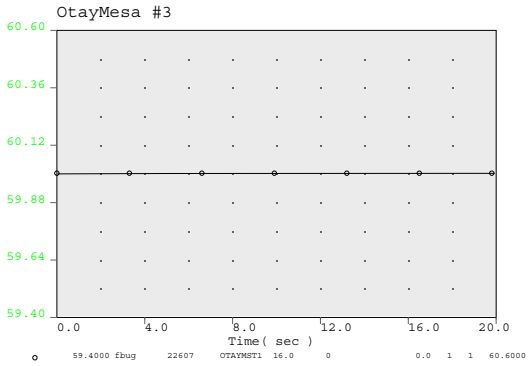












SDG&E Cluster 2 - post
2014 Light Autumn
Flat

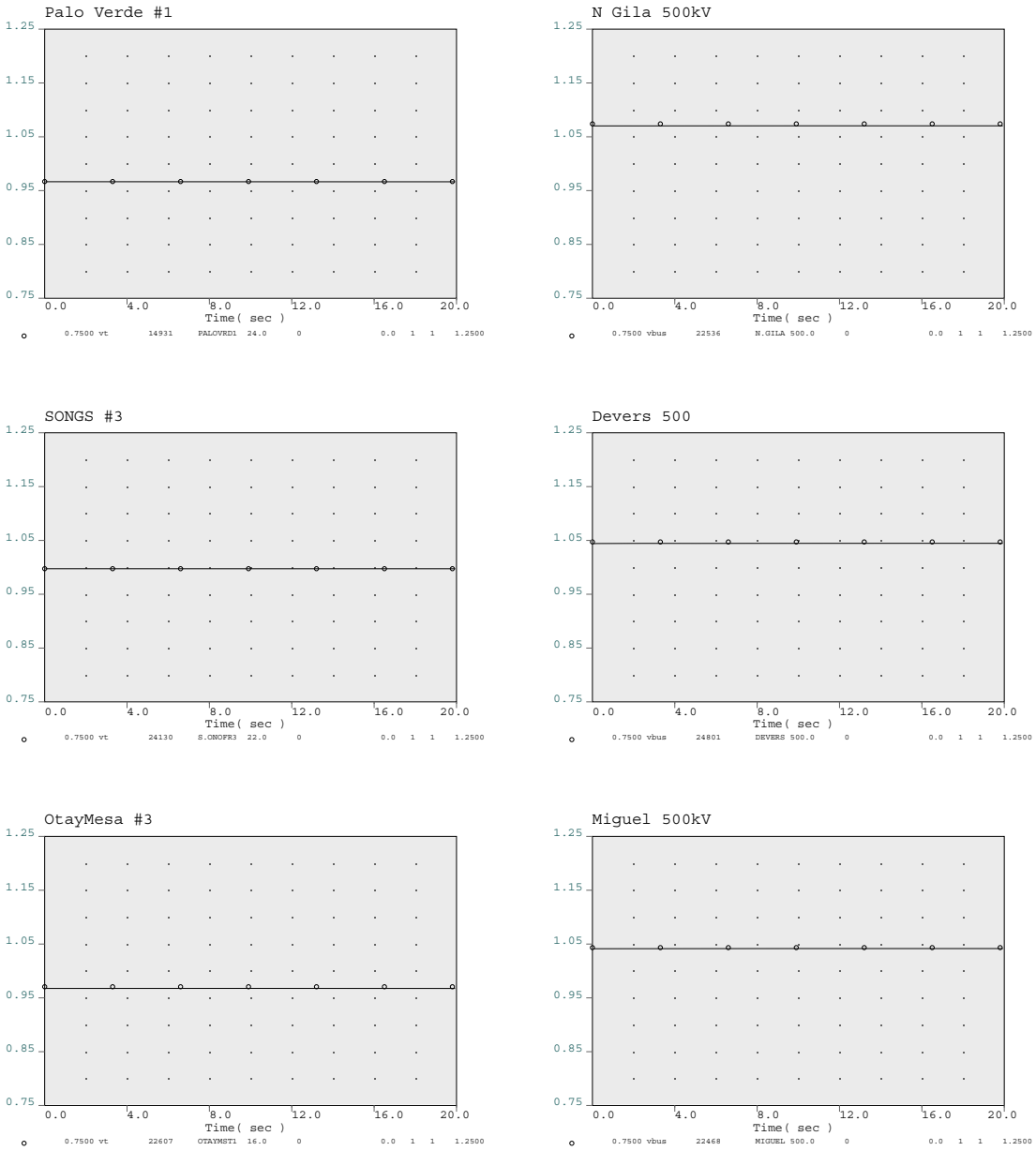
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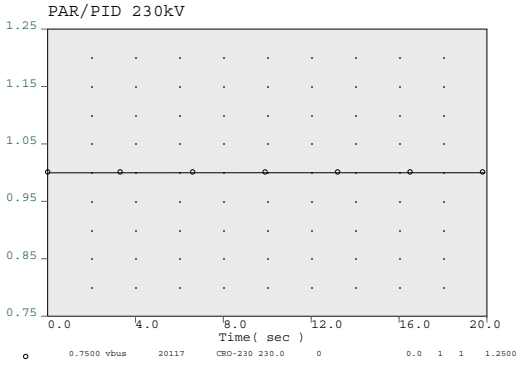
RELATIVE VOLTAGE



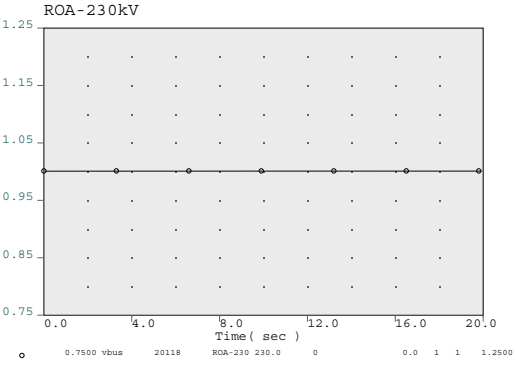
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Affected System Voltage Check and Comparison

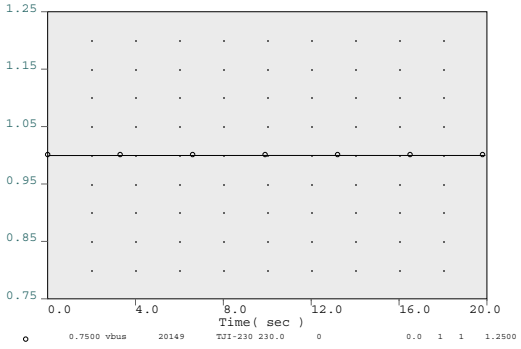
PAR/PID 230kV



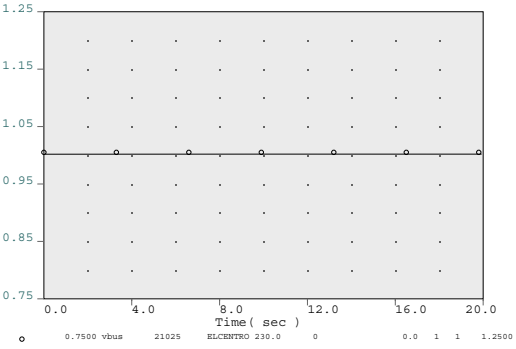
ROA-230kV



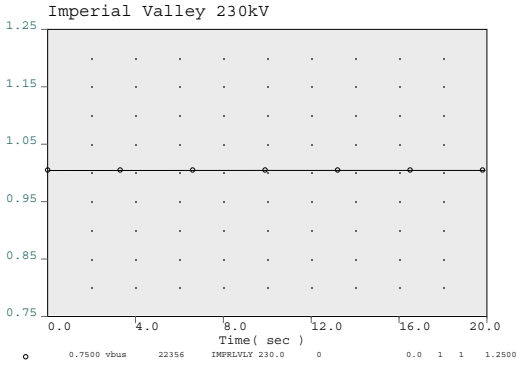
TJ1-230kV



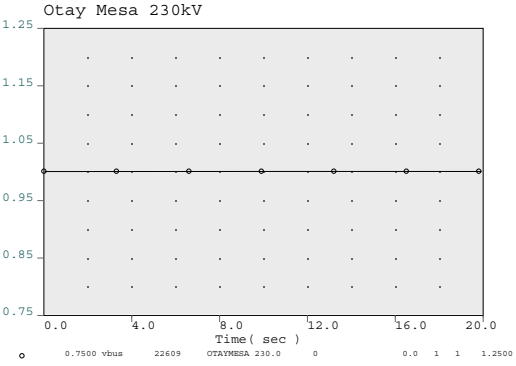
El Centro



Imperial Valley 230kV



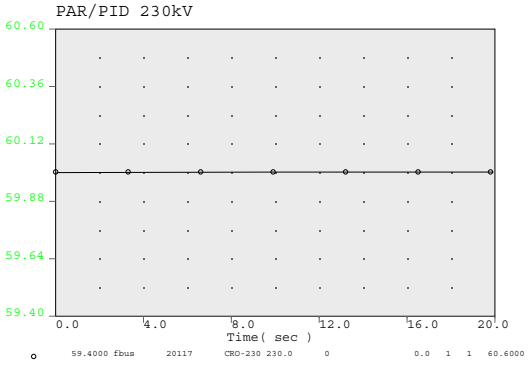
Otay Mesa 230kV



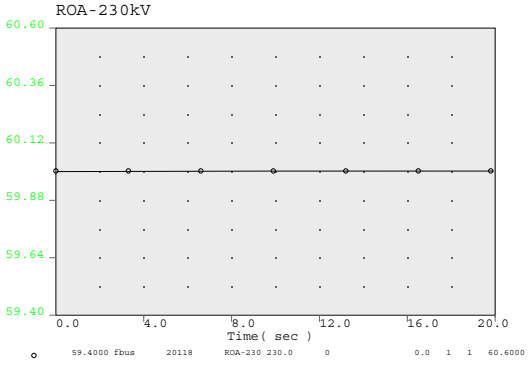
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Affected System Frequency Check and Comparison

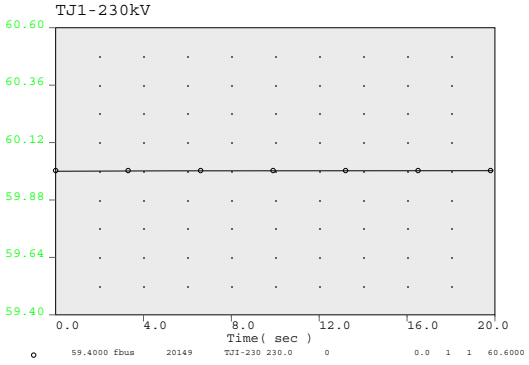
PAR/PID 230kV



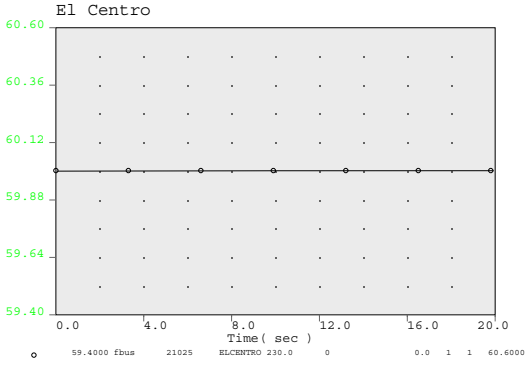
ROA-230kV



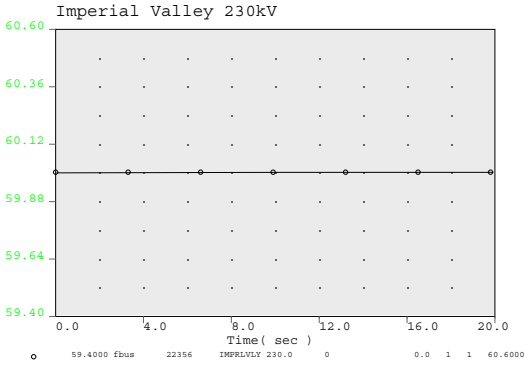
TJ1-230kV



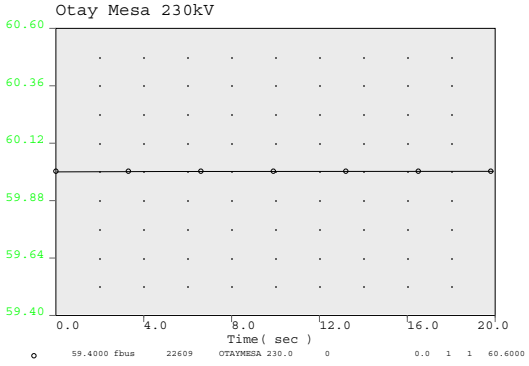
El Centro



Imperial Valley 230kV

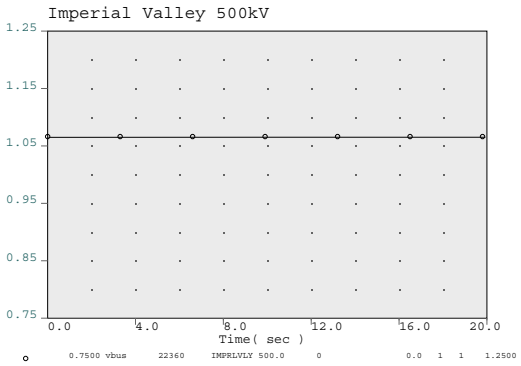


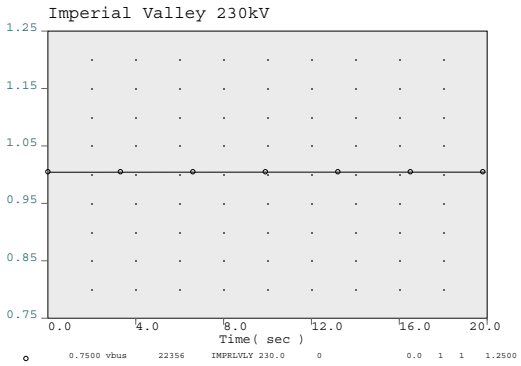
Otay Mesa 230kV

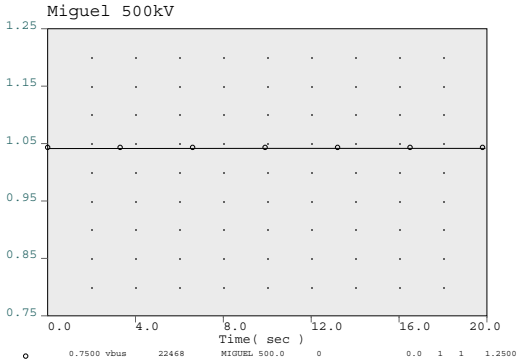


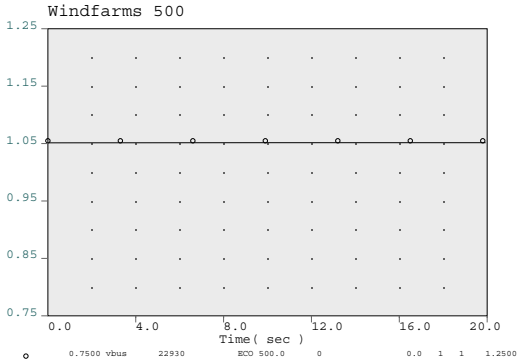
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

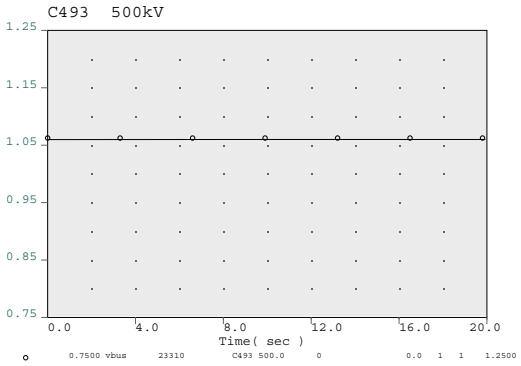
Imperial Valley Area - VOLTAGE

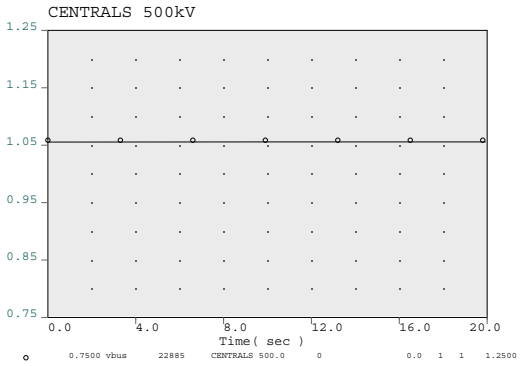










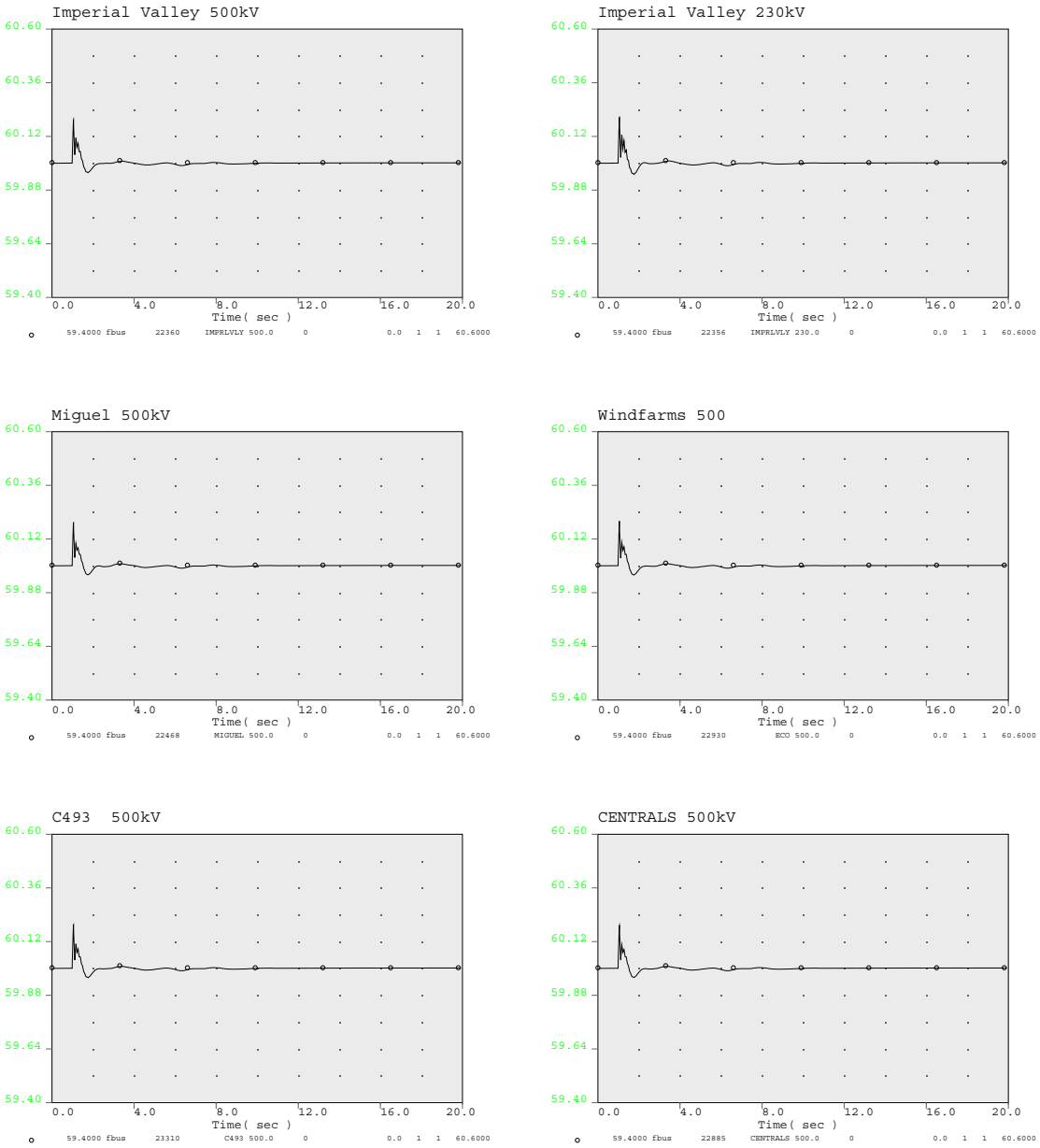


SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Page 5

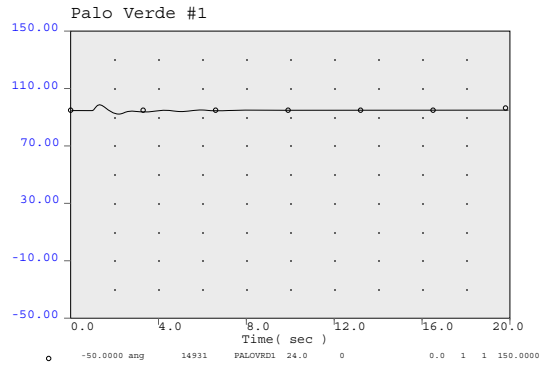
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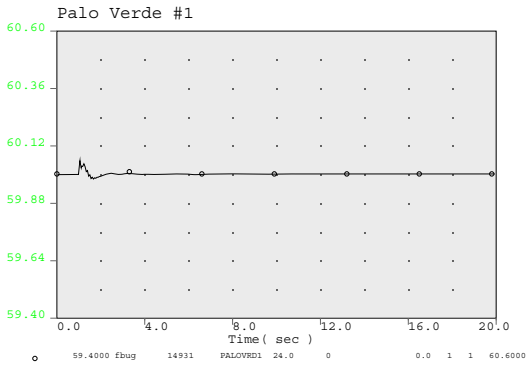
Imperial Valley Area - Frequency

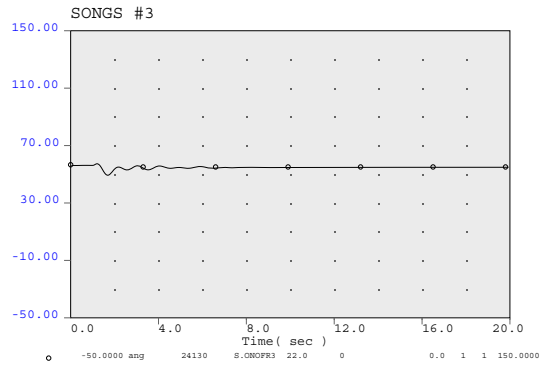


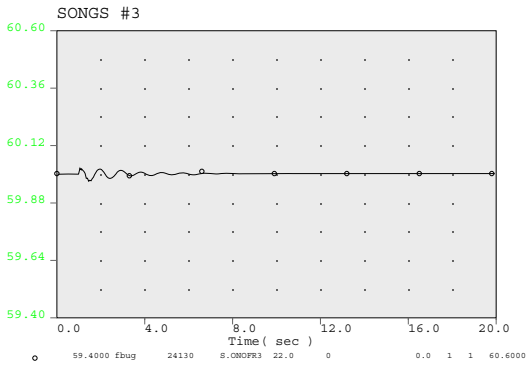
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

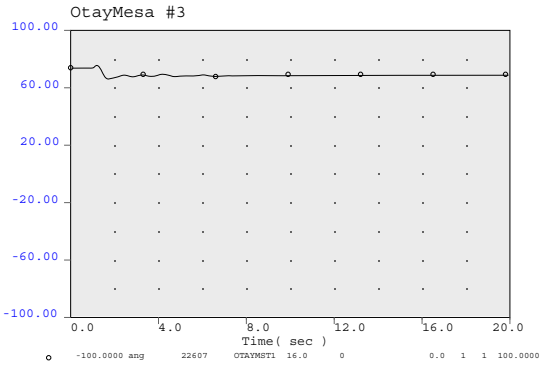
RELATIVE ROTOR ANGLE & FREQUENCY

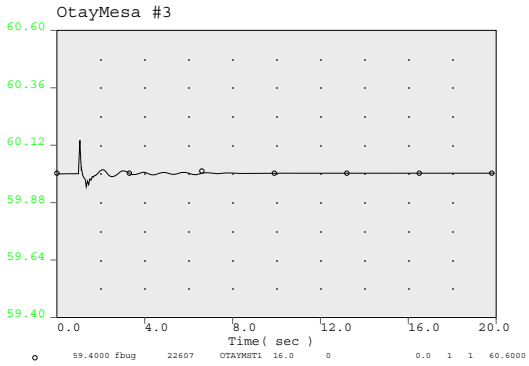












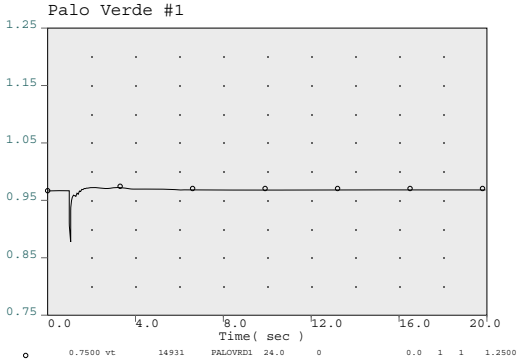
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Page 1

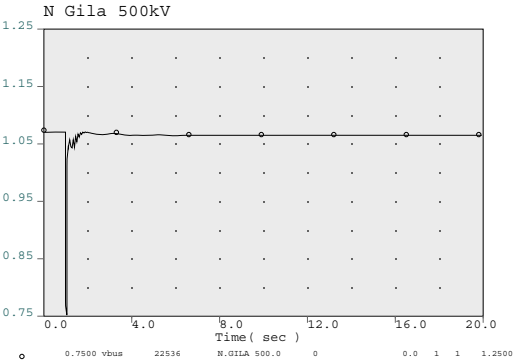
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RELATIVE VOLTAGE

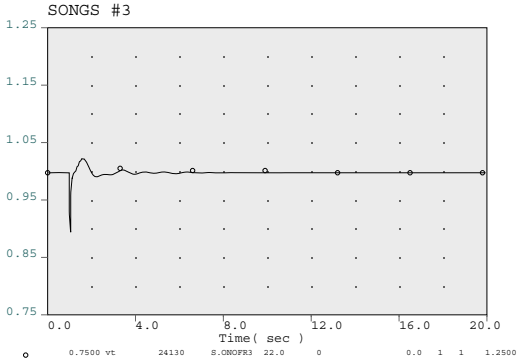
Palo Verde #1



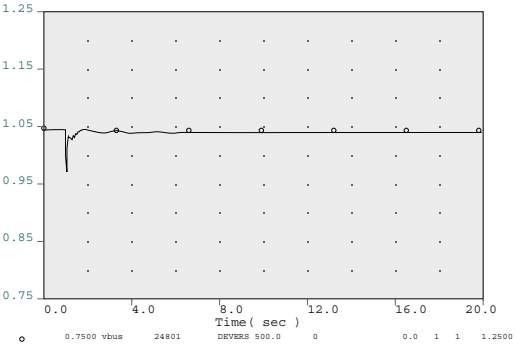
N Gila 500kV



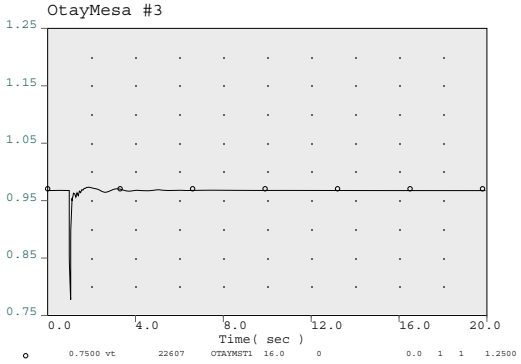
SONGS #3



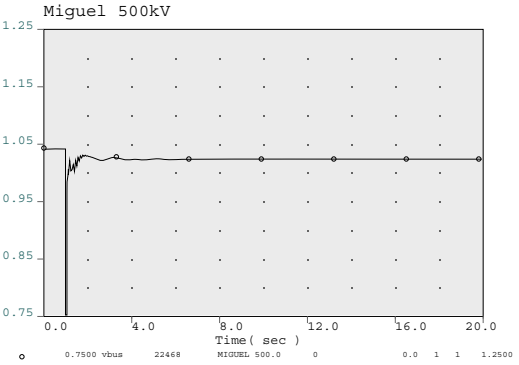
Devers 500



OtayMesa #3



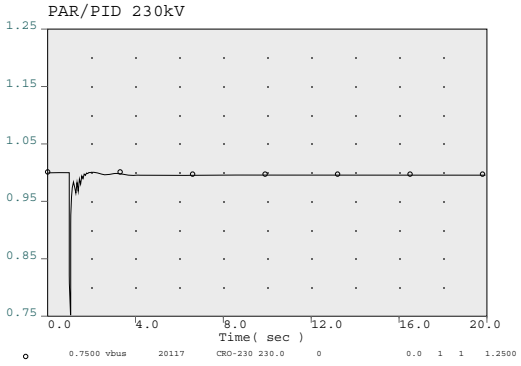
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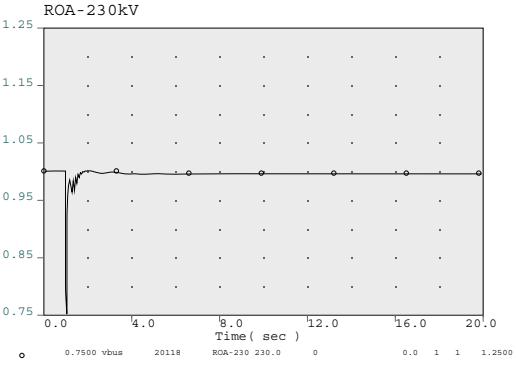
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

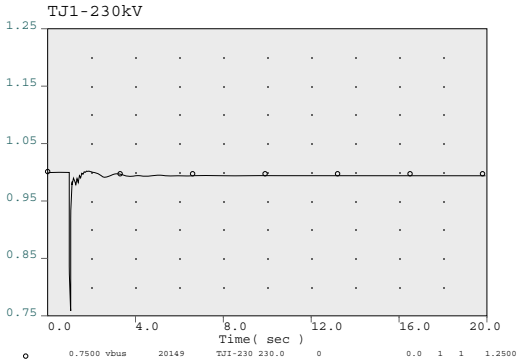
PAR/PID 230kV



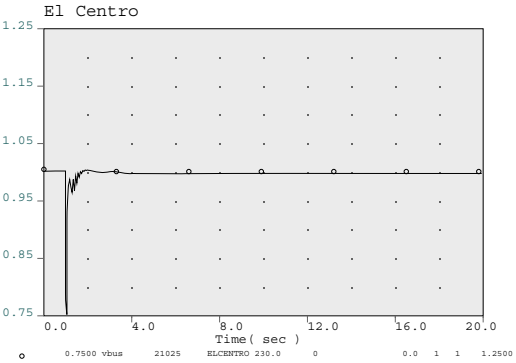
ROA-230kV



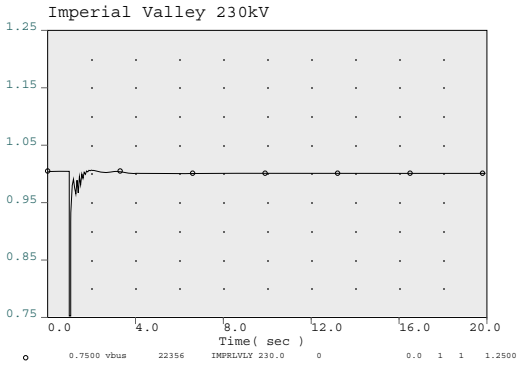
TJ1-230kV



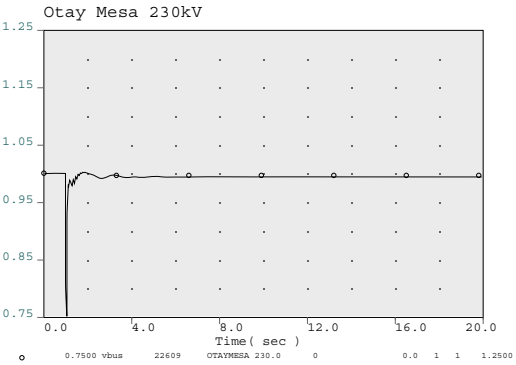
El Centro



Imperial Valley 230kV

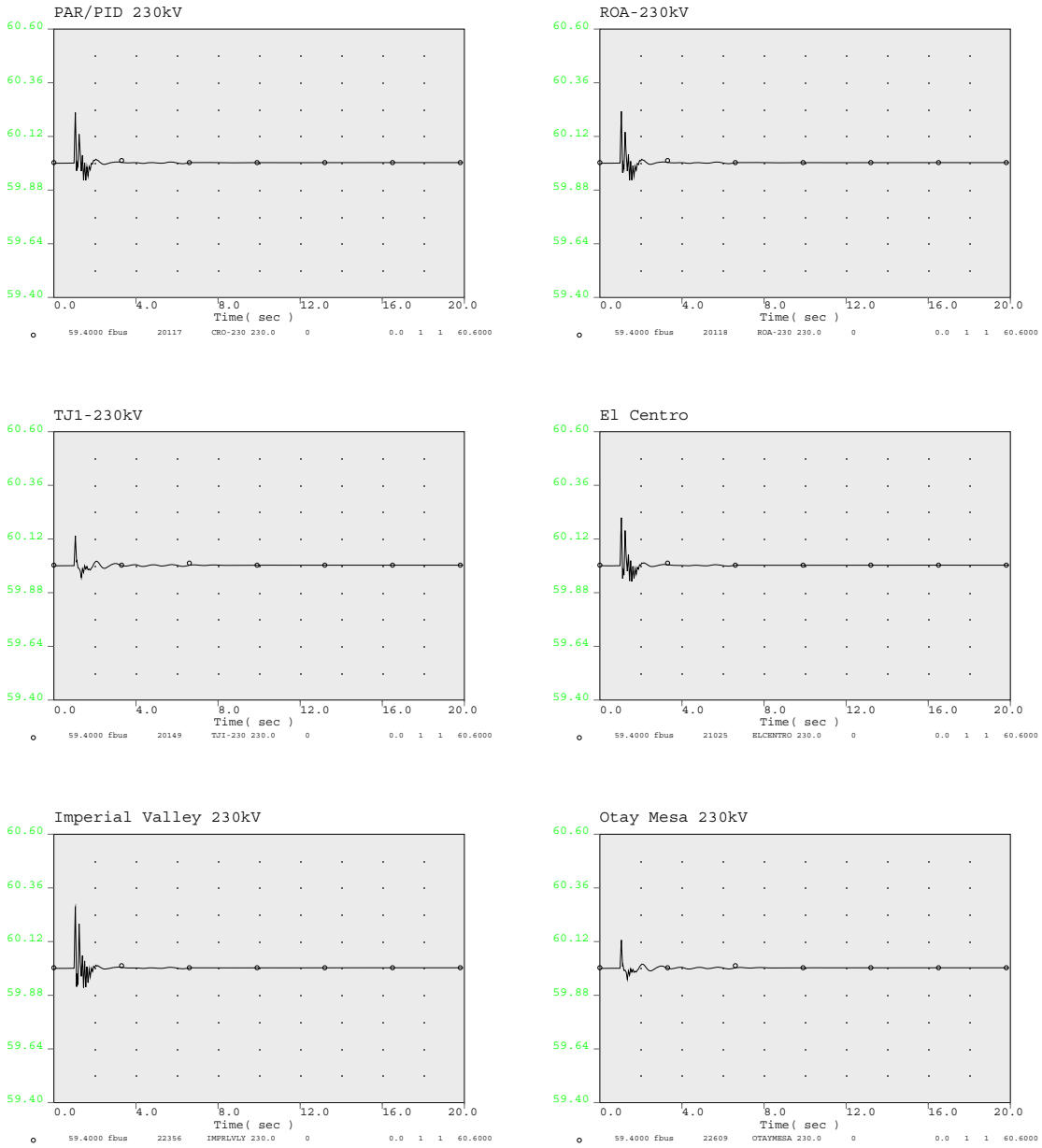


Otay Mesa 230kV



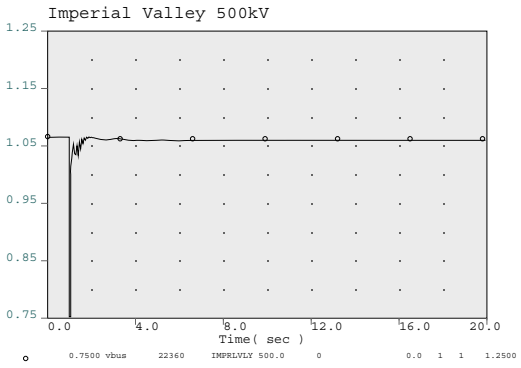
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

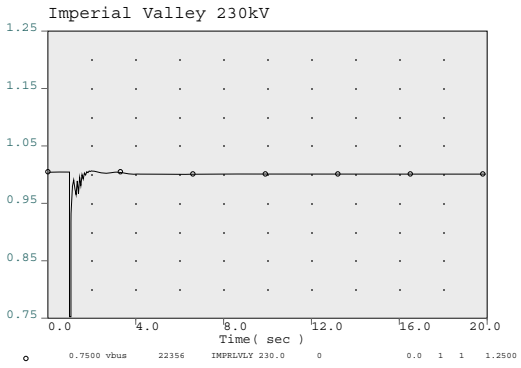
Affected System Frequency Check and Comparison

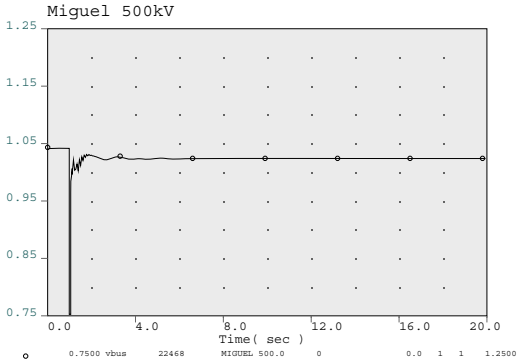


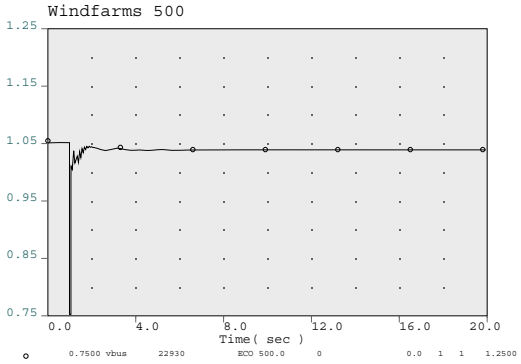
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

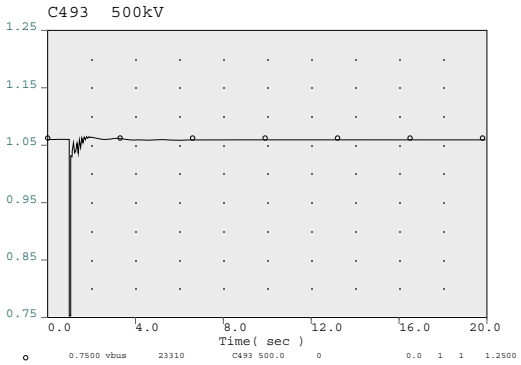
Imperial Valley Area - VOLTAGE

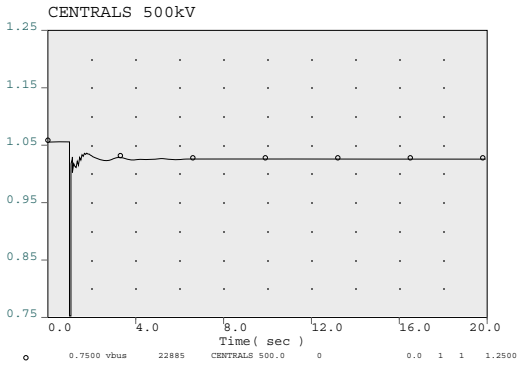






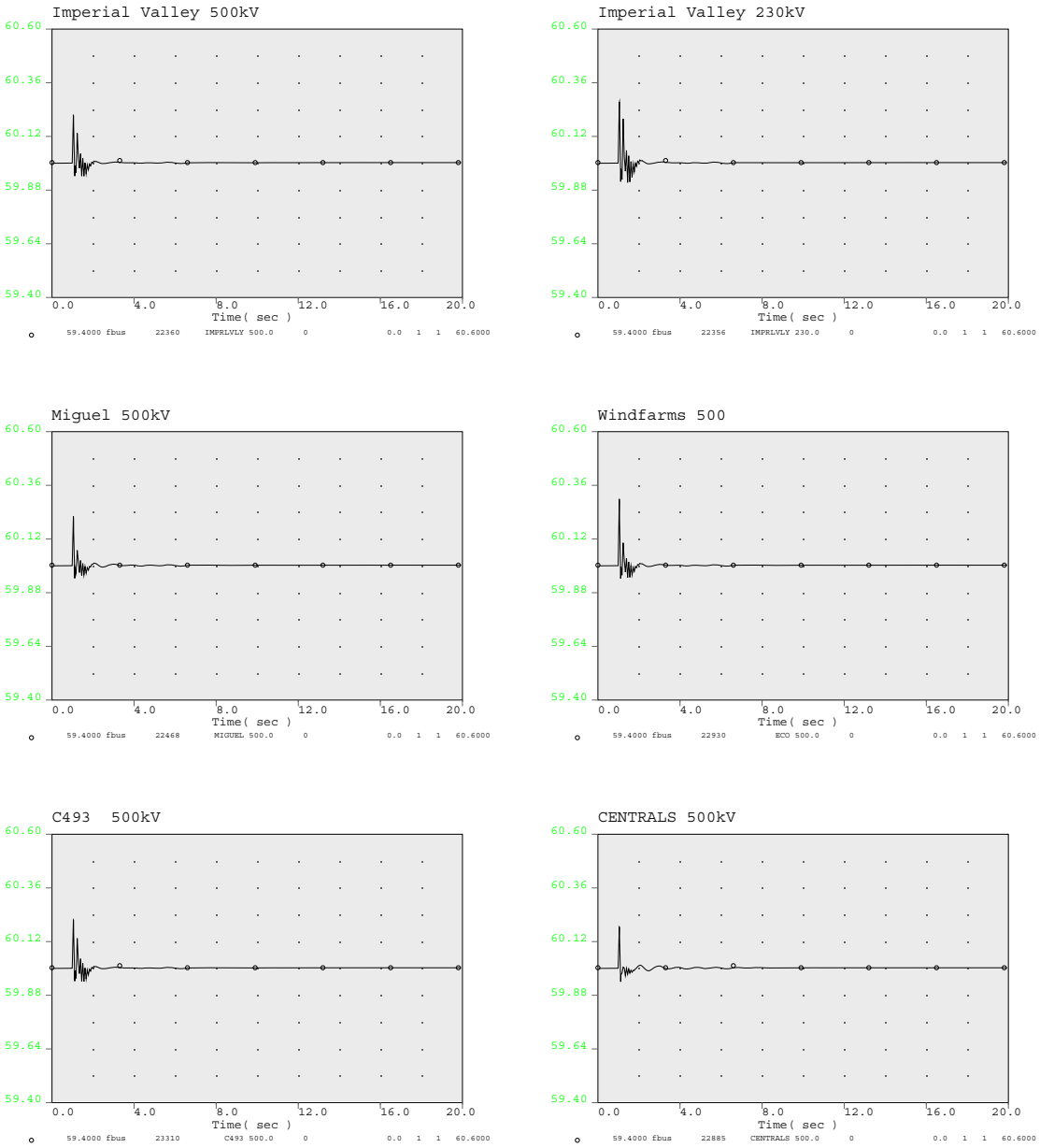






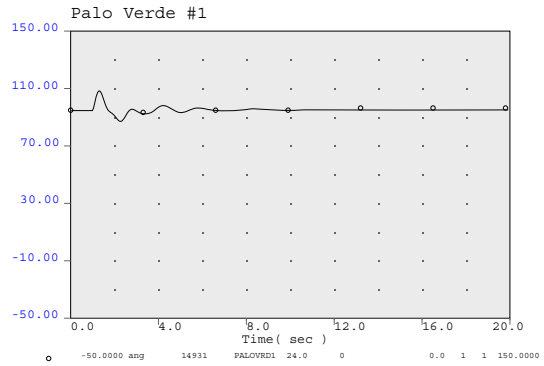
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

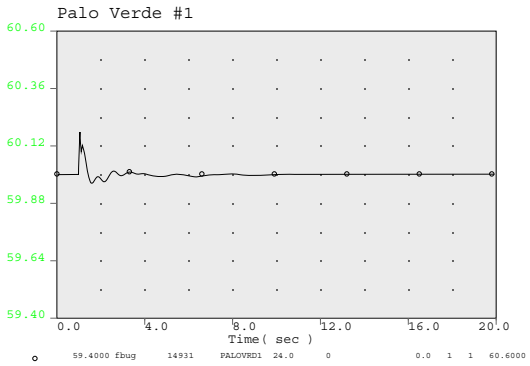
Imperial Valley Area - Frequency

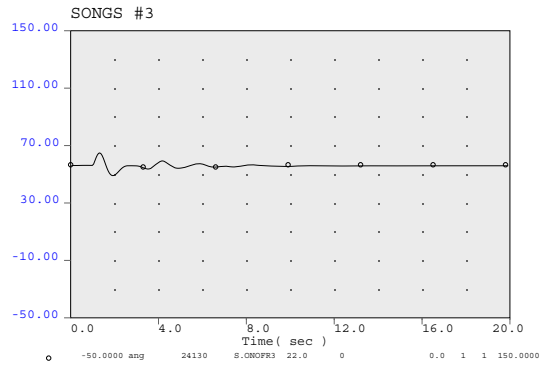


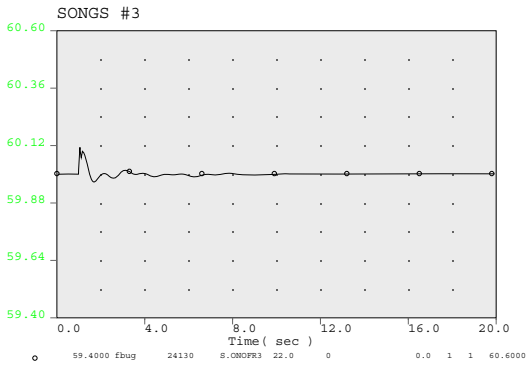
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

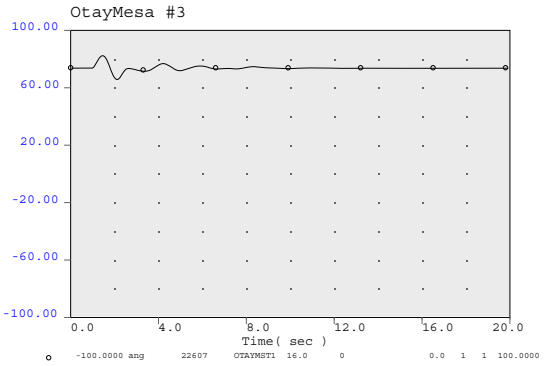
RELATIVE ROTOR ANGLE & FREQUENCY

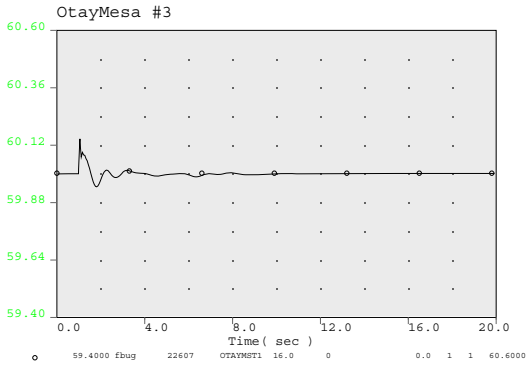












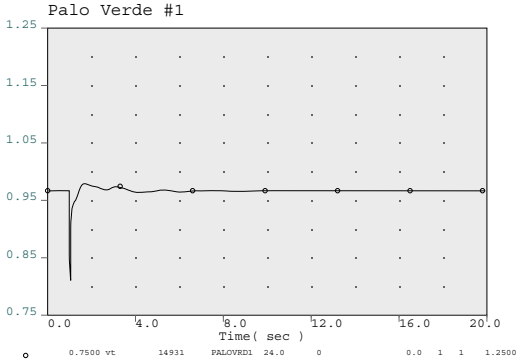
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

Page 1

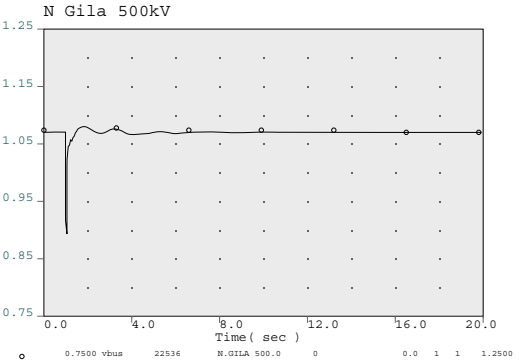
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RELATIVE VOLTAGE

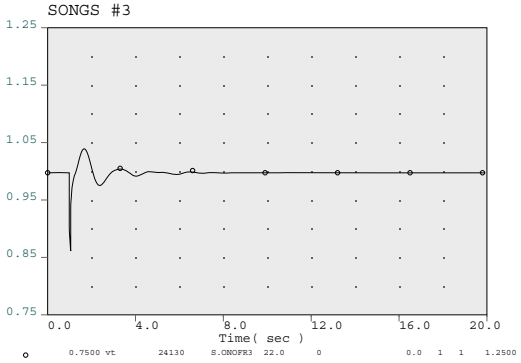
Palo Verde #1



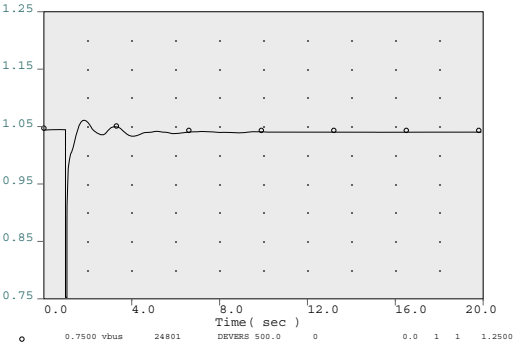
N Gila 500kV



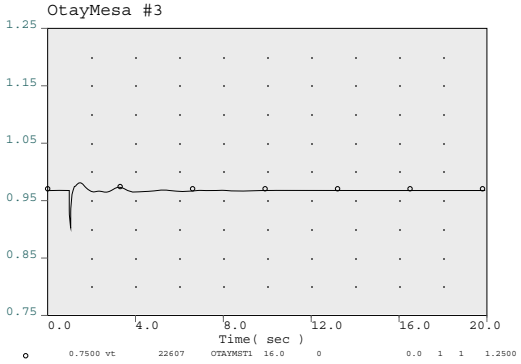
SONGS #3



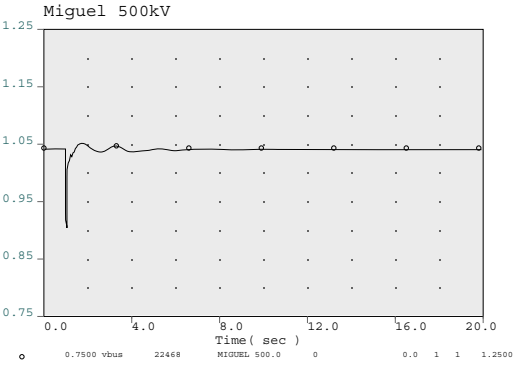
Devers 500



OtayMesa #3



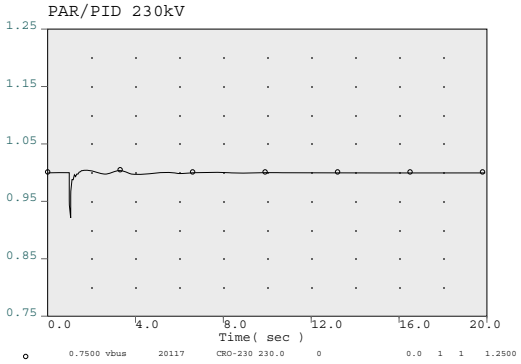
Miguel 500kV



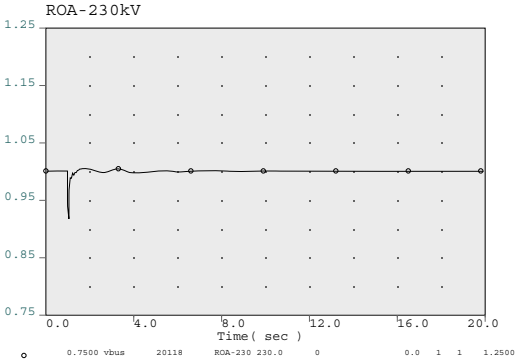
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

Affected System Voltage Check and Comparison

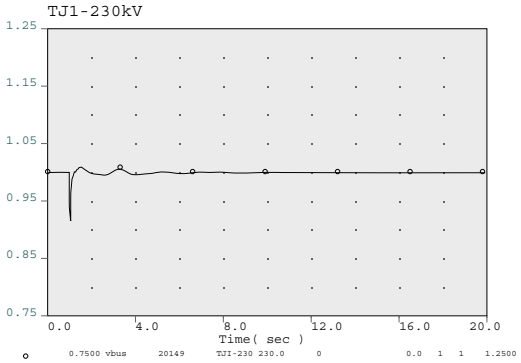
PAR/PID 230kV



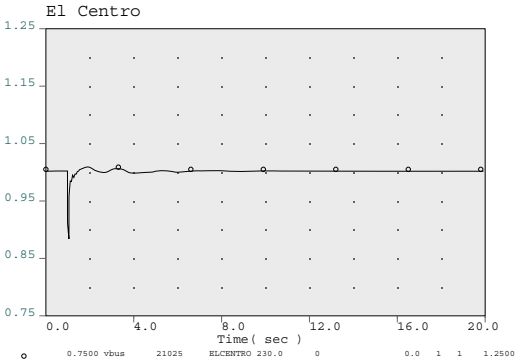
ROA-230kV



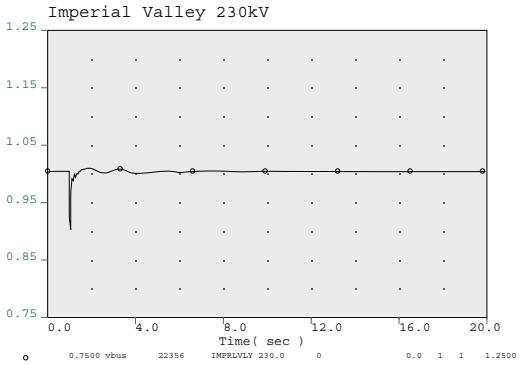
TJ1-230kV



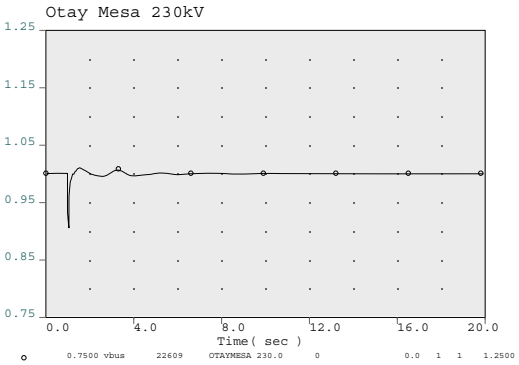
El Centro



Imperial Valley 230kV



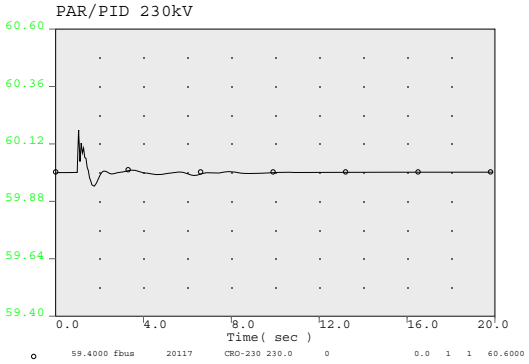
Otay Mesa 230kV



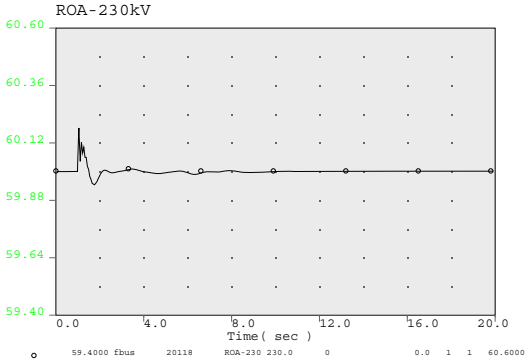
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

Affected System Frequency Check and Comparison

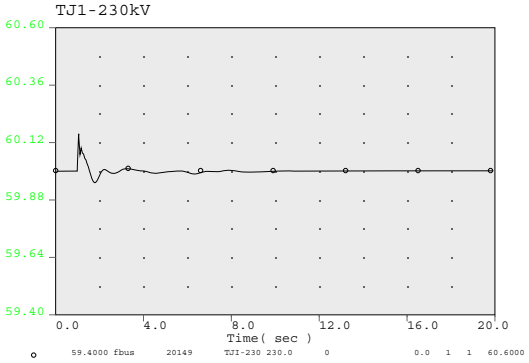
PAR/PID 230kV



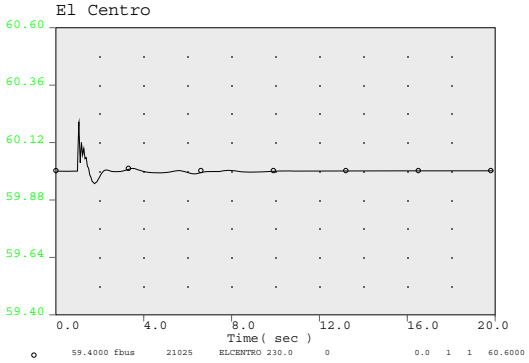
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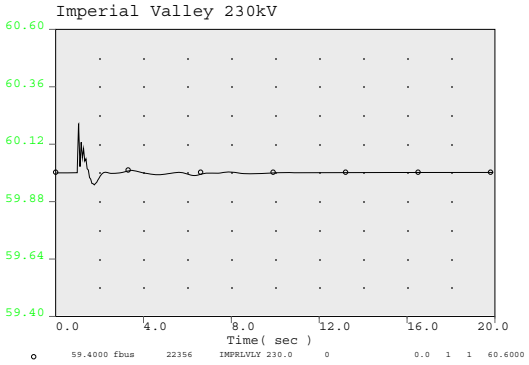
TJ1-230kV



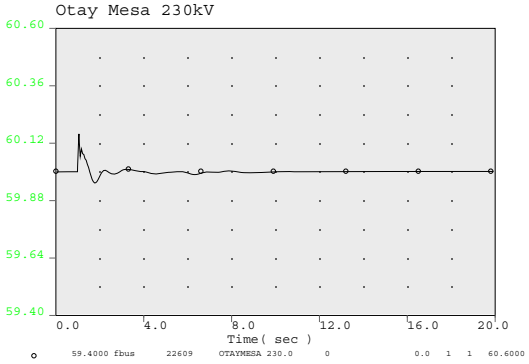
El Centro



Imperial Valley 230kV



Otay Mesa 230kV

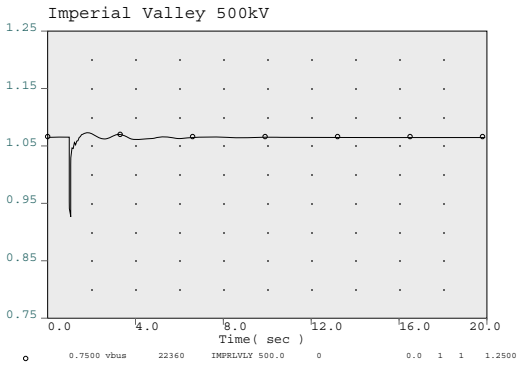


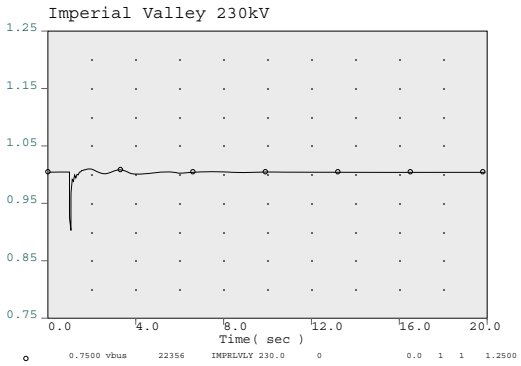
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

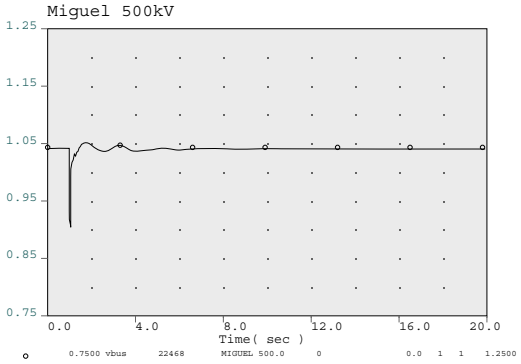
Page 4

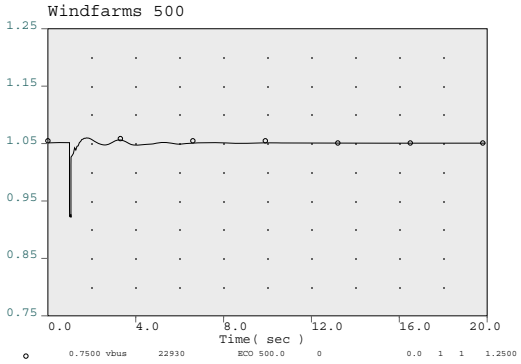
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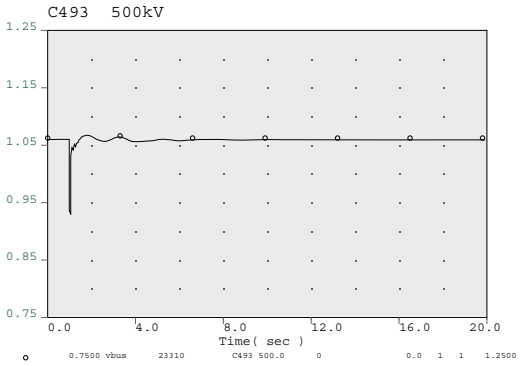
Imperial Valley Area - VOLTAGE

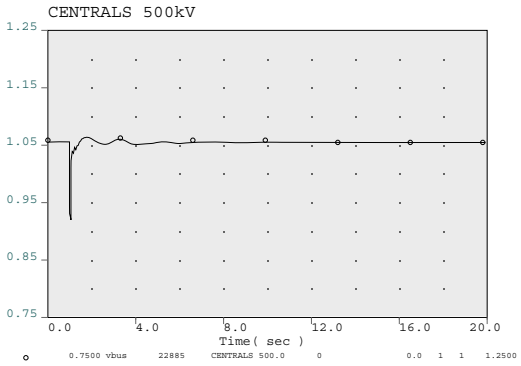






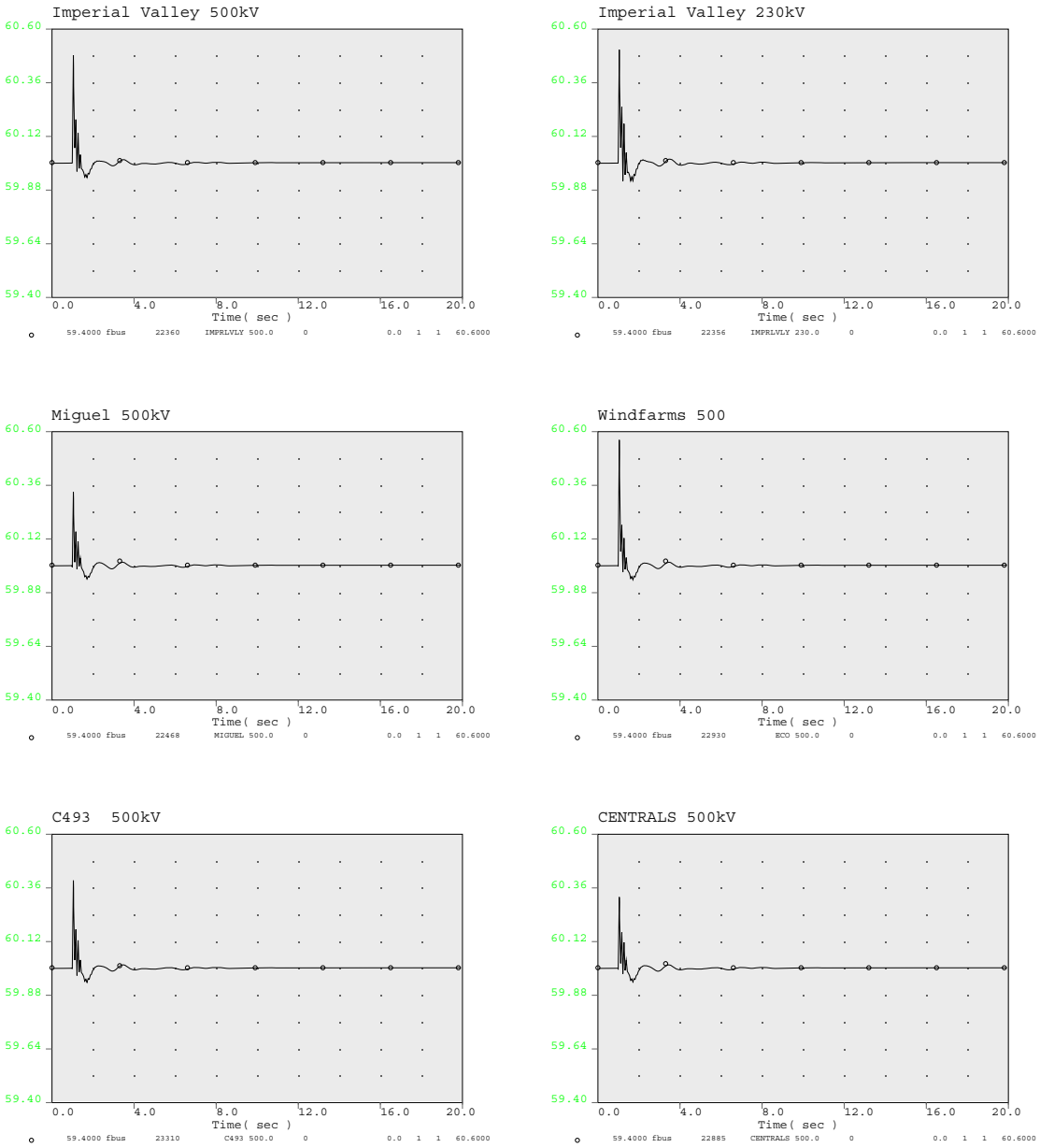






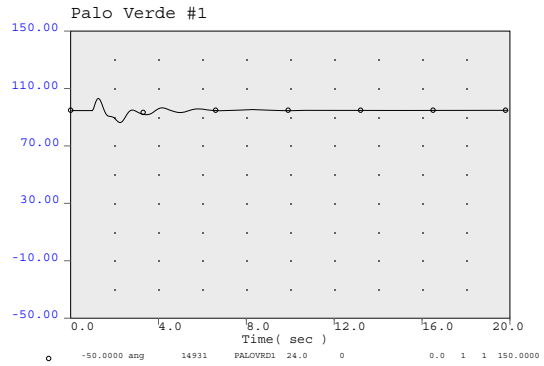
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

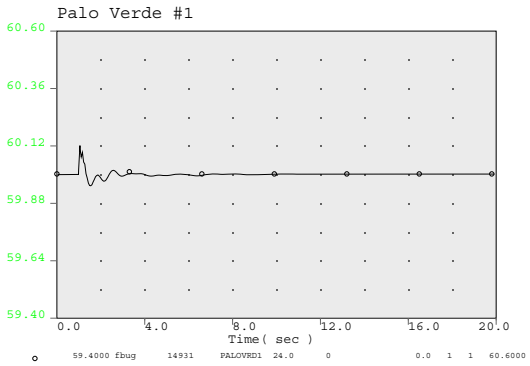
Imperial Valley Area - Frequency

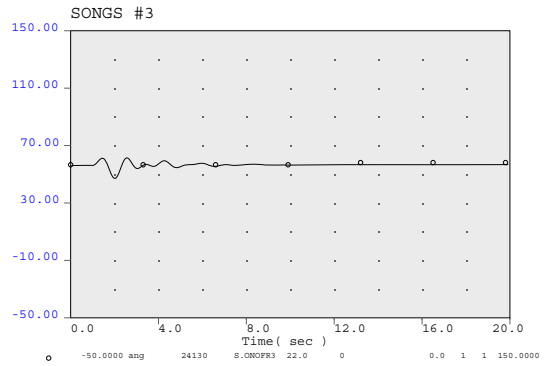


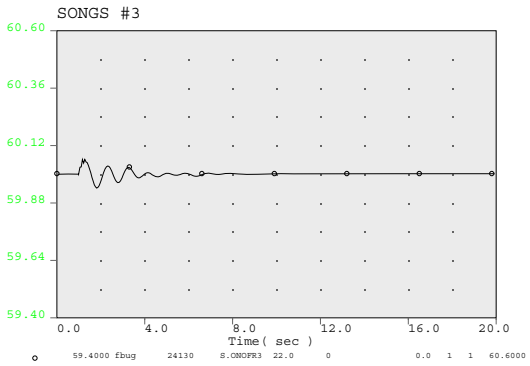
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

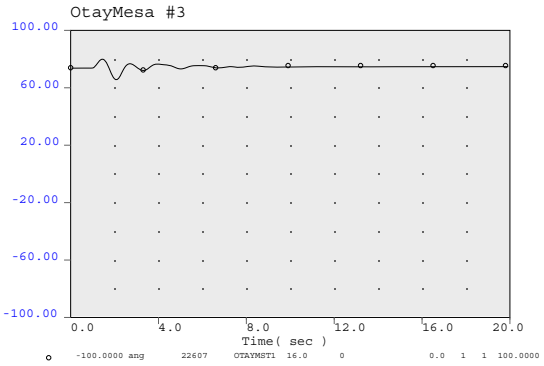
RELATIVE ROTOR ANGLE & FREQUENCY

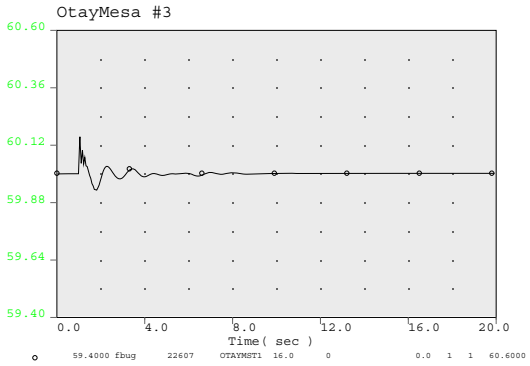










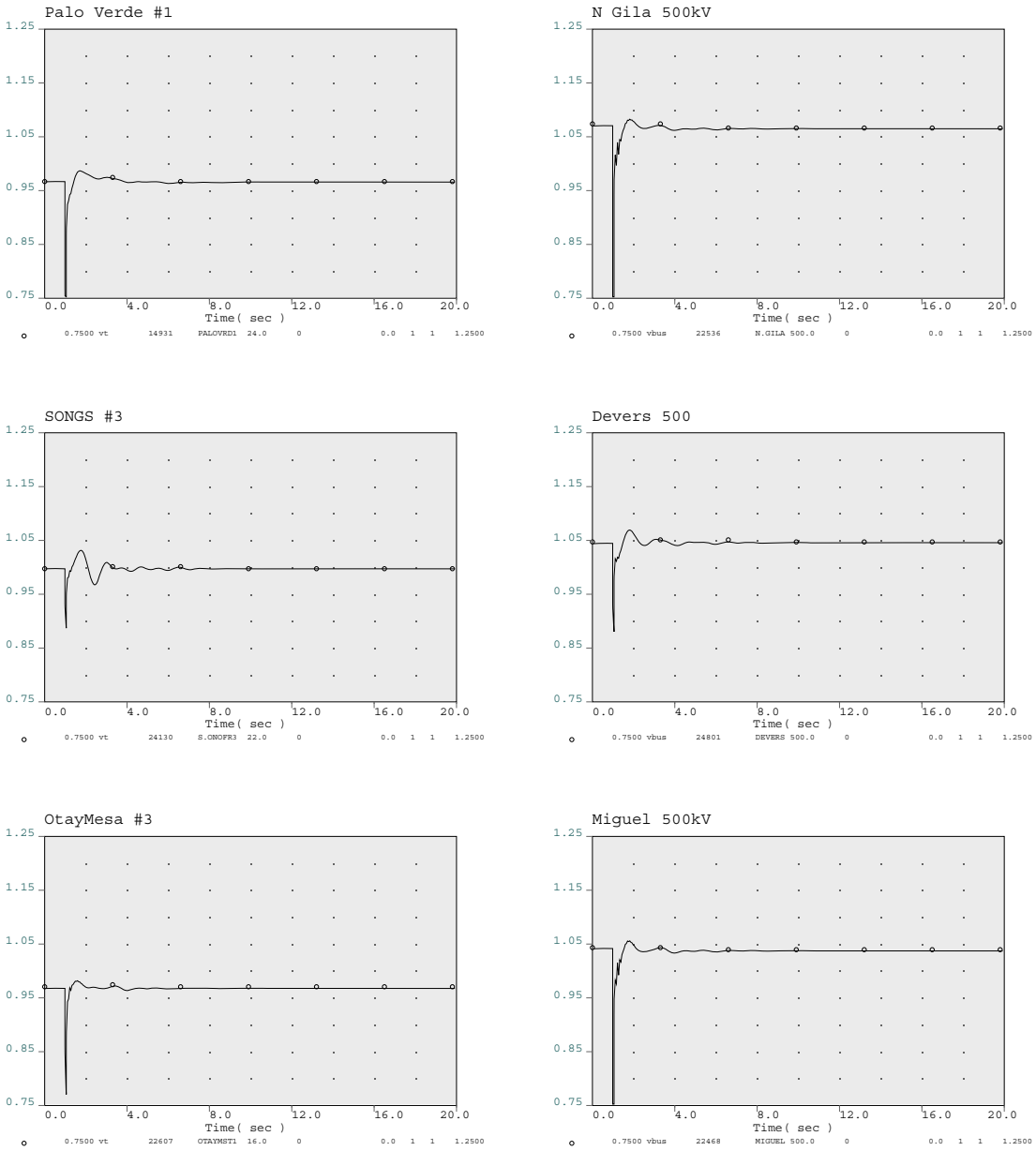


SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

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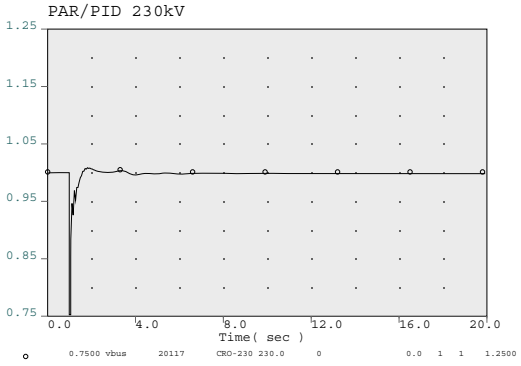
RELATIVE VOLTAGE



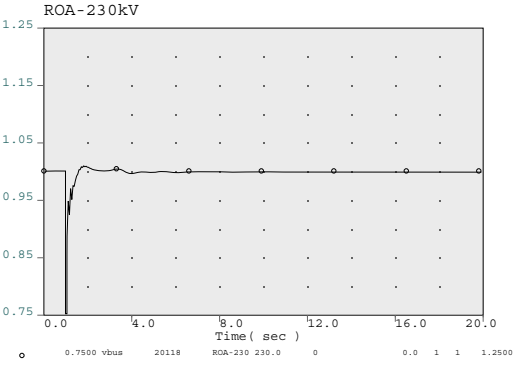
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

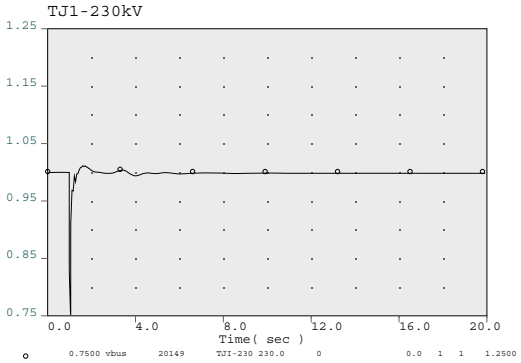
PAR/PID 230kV



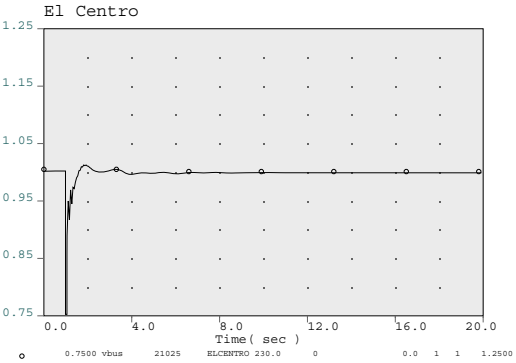
ROA-230kV



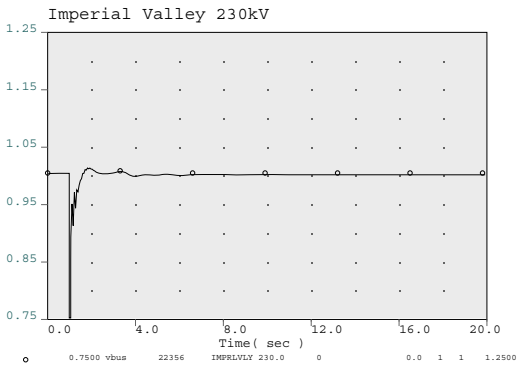
TJ1-230kV



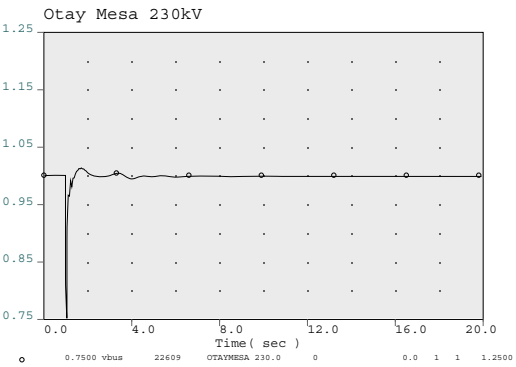
El Centro



Imperial Valley 230kV



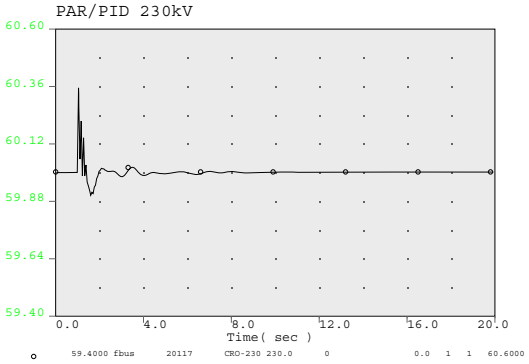
Otay Mesa 230kV



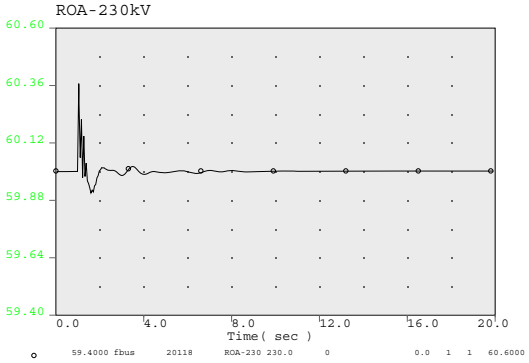
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Frequency Check and Comparison

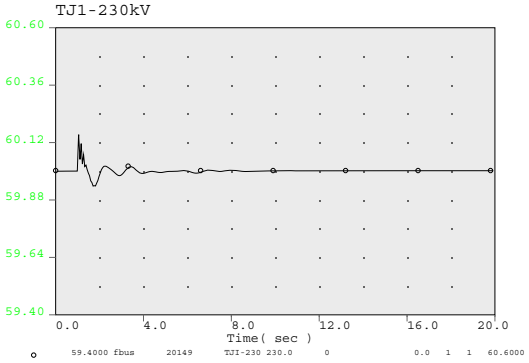
PAR/PID 230kV



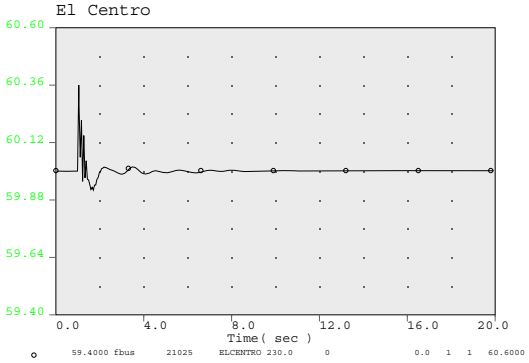
ROA-230kV



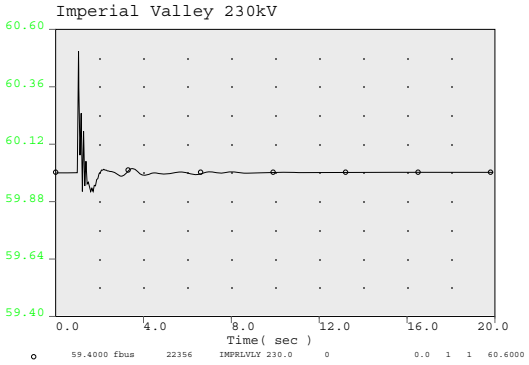
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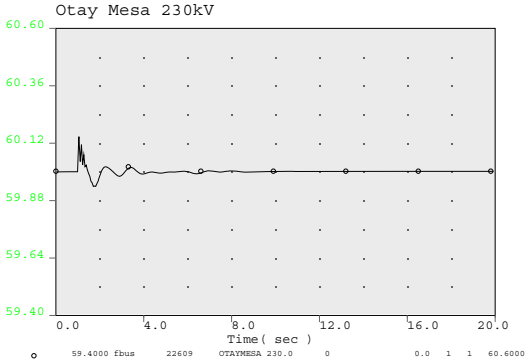
El Centro



Imperial Valley 230kV



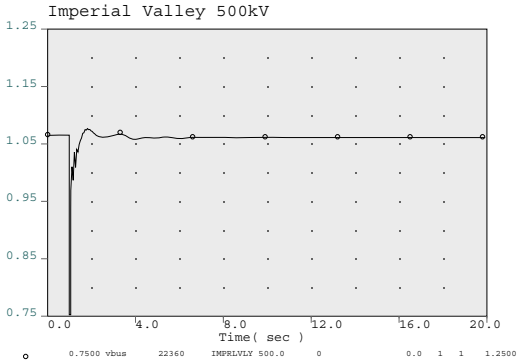
Otay Mesa 230kV



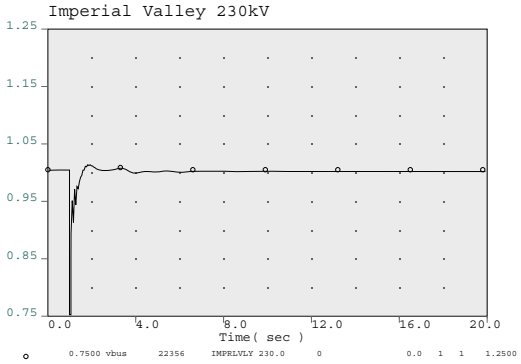
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

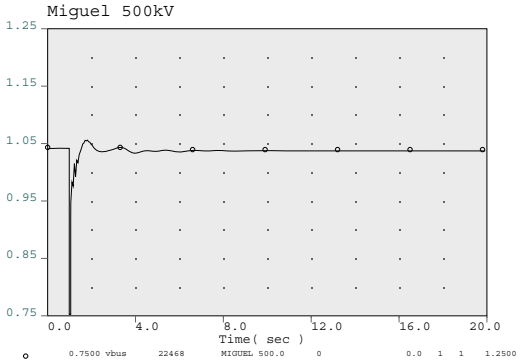
Imperial Valley 500kV



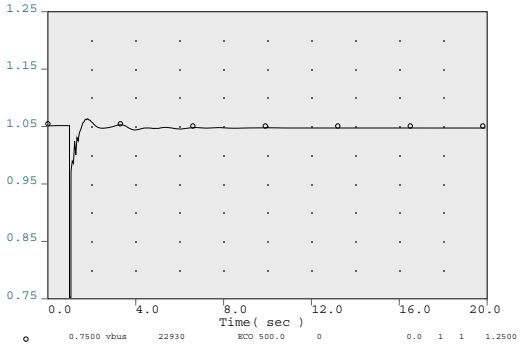
Imperial Valley 230kV



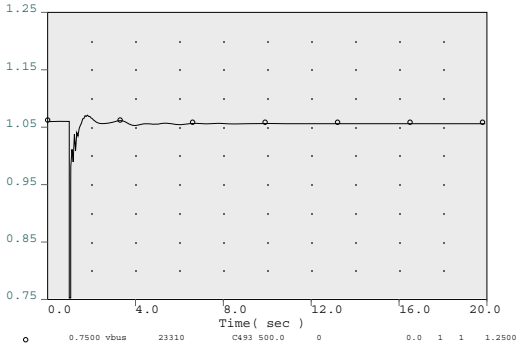
Miguel 500kV



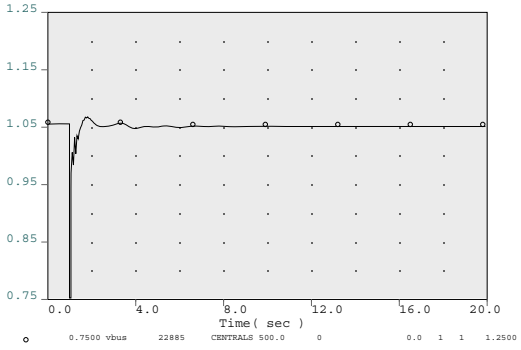
Windfarms 500



C493 500kV

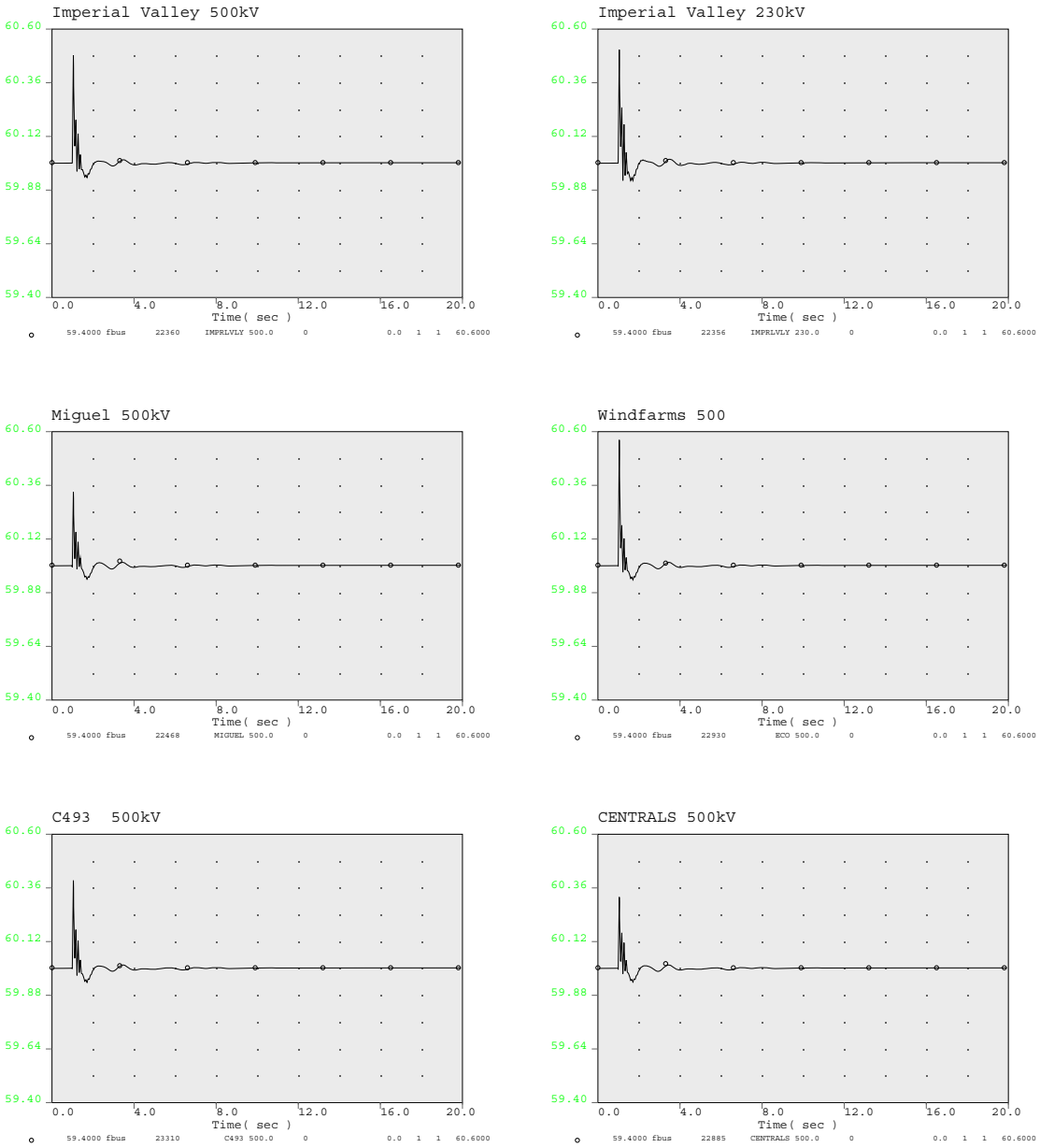


CENTRALS 500kV



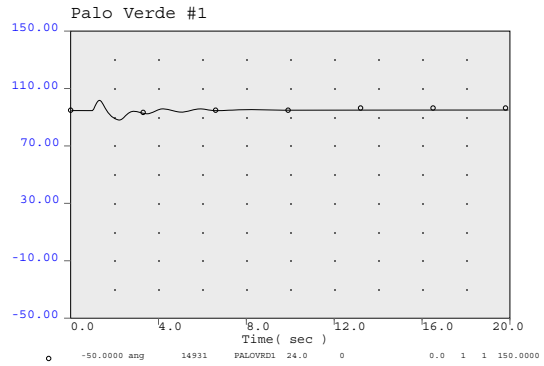
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

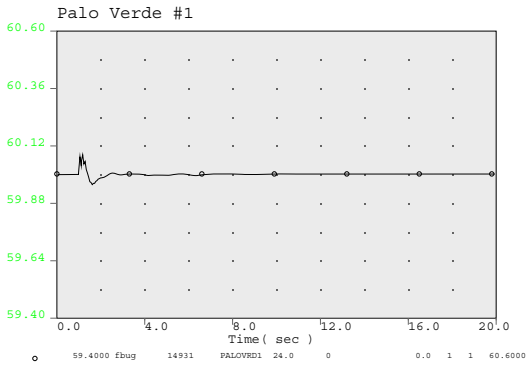
Imperial Valley Area - Frequency

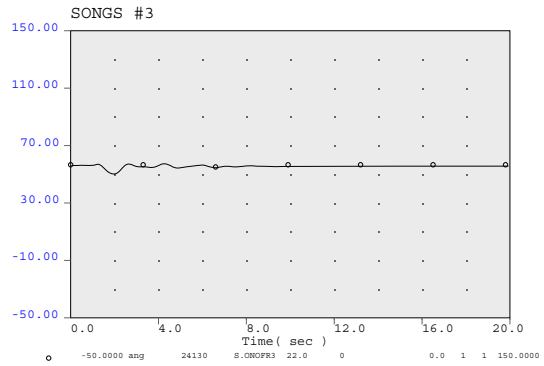


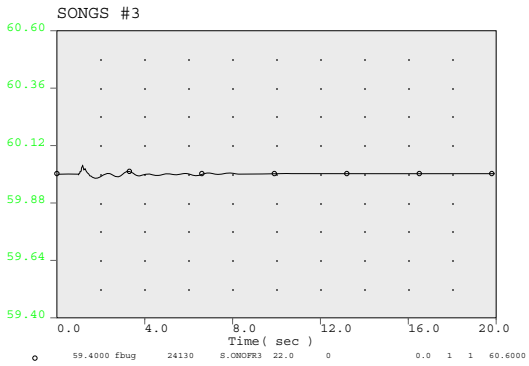
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

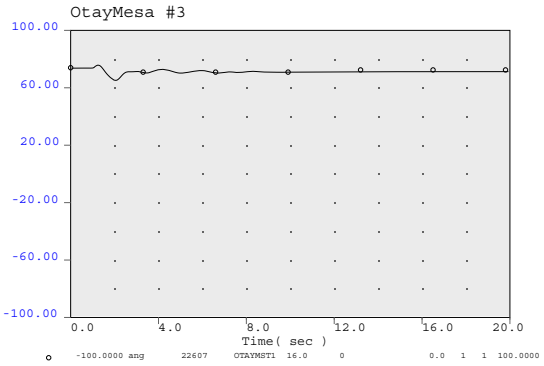
RELATIVE ROTOR ANGLE & FREQUENCY

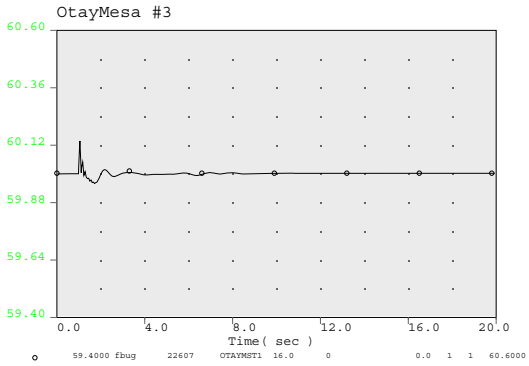












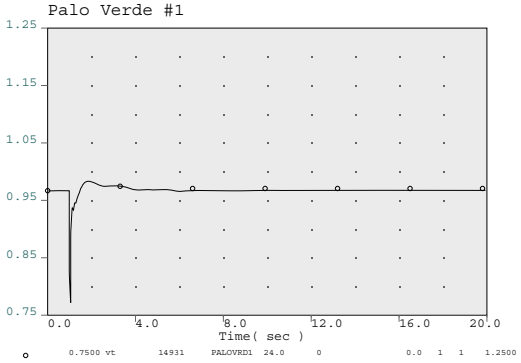
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Page 1

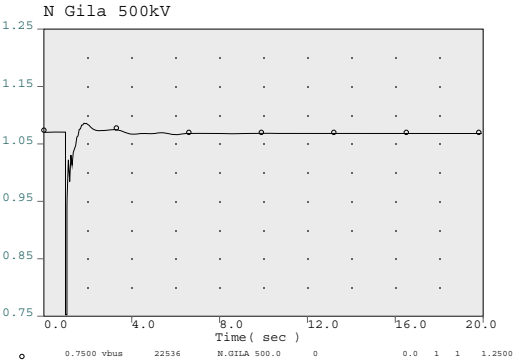
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RELATIVE VOLTAGE

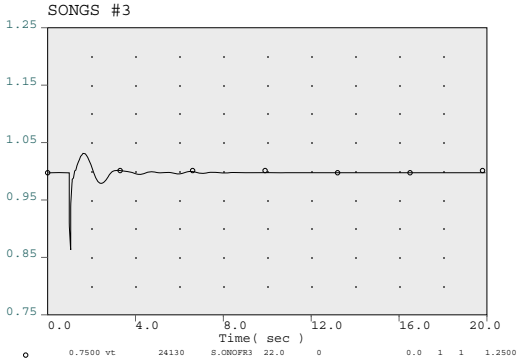
Palo Verde #1



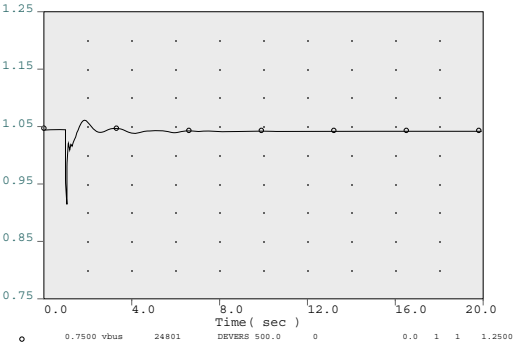
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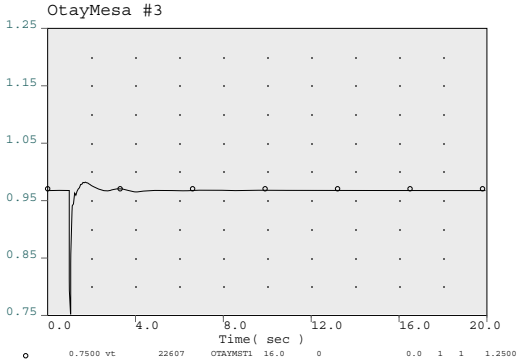
SONGS #3



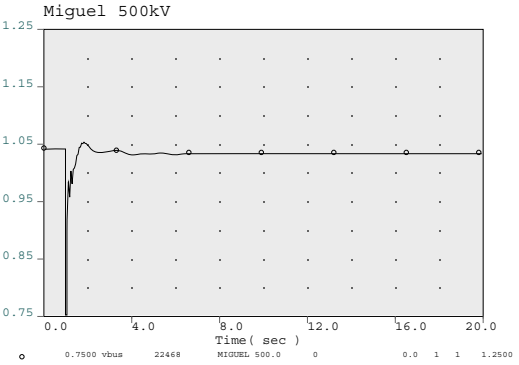
Devers 500



OtayMesa #3



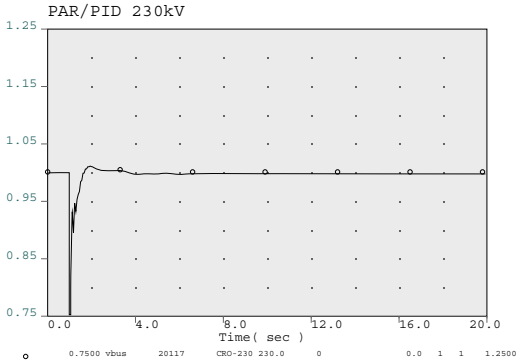
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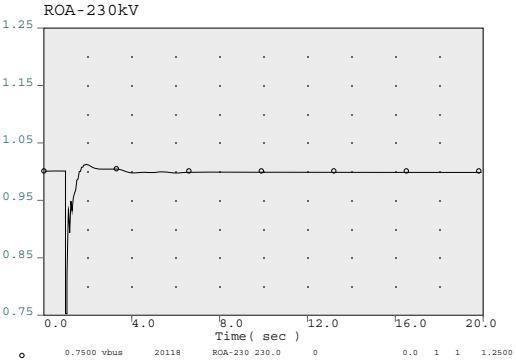
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

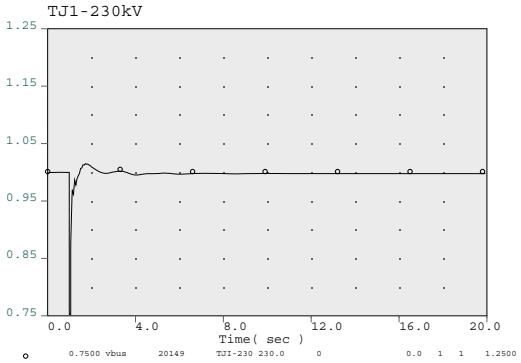
PAR/PID 230kV



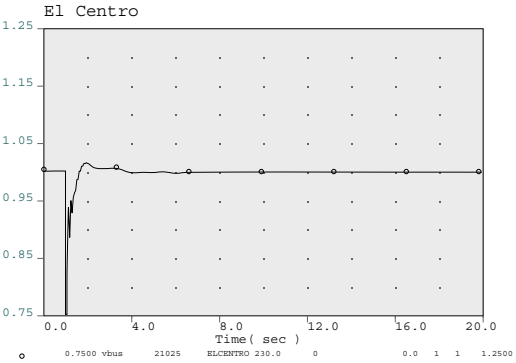
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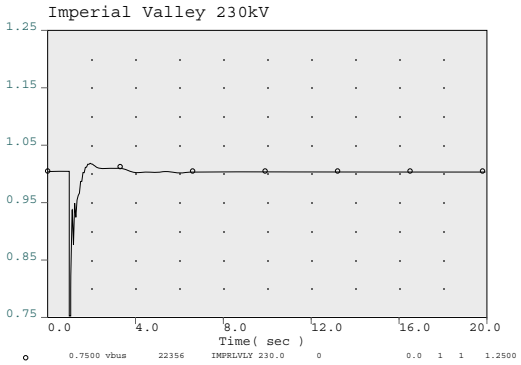
TJ1-230kV



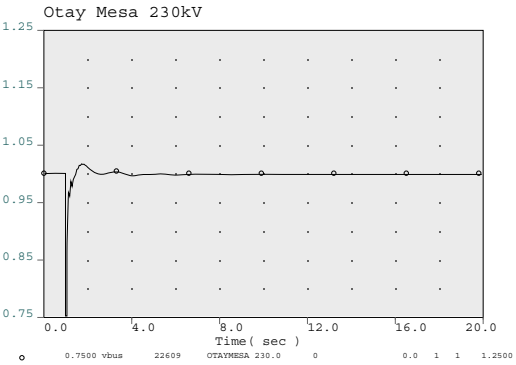
El Centro



Imperial Valley 230kV

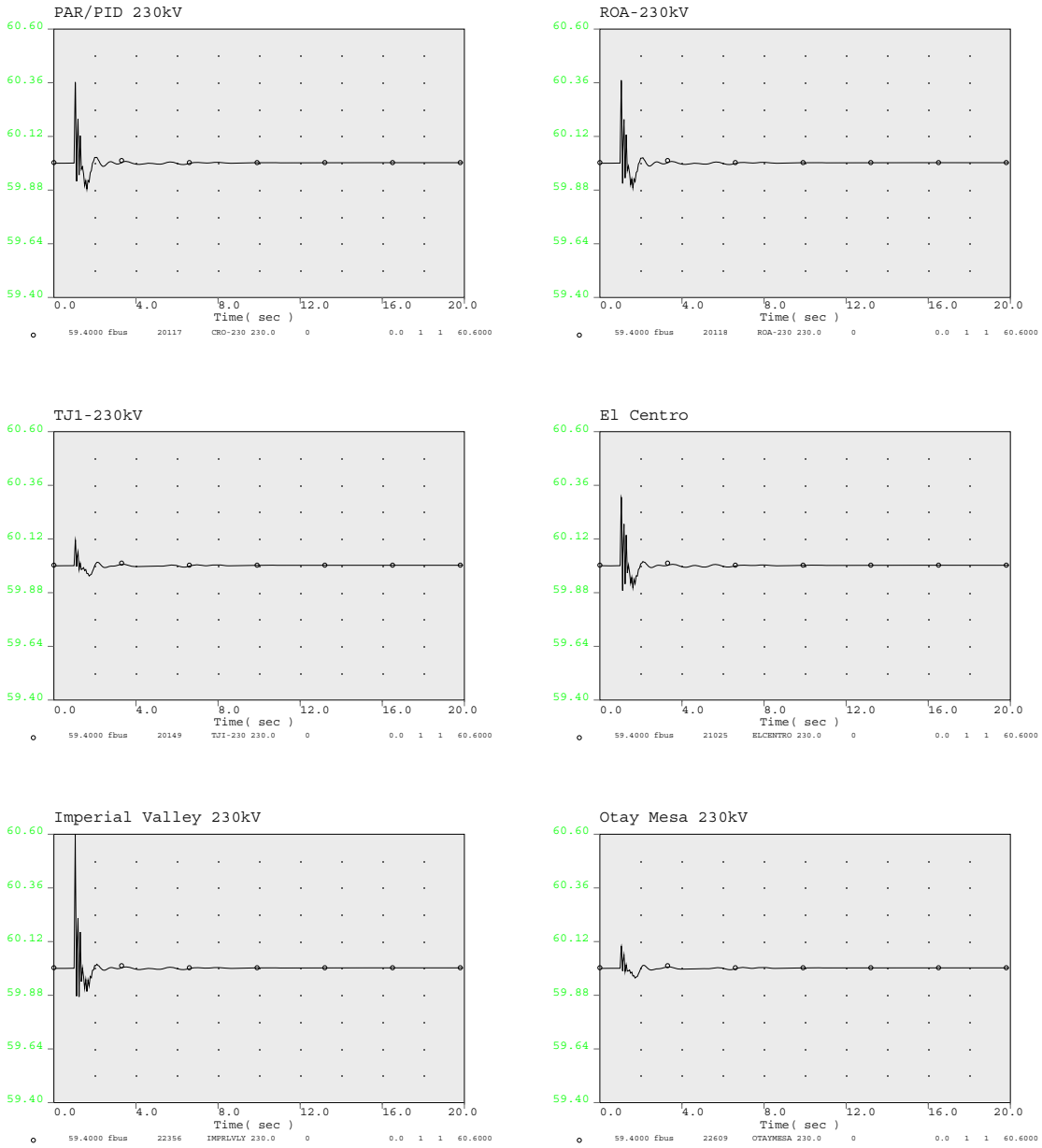


Otay Mesa 230kV



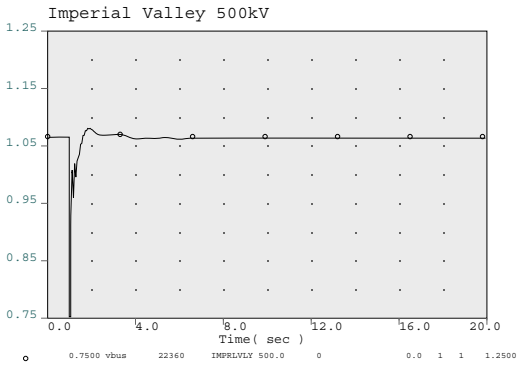
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

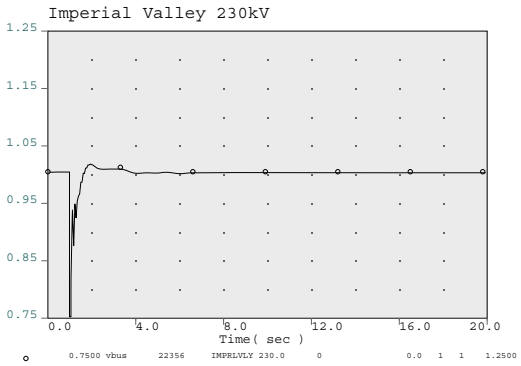
Affected System Frequency Check and Comparison

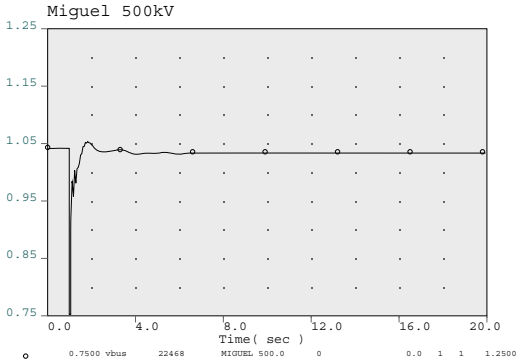


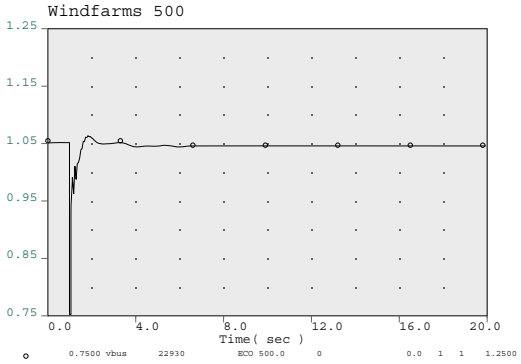
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

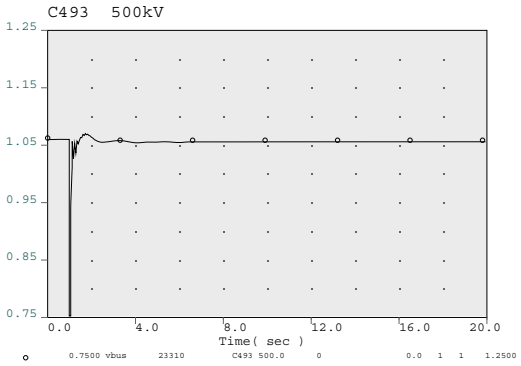
Imperial Valley Area - VOLTAGE

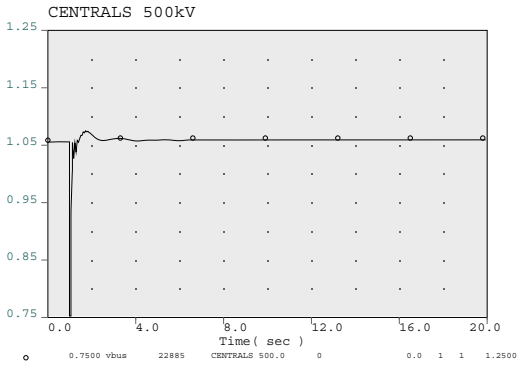






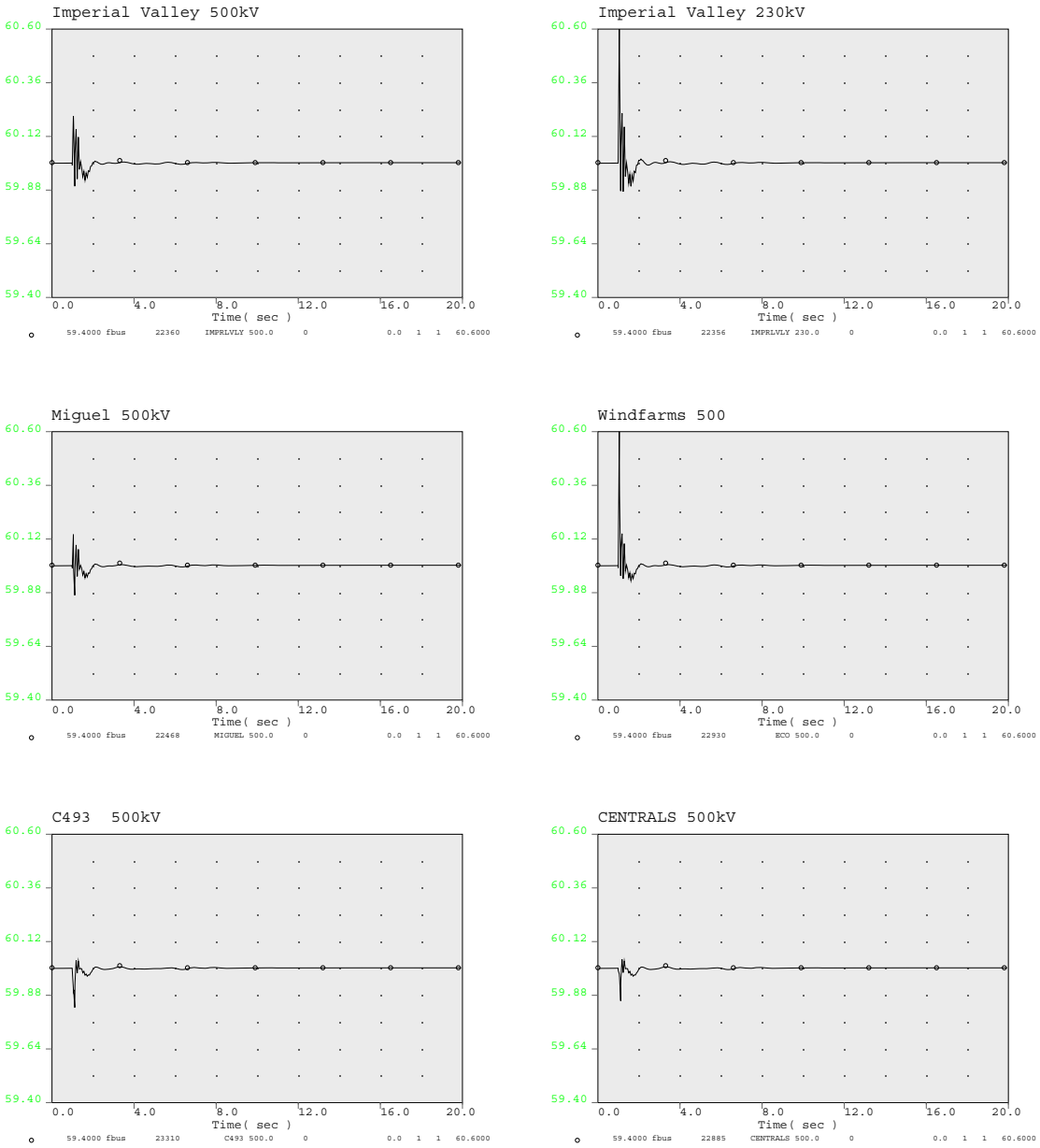






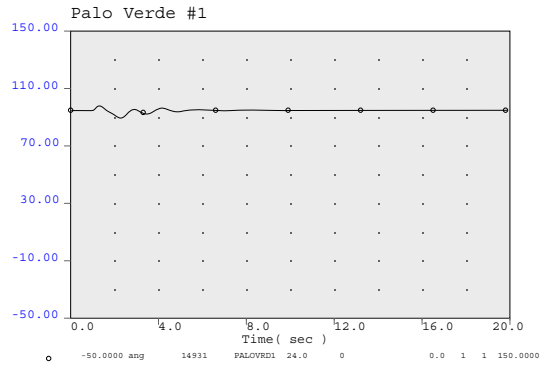
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

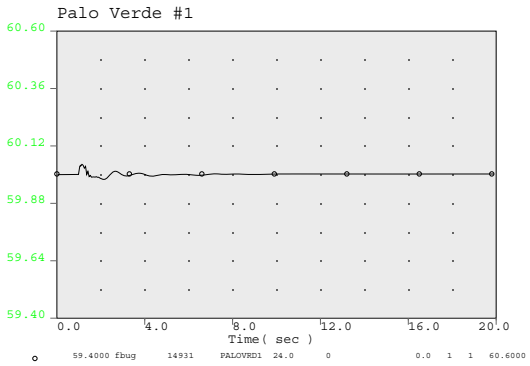
Imperial Valley Area - Frequency

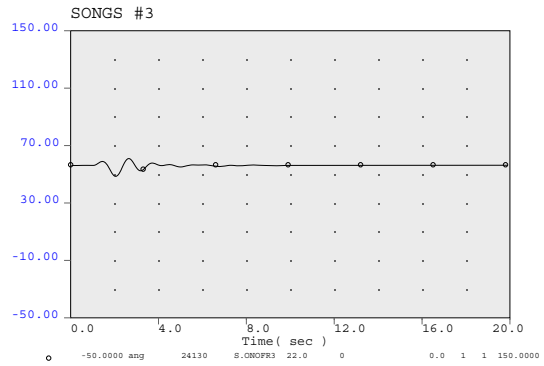


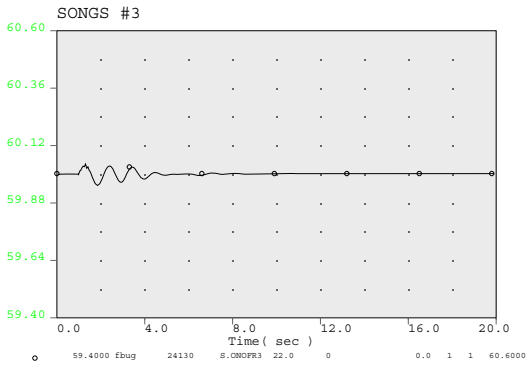
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

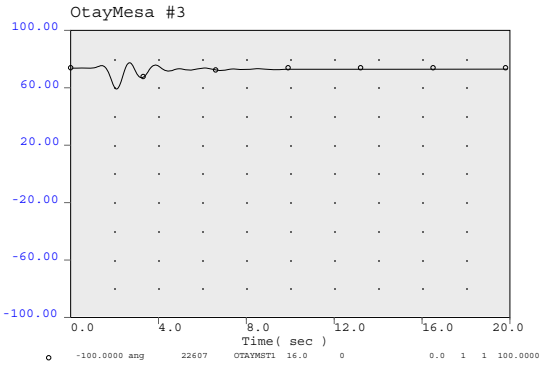
RELATIVE ROTOR ANGLE & FREQUENCY

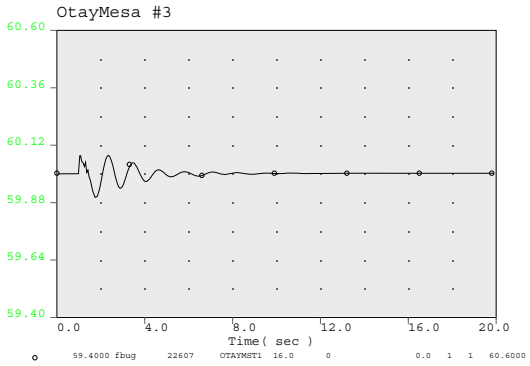












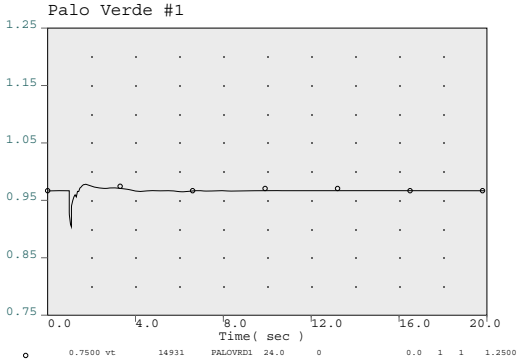
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

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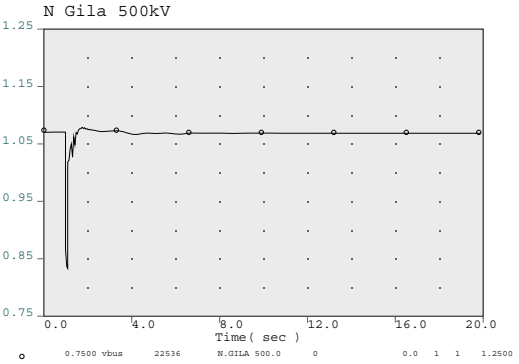
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RELATIVE VOLTAGE

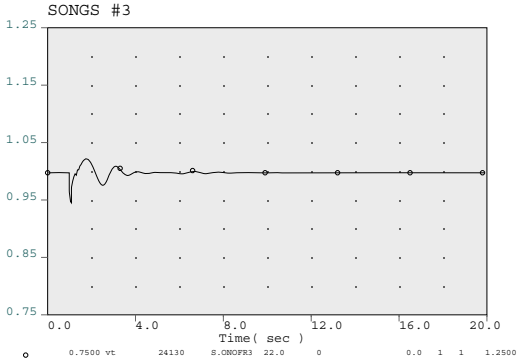
Palo Verde #1



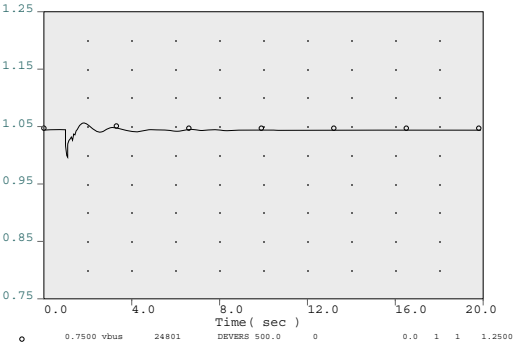
N Gila 500kV



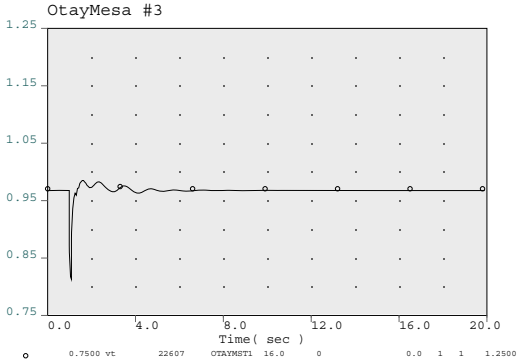
SONGS #3



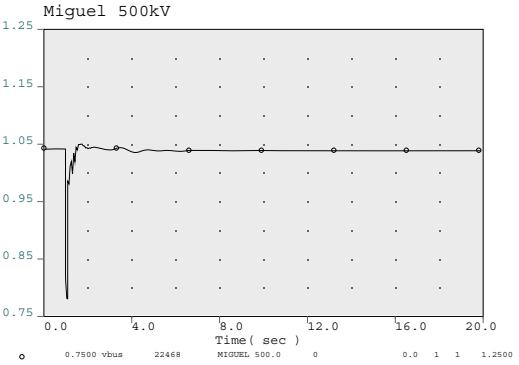
Devers 500



OtayMesa #3



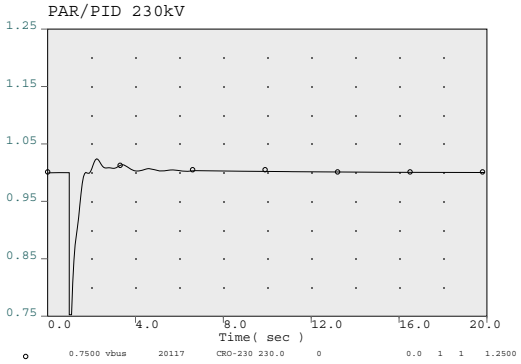
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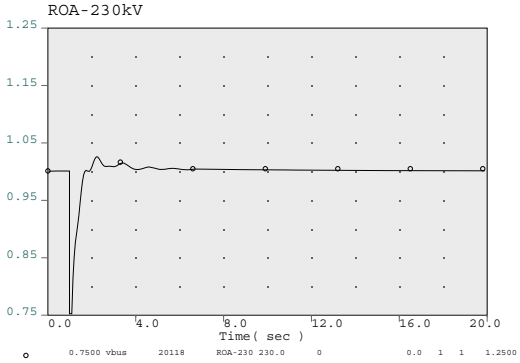
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

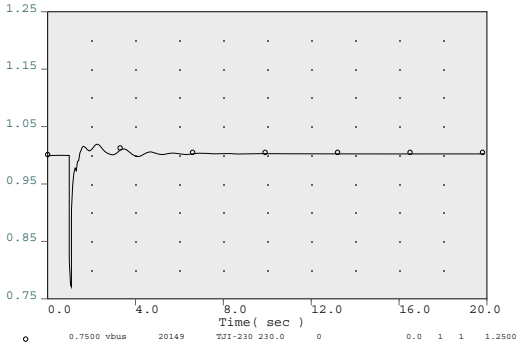
PAR/PID 230kV



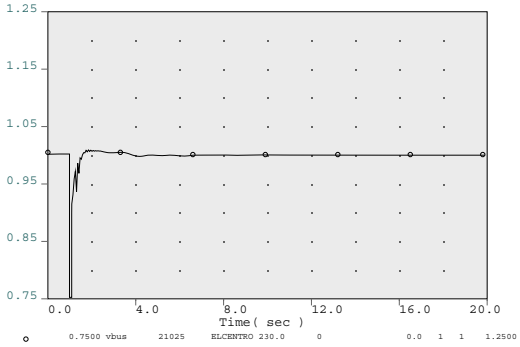
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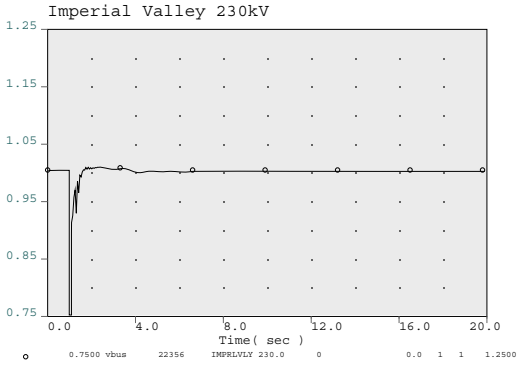
TJ1-230kV



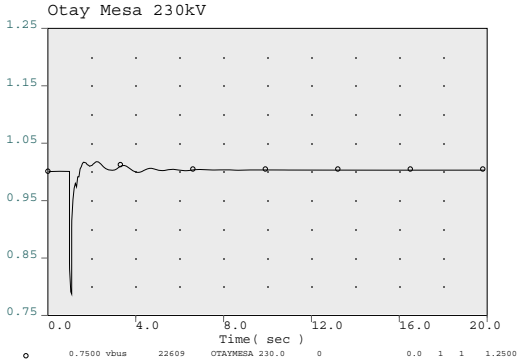
El Centro



Imperial Valley 230kV

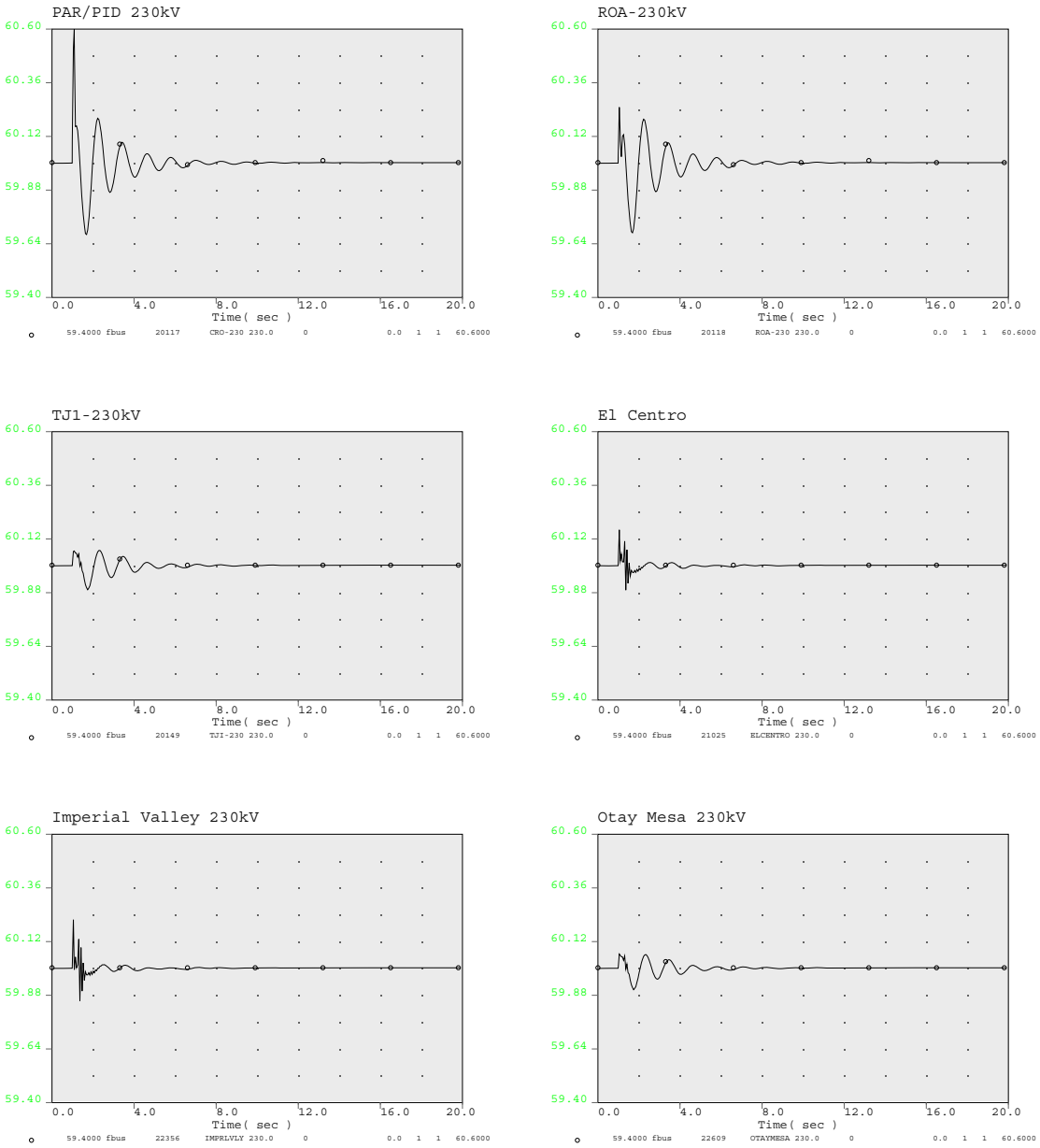


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

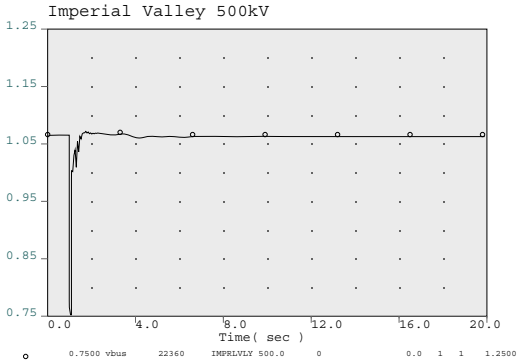
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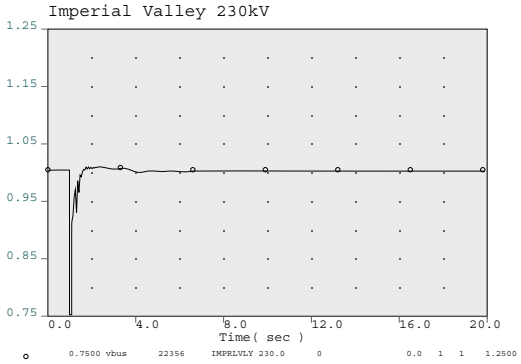
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

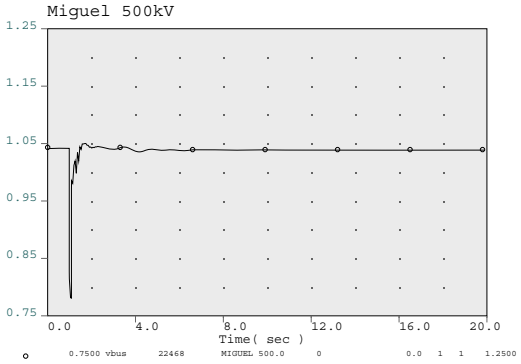
Imperial Valley 500kV



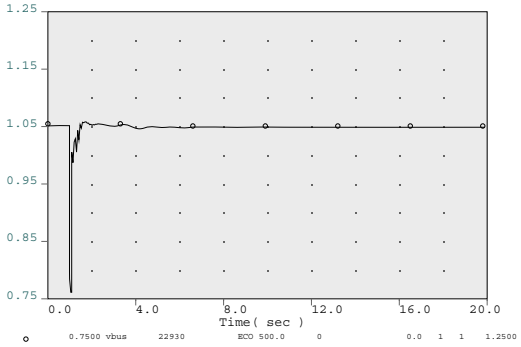
Imperial Valley 230kV



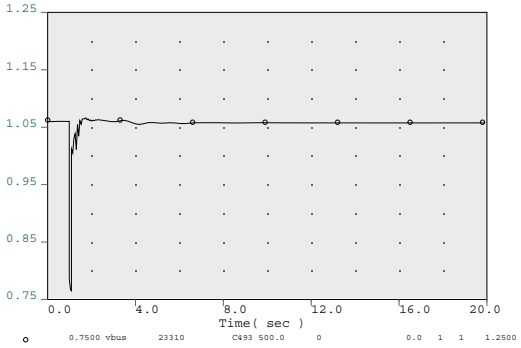
Miguel 500kV



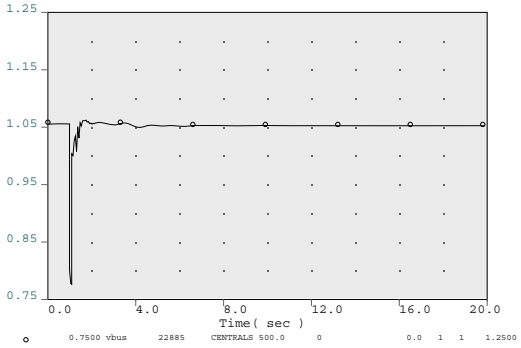
Windfarms 500



C493 500kV

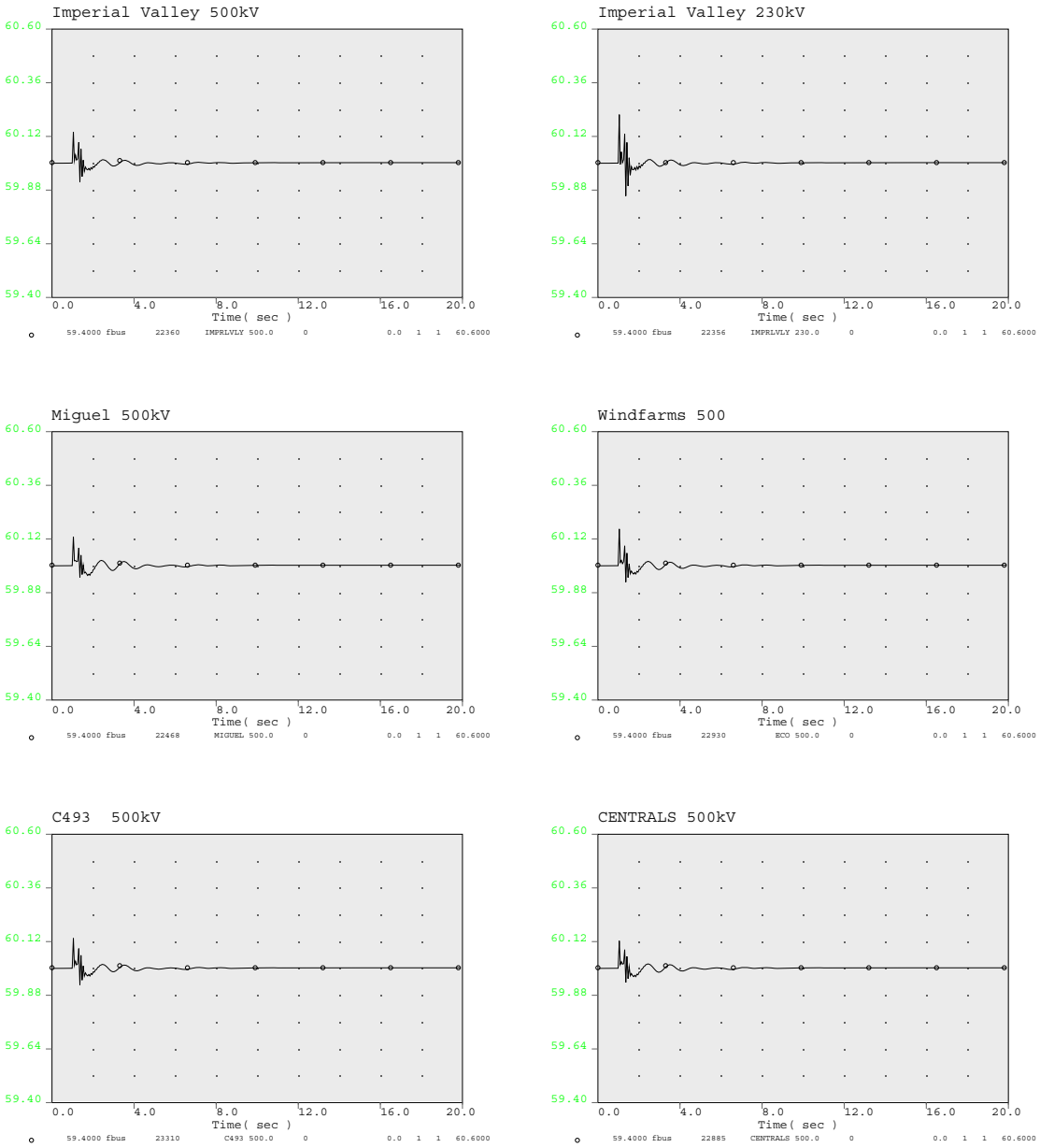


CENTRALS 500kV



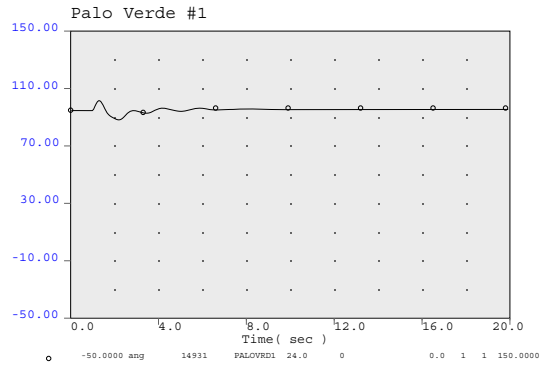
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

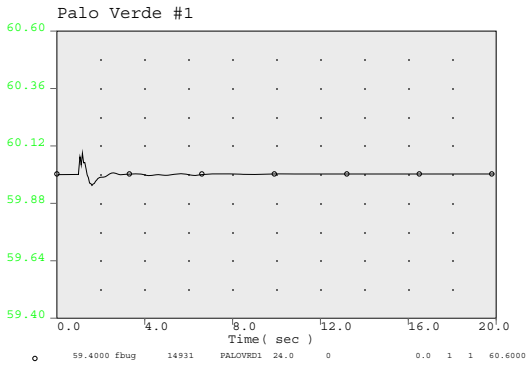
Imperial Valley Area - Frequency

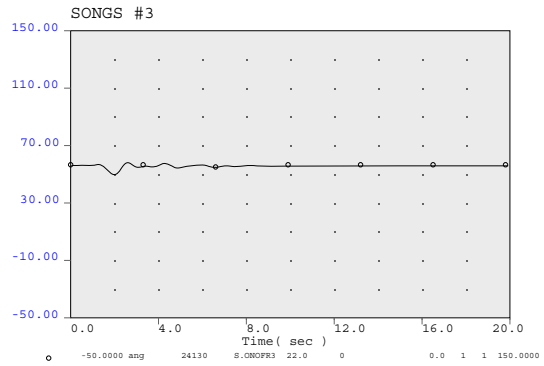


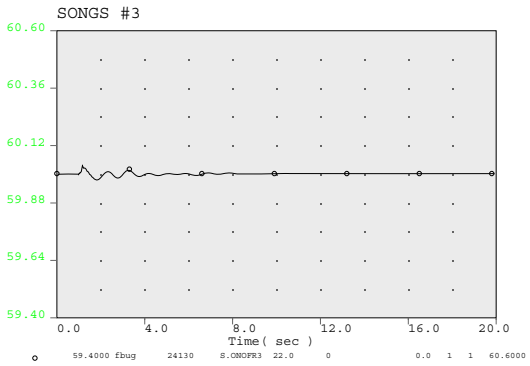
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

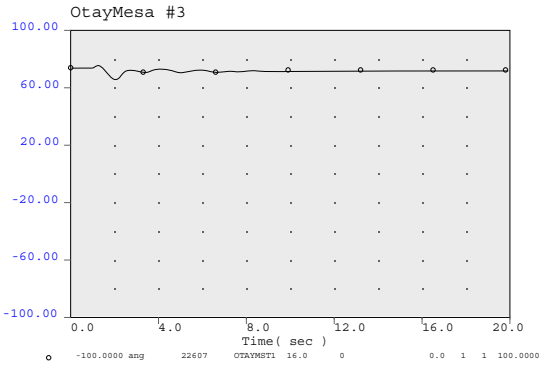
RELATIVE ROTOR ANGLE & FREQUENCY

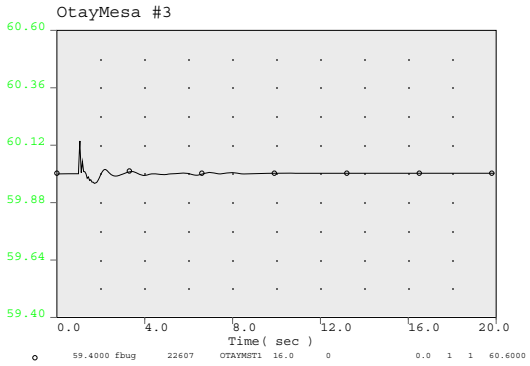












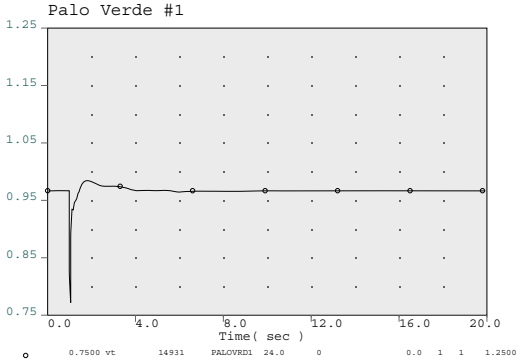
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

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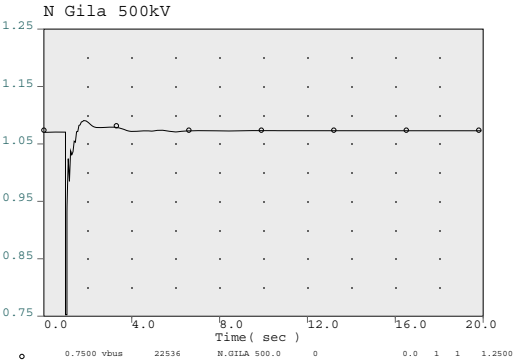
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RELATIVE VOLTAGE

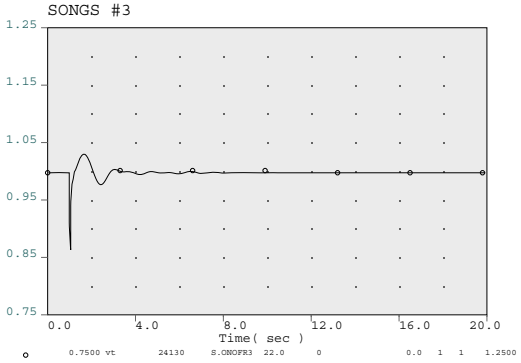
Palo Verde #1



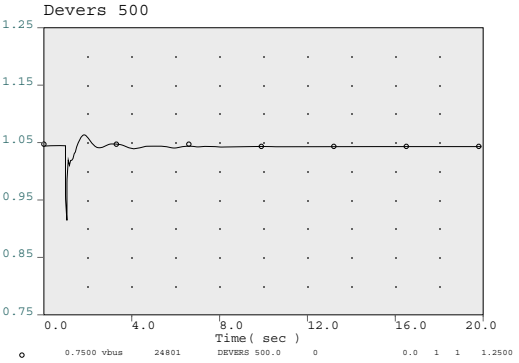
N Gila 500kV



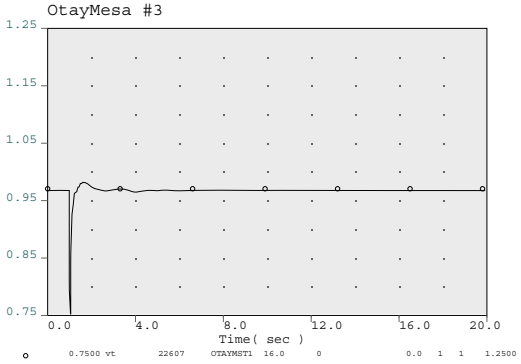
SONGS #3



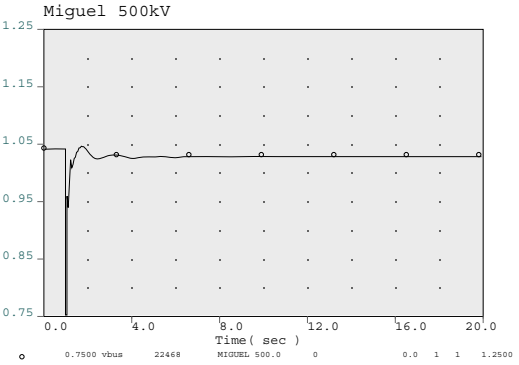
Devers 500



OtayMesa #3



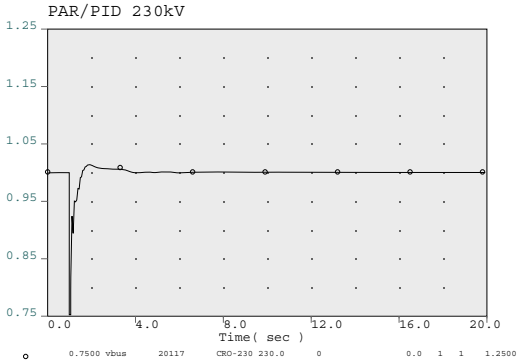
Miguel 500kV



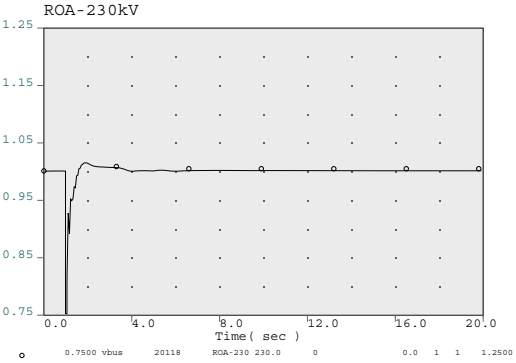
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

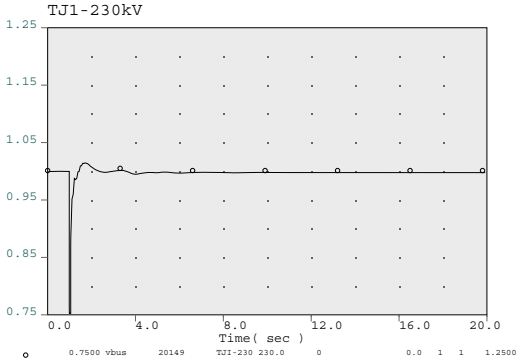
PAR/PID 230kV



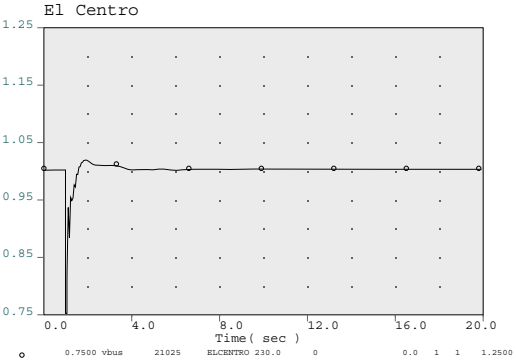
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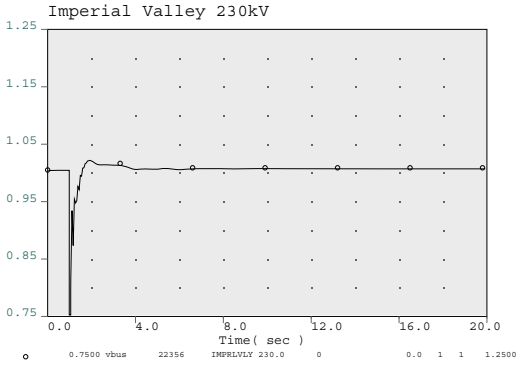
TJ1-230kV



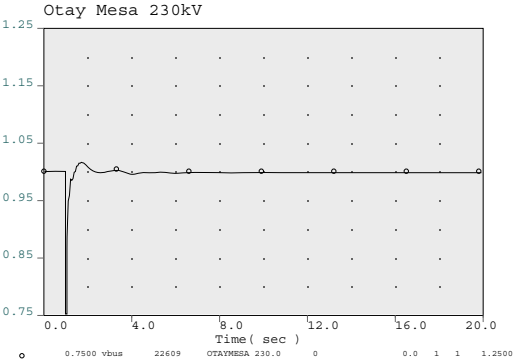
El Centro



Imperial Valley 230kV

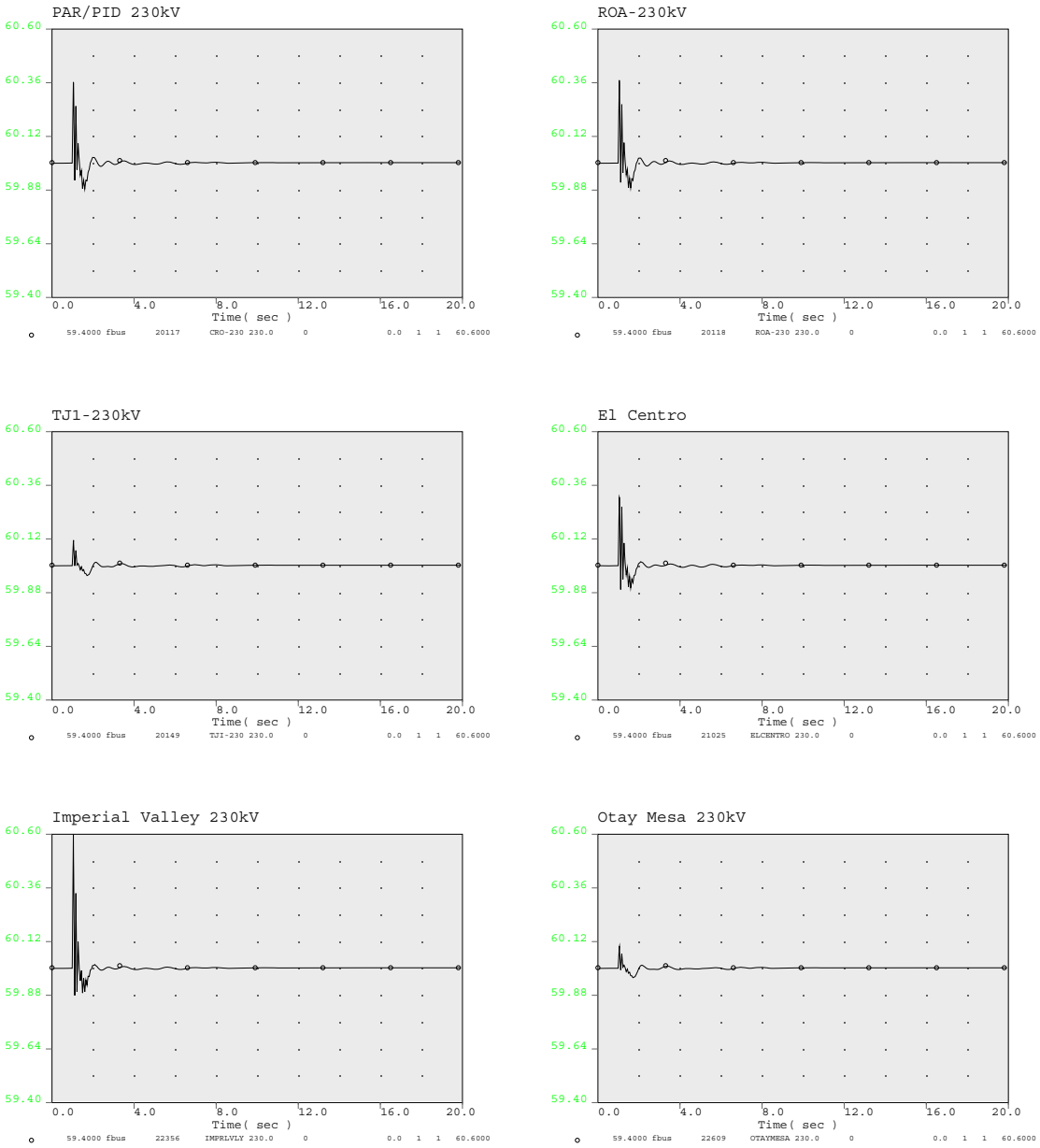


Otay Mesa 230kV



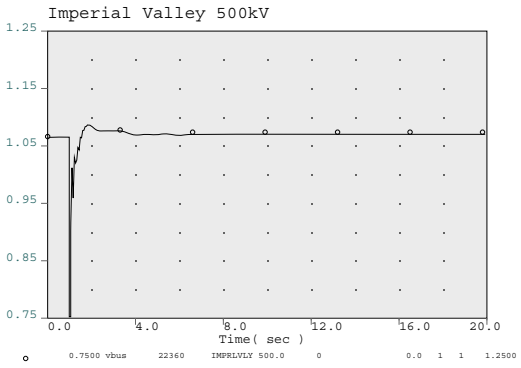
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

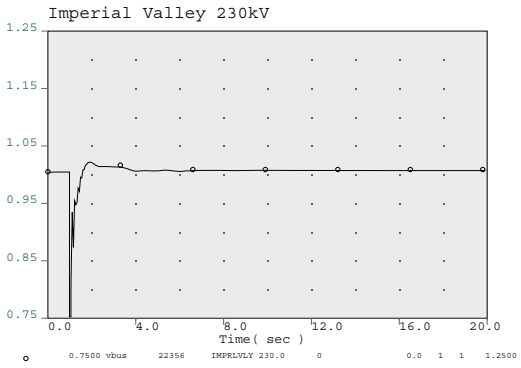
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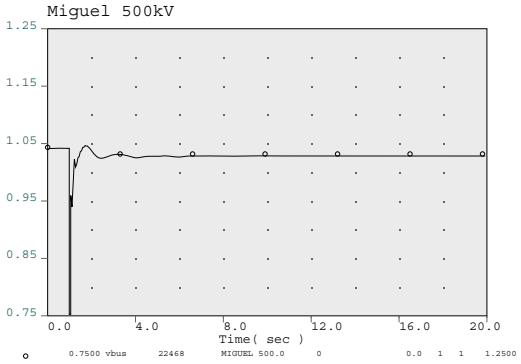


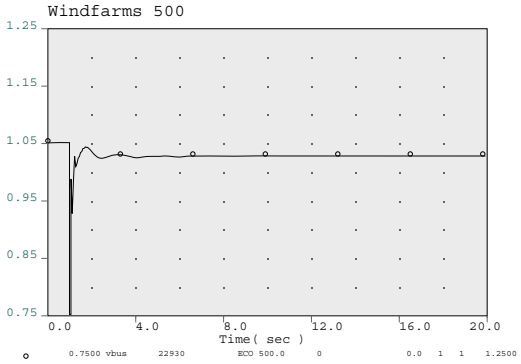
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

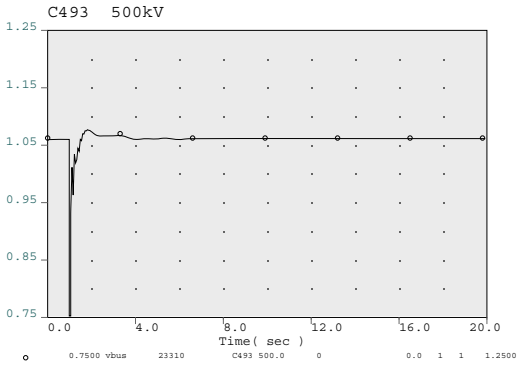
Imperial Valley Area - VOLTAGE

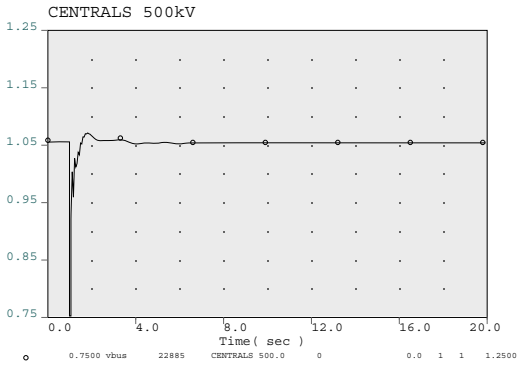






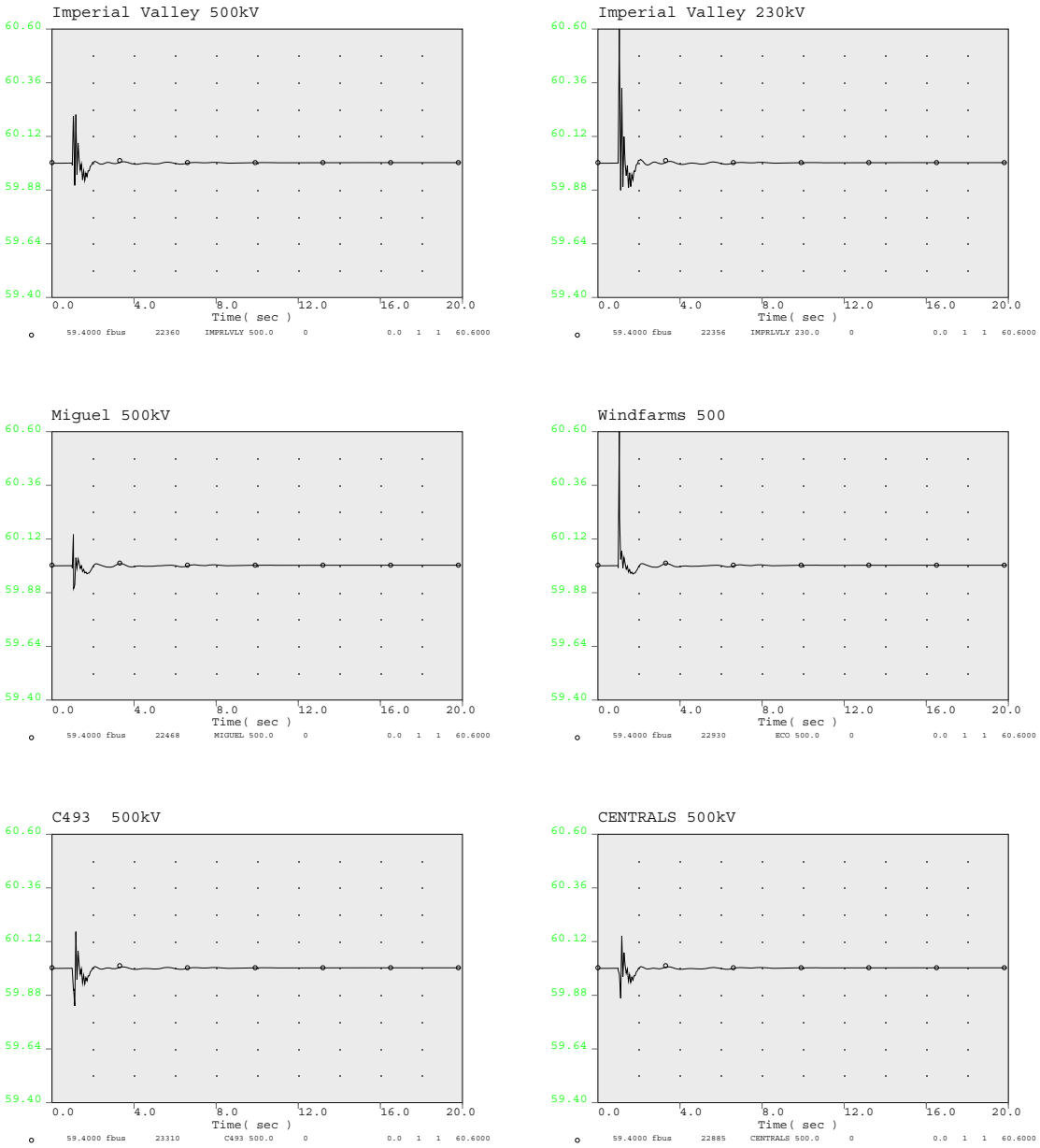






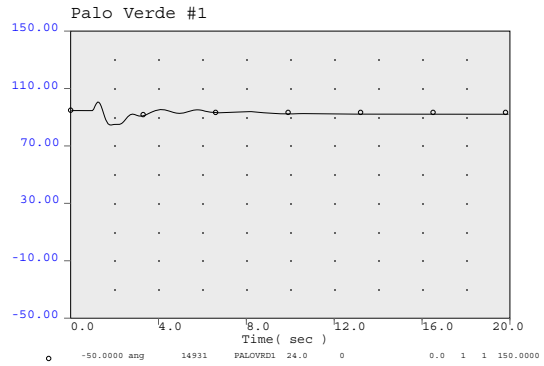
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

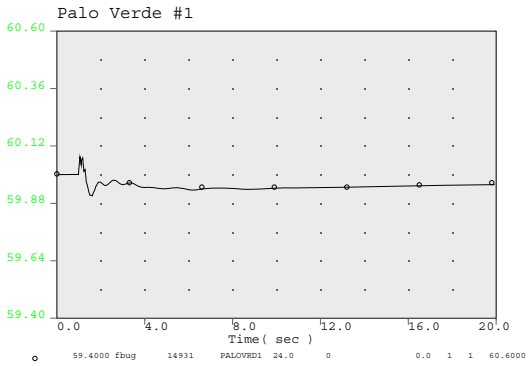
Imperial Valley Area - Frequency

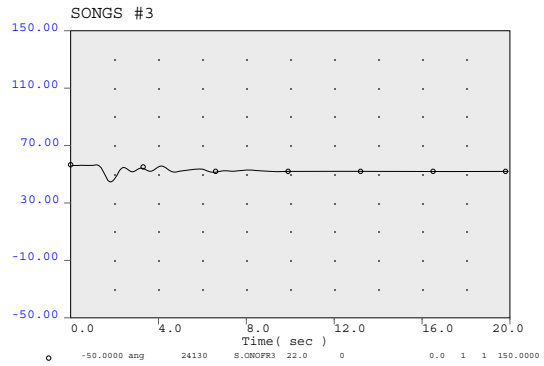


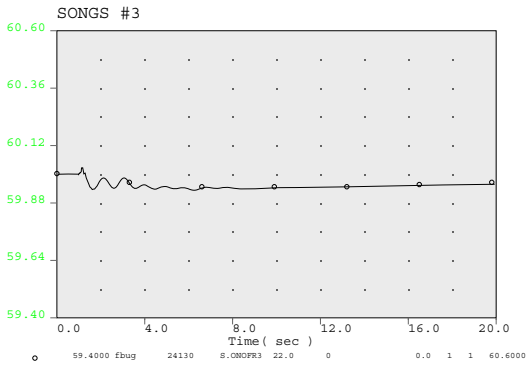
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

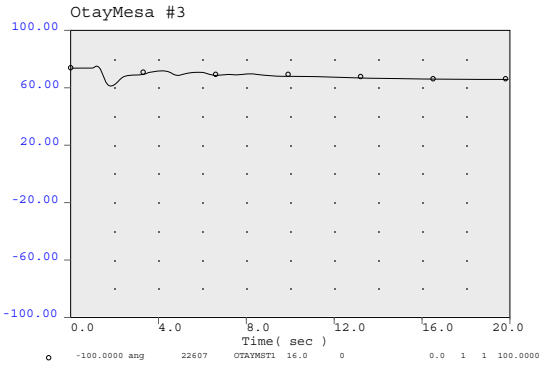
RELATIVE ROTOR ANGLE & FREQUENCY

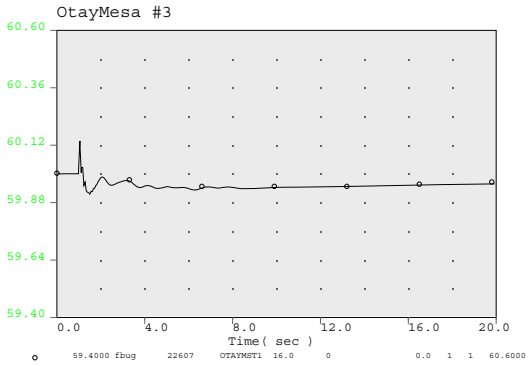












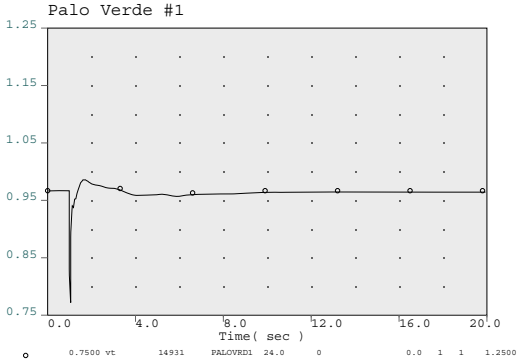
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

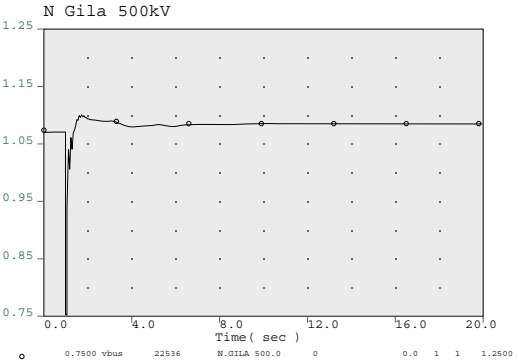
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RELATIVE VOLTAGE

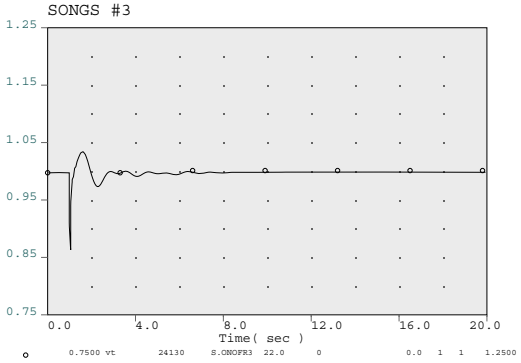
Palo Verde #1



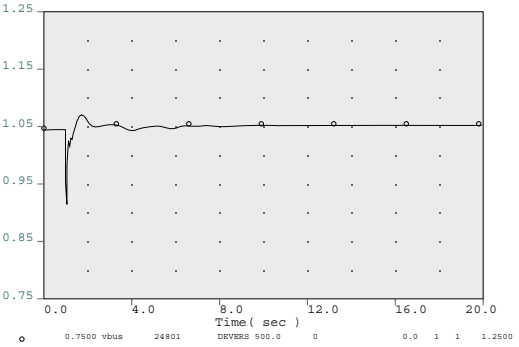
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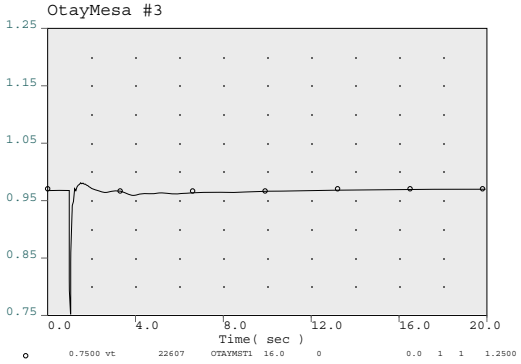
SONGS #3



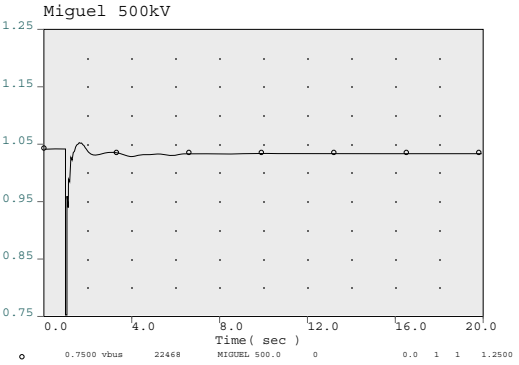
Devers 500



OtayMesa #3



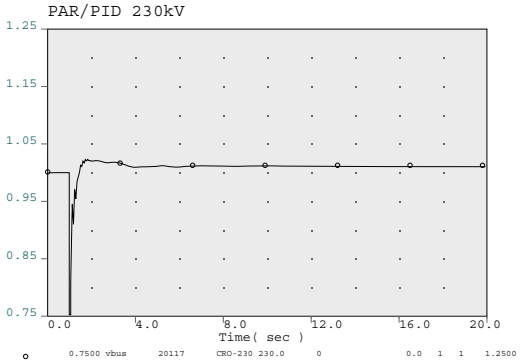
Miguel 500kV



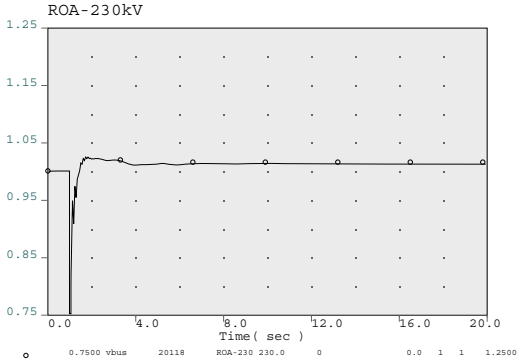
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

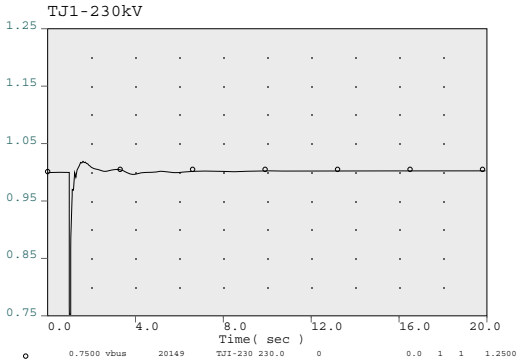
PAR/PID 230kV



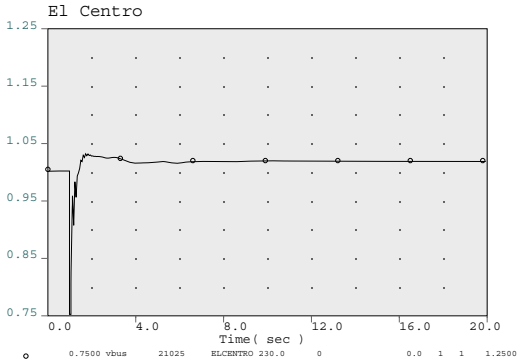
ROA-230kV



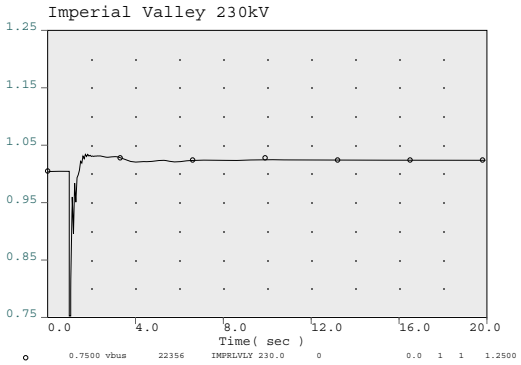
TJ1-230kV



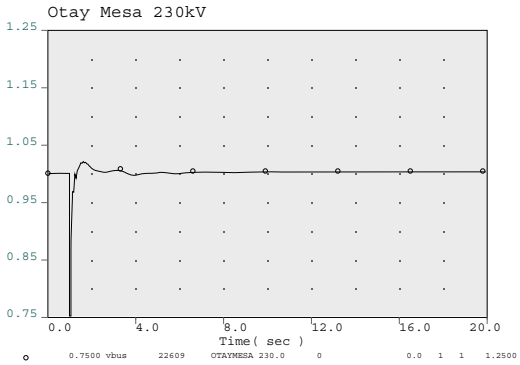
El Centro



Imperial Valley 230kV

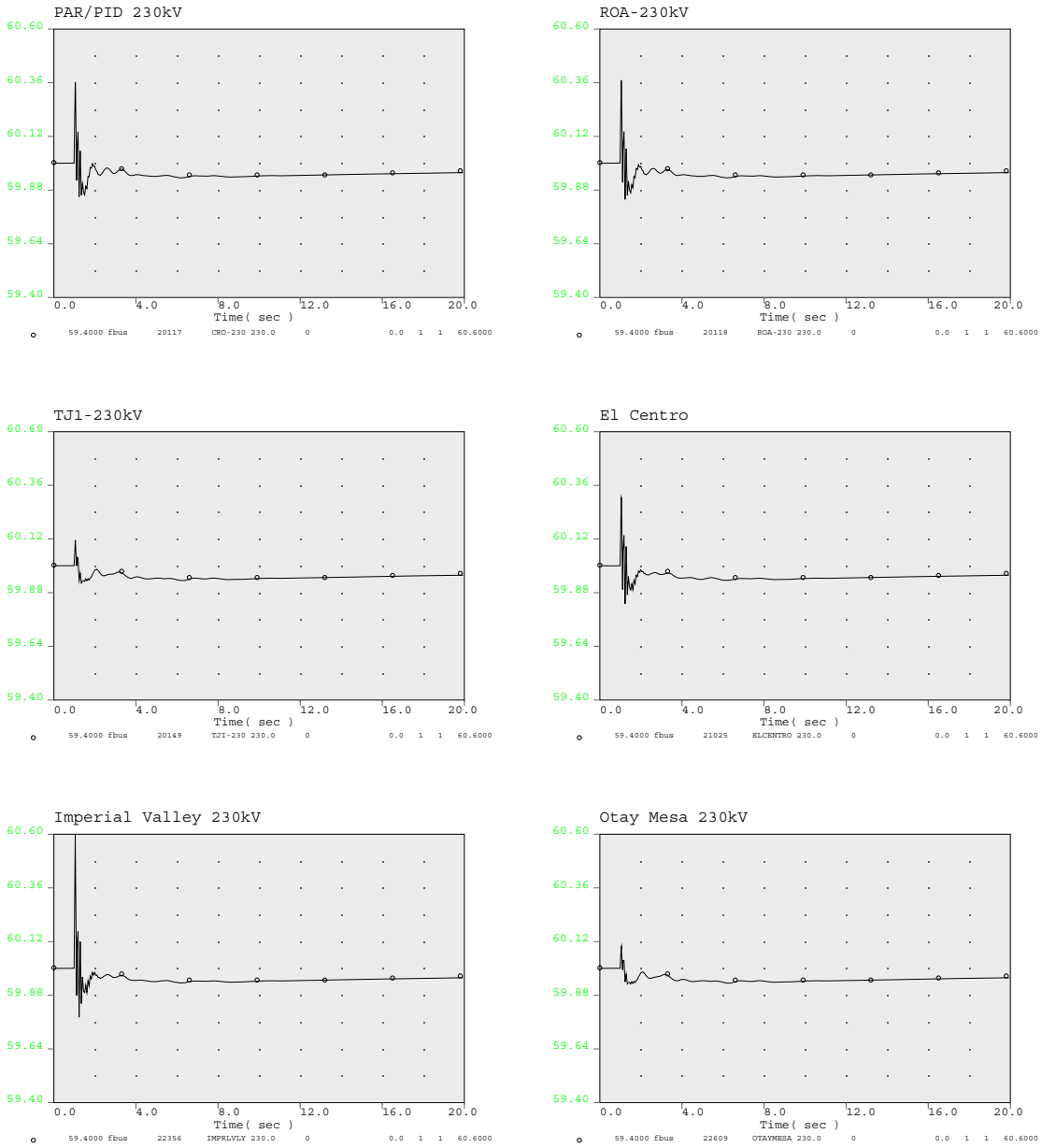


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

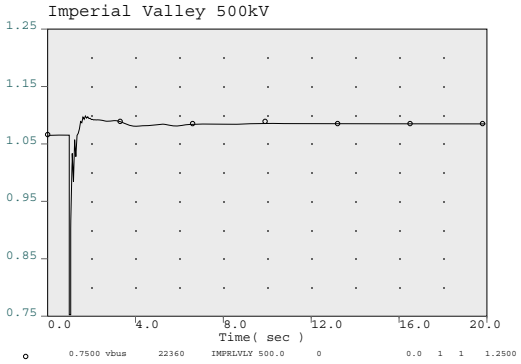
Affected System Frequency Check and Comparison



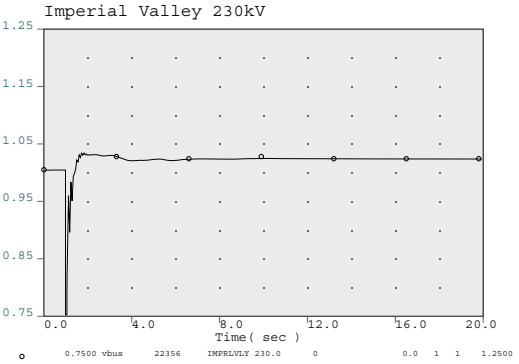
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

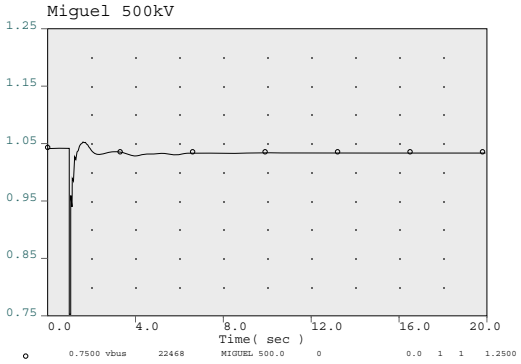
Imperial Valley 500kV



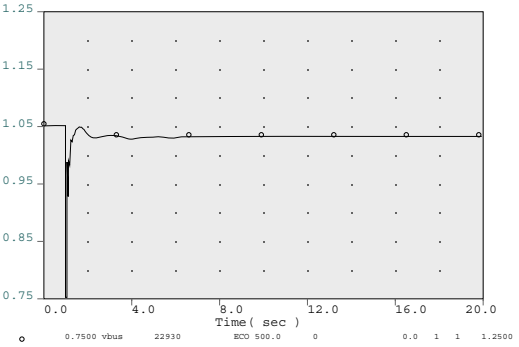
Imperial Valley 230kV



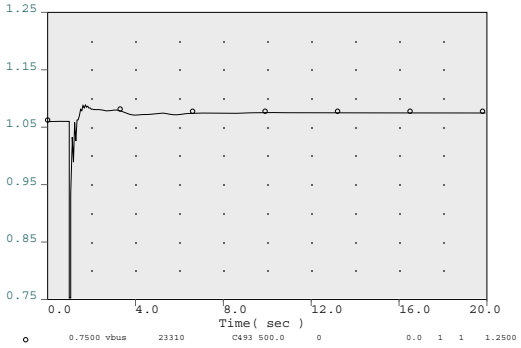
Miguel 500kV



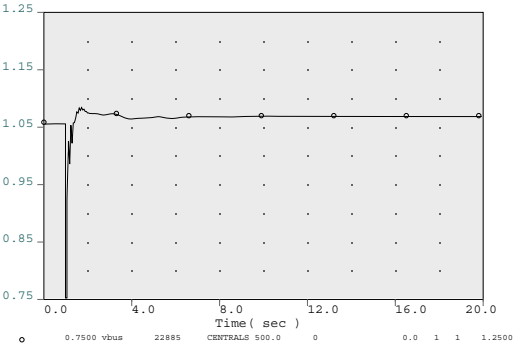
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C493 500kV

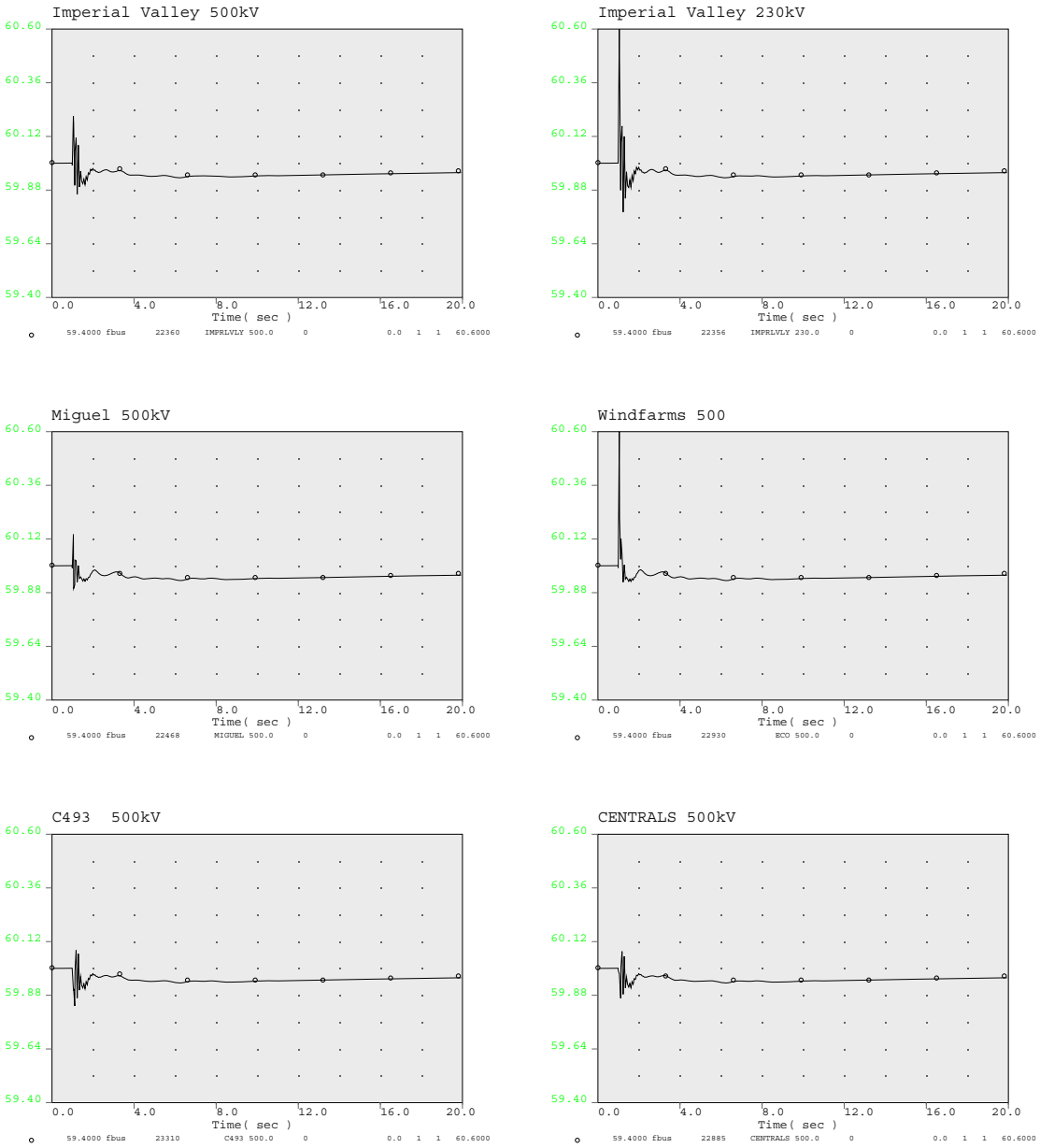


CENTRALS 500kV



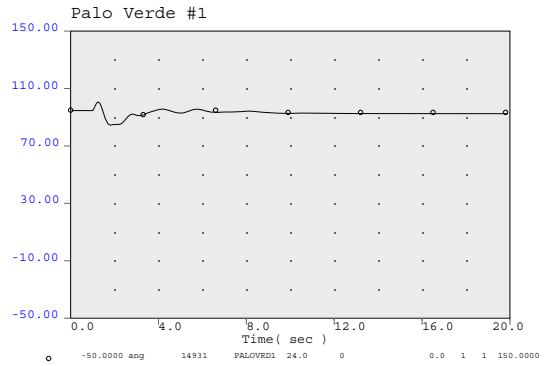
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

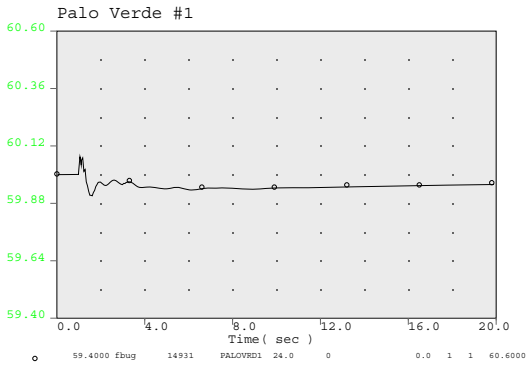
Imperial Valley Area - Frequency

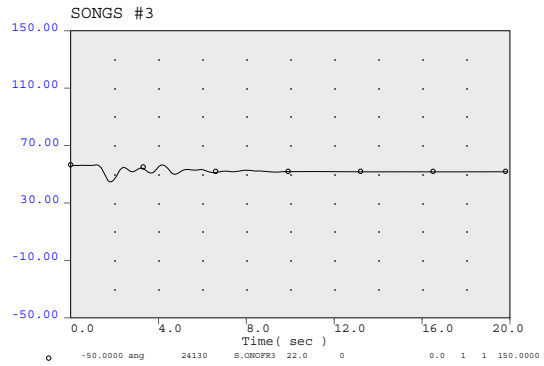


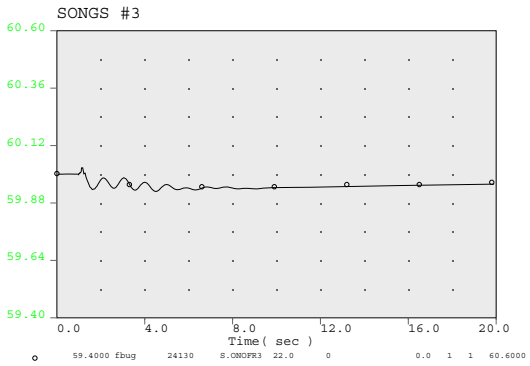
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

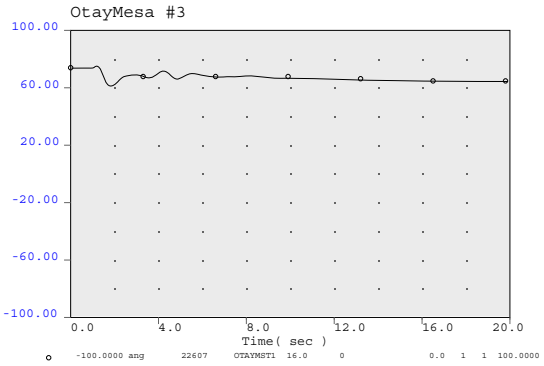
RELATIVE ROTOR ANGLE & FREQUENCY

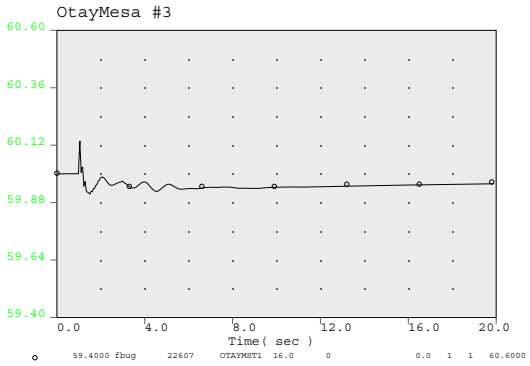












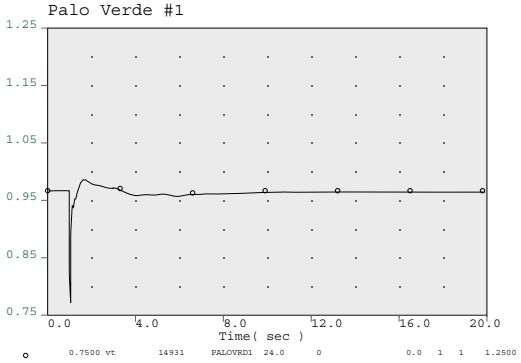
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

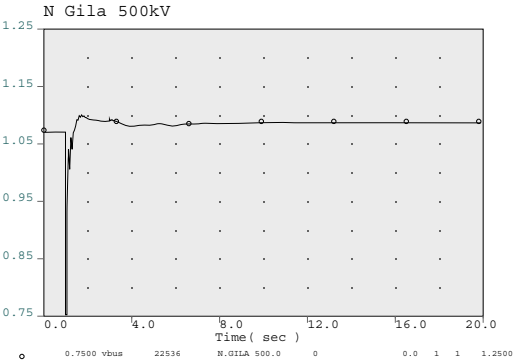
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RELATIVE VOLTAGE

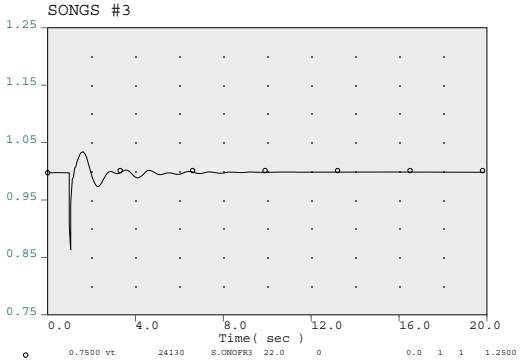
Palo Verde #1



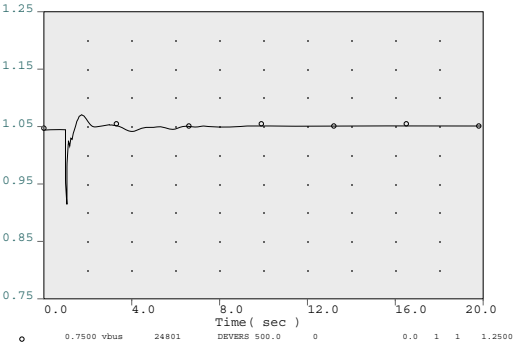
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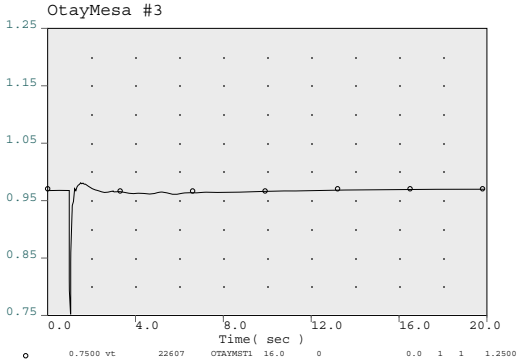
SONGS #3



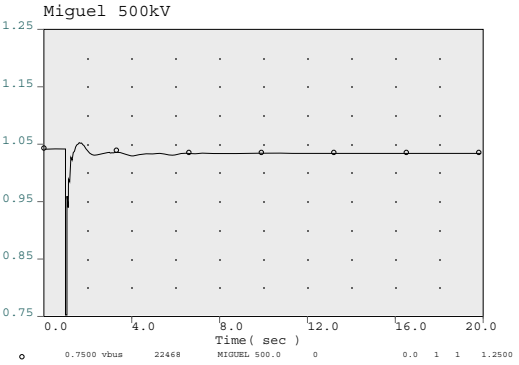
Devers 500



OtayMesa #3



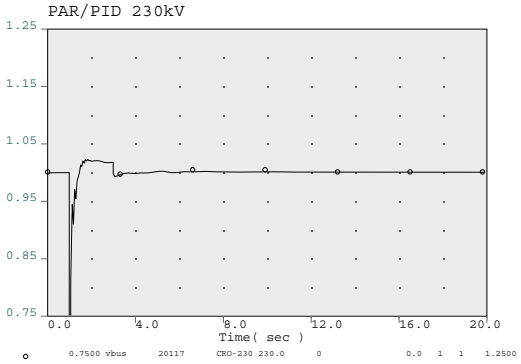
Miguel 500kV



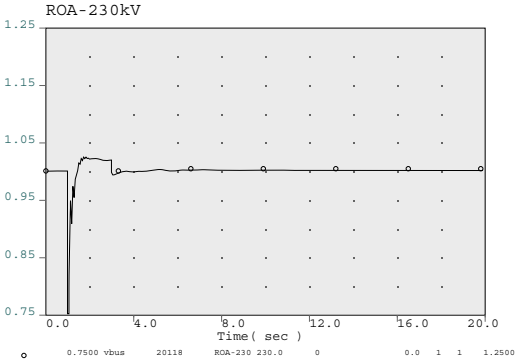
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

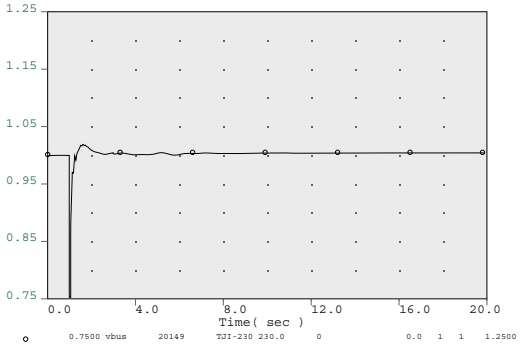
PAR/PID 230kV



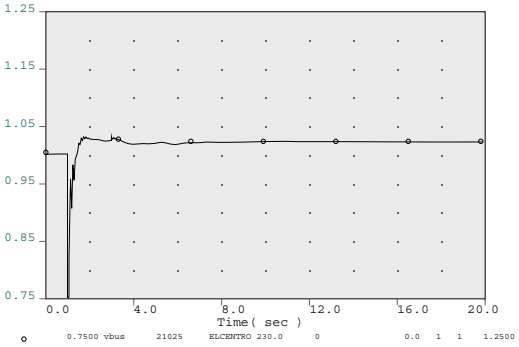
ROA-230kV



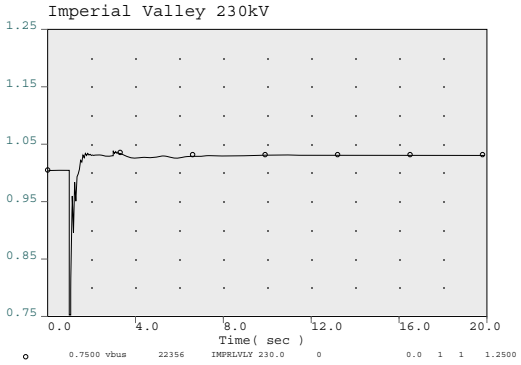
TJ1-230kV



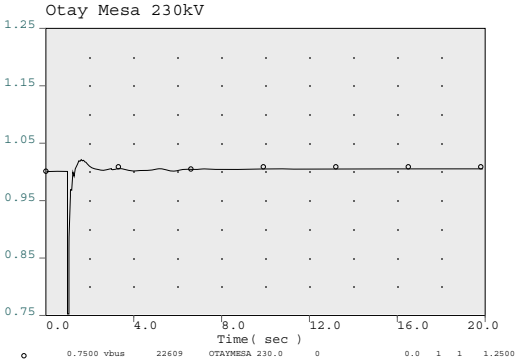
El Centro



Imperial Valley 230kV

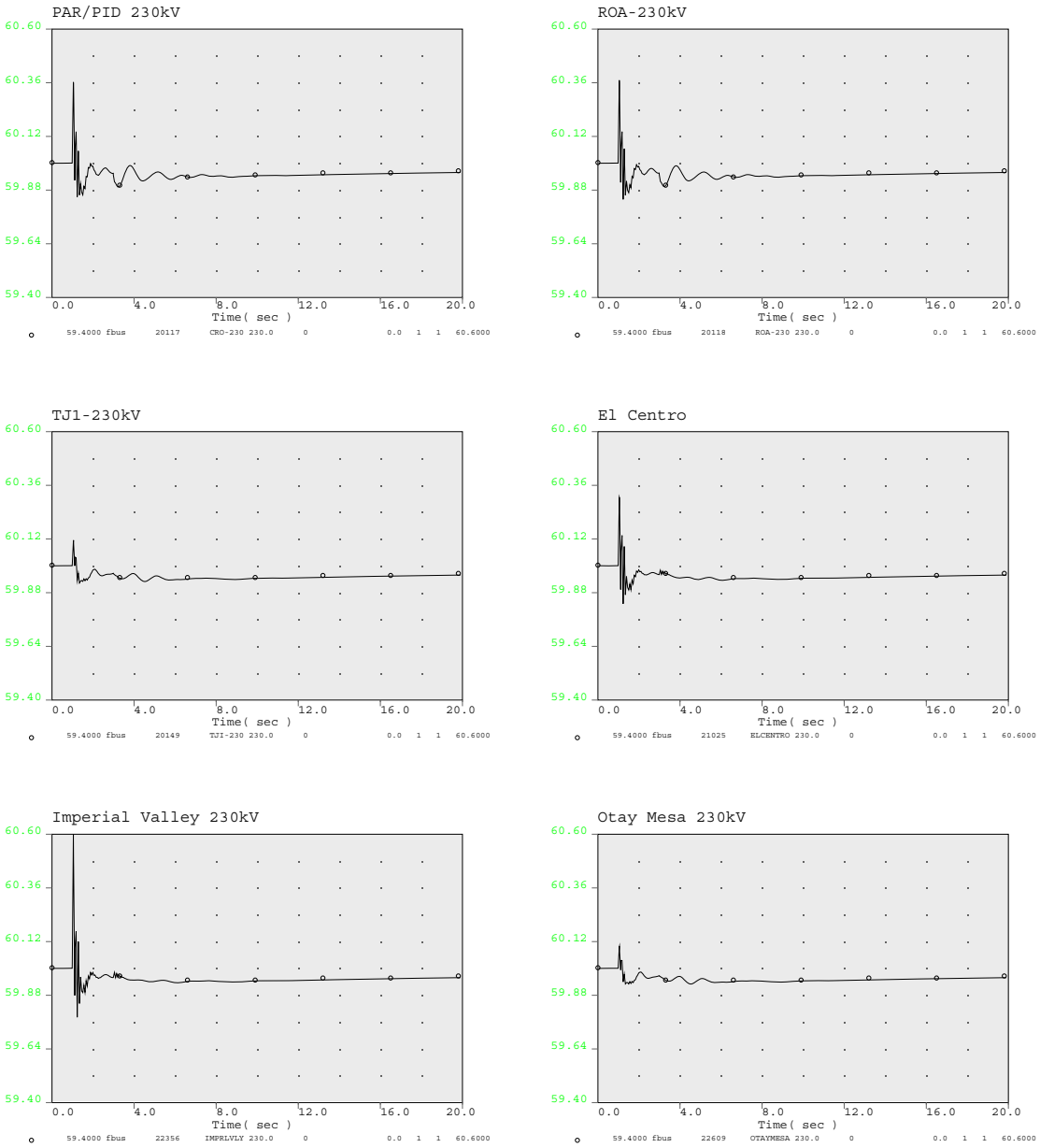


Otay Mesa 230kV



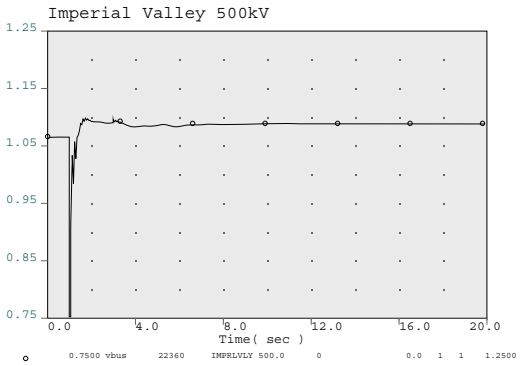
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

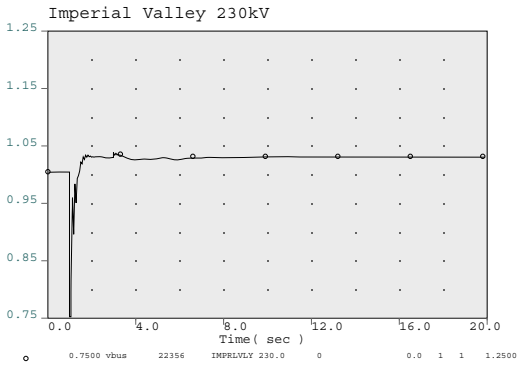
Affected System Frequency Check and Comparison

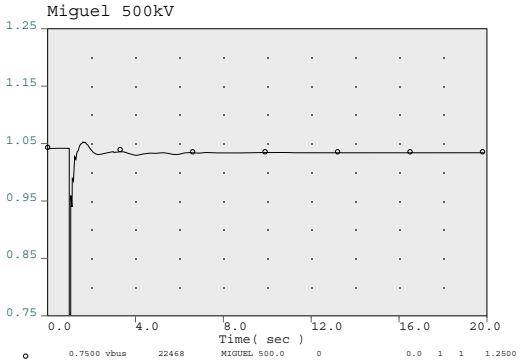


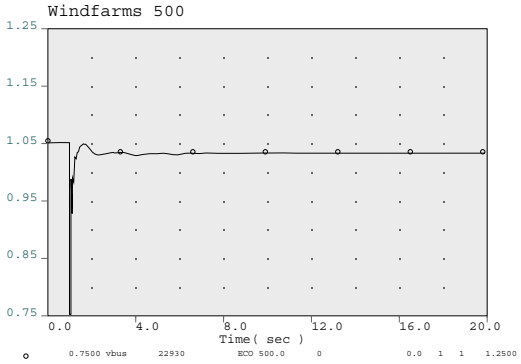
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

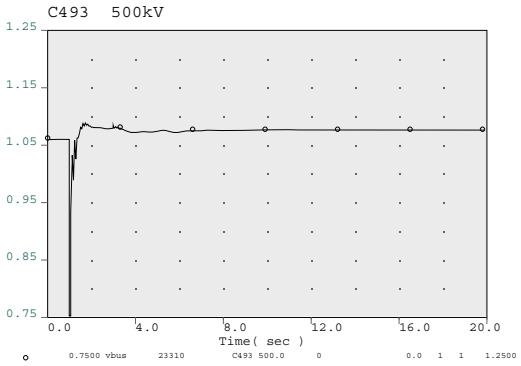
Imperial Valley Area - VOLTAGE

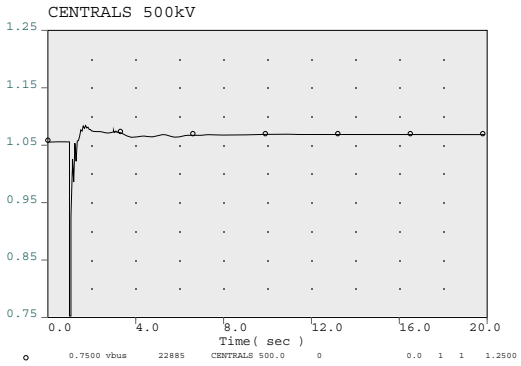










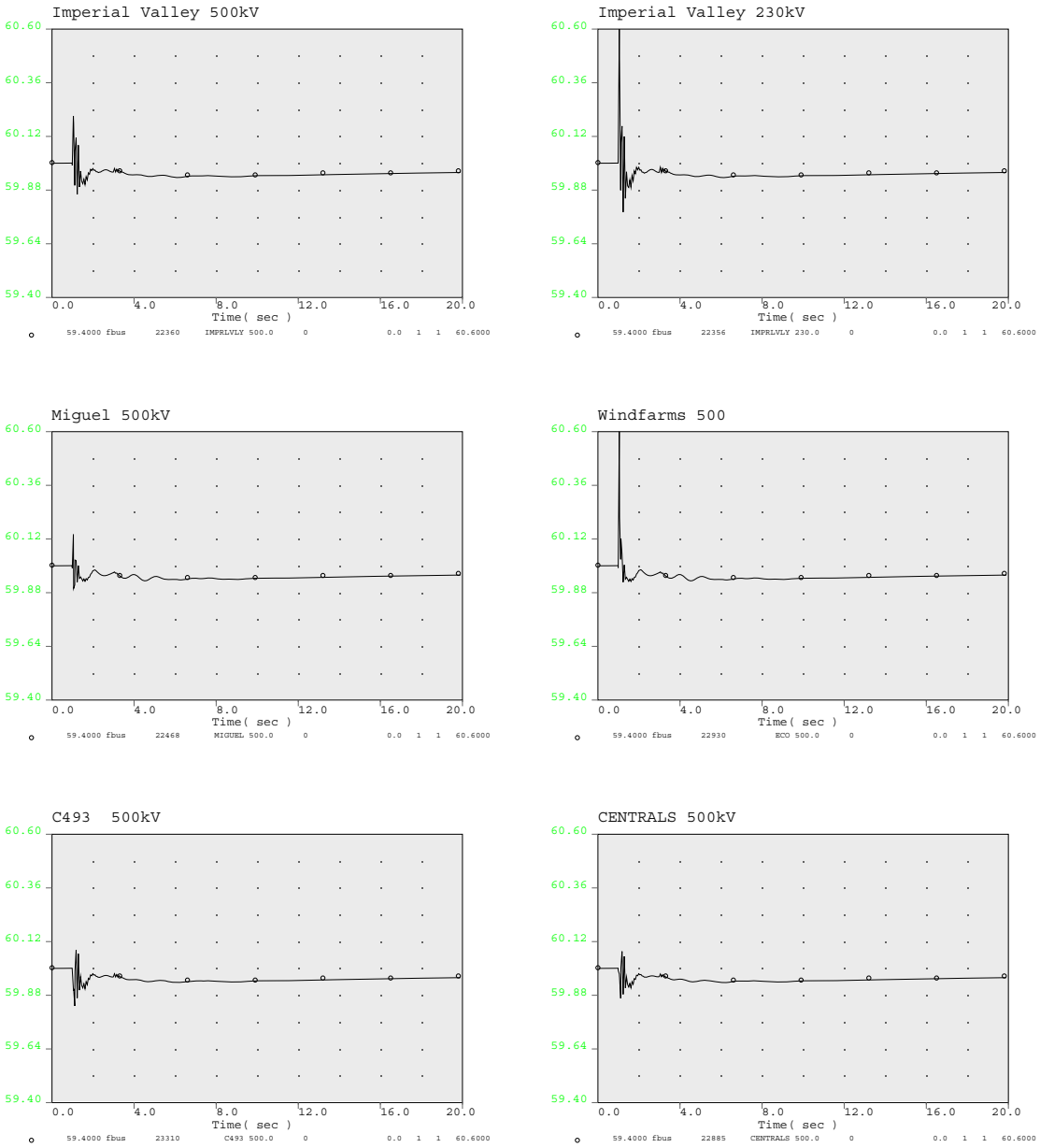


SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

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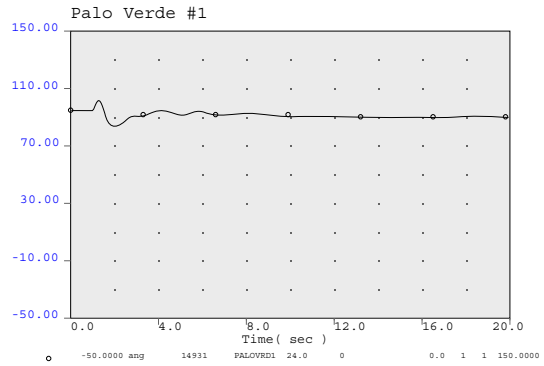
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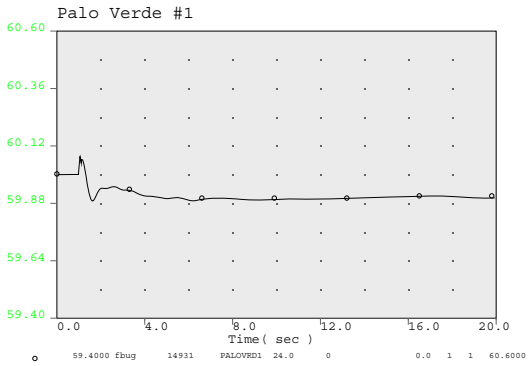
Imperial Valley Area - Frequency

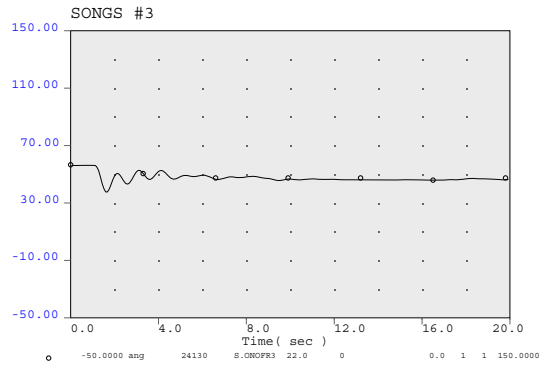


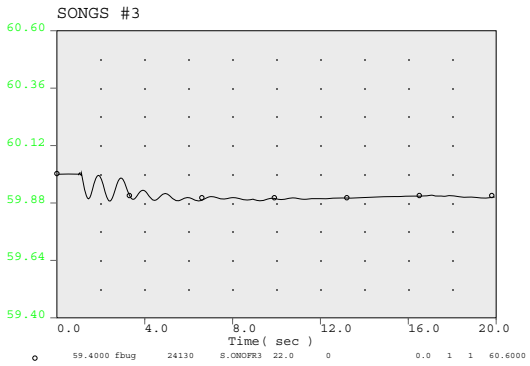
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

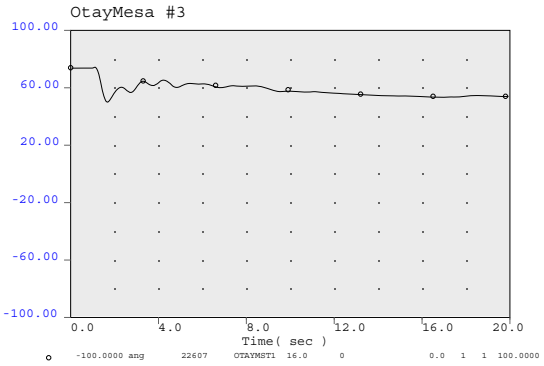
RELATIVE ROTOR ANGLE & FREQUENCY

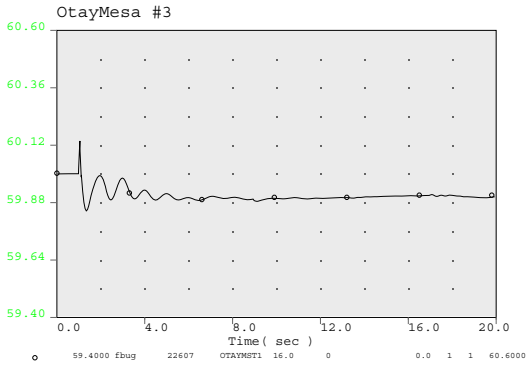












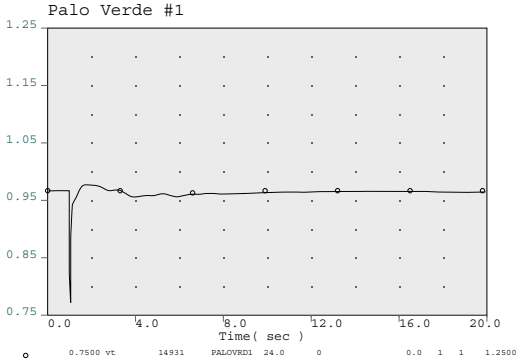
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

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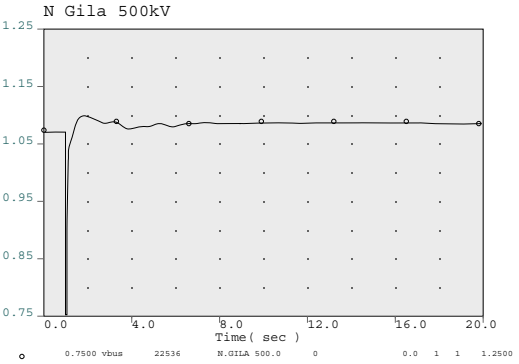
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RELATIVE VOLTAGE

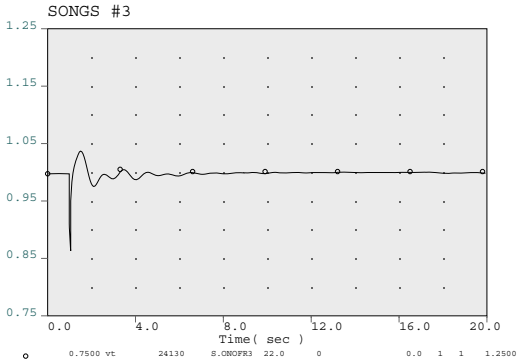
Palo Verde #1



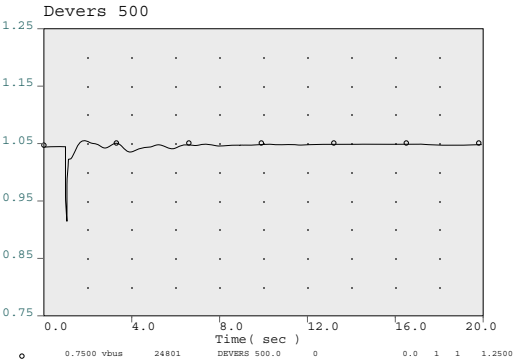
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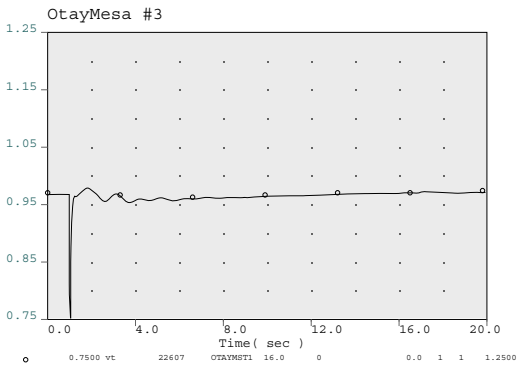
SONGS #3



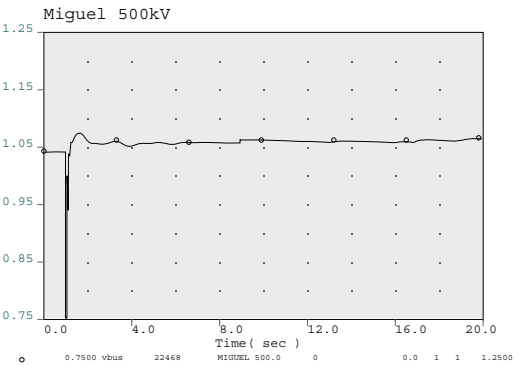
Devers 500



OtayMesa #3



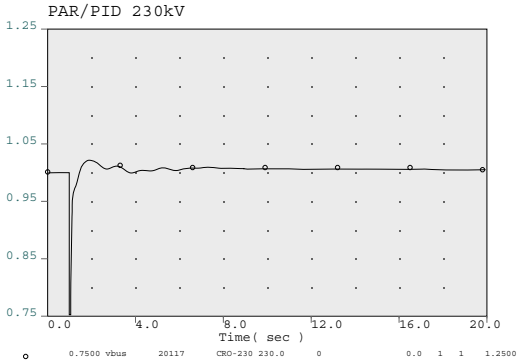
Miguel 500kV



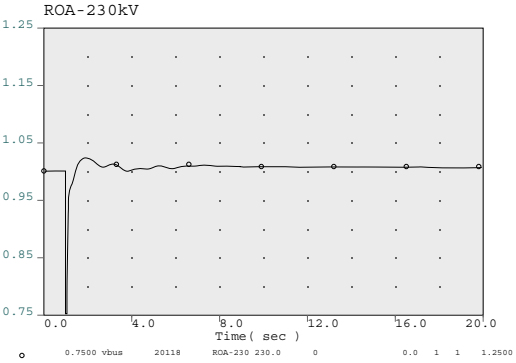
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

Affected System Voltage Check and Comparison

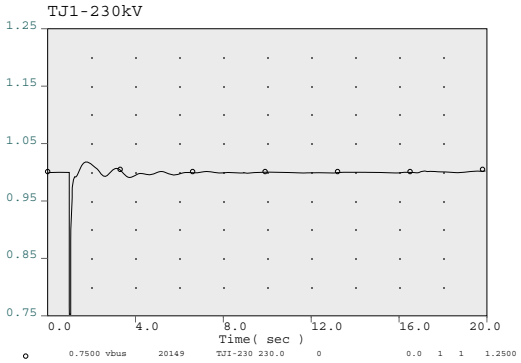
PAR/PID 230kV



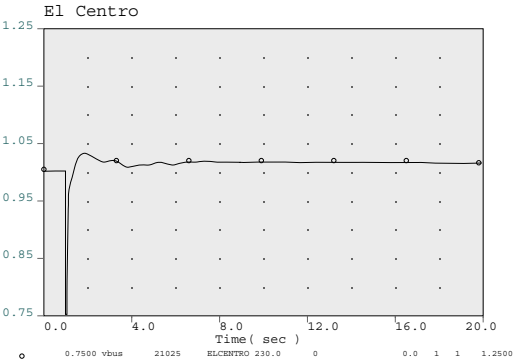
ROA-230kV



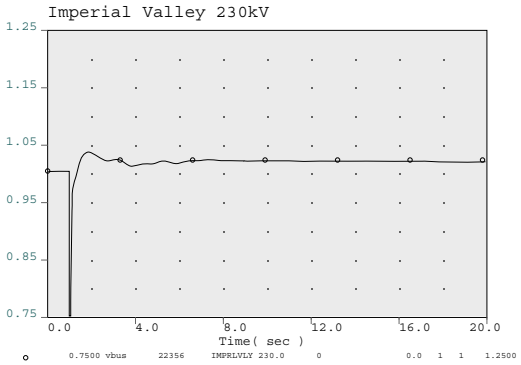
TJ1-230kV



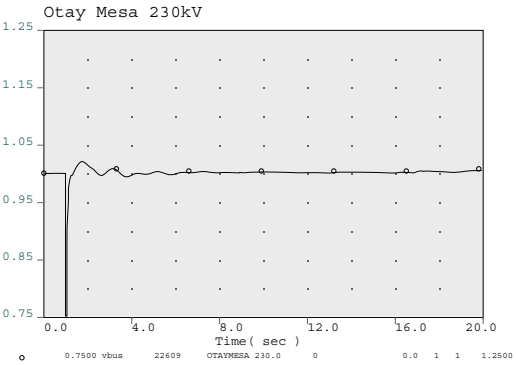
El Centro



Imperial Valley 230kV



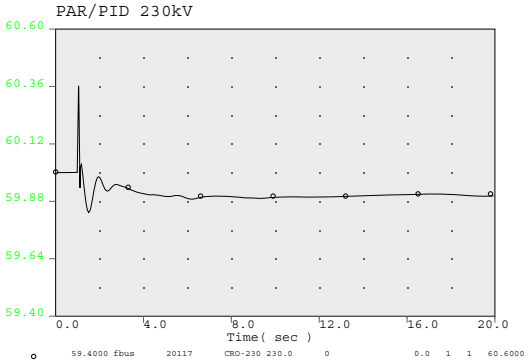
Otay Mesa 230kV



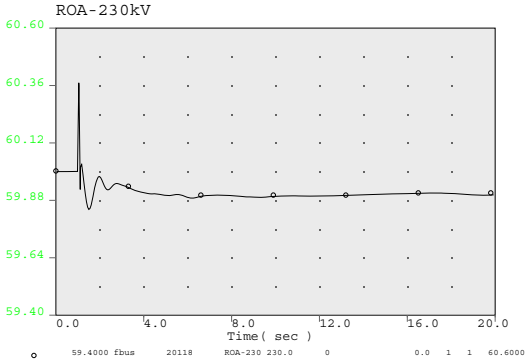
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

Affected System Frequency Check and Comparison

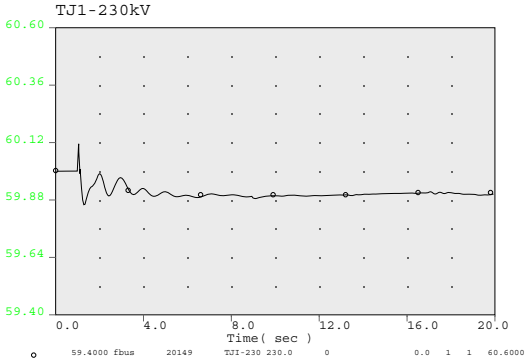
PAR/PID 230kV



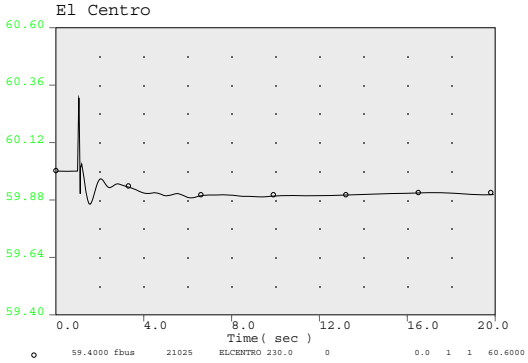
ROA-230kV



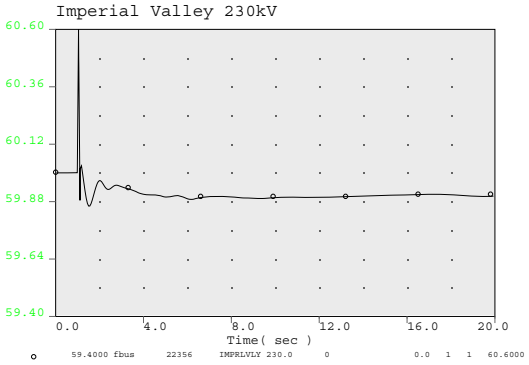
TJ1-230kV



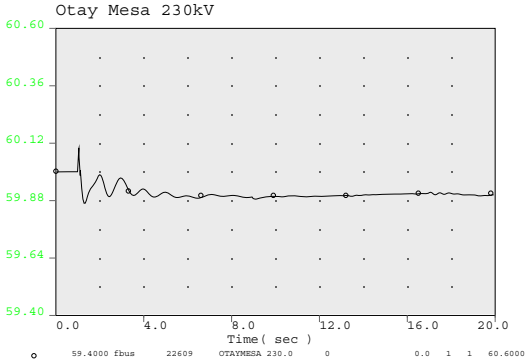
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



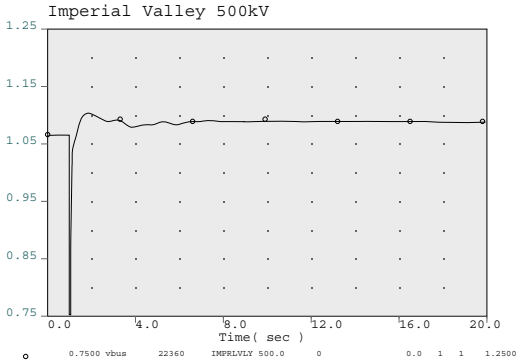
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

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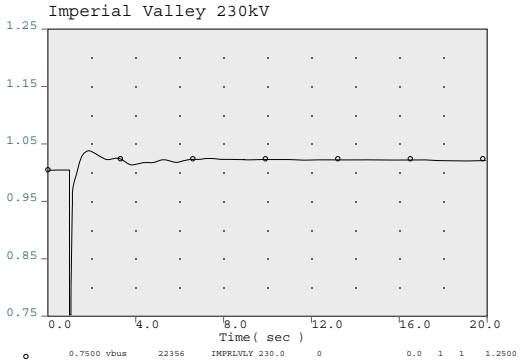
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Imperial Valley Area - VOLTAGE

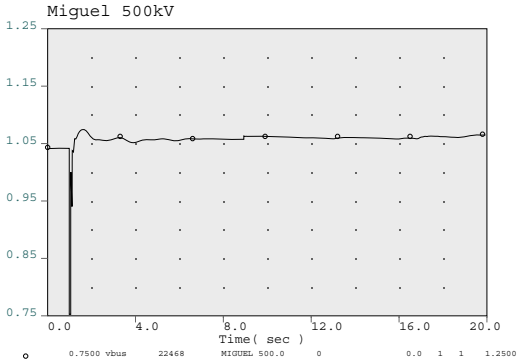
Imperial Valley 500kV



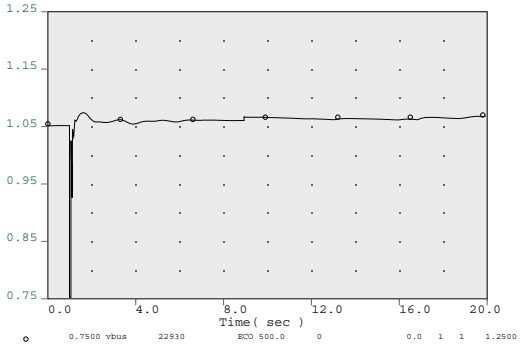
Imperial Valley 230kV



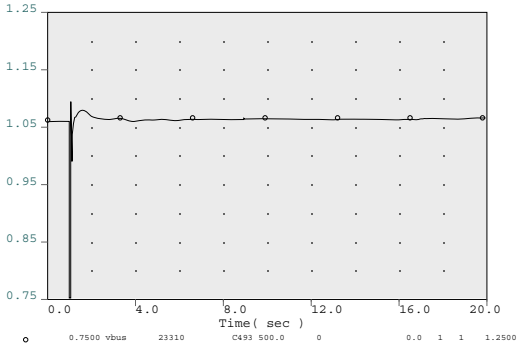
Miguel 500kV



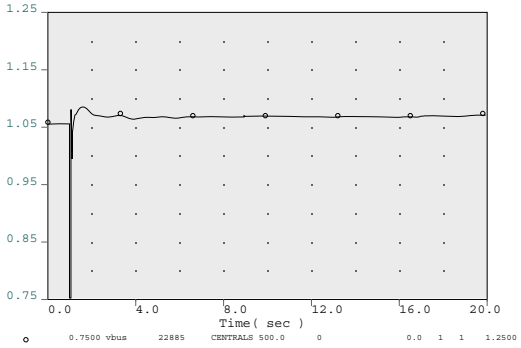
Windfarms 500



C493 500kV

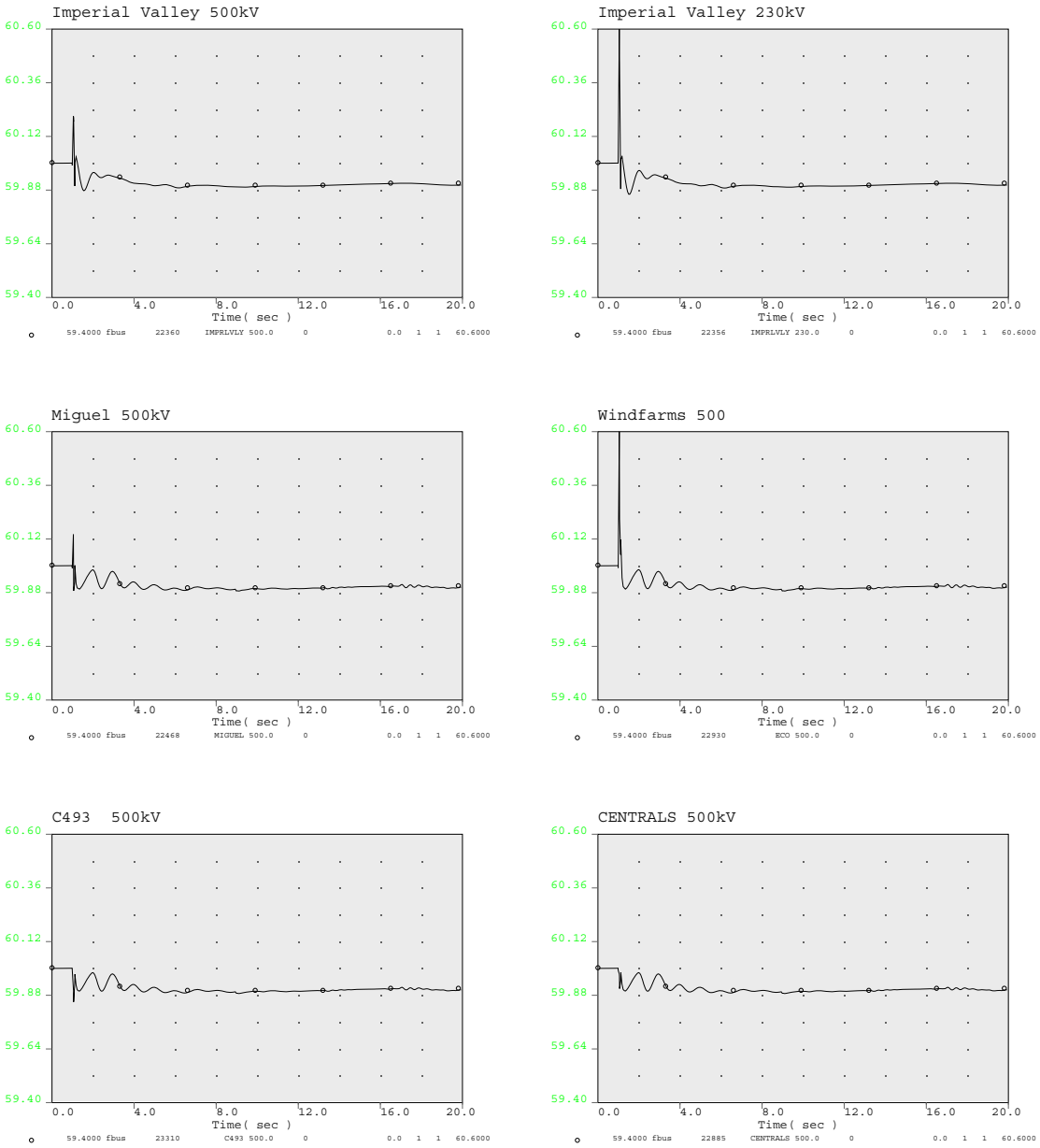


CENTRALS 500kV



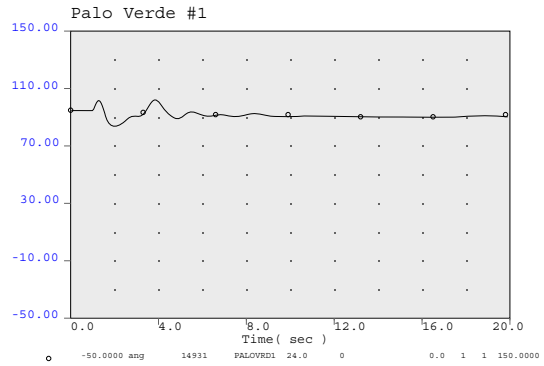
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

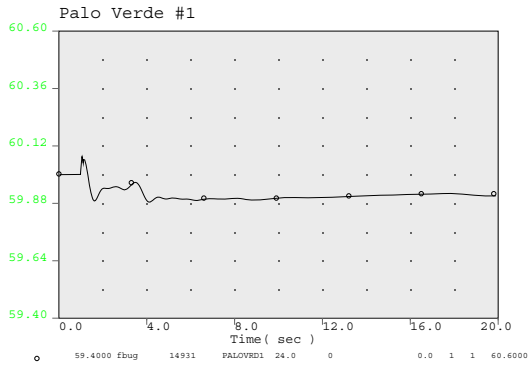
Imperial Valley Area - Frequency

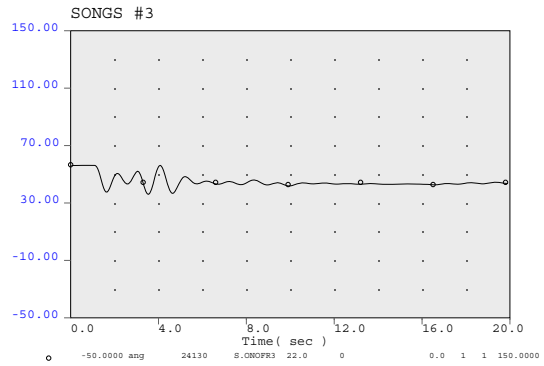


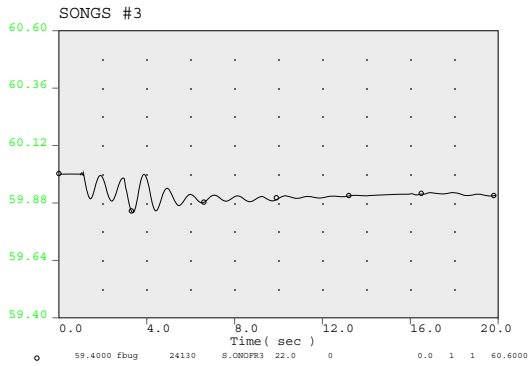
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

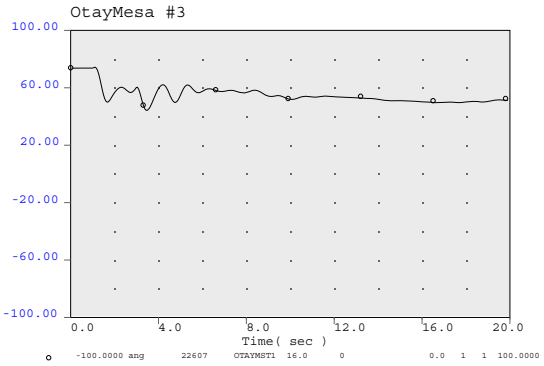
RELATIVE ROTOR ANGLE & FREQUENCY

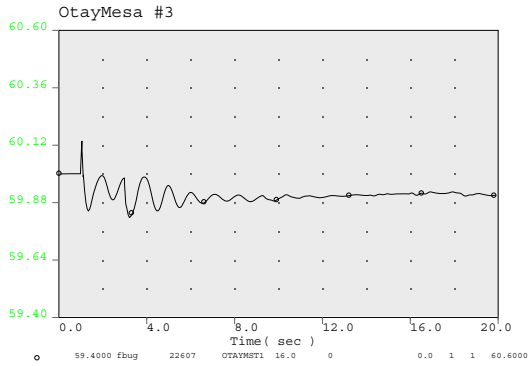












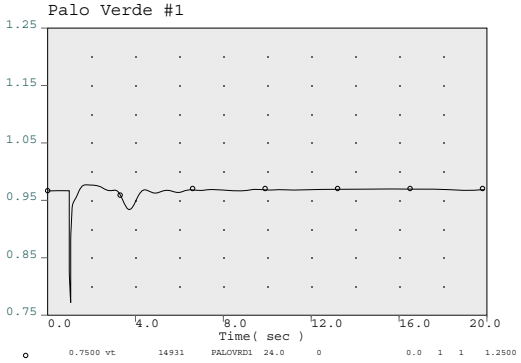
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Page 1

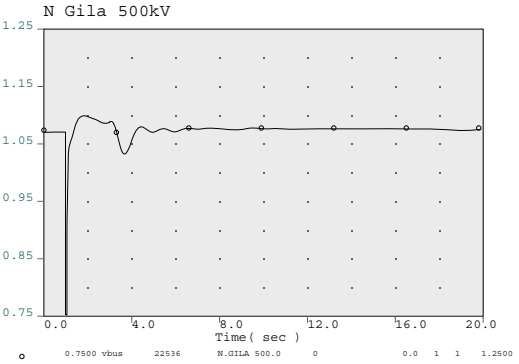
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RELATIVE VOLTAGE

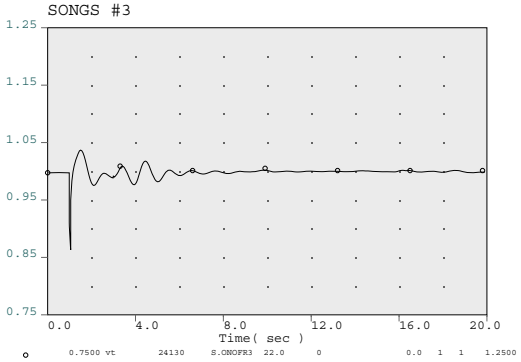
Palo Verde #1



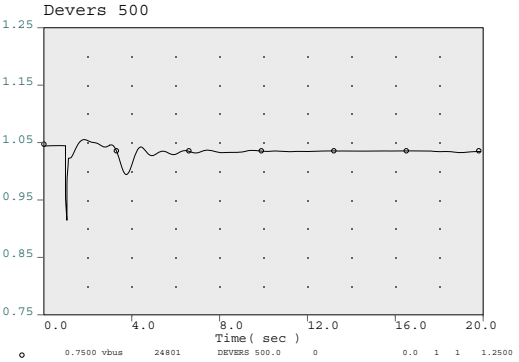
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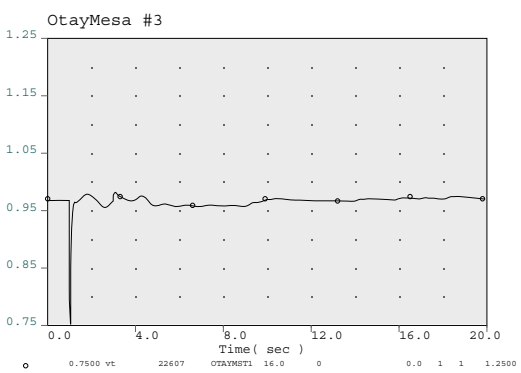
SONGS #3



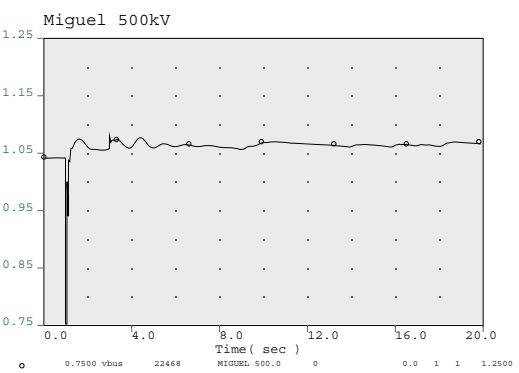
Devers 500



OtayMesa #3



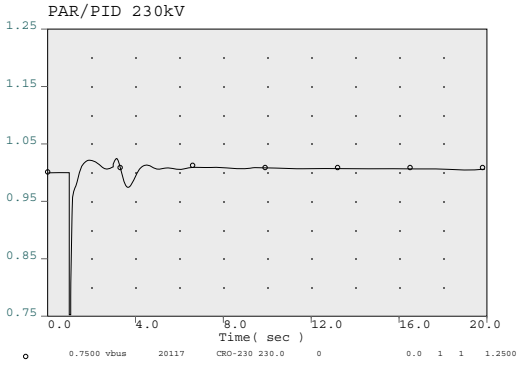
Miguel 500kV



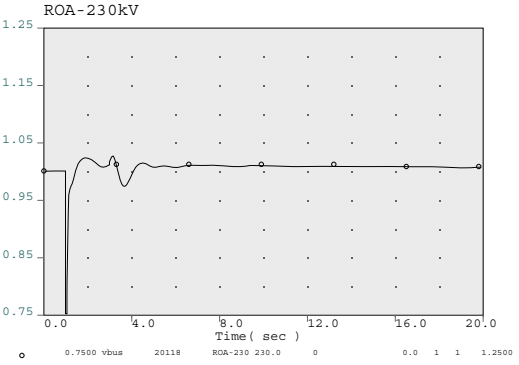
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Voltage Check and Comparison

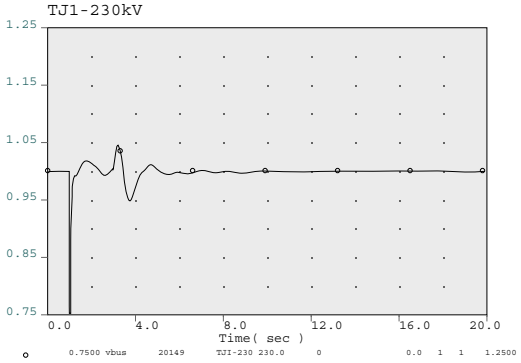
PAR/PID 230kV



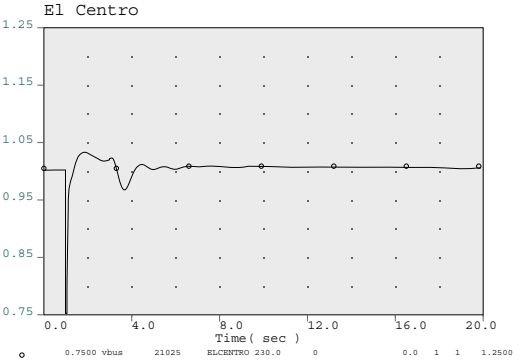
ROA-230kV



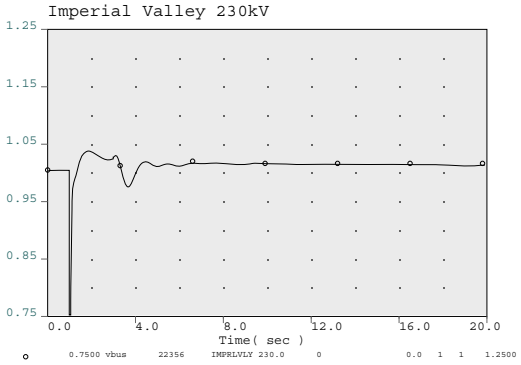
TJ1-230kV



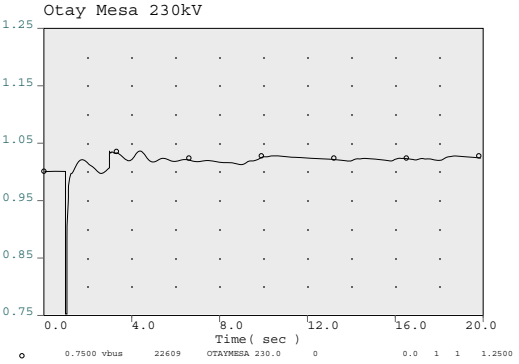
El Centro



Imperial Valley 230kV



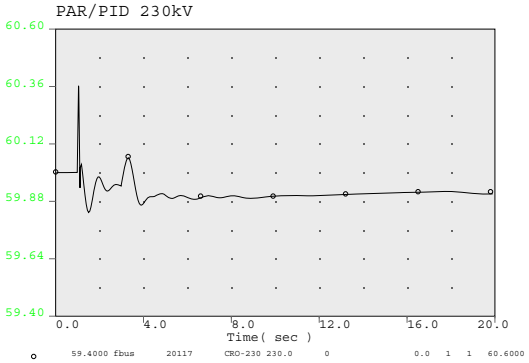
Otay Mesa 230kV



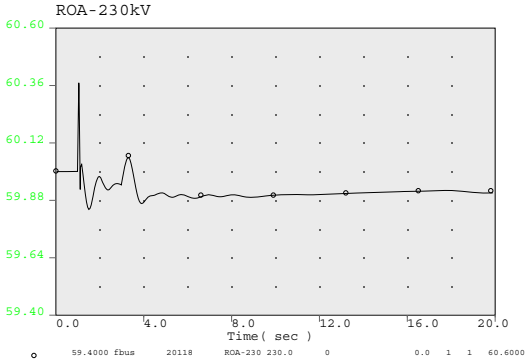
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Frequency Check and Comparison

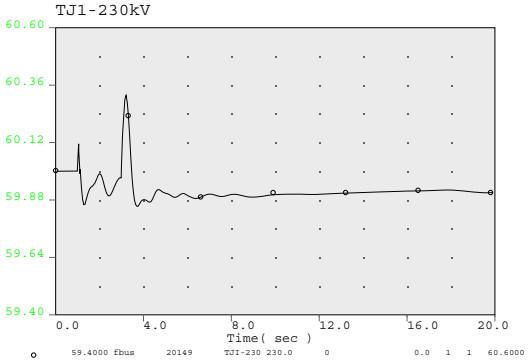
PAR/PID 230kV



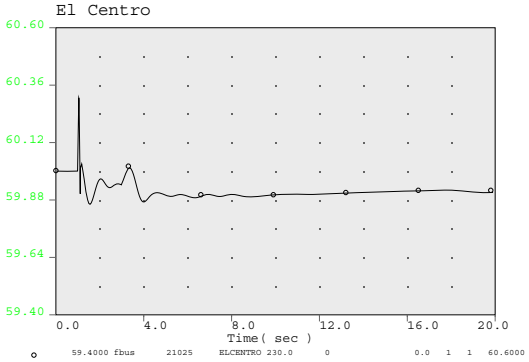
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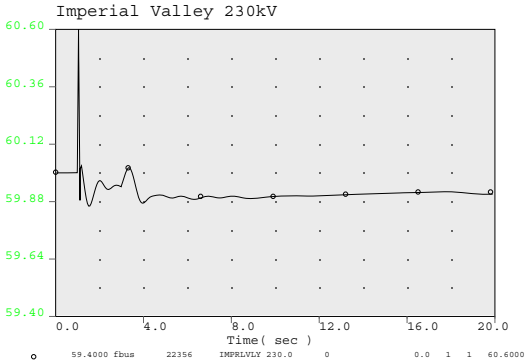
TJ1-230kV



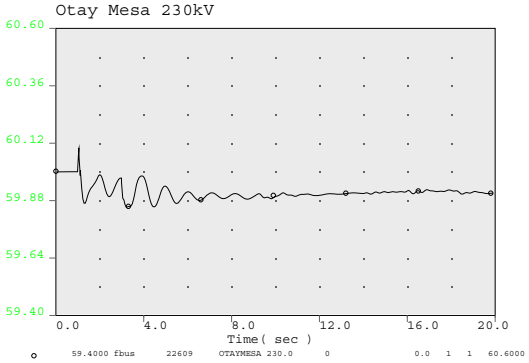
El Centro



Imperial Valley 230kV



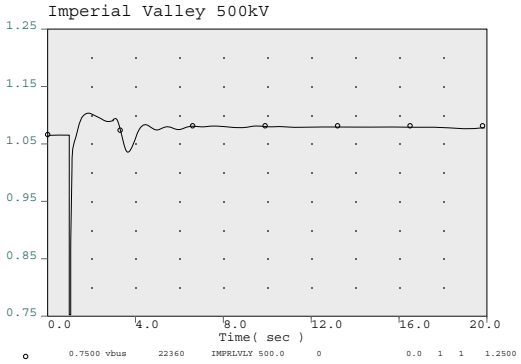
Otay Mesa 230kV



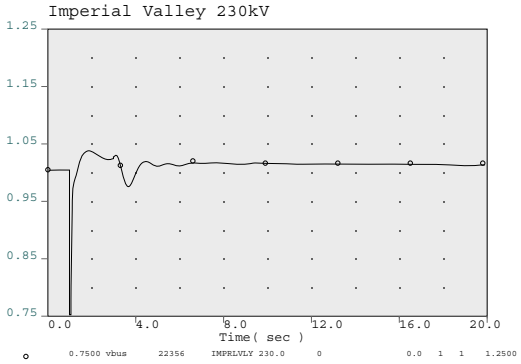
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Imperial Valley Area - VOLTAGE

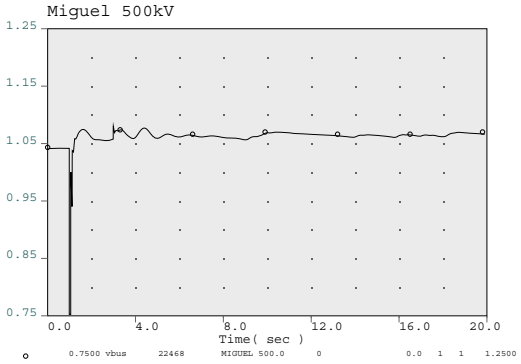
Imperial Valley 500kV



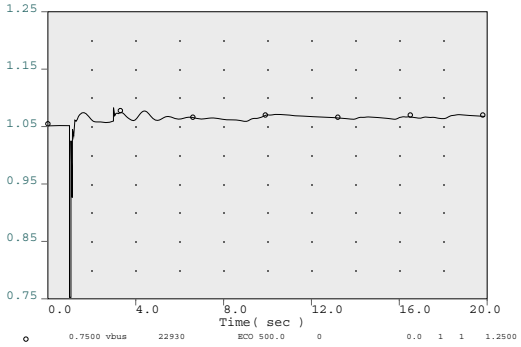
Imperial Valley 230kV



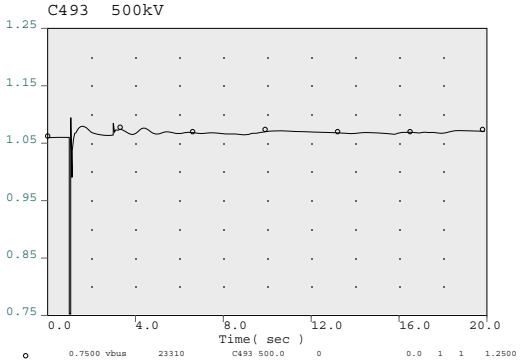
Miguel 500kV



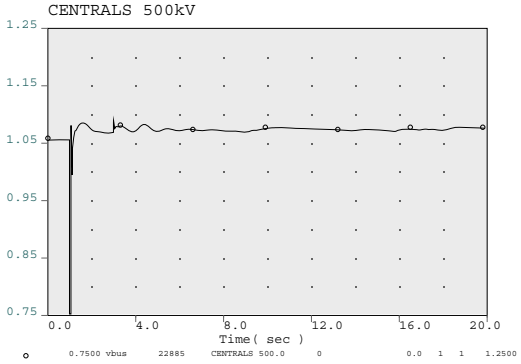
Windfarms 500



C493 500kV

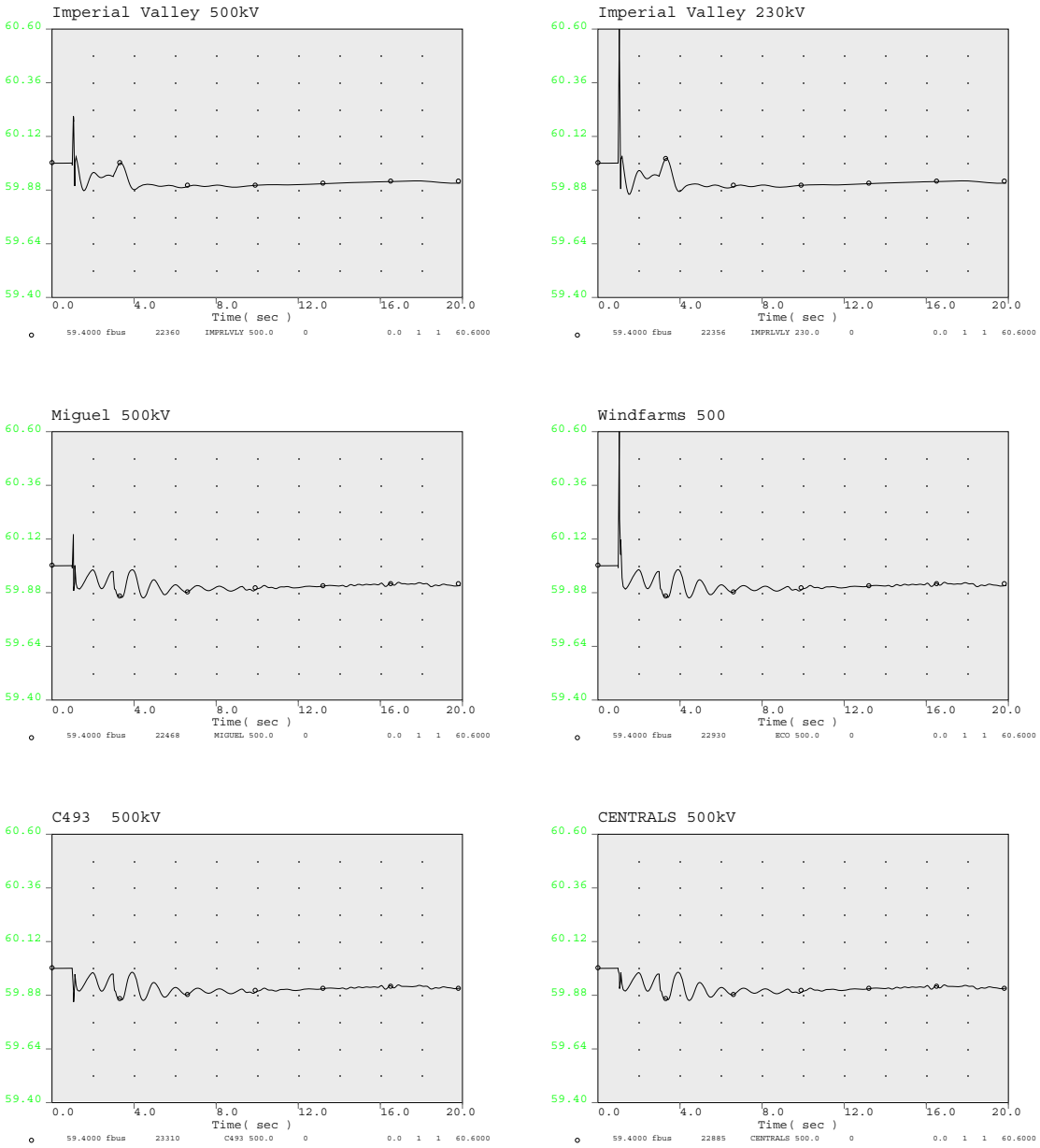


CENTRALS 500kV



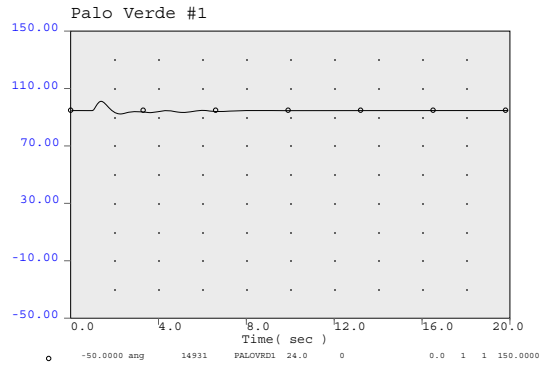
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

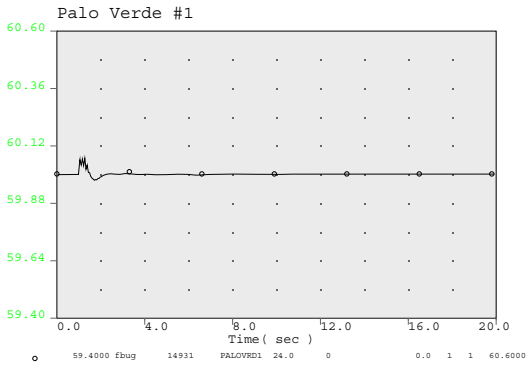
Imperial Valley Area - Frequency

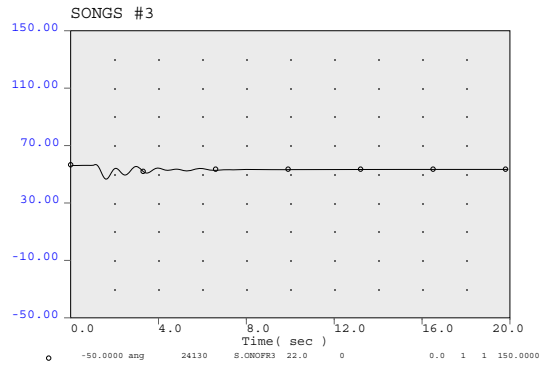


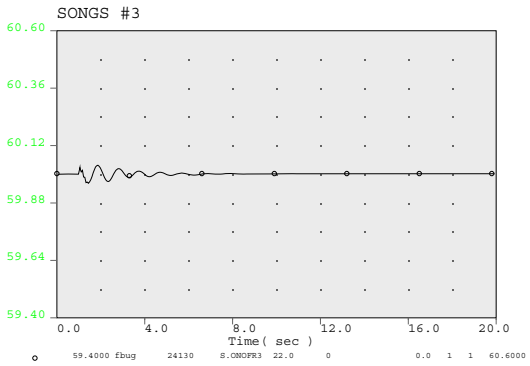
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

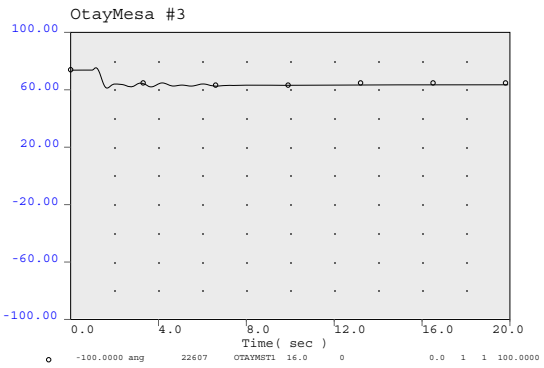
RELATIVE ROTOR ANGLE & FREQUENCY

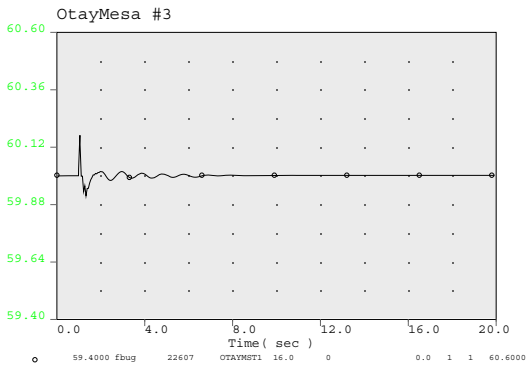












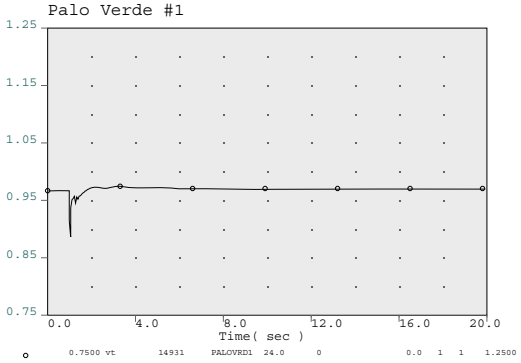
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Page 1

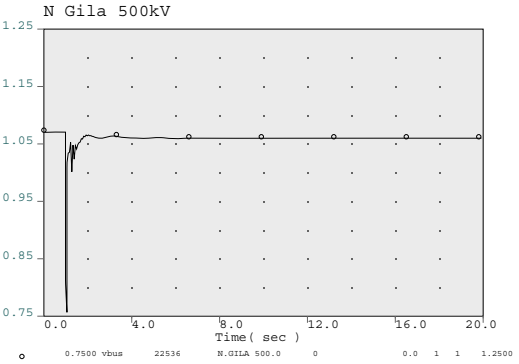
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RELATIVE VOLTAGE

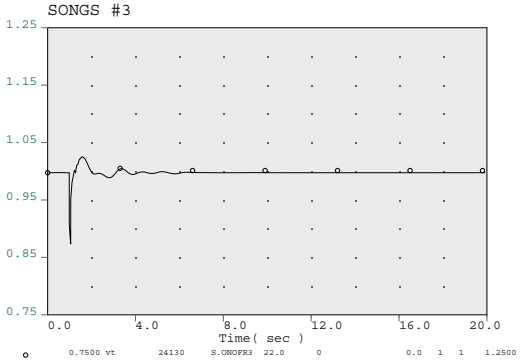
Palo Verde #1



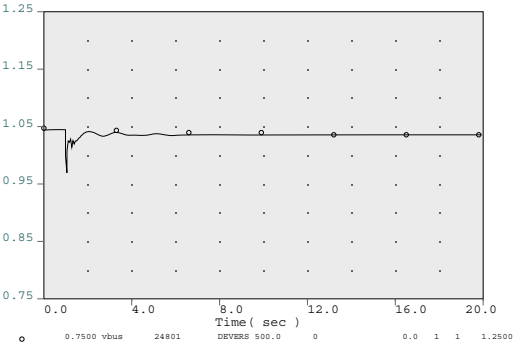
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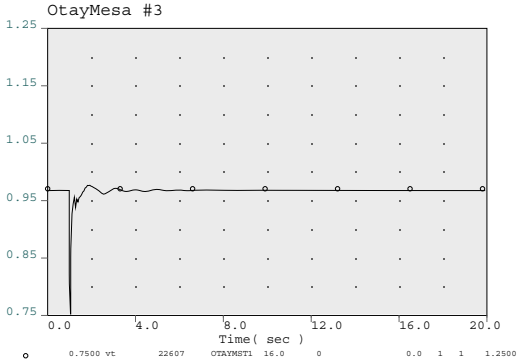
SONGS #3



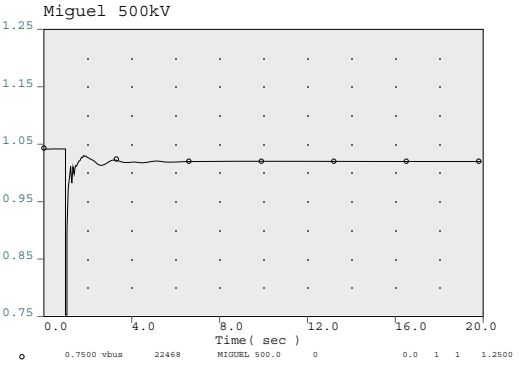
Devers 500



OtayMesa #3



Miguel 500kV



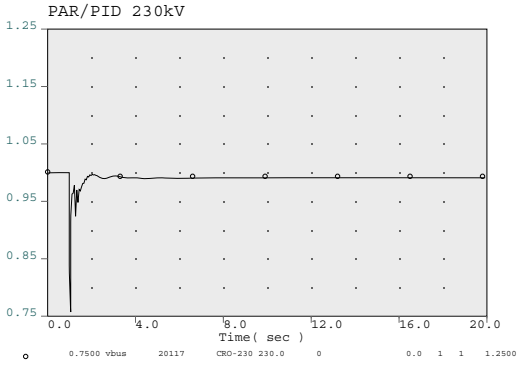
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Page 2

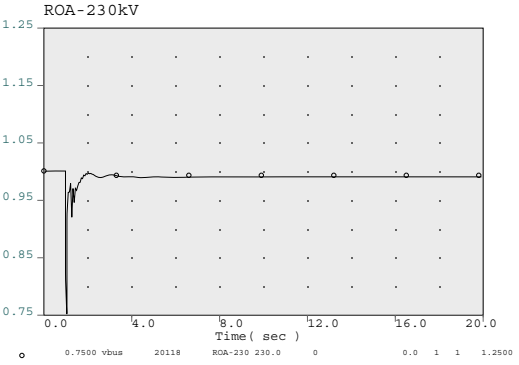
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Affected System Voltage Check and Comparison

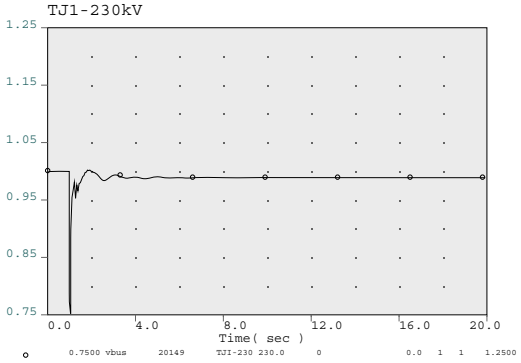
PAR/PID 230kV



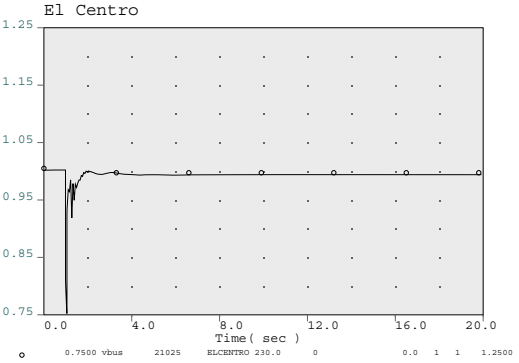
ROA-230kV



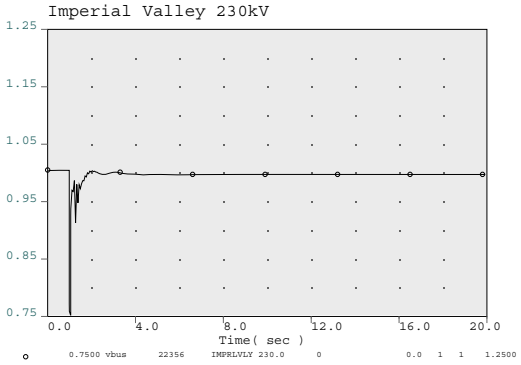
TJ1-230kV



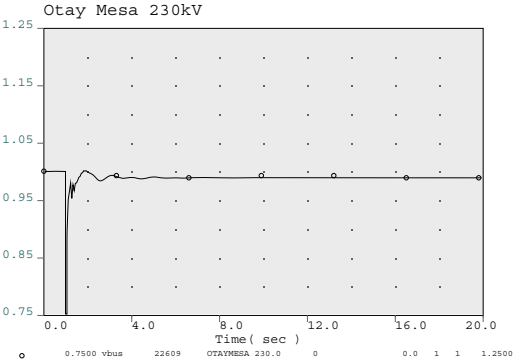
El Centro



Imperial Valley 230kV

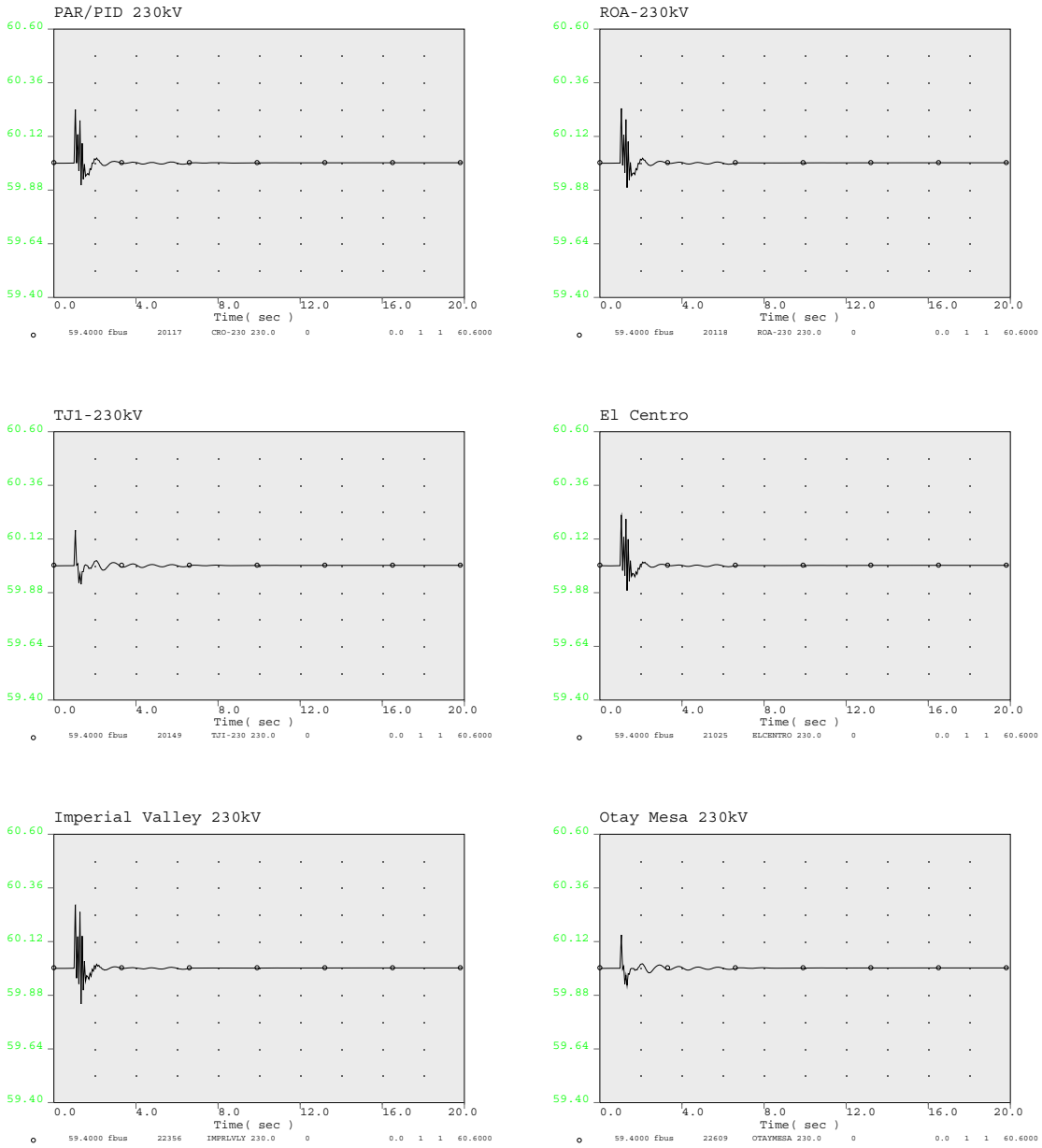


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

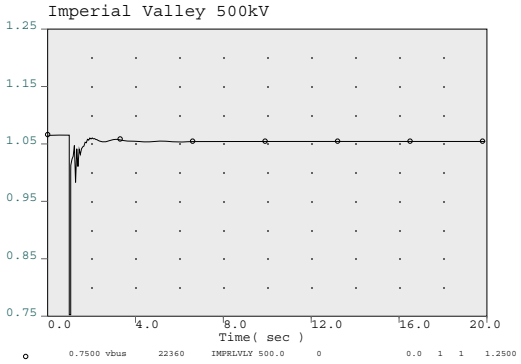
Affected System Frequency Check and Comparison



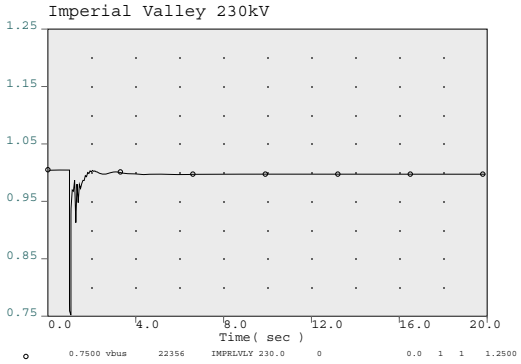
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

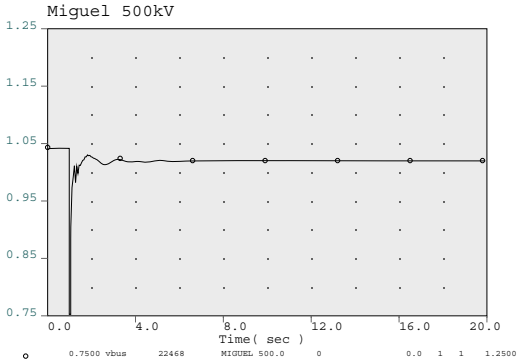
Imperial Valley 500kV



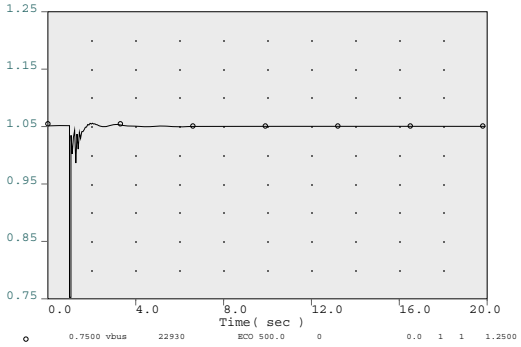
Imperial Valley 230kV



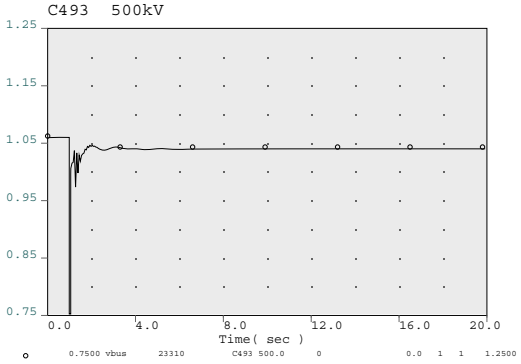
Miguel 500kV



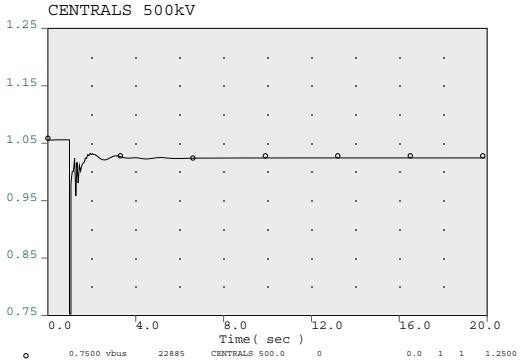
Windfarms 500



C493 500kV

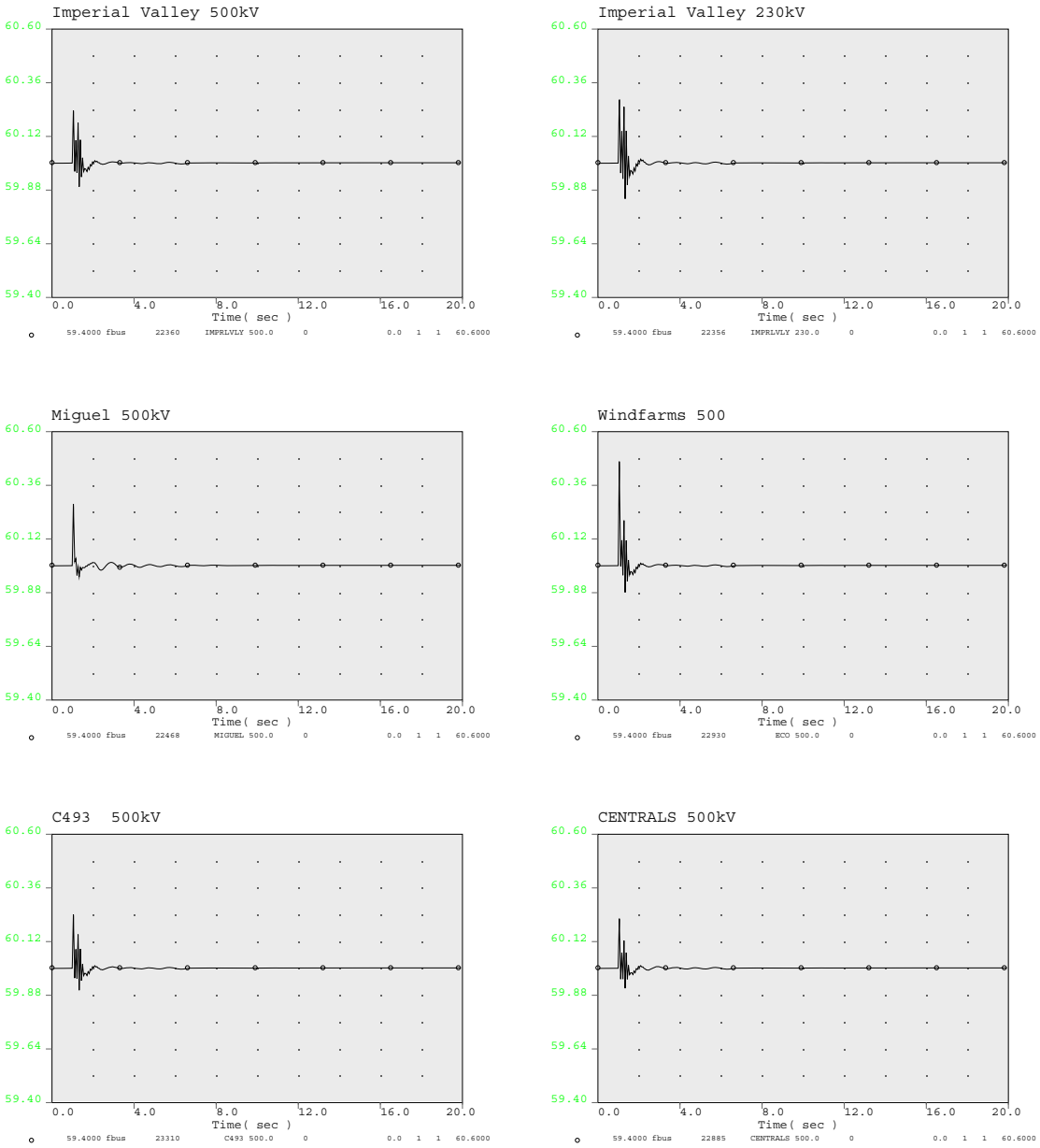


CENTRALS 500kV



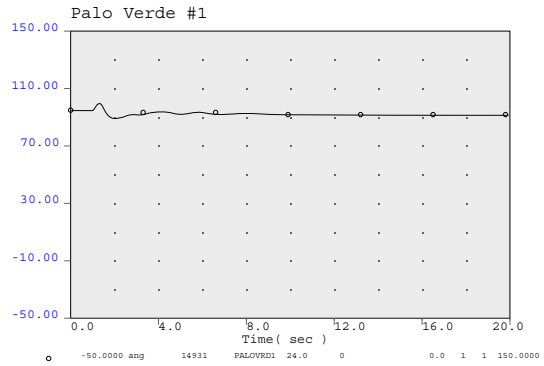
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

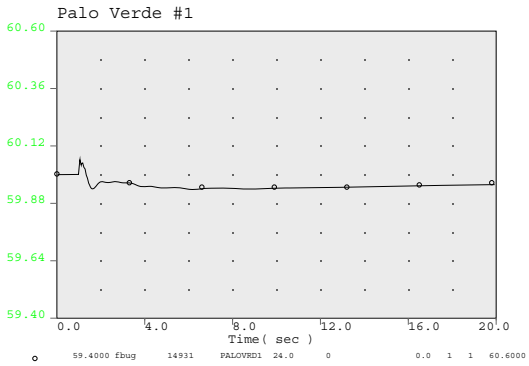
Imperial Valley Area - Frequency

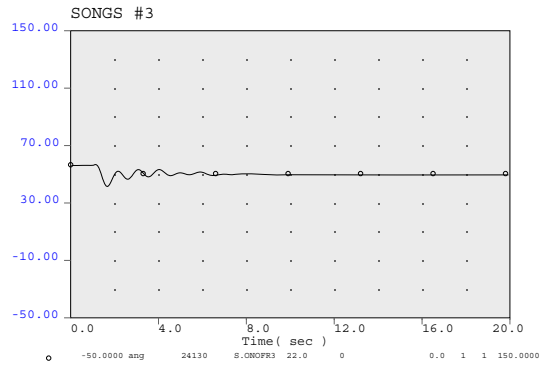


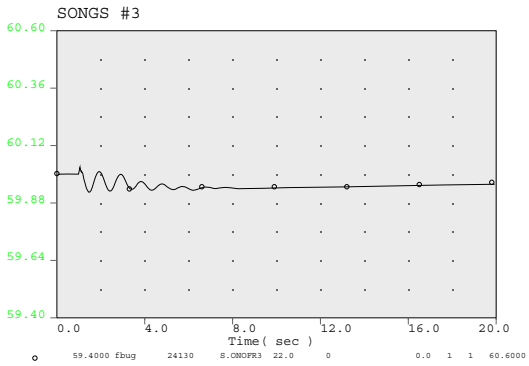
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

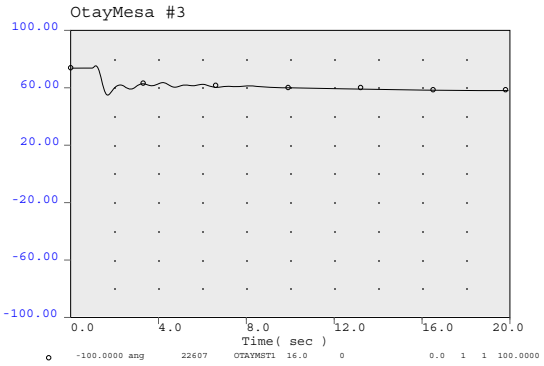
RELATIVE ROTOR ANGLE & FREQUENCY

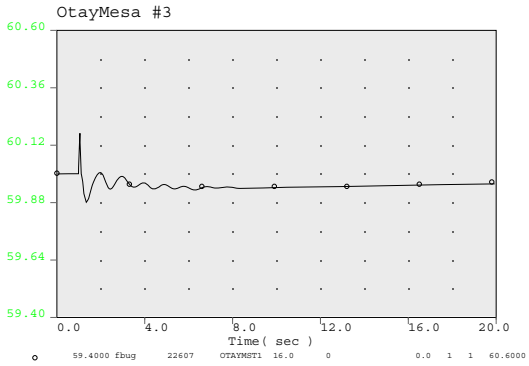










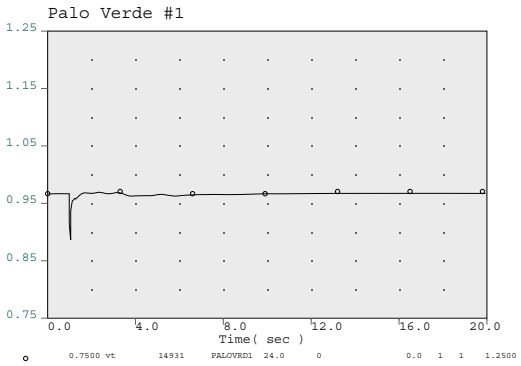


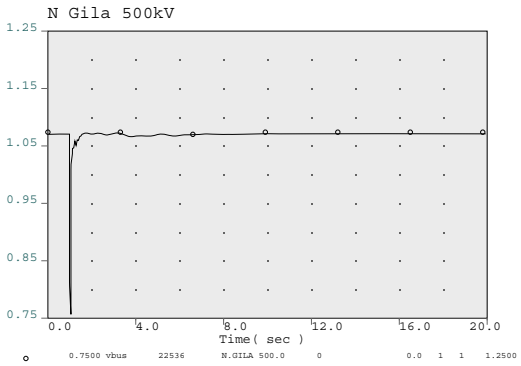
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

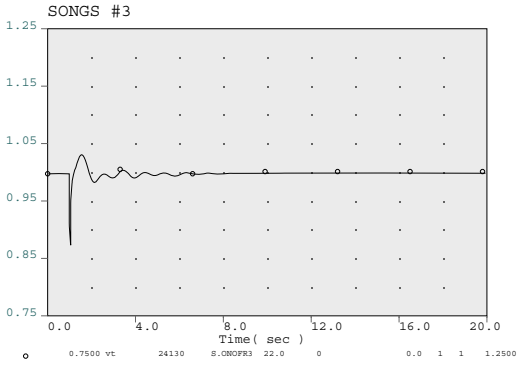
Page 1

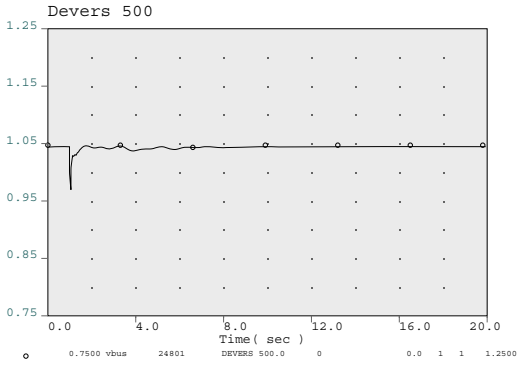
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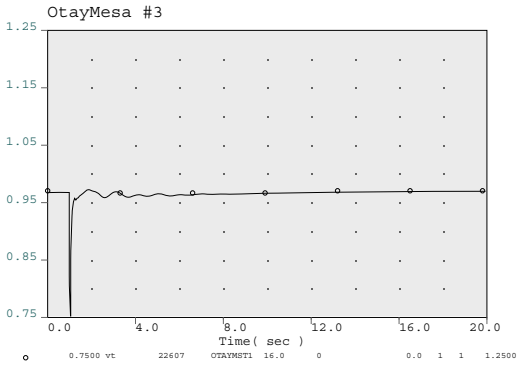
RELATIVE VOLTAGE

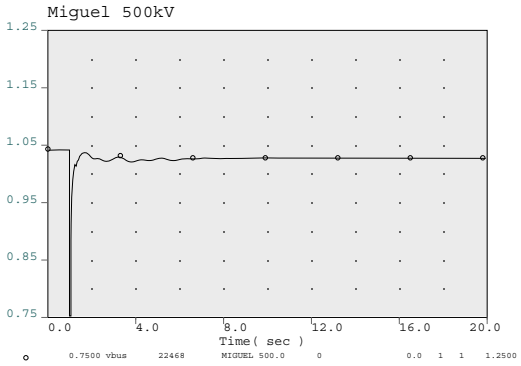








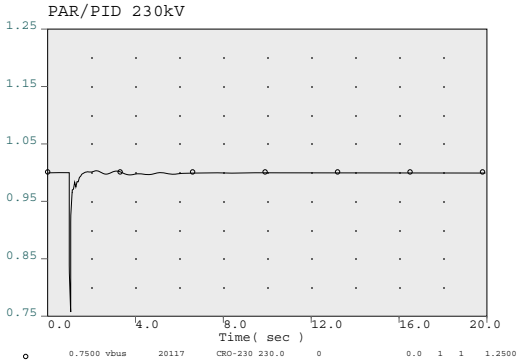




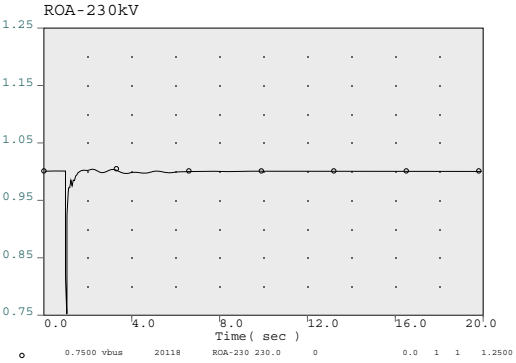
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

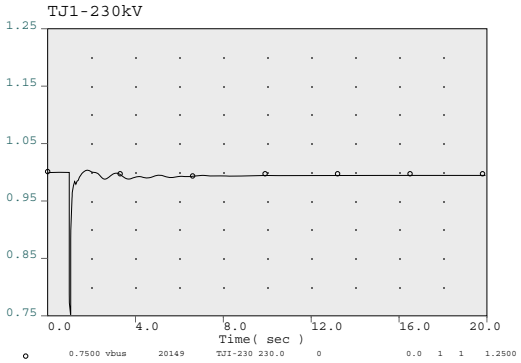
PAR/PID 230kV



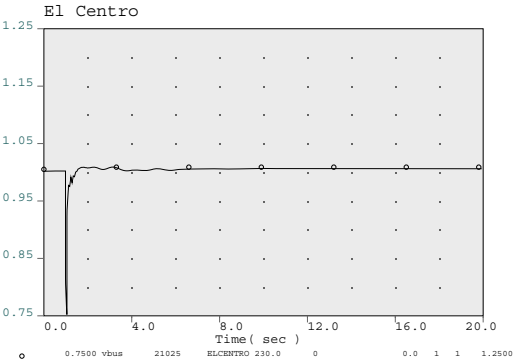
ROA-230kV



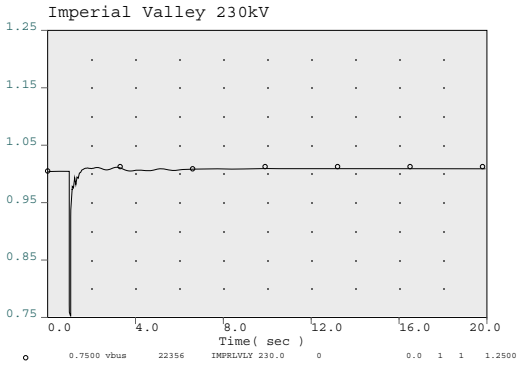
TJ1-230kV



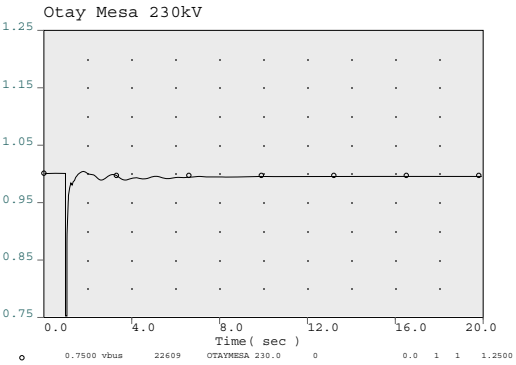
El Centro



Imperial Valley 230kV



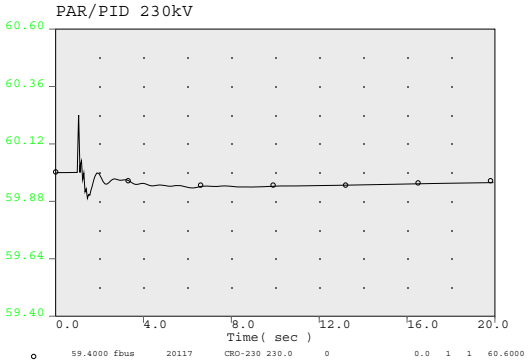
Otay Mesa 230kV



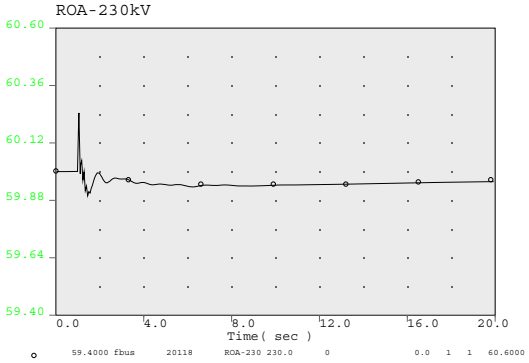
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

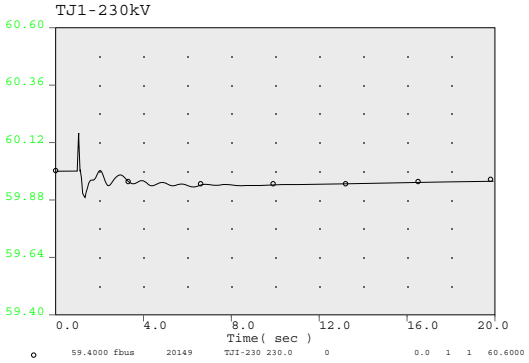
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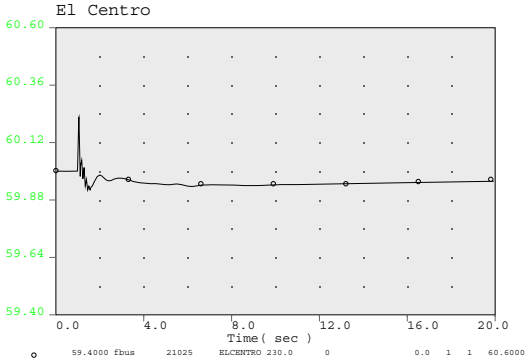
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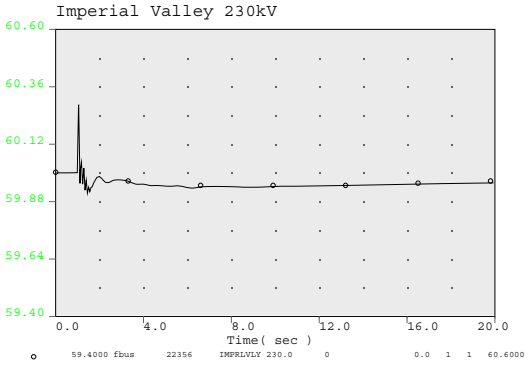
TJ1-230kV



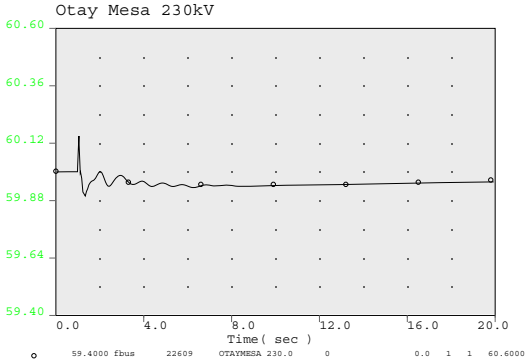
El Centro



Imperial Valley 230kV



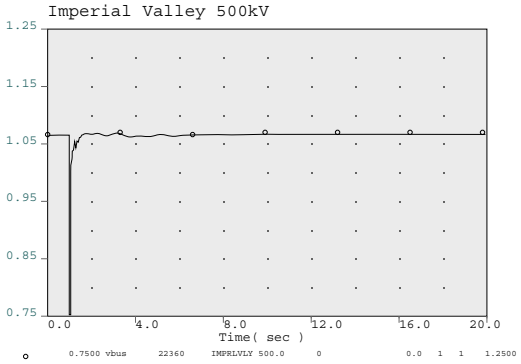
Otay Mesa 230kV



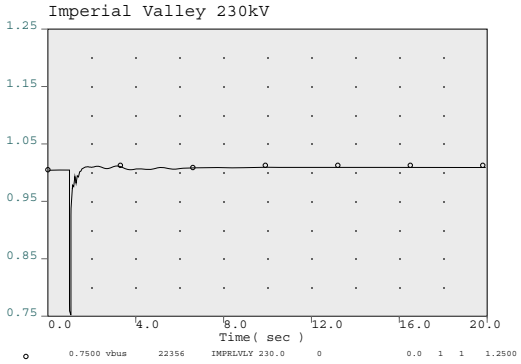
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

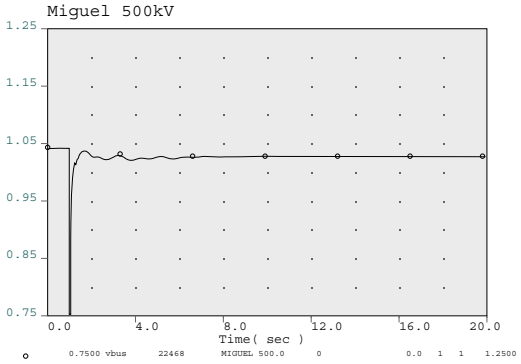
Imperial Valley 500kV



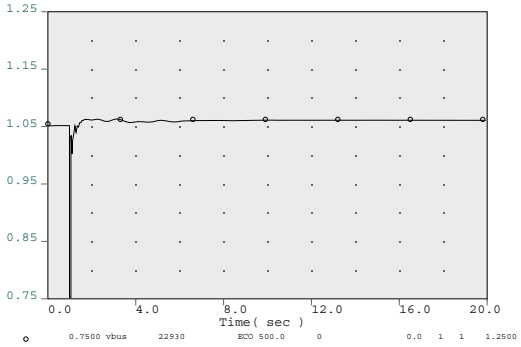
Imperial Valley 230kV



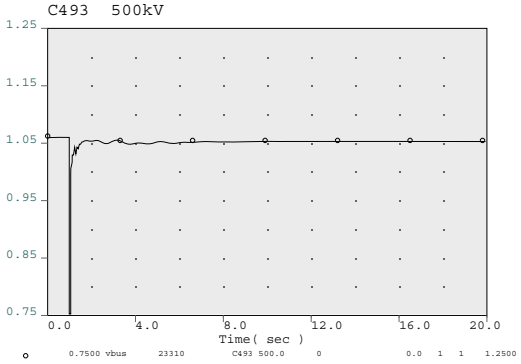
Miguel 500kV



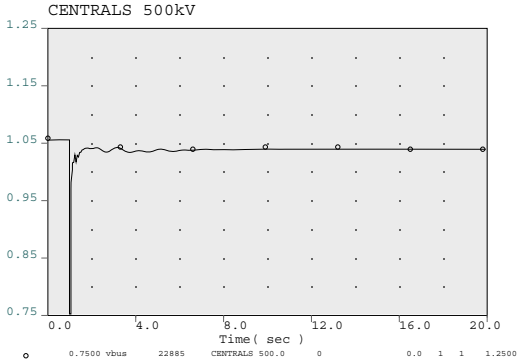
Windfarms 500



C493 500kV

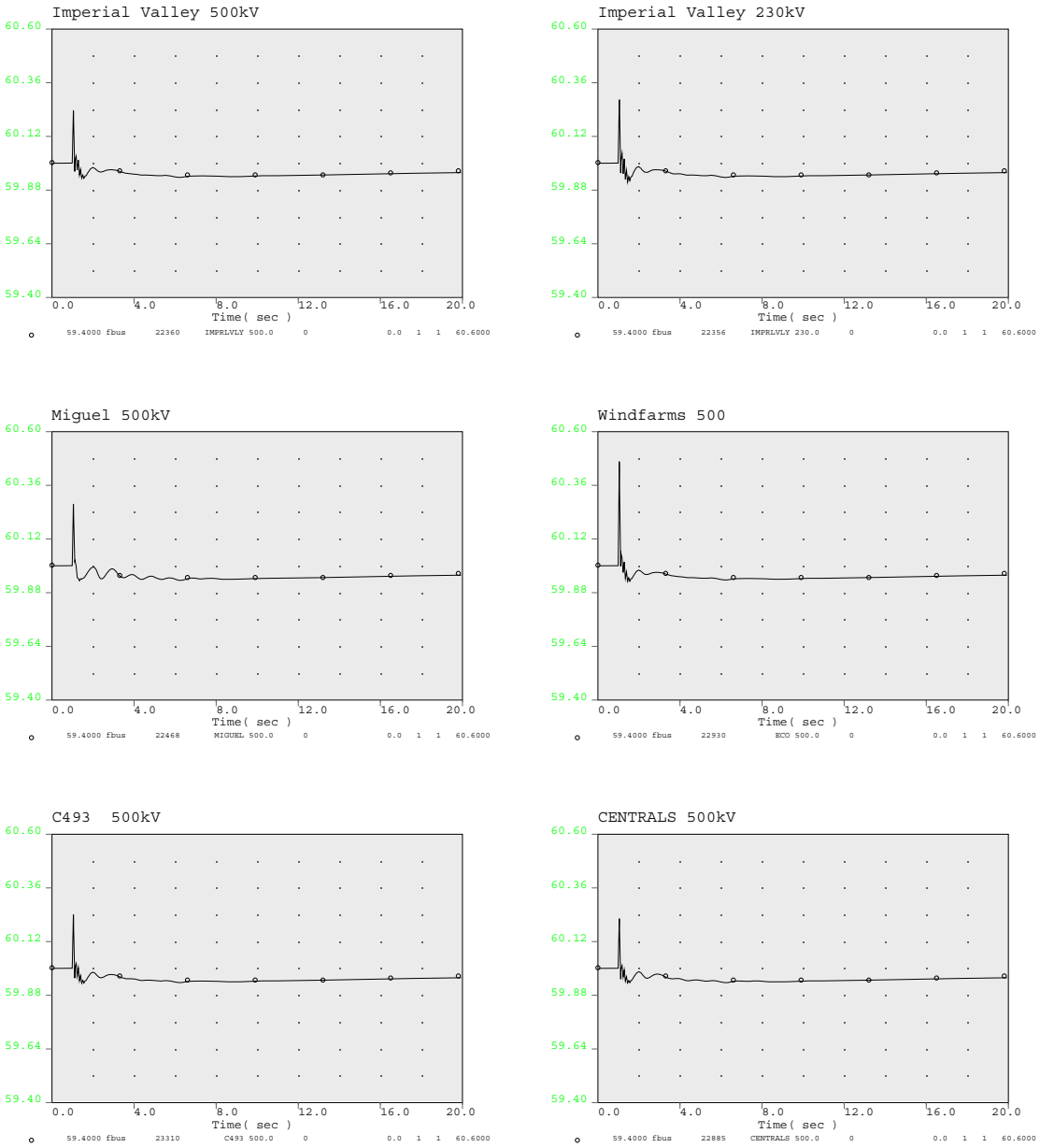


CENTRALS 500kV



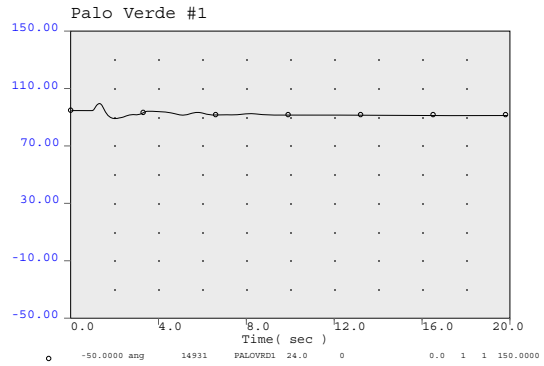
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

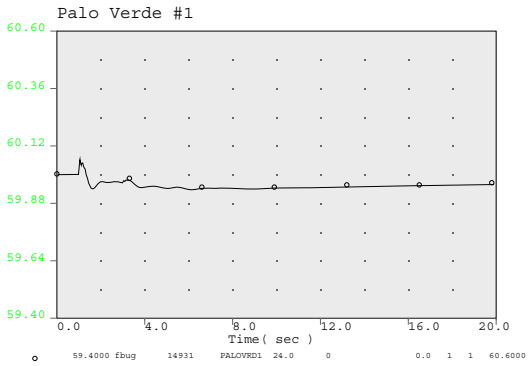
Imperial Valley Area - Frequency

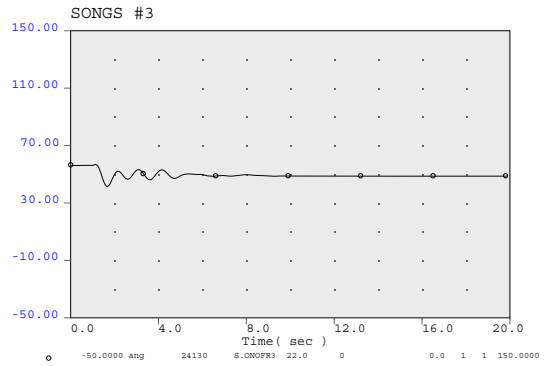


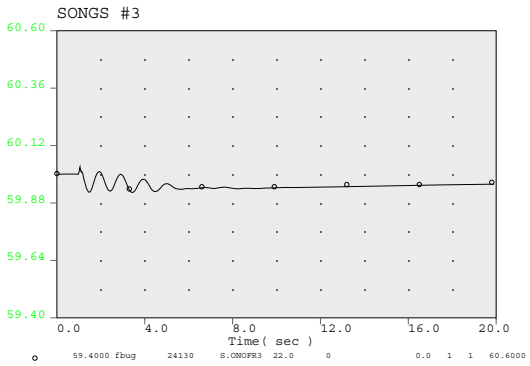
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

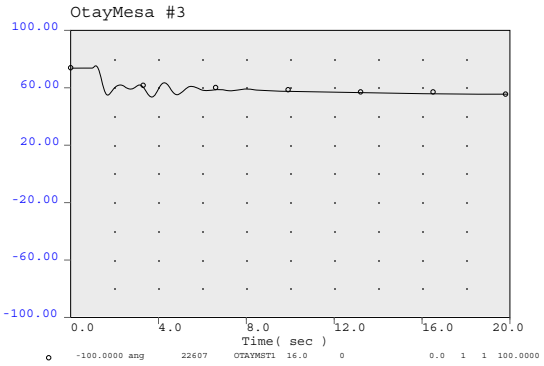
RELATIVE ROTOR ANGLE & FREQUENCY

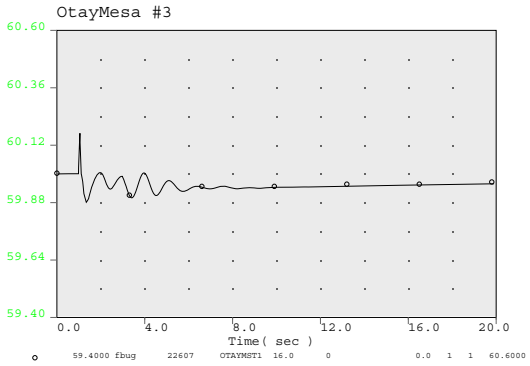










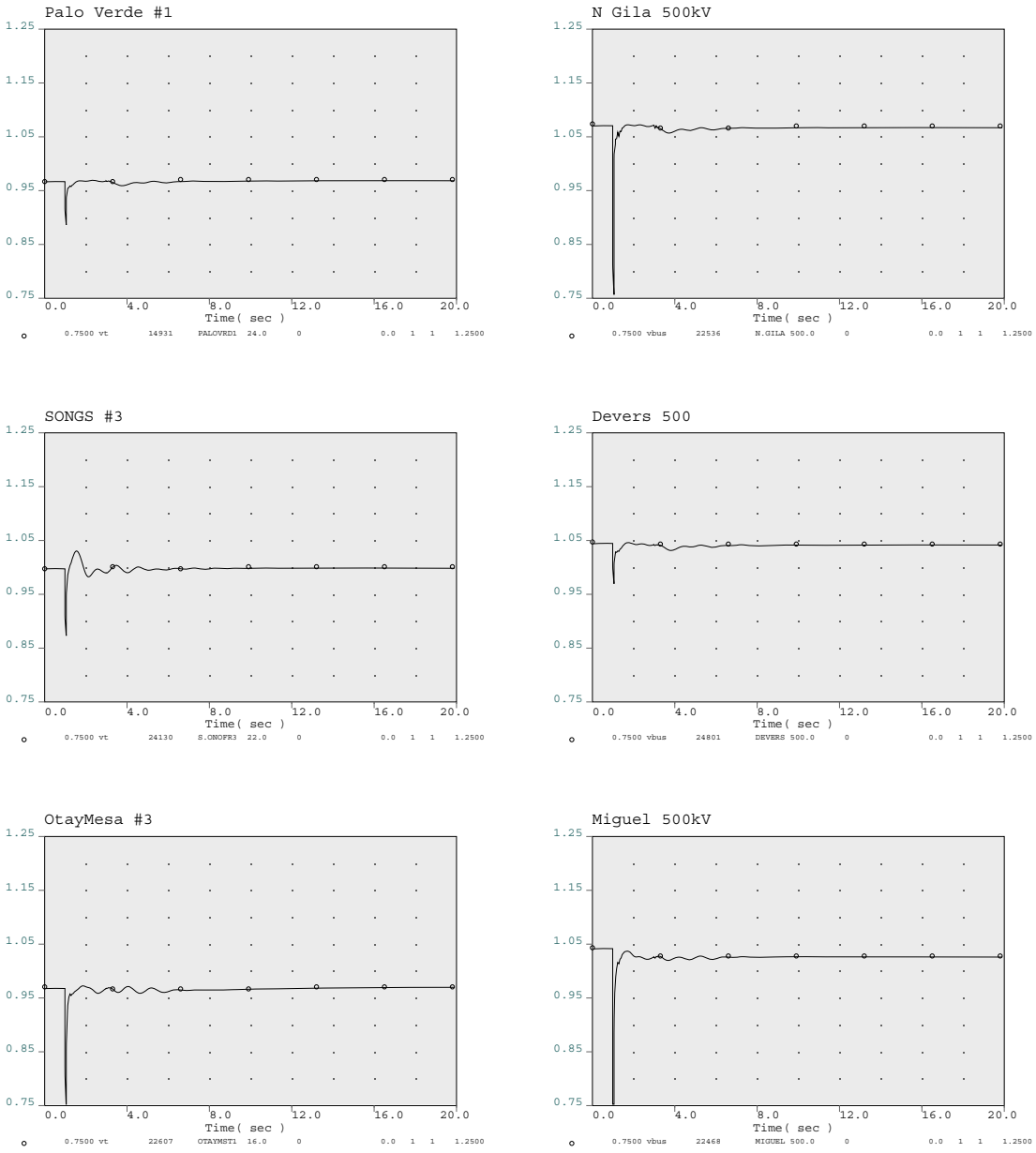


SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

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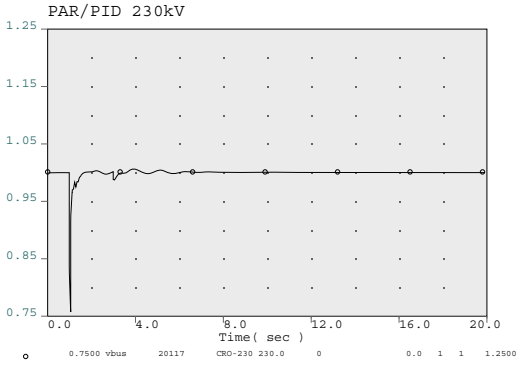
RELATIVE VOLTAGE



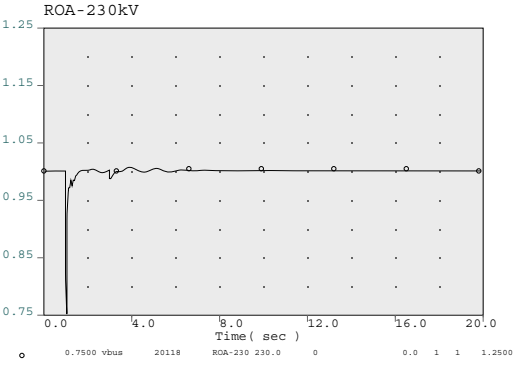
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

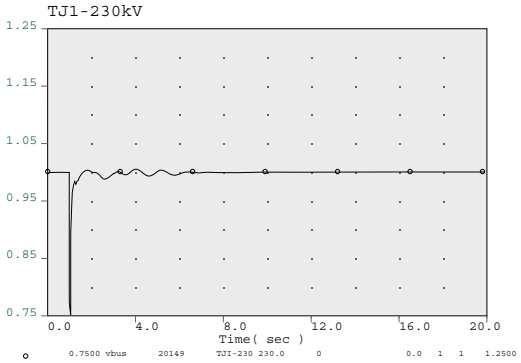
PAR/PID 230kV



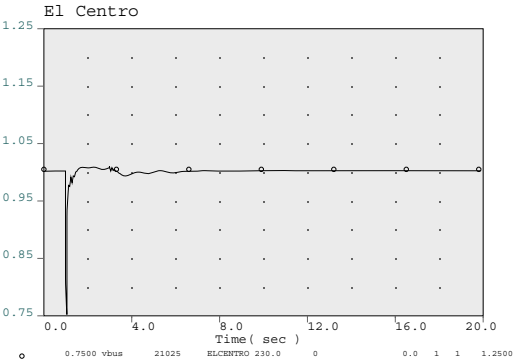
ROA-230kV



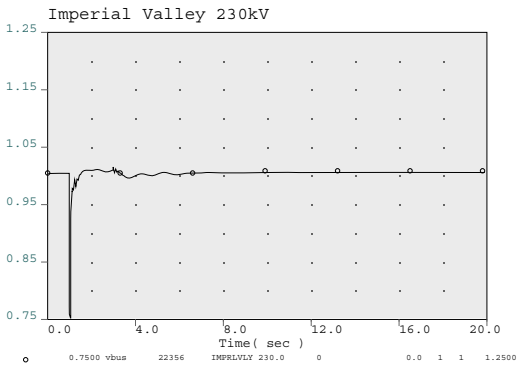
TJ1-230kV



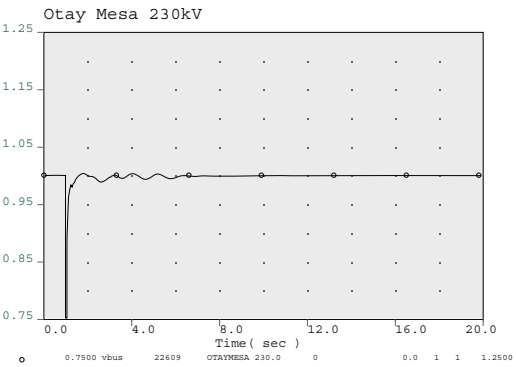
El Centro



Imperial Valley 230kV

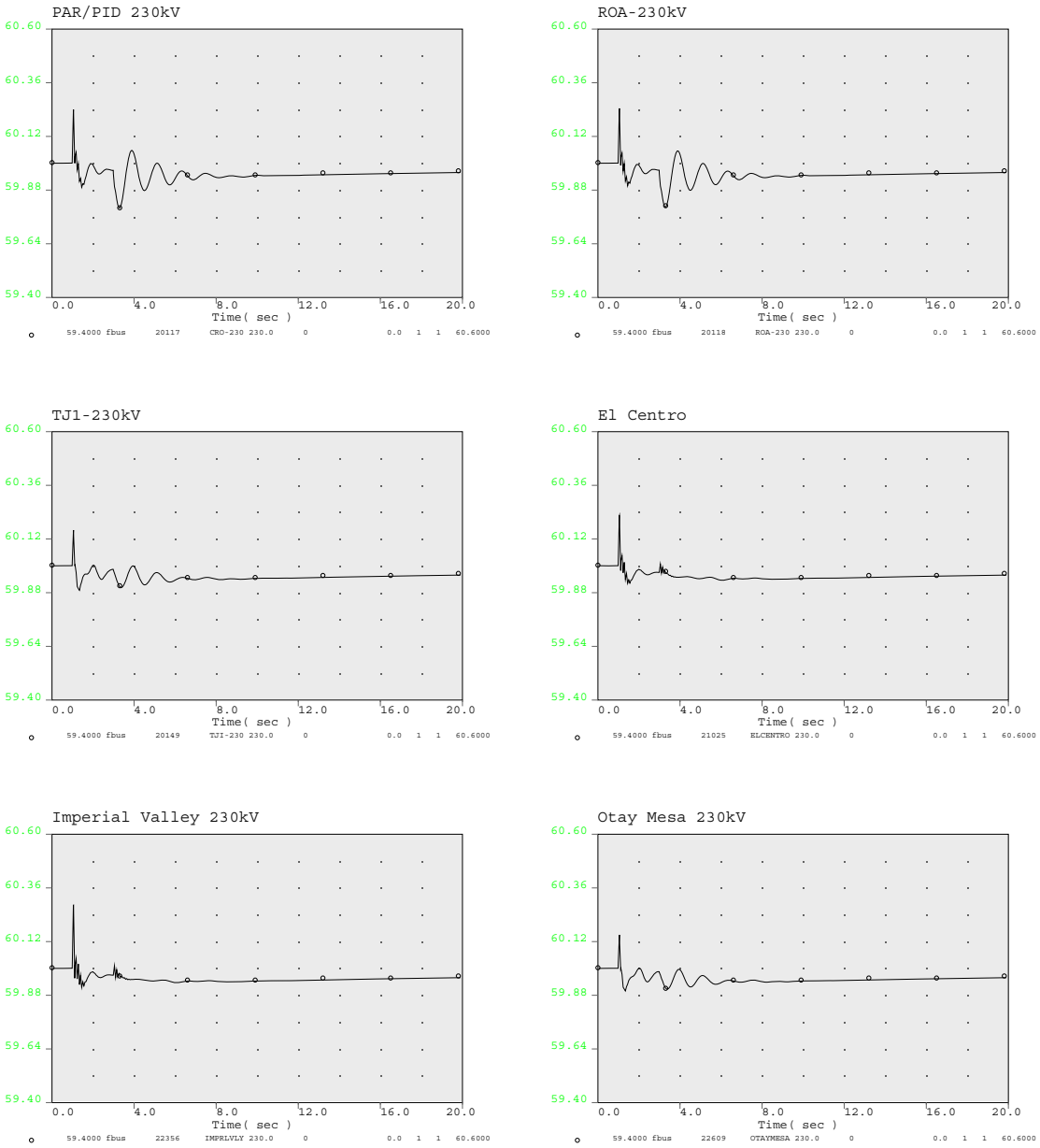


Otay Mesa 230kV



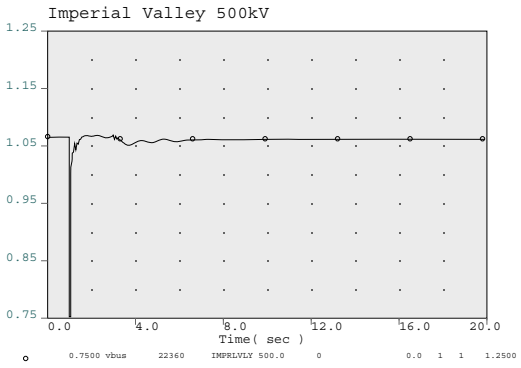
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

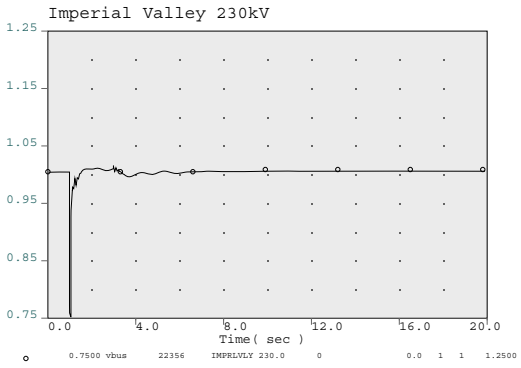
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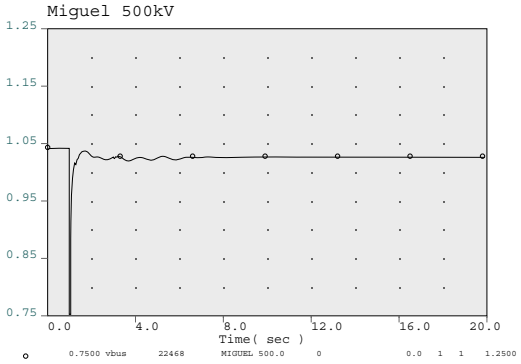


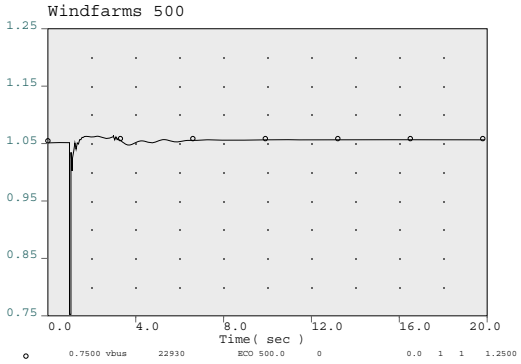
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

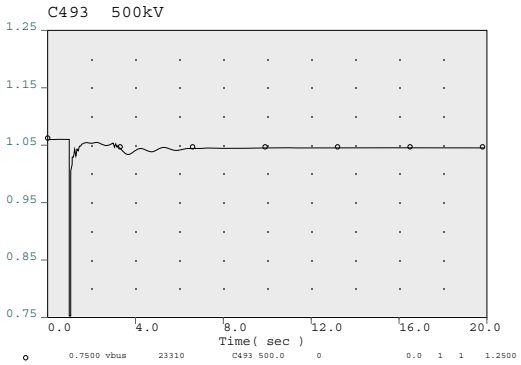
Imperial Valley Area - VOLTAGE

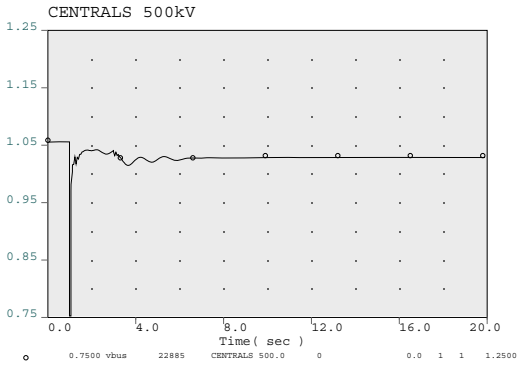










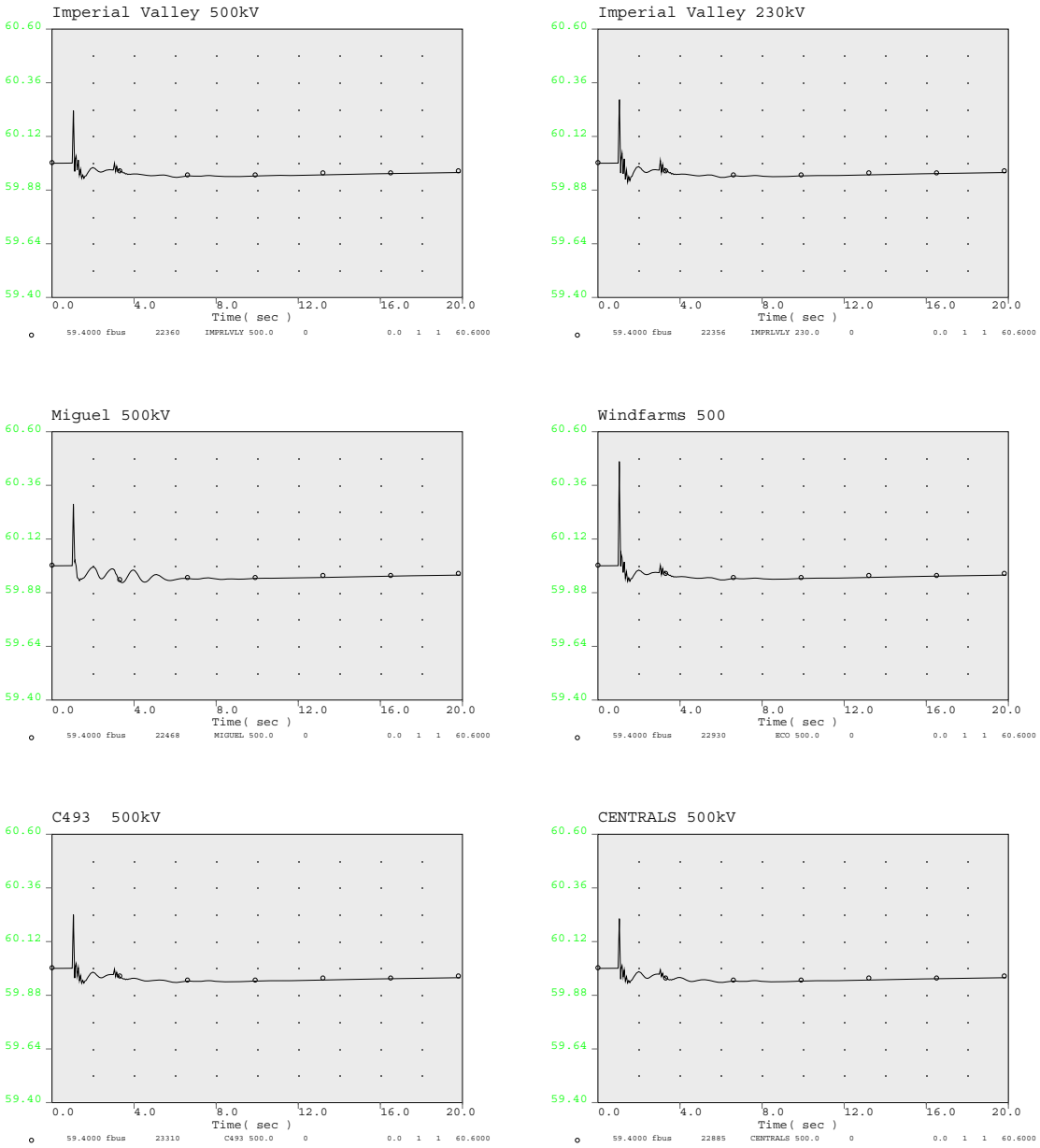


SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Page 5

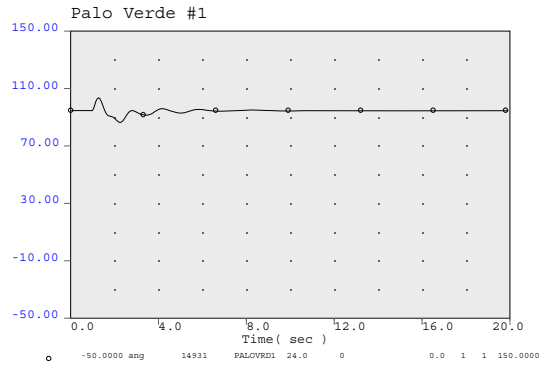
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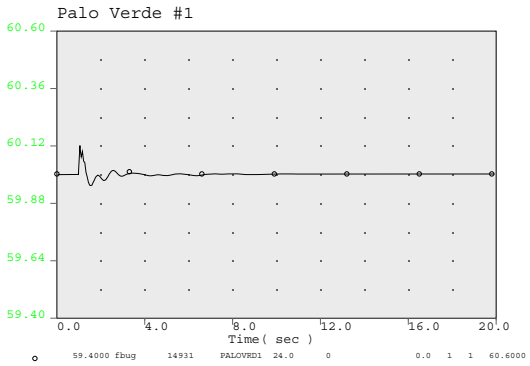
Imperial Valley Area - Frequency

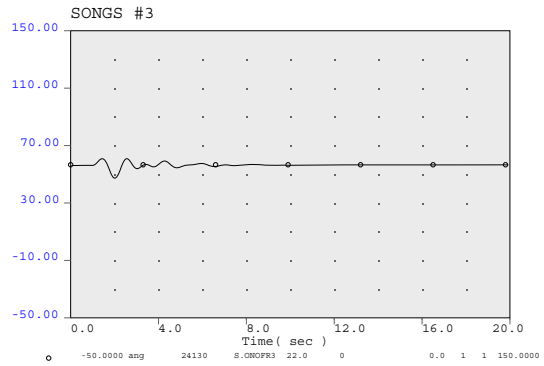


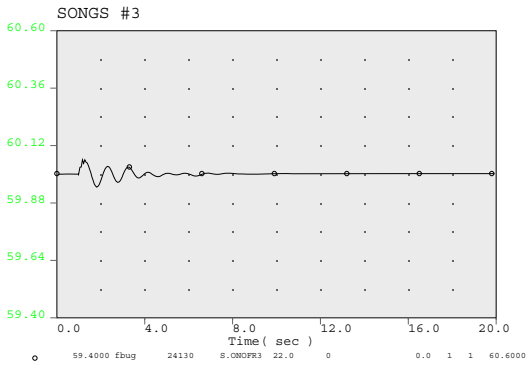
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

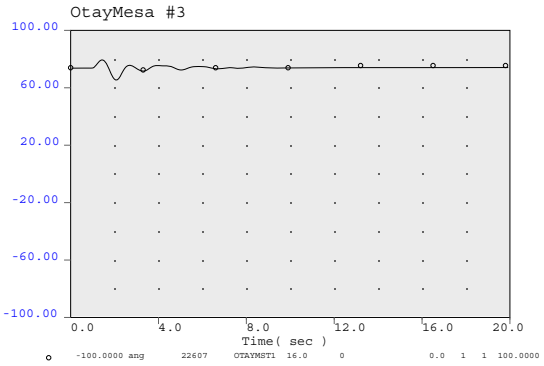
RELATIVE ROTOR ANGLE & FREQUENCY

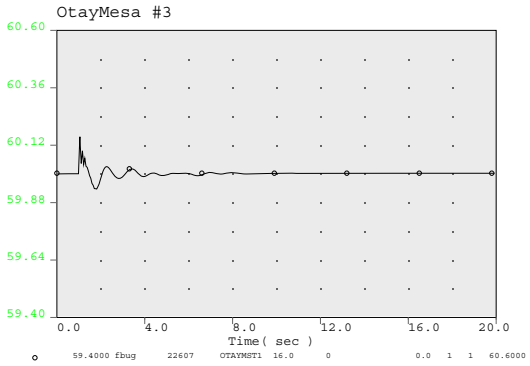












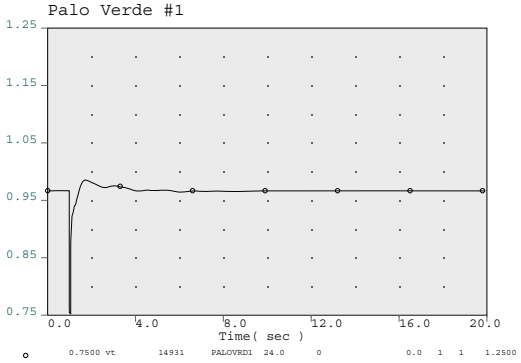
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Page 1

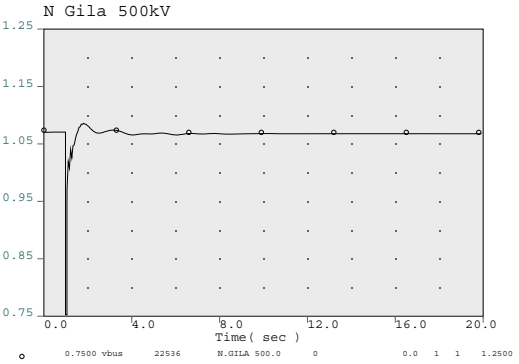
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RELATIVE VOLTAGE

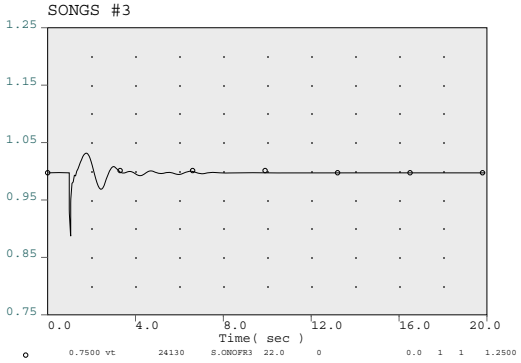
Palo Verde #1



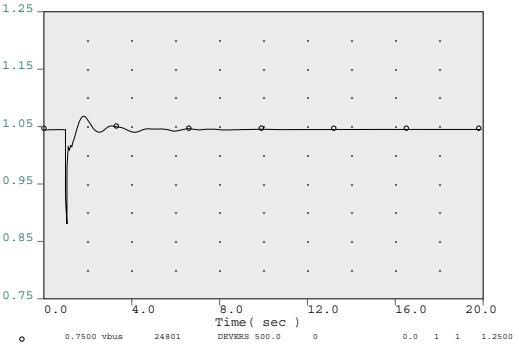
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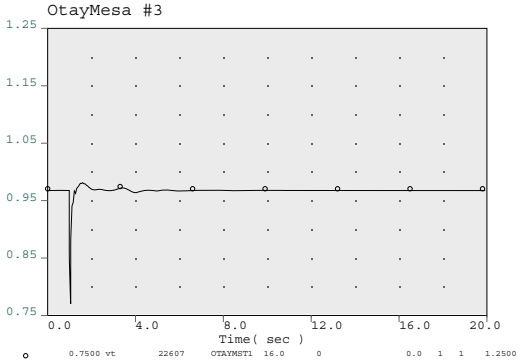
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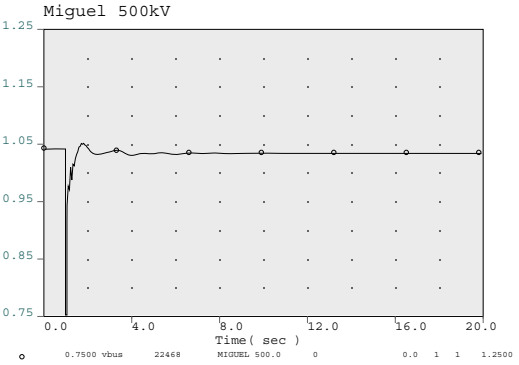
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OtayMesa #3



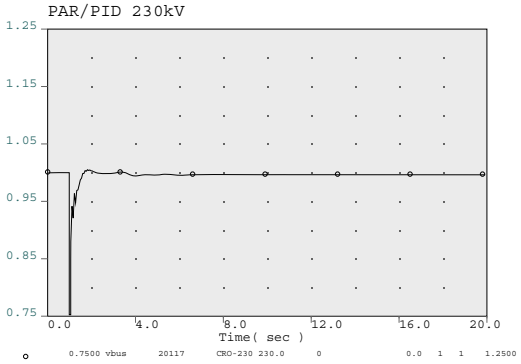
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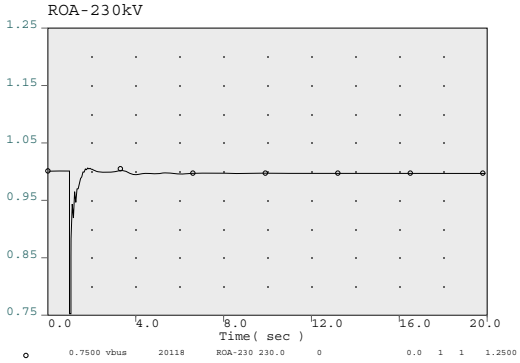
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

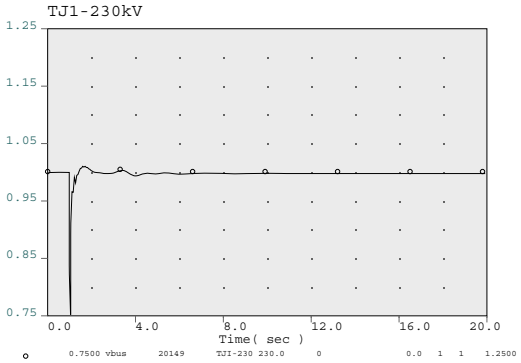
PAR/PID 230kV



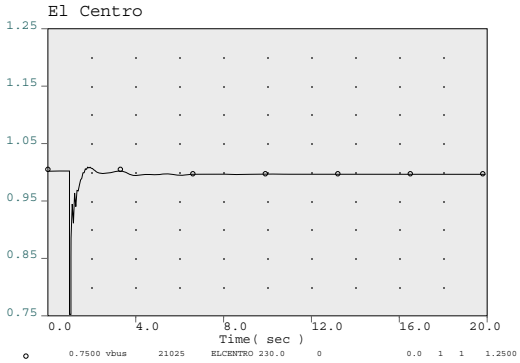
ROA-230kV



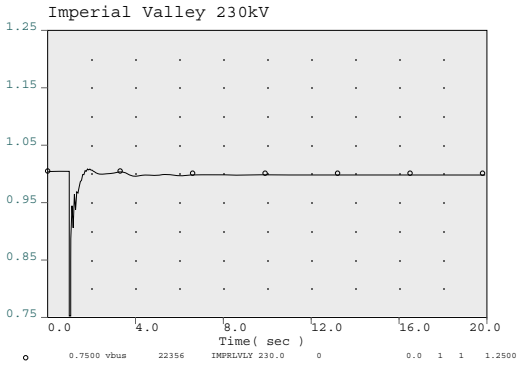
TJ1-230kV



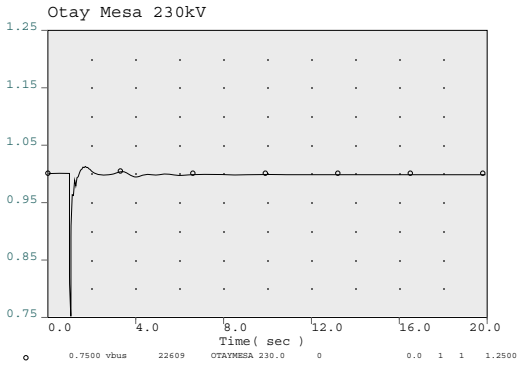
El Centro



Imperial Valley 230kV



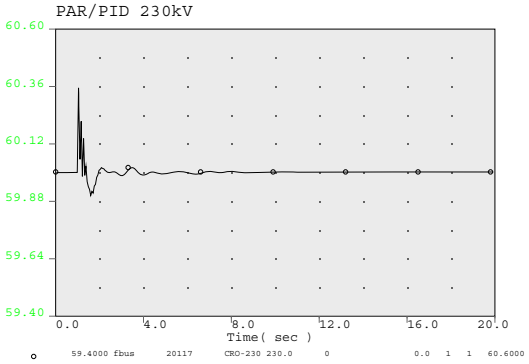
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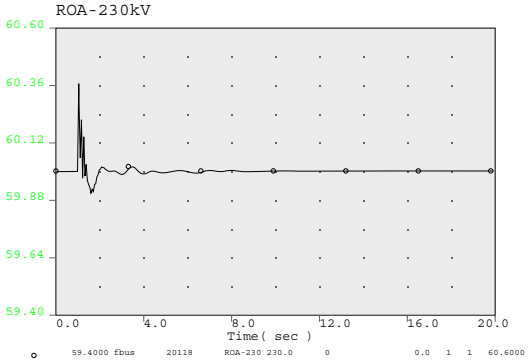
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

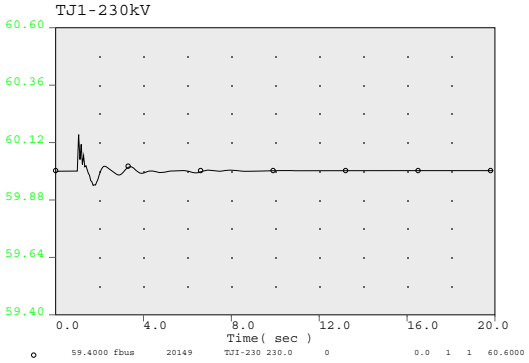
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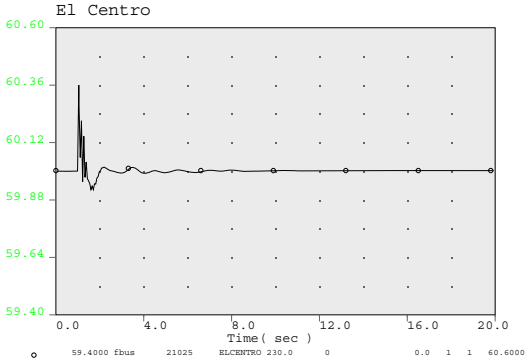
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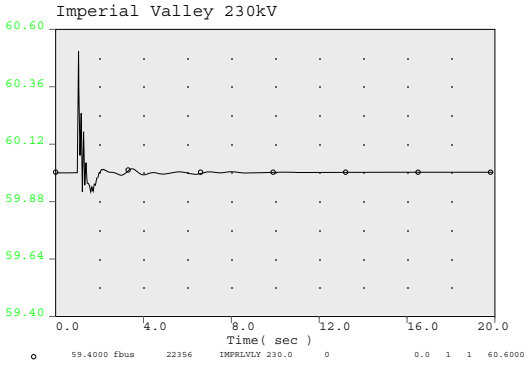
TJ1-230kV



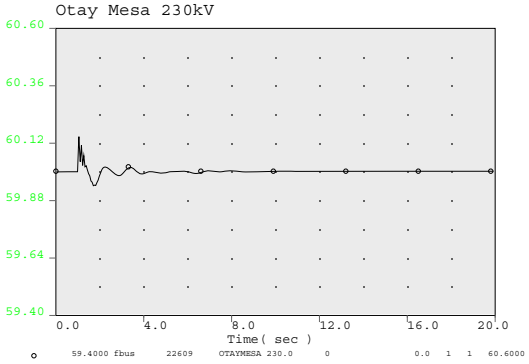
El Centro



Imperial Valley 230kV



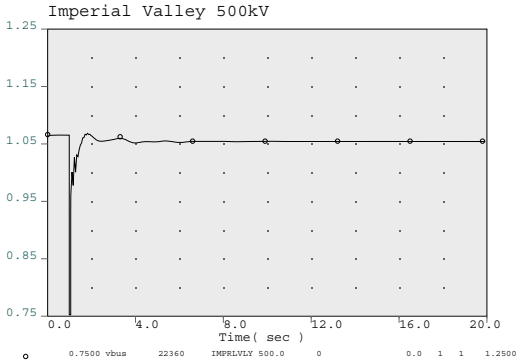
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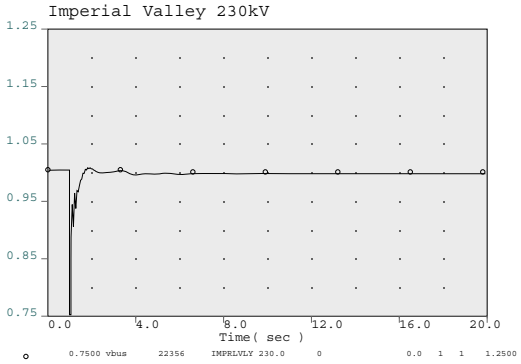
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

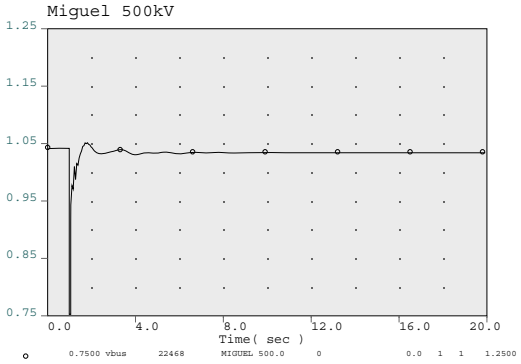
Imperial Valley 500kV



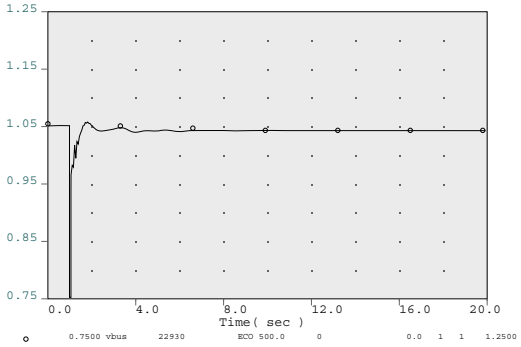
Imperial Valley 230kV



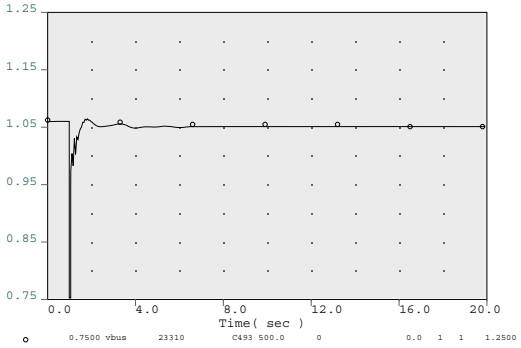
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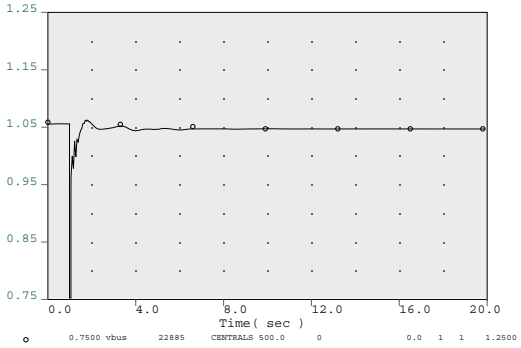
Windfarms 500



C493 500kV



CENTRALS 500kV



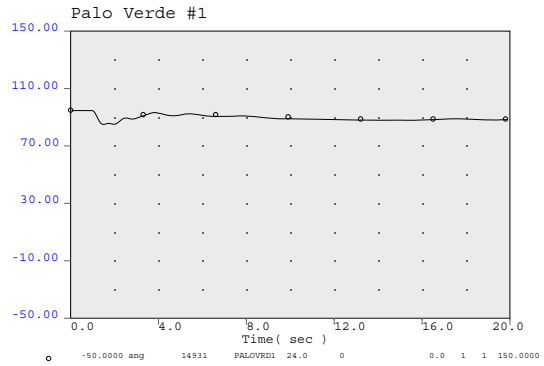
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

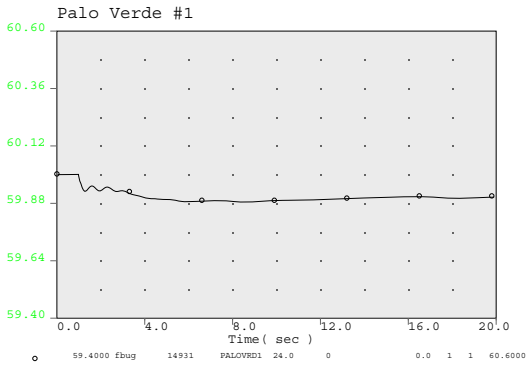
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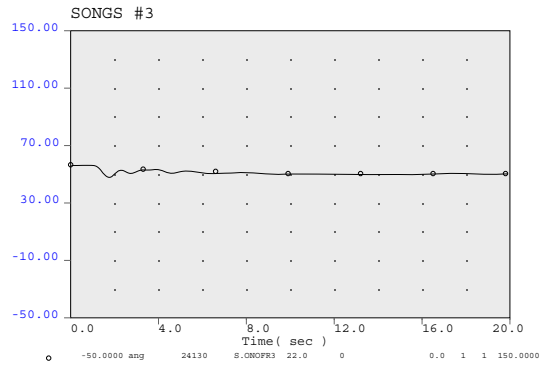


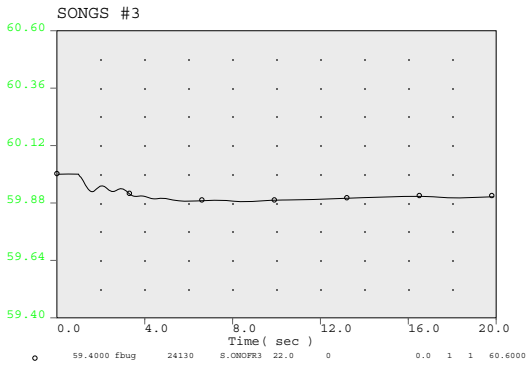
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

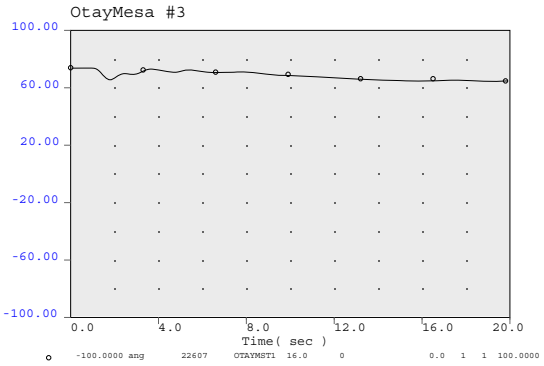
RELATIVE ROTOR ANGLE & FREQUENCY

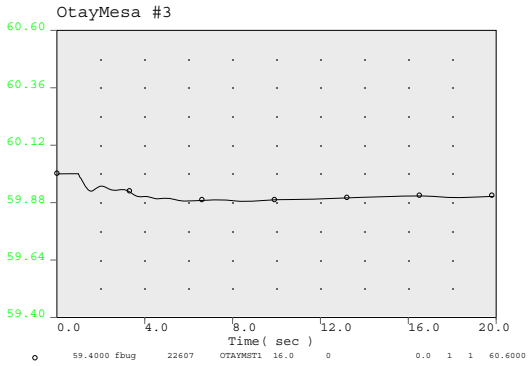










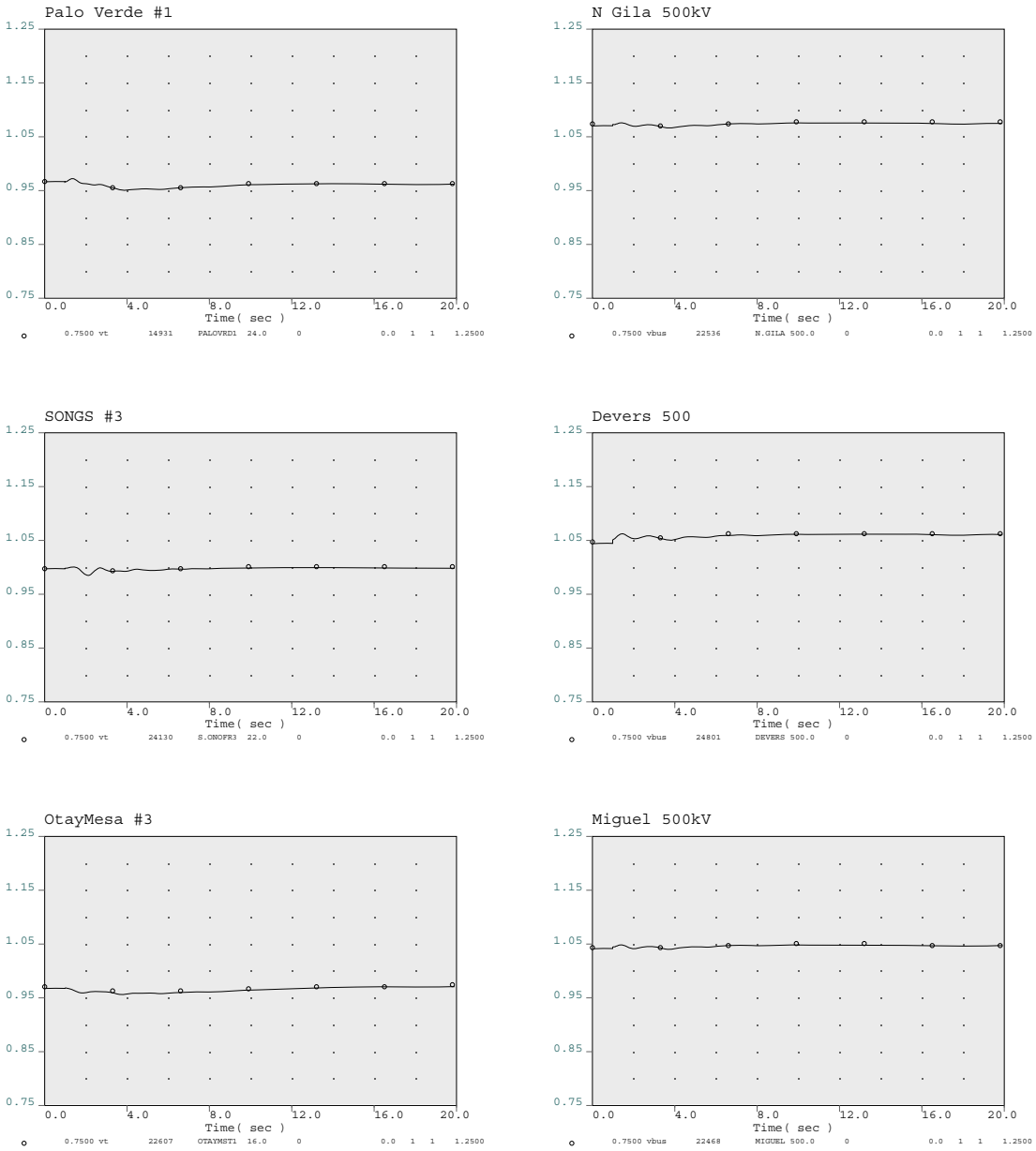


SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Page 1

PaloVerde-g1_pst_iva_ll.chf | p_i\ll\pst_iva\ws_pst_iva | Tue Nov 02 07:30:42 2010

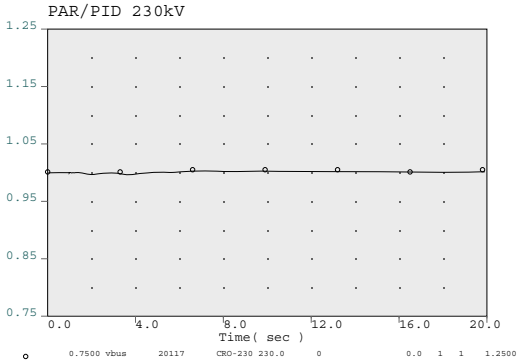
RELATIVE VOLTAGE



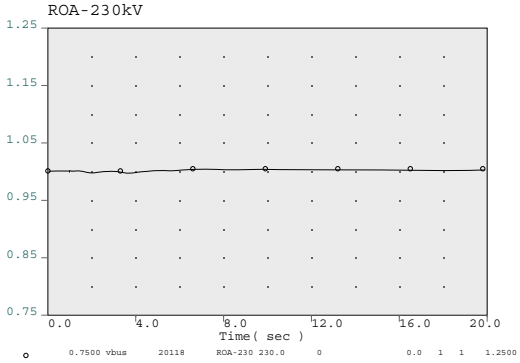
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

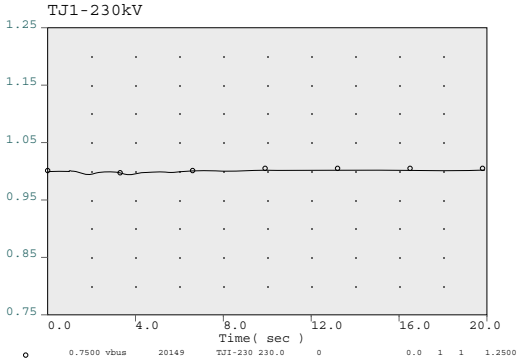
PAR/PID 230kV



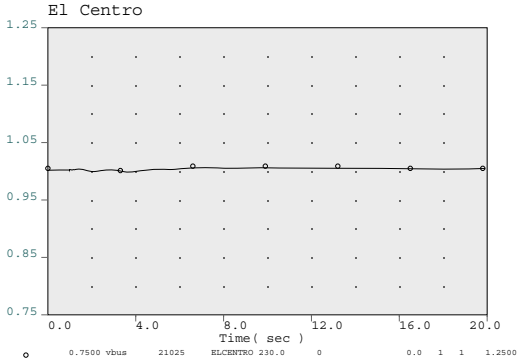
ROA-230kV



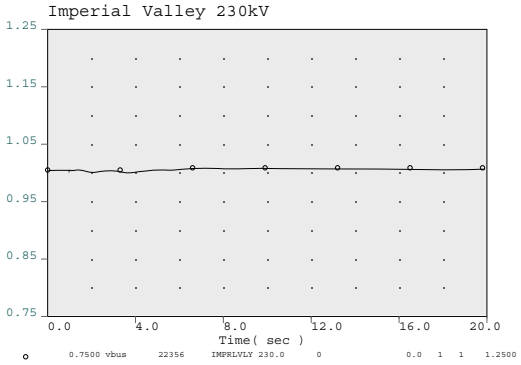
TJ1-230kV



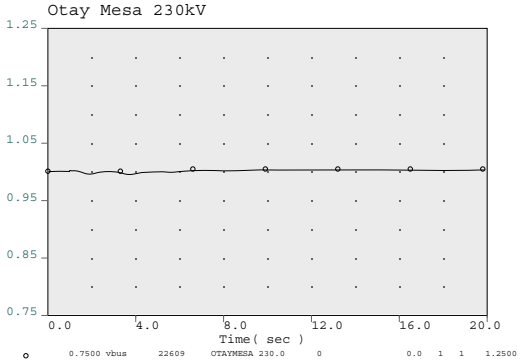
El Centro



Imperial Valley 230kV



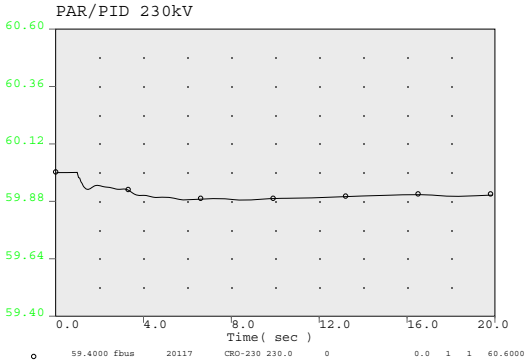
Otay Mesa 230kV



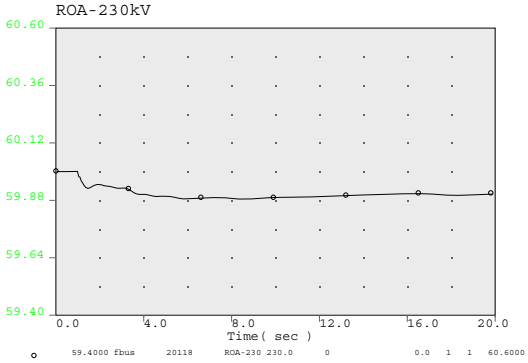
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

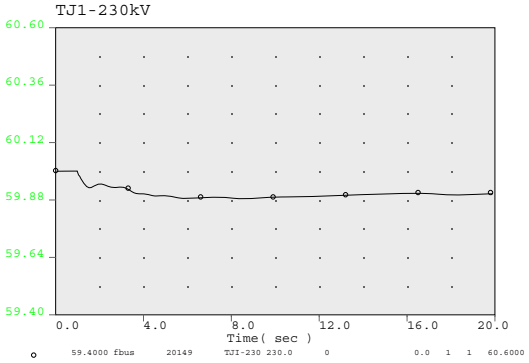
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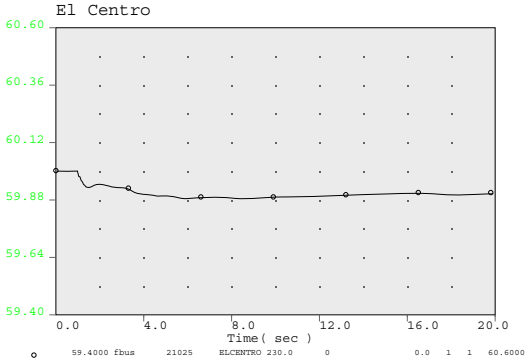
ROA-230kV



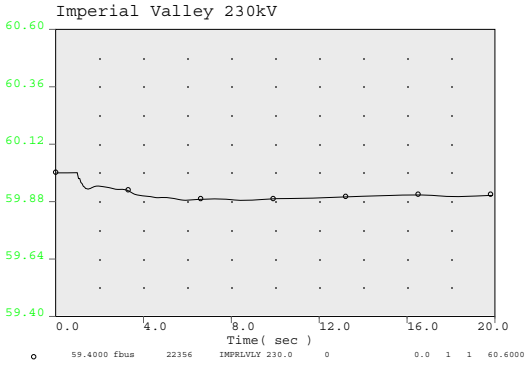
TJ1-230kV



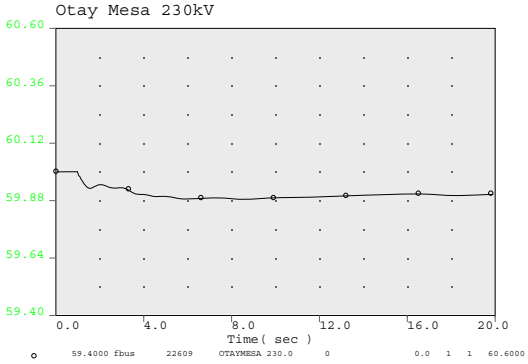
El Centro



Imperial Valley 230kV

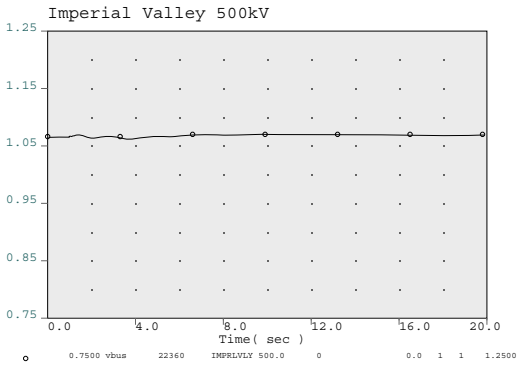


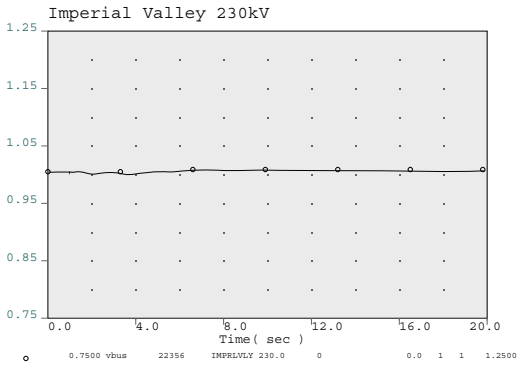
Otay Mesa 230kV

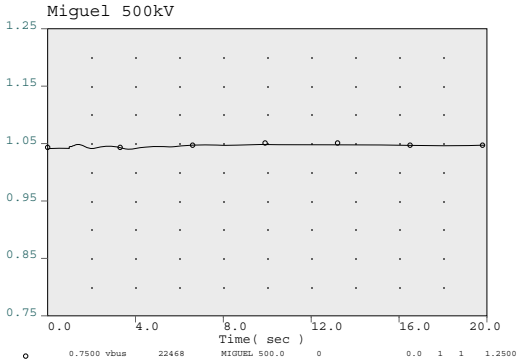


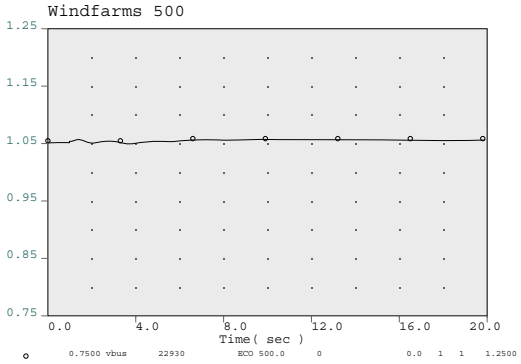
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

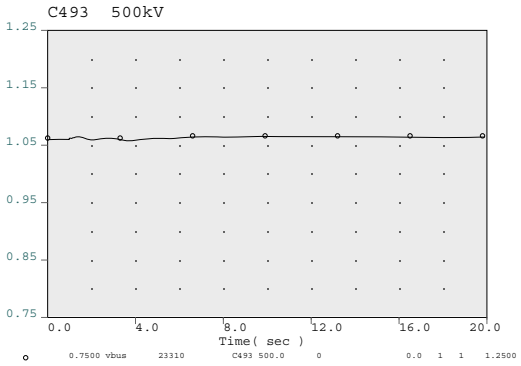
Imperial Valley Area - VOLTAGE

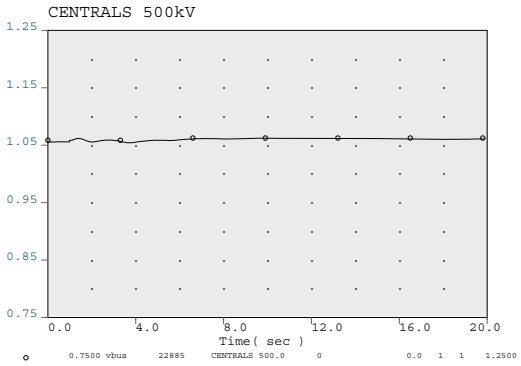






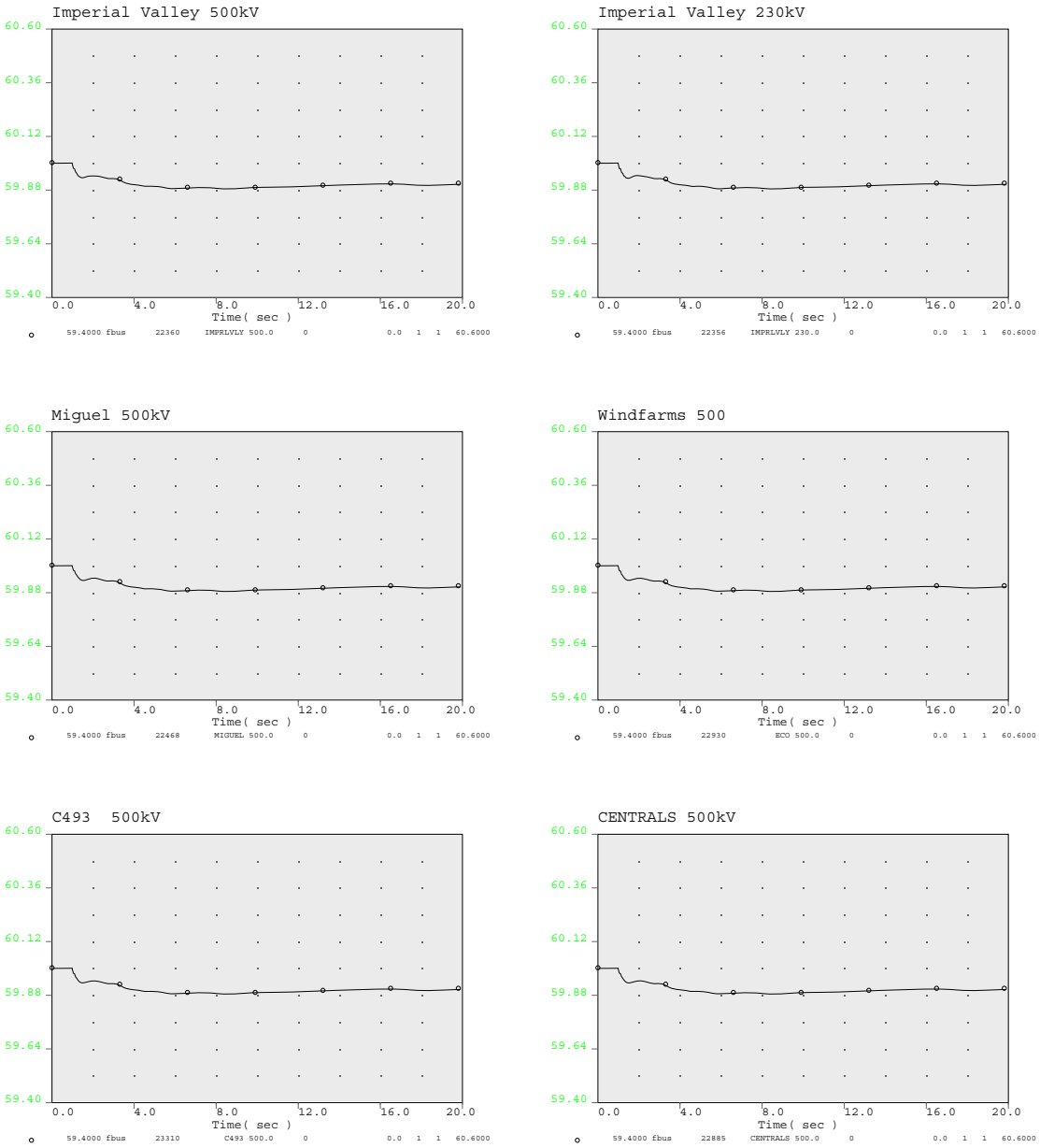






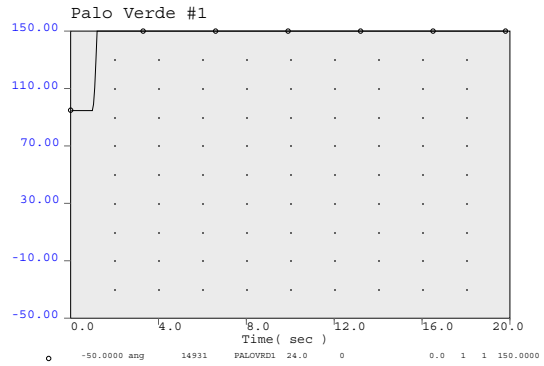
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

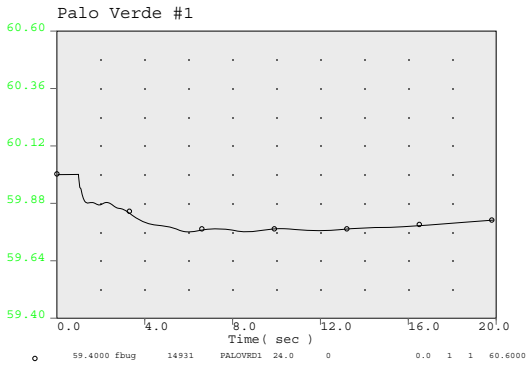
Imperial Valley Area - Frequency

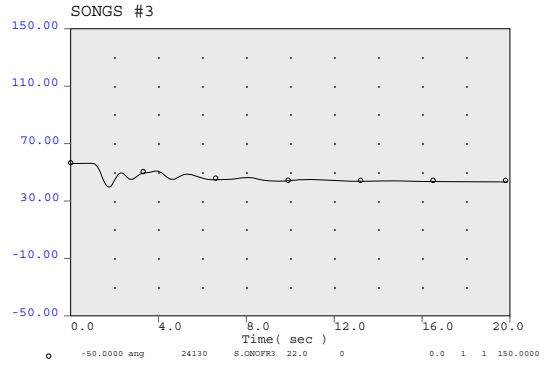


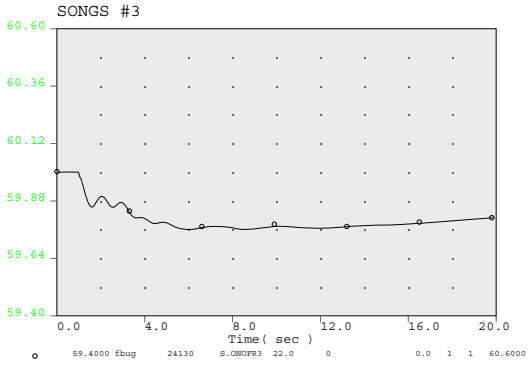
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

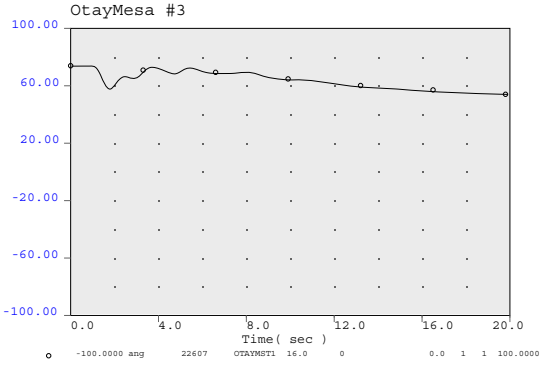
RELATIVE ROTOR ANGLE & FREQUENCY

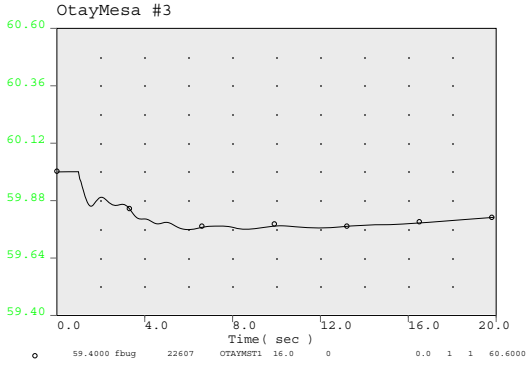












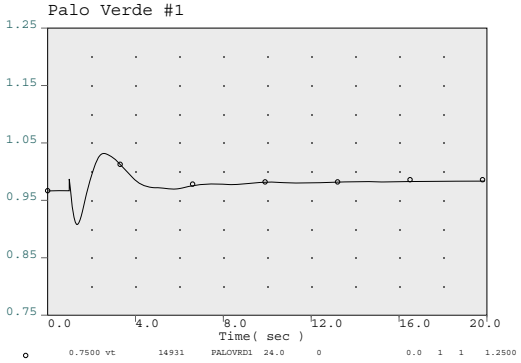
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Page 1

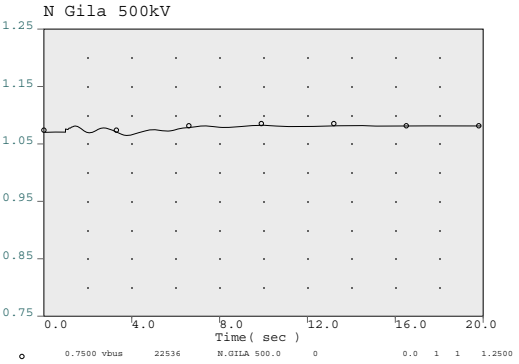
PaloVerde-g2_pst_iva_ll.chf | p_i\ll\pst_iva\ws_pst_iva | Tue Nov 02 07:31:03 2010

RELATIVE VOLTAGE

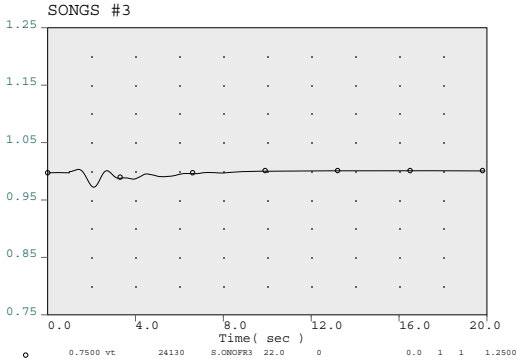
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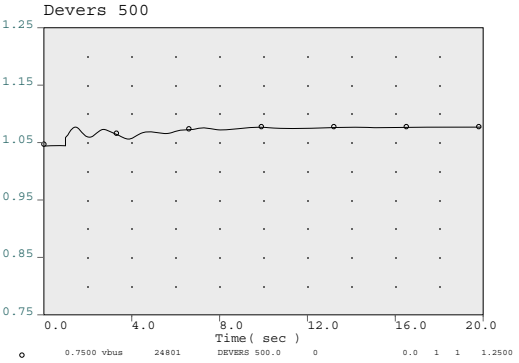
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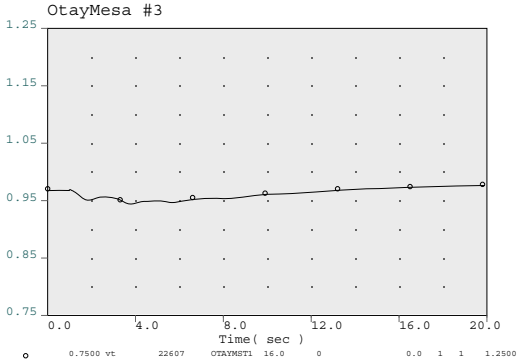
SONGS #3



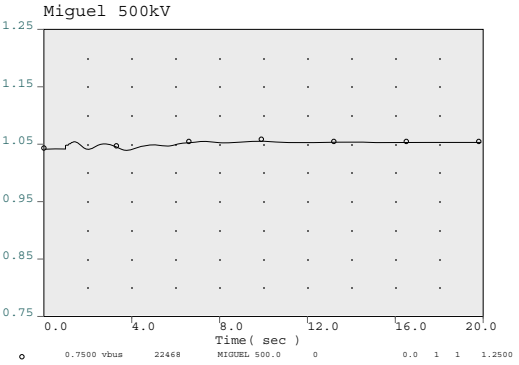
Devers 500



OtayMesa #3



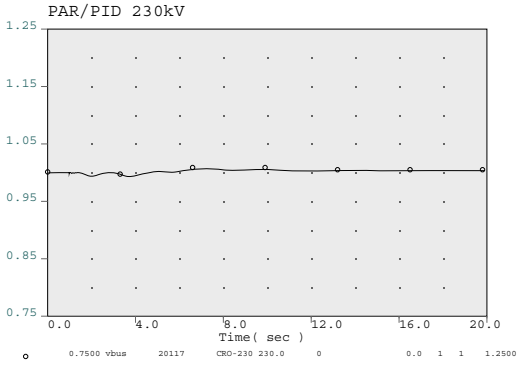
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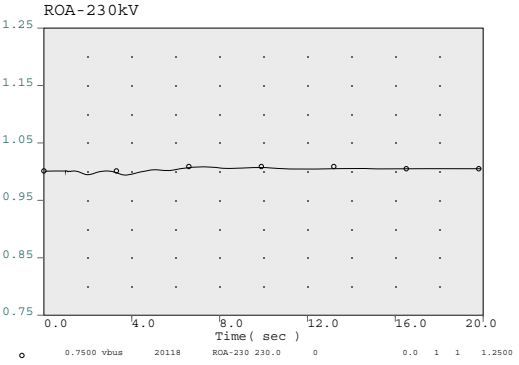
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

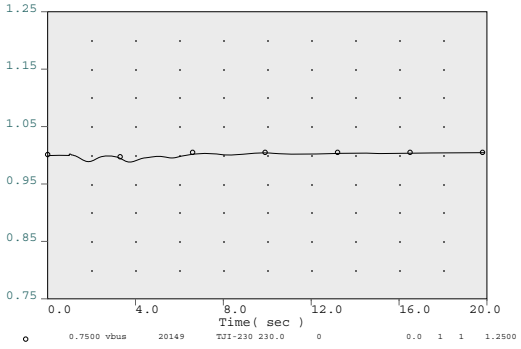
PAR/PID 230kV



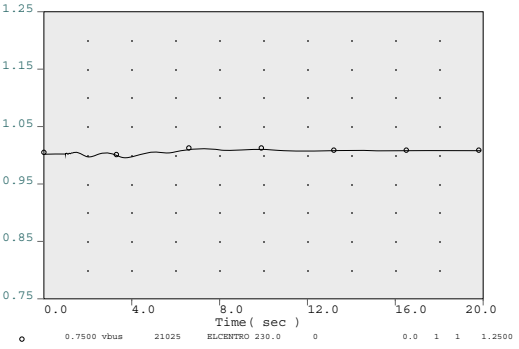
ROA-230kV



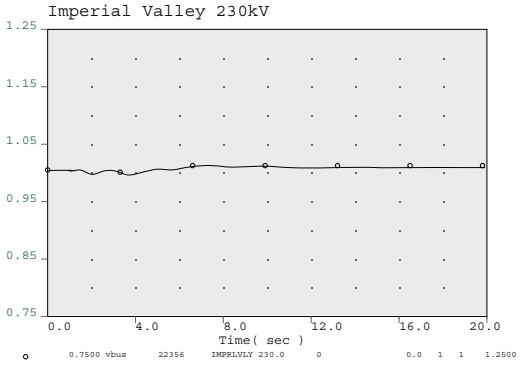
TJ1-230kV



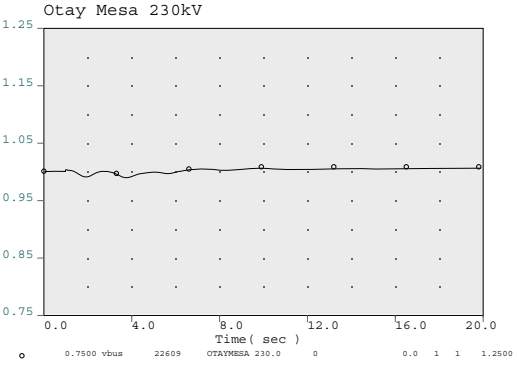
El Centro



Imperial Valley 230kV



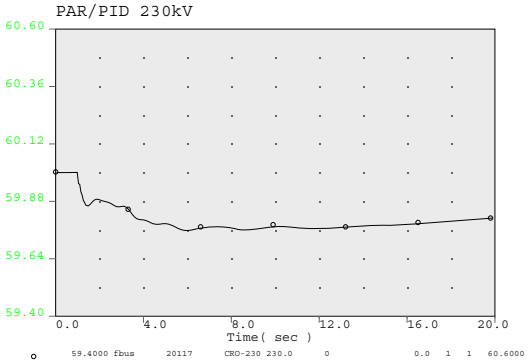
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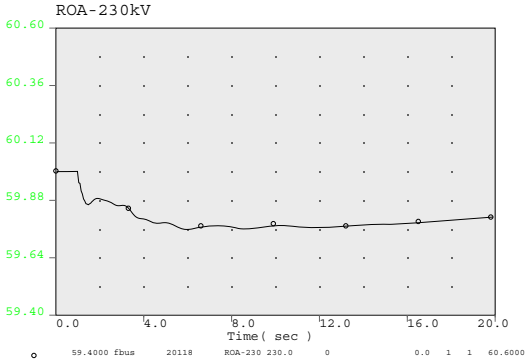
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

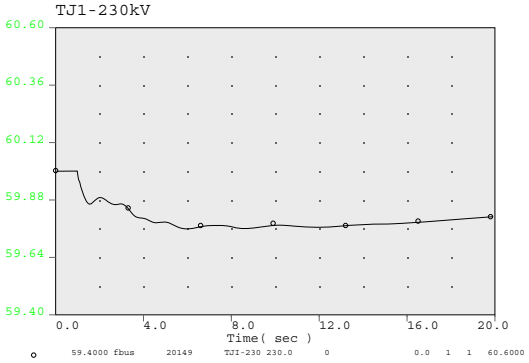
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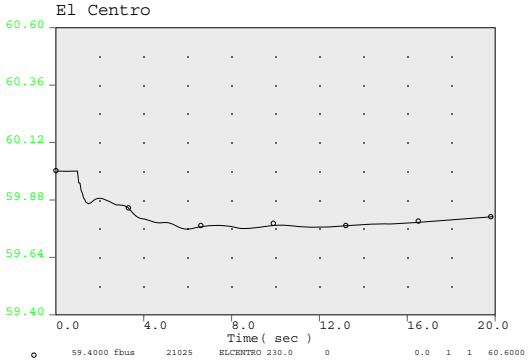
ROA-230kV



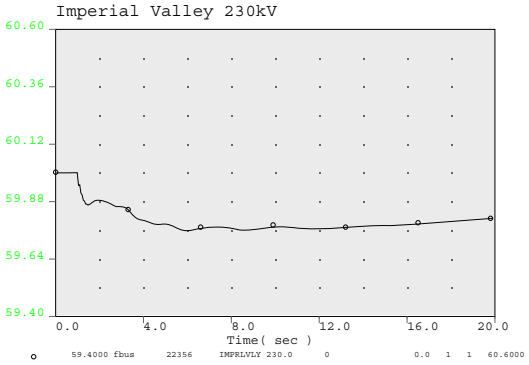
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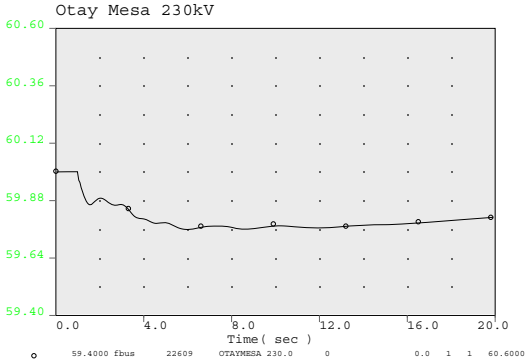
El Centro



Imperial Valley 230kV

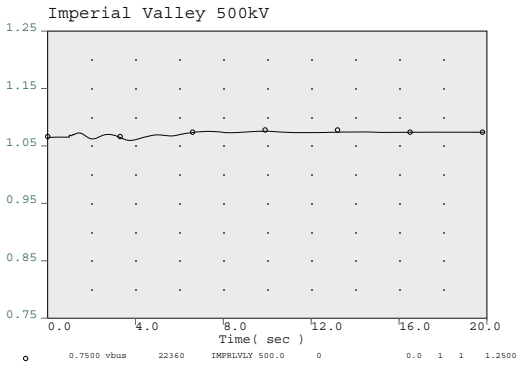


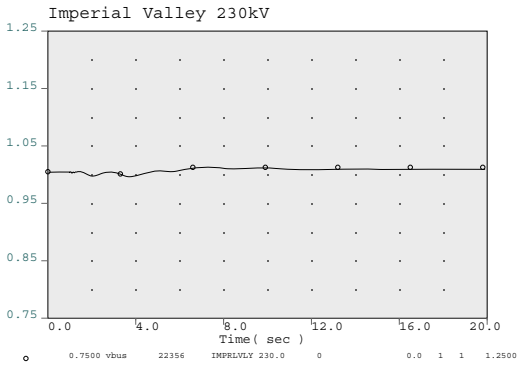
Otay Mesa 230kV

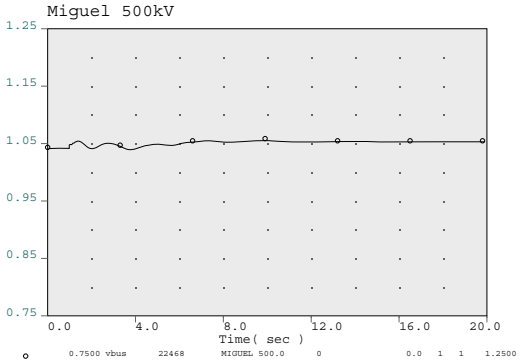


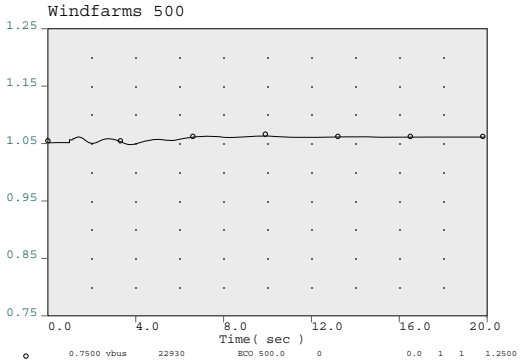
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

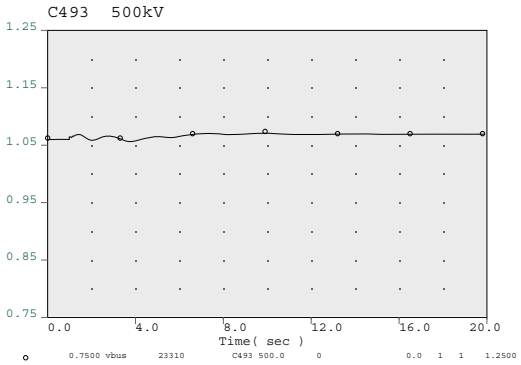
Imperial Valley Area - VOLTAGE

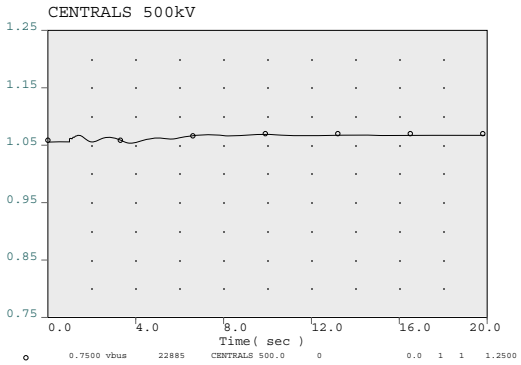










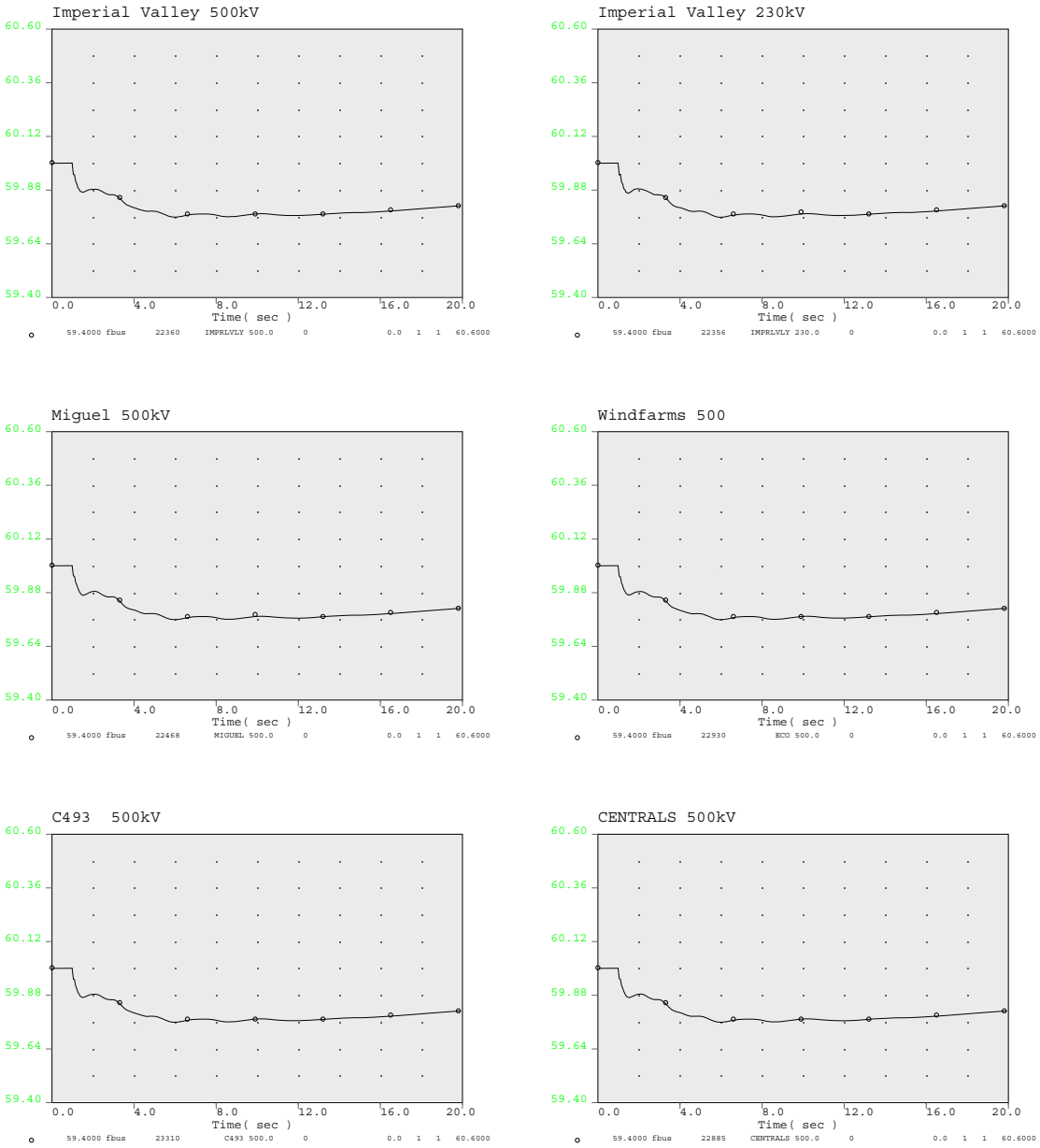


SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Page 5

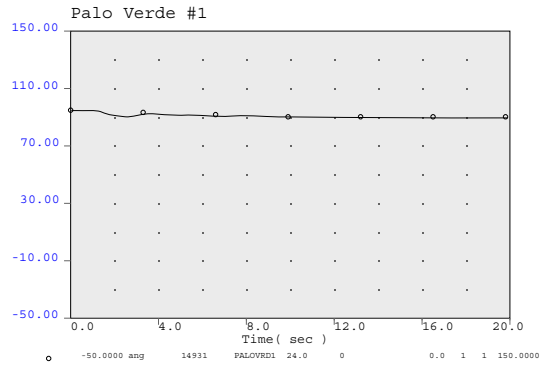
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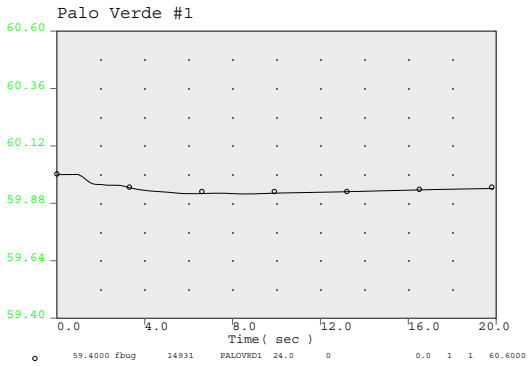
Imperial Valley Area - Frequency

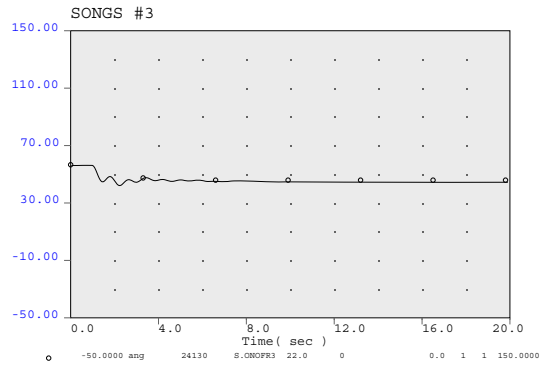


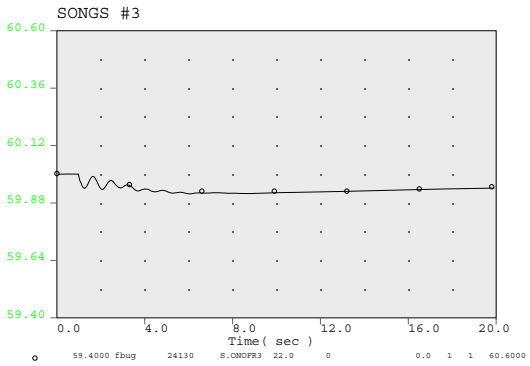
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

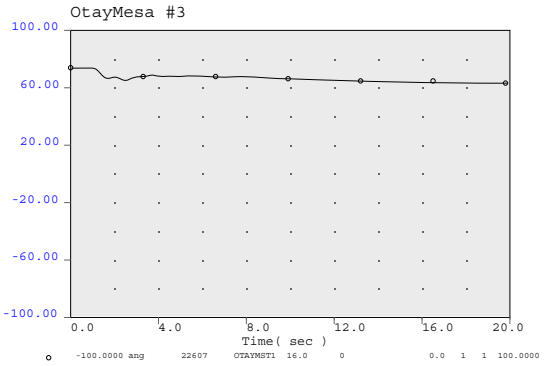
RELATIVE ROTOR ANGLE & FREQUENCY

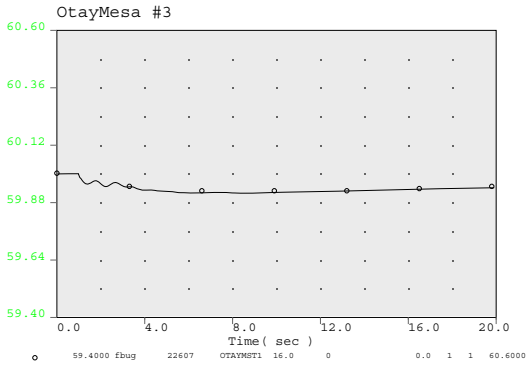










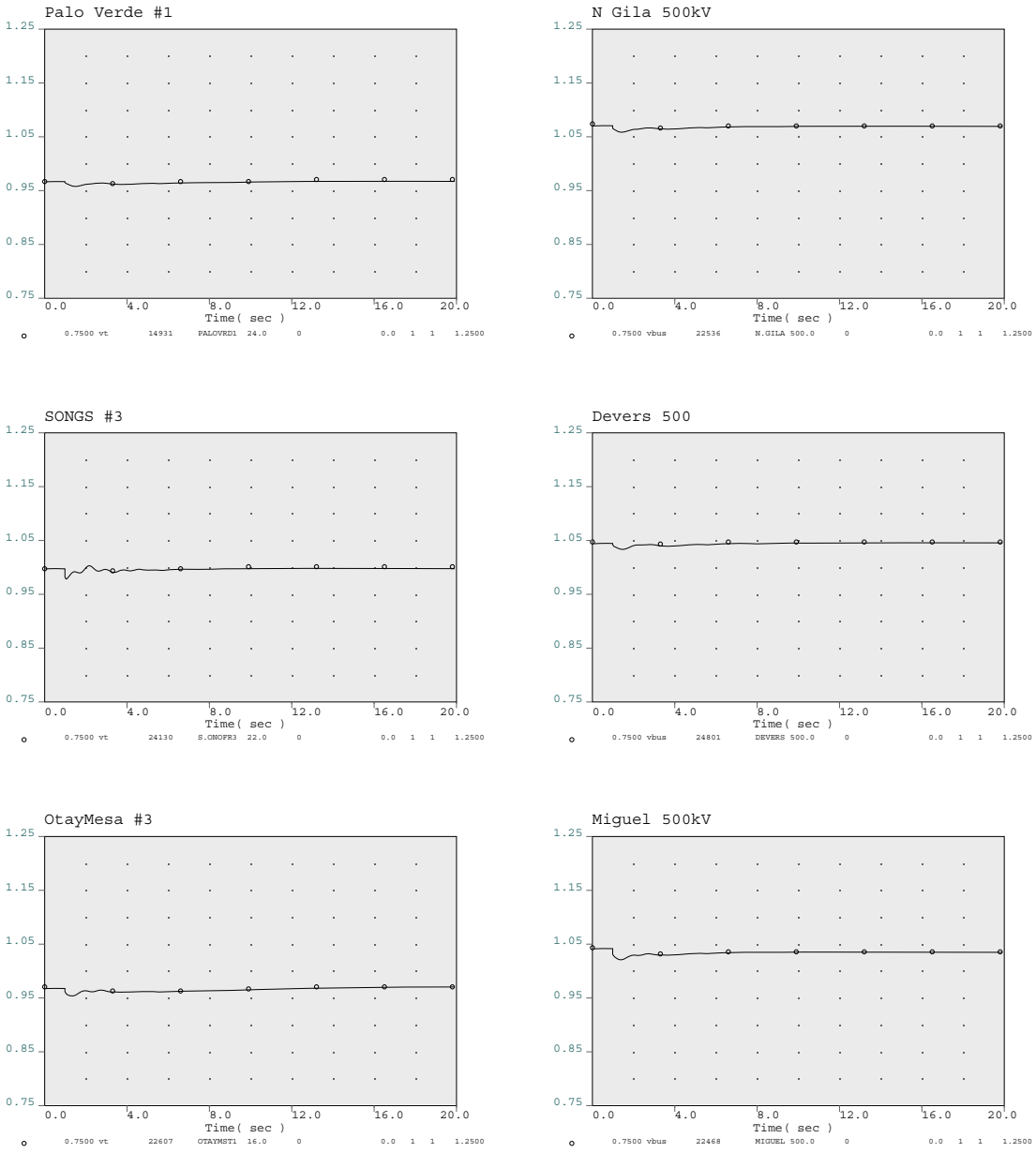


SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Page 1

SONGS-g1_pst_iva_ll.chf | p_i\ll\pst_iva\ws_pst_iva | Tue Nov 02 07:31:26 2010

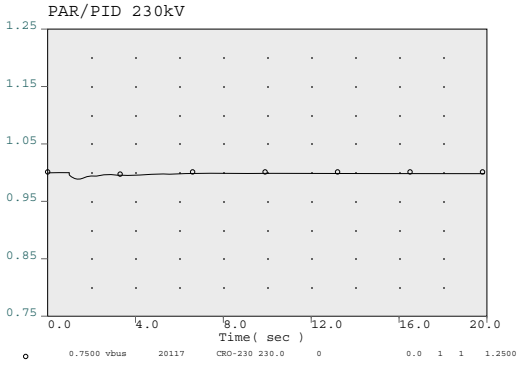
RELATIVE VOLTAGE



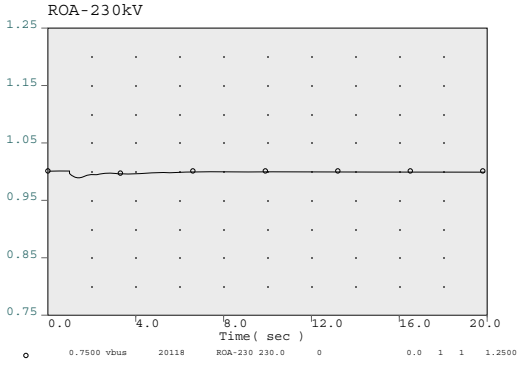
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

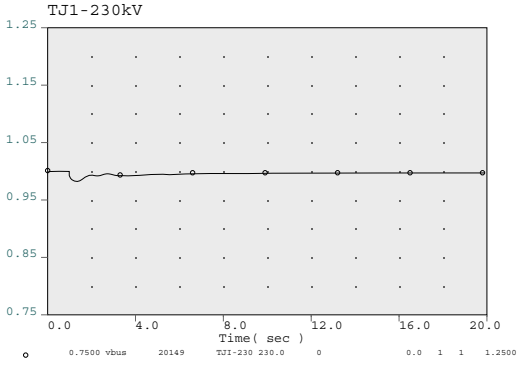
PAR/PID 230kV



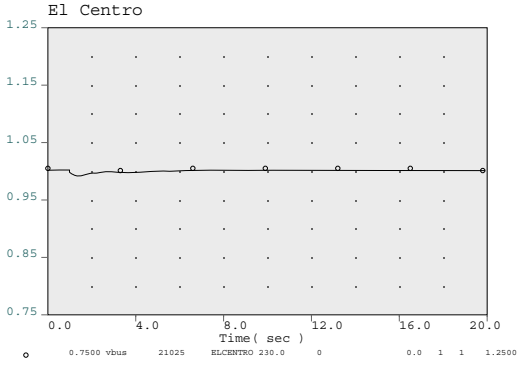
ROA-230kV



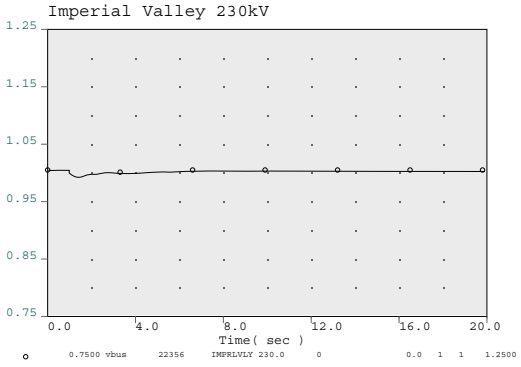
TJ1-230kV



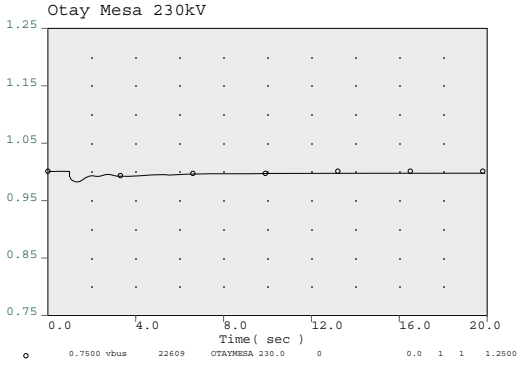
El Centro



Imperial Valley 230kV



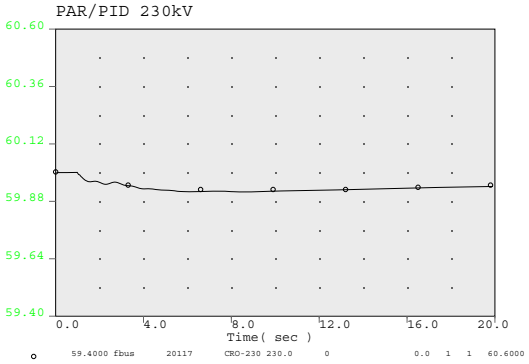
Otay Mesa 230kV



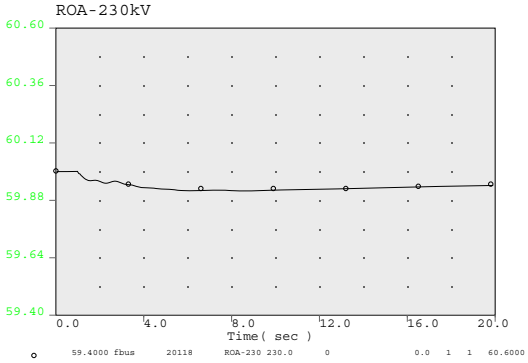
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison

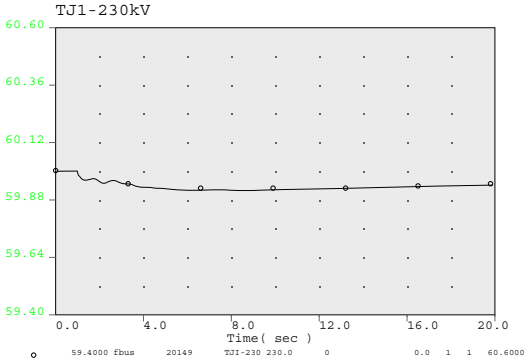
PAR/PID 230kV



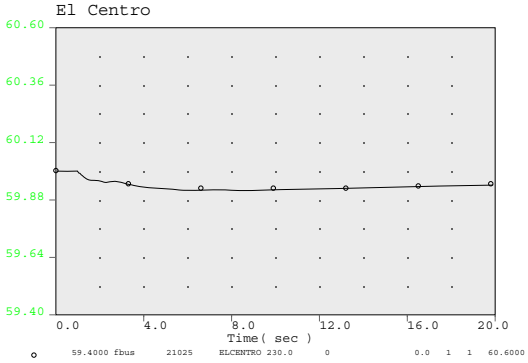
ROA-230kV



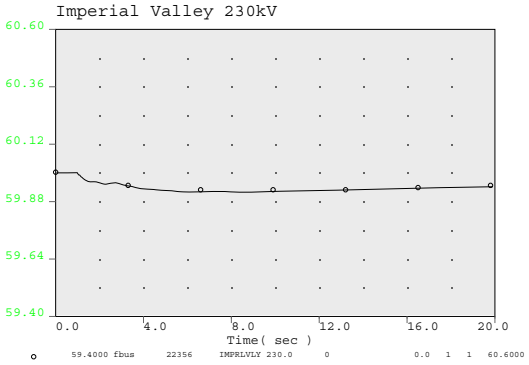
TJ1-230kV



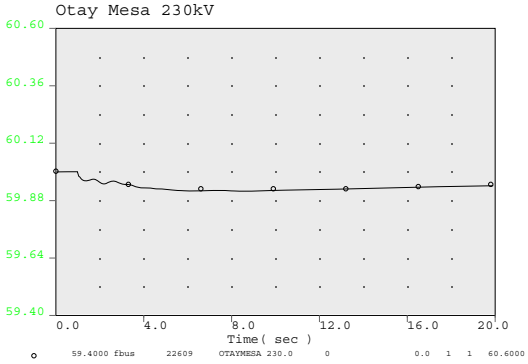
El Centro



Imperial Valley 230kV

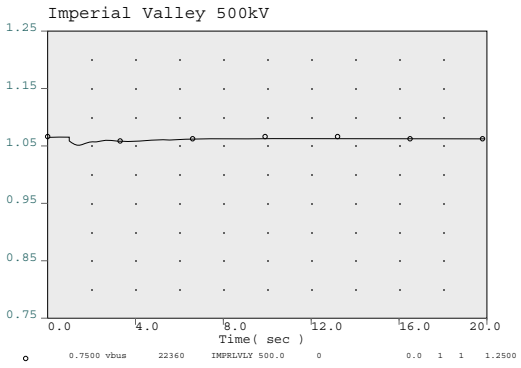


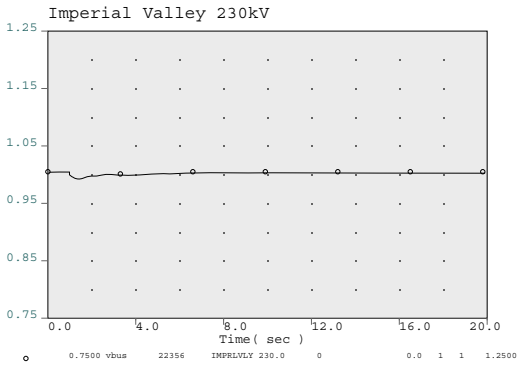
Otay Mesa 230kV

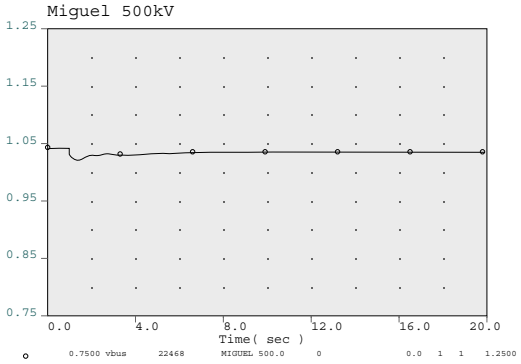


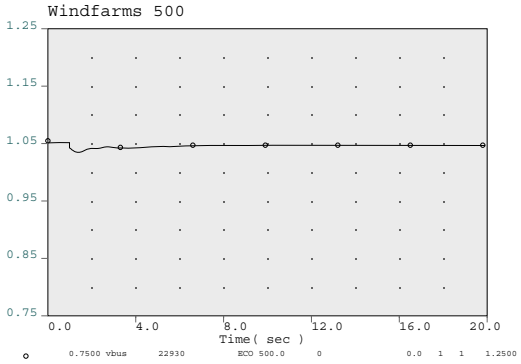
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

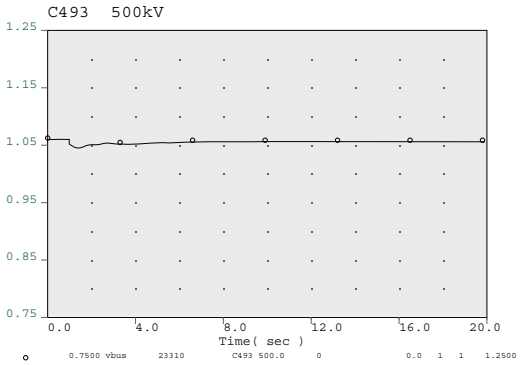
Imperial Valley Area - VOLTAGE

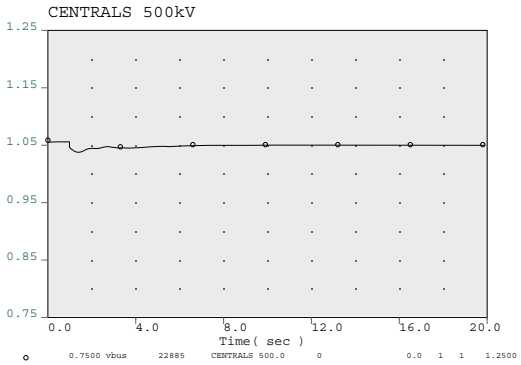










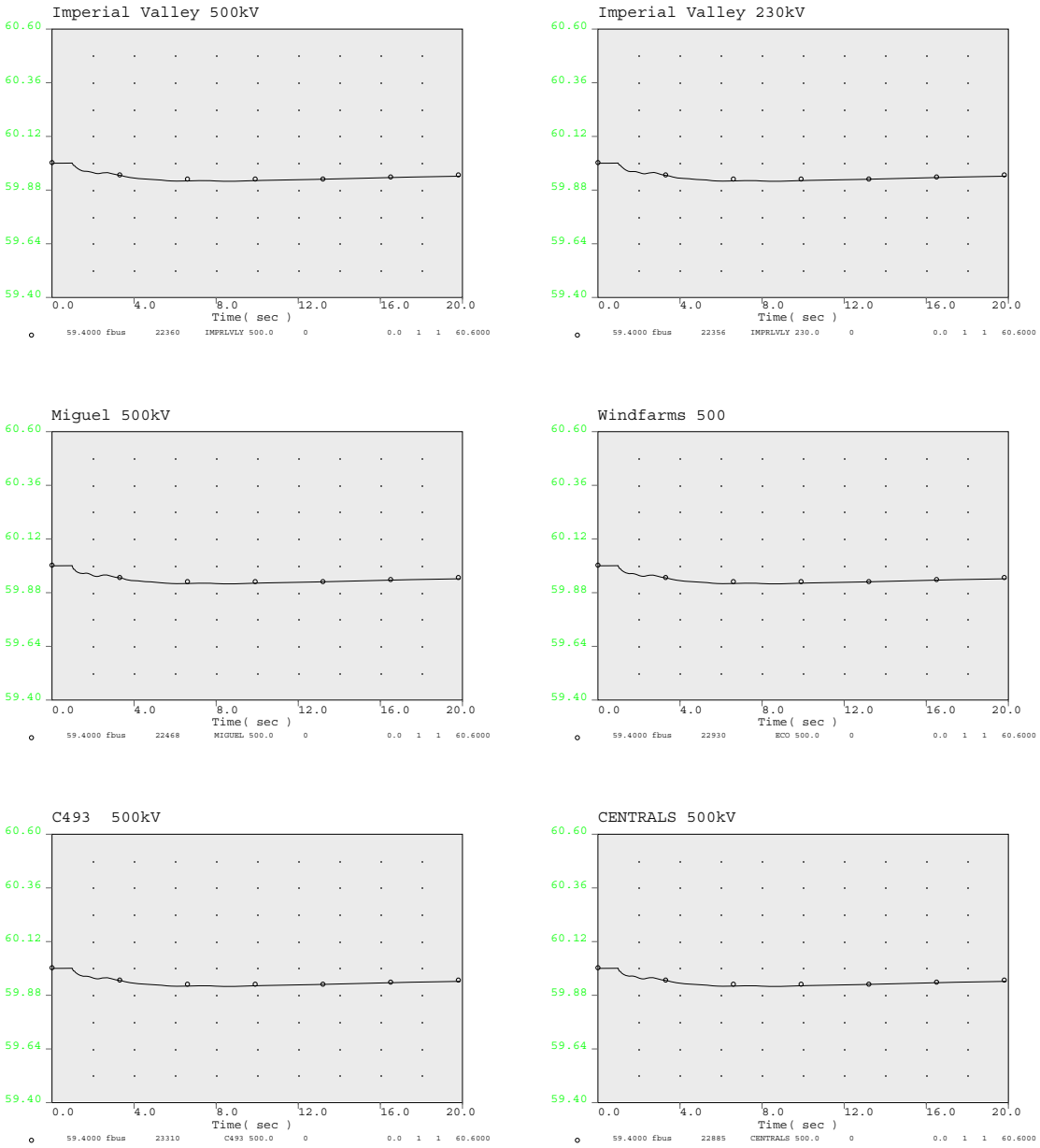


SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

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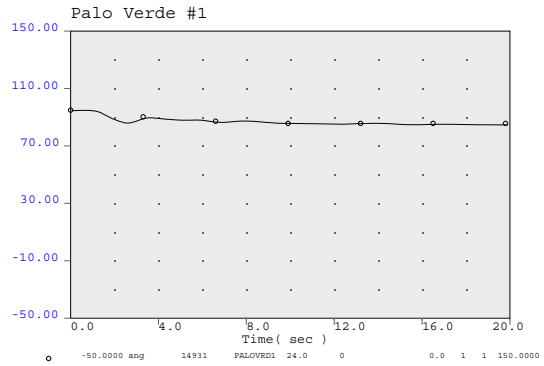
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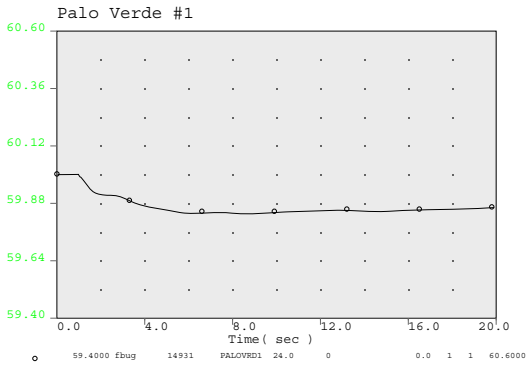
Imperial Valley Area - Frequency

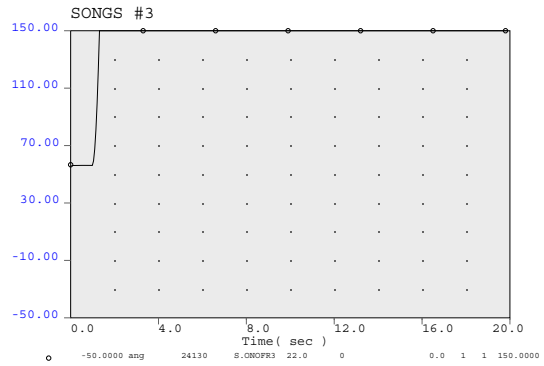


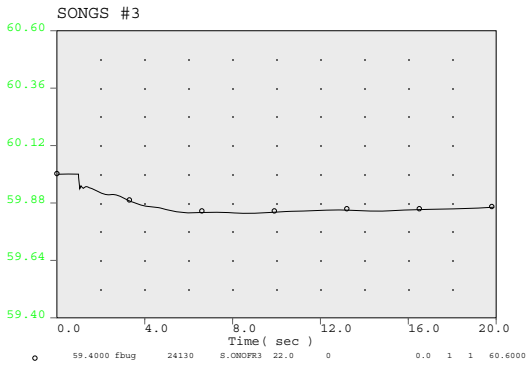
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

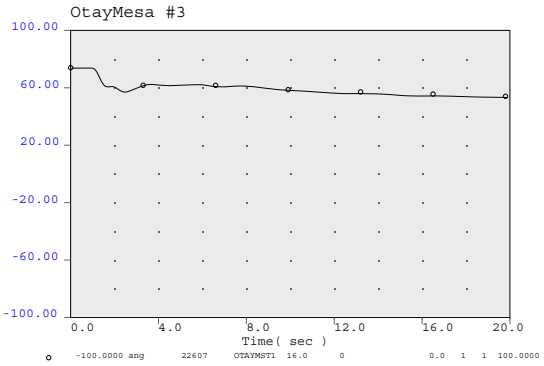
RELATIVE ROTOR ANGLE & FREQUENCY

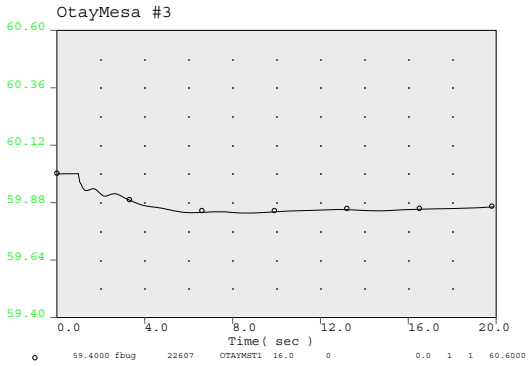












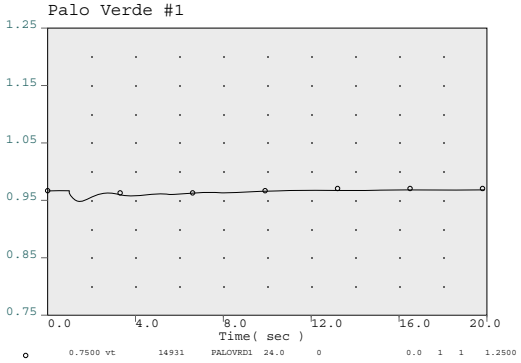
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Page 1

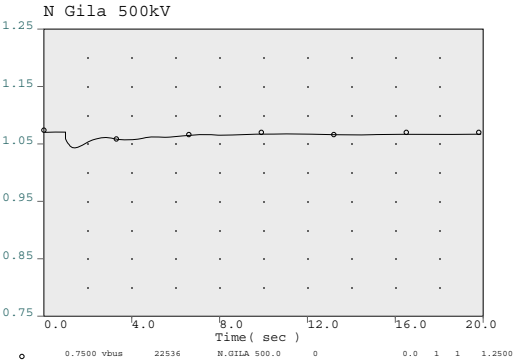
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RELATIVE VOLTAGE

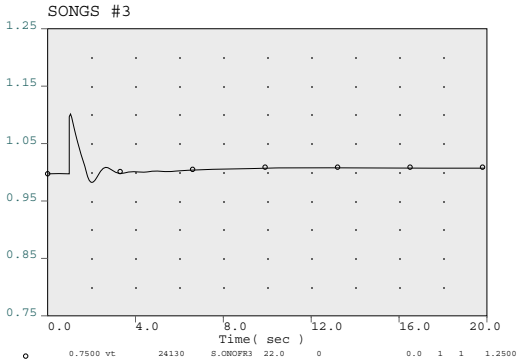
Palo Verde #1



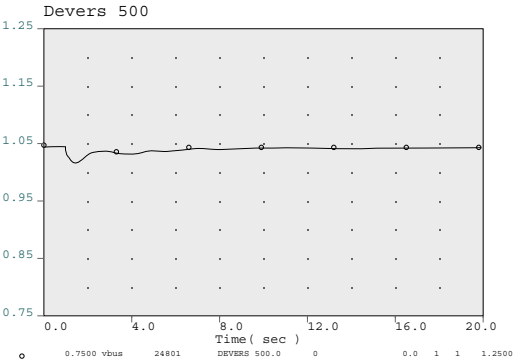
N Gila 500kV



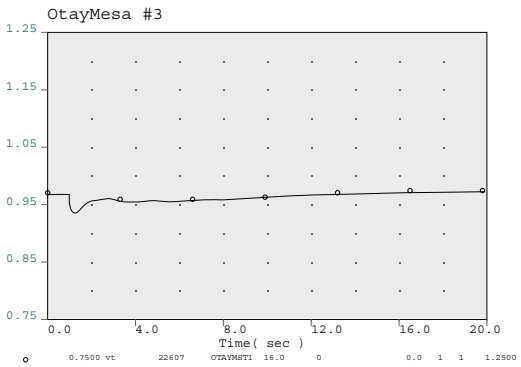
SONGS #3



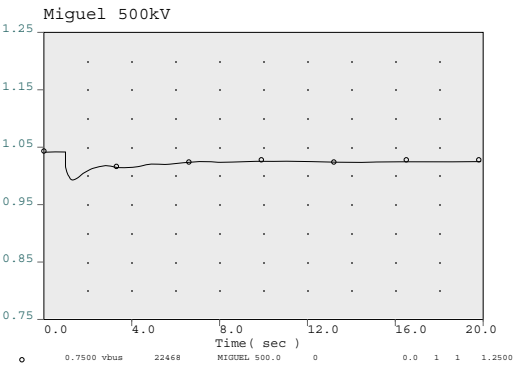
Devers 500



OtayMesa #3



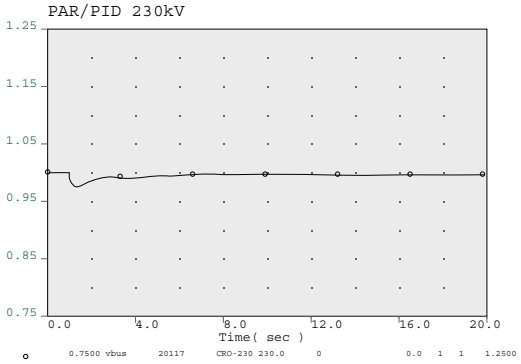
Miguel 500kV



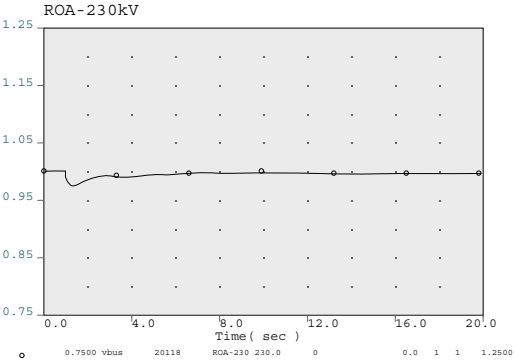
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

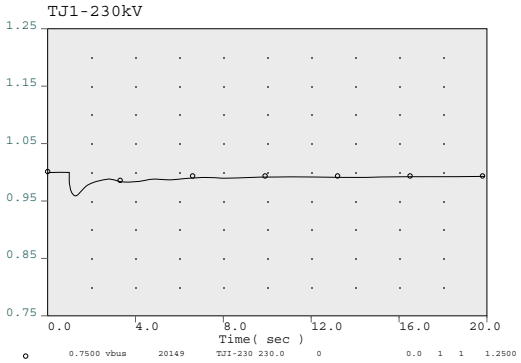
PAR/PID 230kV



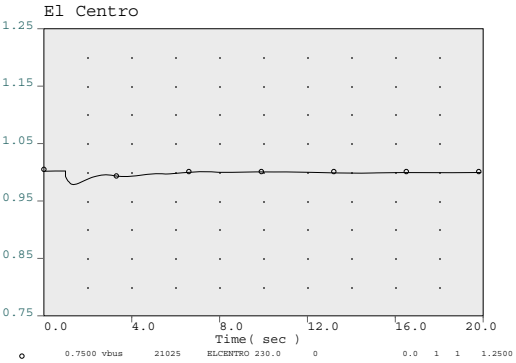
ROA-230kV



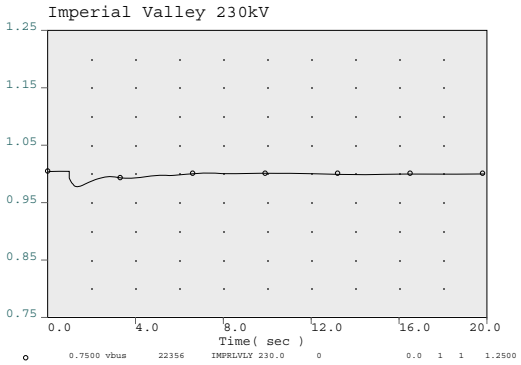
TJ1-230kV



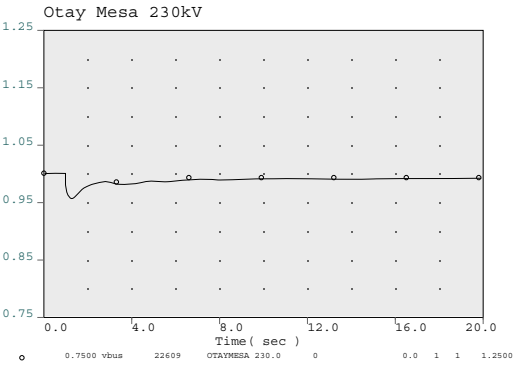
El Centro



Imperial Valley 230kV



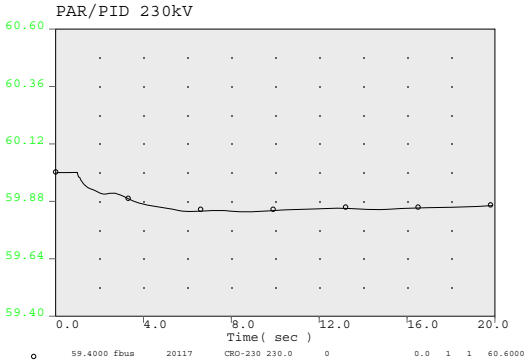
Otay Mesa 230kV



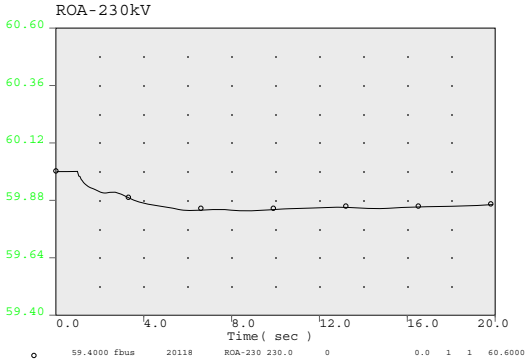
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Frequency Check and Comparison

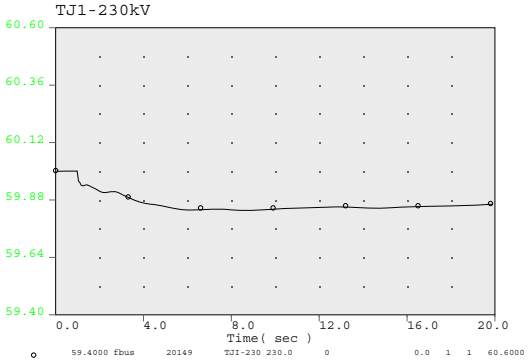
PAR/PID 230kV



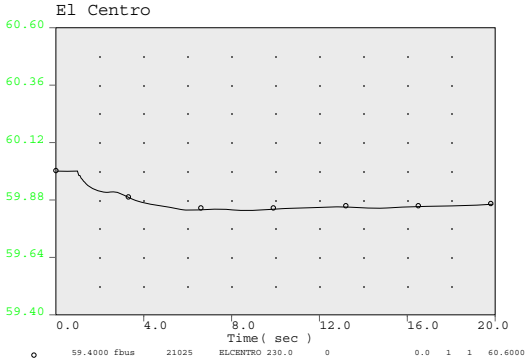
ROA-230kV



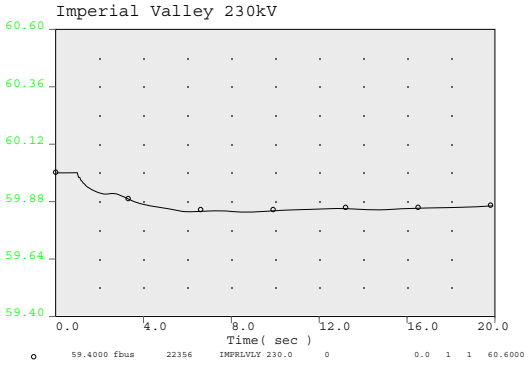
TJ1-230kV



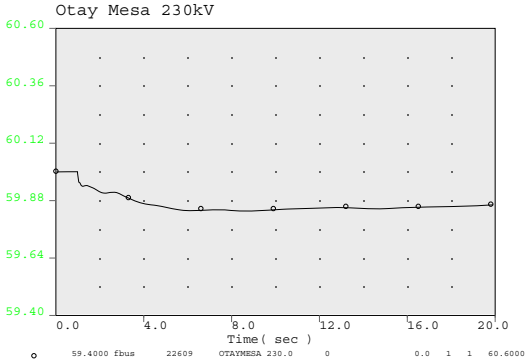
El Centro



Imperial Valley 230kV

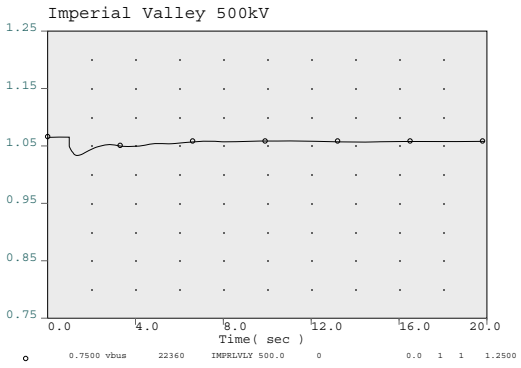


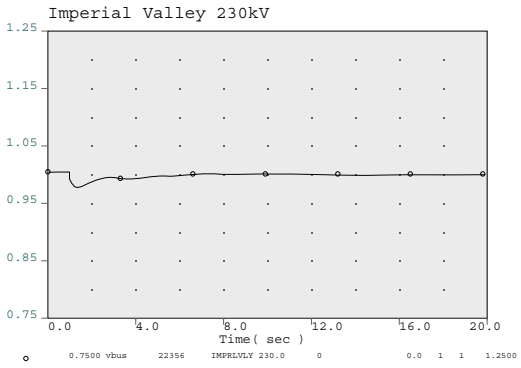
Otay Mesa 230kV

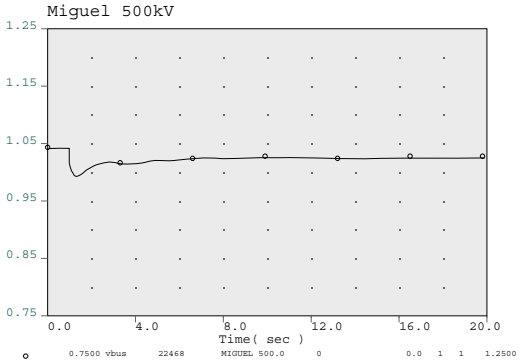


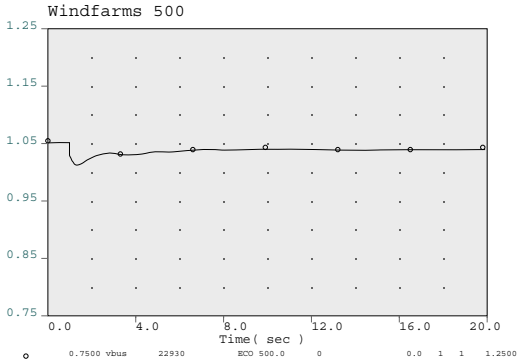
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

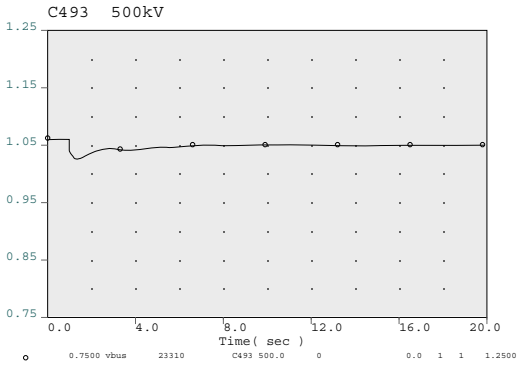
Imperial Valley Area - VOLTAGE

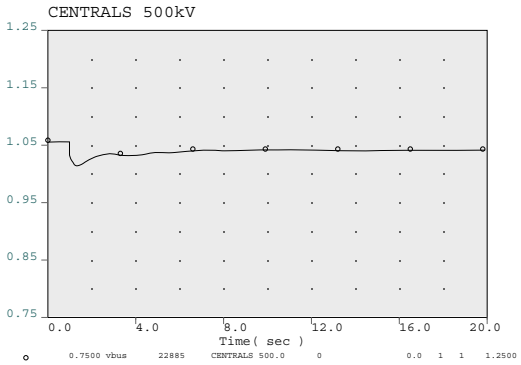






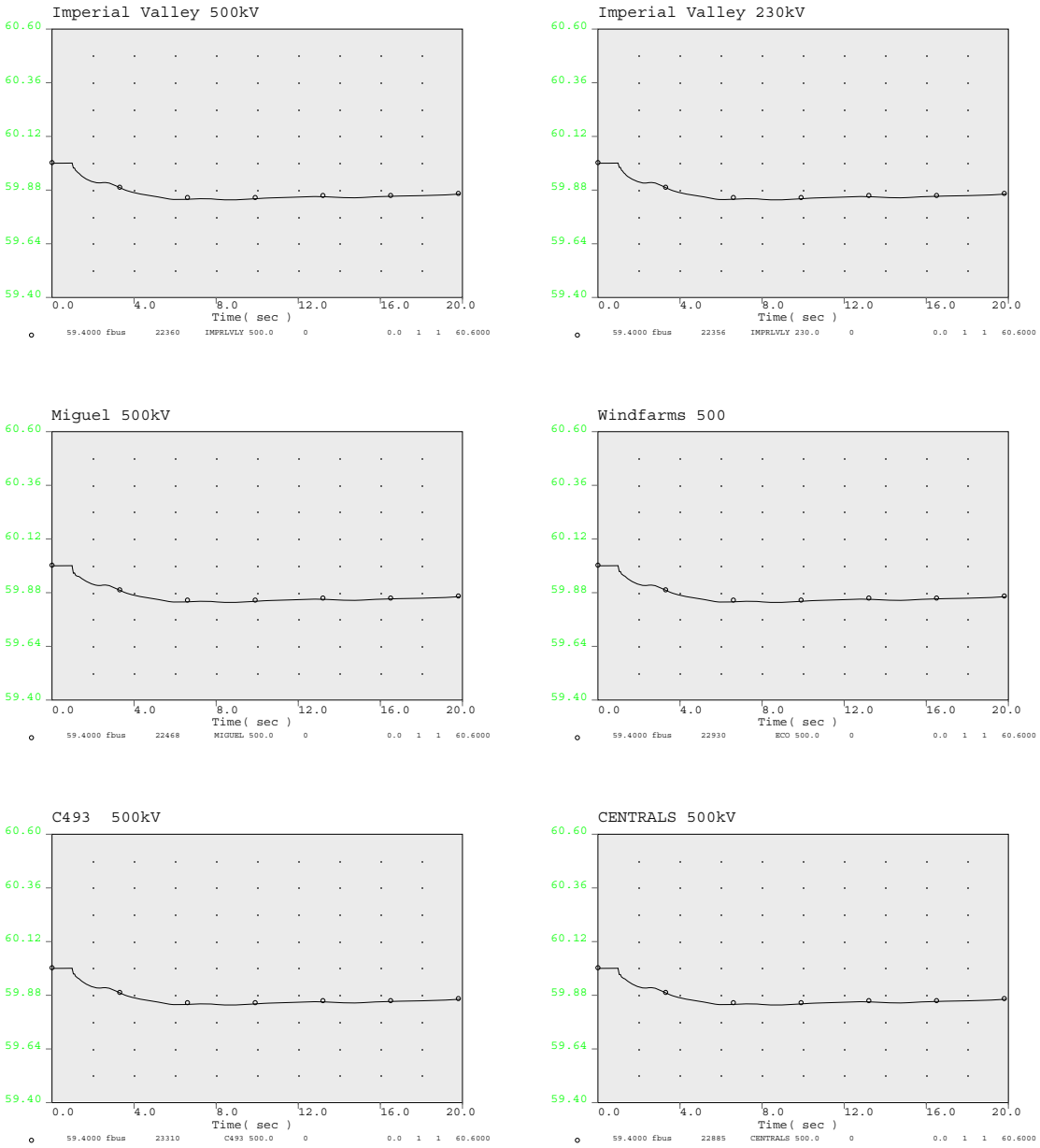






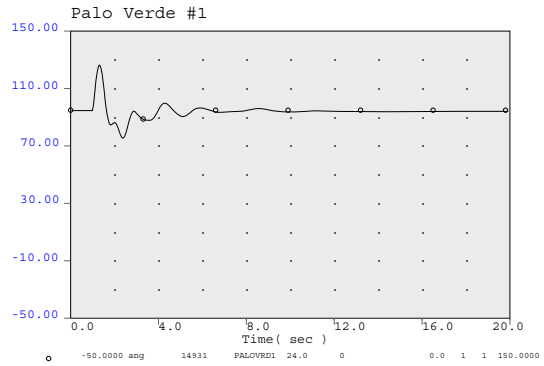
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

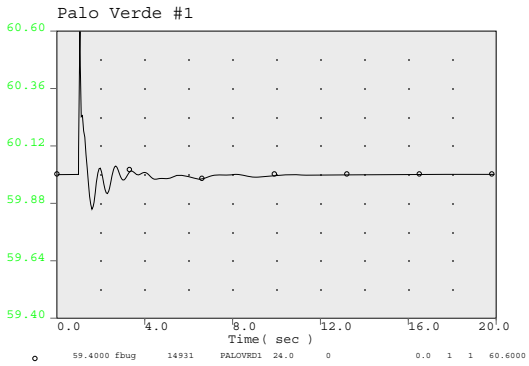
Imperial Valley Area - Frequency

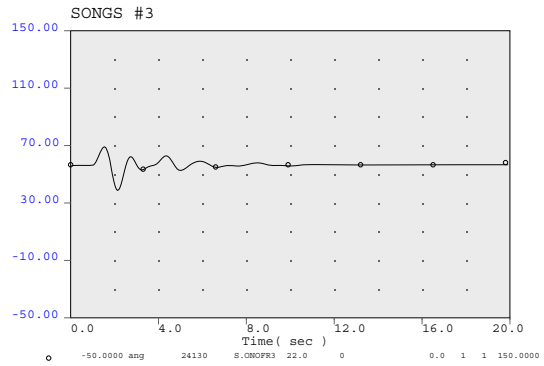


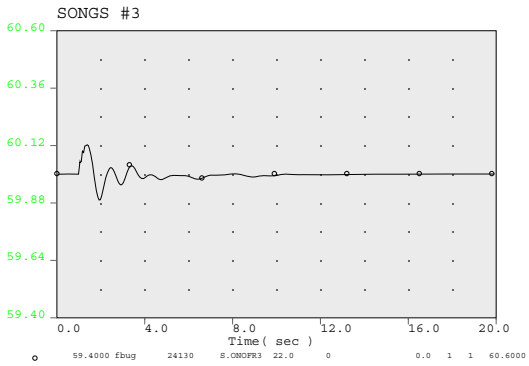
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

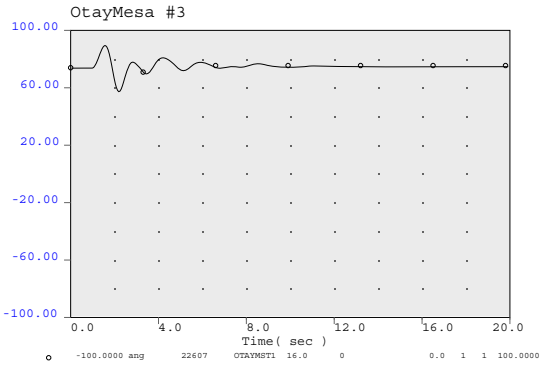
RELATIVE ROTOR ANGLE & FREQUENCY

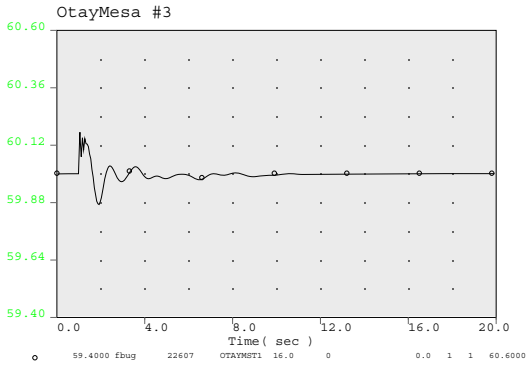












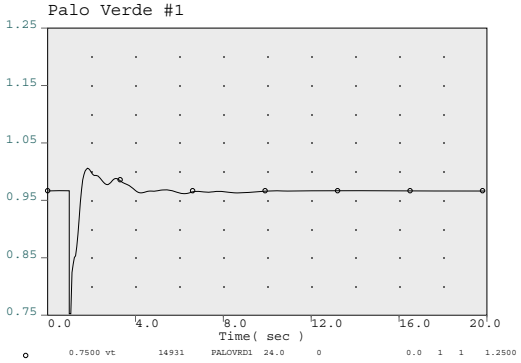
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Page 1

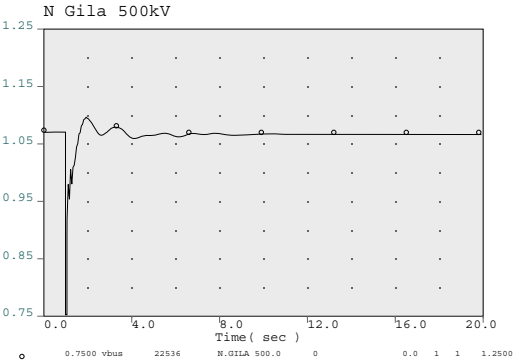
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RELATIVE VOLTAGE

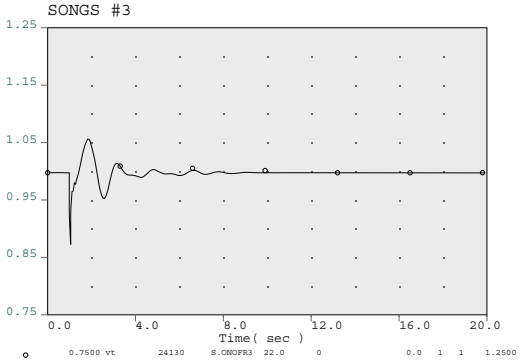
Palo Verde #1



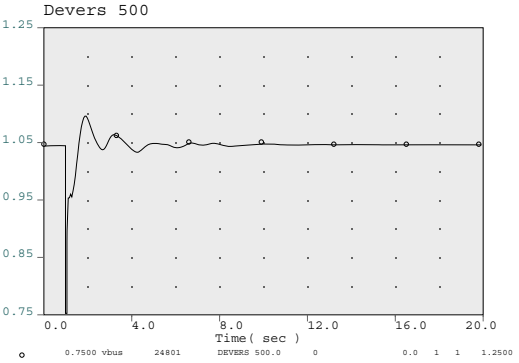
N Gila 500kV



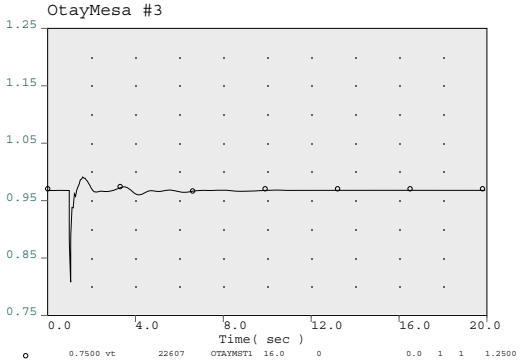
SONGS #3



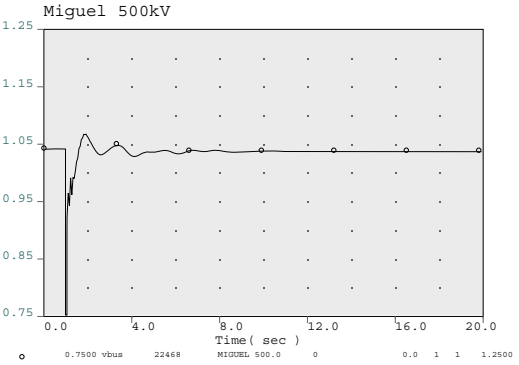
Devers 500



OtayMesa #3



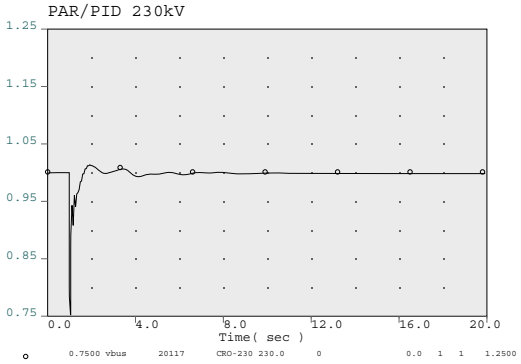
Miguel 500kV



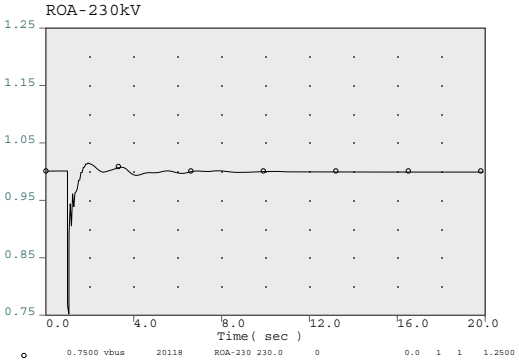
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

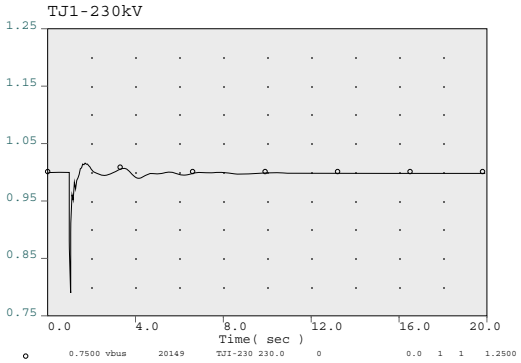
PAR/PID 230kV



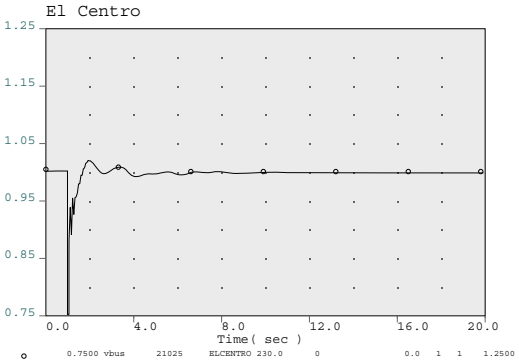
ROA-230kV



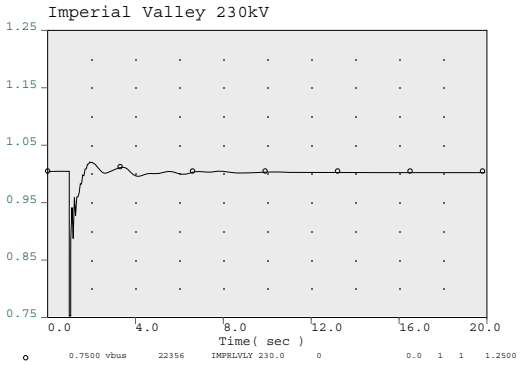
TJ1-230kV



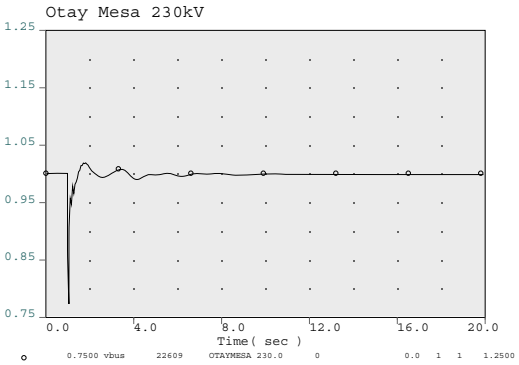
El Centro



Imperial Valley 230kV



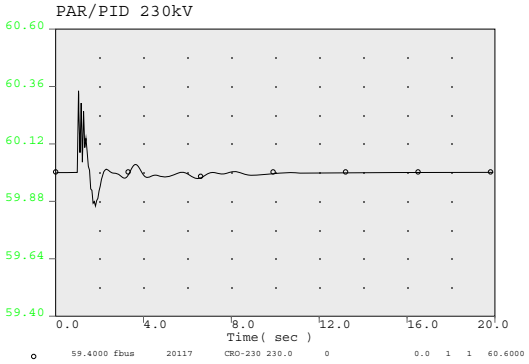
Otay Mesa 230kV



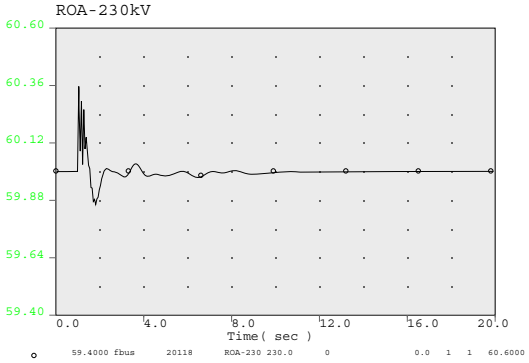
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Affected System Frequency Check and Comparison

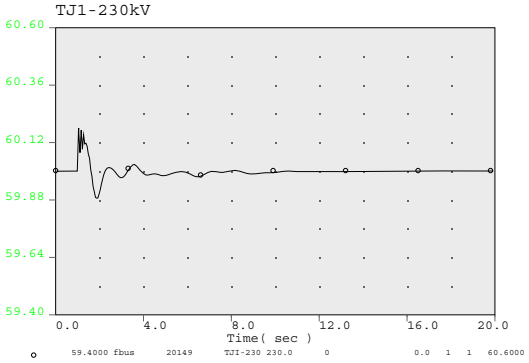
PAR/PID 230kV



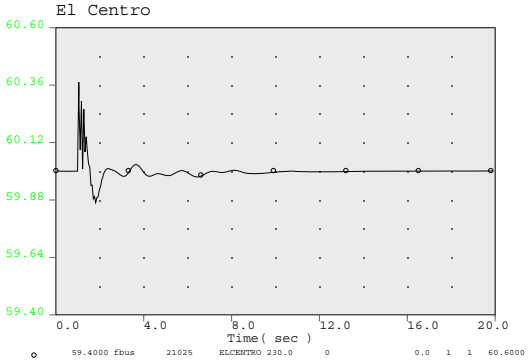
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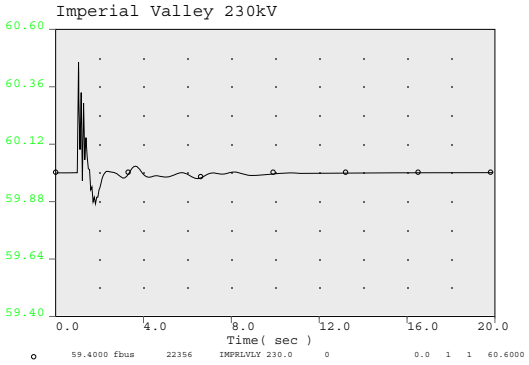
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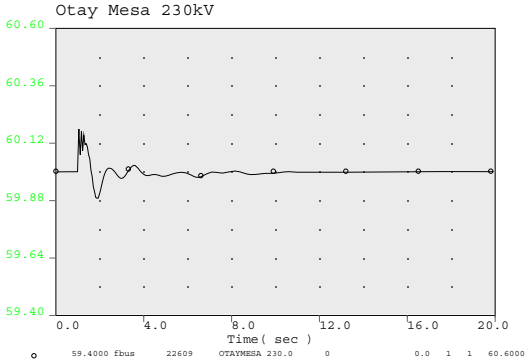
El Centro



Imperial Valley 230kV

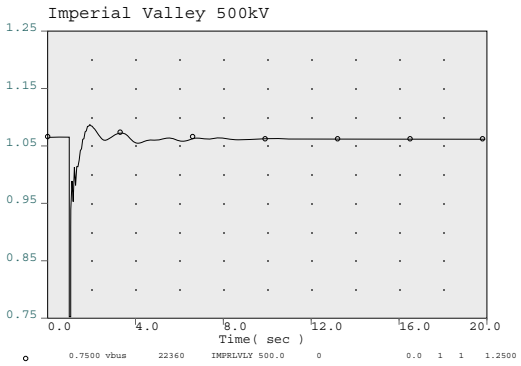


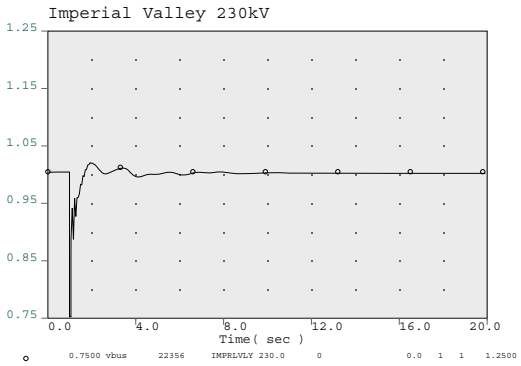
Otay Mesa 230kV

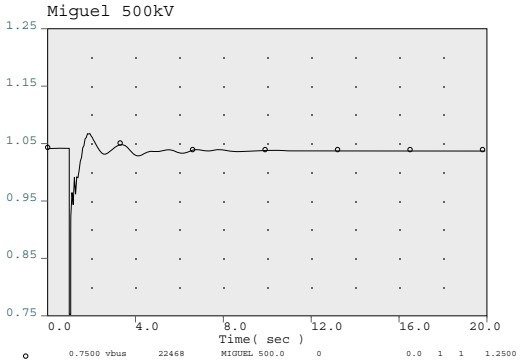


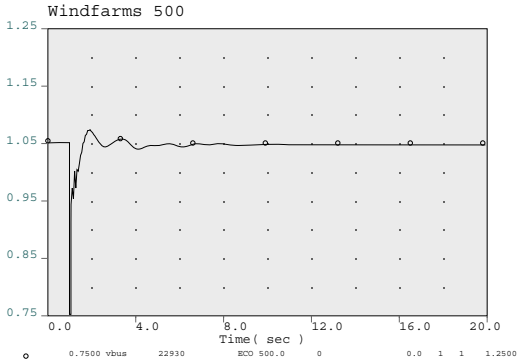
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

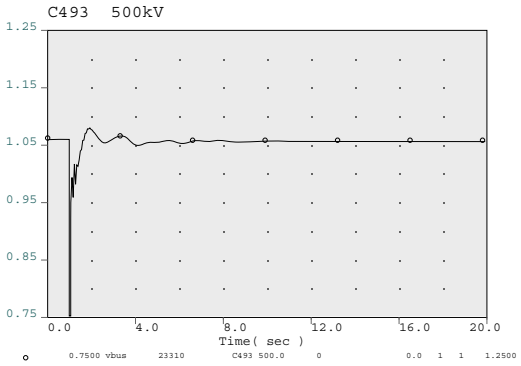
Imperial Valley Area - VOLTAGE

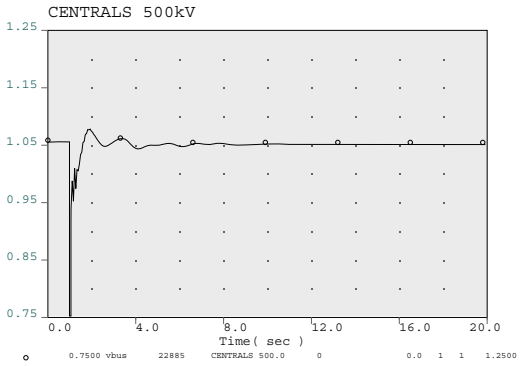






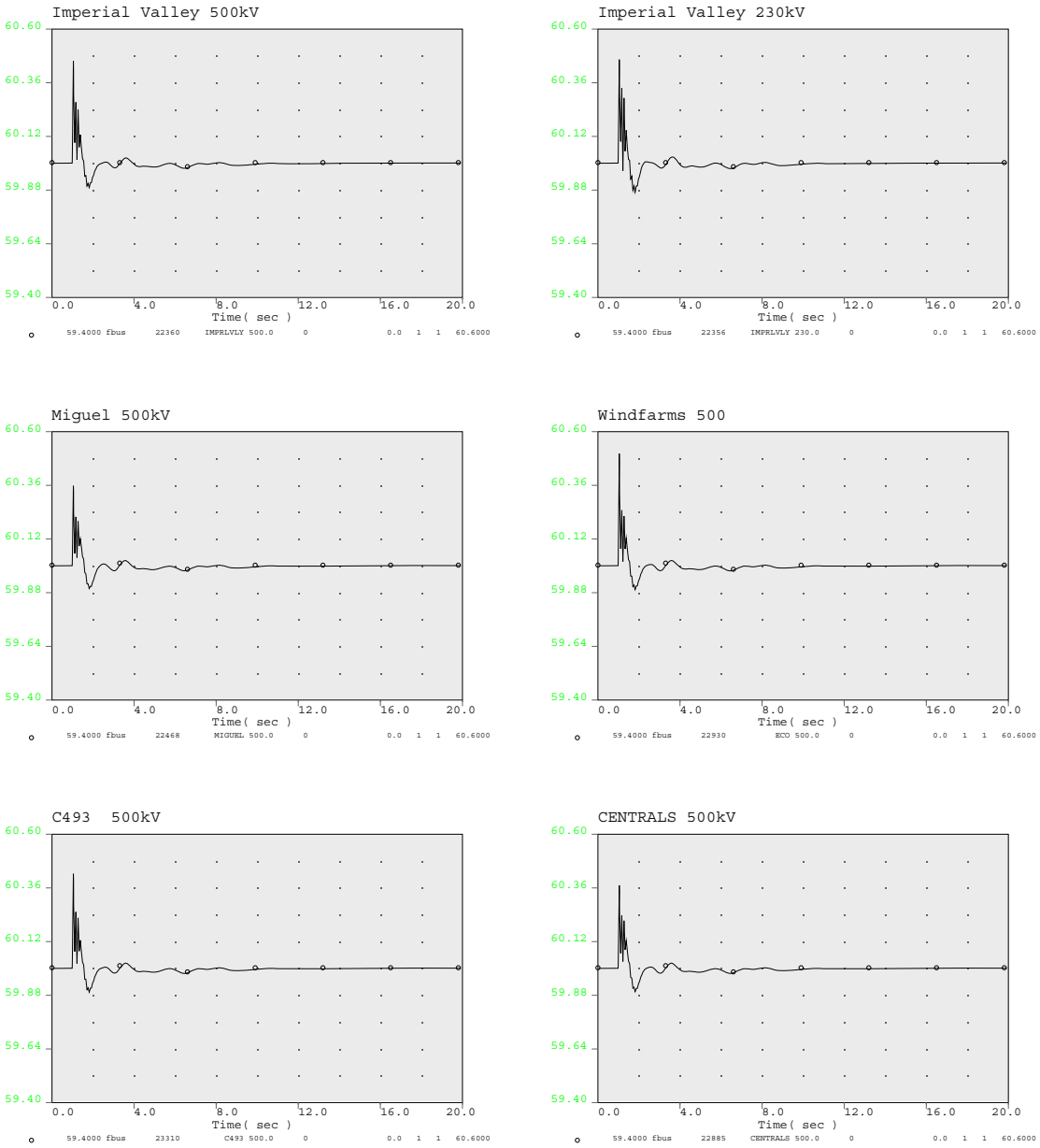






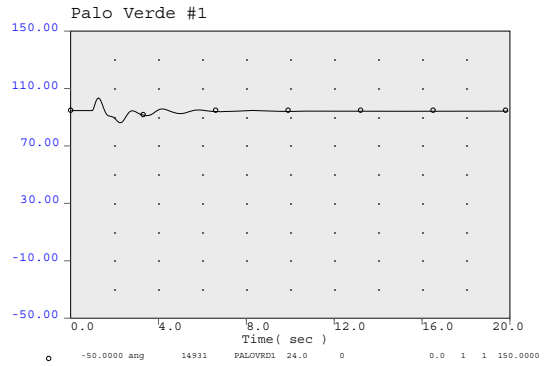
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

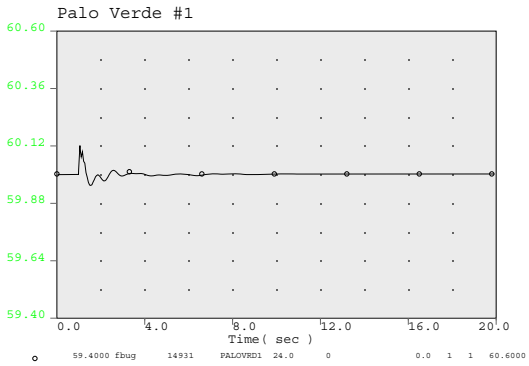
Imperial Valley Area - Frequency

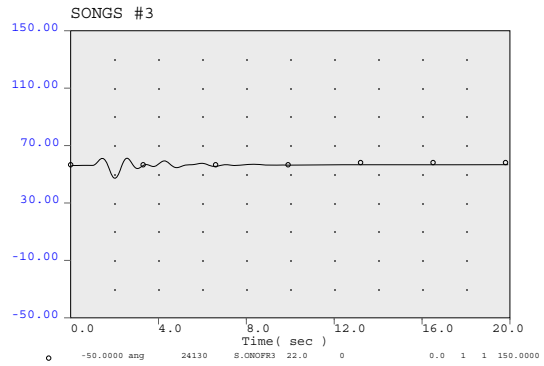


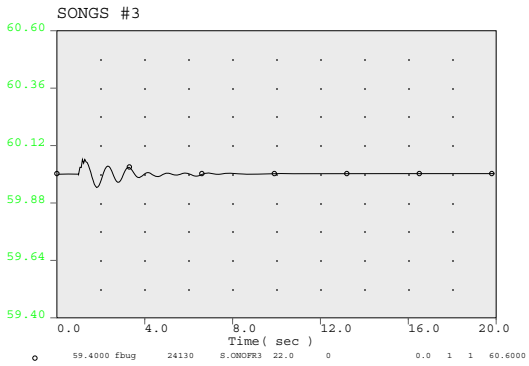
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

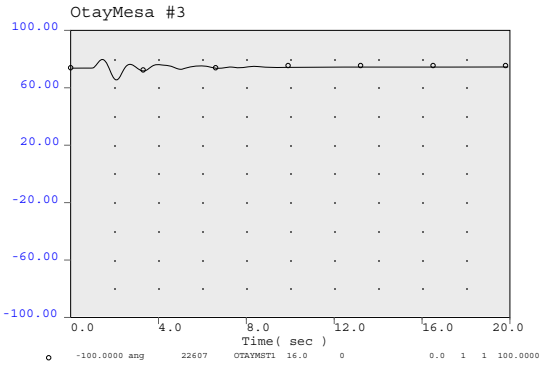
RELATIVE ROTOR ANGLE & FREQUENCY

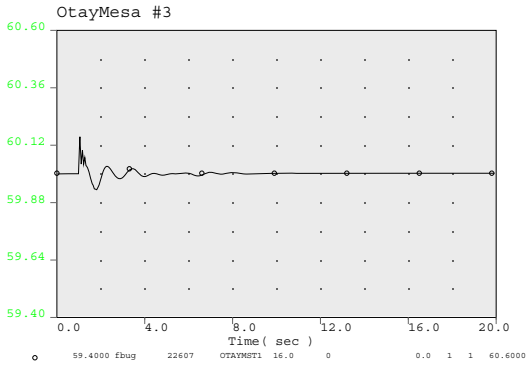












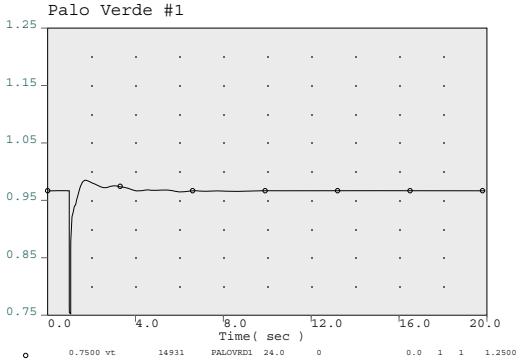
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Page 1

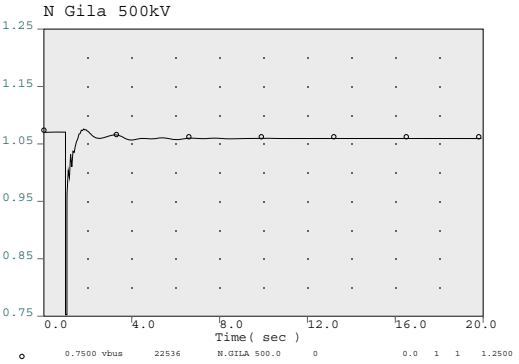
SDGE	T468_NGila_slo_pst_iva_ll.chf	p_i\ll\pst_iva\ws_pst_iva Tue Nov 02 07:32:44 2010

RELATIVE VOLTAGE

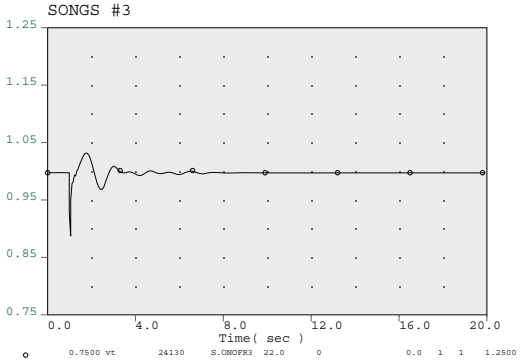
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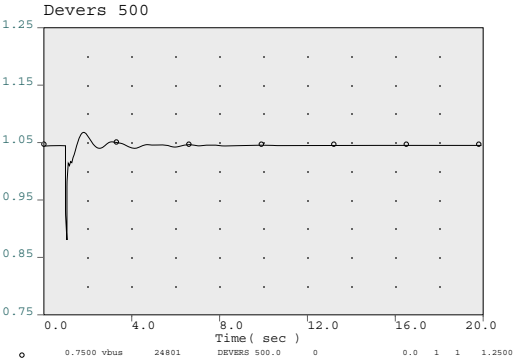
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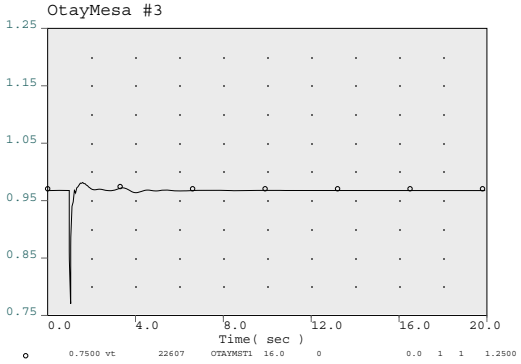
SONGS #3



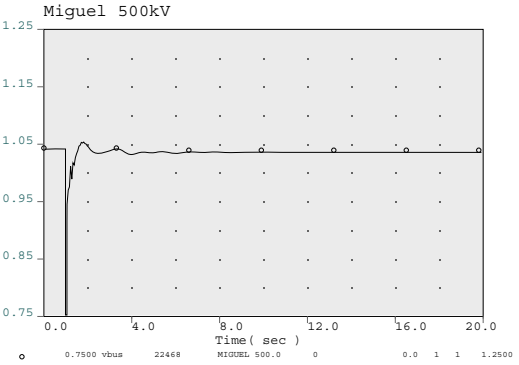
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OtayMesa #3



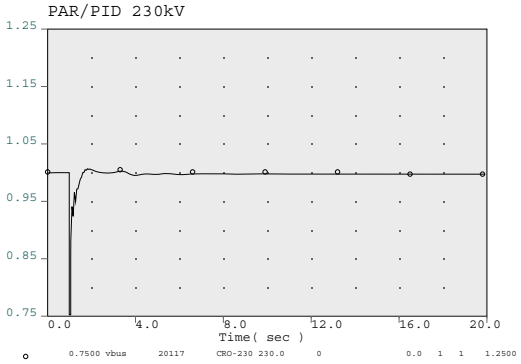
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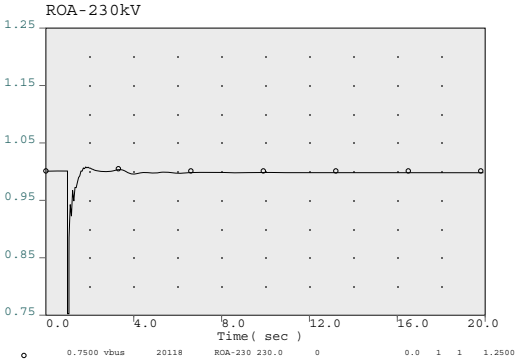
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

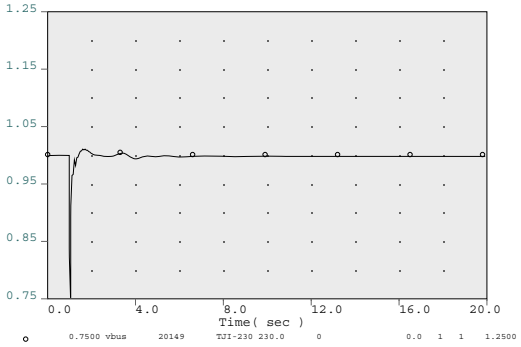
PAR/PID 230kV



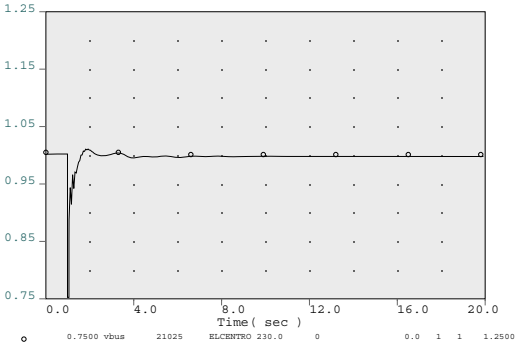
ROA-230kV



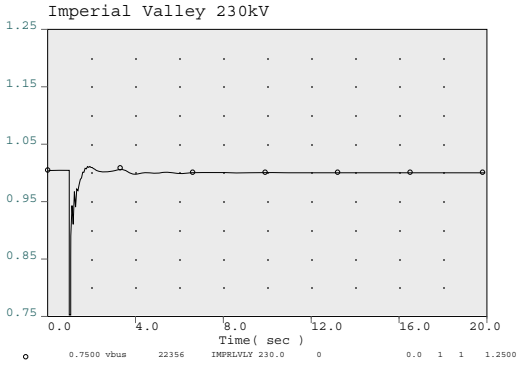
TJ1-230kV



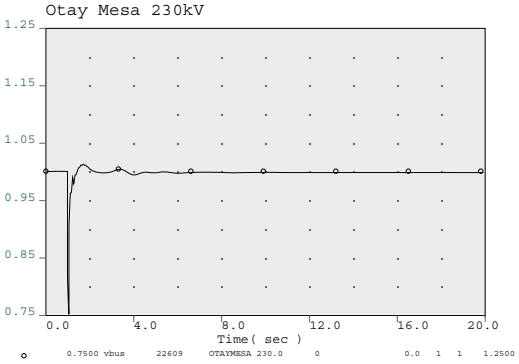
El Centro



Imperial Valley 230kV



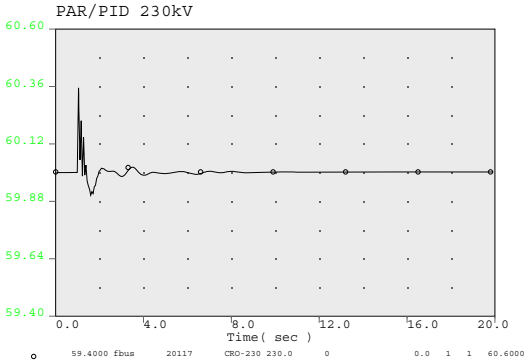
Otay Mesa 230kV



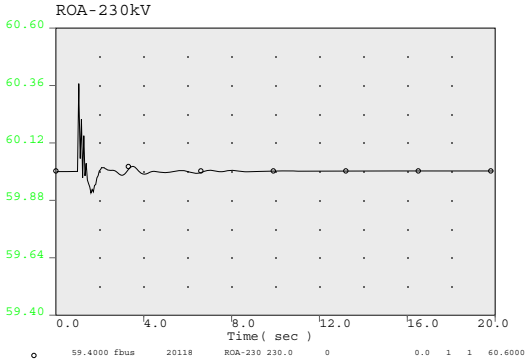
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

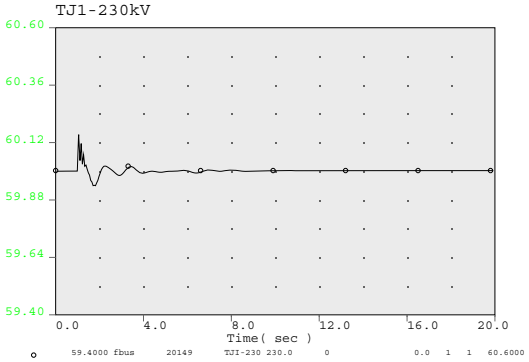
PAR/PID 230kV



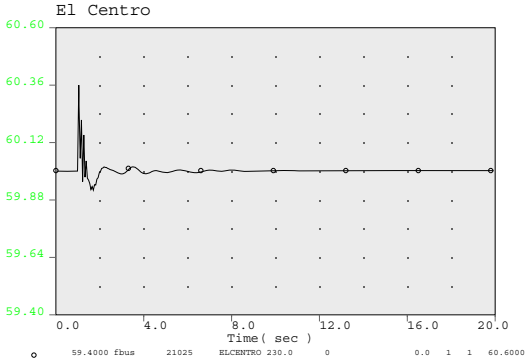
ROA-230kV



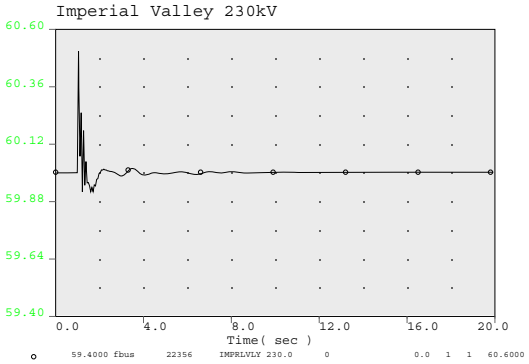
TJ1-230kV



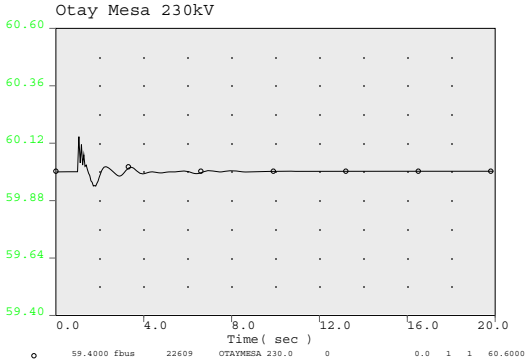
El Centro



Imperial Valley 230kV



Otay Mesa 230kV

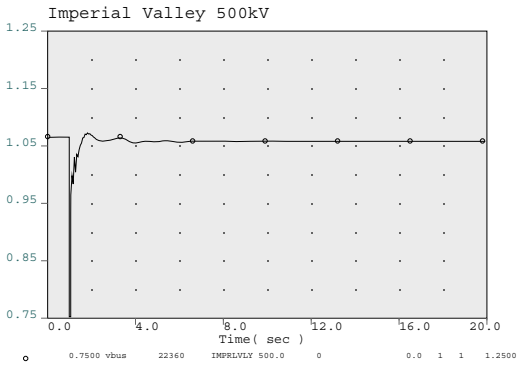


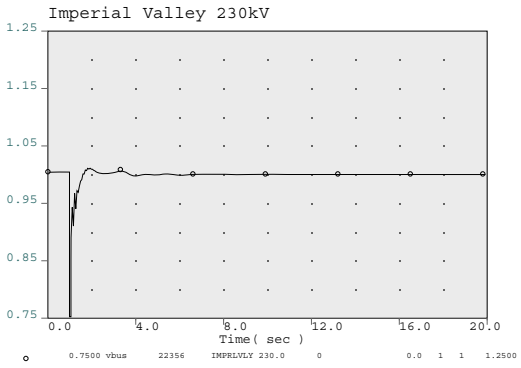
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

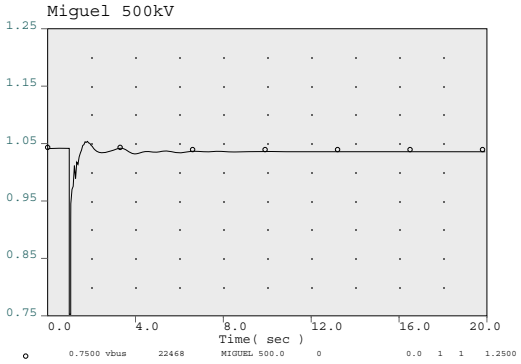
Page 4

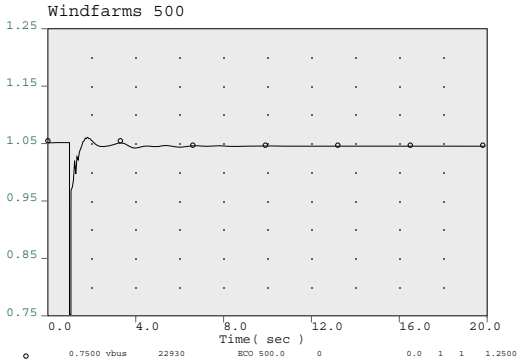
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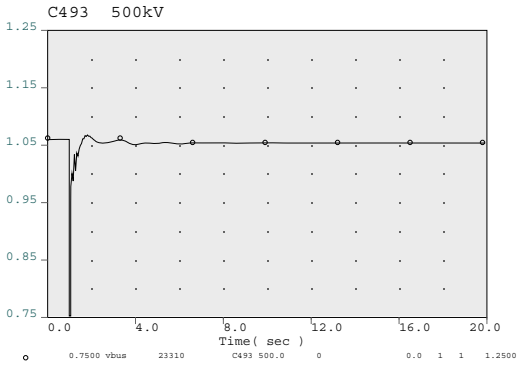
Imperial Valley Area - VOLTAGE

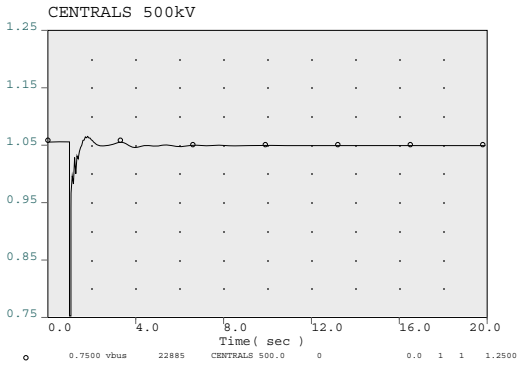












SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Appendix J-5

Transient Stability Analysis Plots

Boulevard Cluster

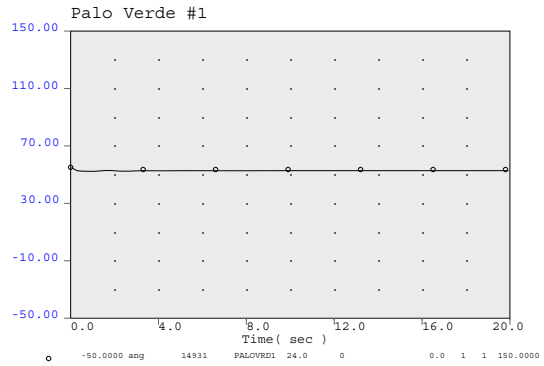
Heavy Summer Post

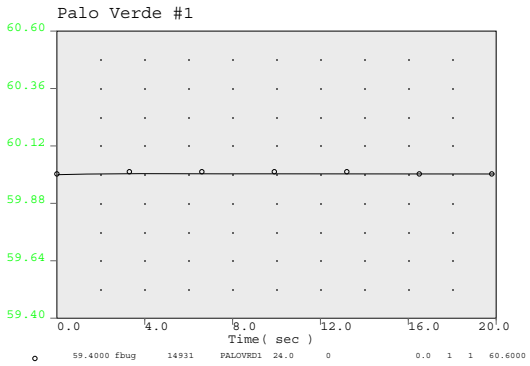
Imperial Valley Area - Frequency

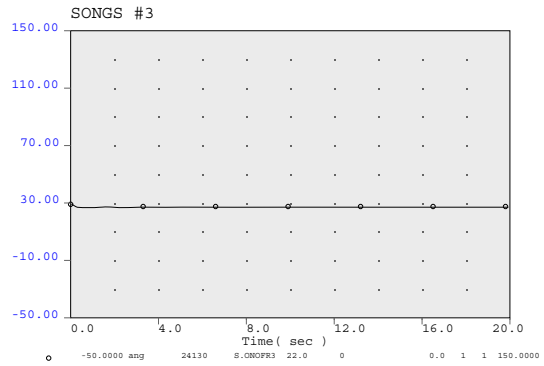


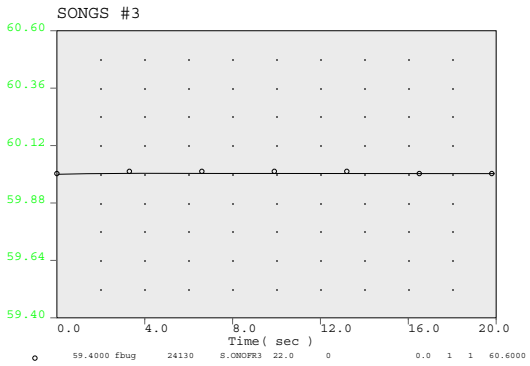
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

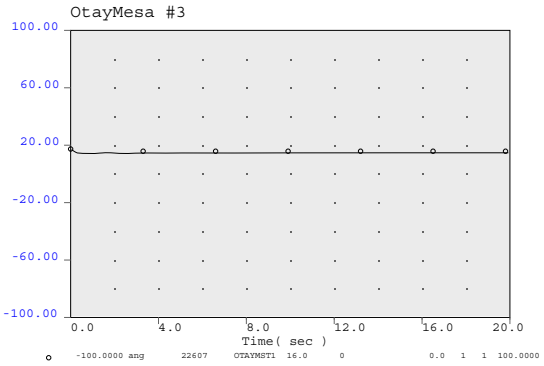
RELATIVE ROTOR ANGLE & FREQUENCY

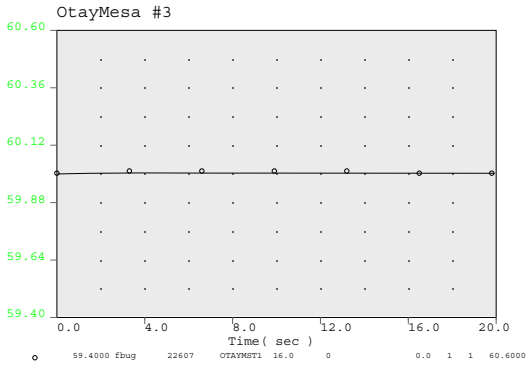










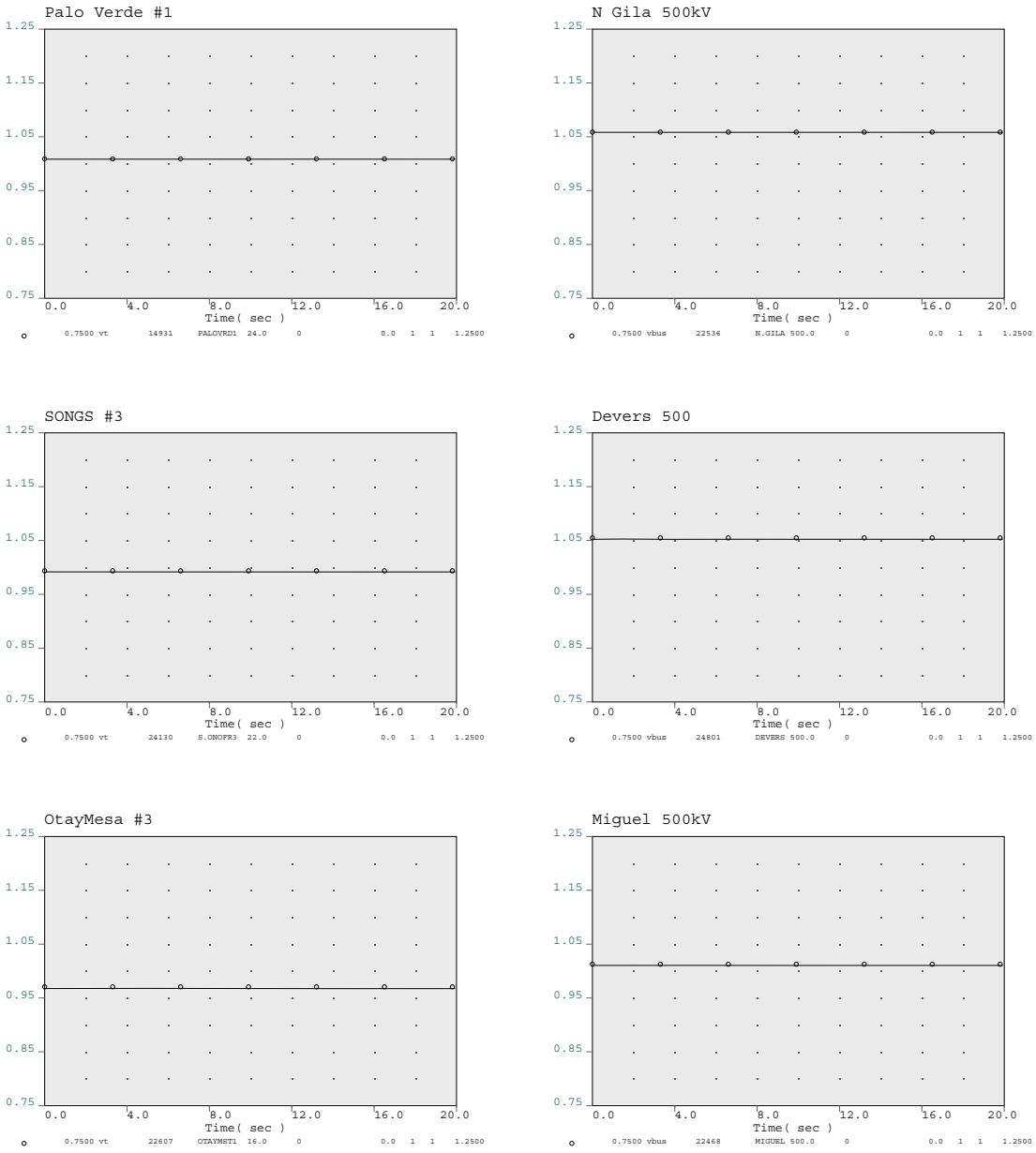


SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Page 1

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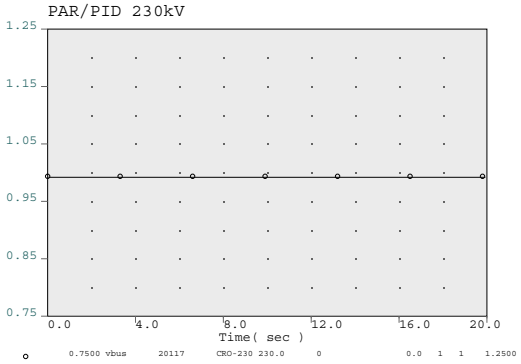
RELATIVE VOLTAGE



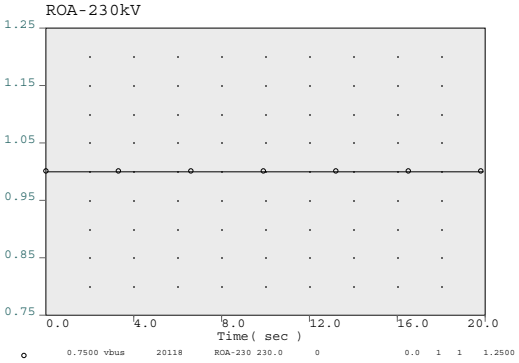
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Affected System Voltage Check and Comparison

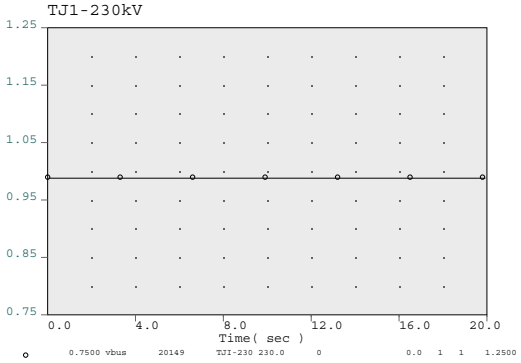
PAR/PID 230kV



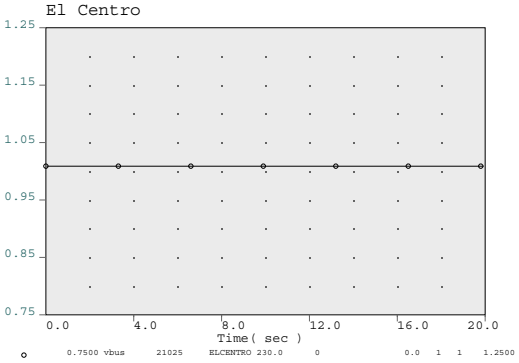
ROA-230kV



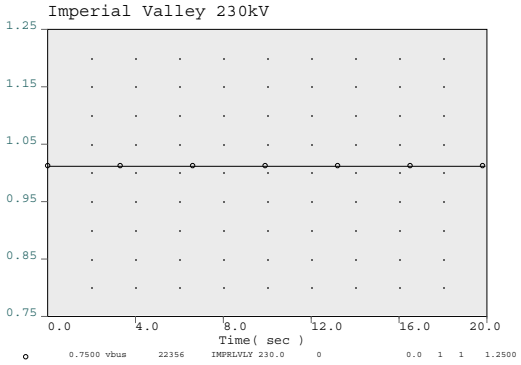
TJ1-230kV



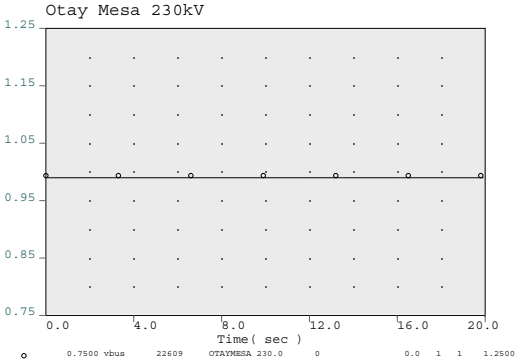
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



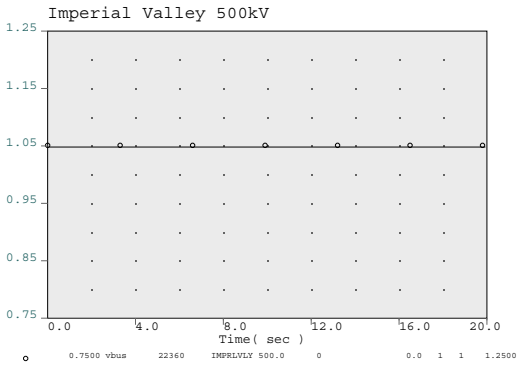
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

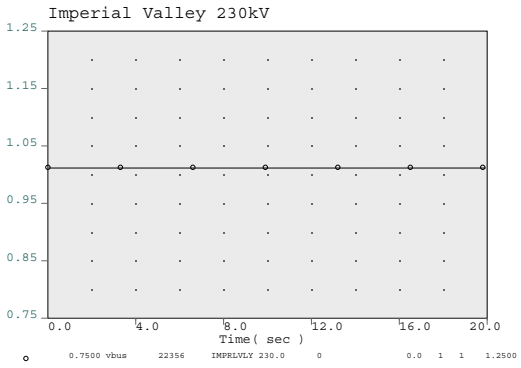
Affected System Frequency Check and Comparison

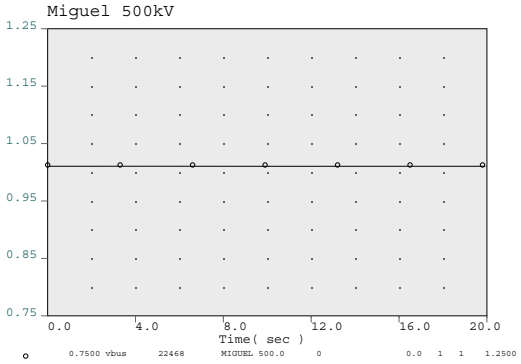


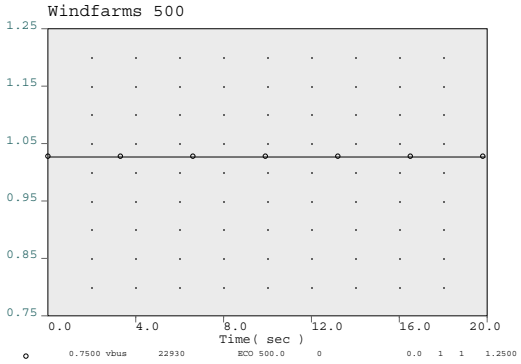
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

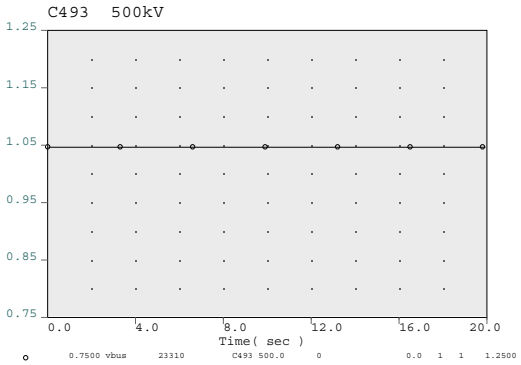
Imperial Valley Area - VOLTAGE

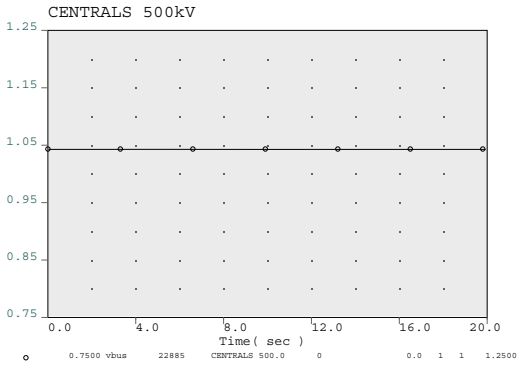












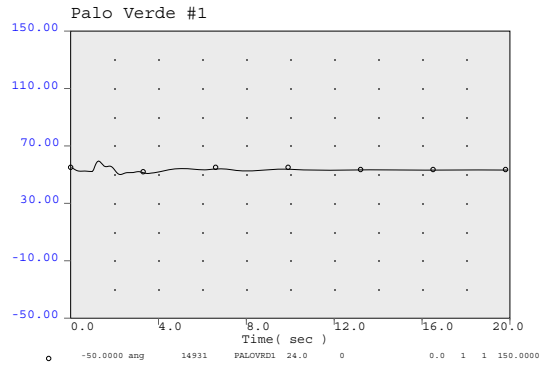
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

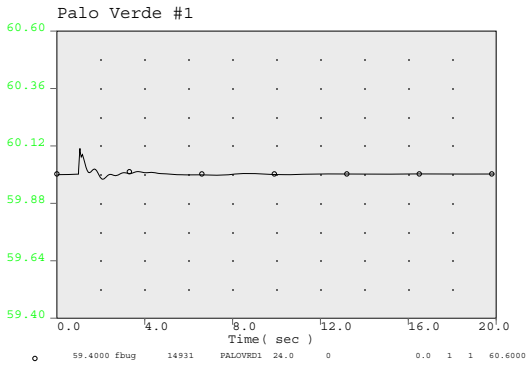
Imperial Valley Area - Frequency

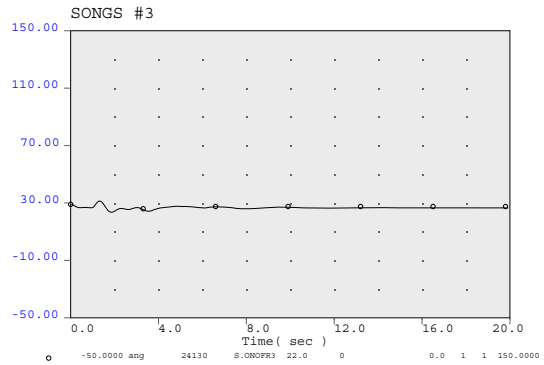


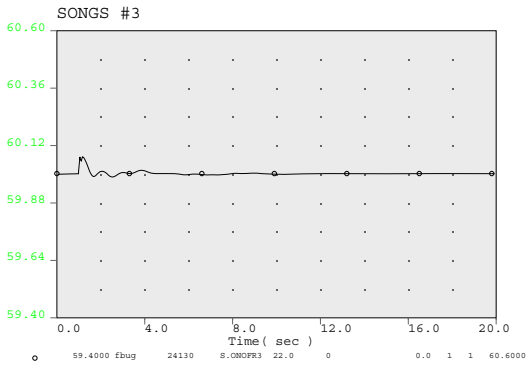
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

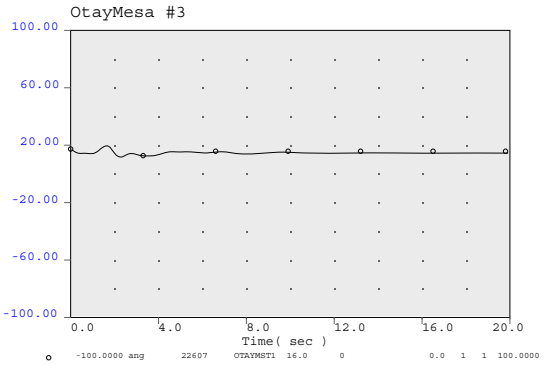
RELATIVE ROTOR ANGLE & FREQUENCY

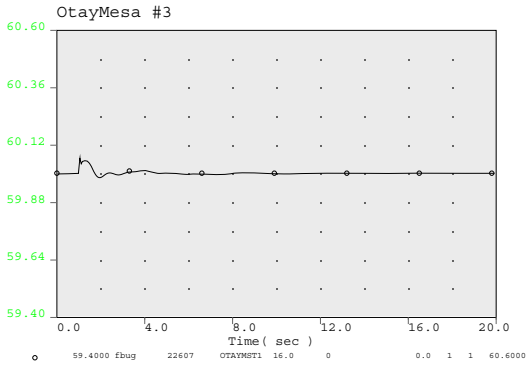












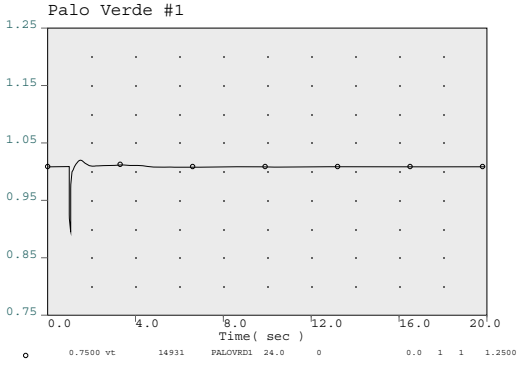
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Page 1

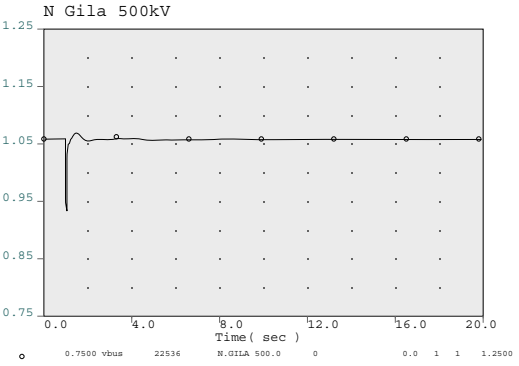
SDGE	Dev_Val_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:23:18 2010

RELATIVE VOLTAGE

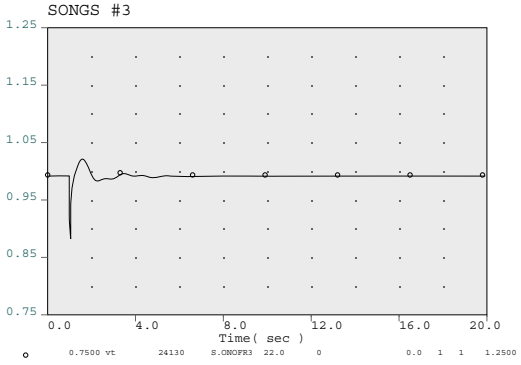
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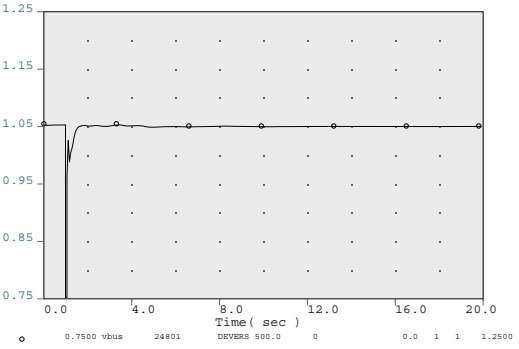
N Gila 500kV



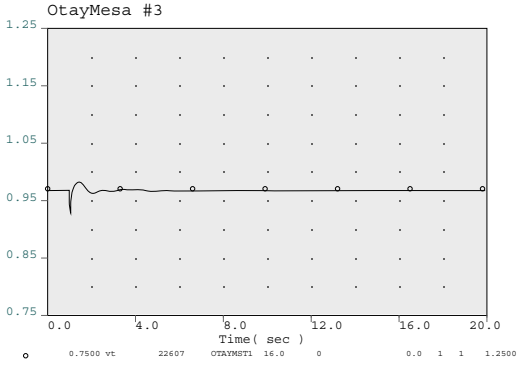
SONGS #3



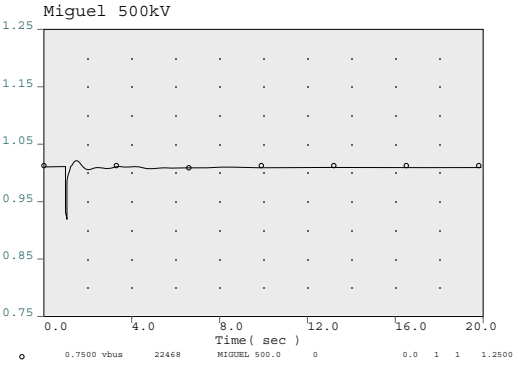
Devers 500



OtayMesa #3



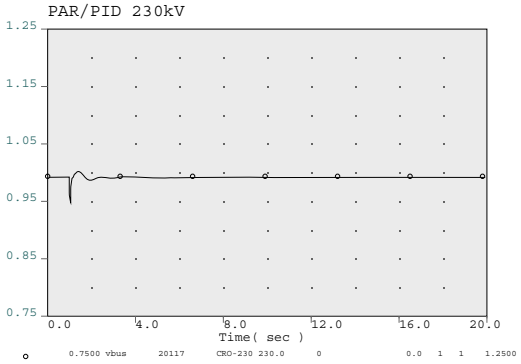
Miguel 500kV



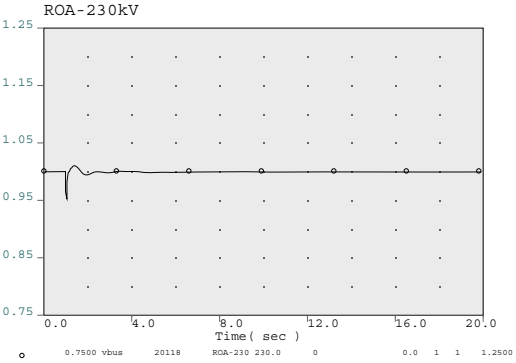
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Affected System Voltage Check and Comparison

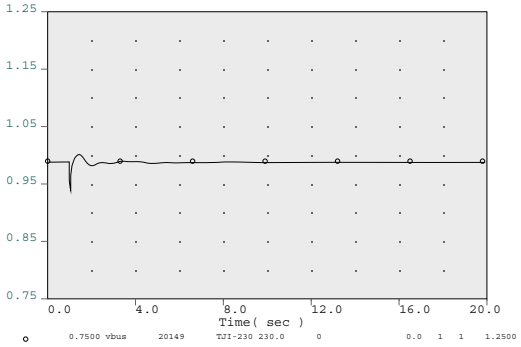
PAR/PID 230kV



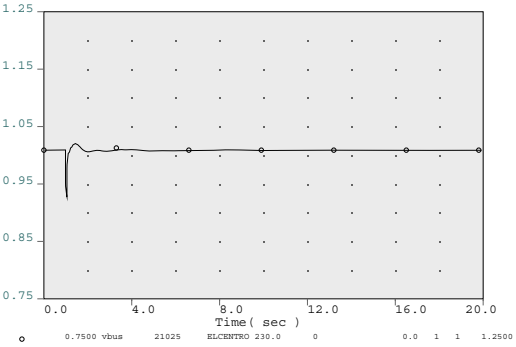
ROA-230kV



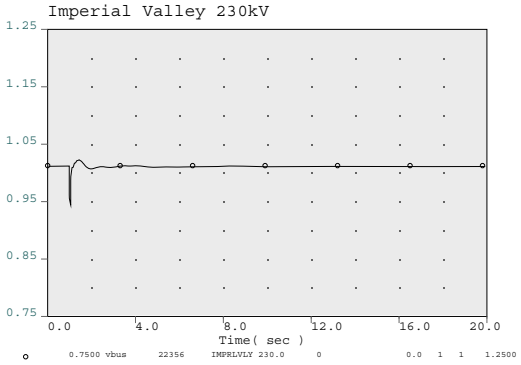
TJ1-230kV



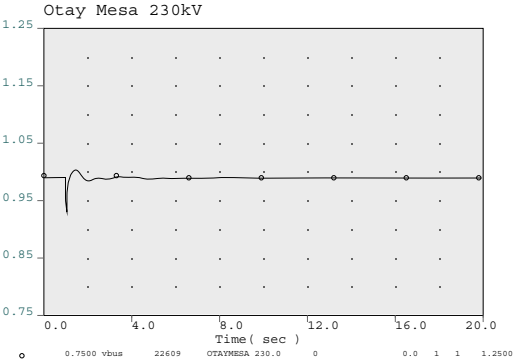
El Centro



Imperial Valley 230kV



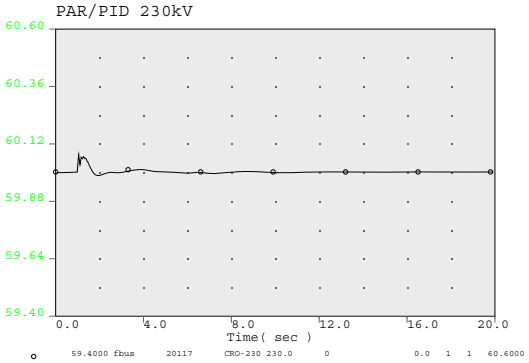
Otay Mesa 230kV



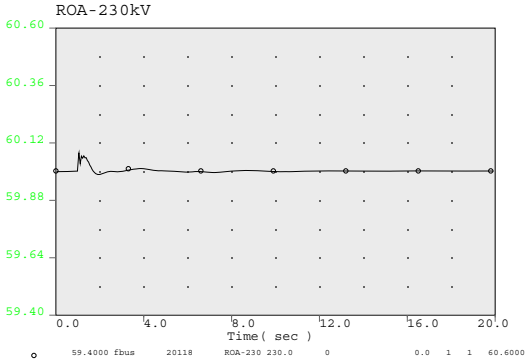
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Affected System Frequency Check and Comparison

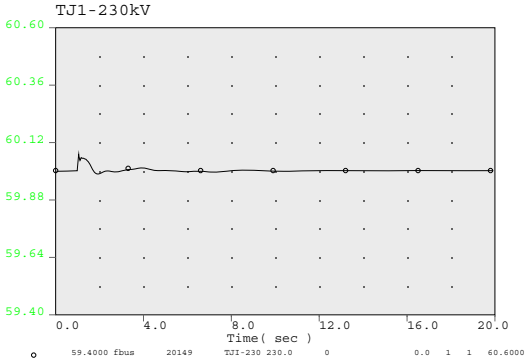
PAR/PID 230kV



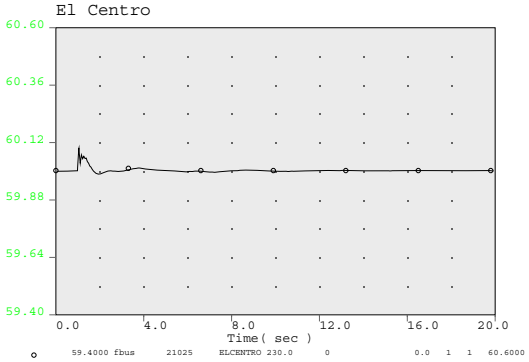
ROA-230kV



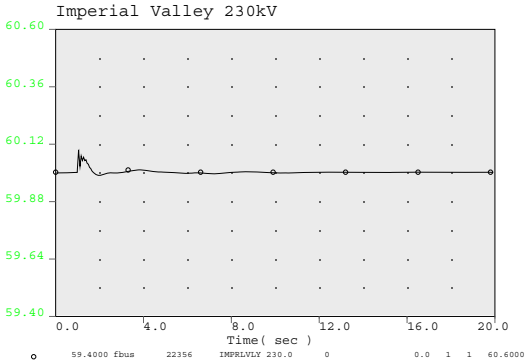
TJ1-230kV



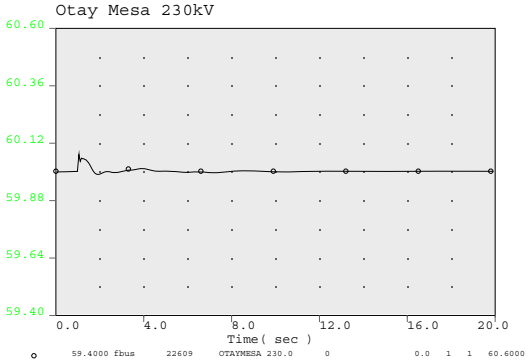
El Centro



Imperial Valley 230kV



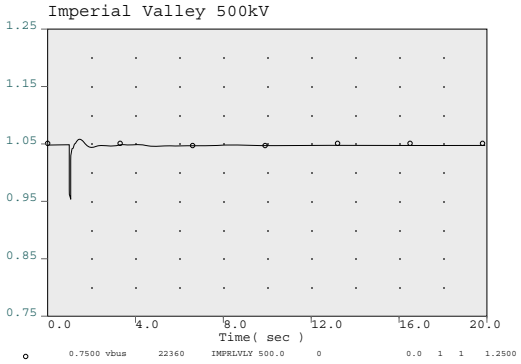
Otay Mesa 230kV



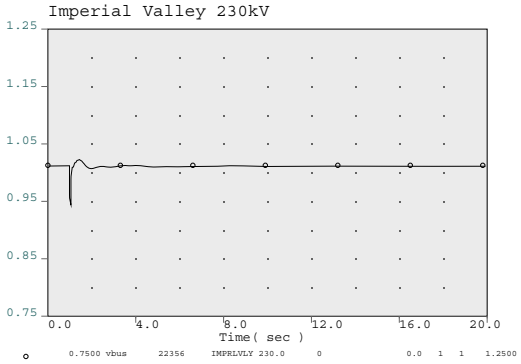
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Imperial Valley Area - VOLTAGE

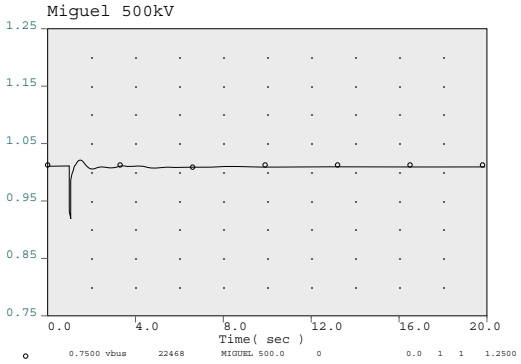
Imperial Valley 500kV



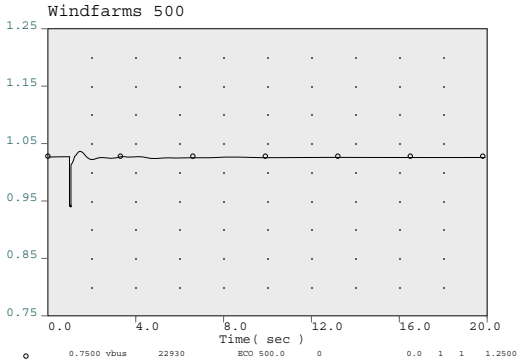
Imperial Valley 230kV



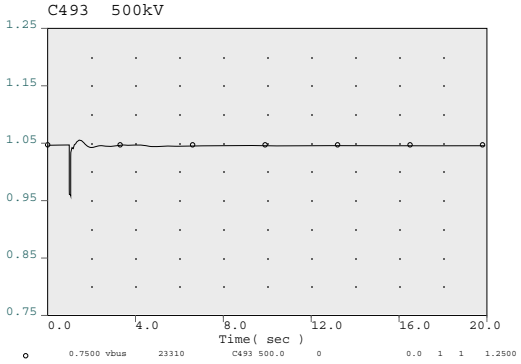
Miguel 500kV



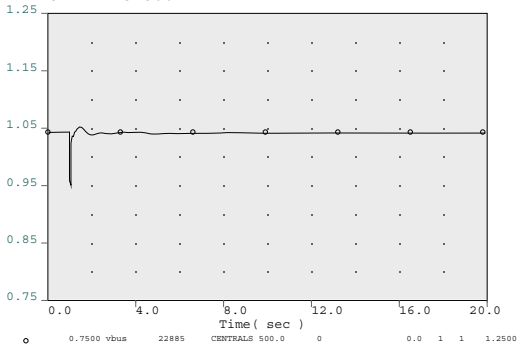
Windfarms 500



C493 500kV



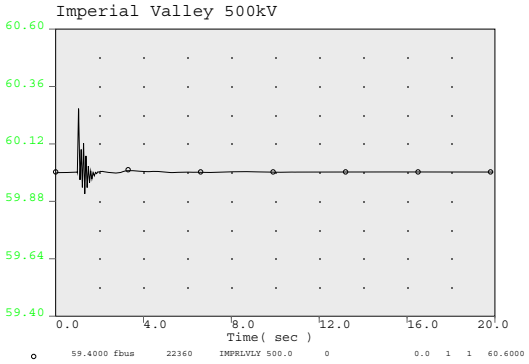
CENTRALS 500kV



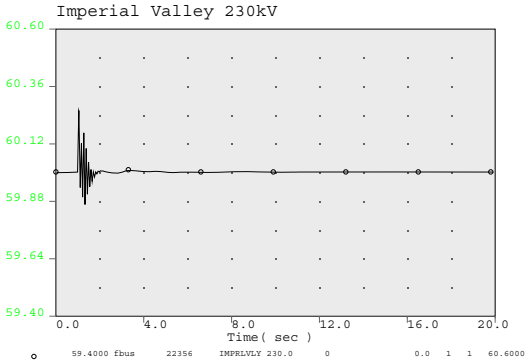
SDG&E Cluster 2 - post
2014 Heavy Summer
Valley - Devers 500 kV line

Imperial Valley Area - Frequency

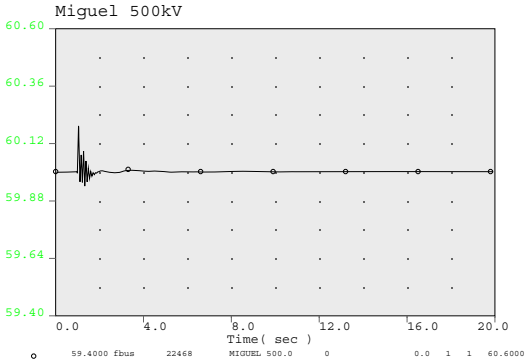
Imperial Valley 500kV



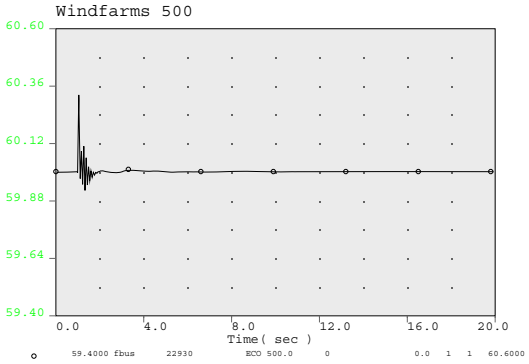
Imperial Valley 230kV



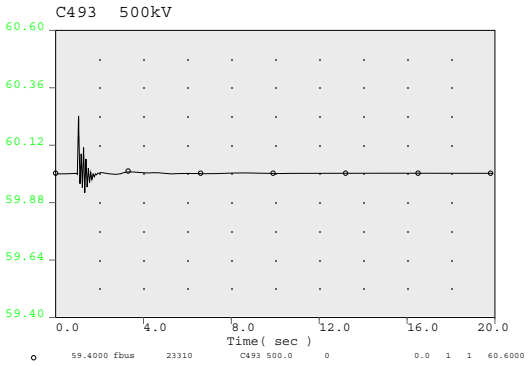
Miguel 500kV



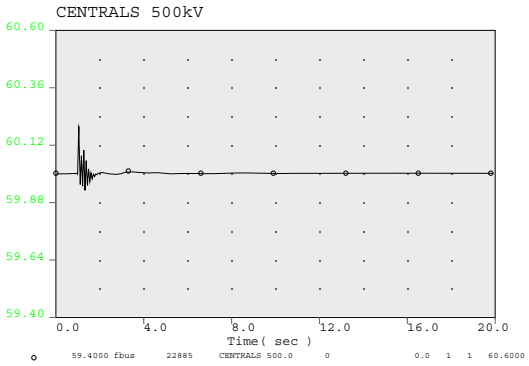
Windfarms 500



C493 500kV

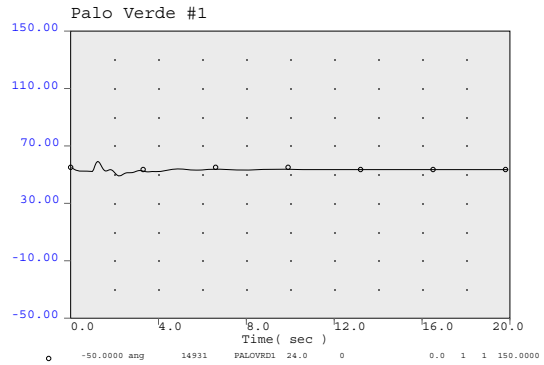


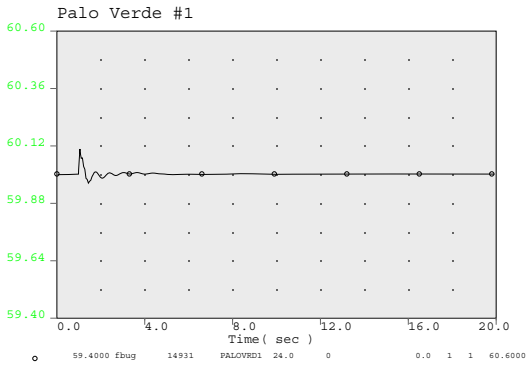
CENTRALS 500kV

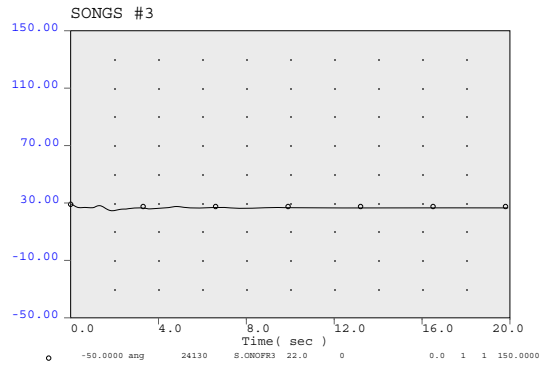


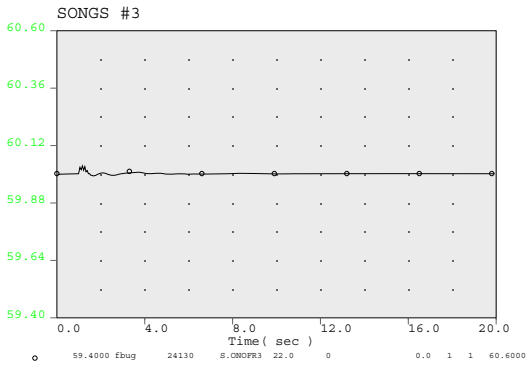
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

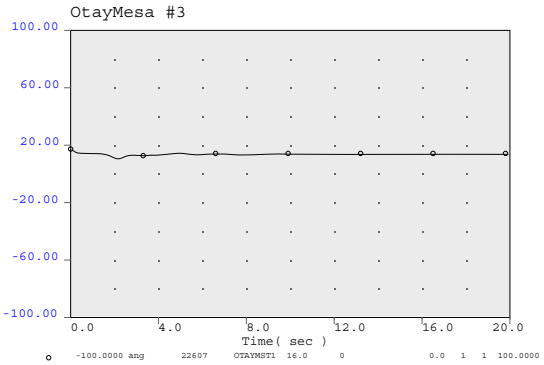
RELATIVE ROTOR ANGLE & FREQUENCY

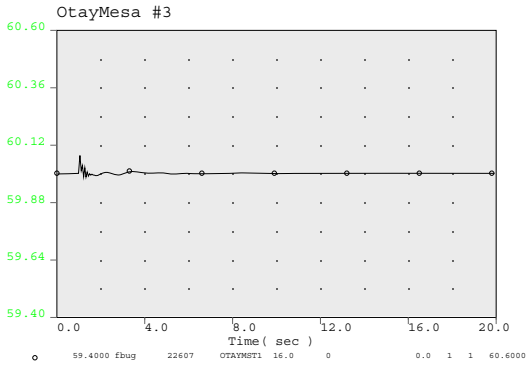












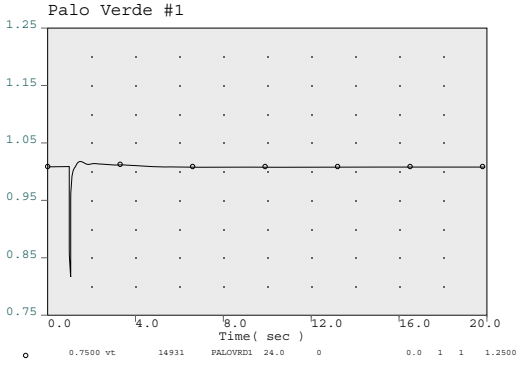
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Page 1

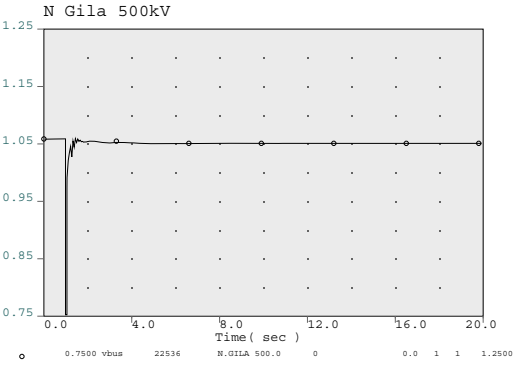
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RELATIVE VOLTAGE

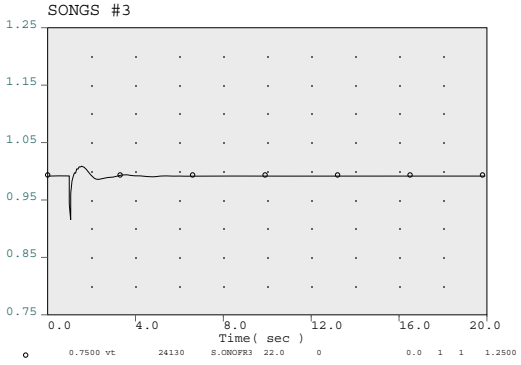
Palo Verde #1



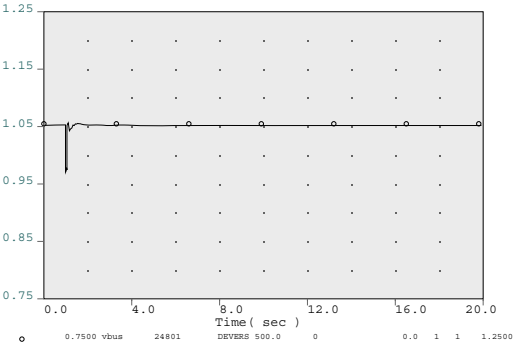
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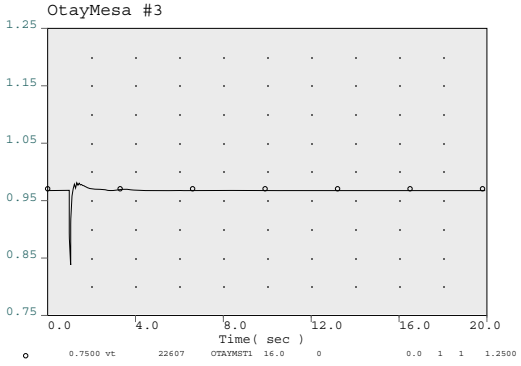
SONGS #3



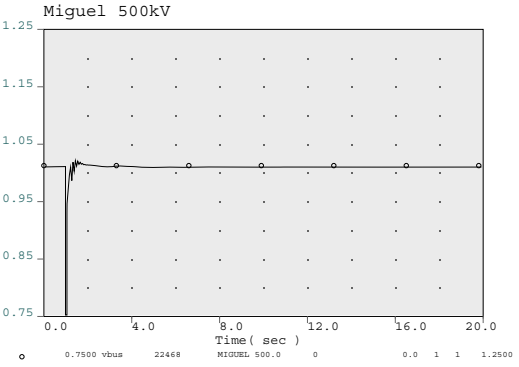
Devers 500



OtayMesa #3



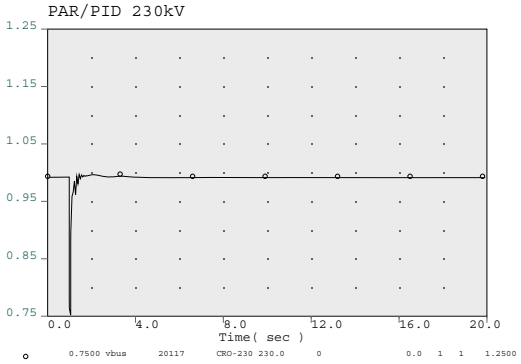
Miguel 500kV



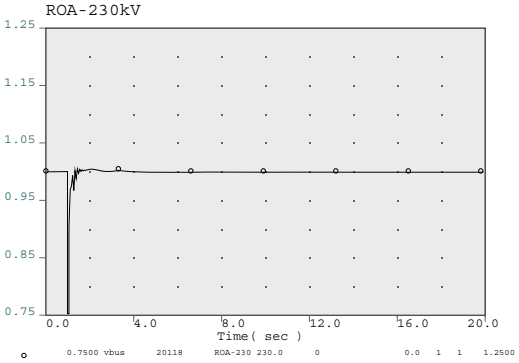
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

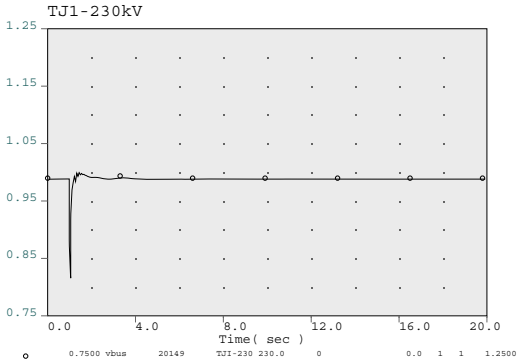
PAR/PID 230kV



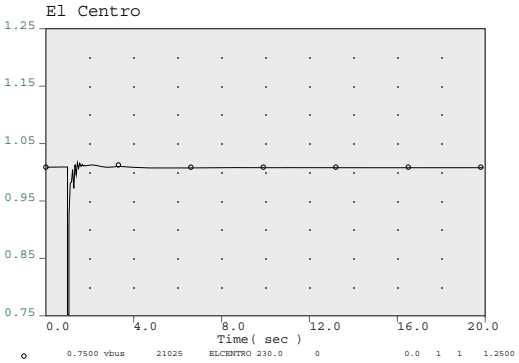
ROA-230kV



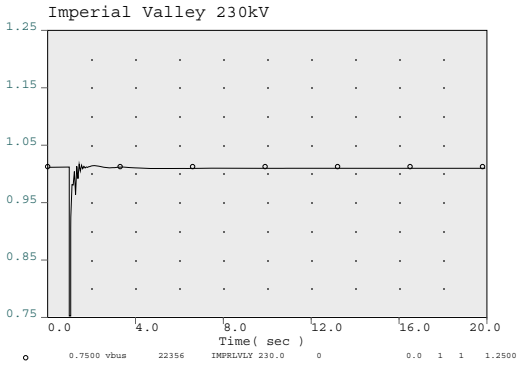
TJ1-230kV



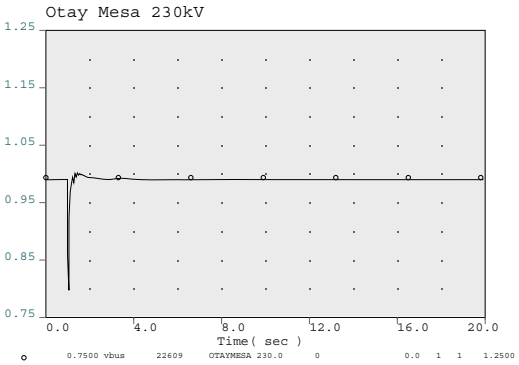
El Centro



Imperial Valley 230kV



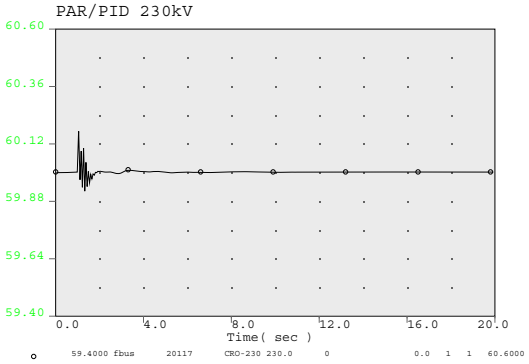
Otay Mesa 230kV



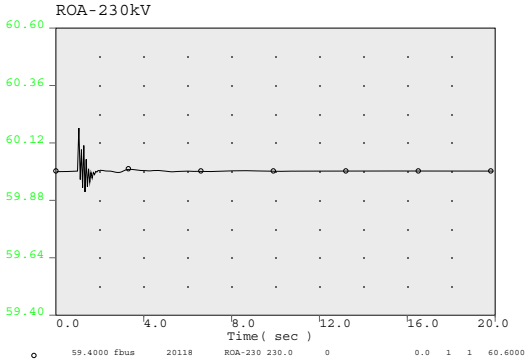
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Affected System Frequency Check and Comparison

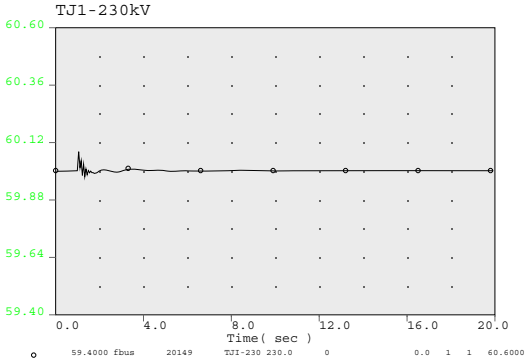
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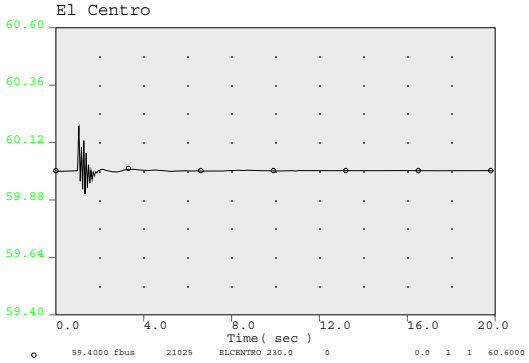
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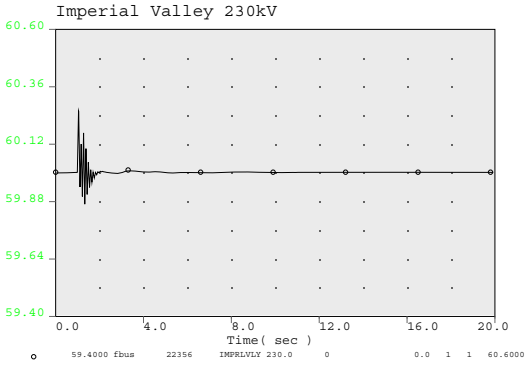
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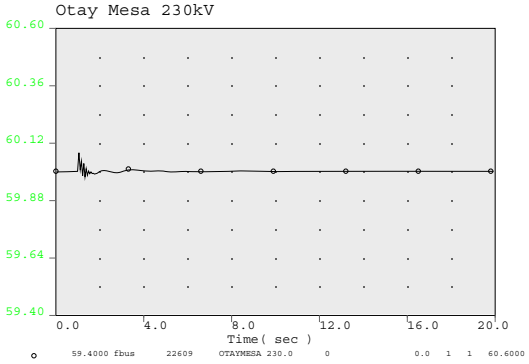
El Centro



Imperial Valley 230kV



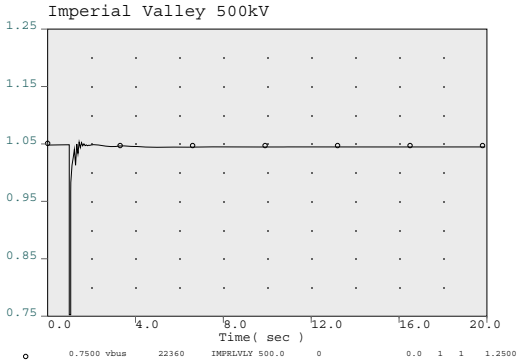
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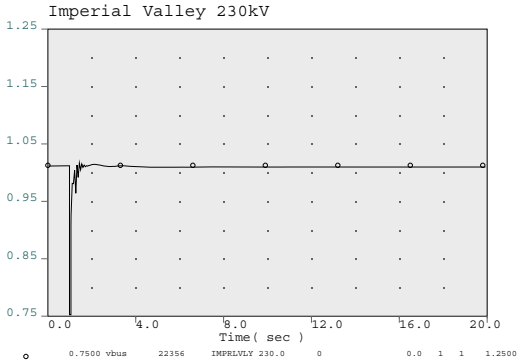
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

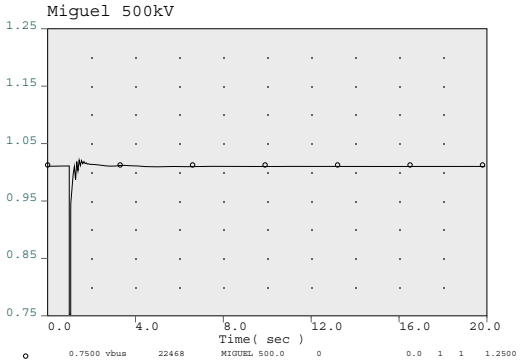
Imperial Valley 500kV



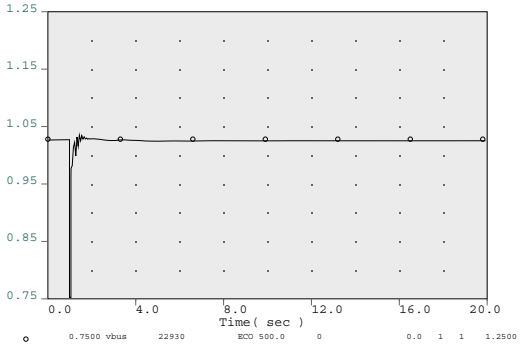
Imperial Valley 230kV



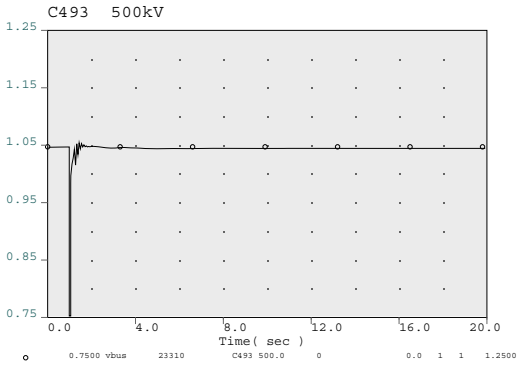
Miguel 500kV



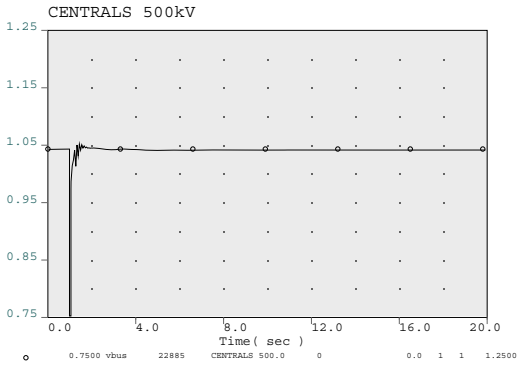
Windfarms 500



C493 500kV



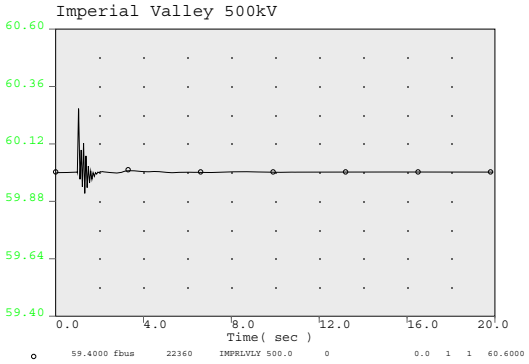
CENTRALS 500kV



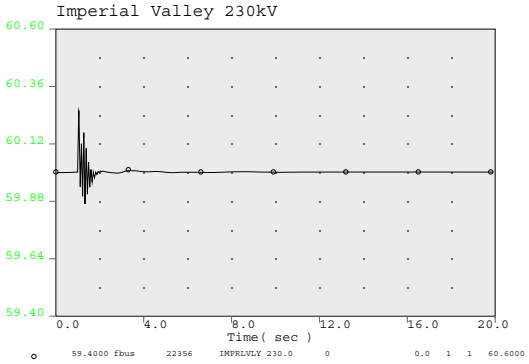
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - Frequency

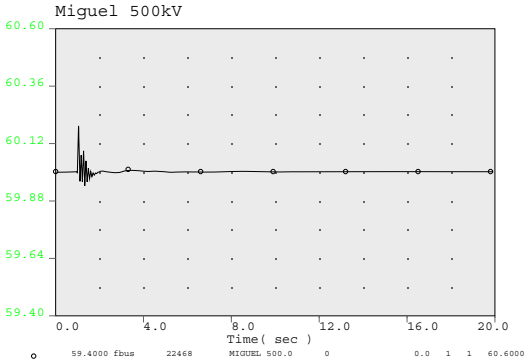
Imperial Valley 500kV



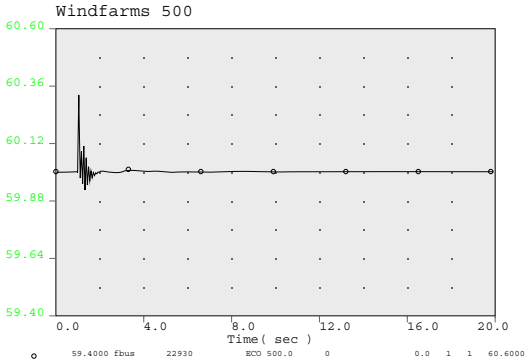
Imperial Valley 230kV



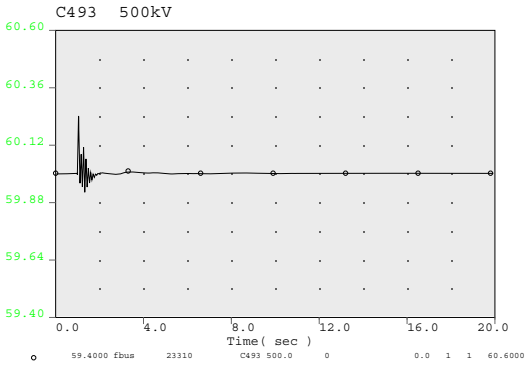
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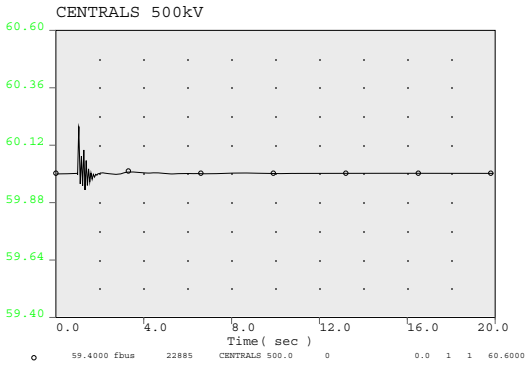
Windfarms 500



C493 500kV

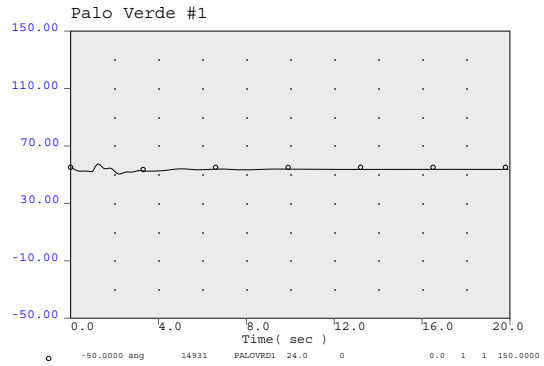


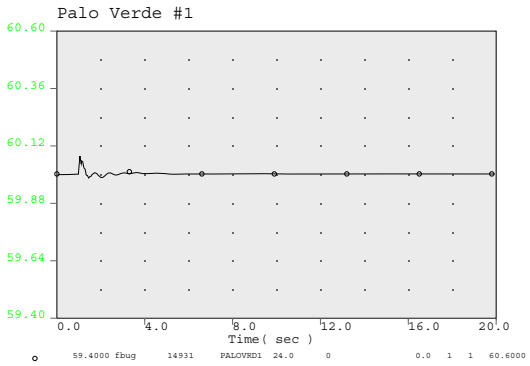
CENTRALS 500kV

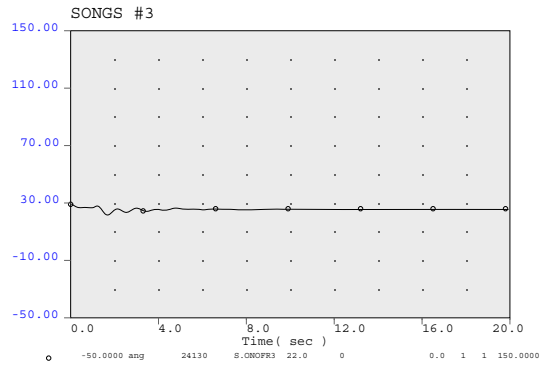


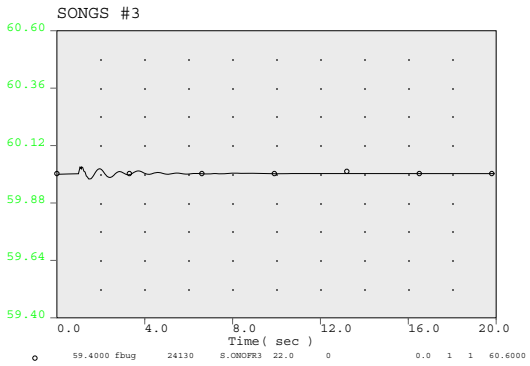
SDG&E Cluster 2 - post
2014 Heavy Summer
Haasyampa-N.Gila 500 kV line

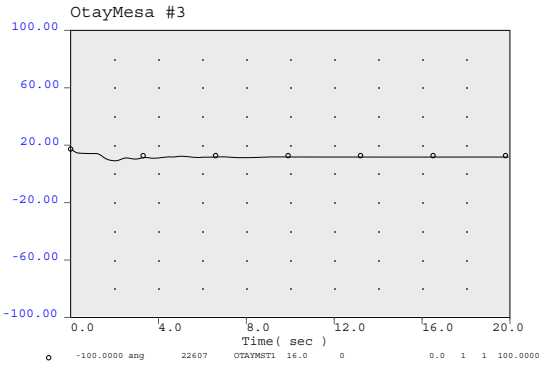
RELATIVE ROTOR ANGLE & FREQUENCY

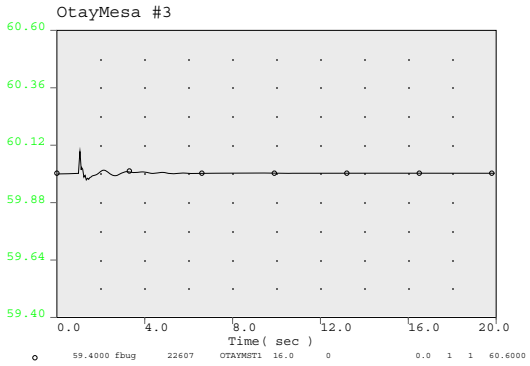












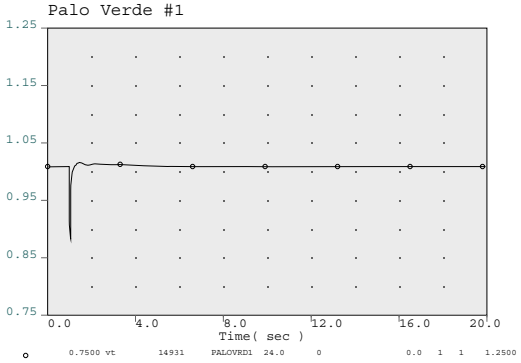
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Page 1

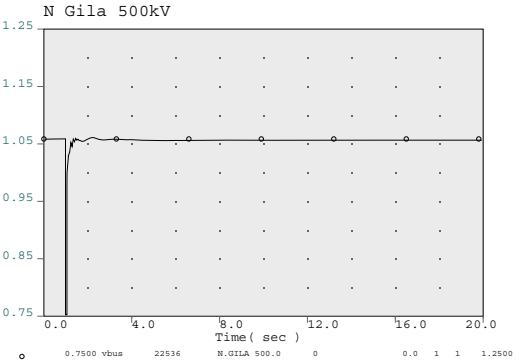
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RELATIVE VOLTAGE

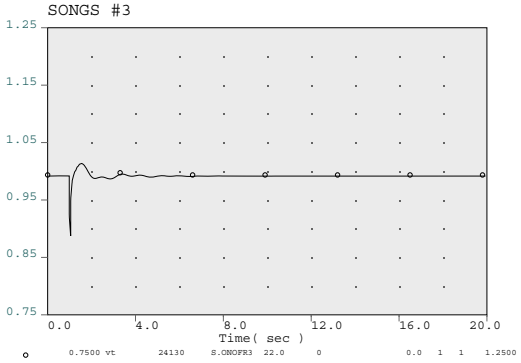
Palo Verde #1



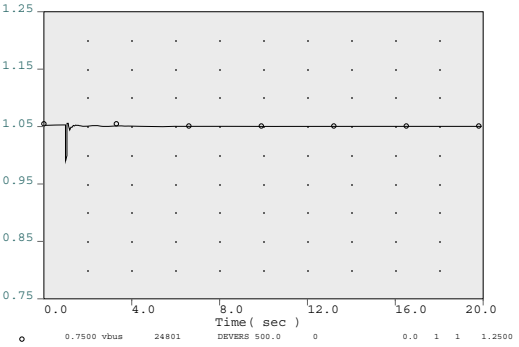
N Gila 500kV



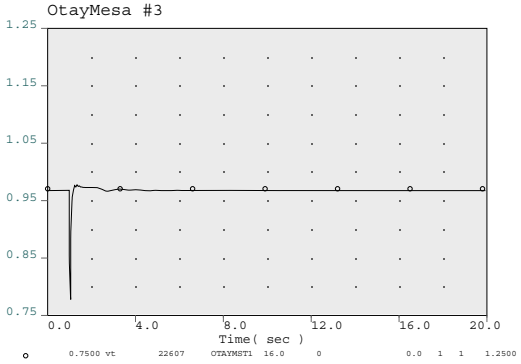
SONGS #3



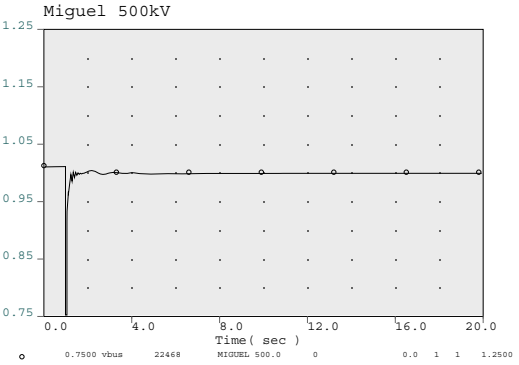
Devers 500



OtayMesa #3



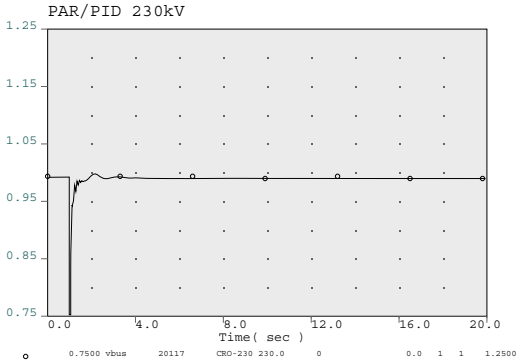
Miguel 500kV



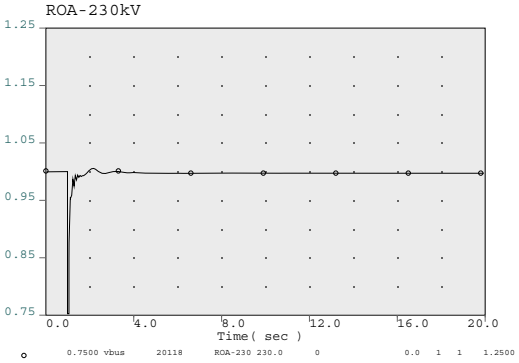
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

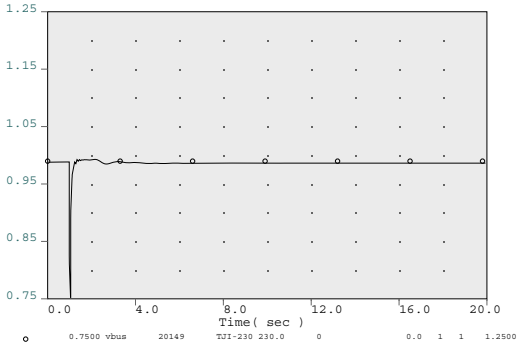
PAR/PID 230kV



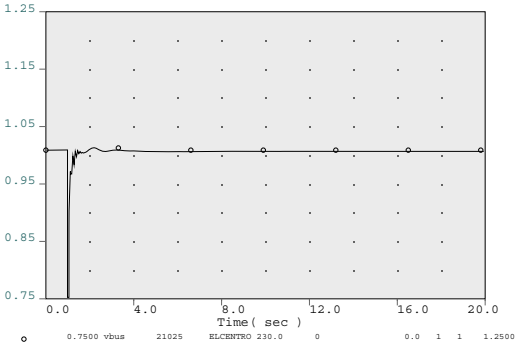
ROA-230kV



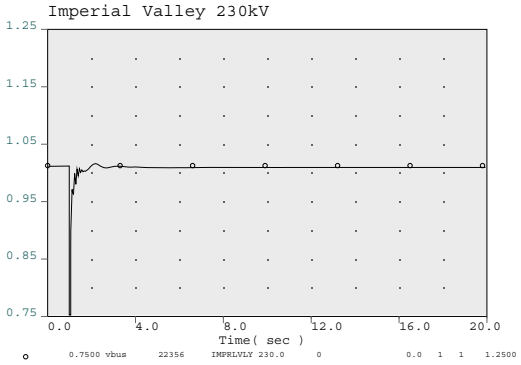
TJ1-230kV



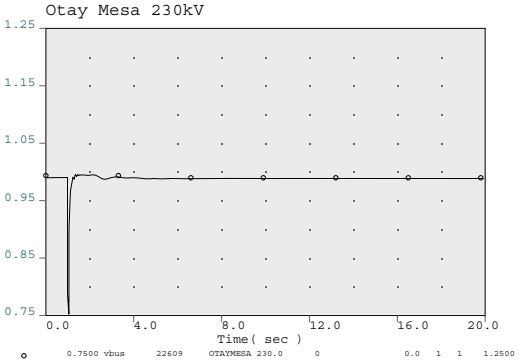
El Centro



Imperial Valley 230kV



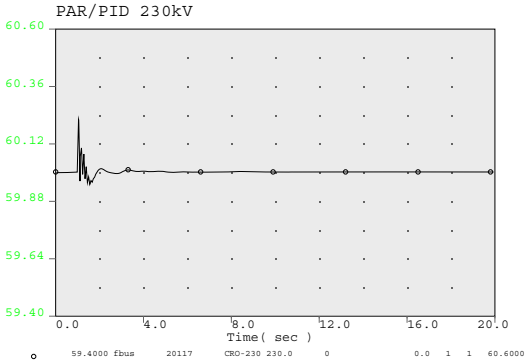
Otay Mesa 230kV



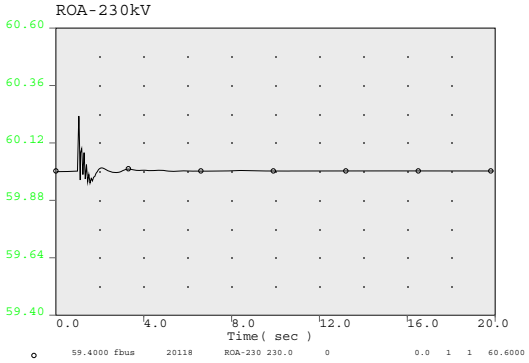
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

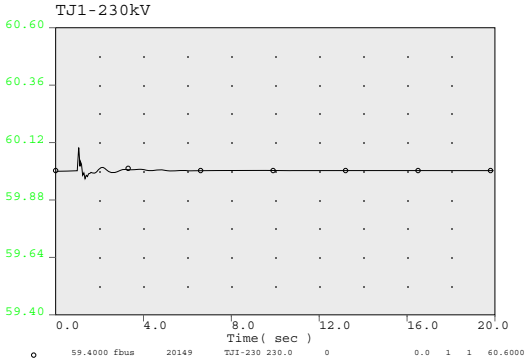
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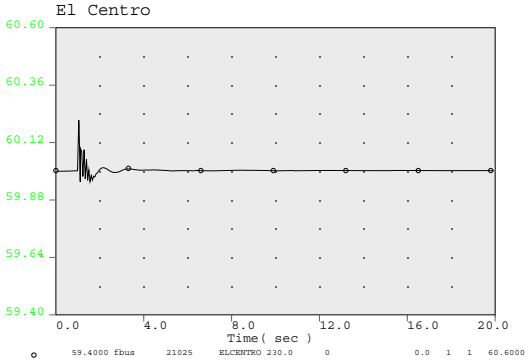
ROA-230kV



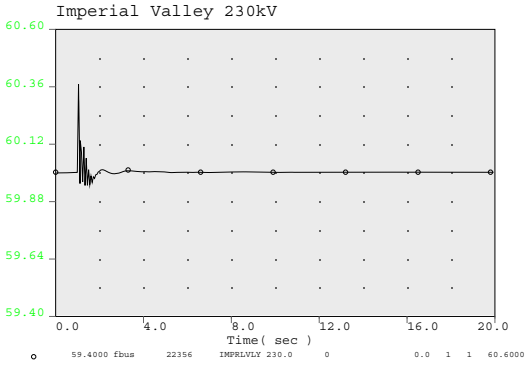
TJ1-230kV



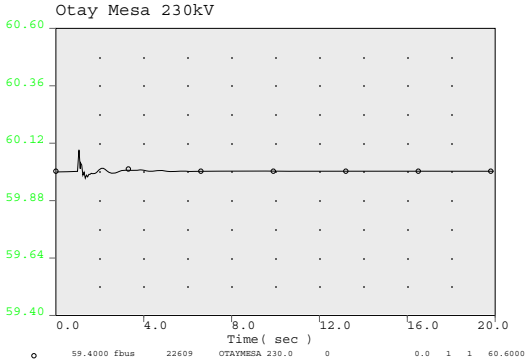
El Centro



Imperial Valley 230kV

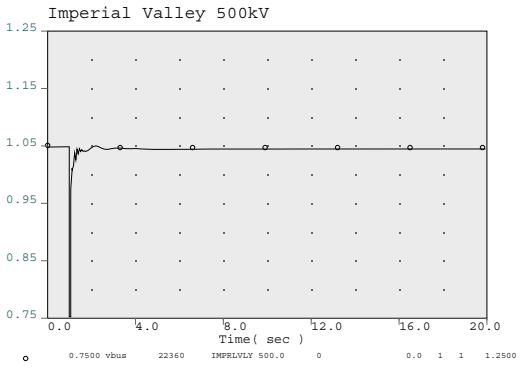


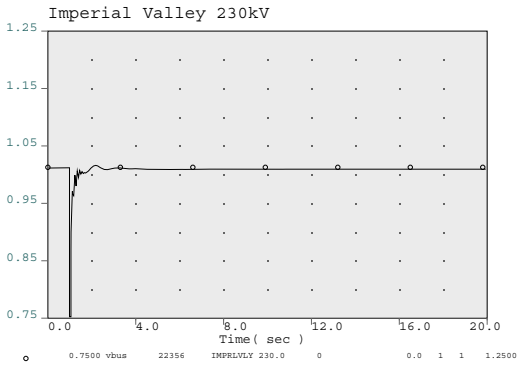
Otay Mesa 230kV

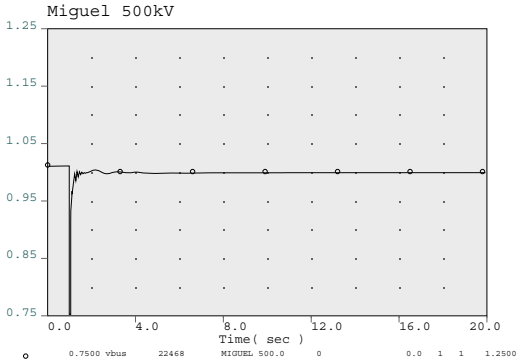


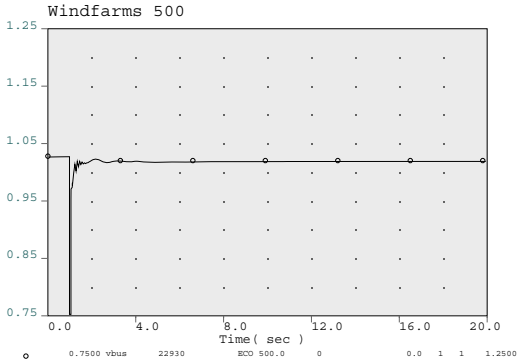
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

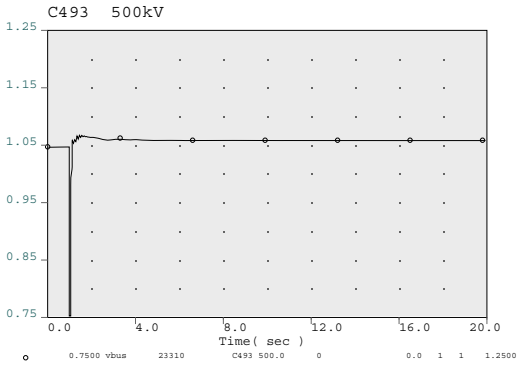
Imperial Valley Area - VOLTAGE

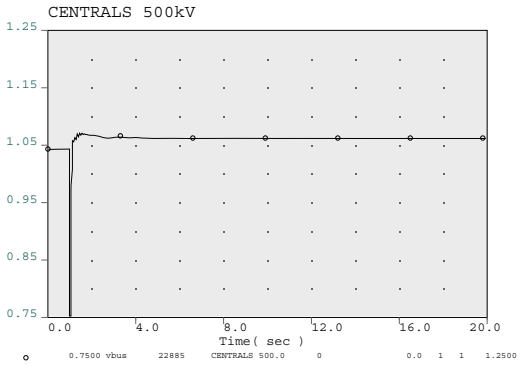






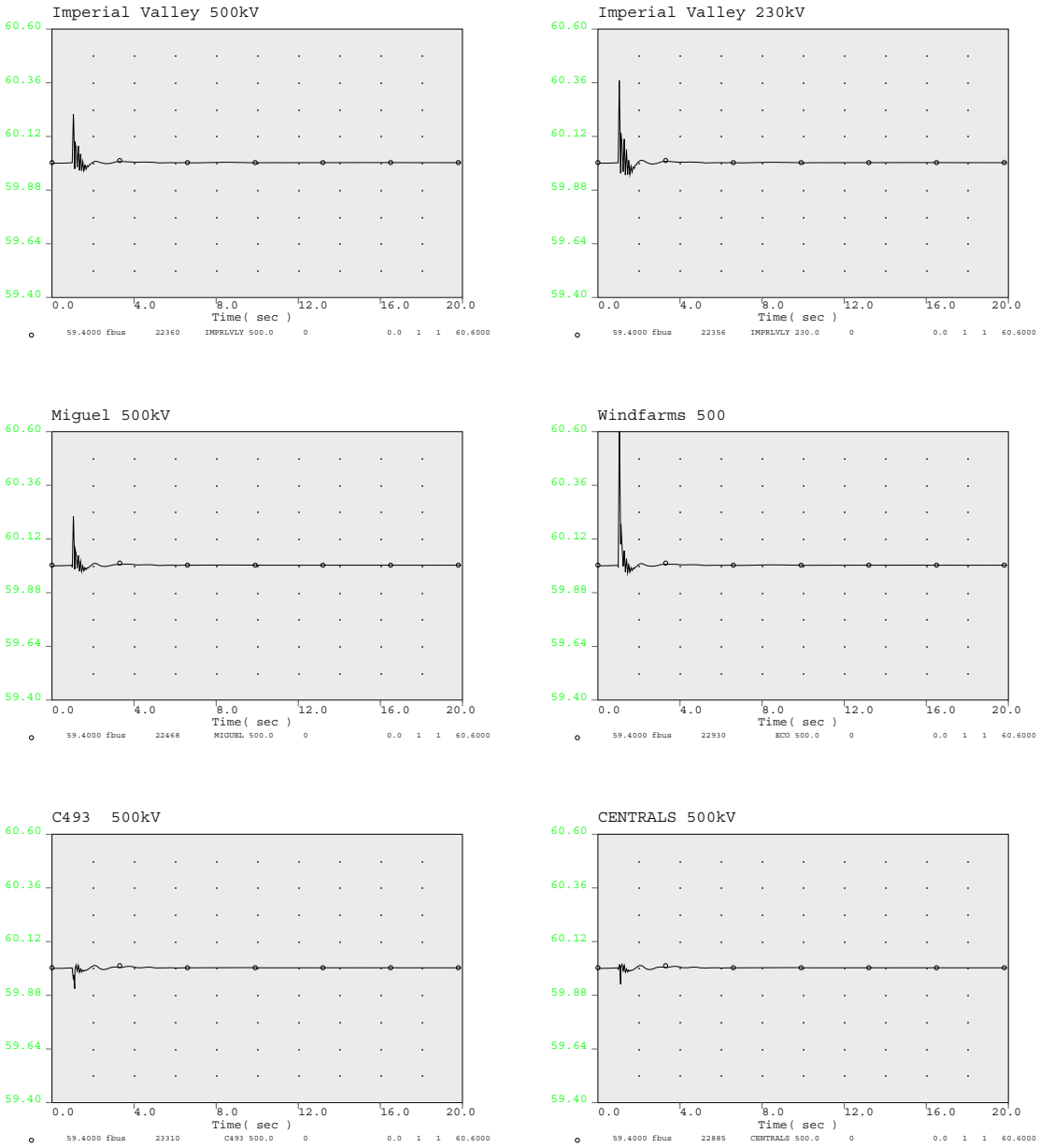






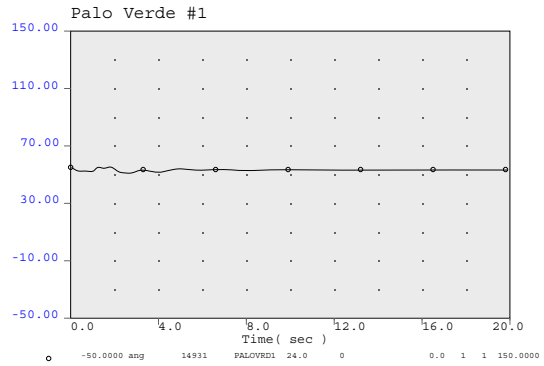
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

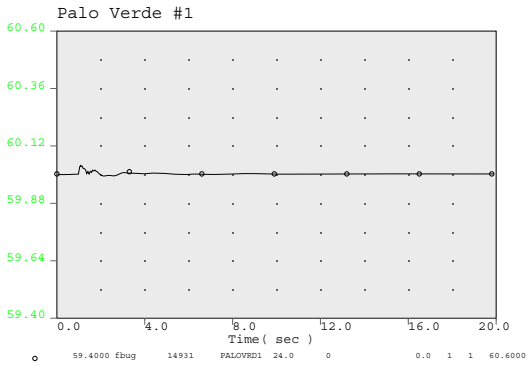
Imperial Valley Area - Frequency

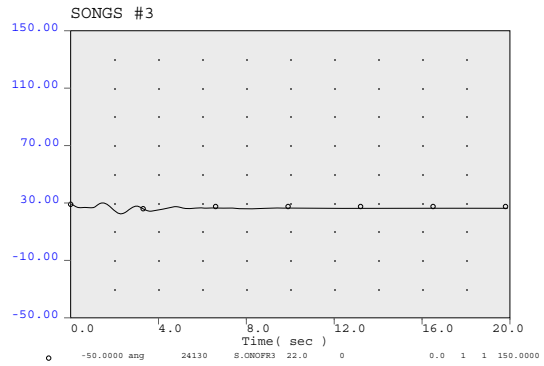


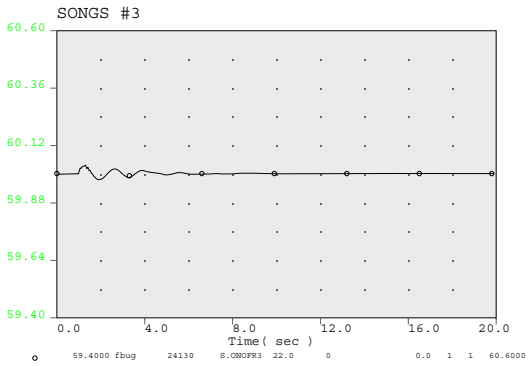
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

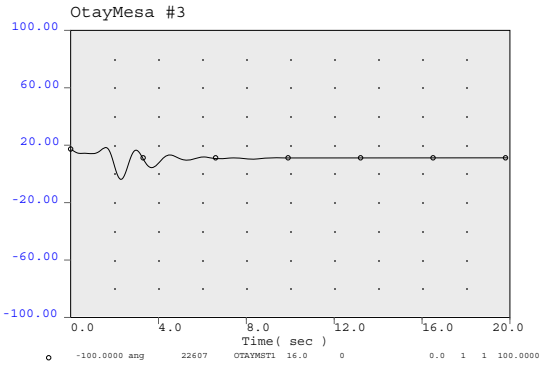
RELATIVE ROTOR ANGLE & FREQUENCY

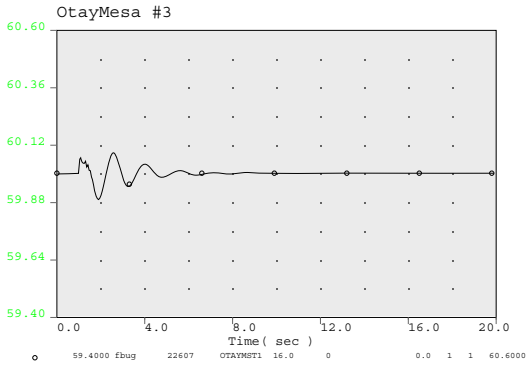










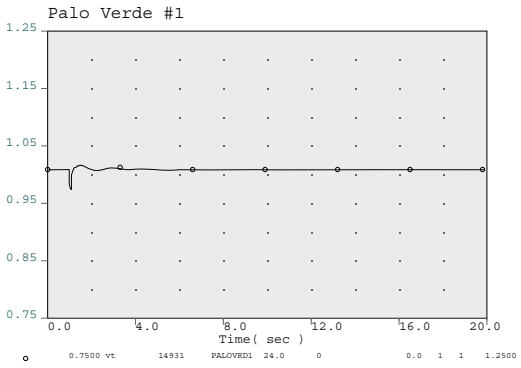


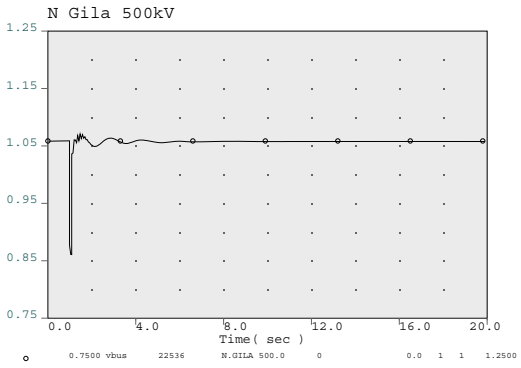
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

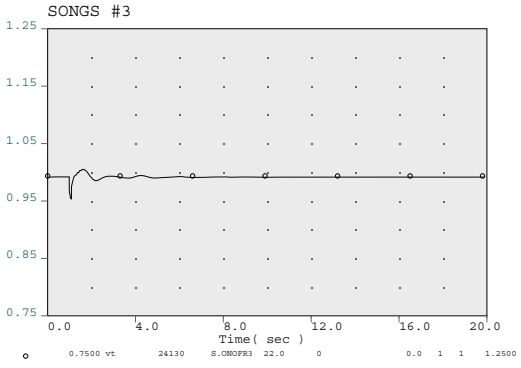
Page 1

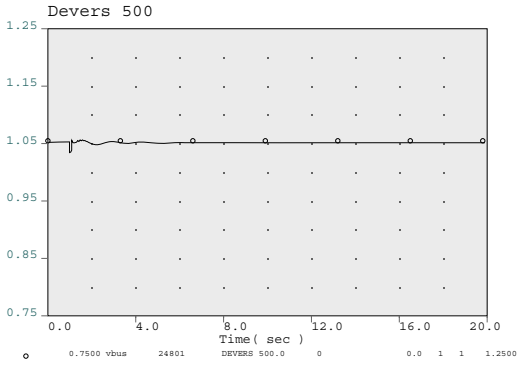
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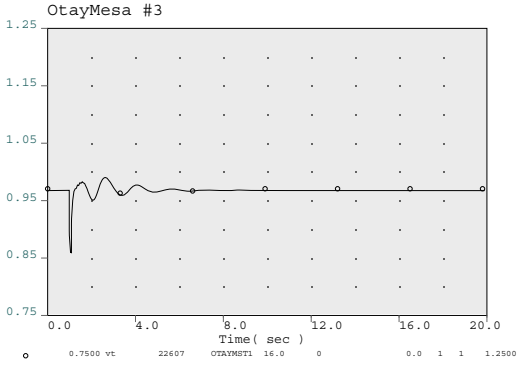
RELATIVE VOLTAGE

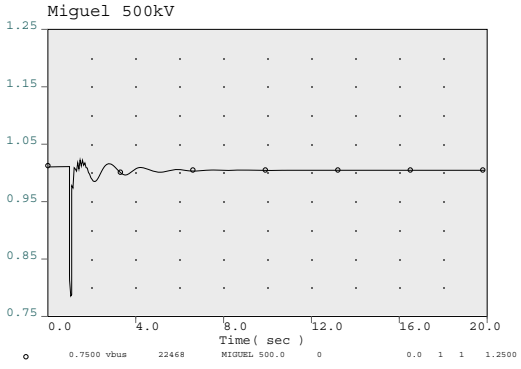








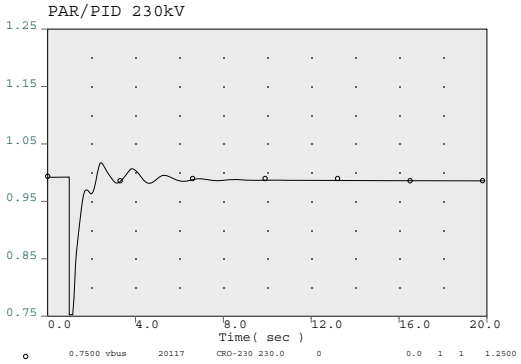




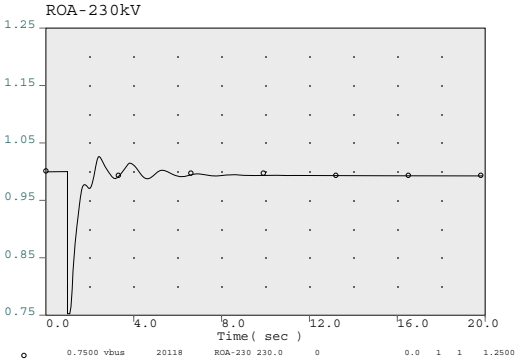
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

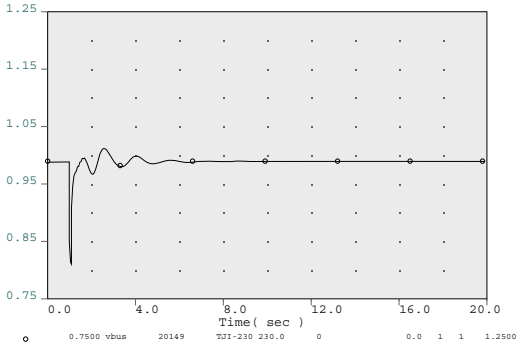
PAR/PID 230kV



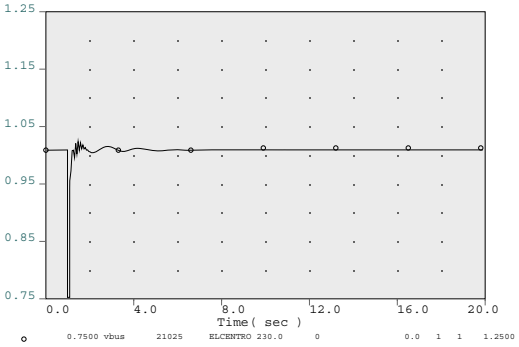
ROA-230kV



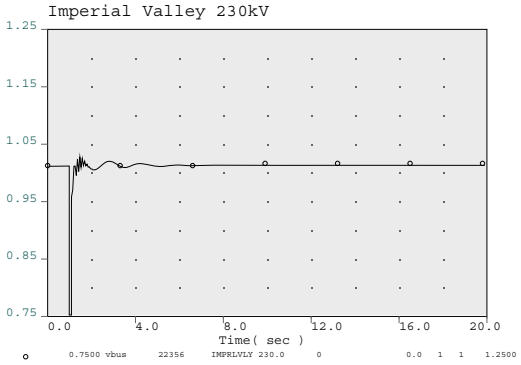
TJ1-230kV



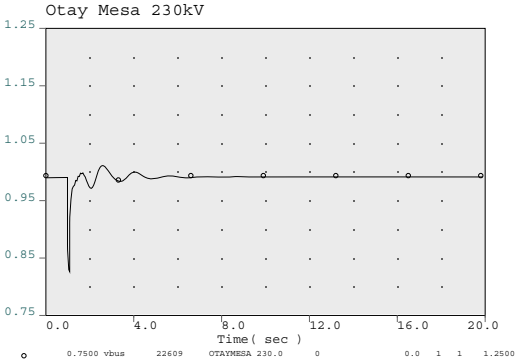
El Centro



Imperial Valley 230kV



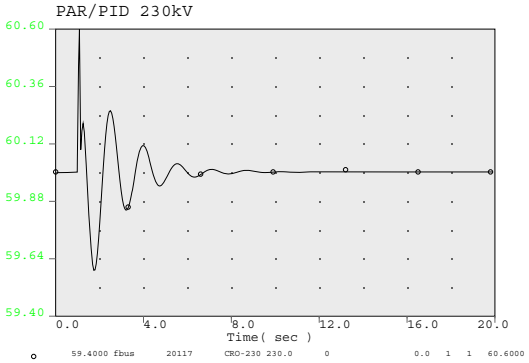
Otay Mesa 230kV



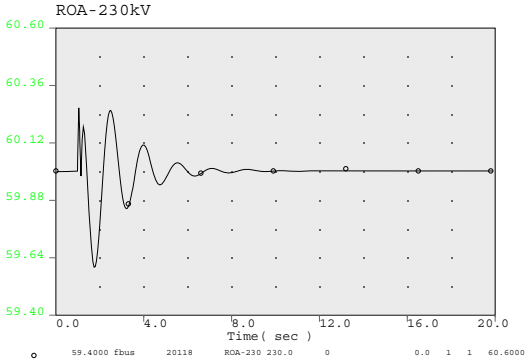
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Frequency Check and Comparison

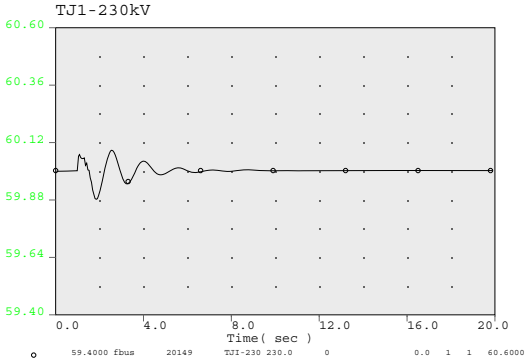
PAR/PID 230kV



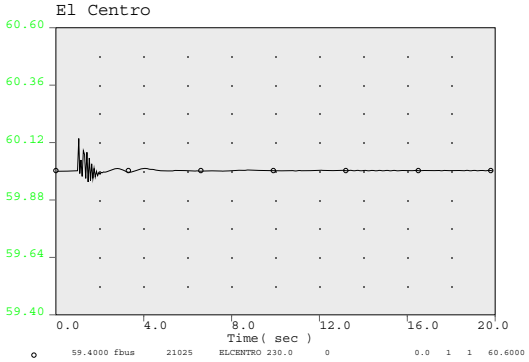
ROA-230kV



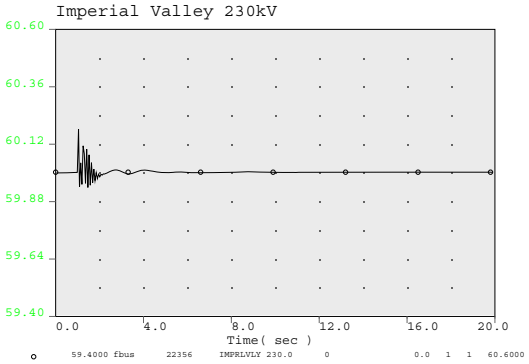
TJ1-230kV



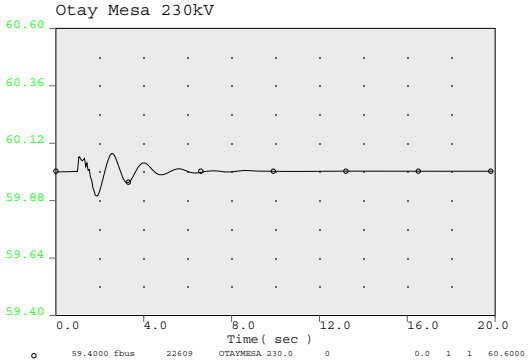
El Centro



Imperial Valley 230kV



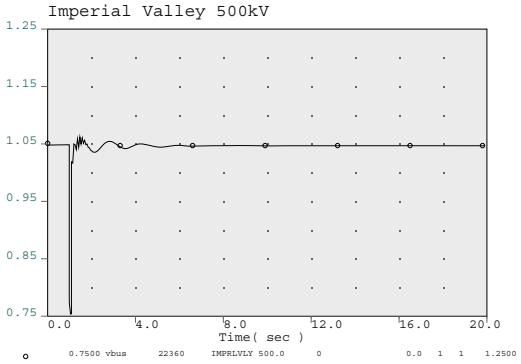
Otay Mesa 230kV



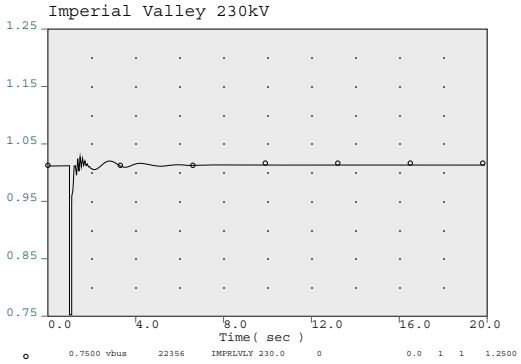
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

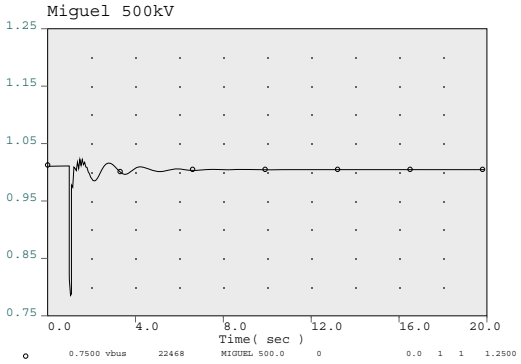
Imperial Valley 500kV



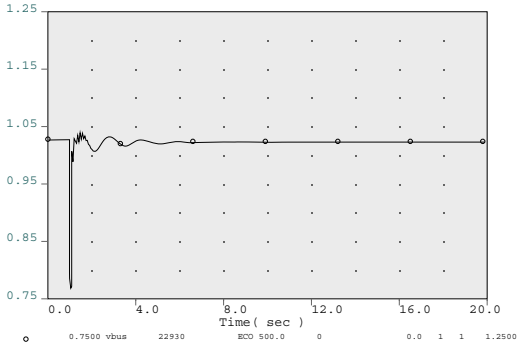
Imperial Valley 230kV



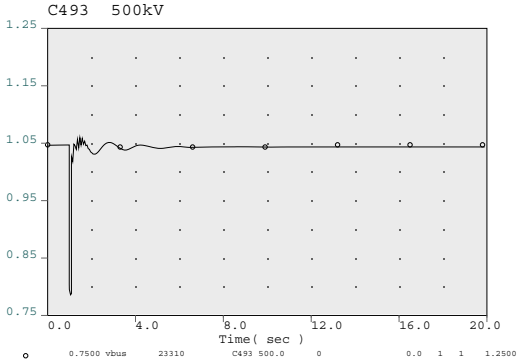
Miguel 500kV



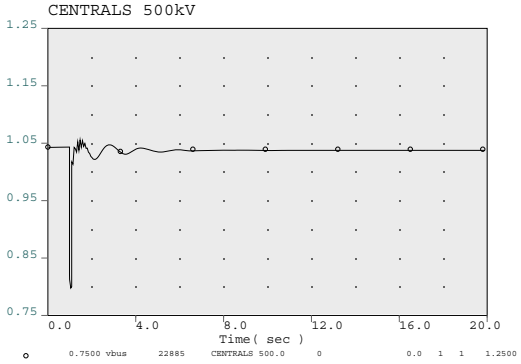
Windfarms 500



C493 500kV

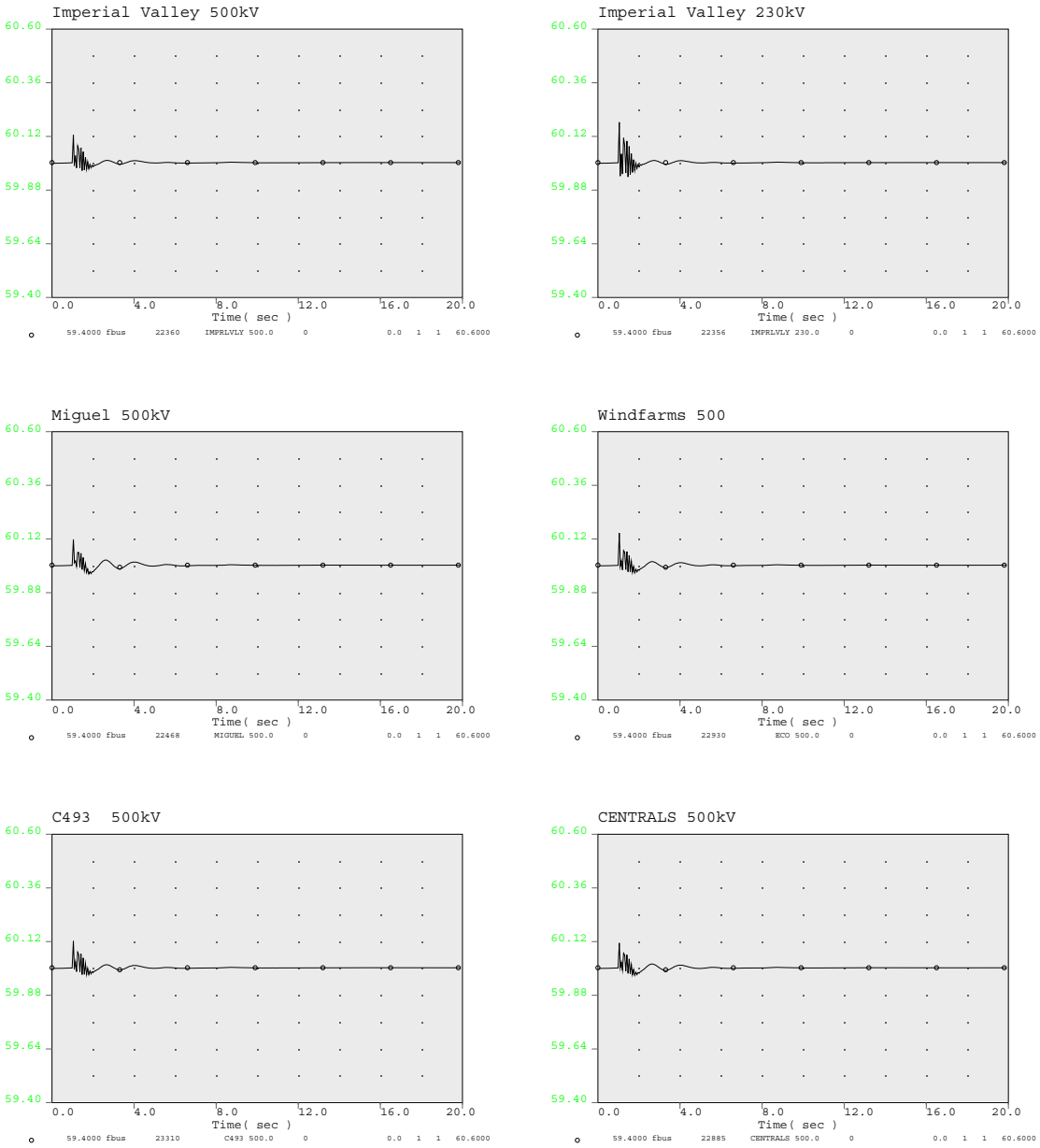


CENTRALS 500kV



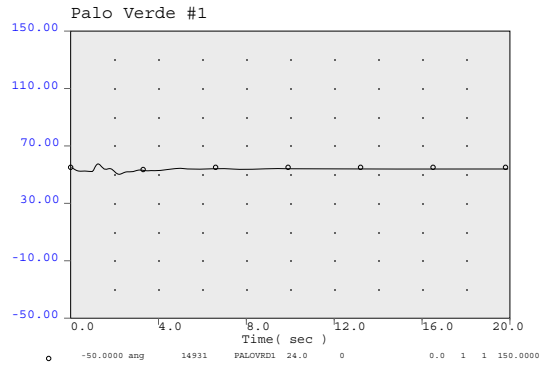
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

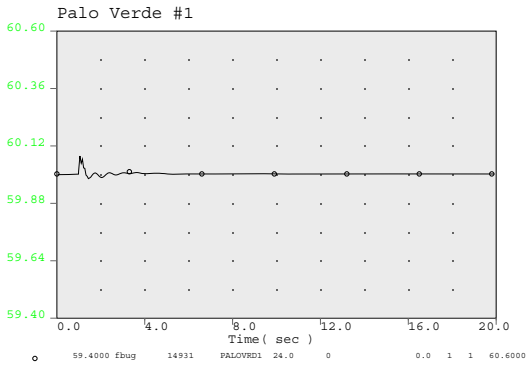
Imperial Valley Area - Frequency

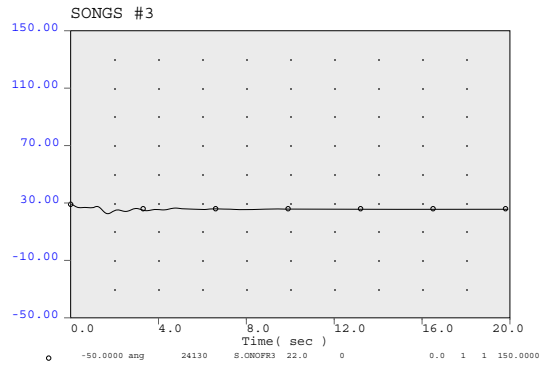


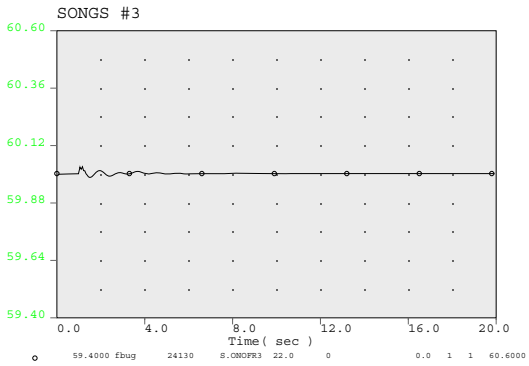
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

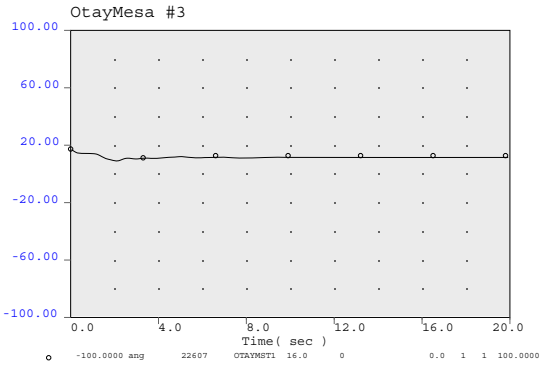
RELATIVE ROTOR ANGLE & FREQUENCY

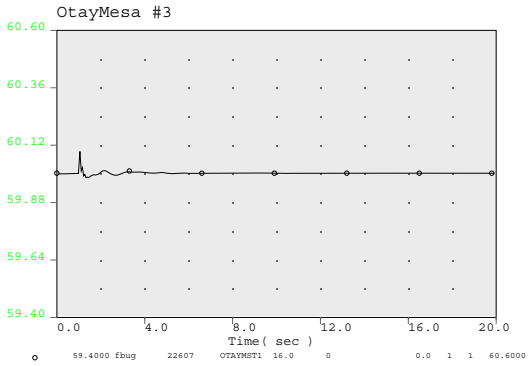










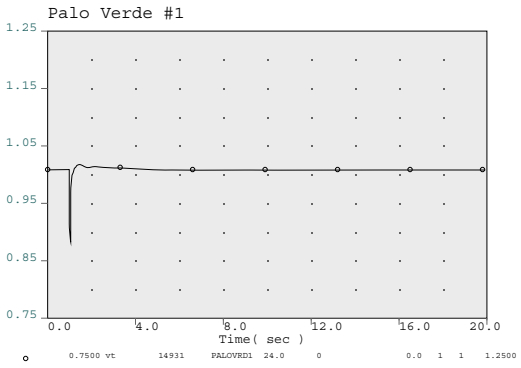


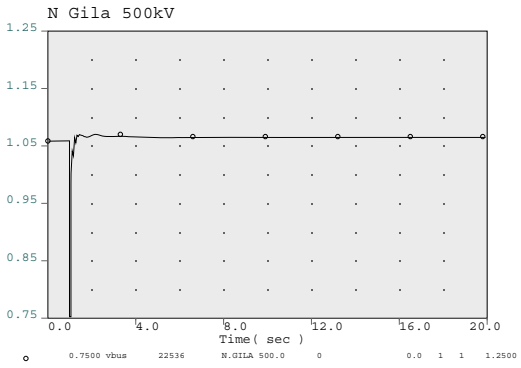
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

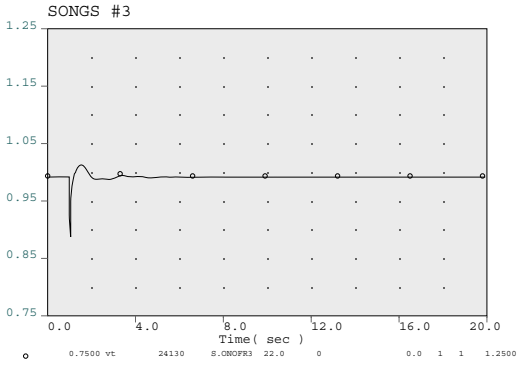
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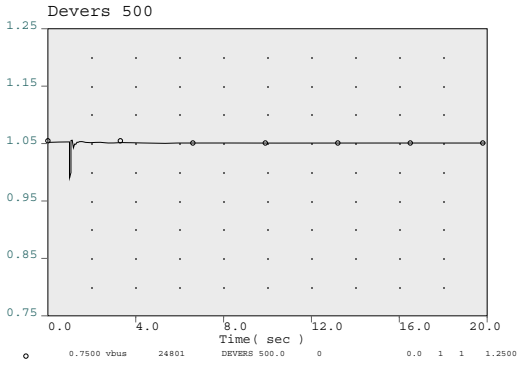
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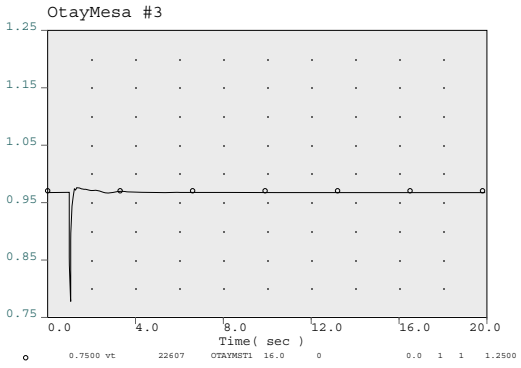
RELATIVE VOLTAGE

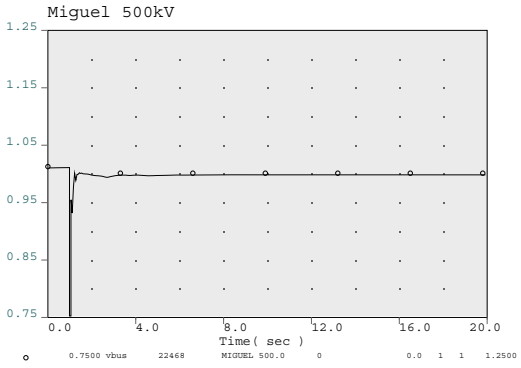








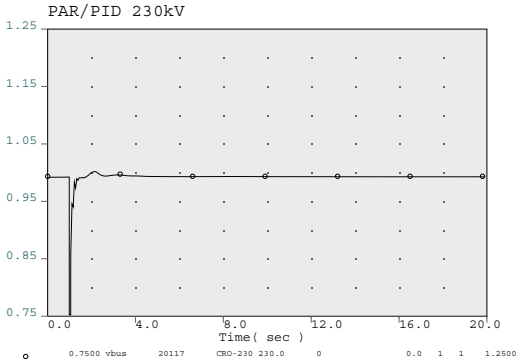




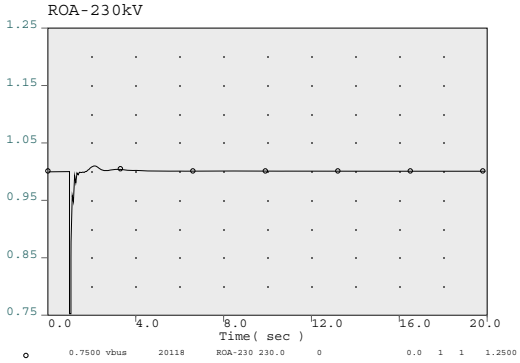
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

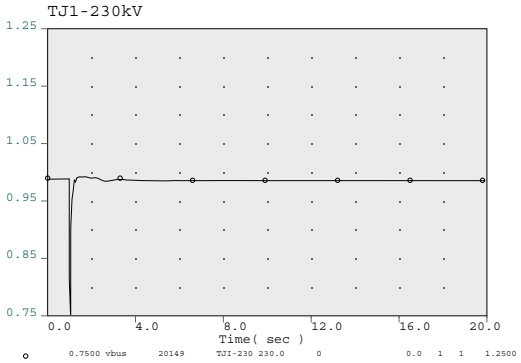
PAR/PID 230kV



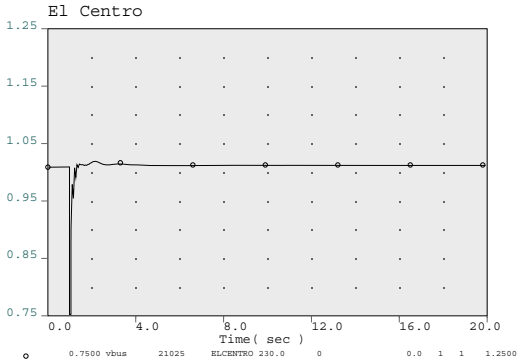
ROA-230kV



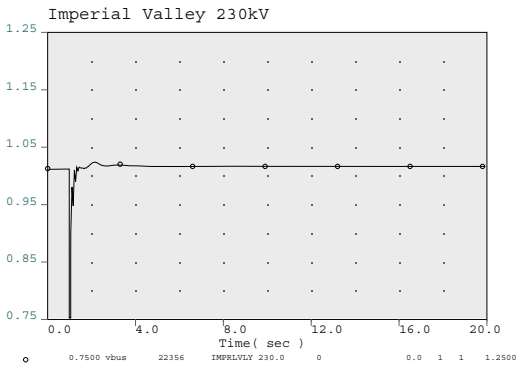
TJ1-230kV



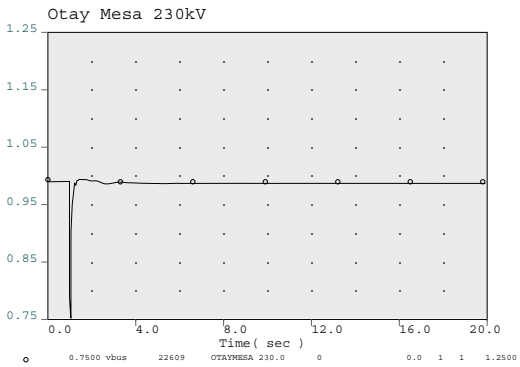
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



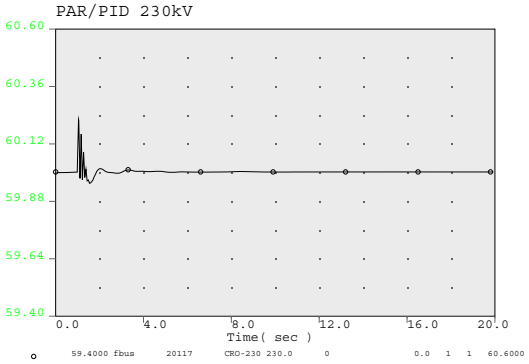
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

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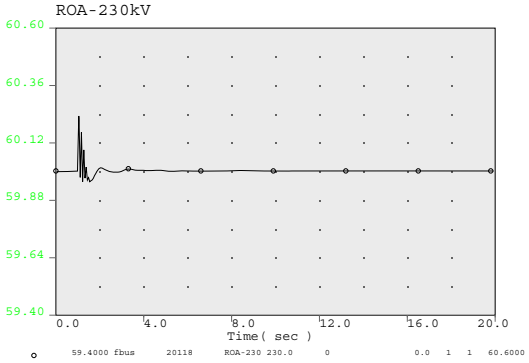
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Affected System Frequency Check and Comparison

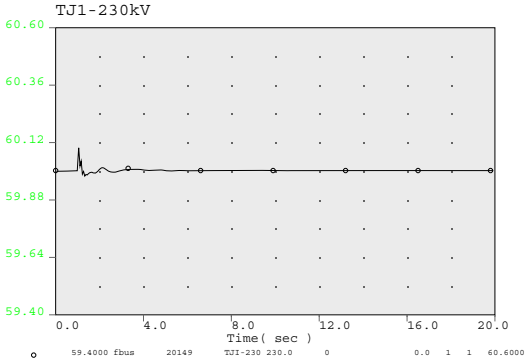
PAR/PID 230kV



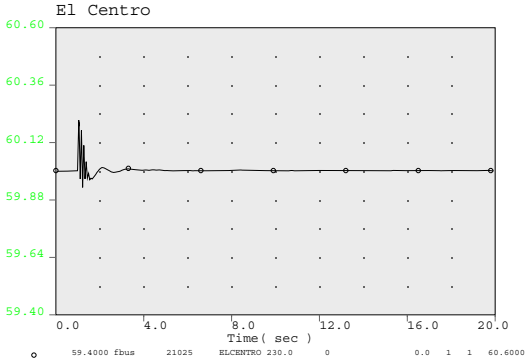
ROA-230kV



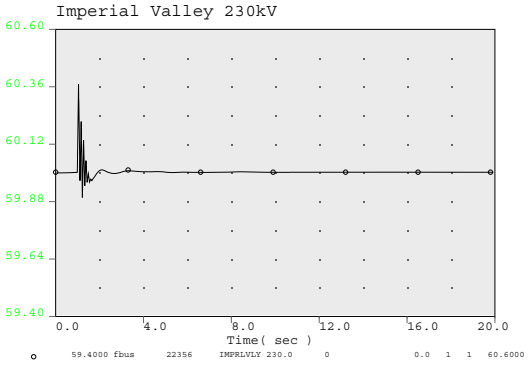
TJ1-230kV



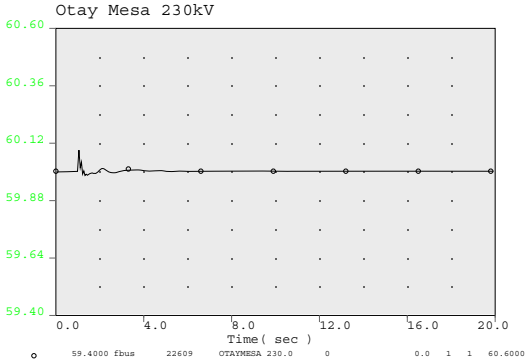
El Centro



Imperial Valley 230kV



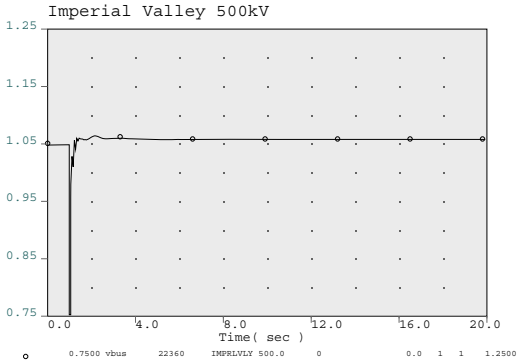
Otay Mesa 230kV



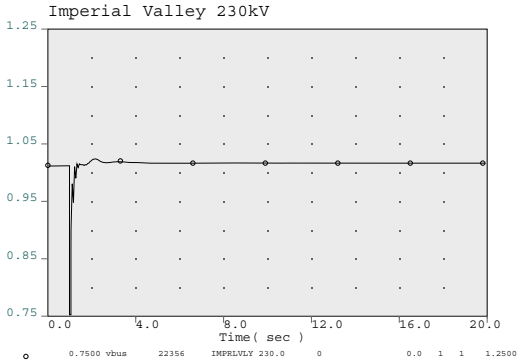
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

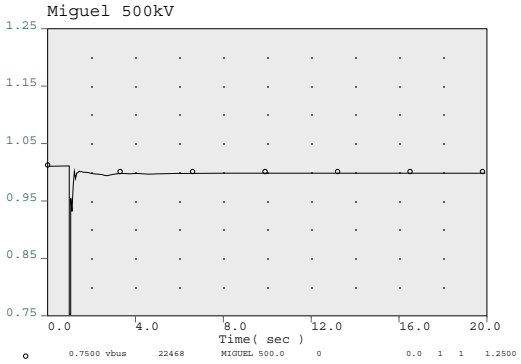
Imperial Valley 500kV



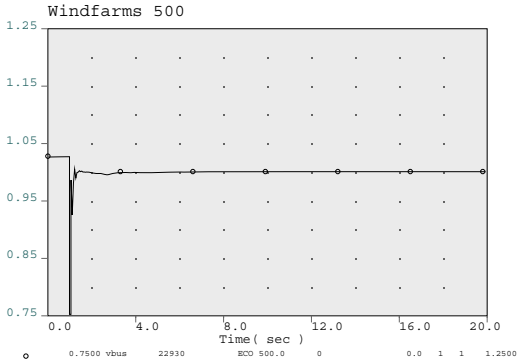
Imperial Valley 230kV



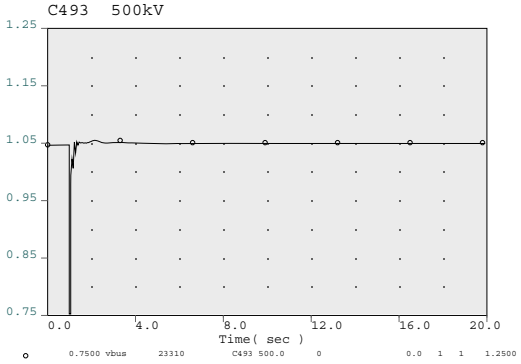
Miguel 500kV



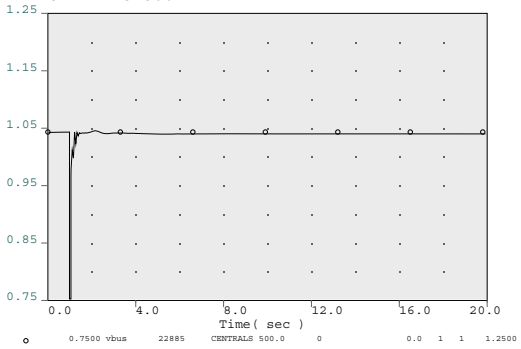
Windfarms 500



C493 500kV

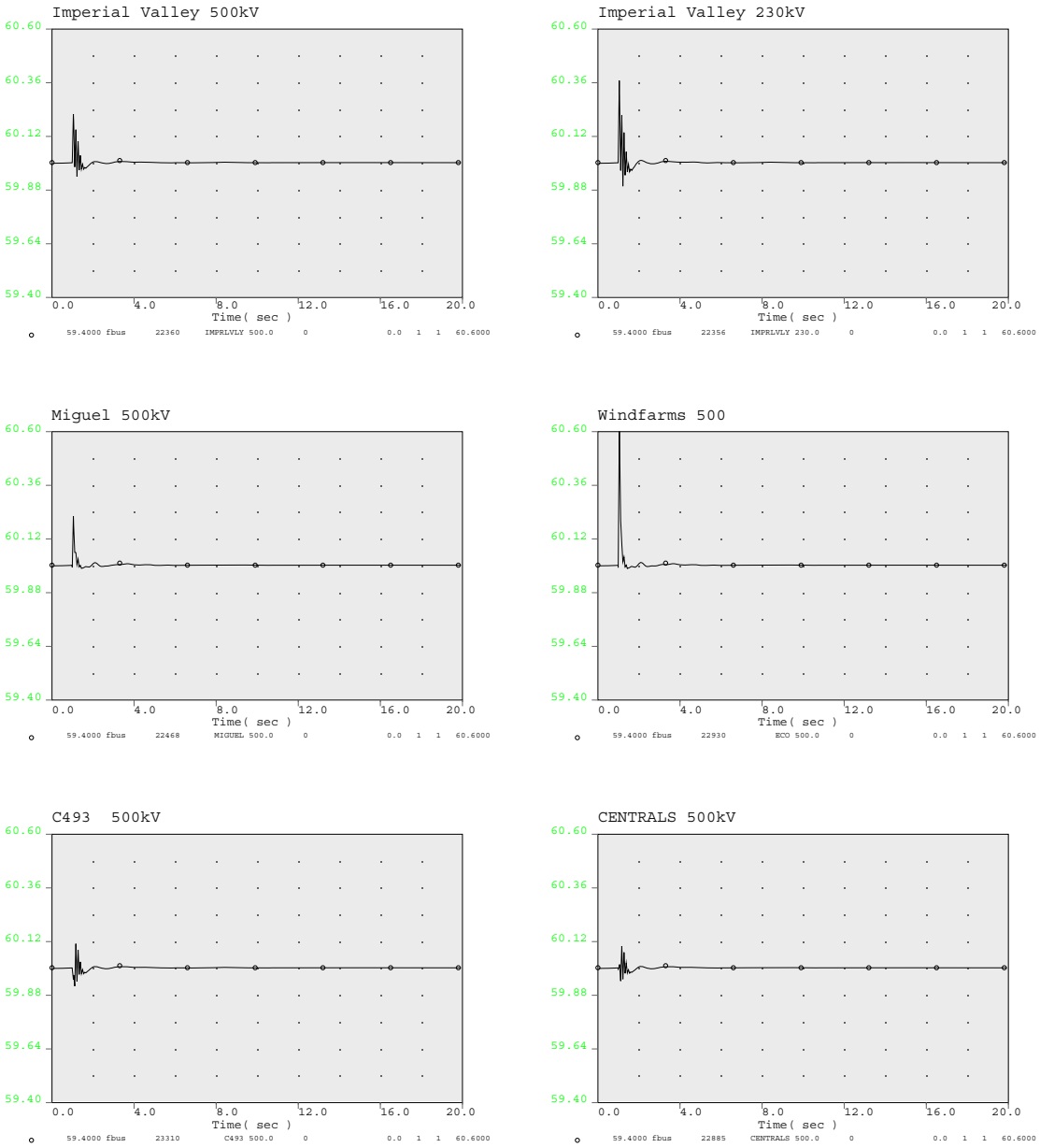


CENTRALS 500kV



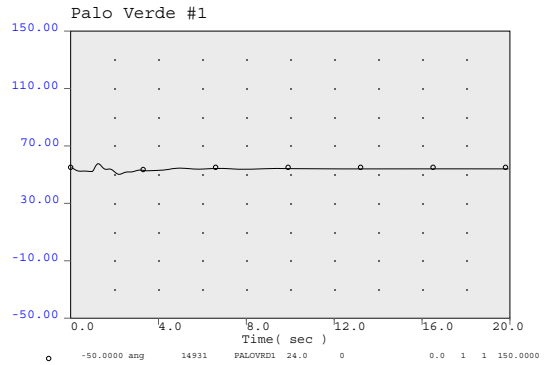
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

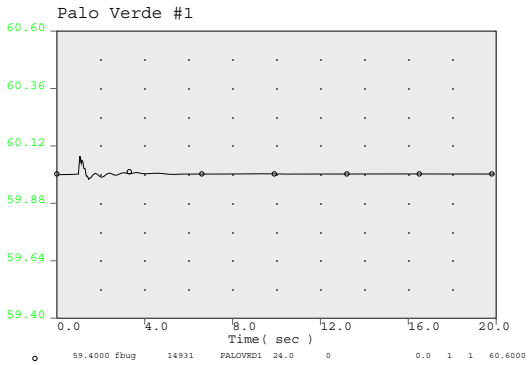
Imperial Valley Area - Frequency

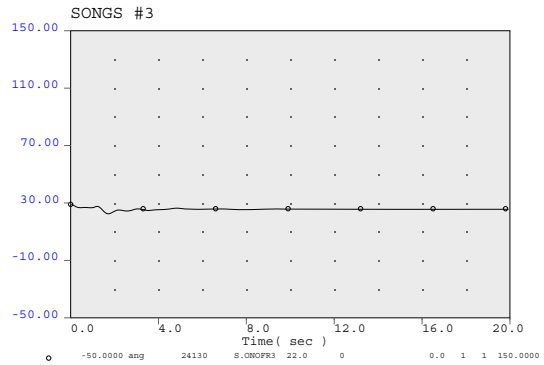


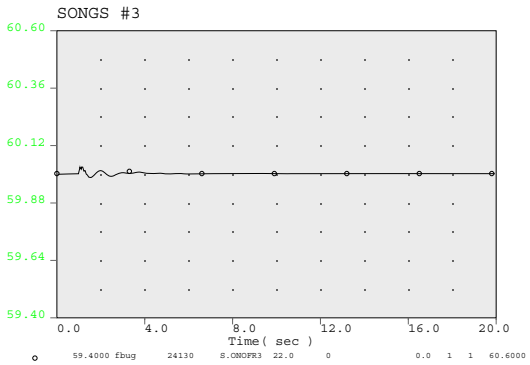
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

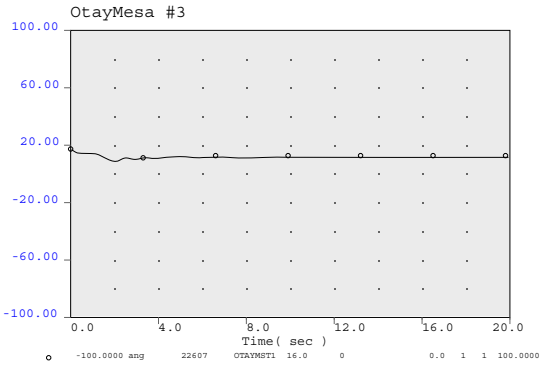
RELATIVE ROTOR ANGLE & FREQUENCY

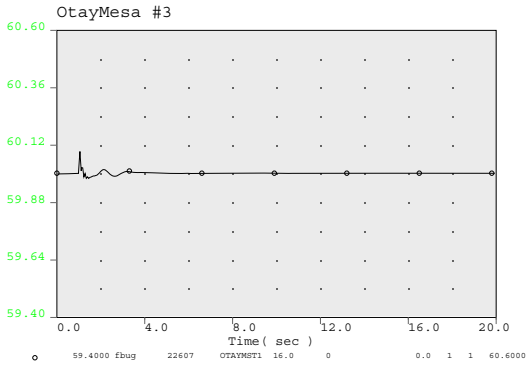












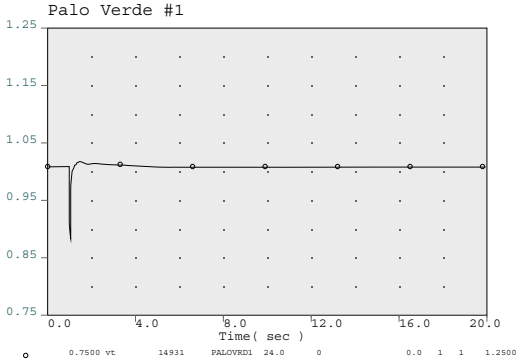
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

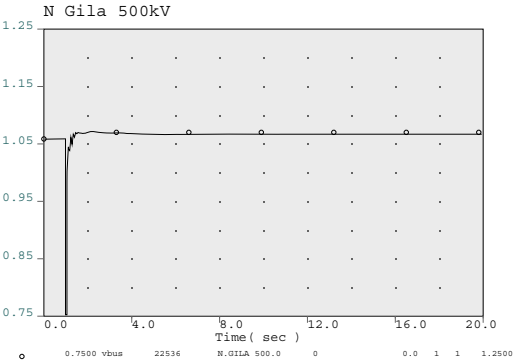
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RELATIVE VOLTAGE

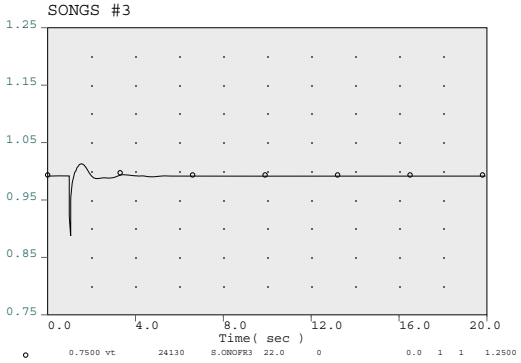
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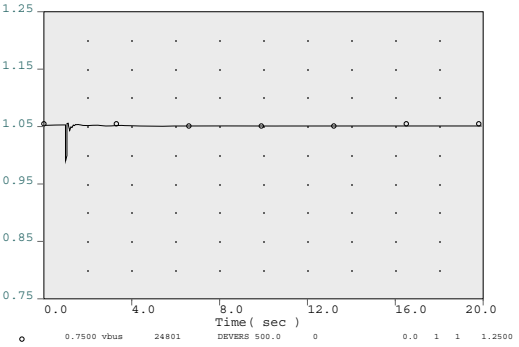
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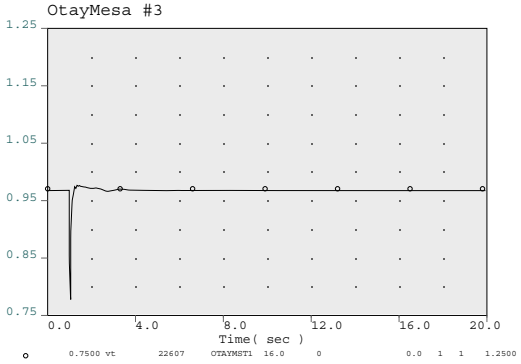
SONGS #3



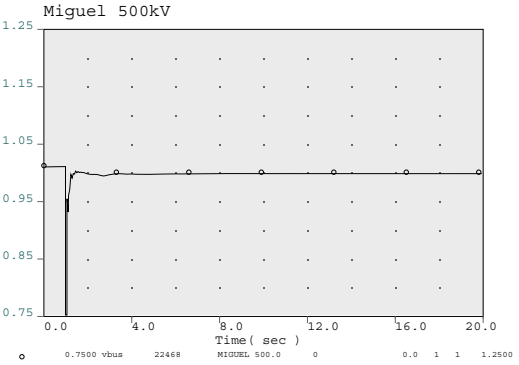
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OtayMesa #3



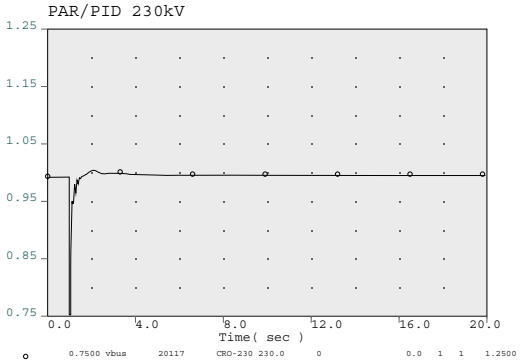
Miguel 500kV



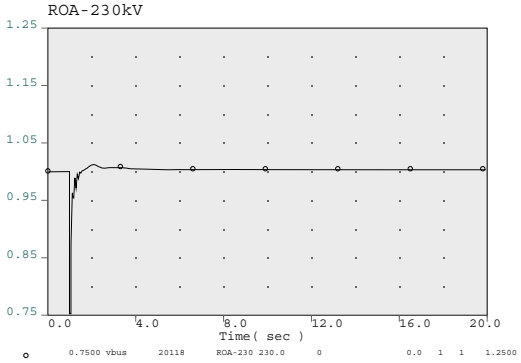
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

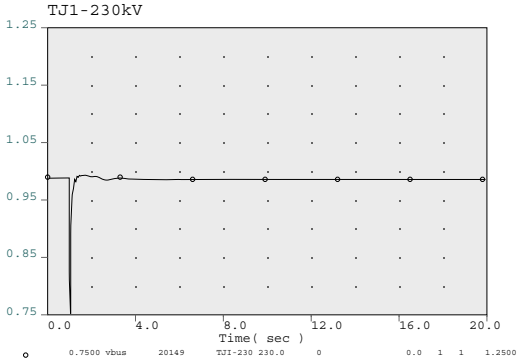
PAR/PID 230kV



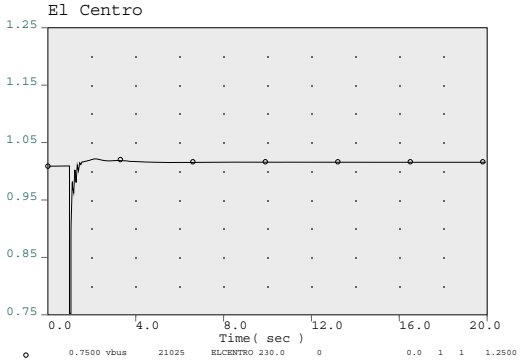
ROA-230kV



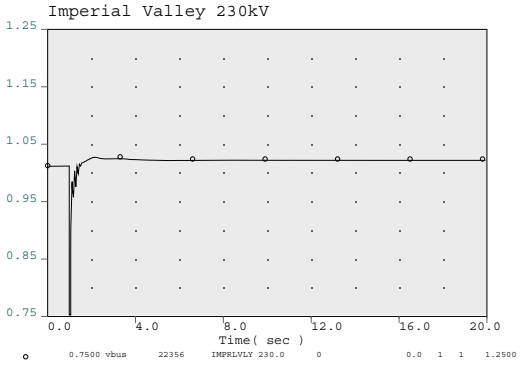
TJ1-230kV



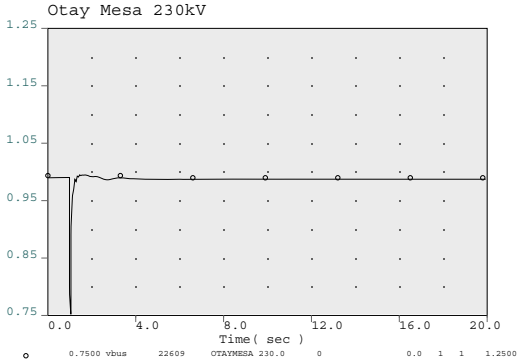
El Centro



Imperial Valley 230kV



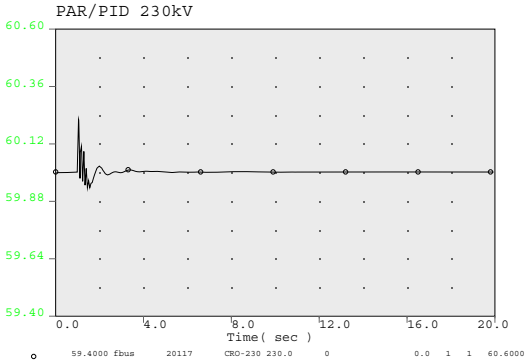
Otay Mesa 230kV



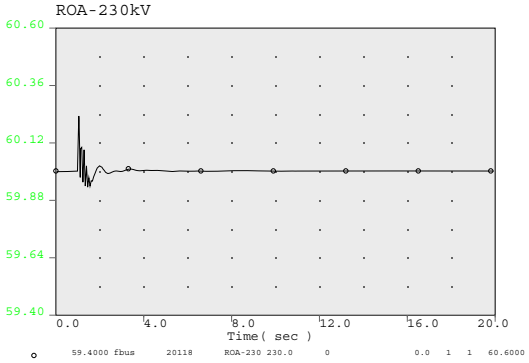
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

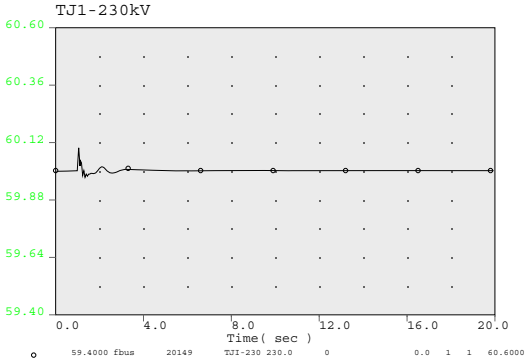
PAR/PID 230kV



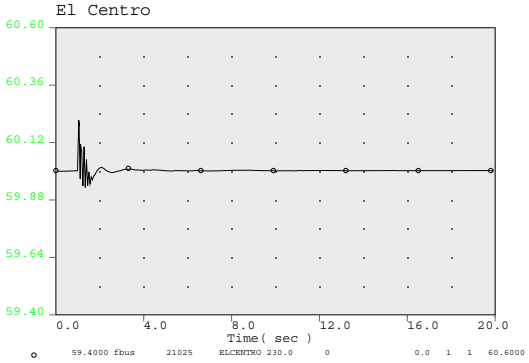
ROA-230kV



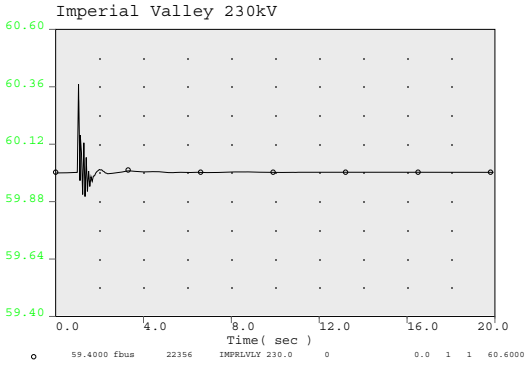
TJ1-230kV



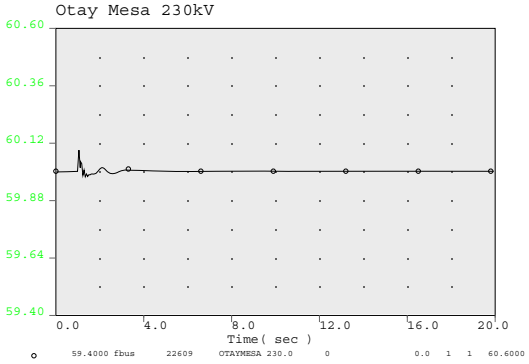
El Centro



Imperial Valley 230kV



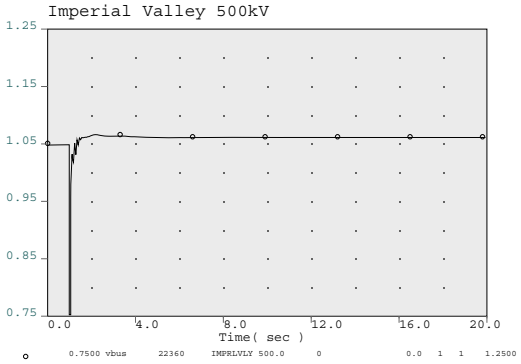
Otay Mesa 230kV



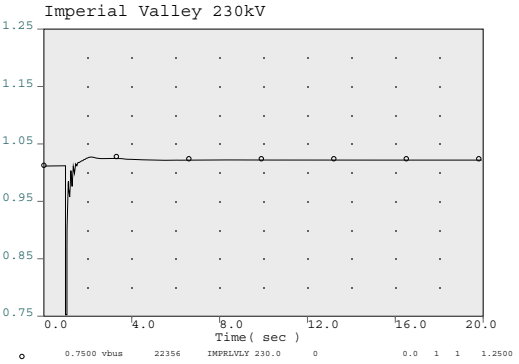
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

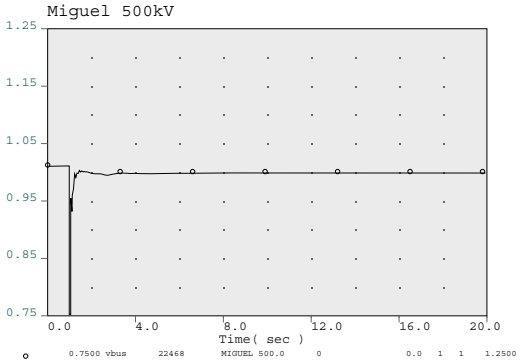
Imperial Valley 500kV



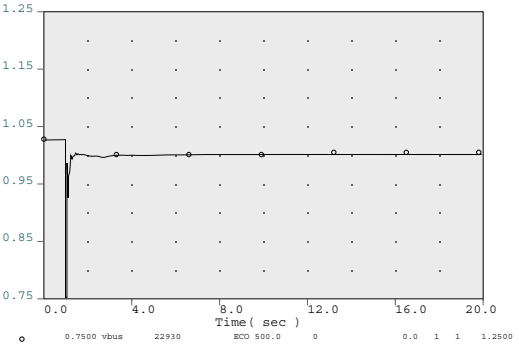
Imperial Valley 230kV



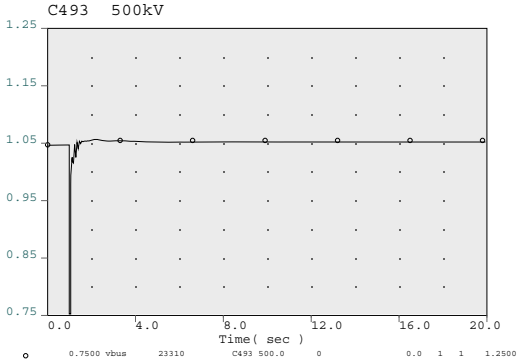
Miguel 500kV



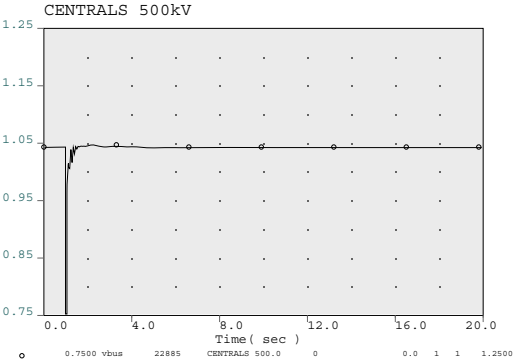
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

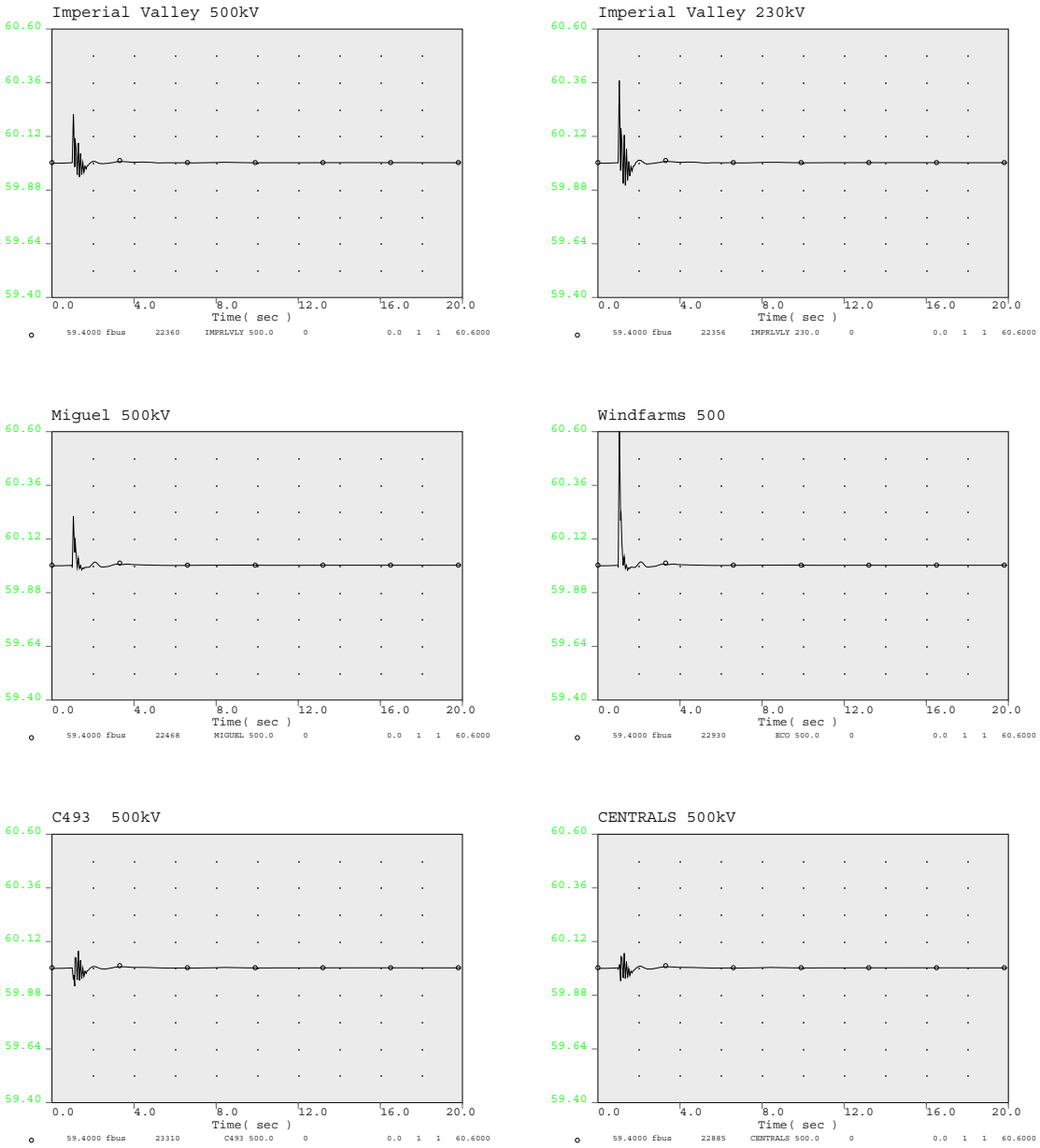
Page 5

IV_Wnd1_noXTrp_pst_hs_eco4.chf

ii phase i\dyds\pst_bu4up

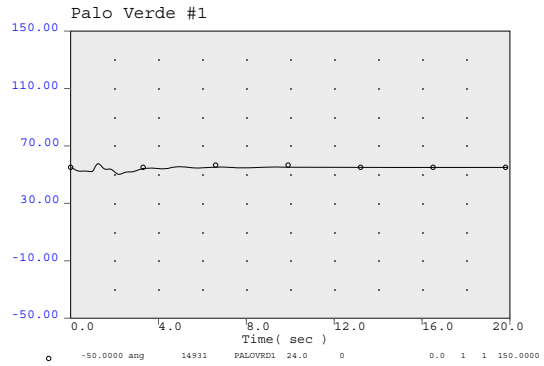
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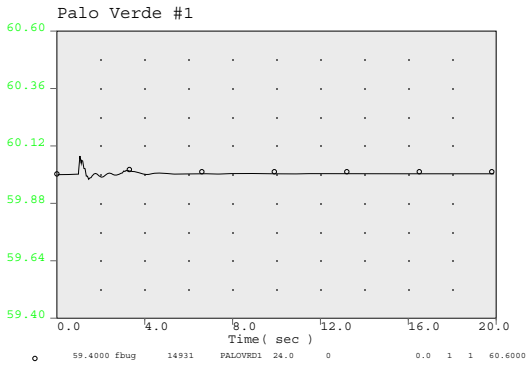
Imperial Valley Area - Frequency

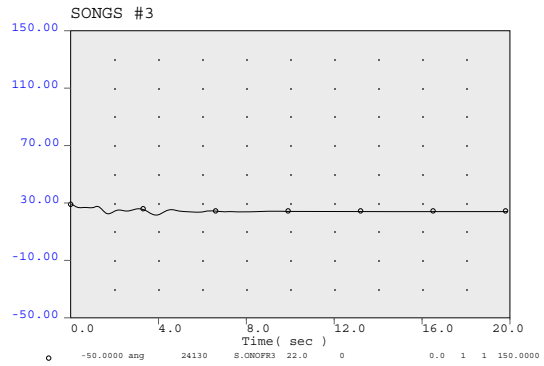


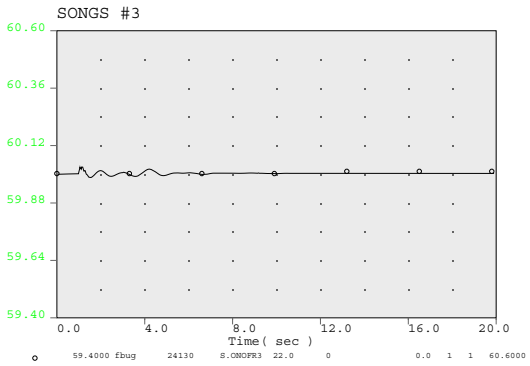
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

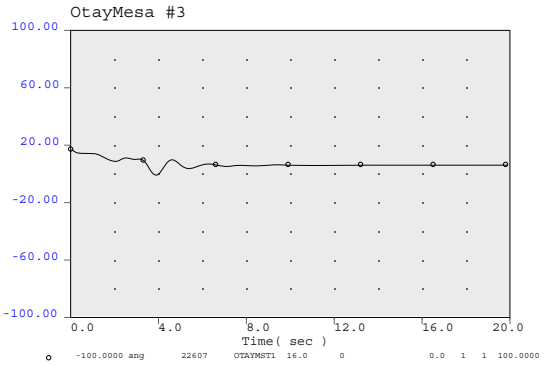
RELATIVE ROTOR ANGLE & FREQUENCY

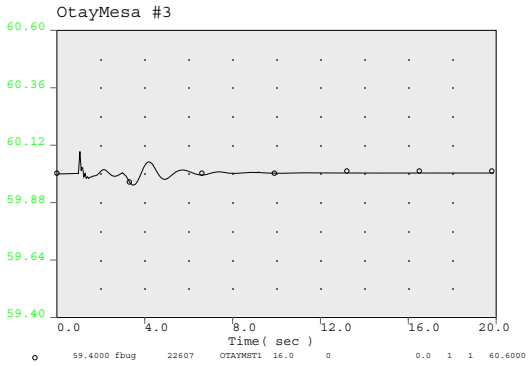












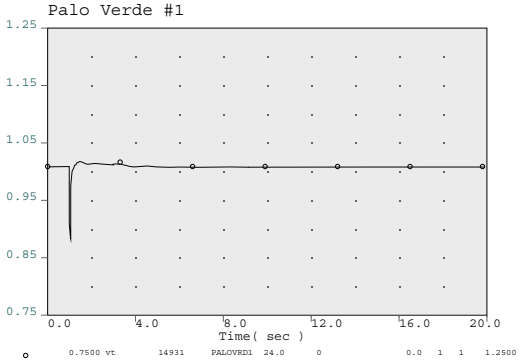
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

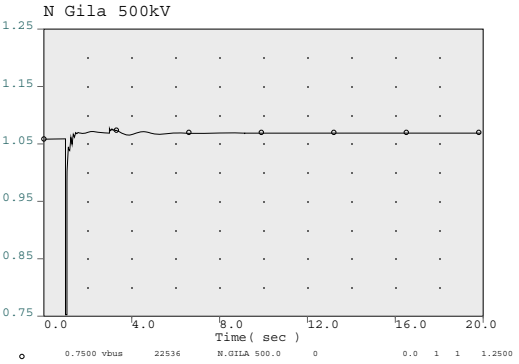
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RELATIVE VOLTAGE

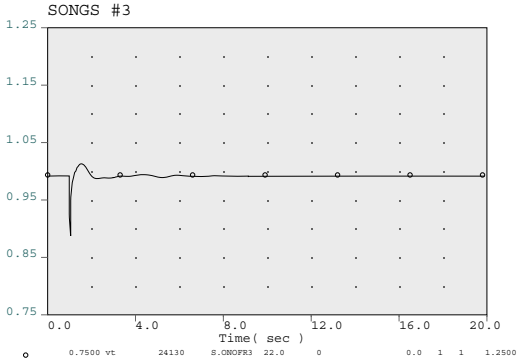
Palo Verde #1



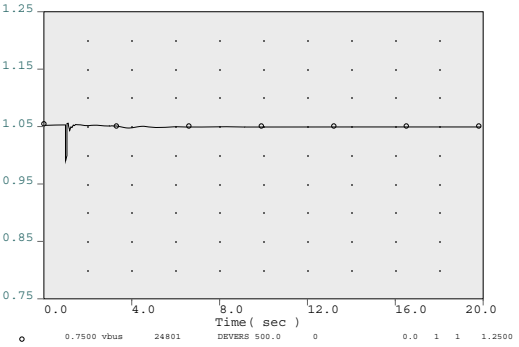
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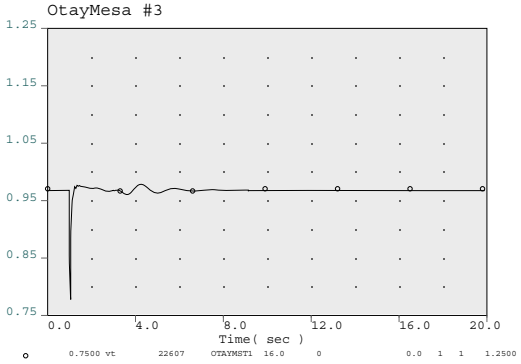
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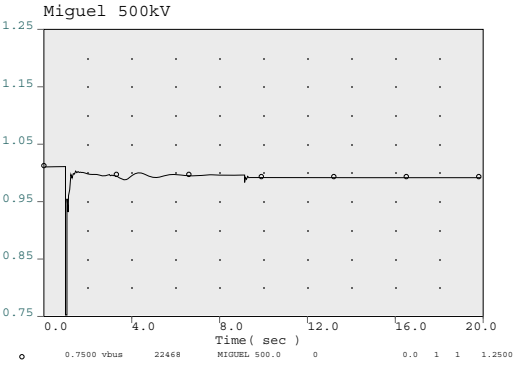
Devers 500



OtayMesa #3



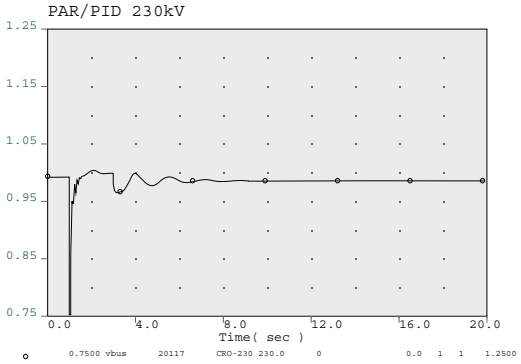
Miguel 500kV



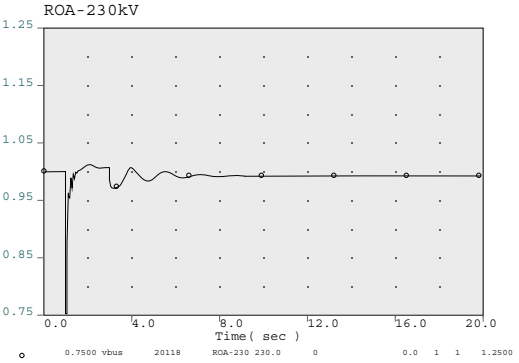
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

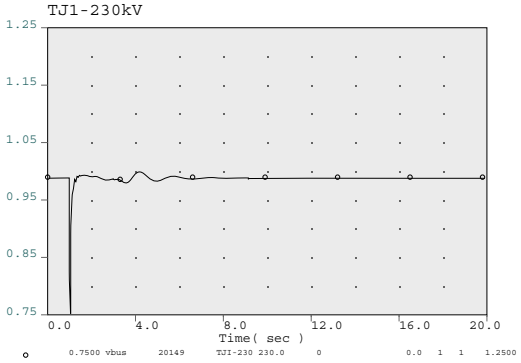
PAR/PID 230kV



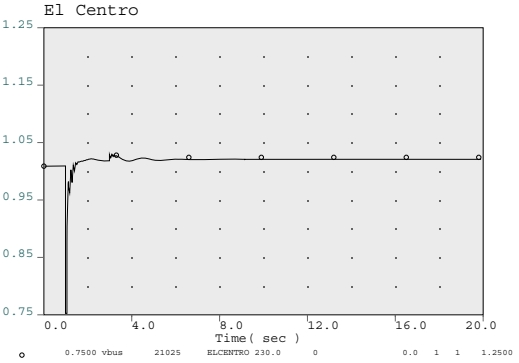
ROA-230kV



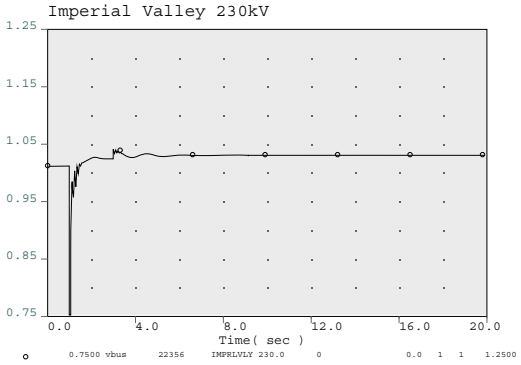
TJ1-230kV



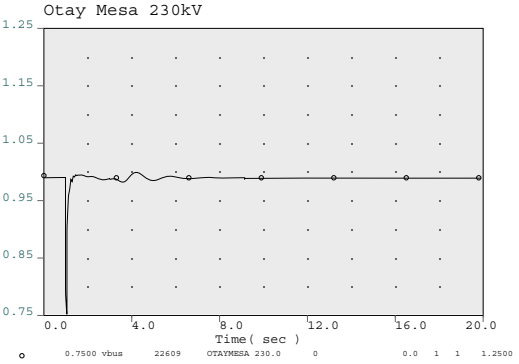
El Centro



Imperial Valley 230kV



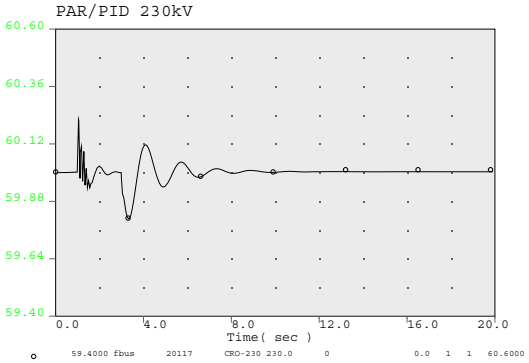
Otay Mesa 230kV



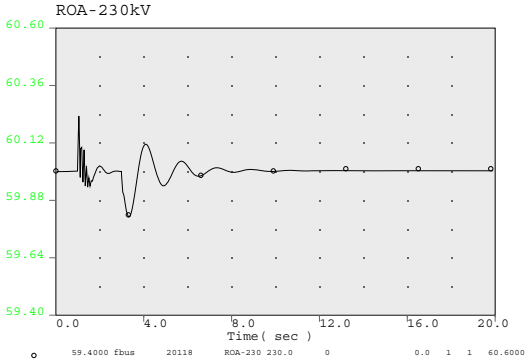
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

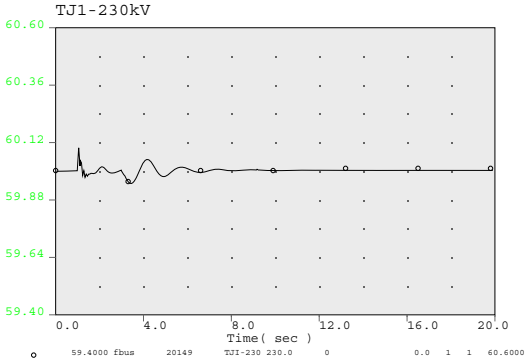
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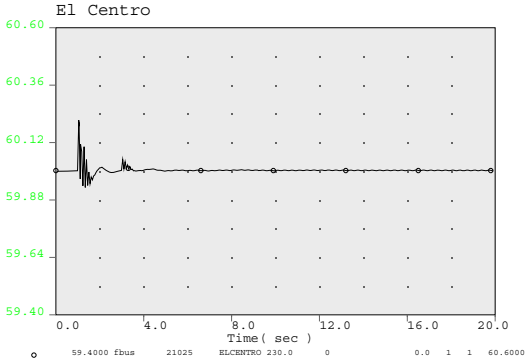
ROA-230kV



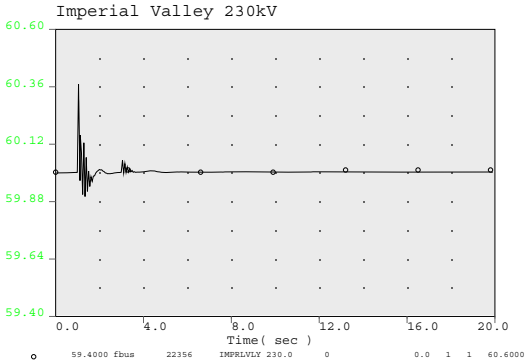
TJ1-230kV



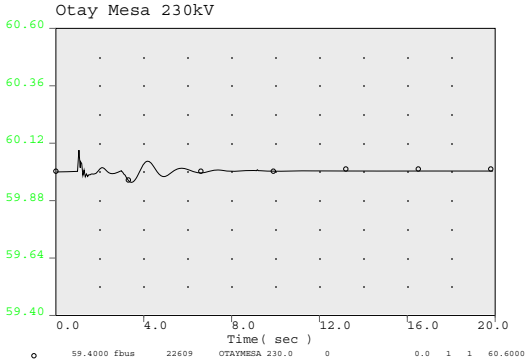
El Centro



Imperial Valley 230kV



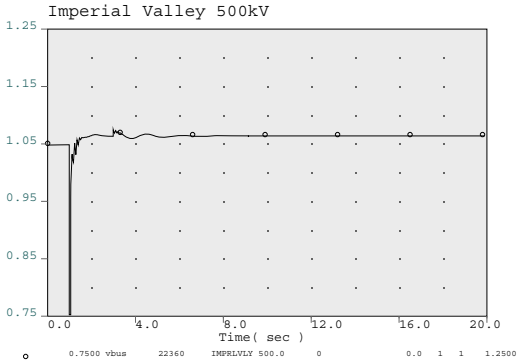
Otay Mesa 230kV



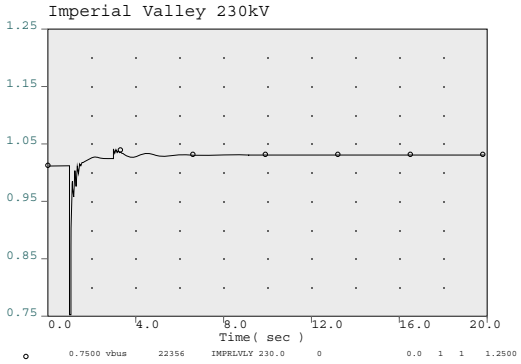
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

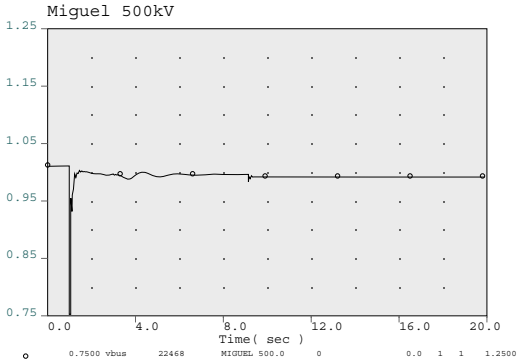
Imperial Valley 500kV



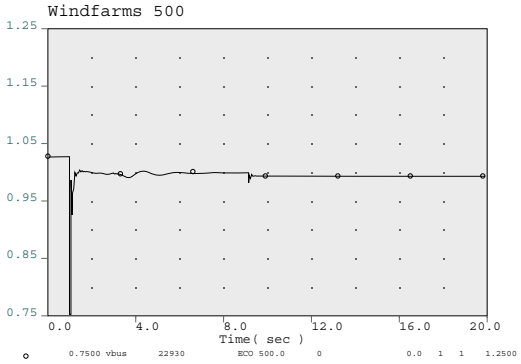
Imperial Valley 230kV



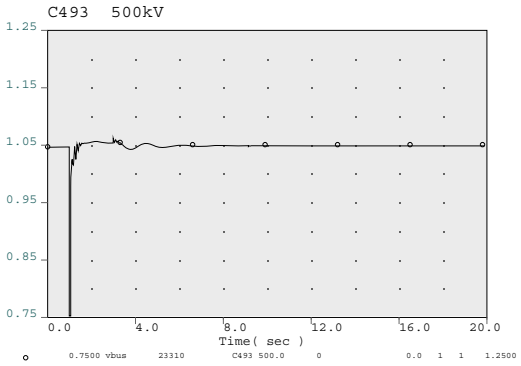
Miguel 500kV



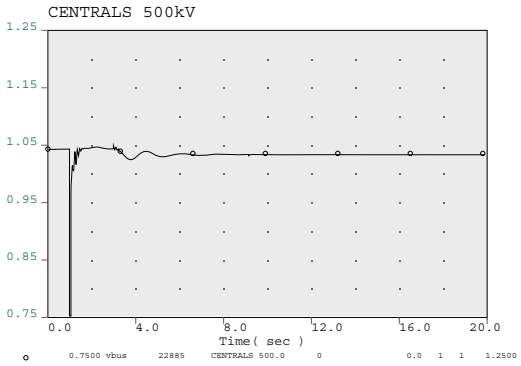
Windfarms 500



C493 500kV

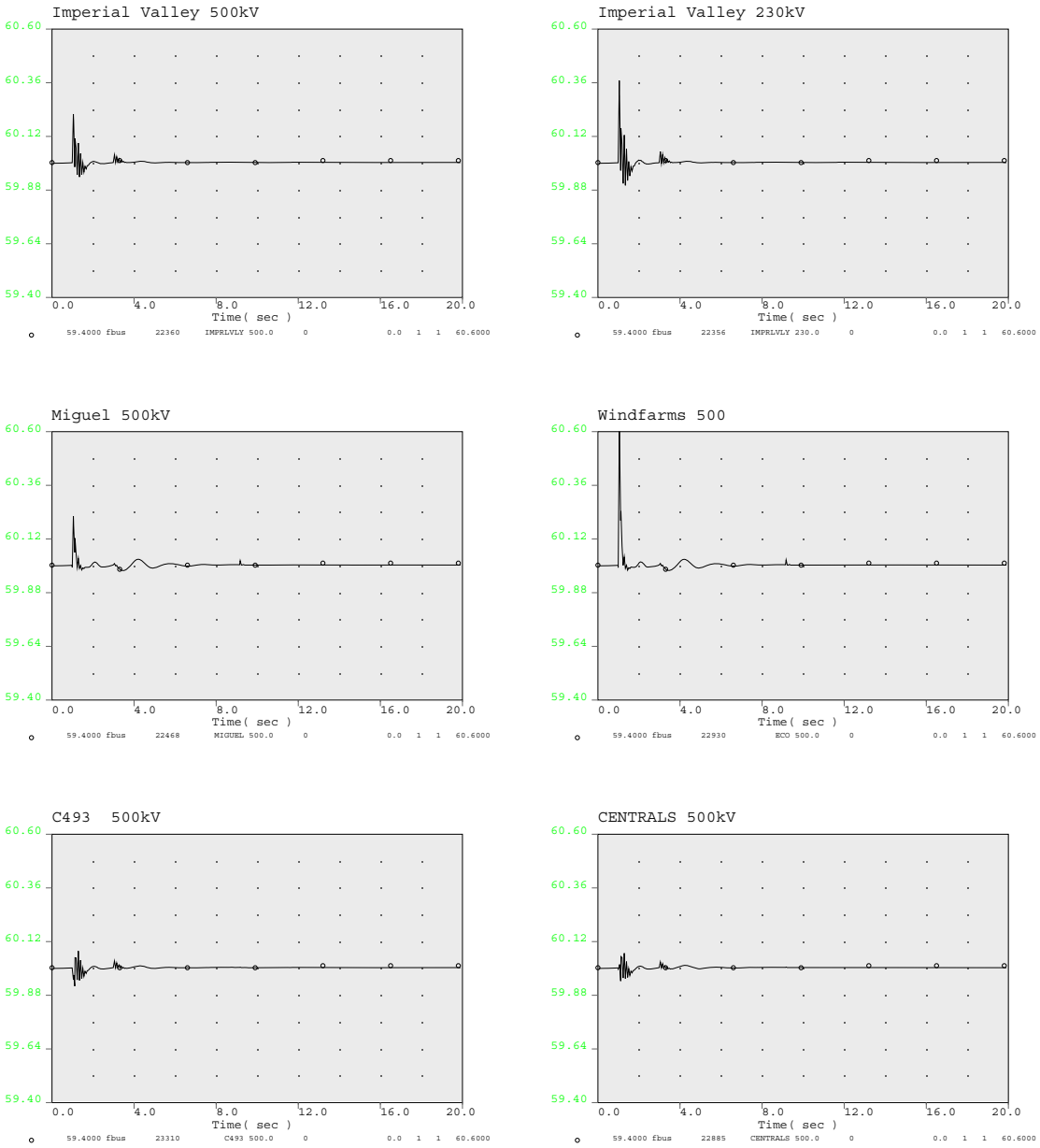


CENTRALS 500kV



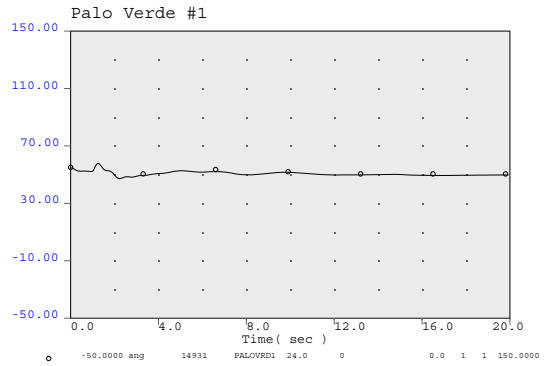
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

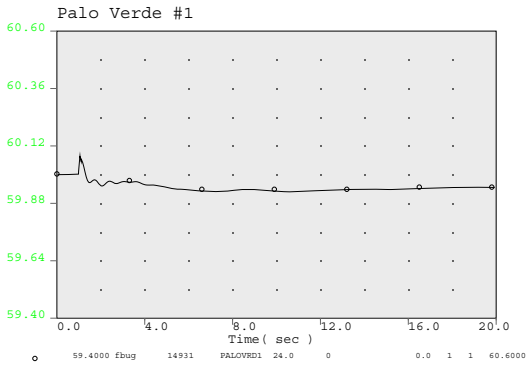
Imperial Valley Area - Frequency

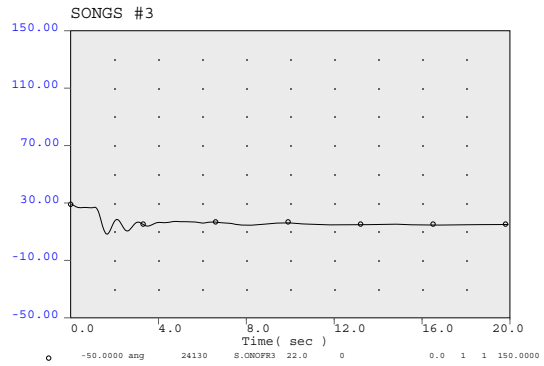


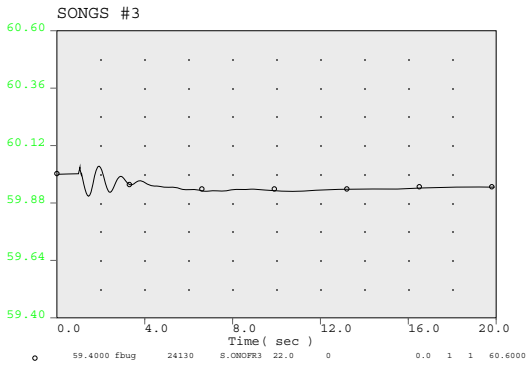
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

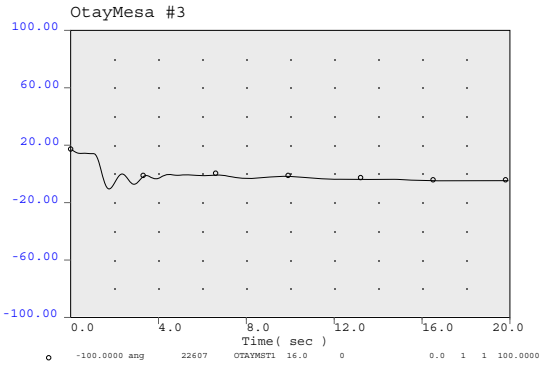
RELATIVE ROTOR ANGLE & FREQUENCY

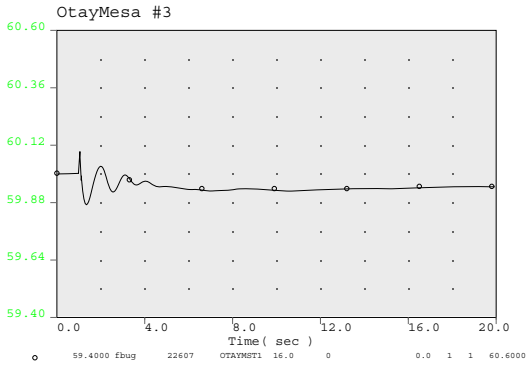












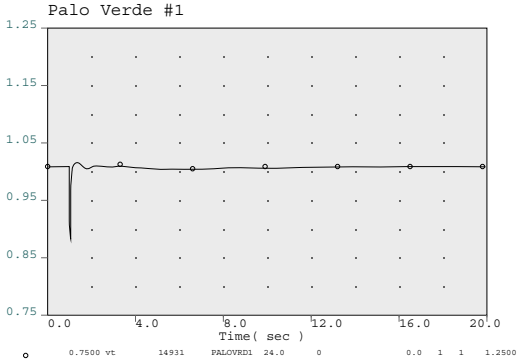
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Page 1

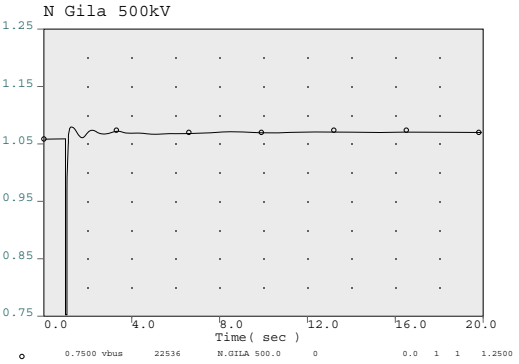
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RELATIVE VOLTAGE

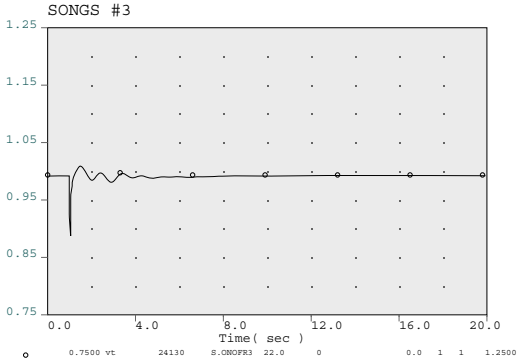
Palo Verde #1



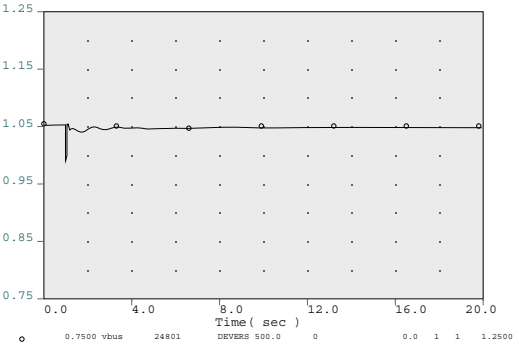
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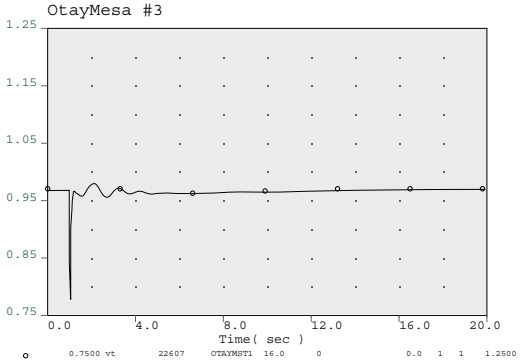
SONGS #3



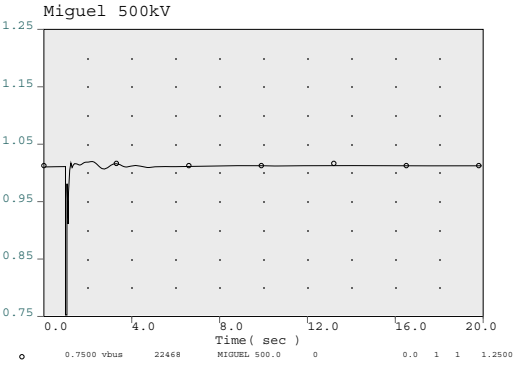
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OtayMesa #3



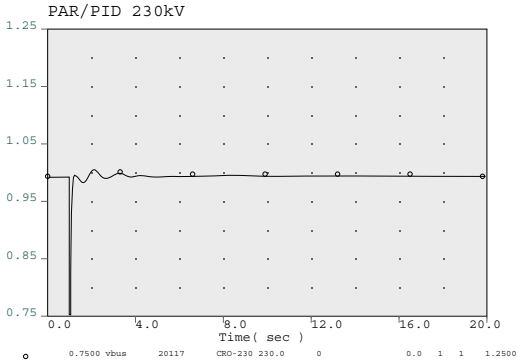
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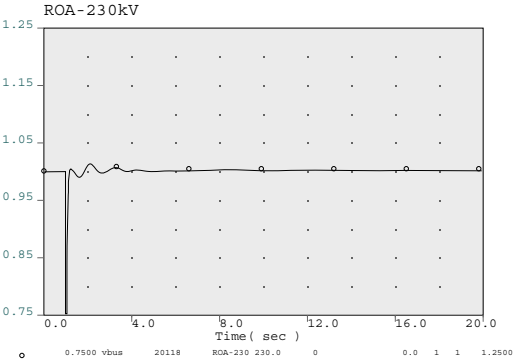
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Affected System Voltage Check and Comparison

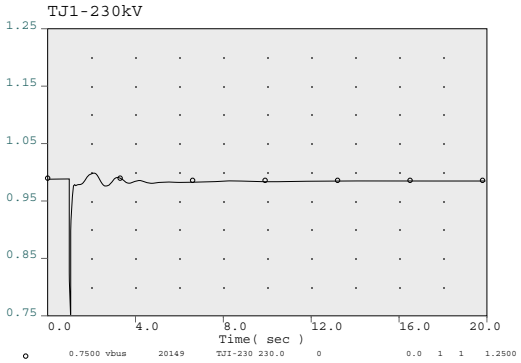
PAR/PID 230kV



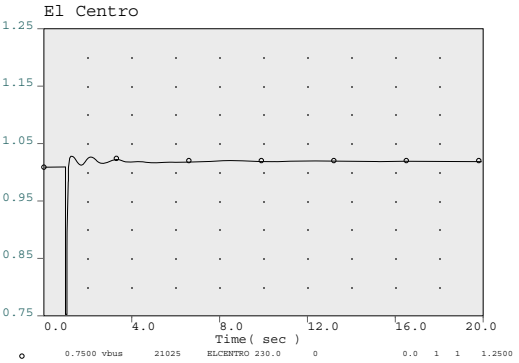
ROA-230kV



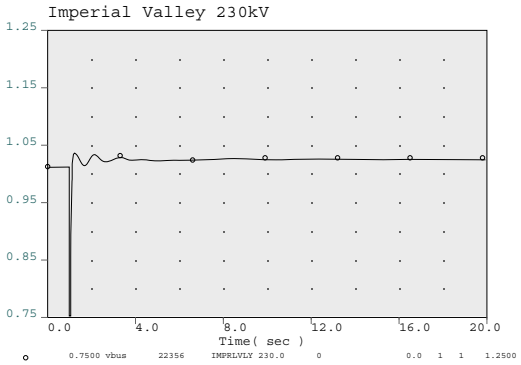
TJ1-230kV



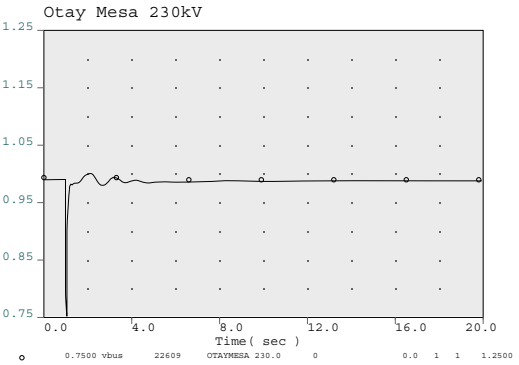
El Centro



Imperial Valley 230kV



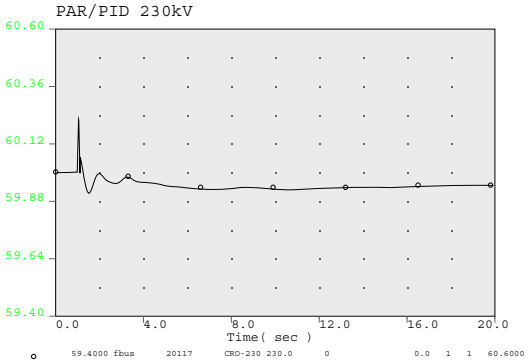
Otay Mesa 230kV



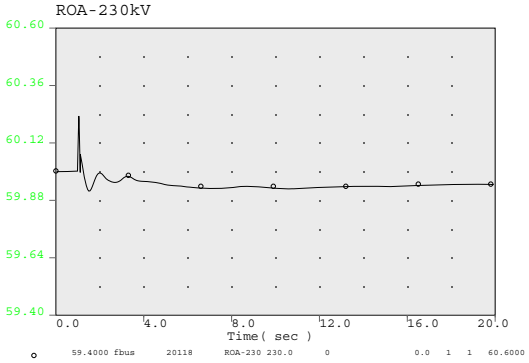
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Affected System Frequency Check and Comparison

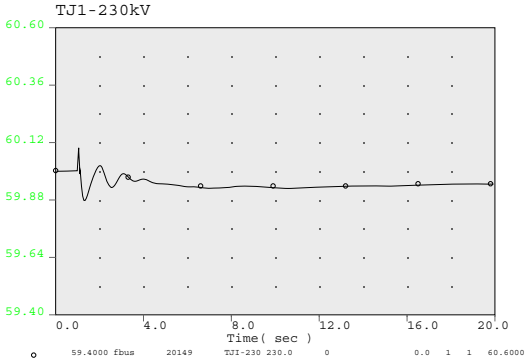
PAR/PID 230kV



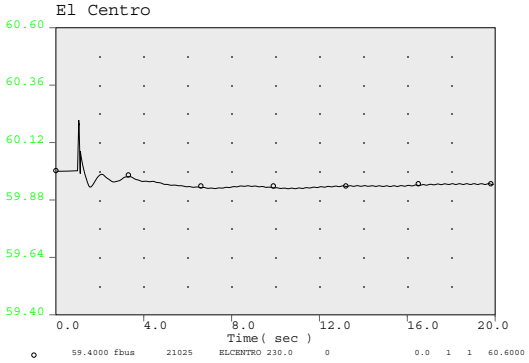
ROA-230kV



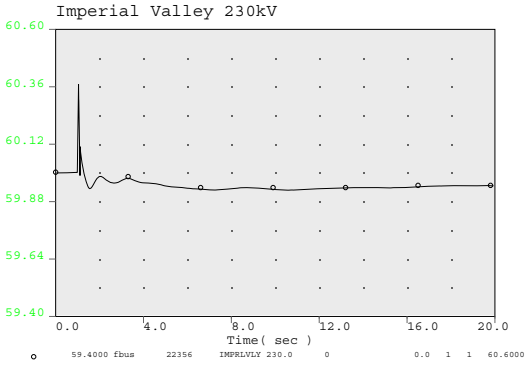
TJ1-230kV



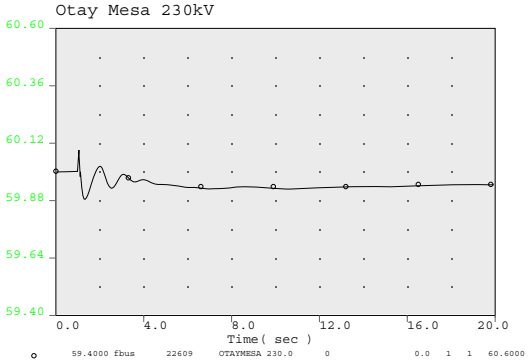
El Centro



Imperial Valley 230kV



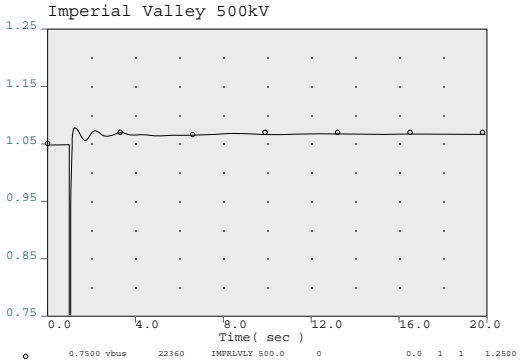
Otay Mesa 230kV



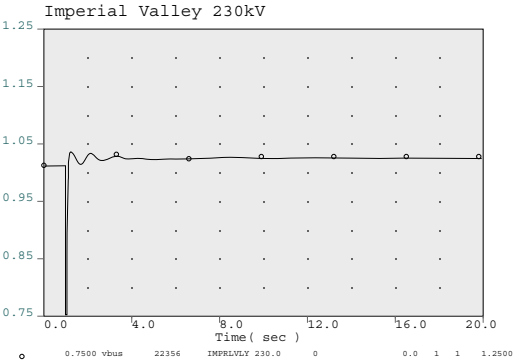
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

Imperial Valley Area - VOLTAGE

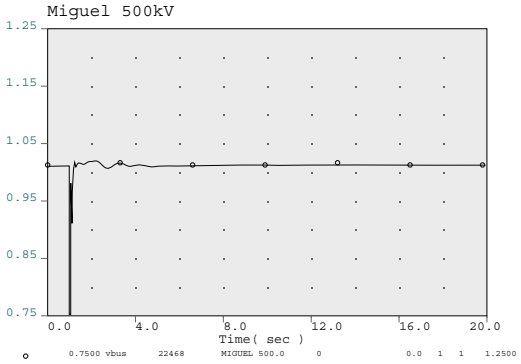
Imperial Valley 500kV



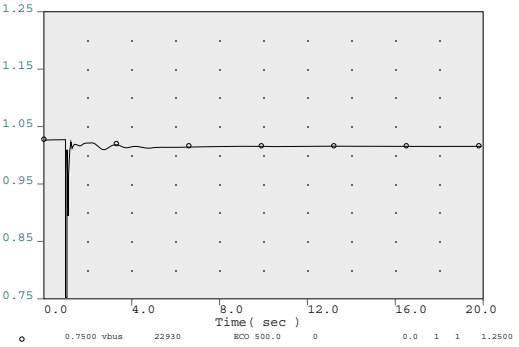
Imperial Valley 230kV



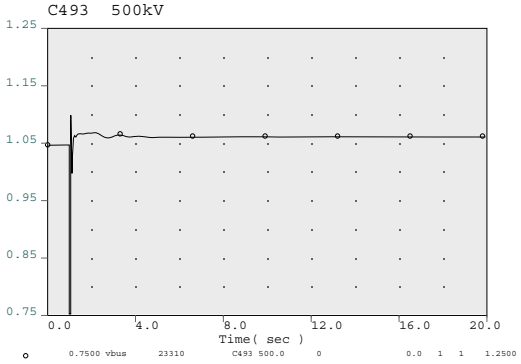
Miguel 500kV



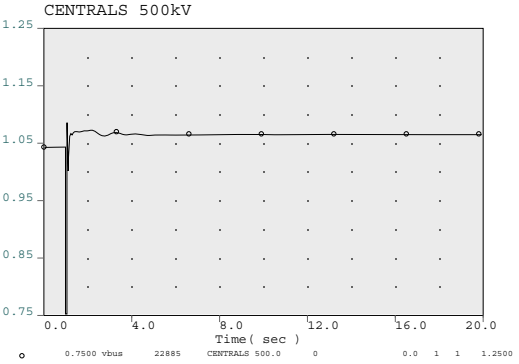
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C493 500kV

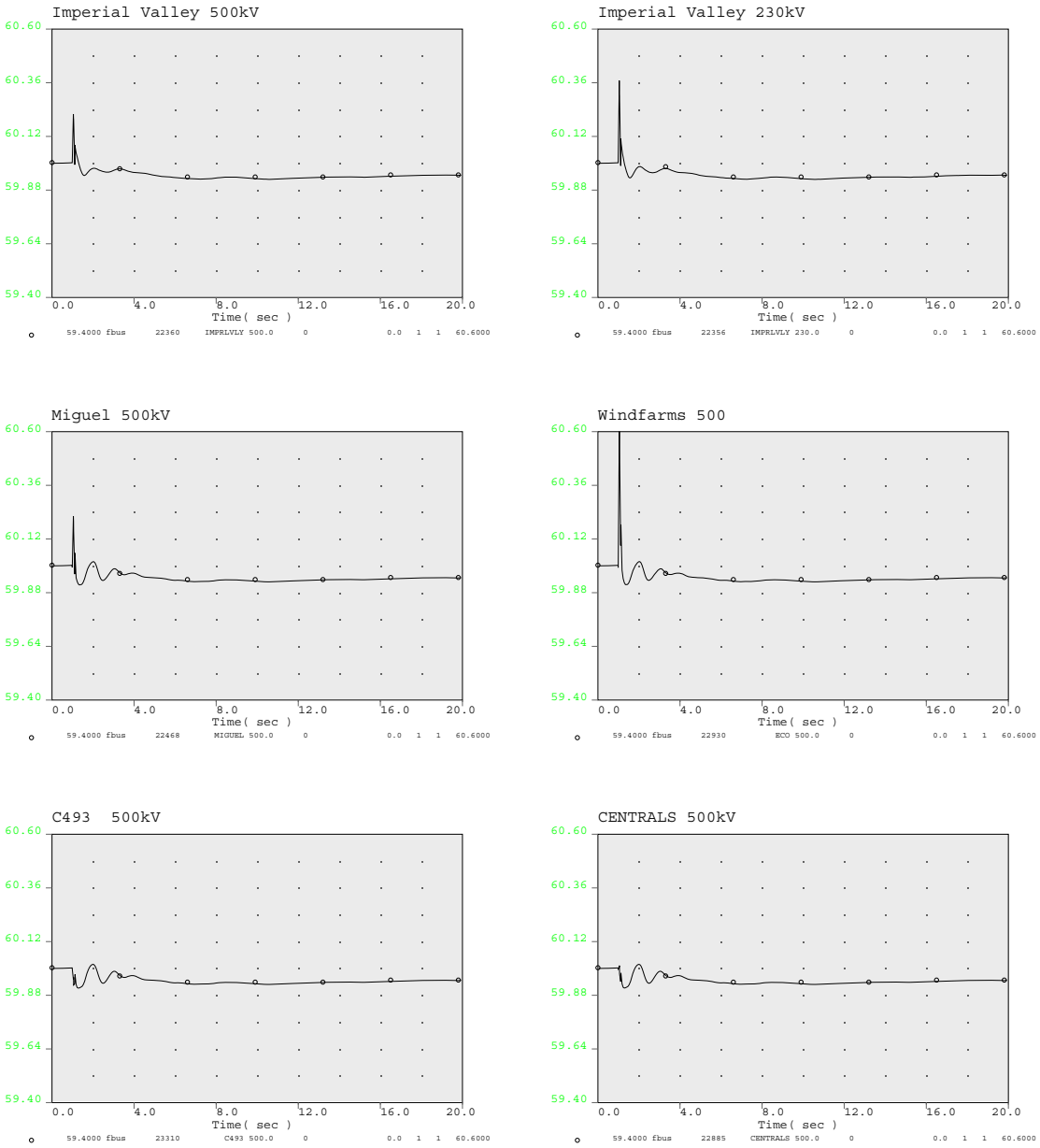


CENTRALS 500kV



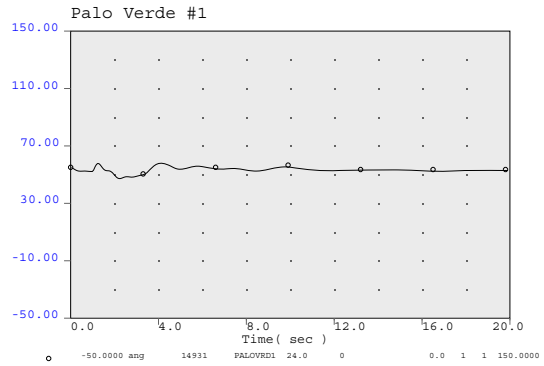
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

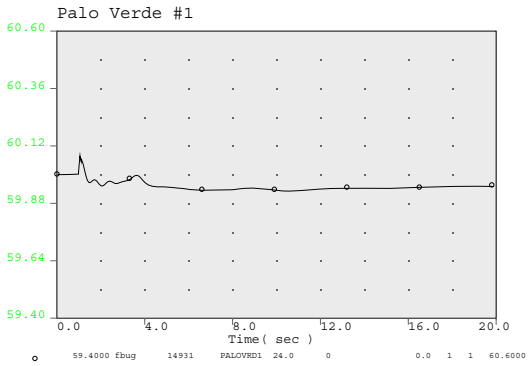
Imperial Valley Area - Frequency

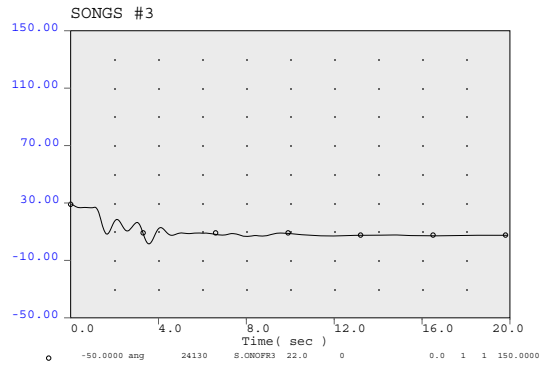


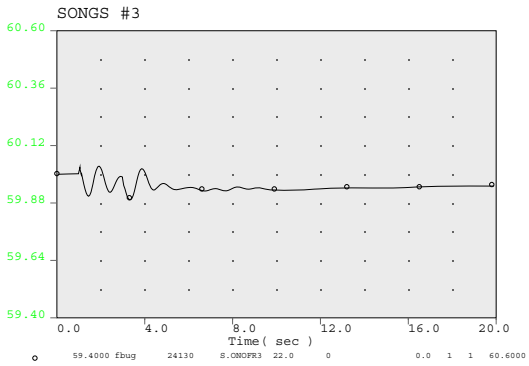
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage

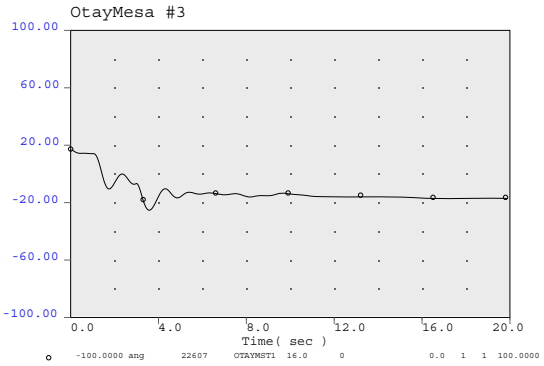
RELATIVE ROTOR ANGLE & FREQUENCY

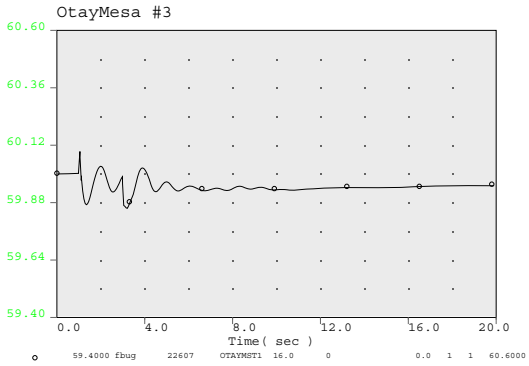










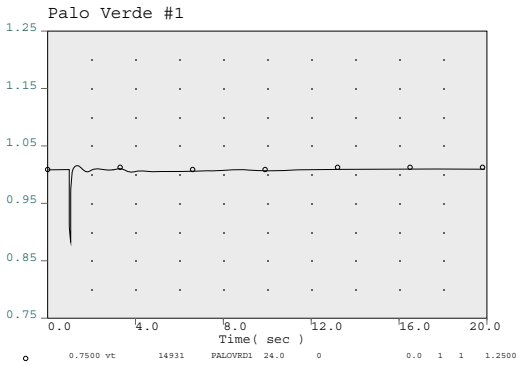


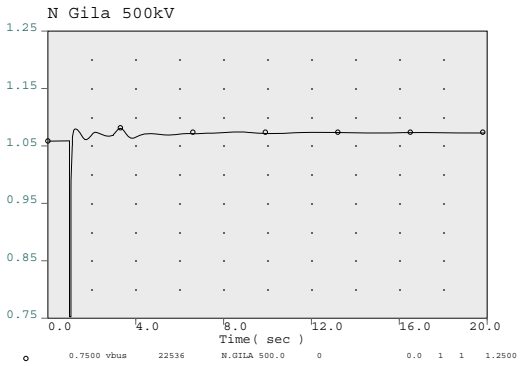
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

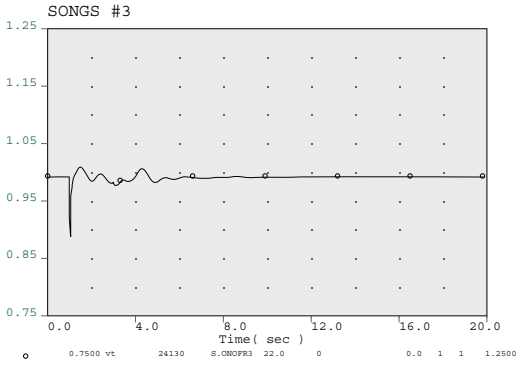
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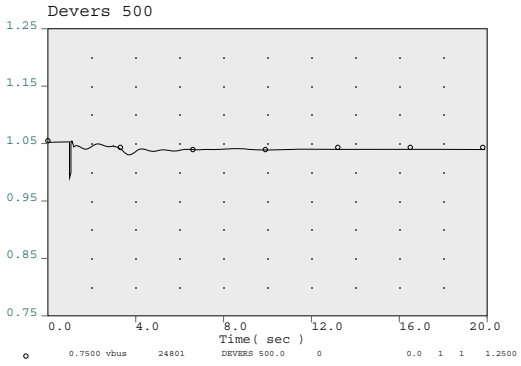
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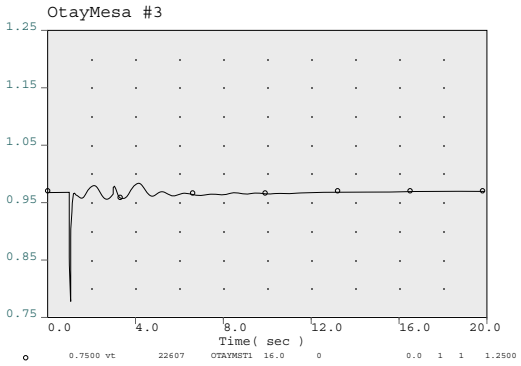
RELATIVE VOLTAGE

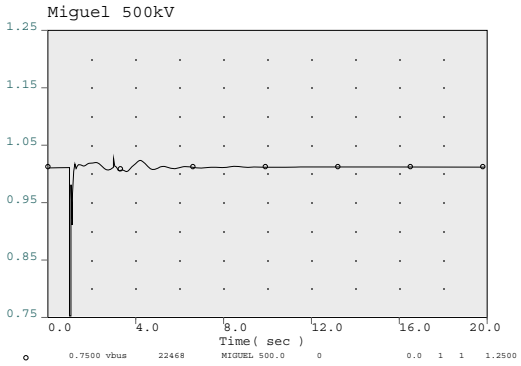








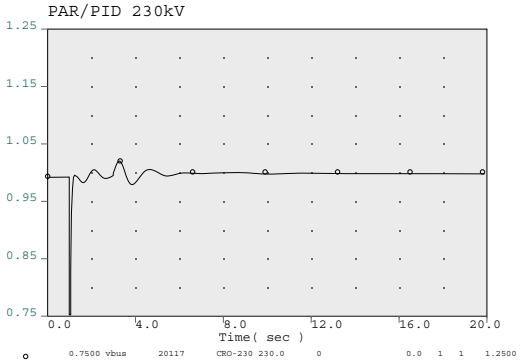




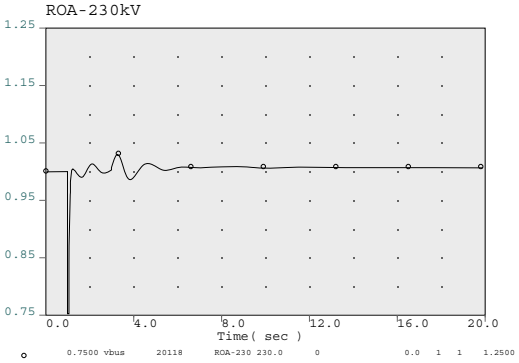
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Voltage Check and Comparison

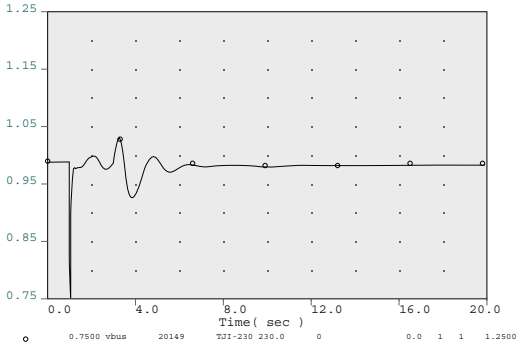
PAR/PID 230kV



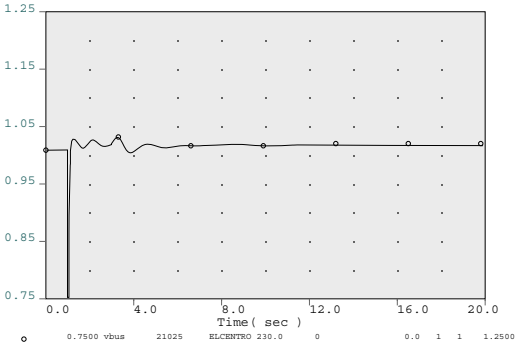
ROA-230kV



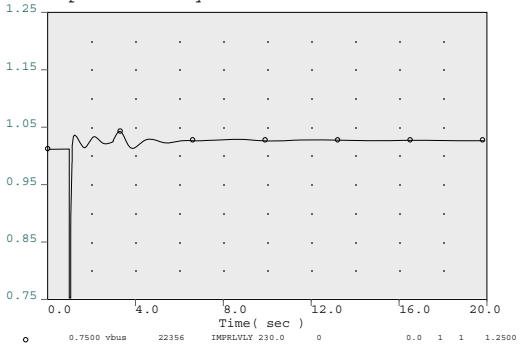
TJ1-230kV



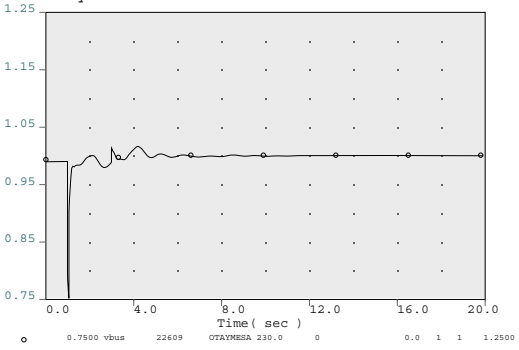
El Centro



Imperial Valley 230kV



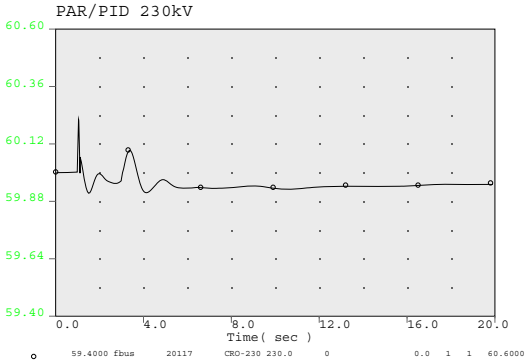
Otay Mesa 230kV



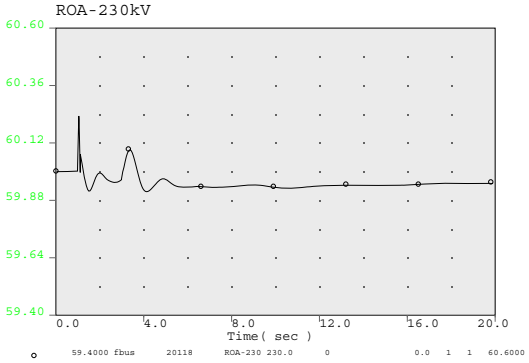
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Frequency Check and Comparison

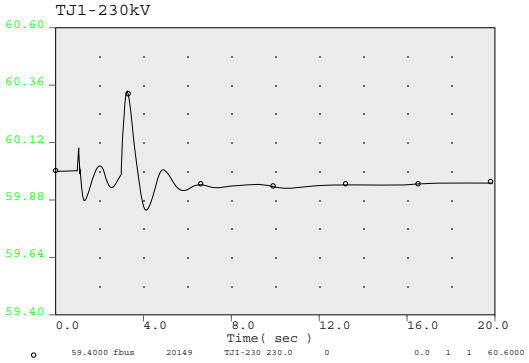
PAR/PID 230kV



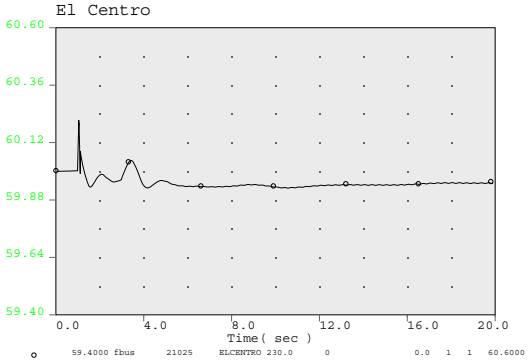
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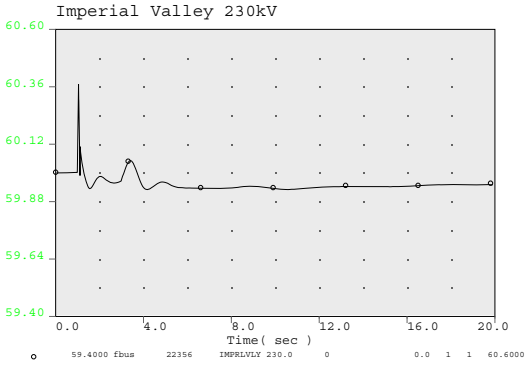
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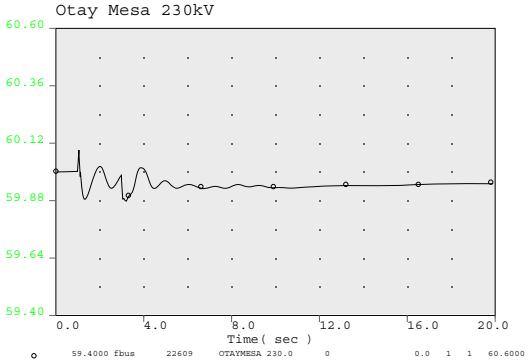
El Centro



Imperial Valley 230kV



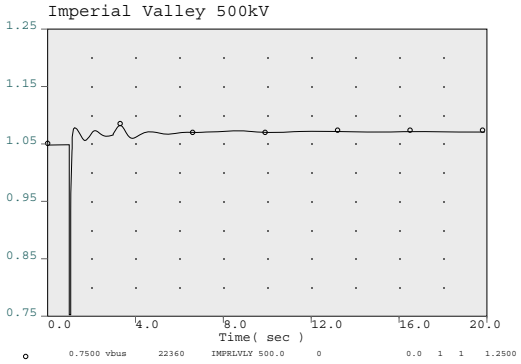
Otay Mesa 230kV



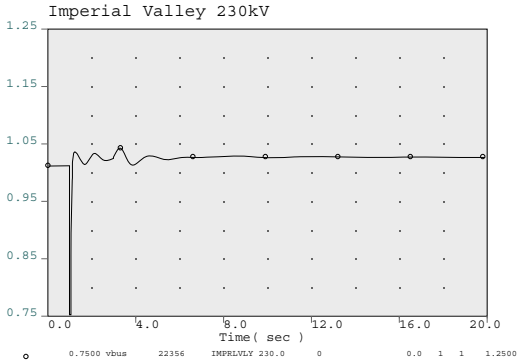
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Imperial Valley Area - VOLTAGE

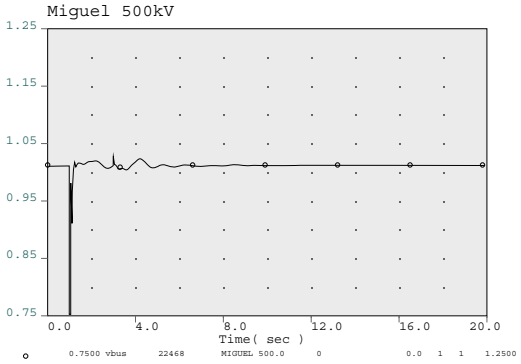
Imperial Valley 500kV



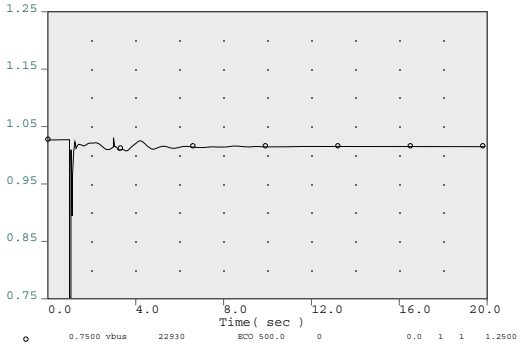
Imperial Valley 230kV



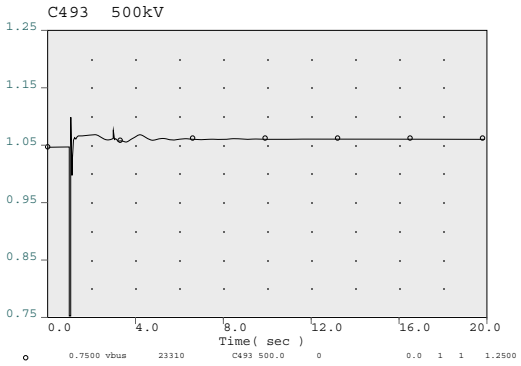
Miguel 500kV



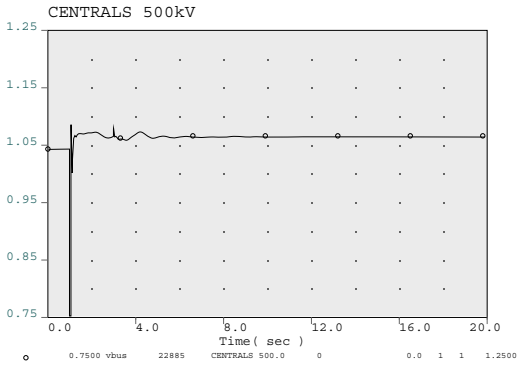
Windfarms 500



C493 500kV

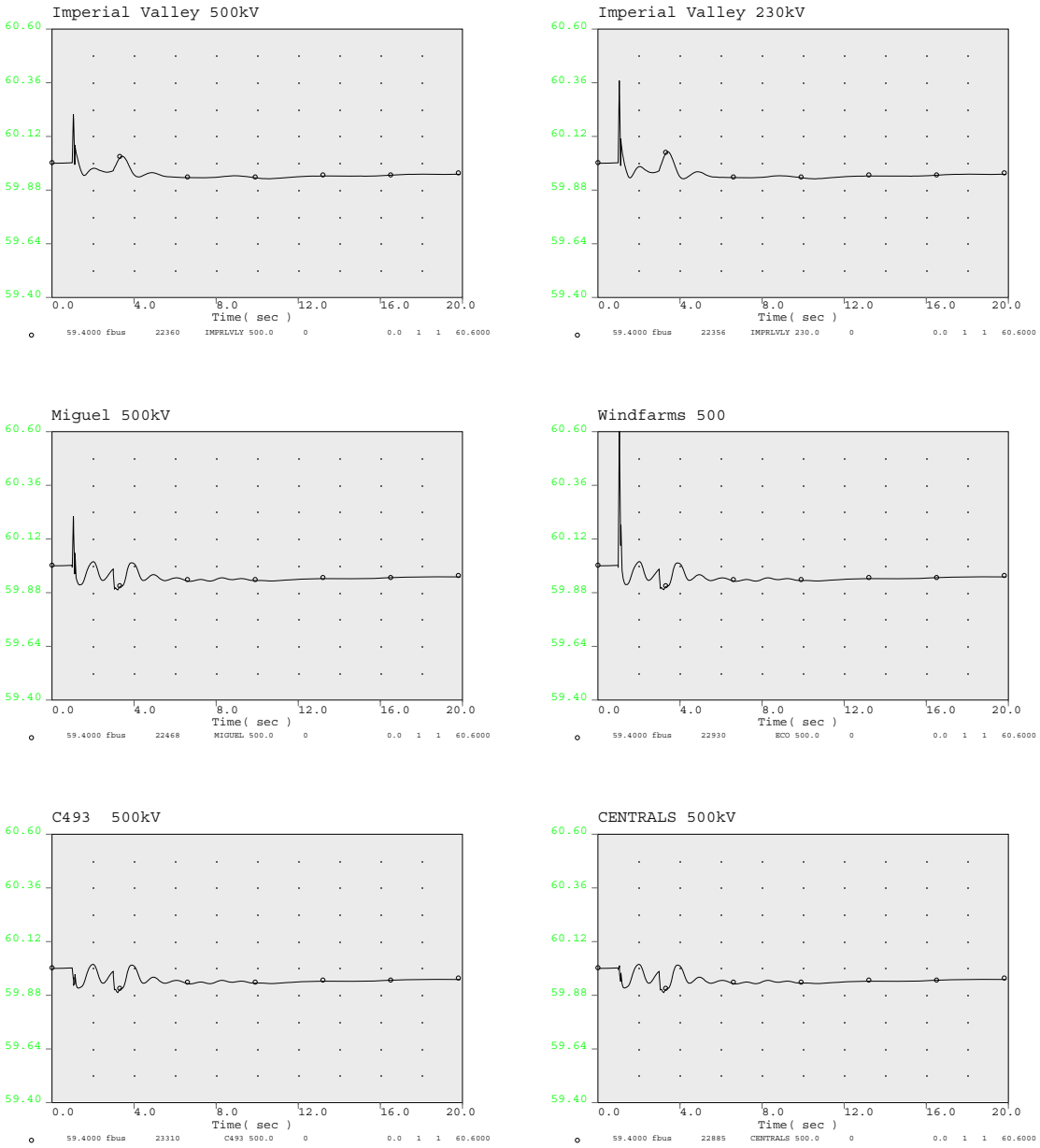


CENTRALS 500kV



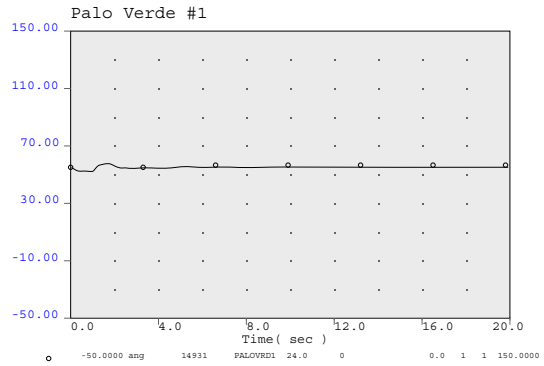
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

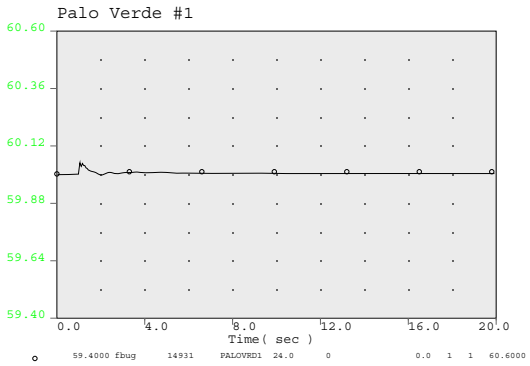
Imperial Valley Area - Frequency

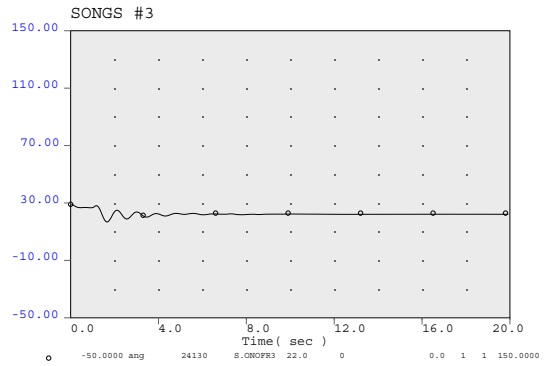


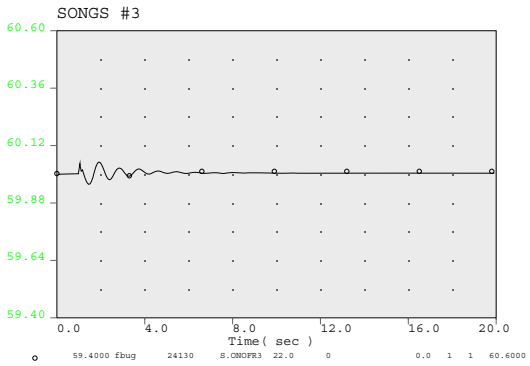
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

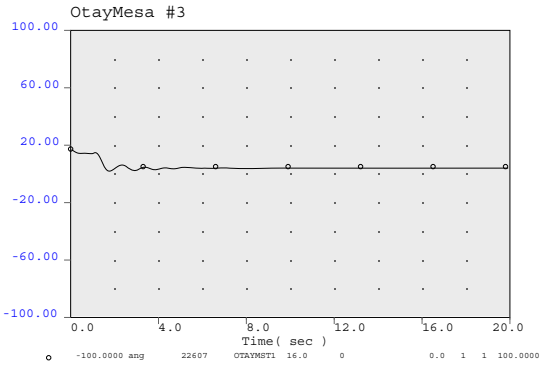
RELATIVE ROTOR ANGLE & FREQUENCY

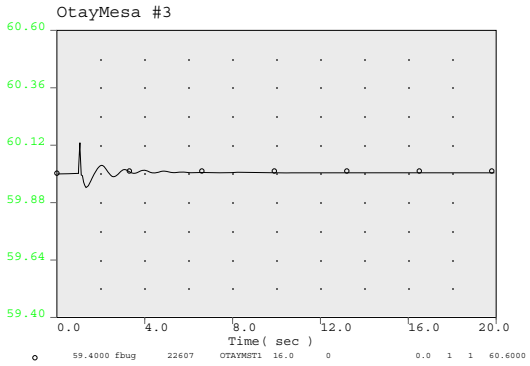










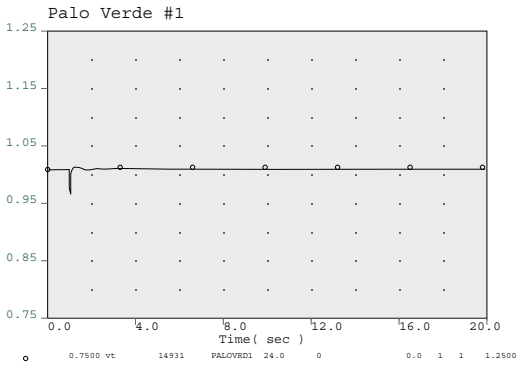


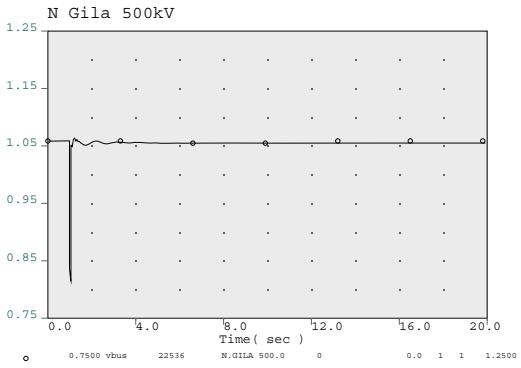
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

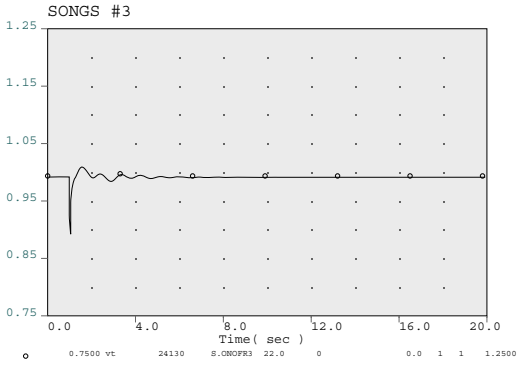
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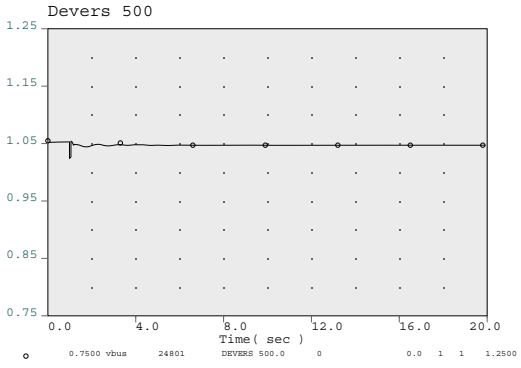
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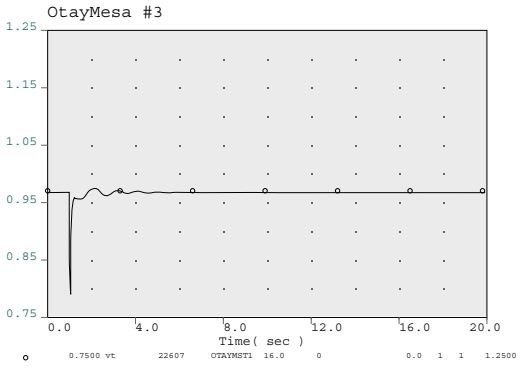
RELATIVE VOLTAGE

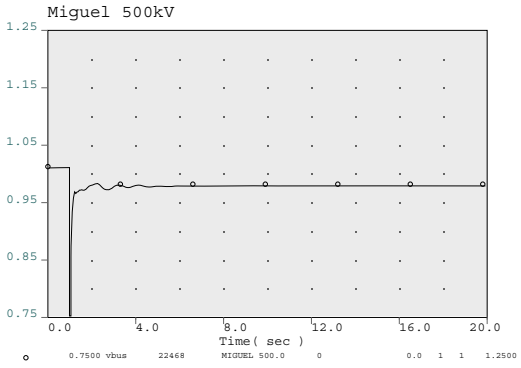








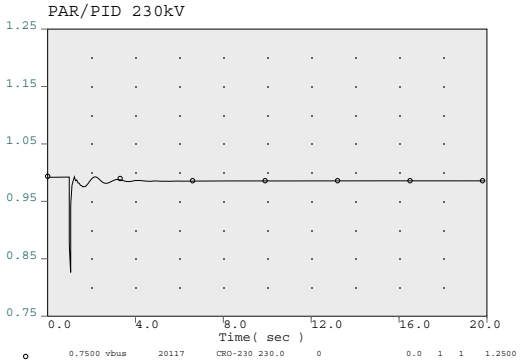




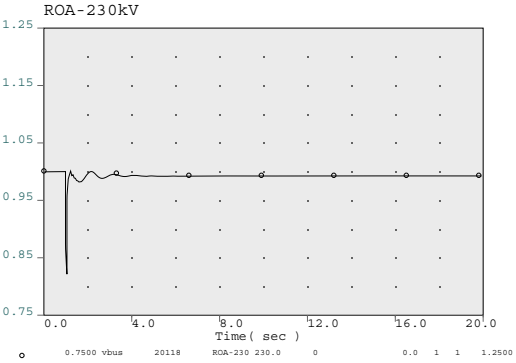
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

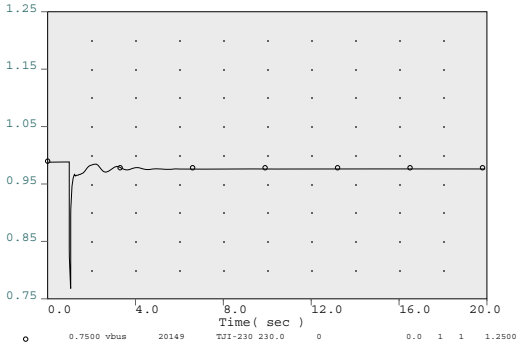
PAR/PID 230kV



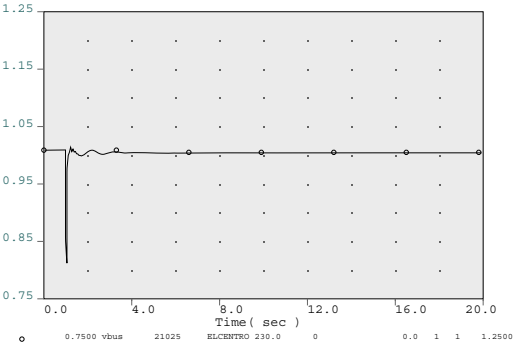
ROA-230kV



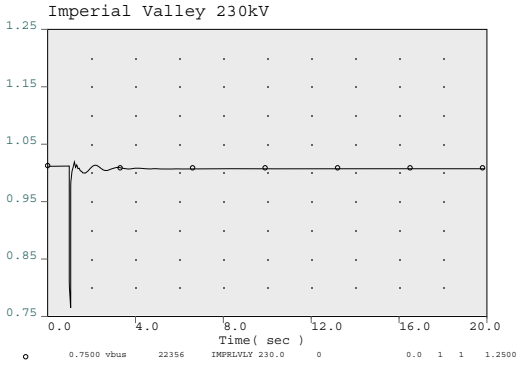
TJ1-230kV



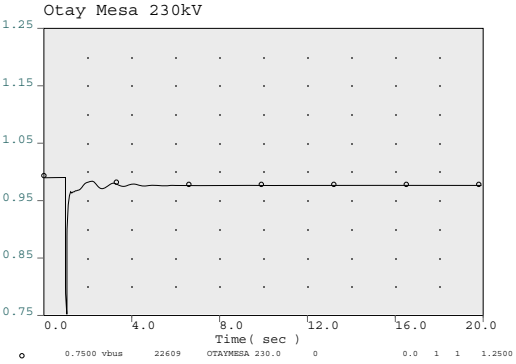
El Centro



Imperial Valley 230kV



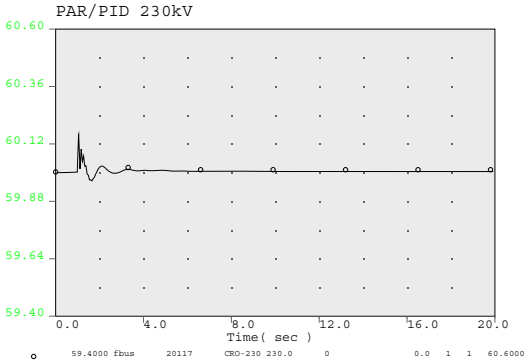
Otay Mesa 230kV



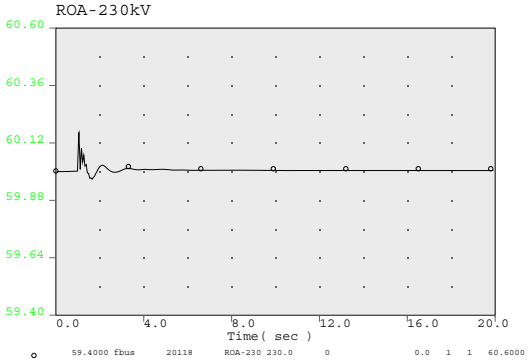
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

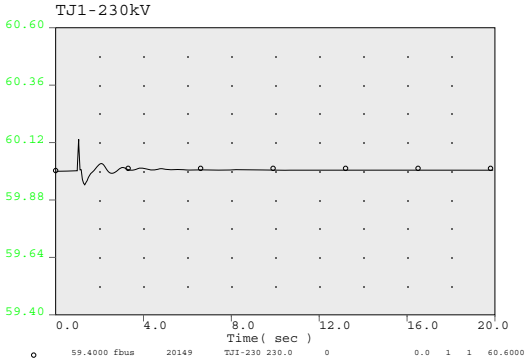
PAR/PID 230kV



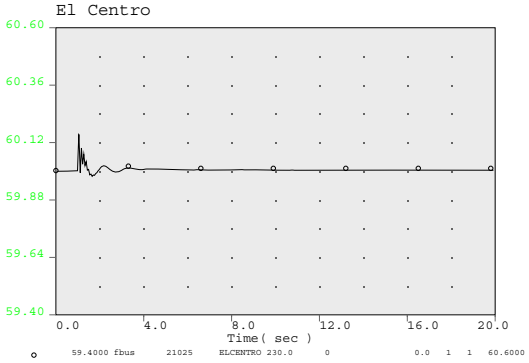
ROA-230kV



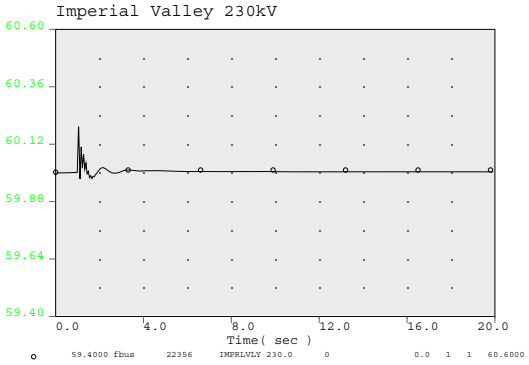
TJ1-230kV



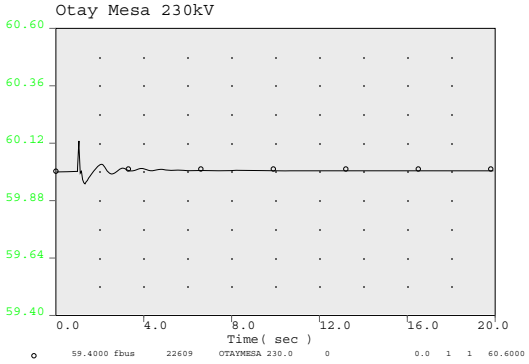
El Centro



Imperial Valley 230kV

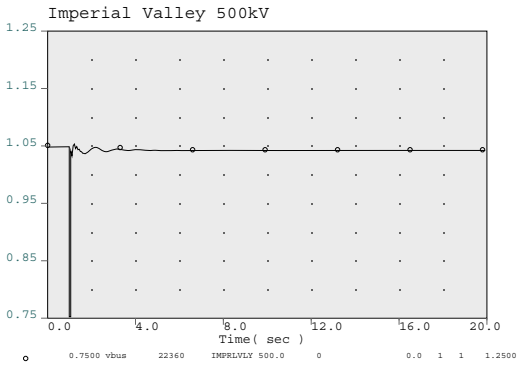


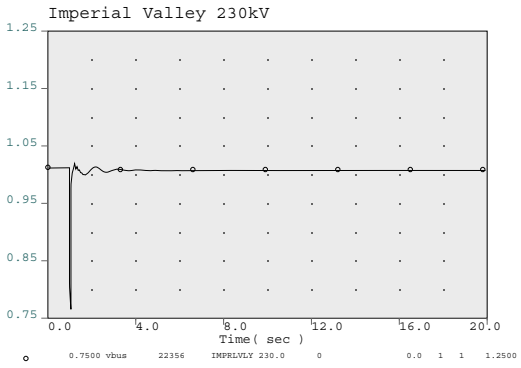
Otay Mesa 230kV

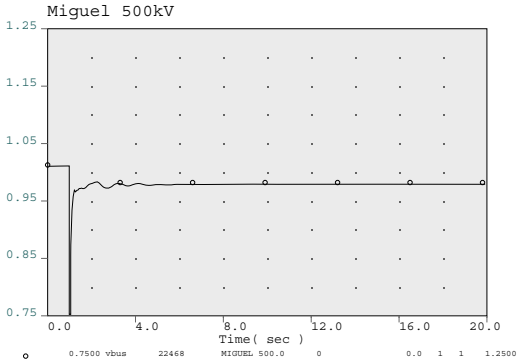


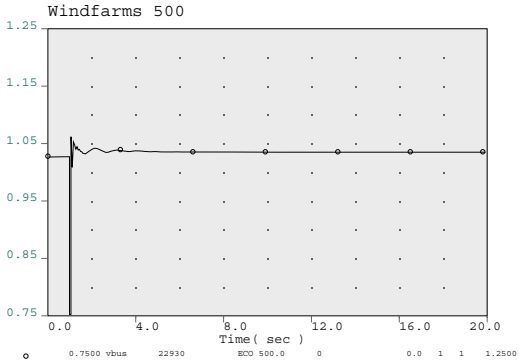
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

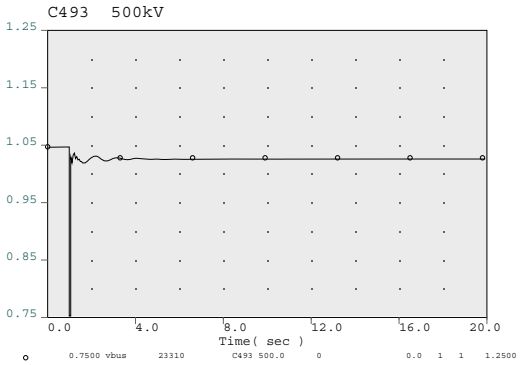
Imperial Valley Area - VOLTAGE

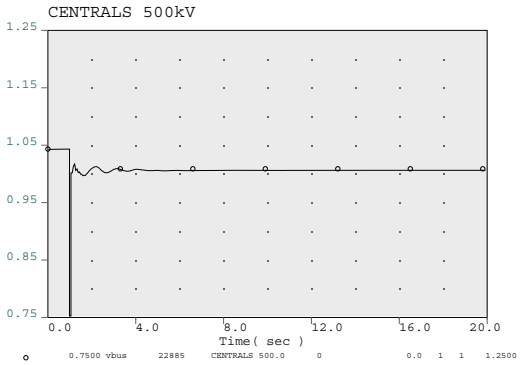












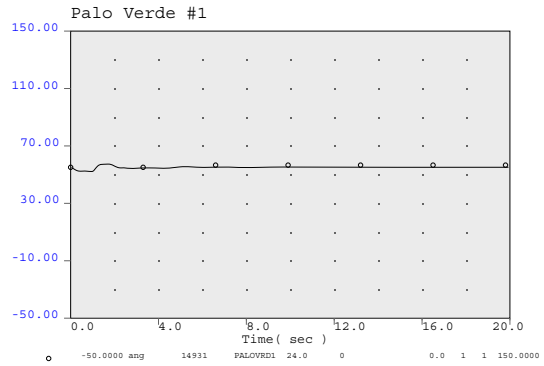
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

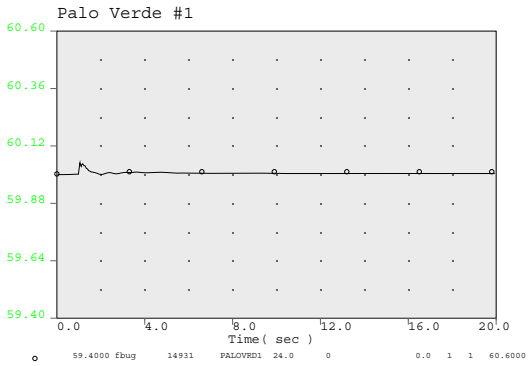
Imperial Valley Area - Frequency

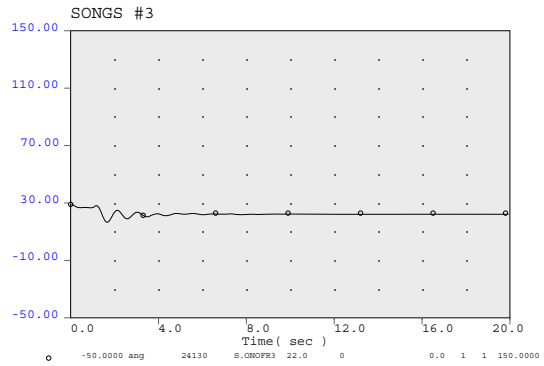


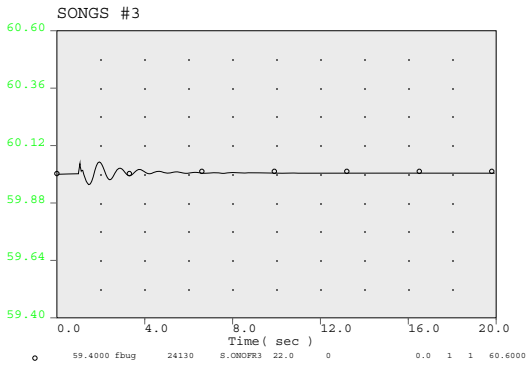
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

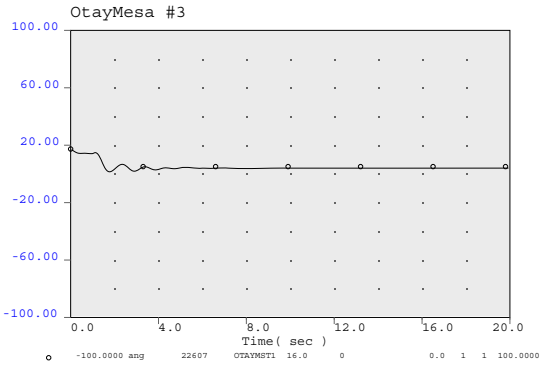
RELATIVE ROTOR ANGLE & FREQUENCY

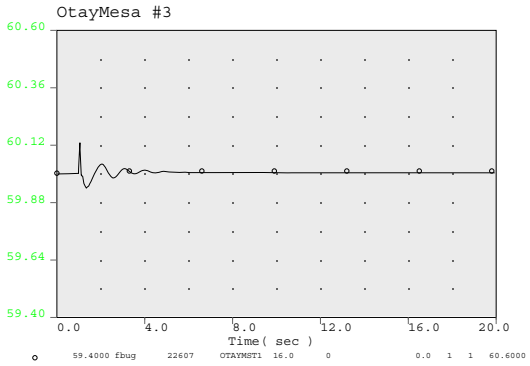












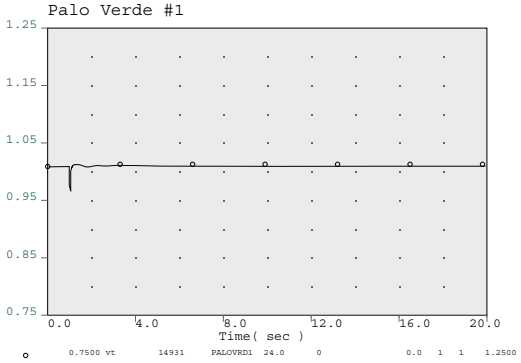
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

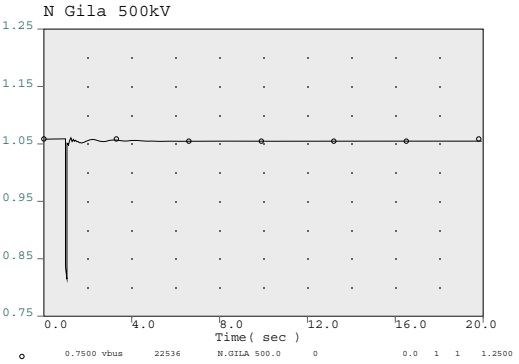
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RELATIVE VOLTAGE

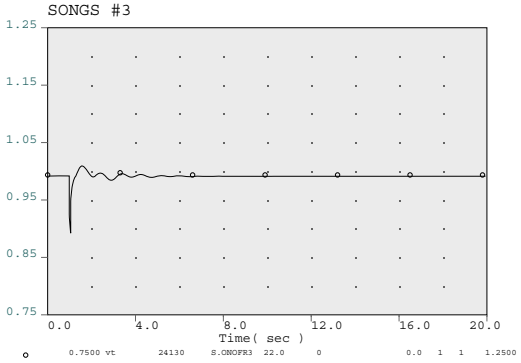
Palo Verde #1



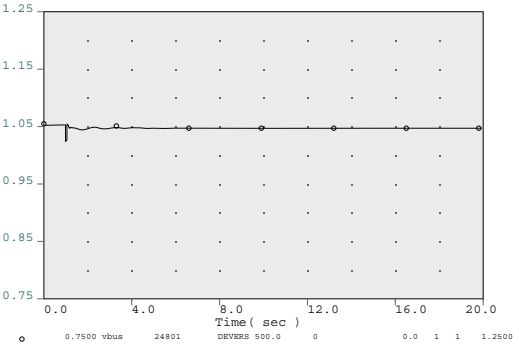
N Gila 500kV



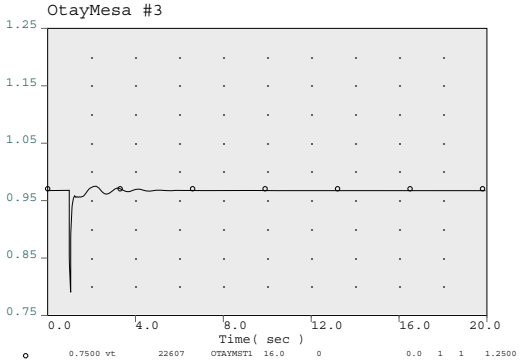
SONGS #3



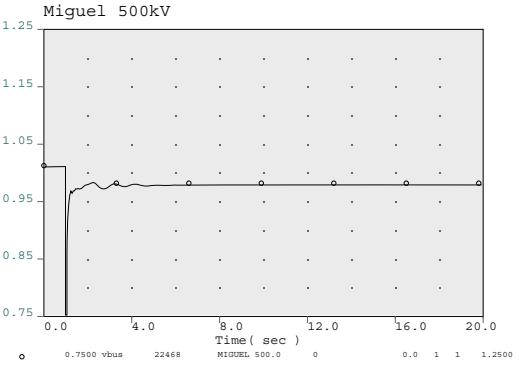
Devers 500



OtayMesa #3



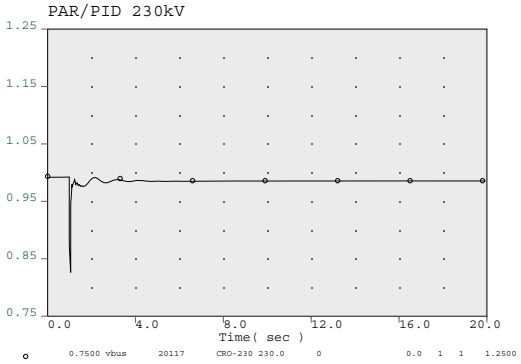
Miguel 500kV



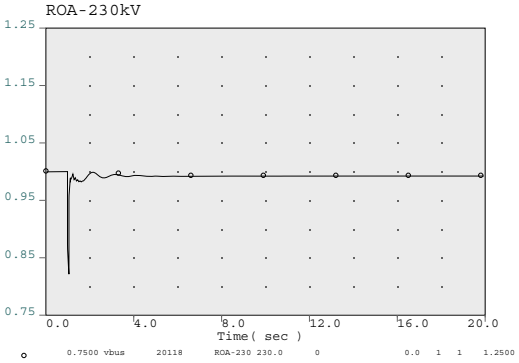
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

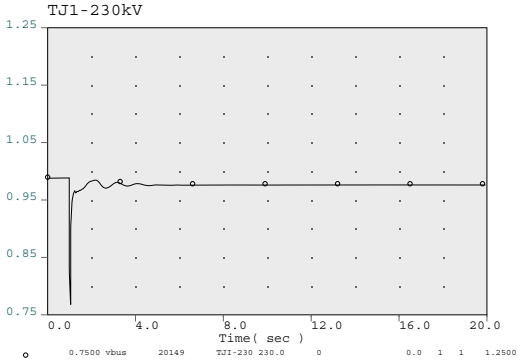
PAR/PID 230kV



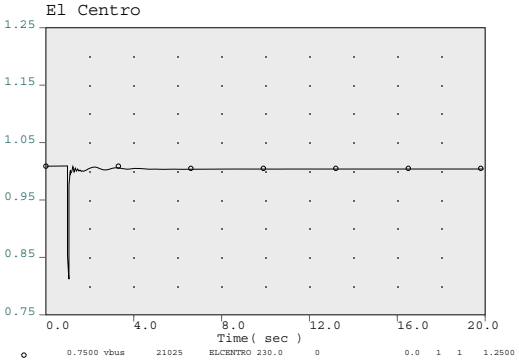
ROA-230kV



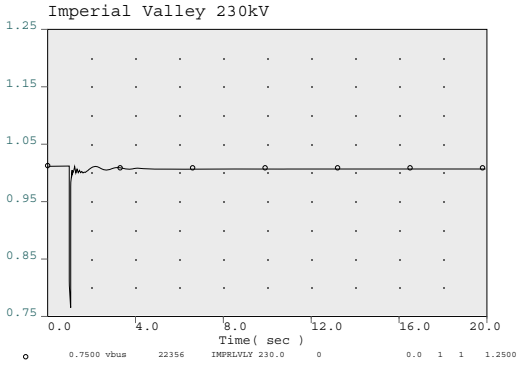
TJ1-230kV



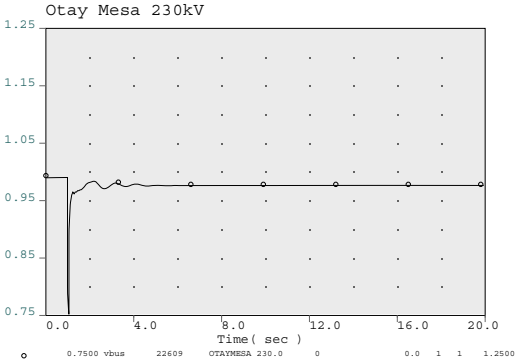
El Centro



Imperial Valley 230kV



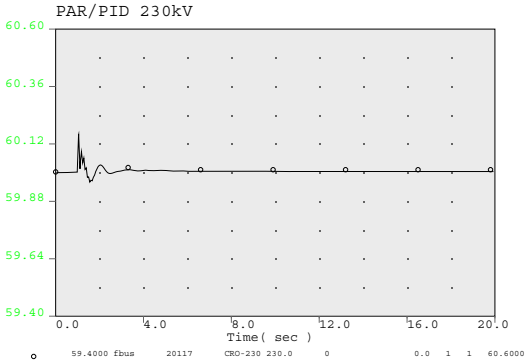
Otay Mesa 230kV



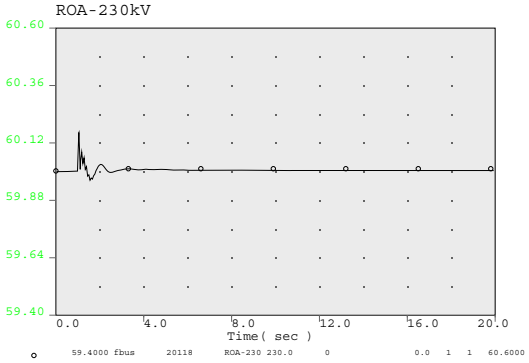
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

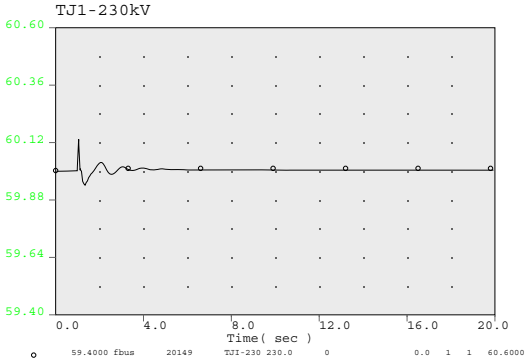
PAR/PID 230kV



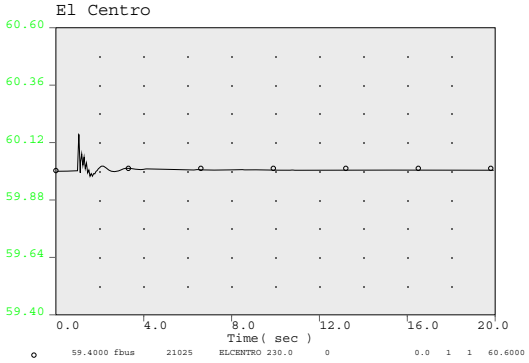
ROA-230kV



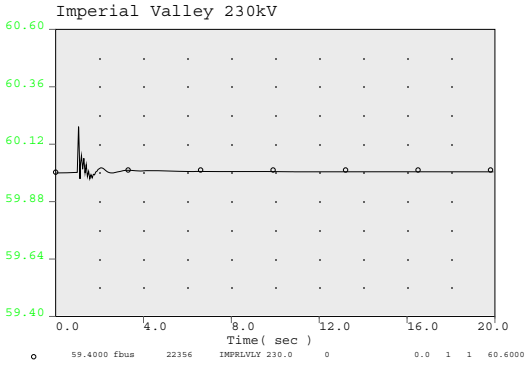
TJ1-230kV



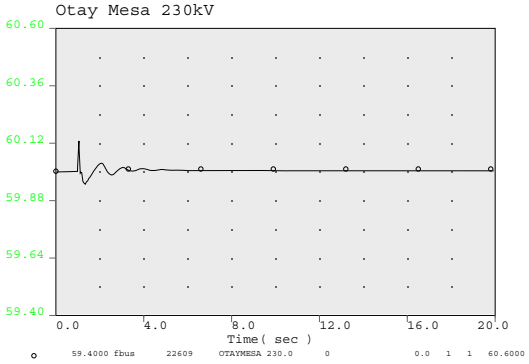
El Centro



Imperial Valley 230kV



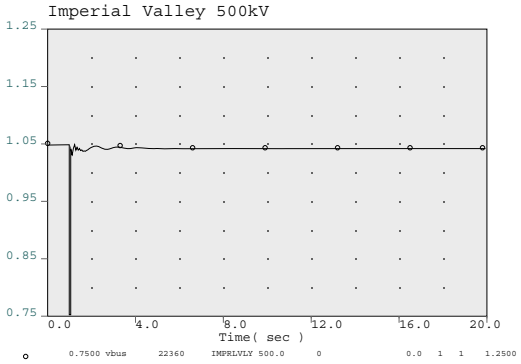
Otay Mesa 230kV



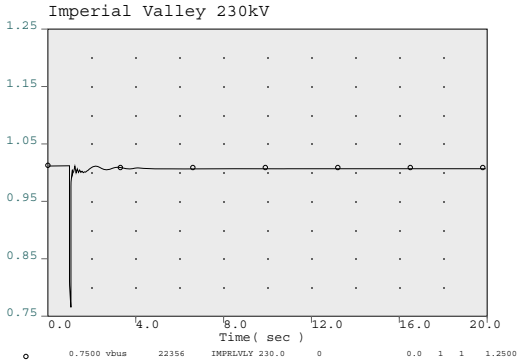
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

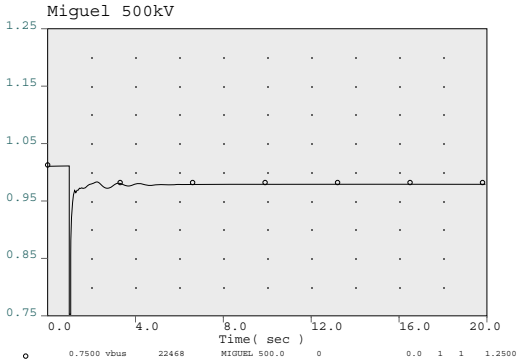
Imperial Valley 500kV



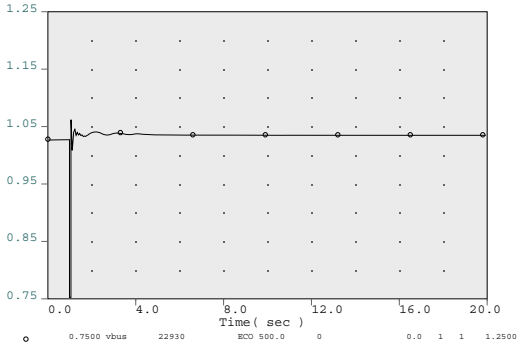
Imperial Valley 230kV



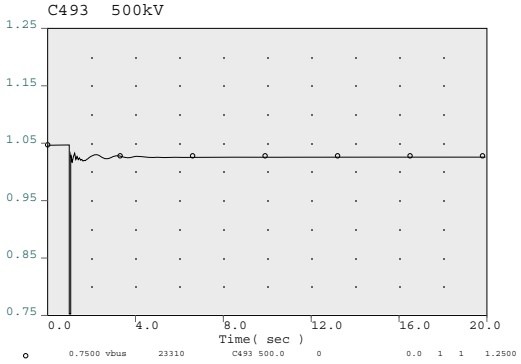
Miguel 500kV



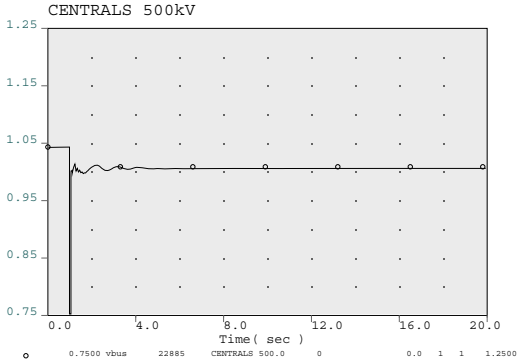
Windfarms 500



C493 500kV



CENTRALS 500kV



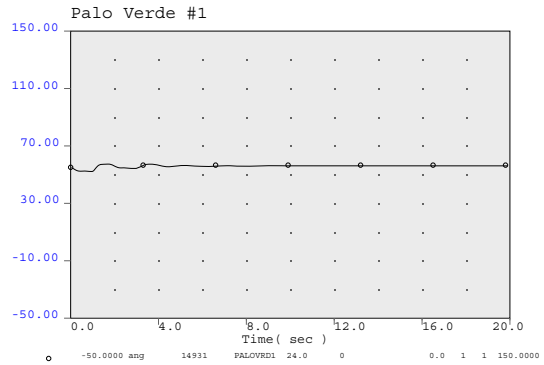
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

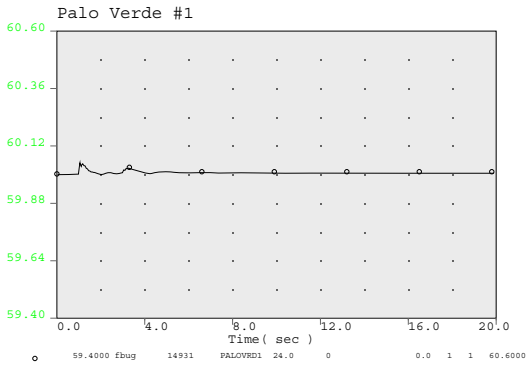
Imperial Valley Area - Frequency

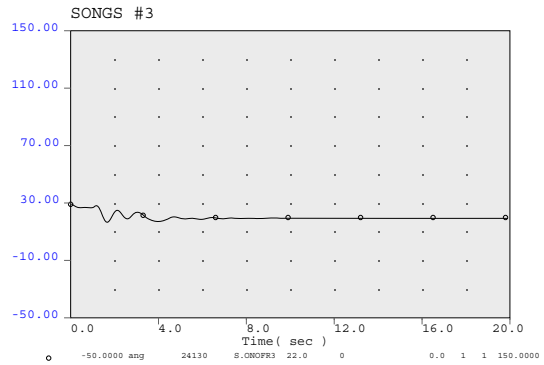


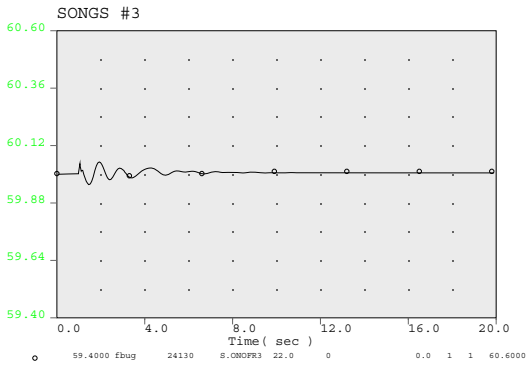
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

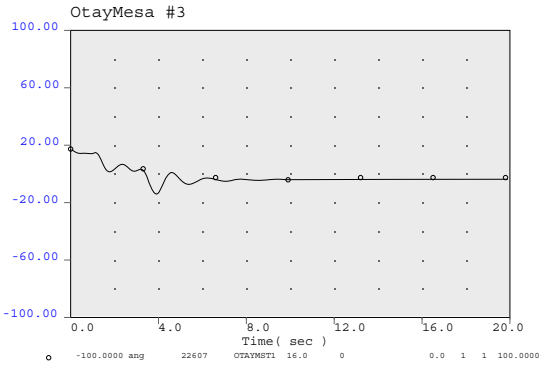
RELATIVE ROTOR ANGLE & FREQUENCY

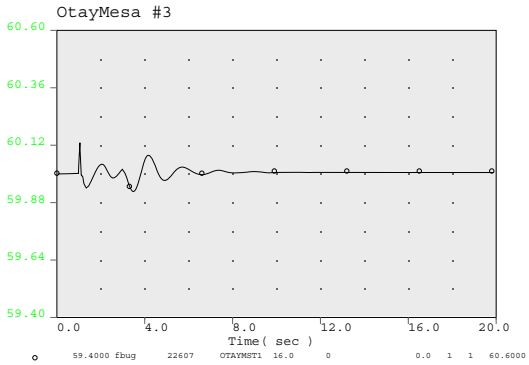












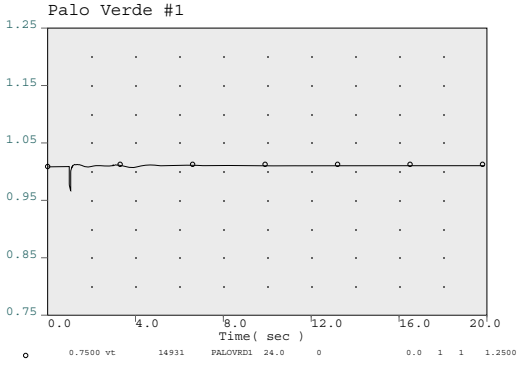
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

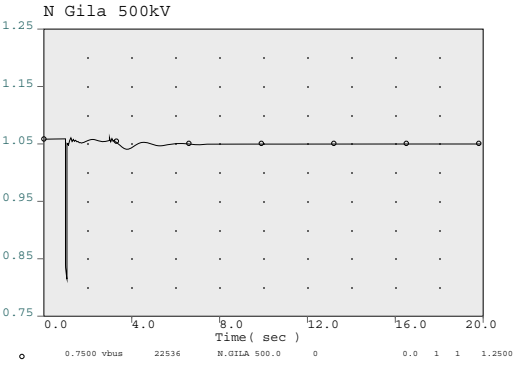
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RELATIVE VOLTAGE

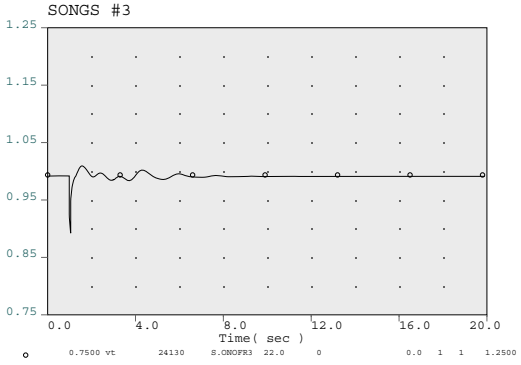
Palo Verde #1



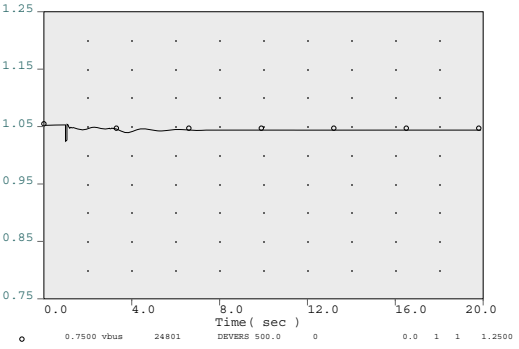
N Gila 500kV



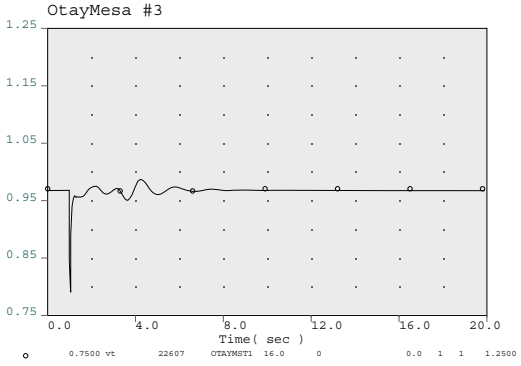
SONGS #3



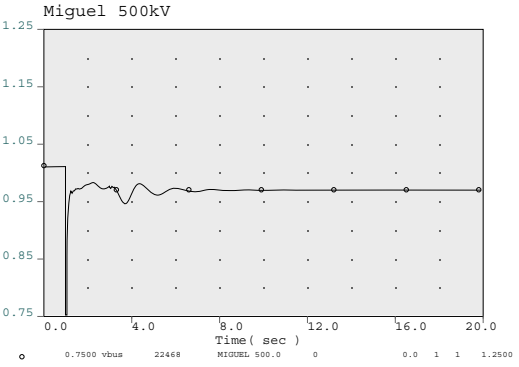
Devers 500



OtayMesa #3



Miguel 500kV

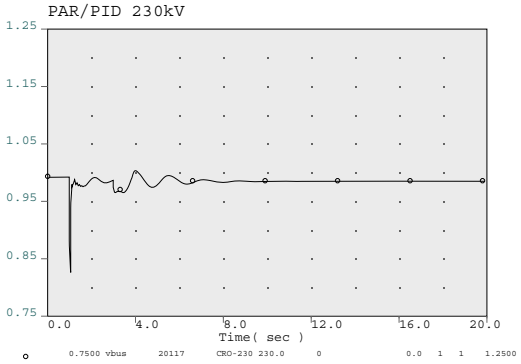


SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

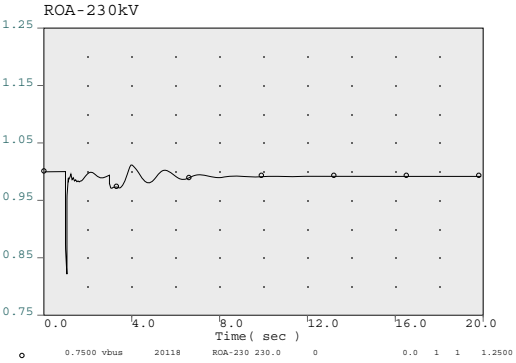
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Affected System Voltage Check and Comparison

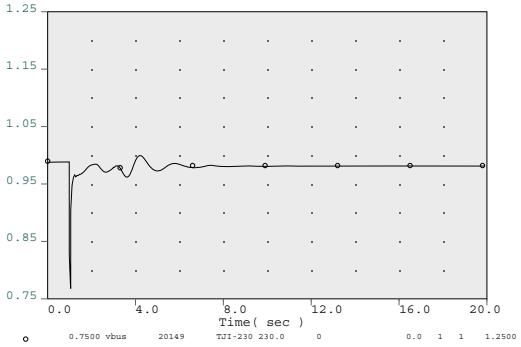
PAR/PID 230kV



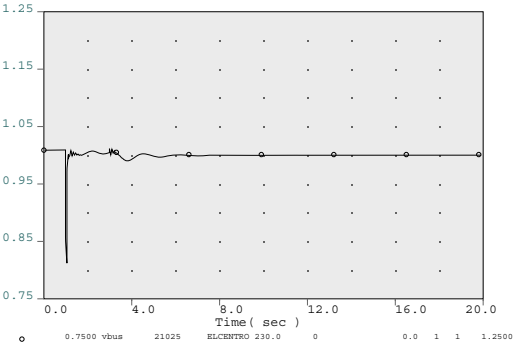
ROA-230kV



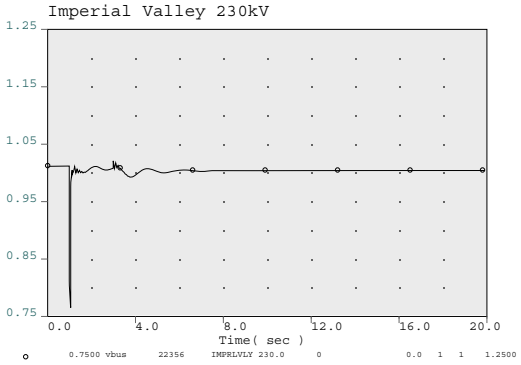
TJ1-230kV



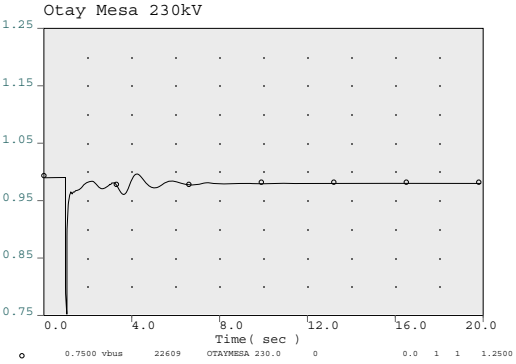
El Centro



Imperial Valley 230kV



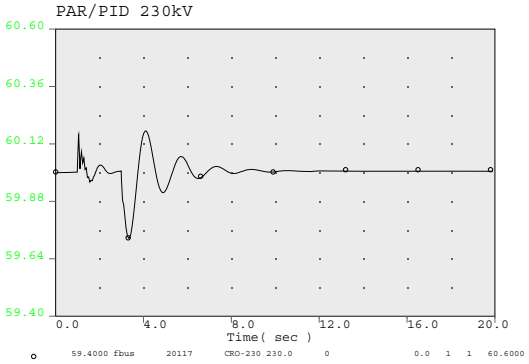
Otay Mesa 230kV



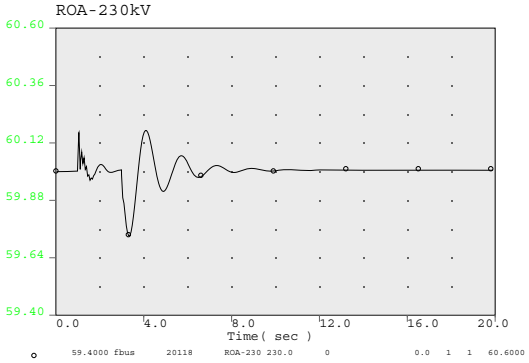
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

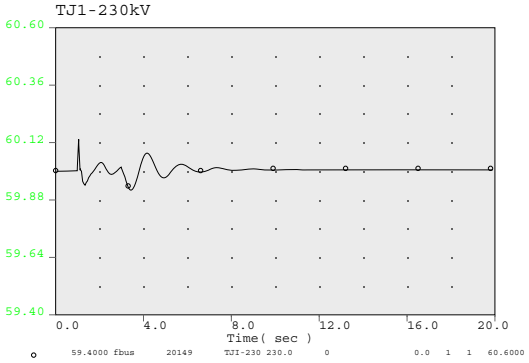
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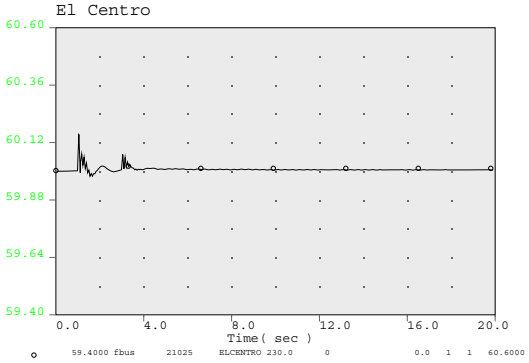
ROA-230kV



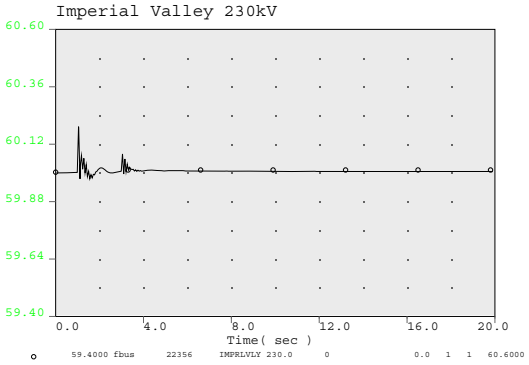
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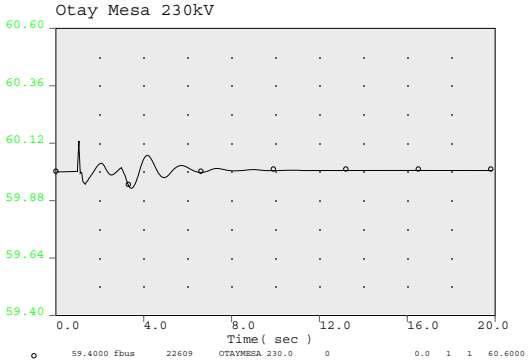
El Centro



Imperial Valley 230kV



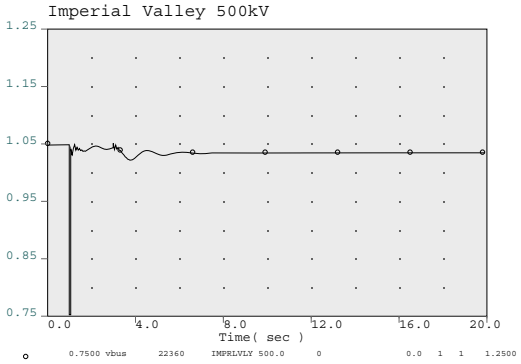
Otay Mesa 230kV



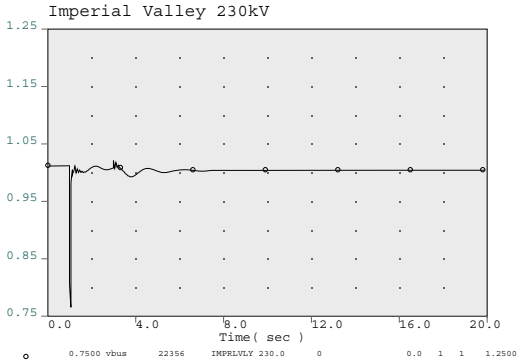
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

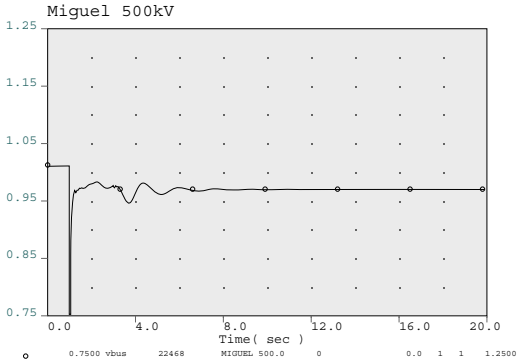
Imperial Valley 500kV



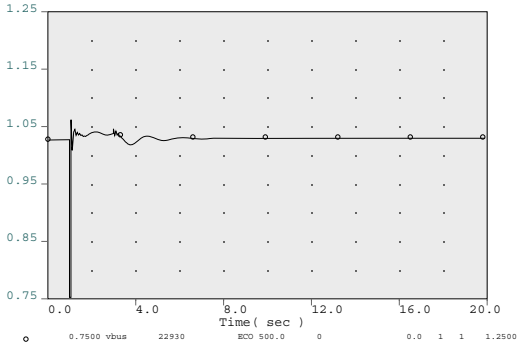
Imperial Valley 230kV



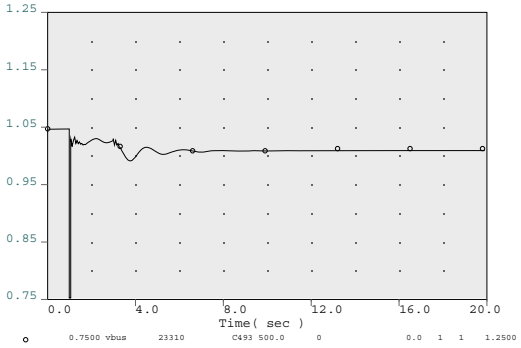
Miguel 500kV



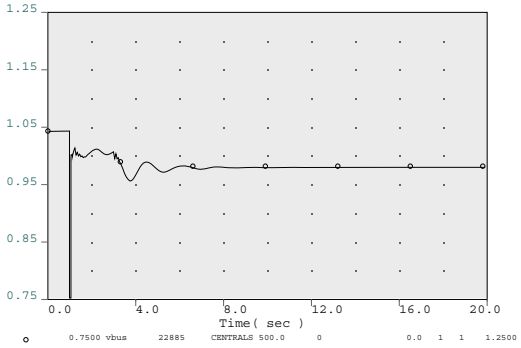
Windfarms 500



C493 500kV

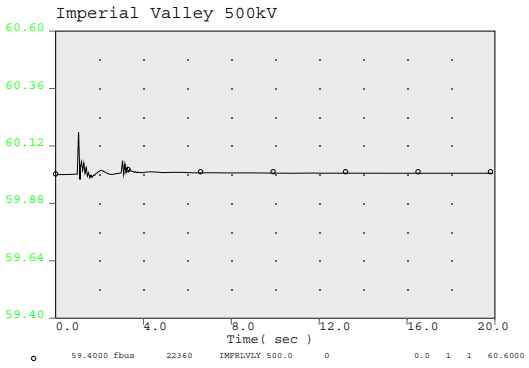


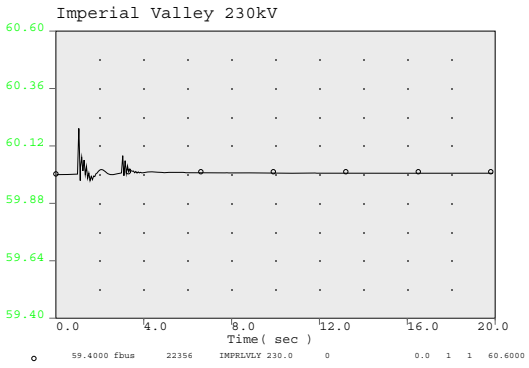
CENTRALS 500kV

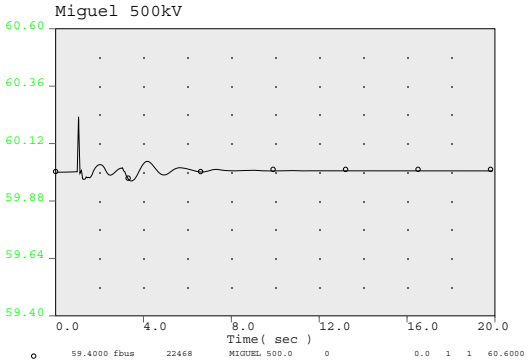


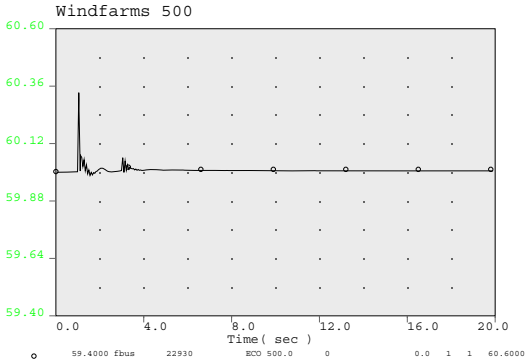
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

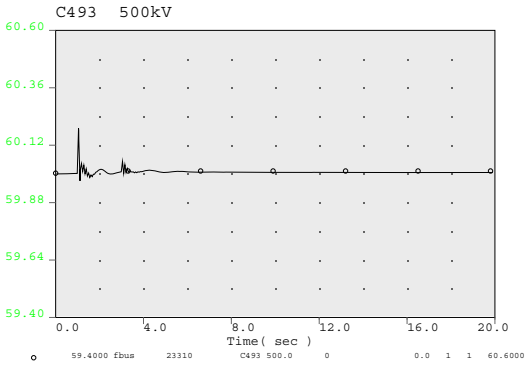
Imperial Valley Area - Frequency

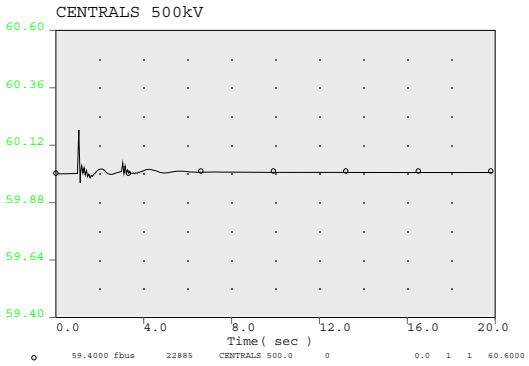






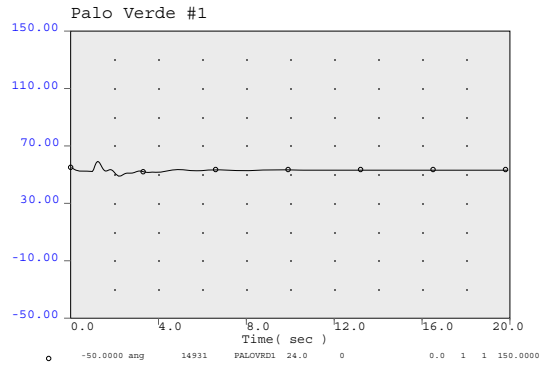


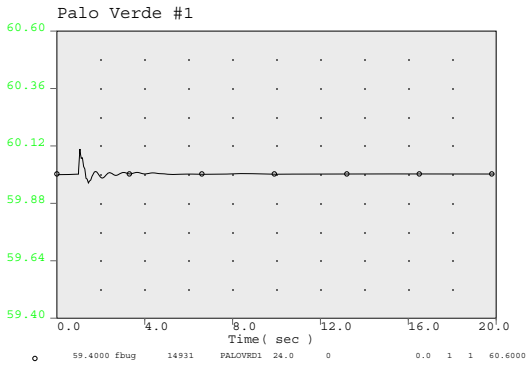


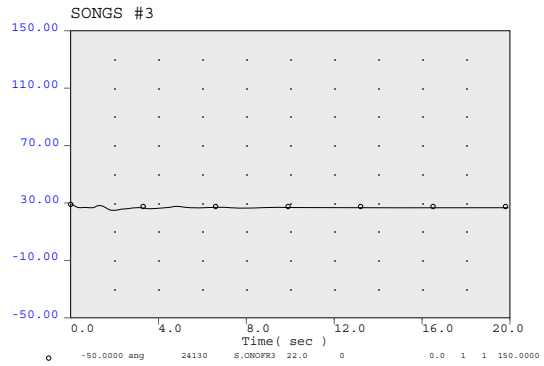


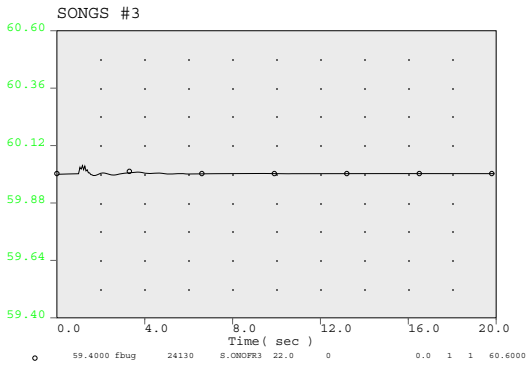
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

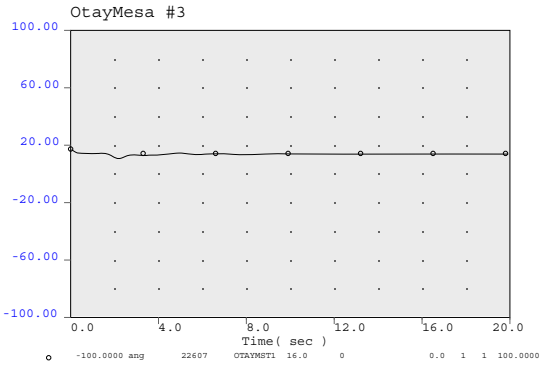
RELATIVE ROTOR ANGLE & FREQUENCY

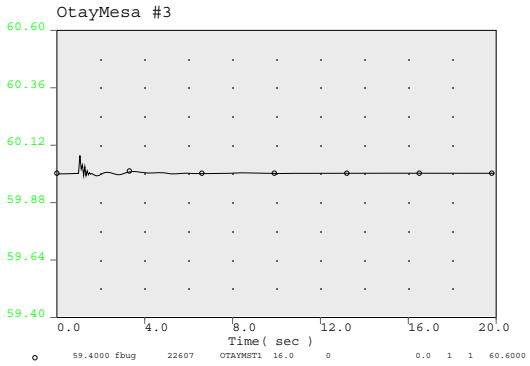










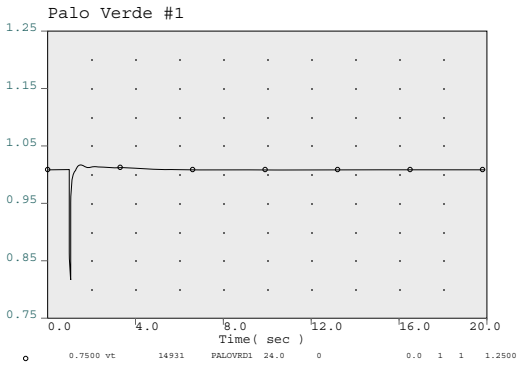


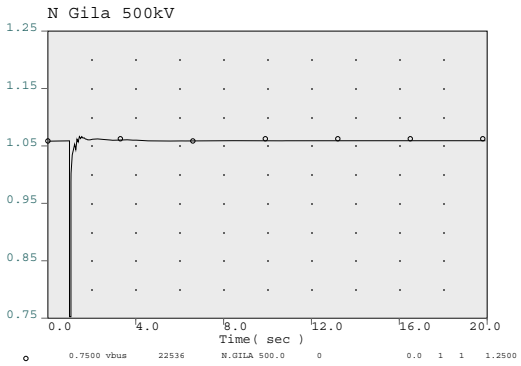
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

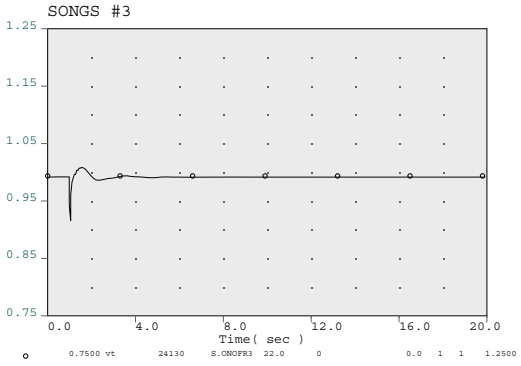
Page 1

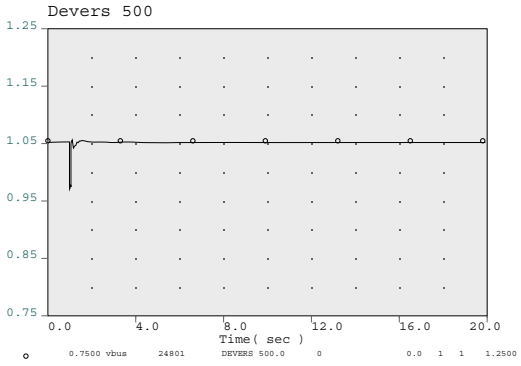
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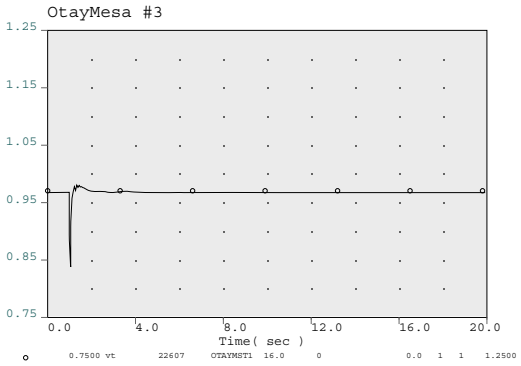
RELATIVE VOLTAGE

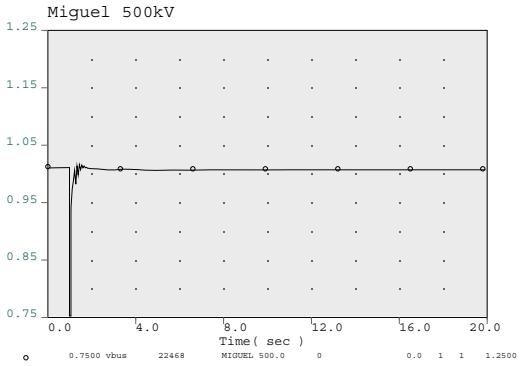








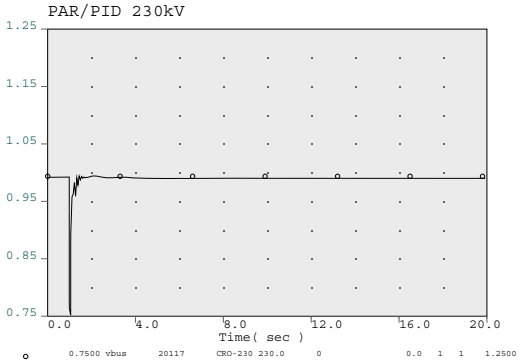




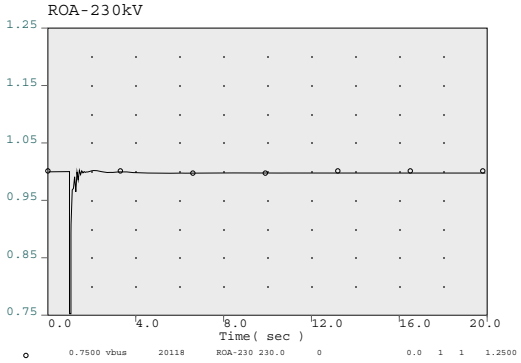
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

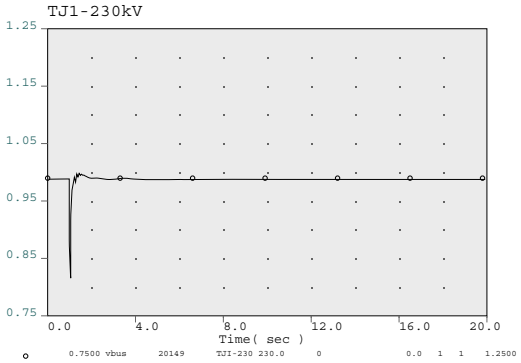
PAR/PID 230kV



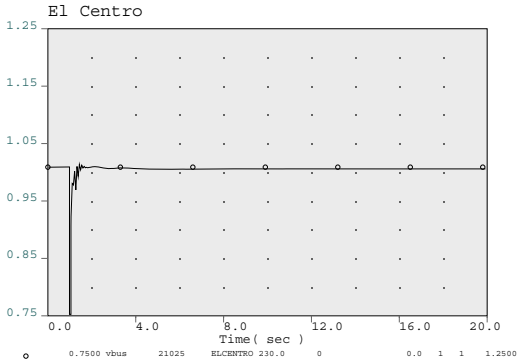
ROA-230kV



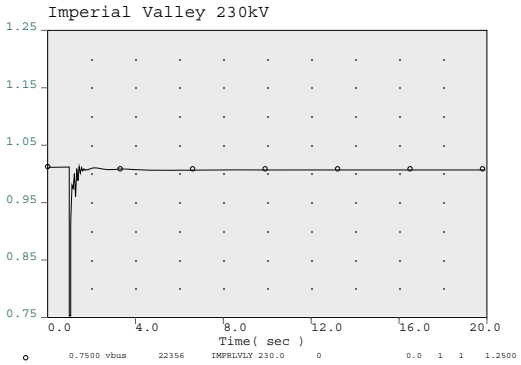
TJ1-230kV



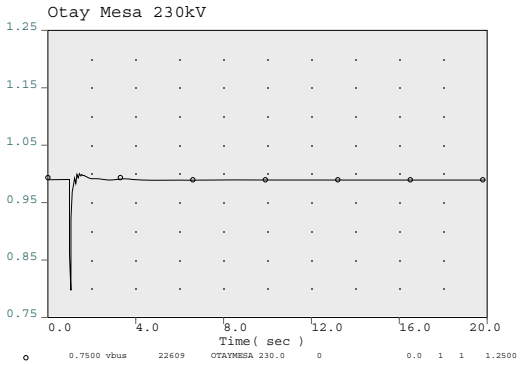
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



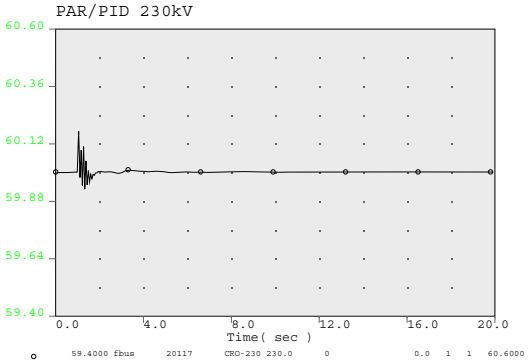
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Page 3

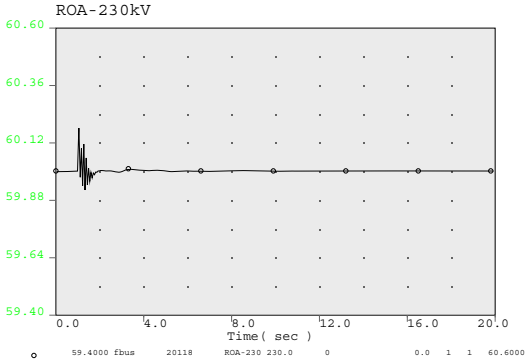
SDGE	NGila_IV_slo_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:28:30 2010

Affected System Frequency Check and Comparison

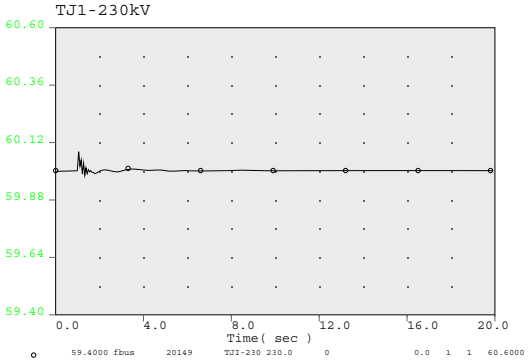
PAR/PID 230kV



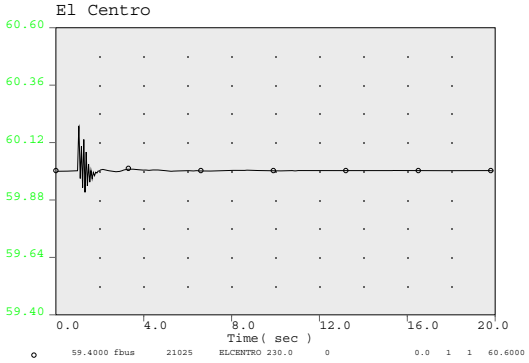
ROA-230kV



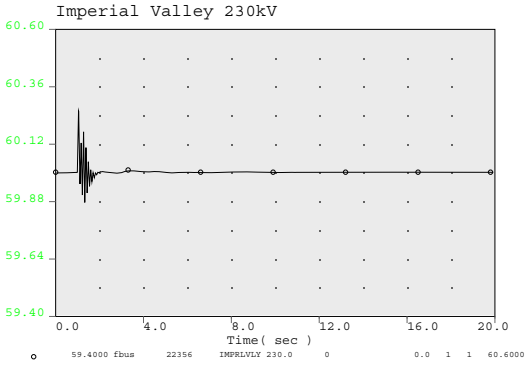
TJ1-230kV



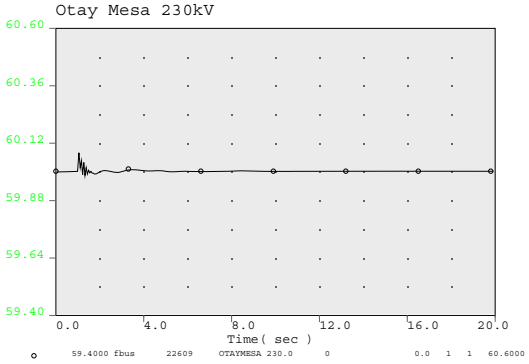
El Centro



Imperial Valley 230kV



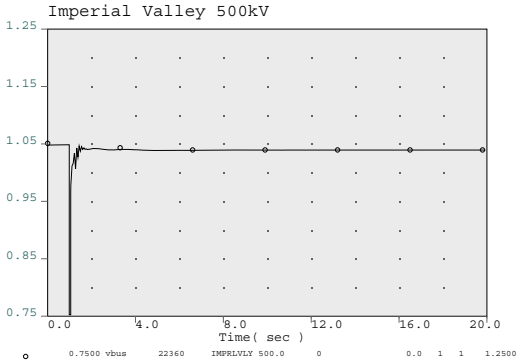
Otay Mesa 230kV



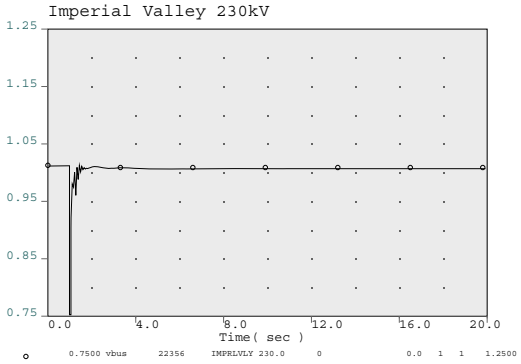
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

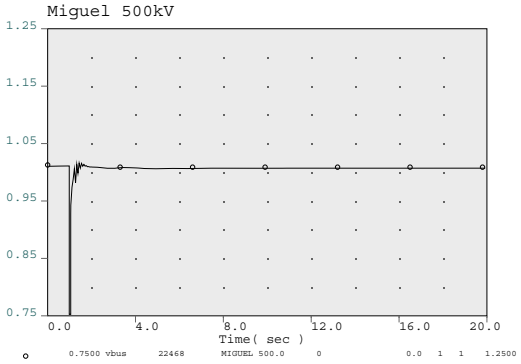
Imperial Valley 500kV



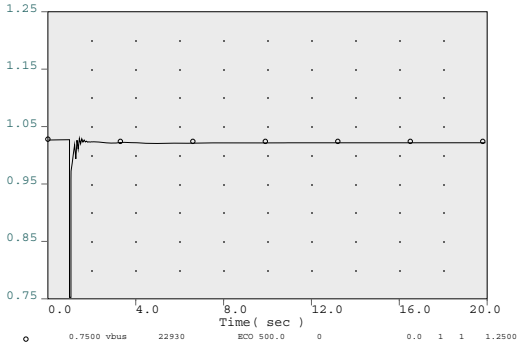
Imperial Valley 230kV



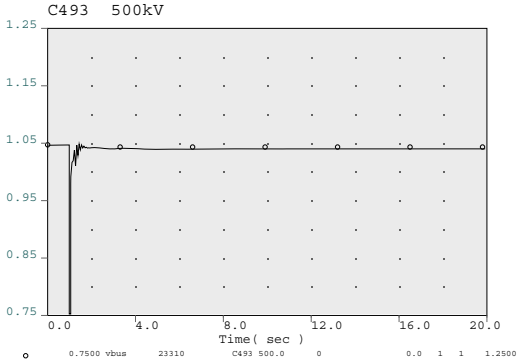
Miguel 500kV



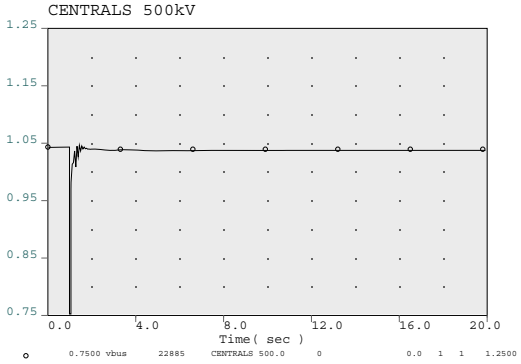
Windfarms 500



C493 500kV

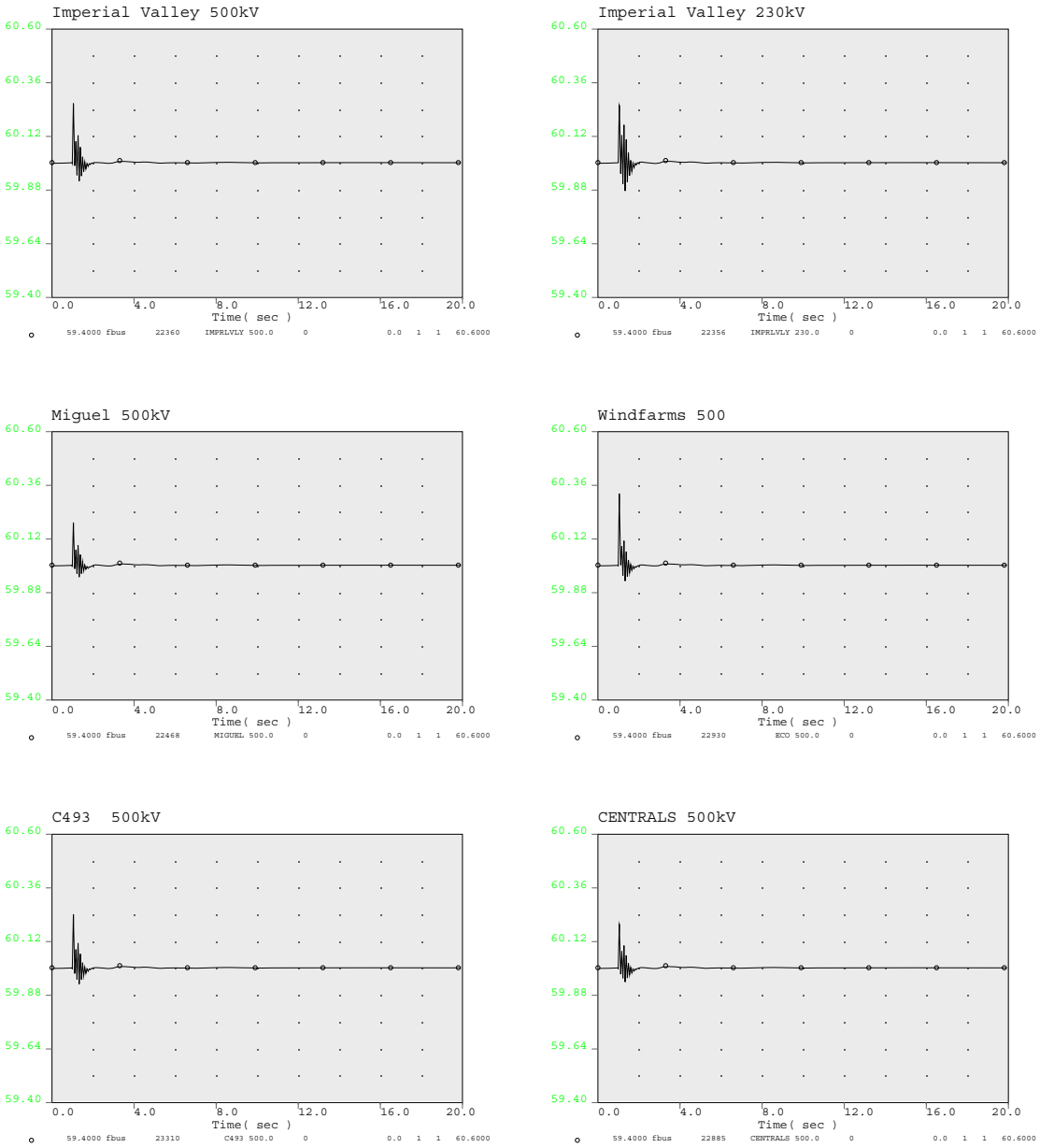


CENTRALS 500kV



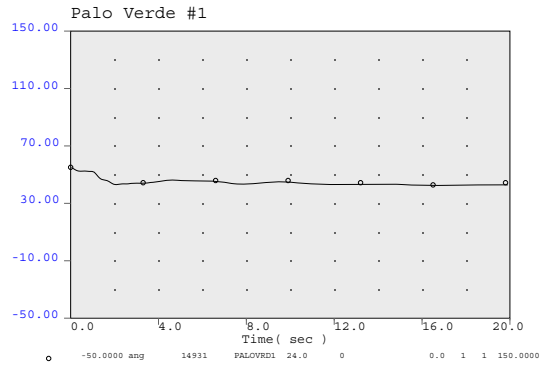
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

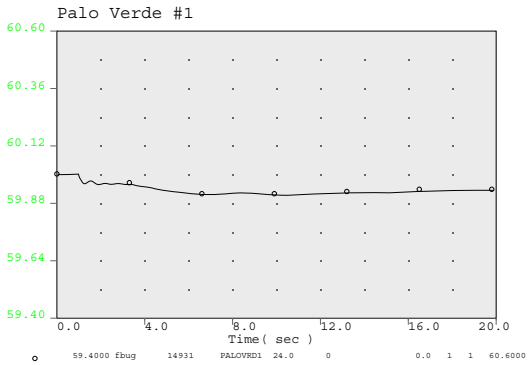
Imperial Valley Area - Frequency

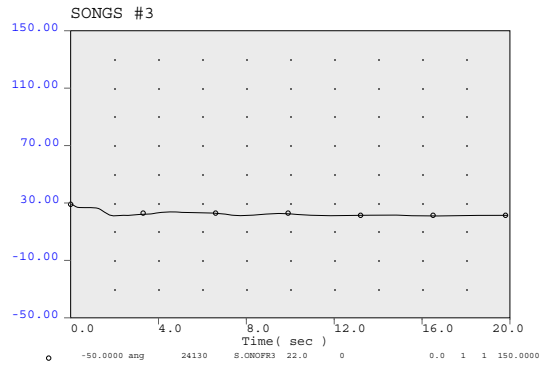


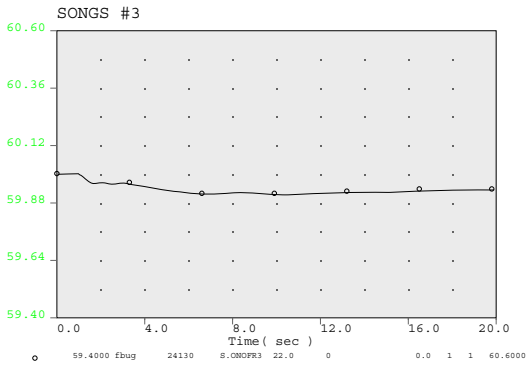
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

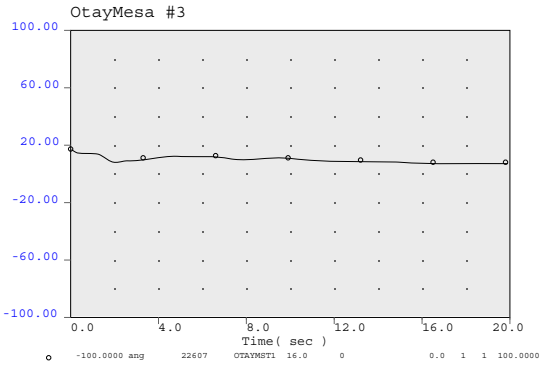
RELATIVE ROTOR ANGLE & FREQUENCY

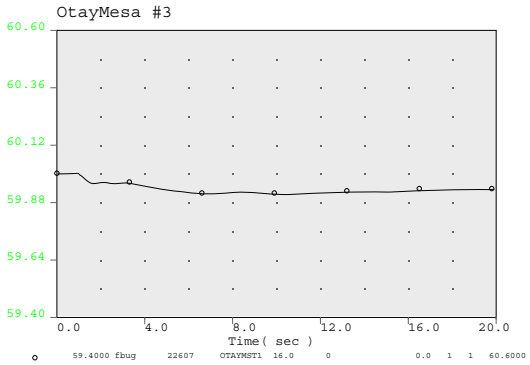










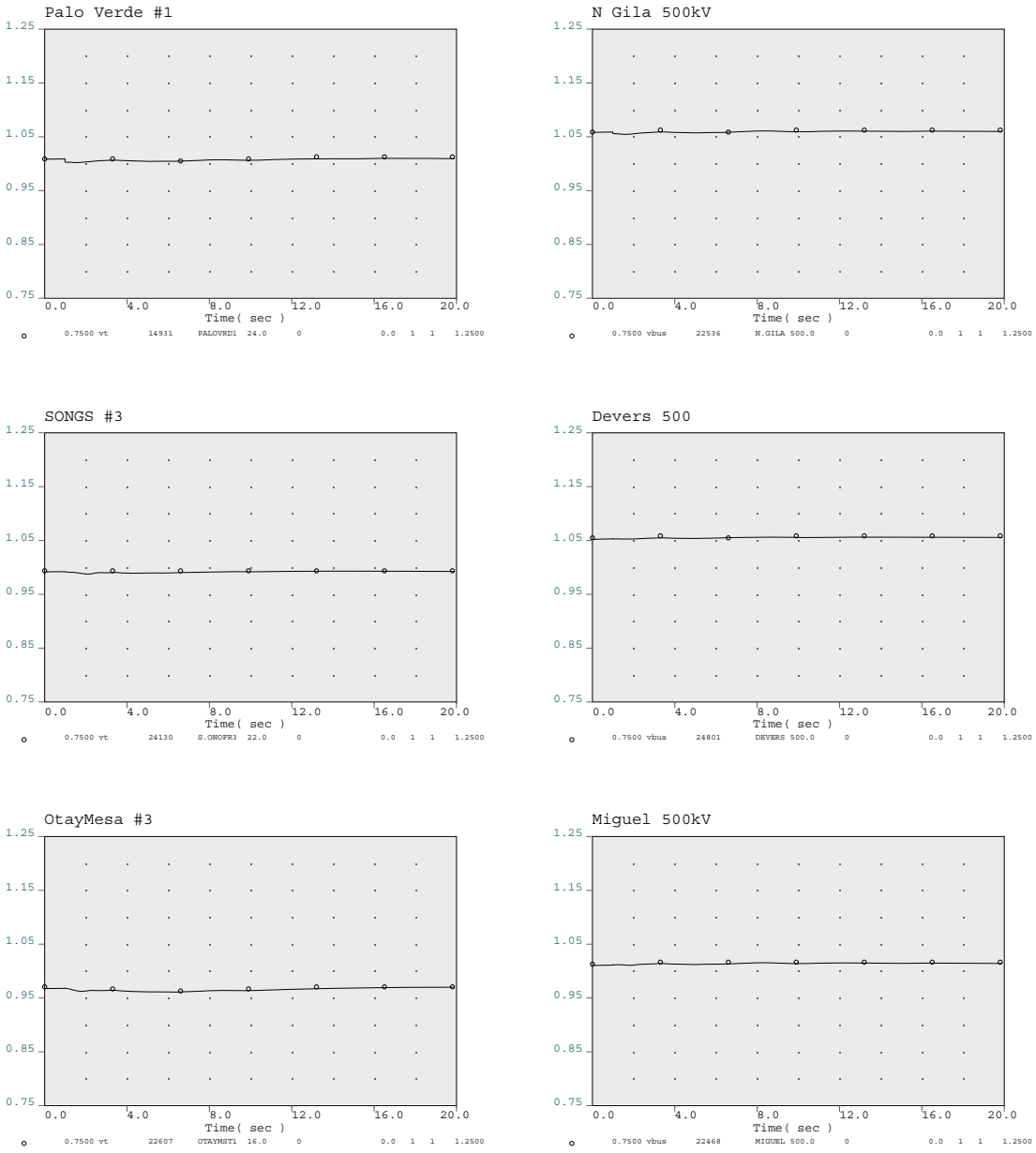


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Page 1

SDGE	PaloVerde-g1_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:25:57 2010

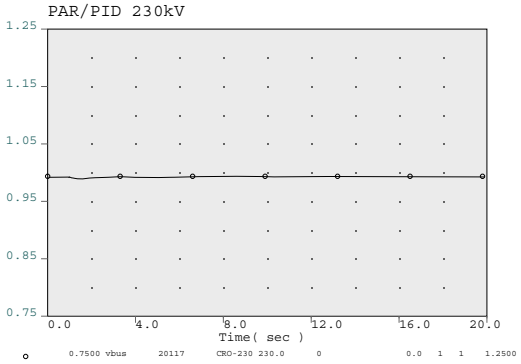
RELATIVE VOLTAGE



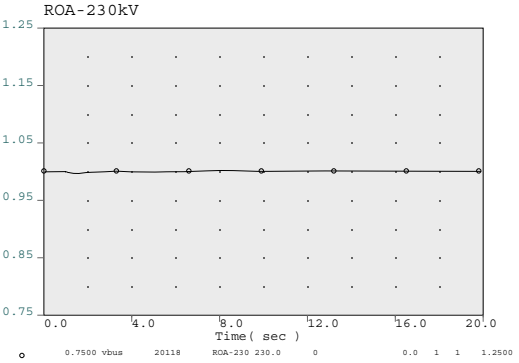
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

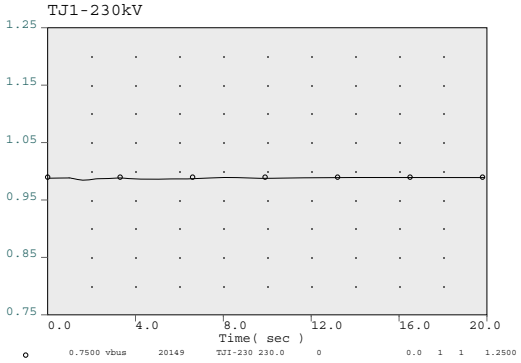
PAR/PID 230kV



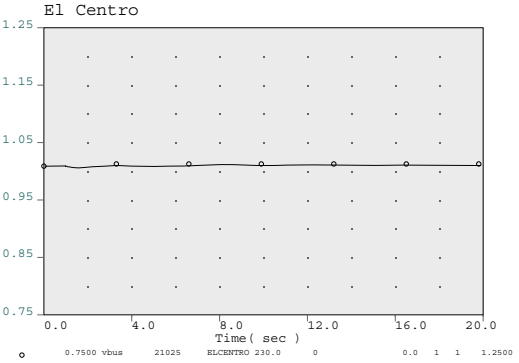
ROA-230kV



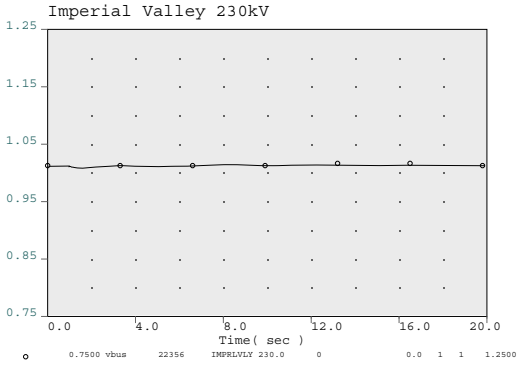
TJ1-230kV



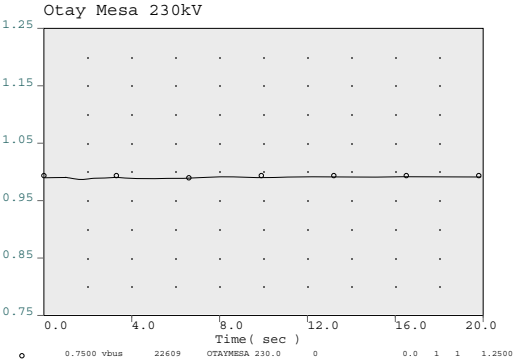
El Centro



Imperial Valley 230kV



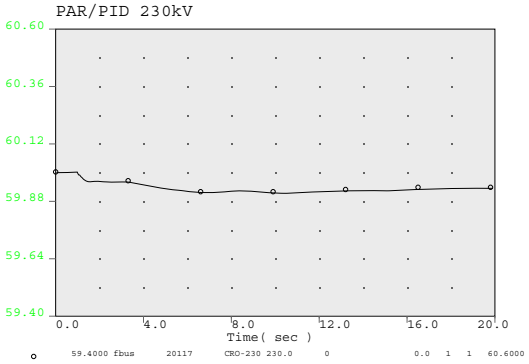
Otay Mesa 230kV



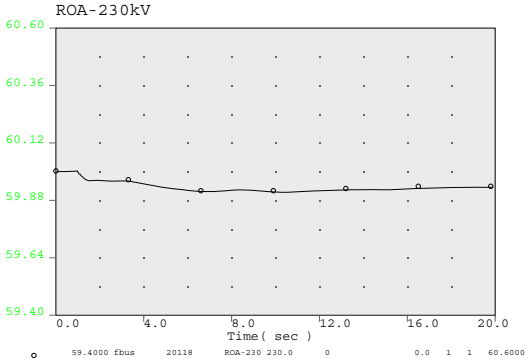
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

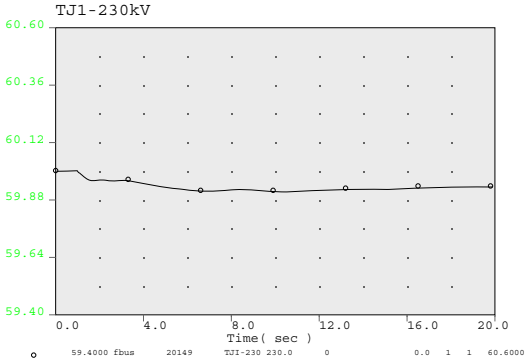
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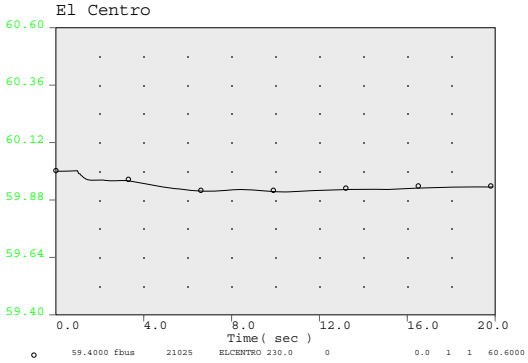
ROA-230kV



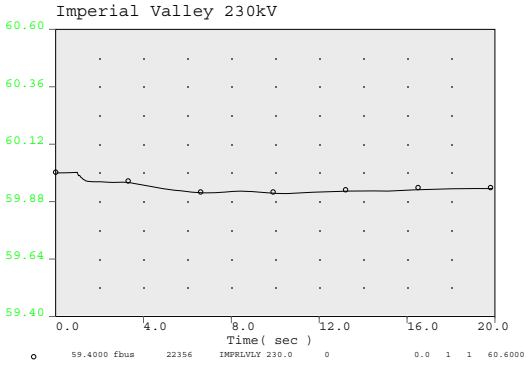
TJ1-230kV



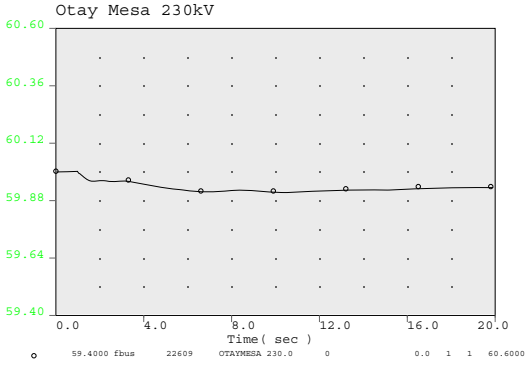
El Centro



Imperial Valley 230kV

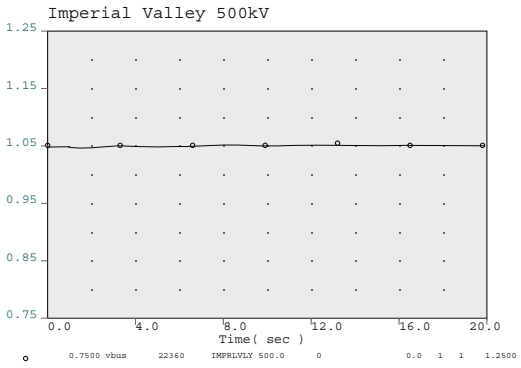


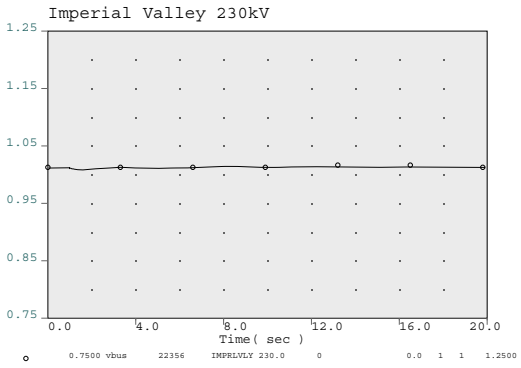
Otay Mesa 230kV

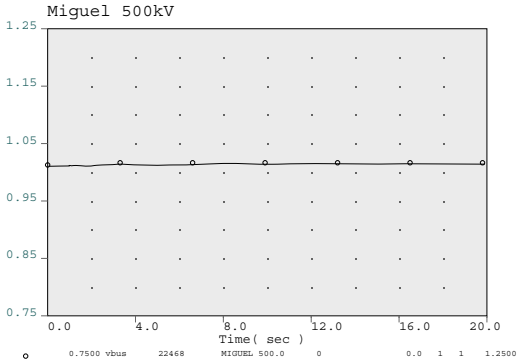


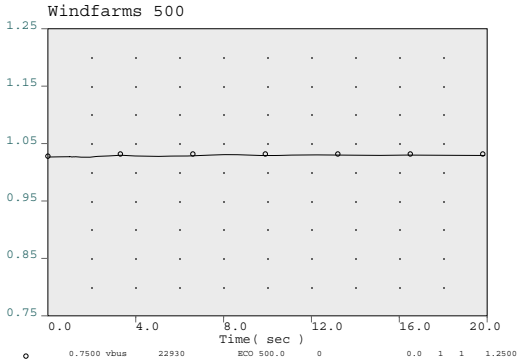
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

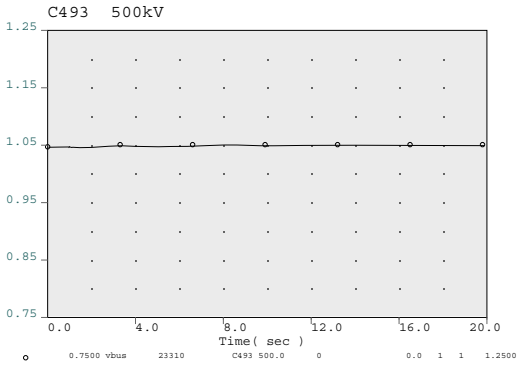
Imperial Valley Area - VOLTAGE

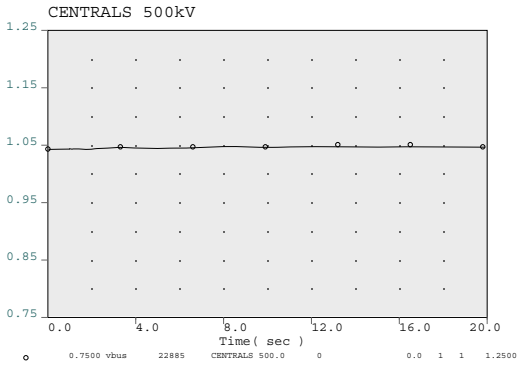










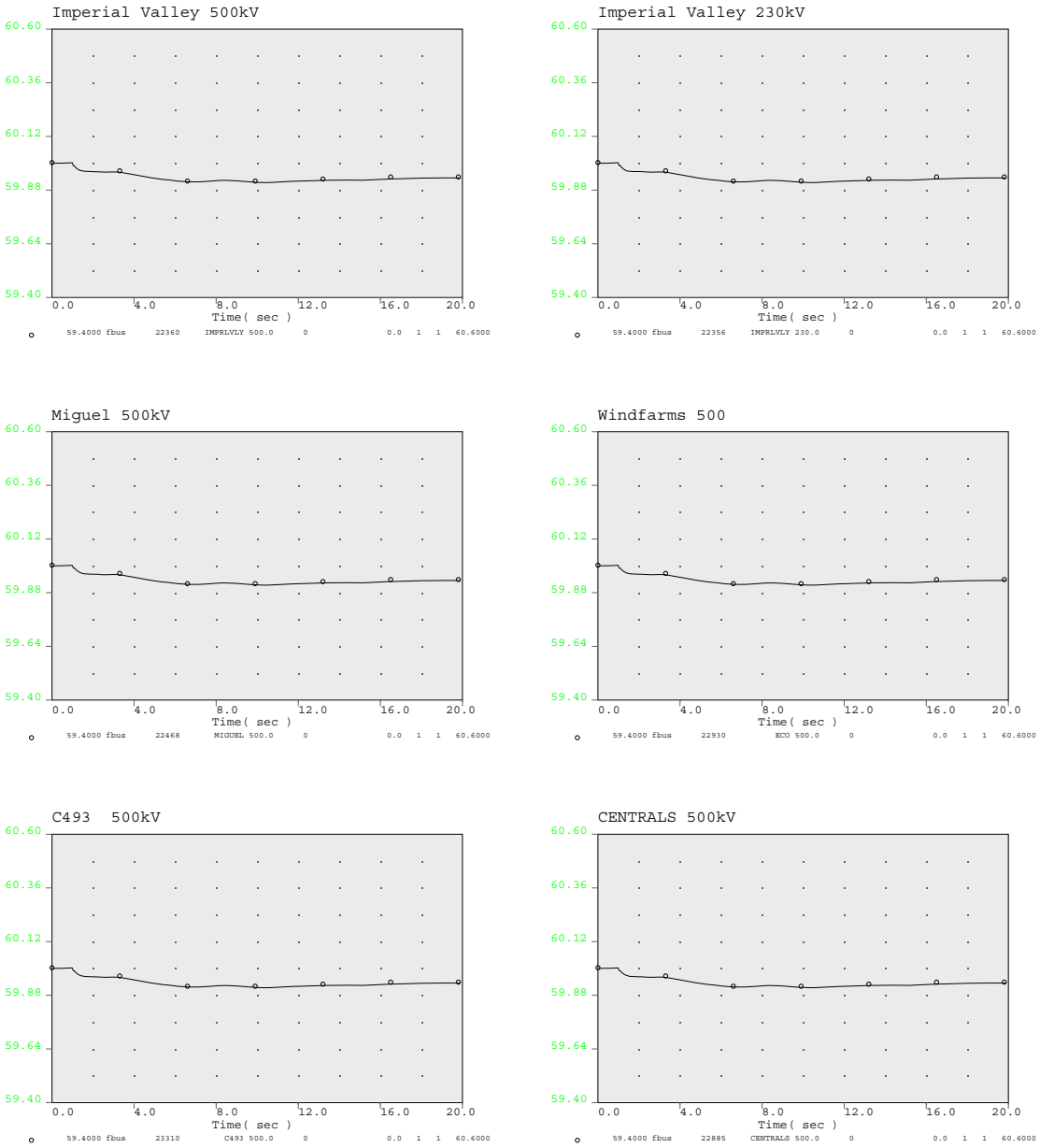


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

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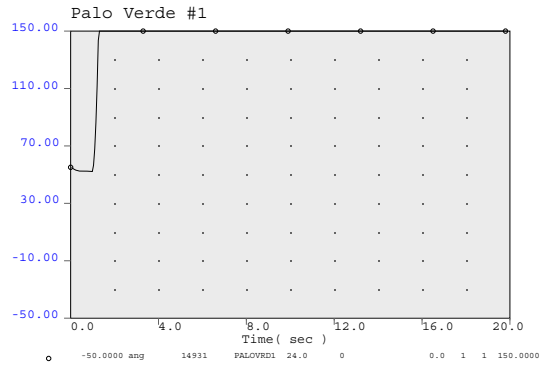
SDGE	PaloVerde-g1_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:25:57 2010

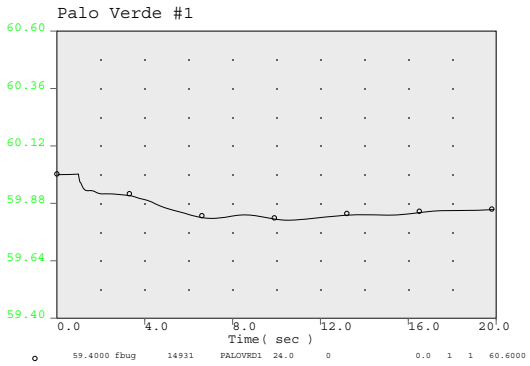
Imperial Valley Area - Frequency

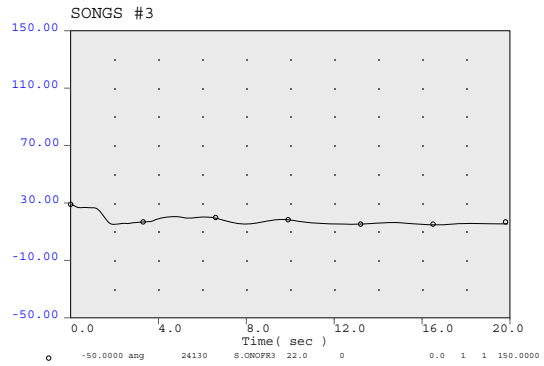


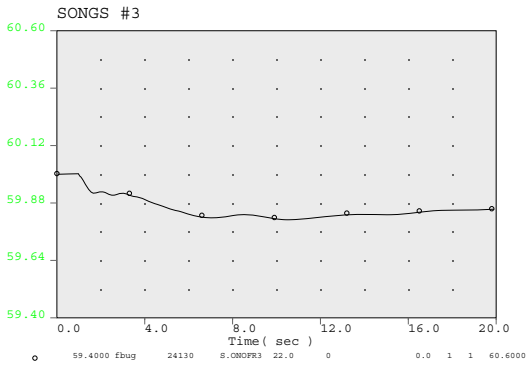
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

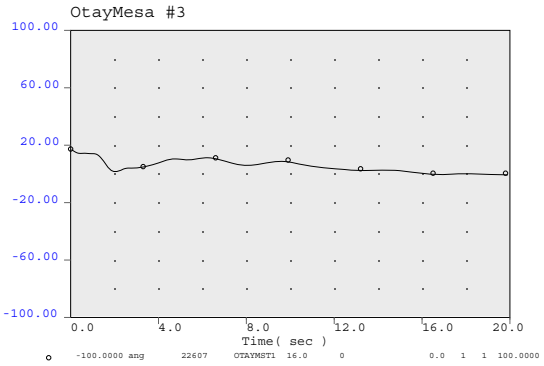
RELATIVE ROTOR ANGLE & FREQUENCY

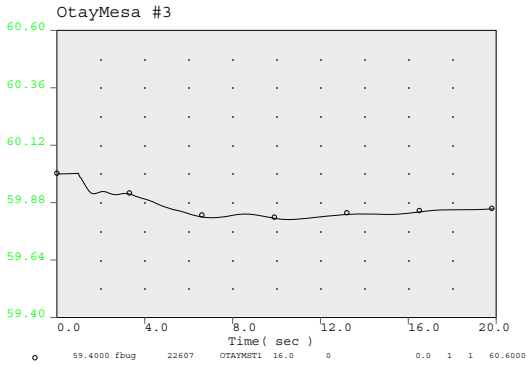












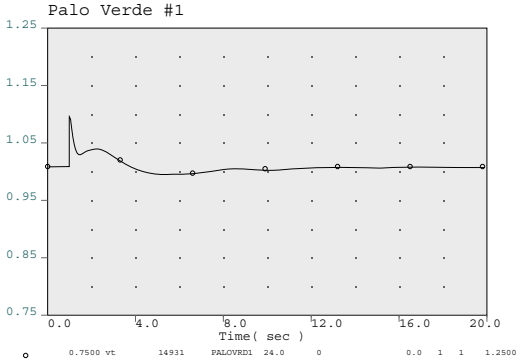
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

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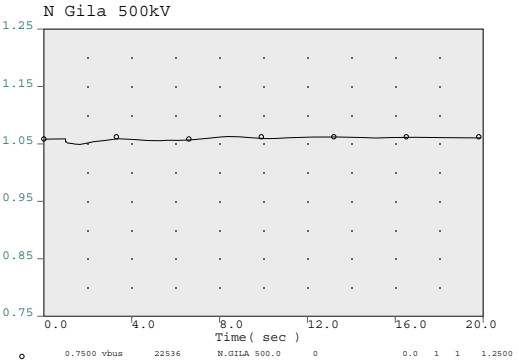
SDGE	PaloVerde-g2_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:26:13 2010

RELATIVE VOLTAGE

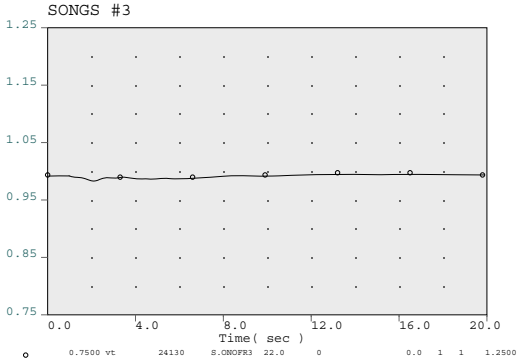
Palo Verde #1



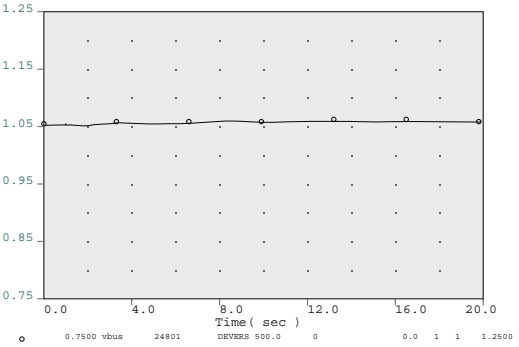
N Gila 500kV



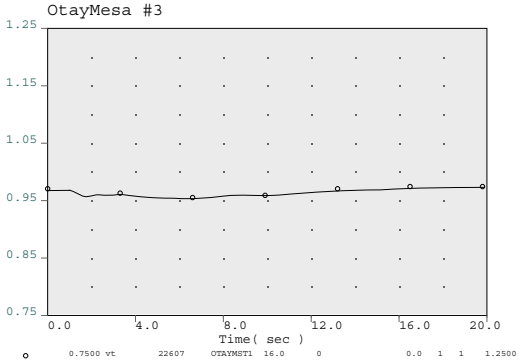
SONGS #3



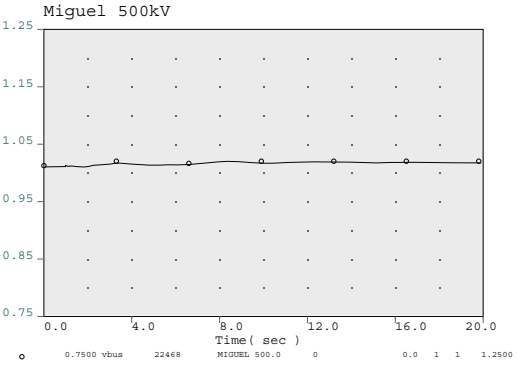
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OtayMesa #3



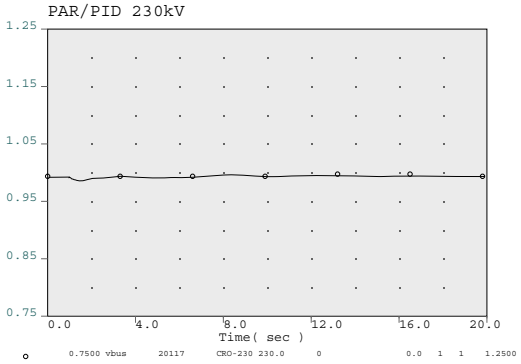
Miguel 500kV



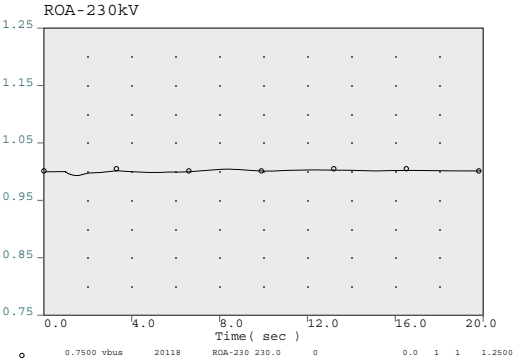
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

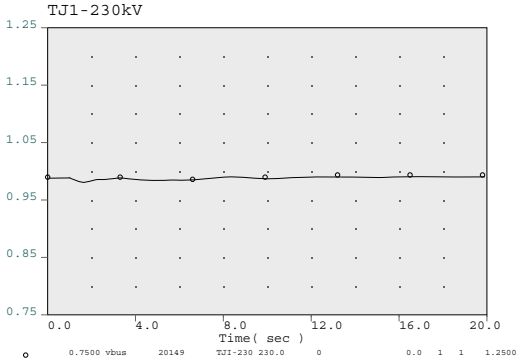
PAR/PID 230kV



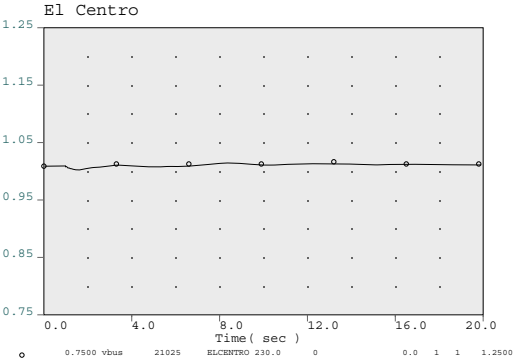
ROA-230kV



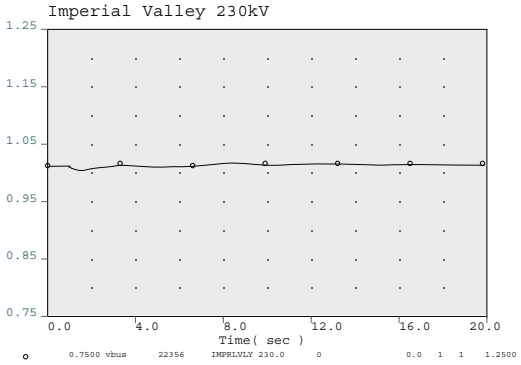
TJ1-230kV



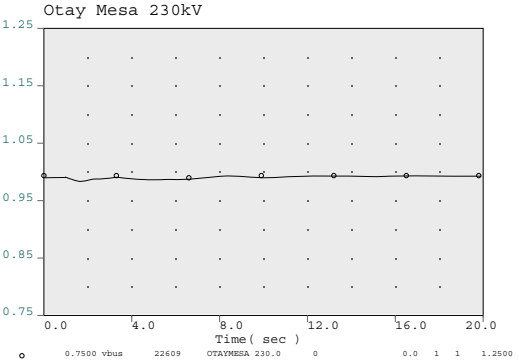
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Page 3

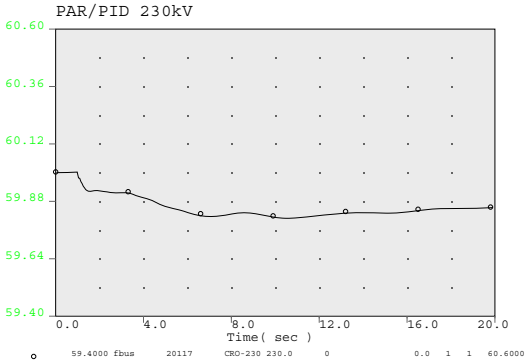
PaloVerde-g2_pst_hs_eco4.chf

ii phase i\dyds\pst_bu4up

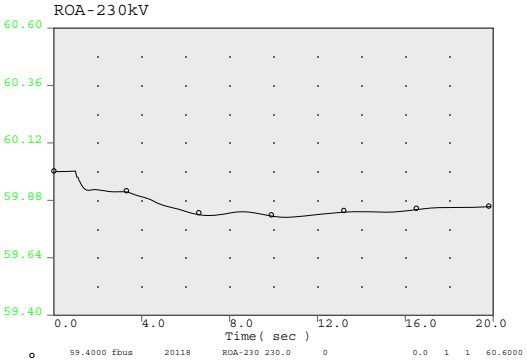
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Affected System Frequency Check and Comparison

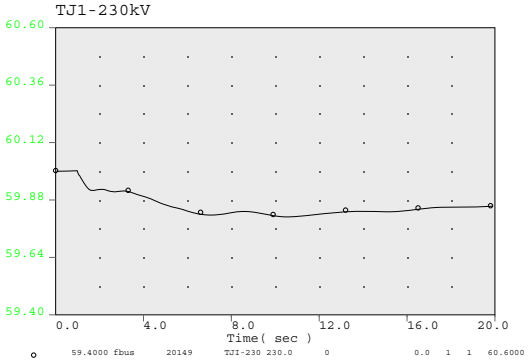
PAR/PID 230kV



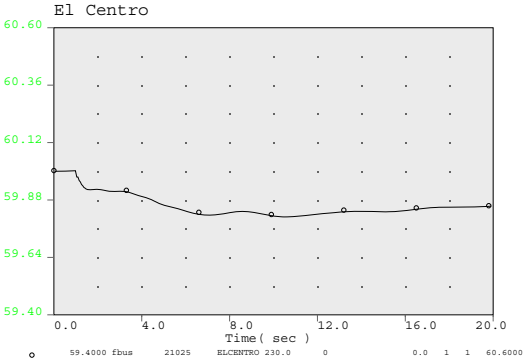
ROA-230kV



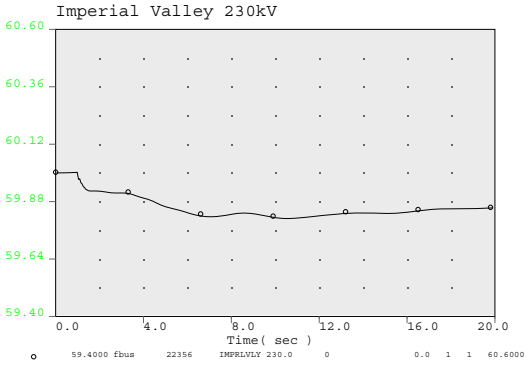
TJ1-230kV



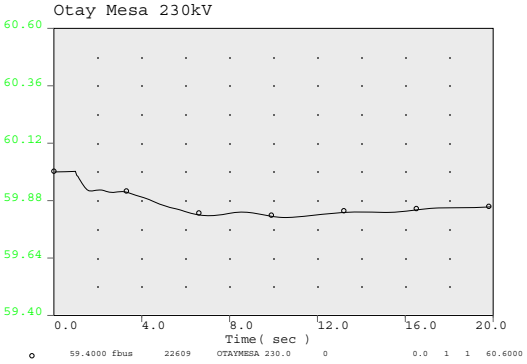
El Centro



Imperial Valley 230kV

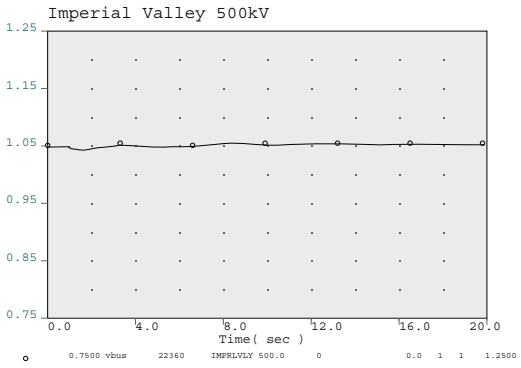


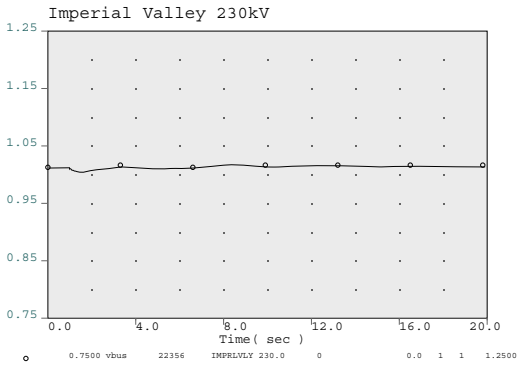
Otay Mesa 230kV

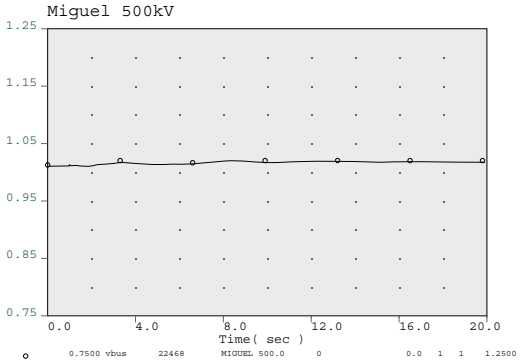


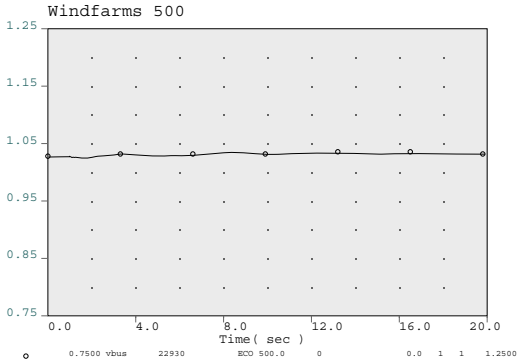
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

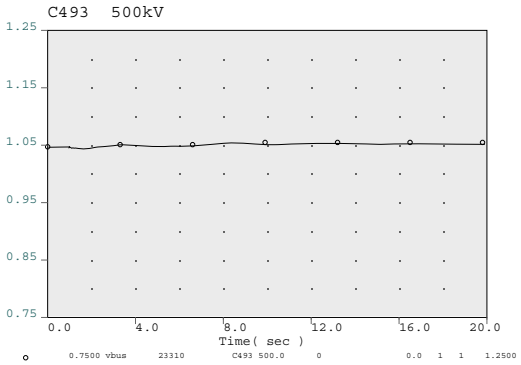
Imperial Valley Area - VOLTAGE

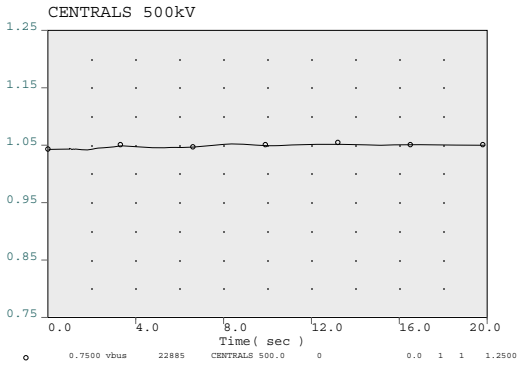








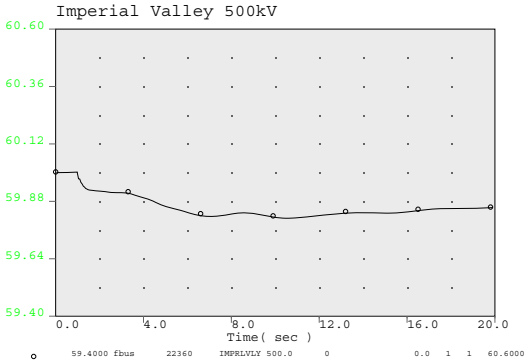




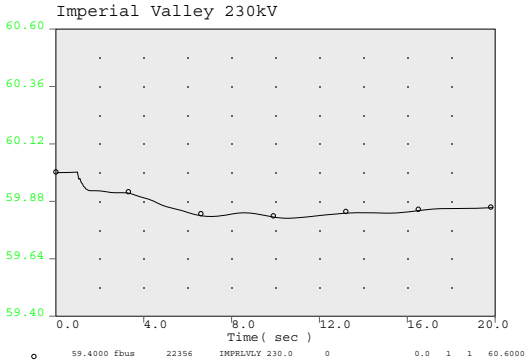
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - Frequency

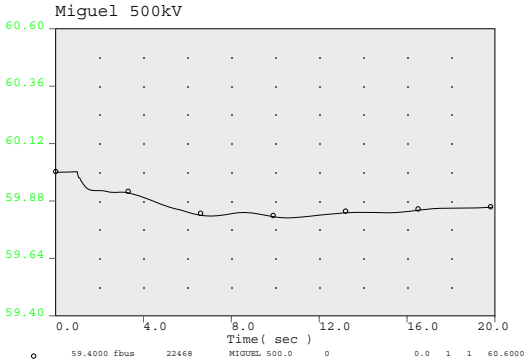
Imperial Valley 500kV



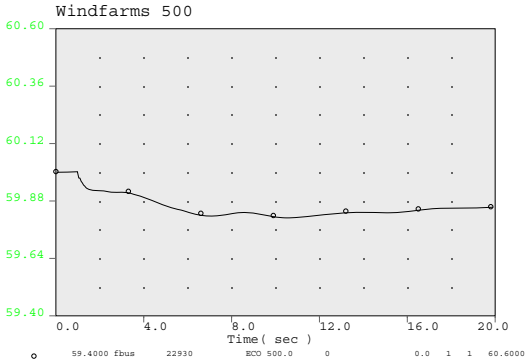
Imperial Valley 230kV



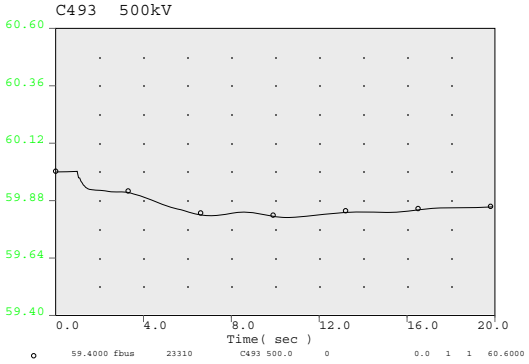
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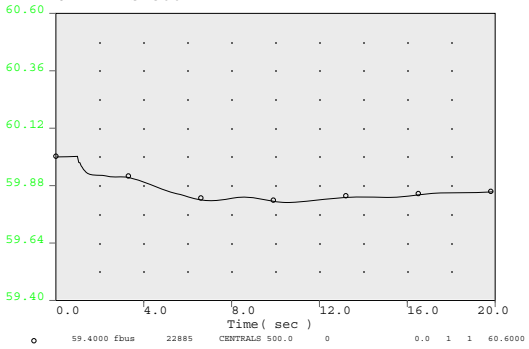
Windfarms 500



C493 500kV

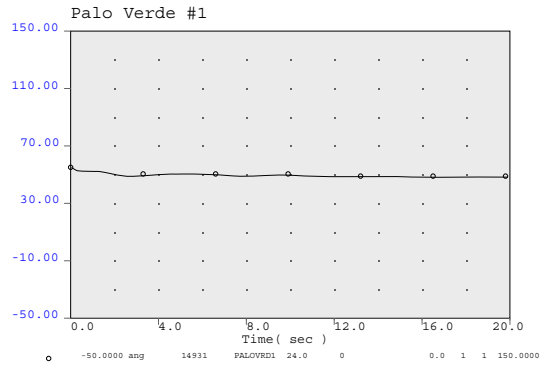


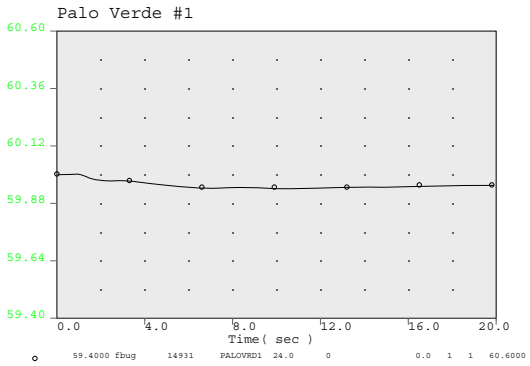
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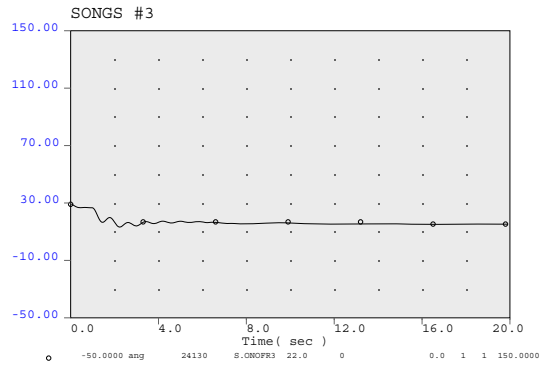


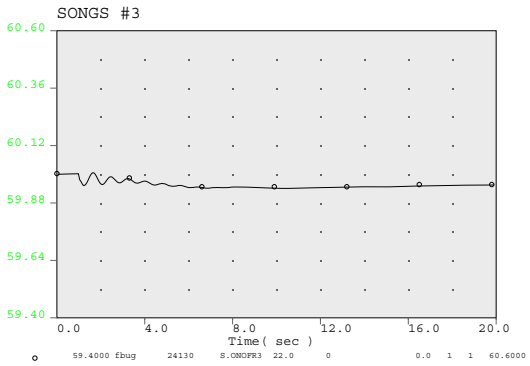
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

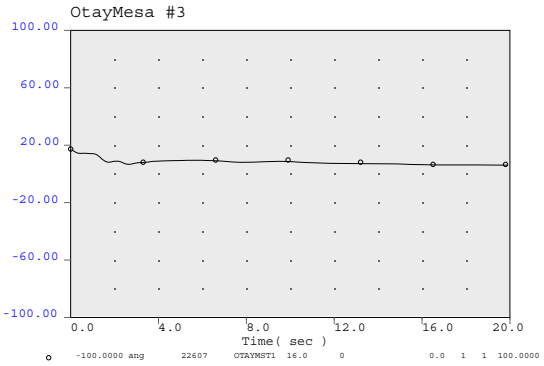
RELATIVE ROTOR ANGLE & FREQUENCY

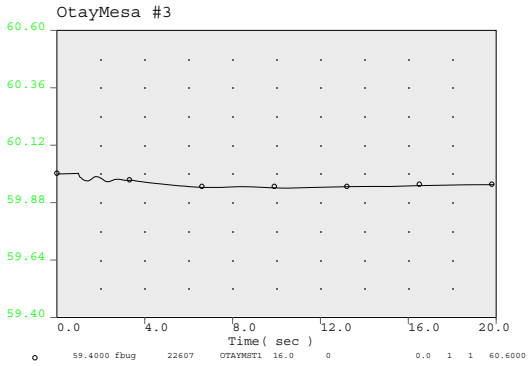










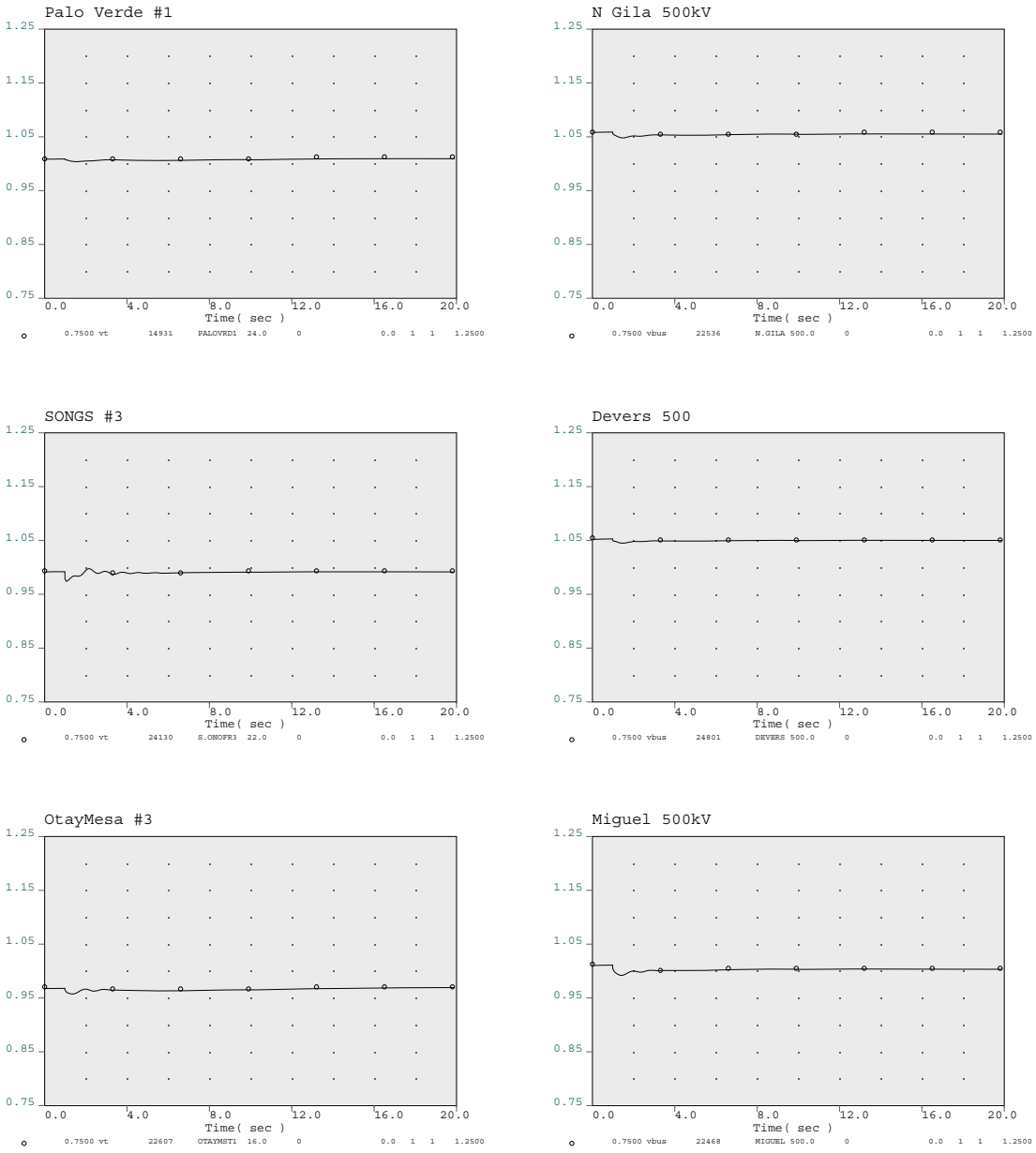


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

Page 1

SDGE	SONGS-g1_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:26:29 2010

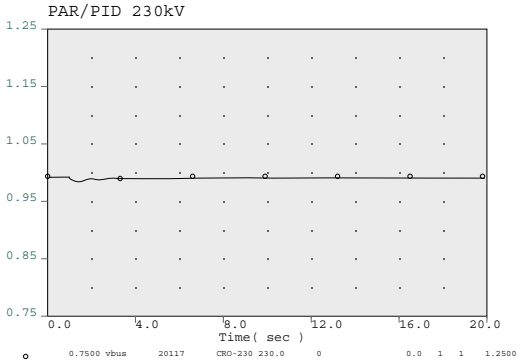
RELATIVE VOLTAGE



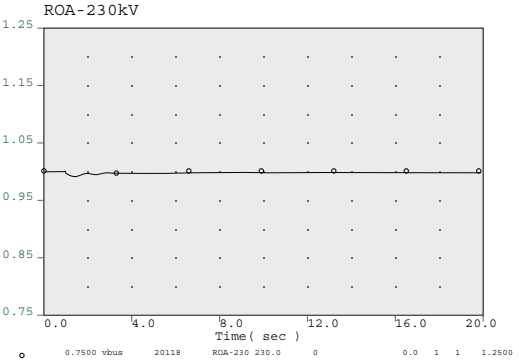
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

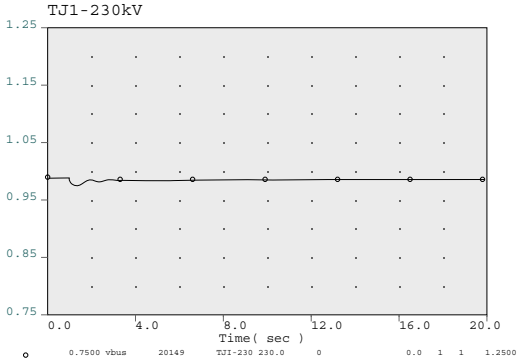
PAR/PID 230kV



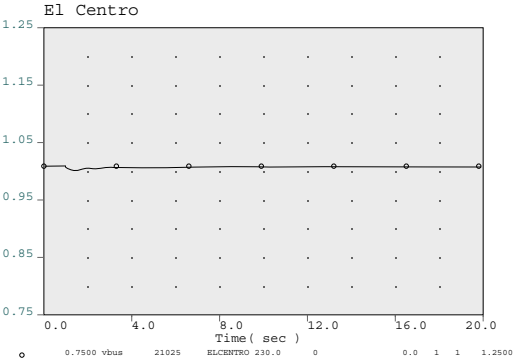
ROA-230kV



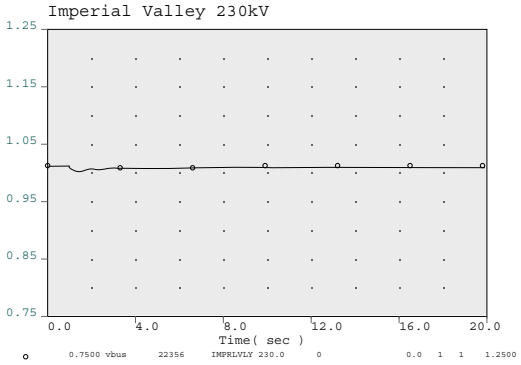
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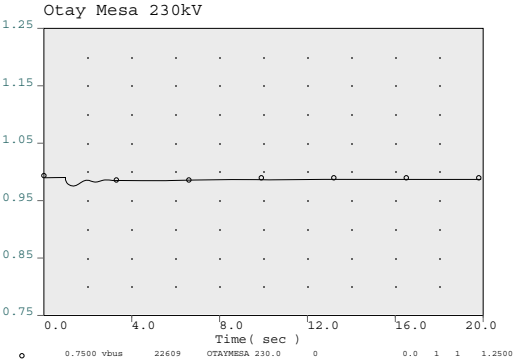
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

Page 3

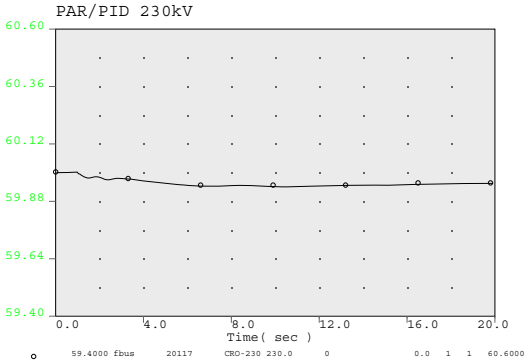
SONGS-g1_pst_hs_eco4.chf

ii phase i\dyds\pst_bu4up

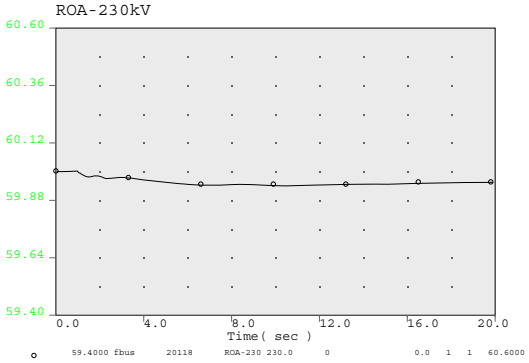
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Affected System Frequency Check and Comparison

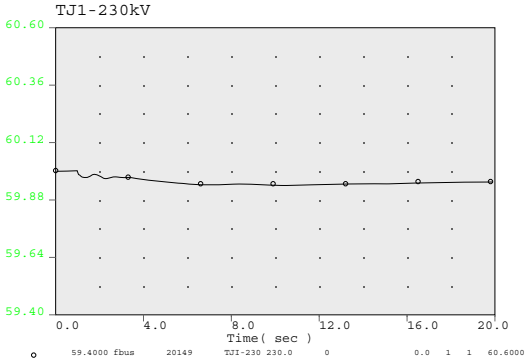
PAR/PID 230kV



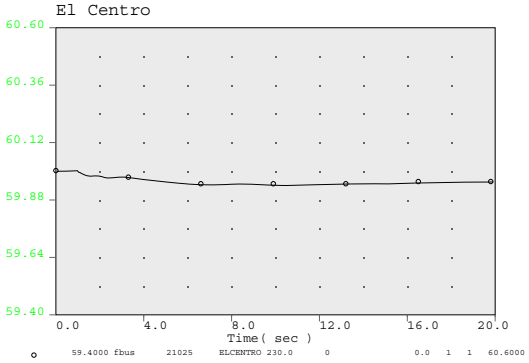
ROA-230kV



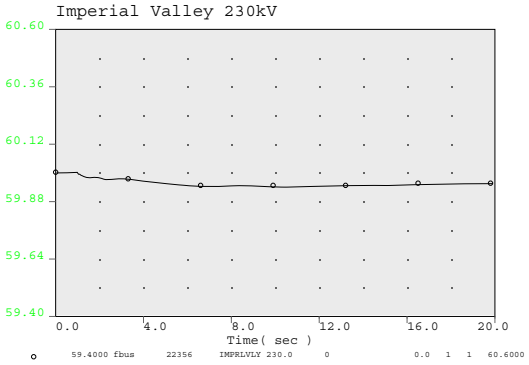
TJ1-230kV



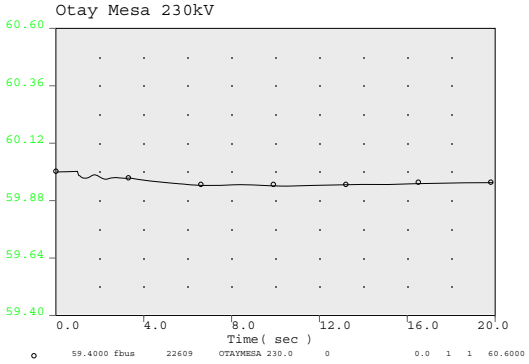
El Centro



Imperial Valley 230kV

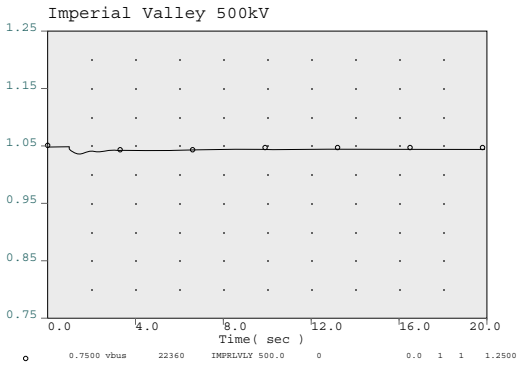


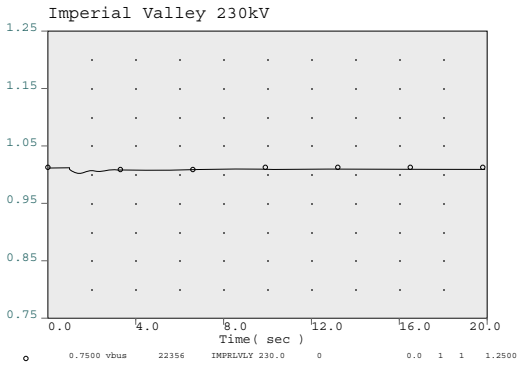
Otay Mesa 230kV

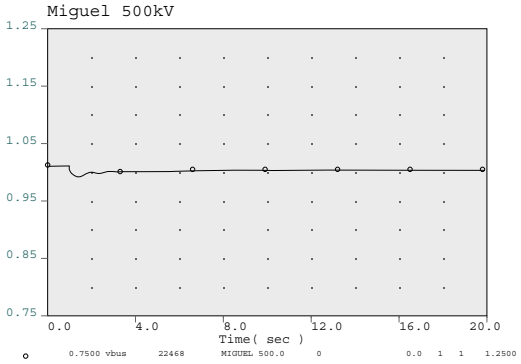


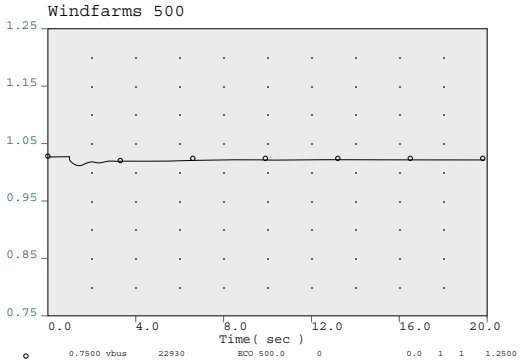
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

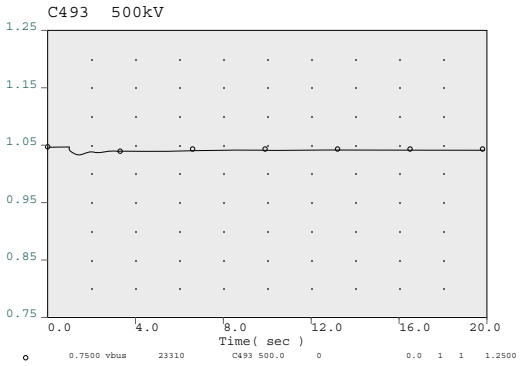
Imperial Valley Area - VOLTAGE

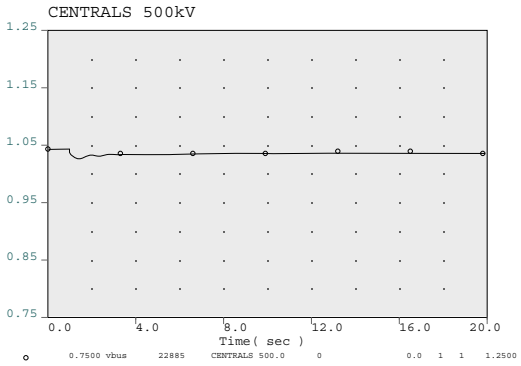










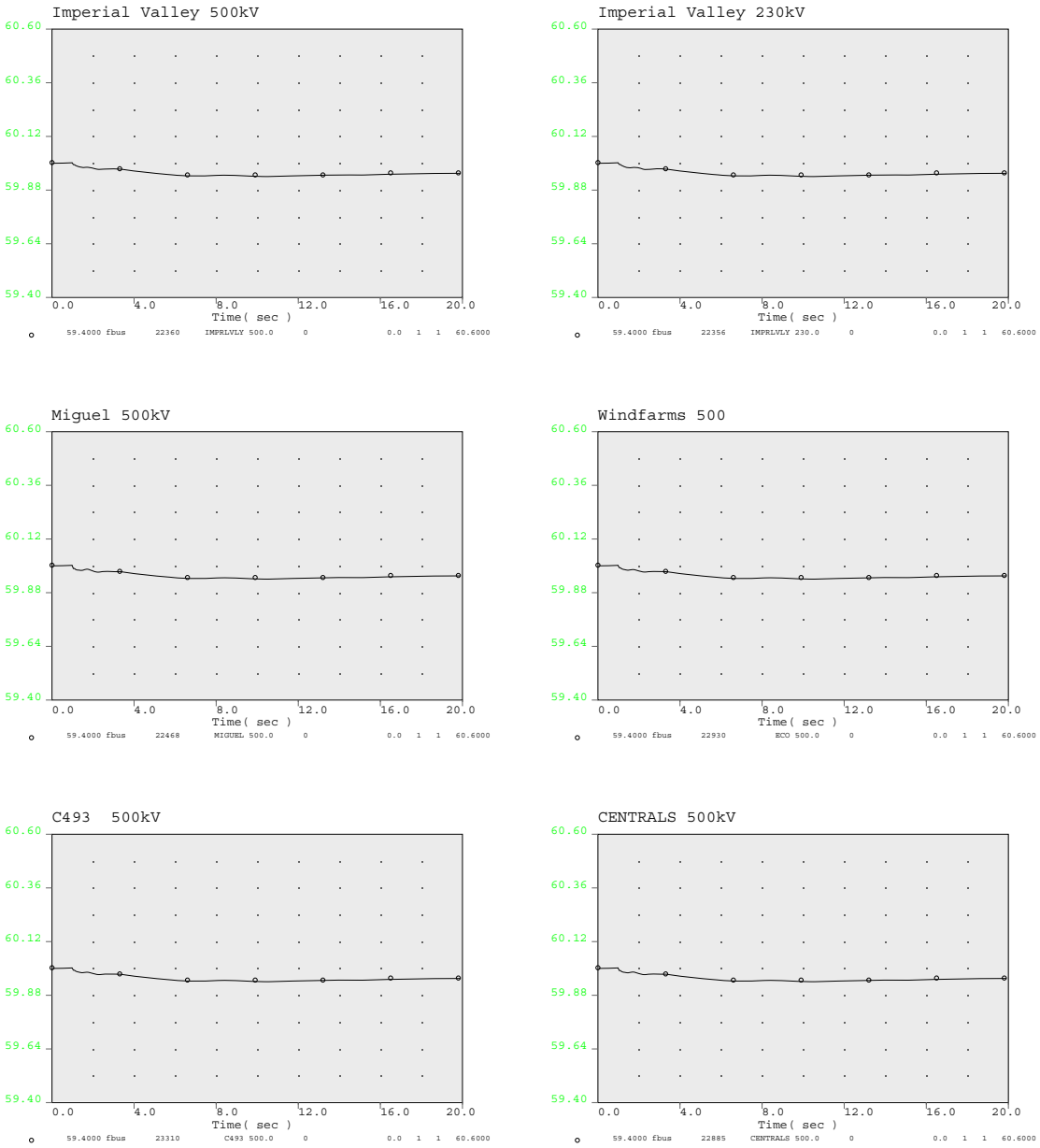


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

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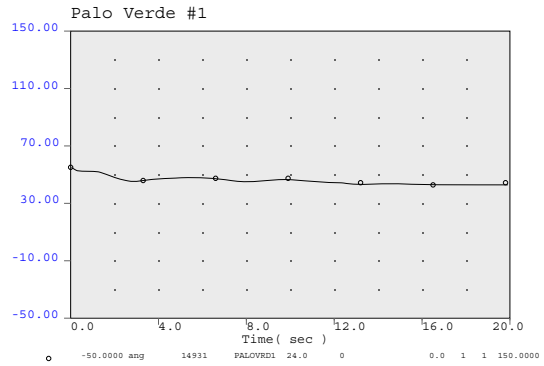
SDGE	SONGS-g1_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:26:29 2010

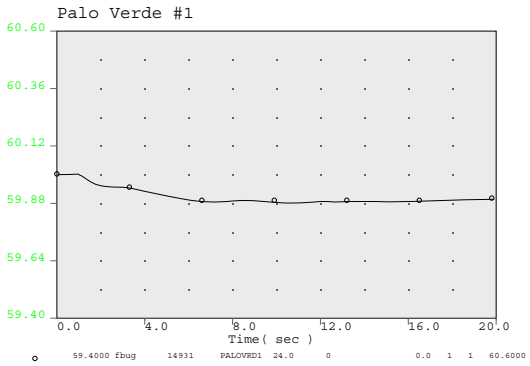
Imperial Valley Area - Frequency

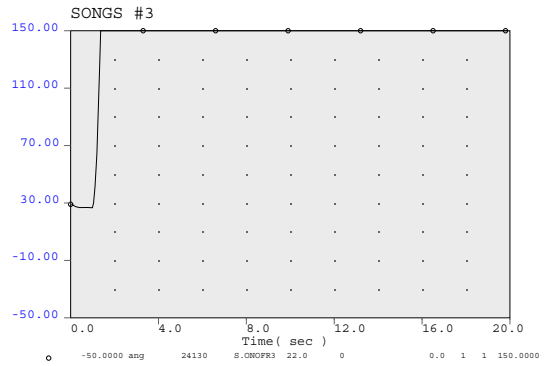


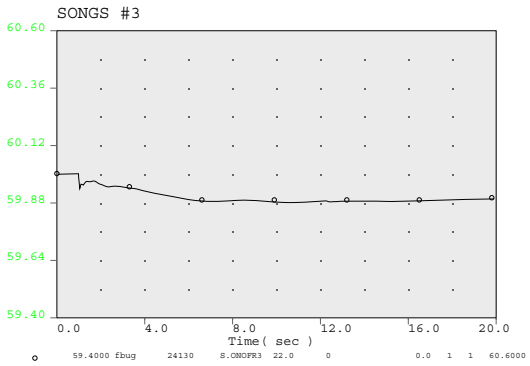
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

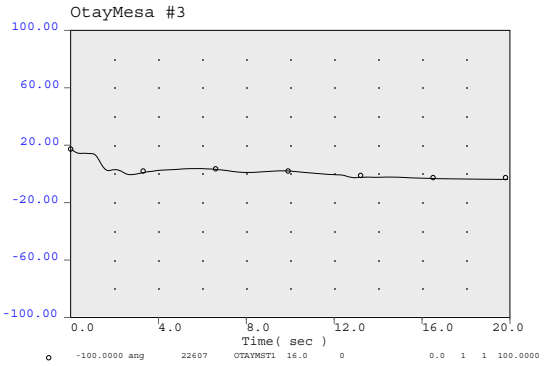
RELATIVE ROTOR ANGLE & FREQUENCY

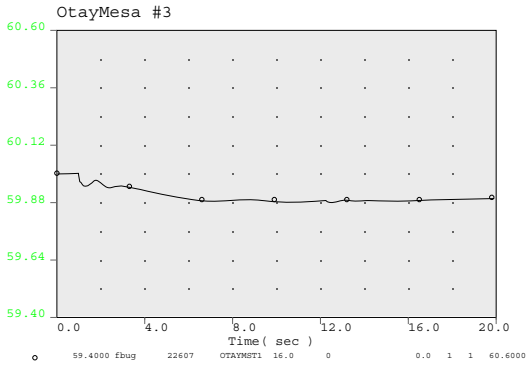










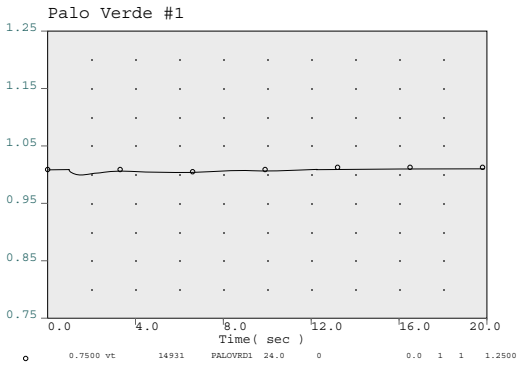


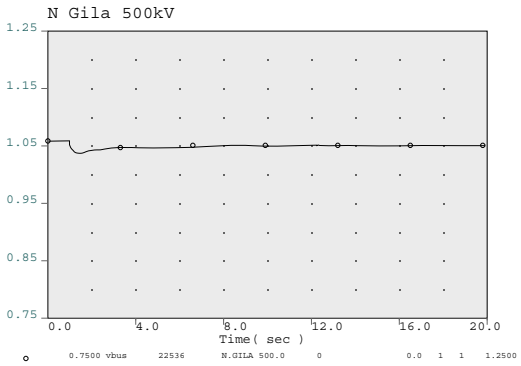
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

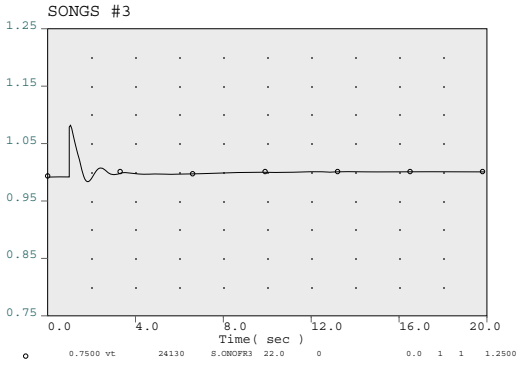
Page 1

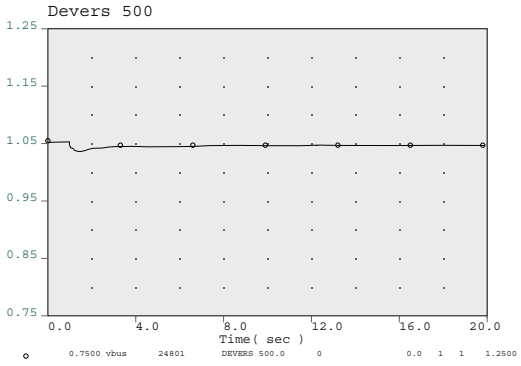
SDGE	SONGS-g2_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:26:45 2010

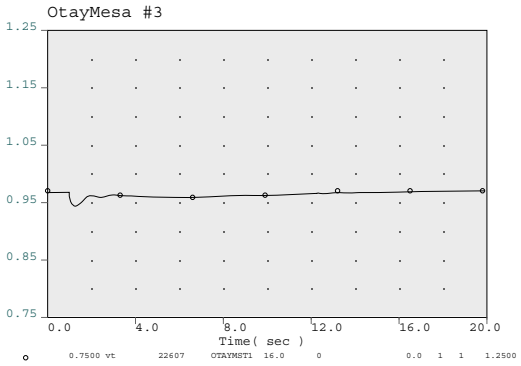
RELATIVE VOLTAGE

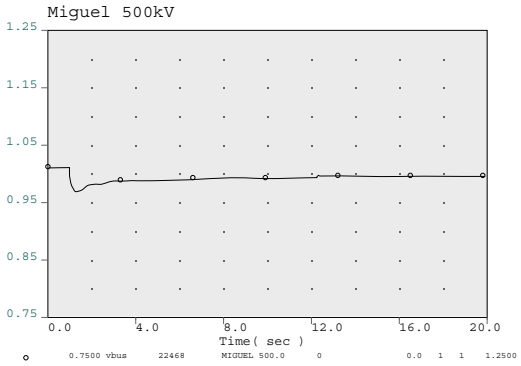












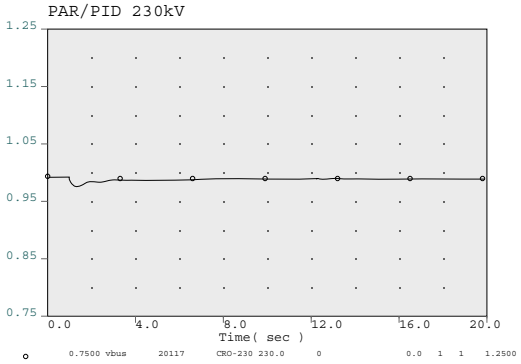
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 2

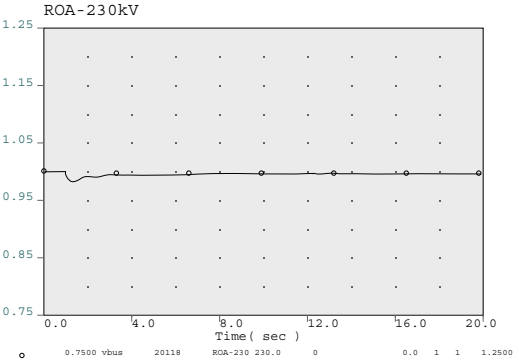
SDGE	SONGS-g2_pst_hs_eco4.chf	ii phase i\dyds\pst_bu4up Tue Oct 12 14:26:45 2010

Affected System Voltage Check and Comparison

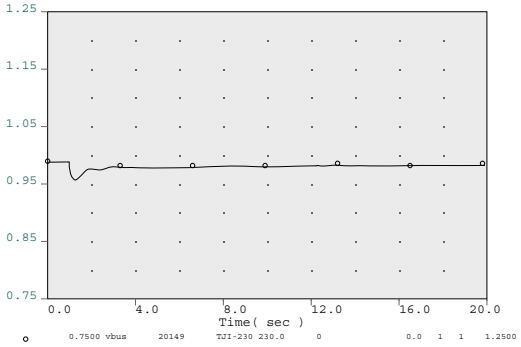
PAR/PID 230kV



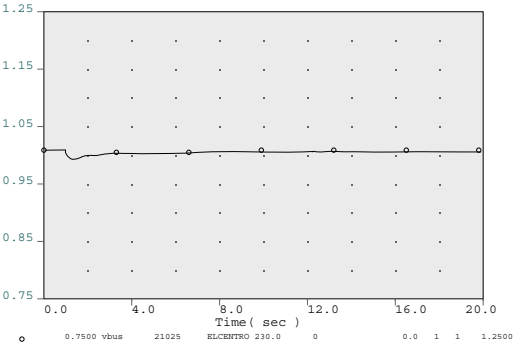
ROA-230kV



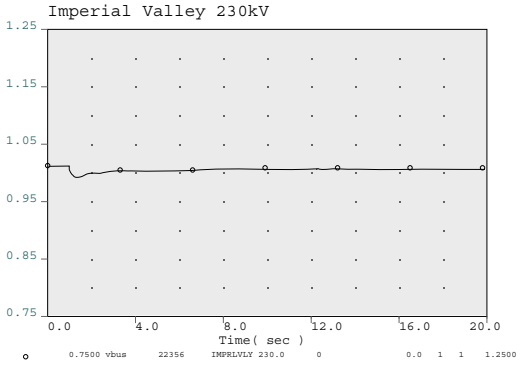
TJ1-230kV



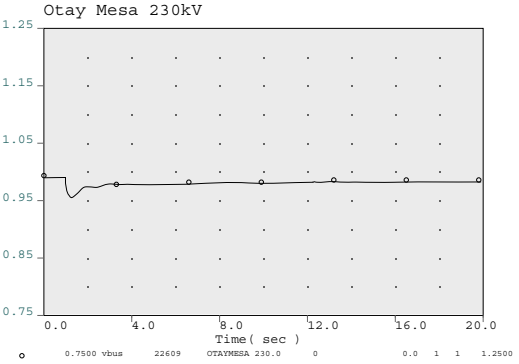
El Centro



Imperial Valley 230kV



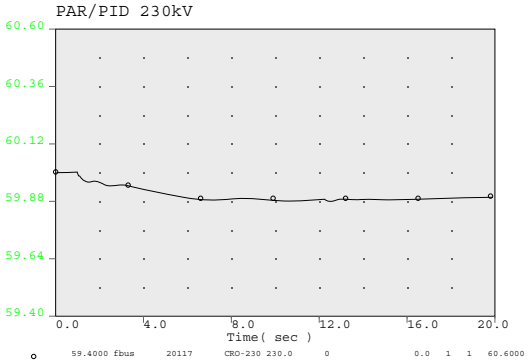
Otay Mesa 230kV



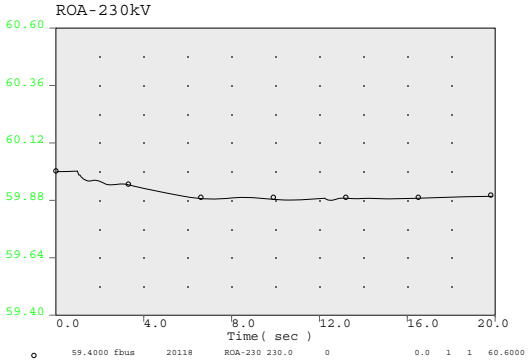
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Affected System Frequency Check and Comparison

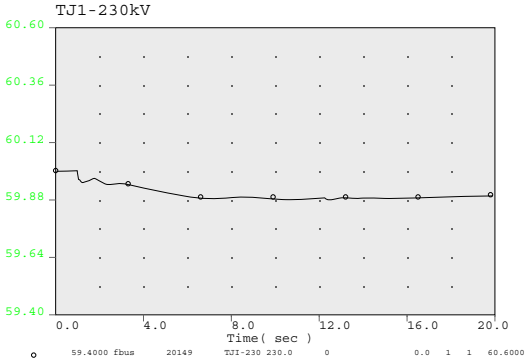
PAR/PID 230kV



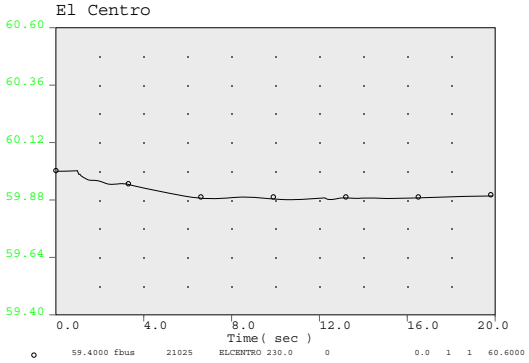
ROA-230kV



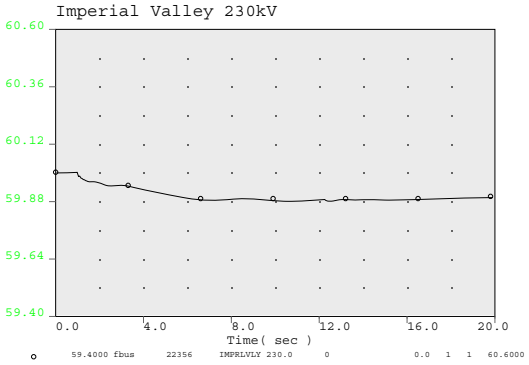
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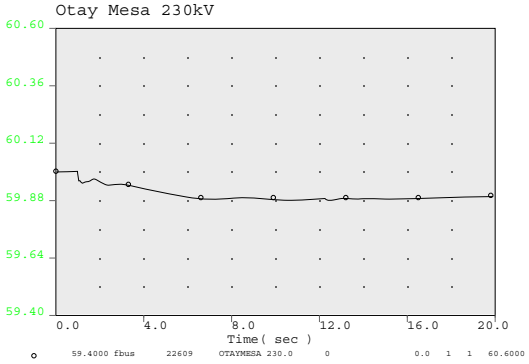
El Centro



Imperial Valley 230kV



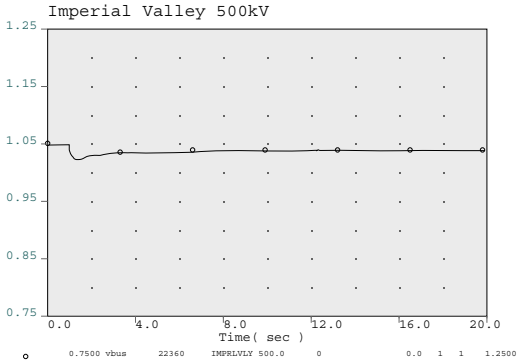
Otay Mesa 230kV



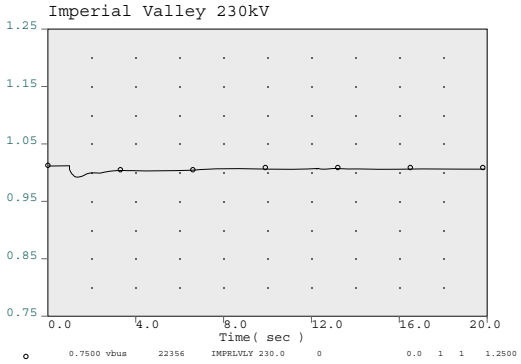
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

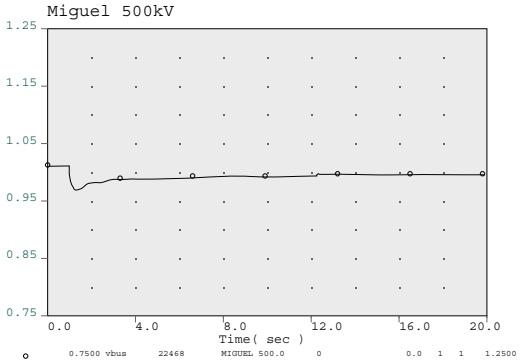
Imperial Valley 500kV



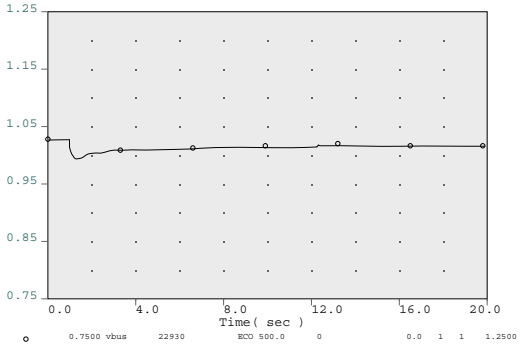
Imperial Valley 230kV



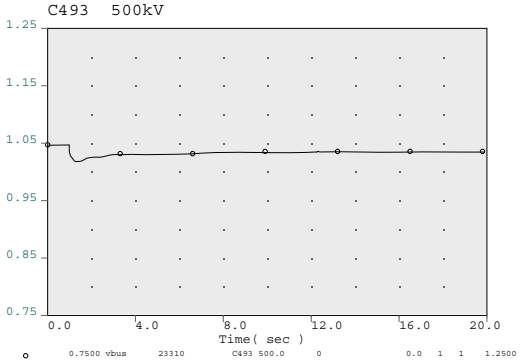
Miguel 500kV



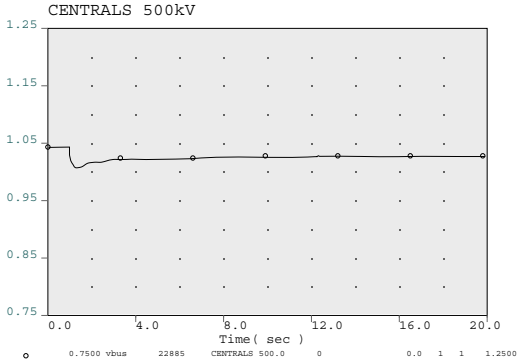
Windfarms 500



C493 500kV

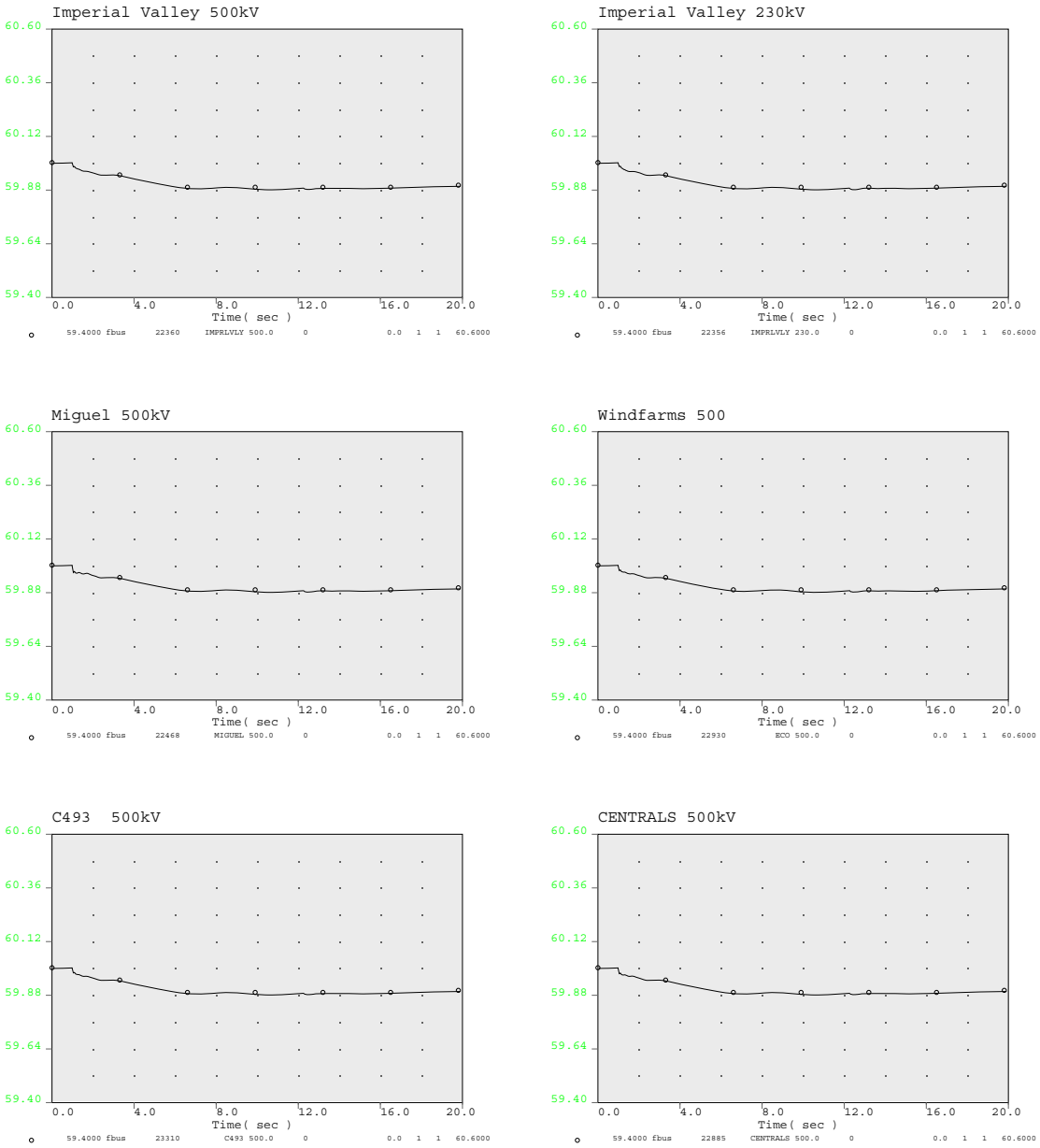


CENTRALS 500kV



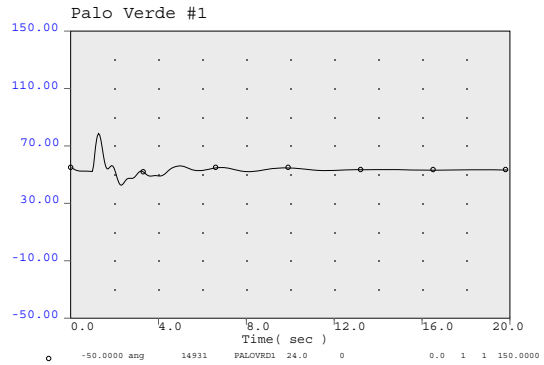
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

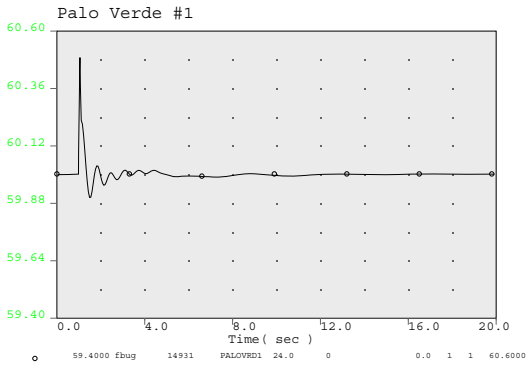
Imperial Valley Area - Frequency

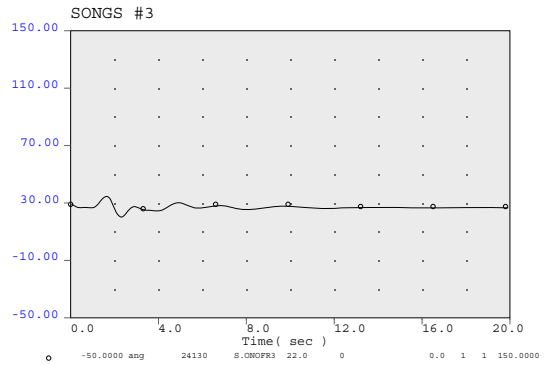


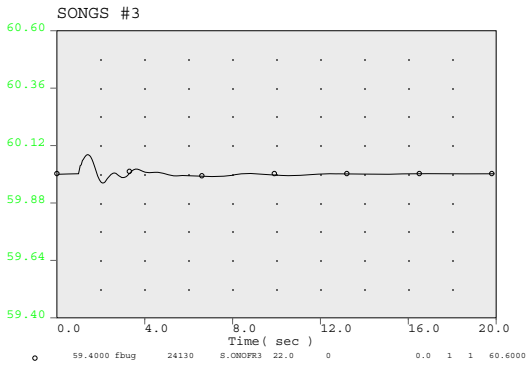
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

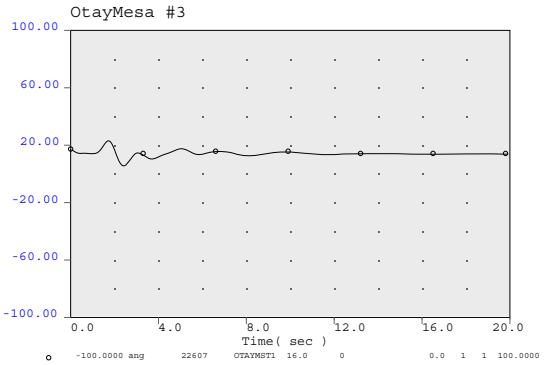
RELATIVE ROTOR ANGLE & FREQUENCY

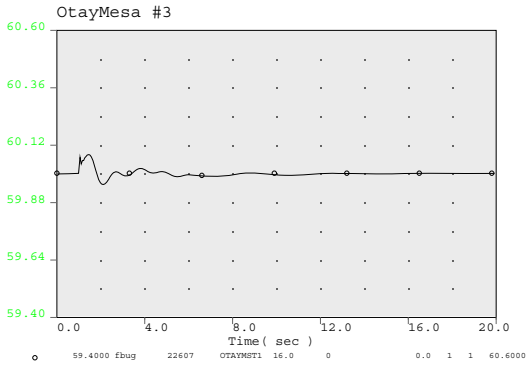












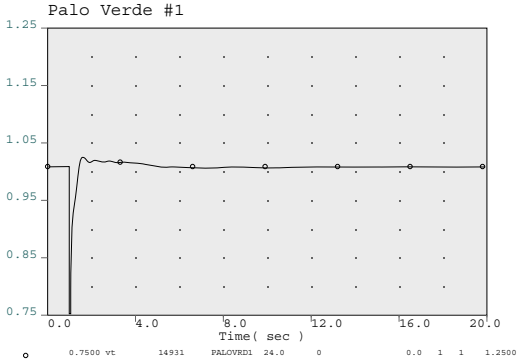
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

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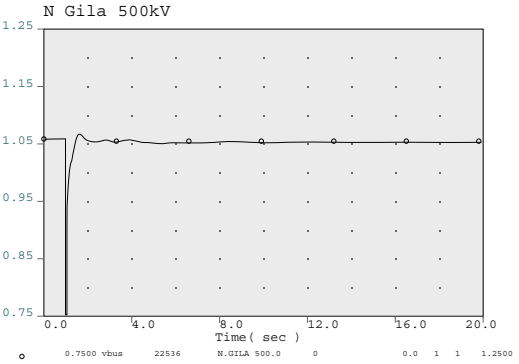
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RELATIVE VOLTAGE

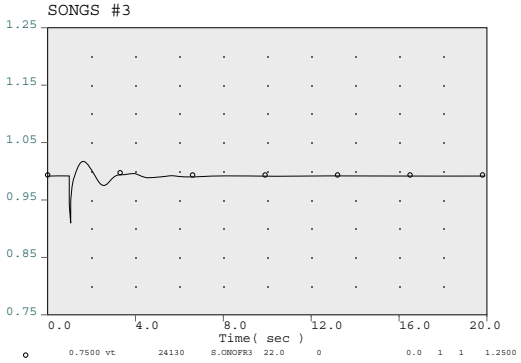
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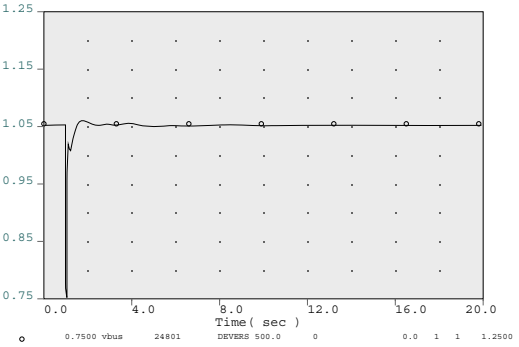
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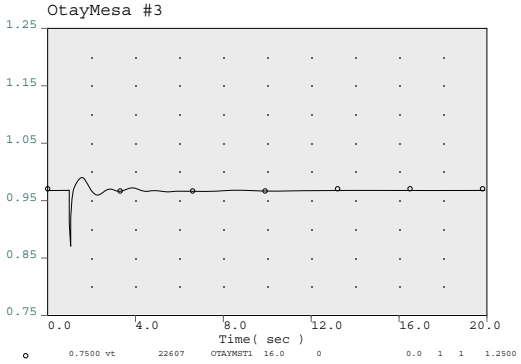
SONGS #3



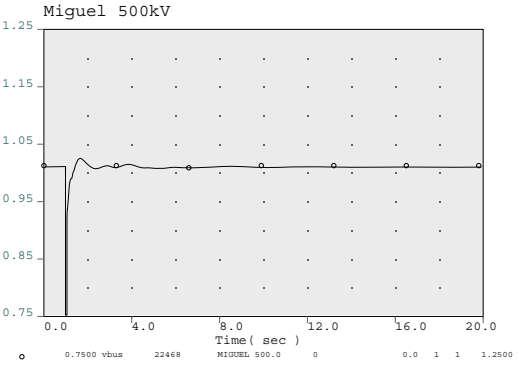
Devers 500



OtayMesa #3



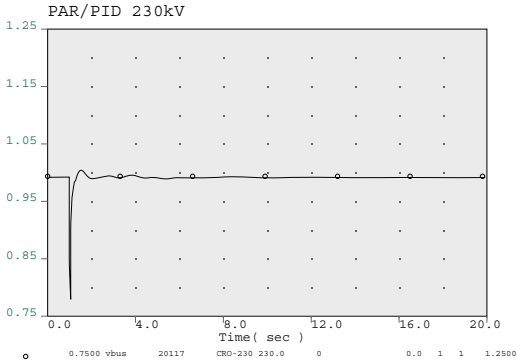
Miguel 500kV



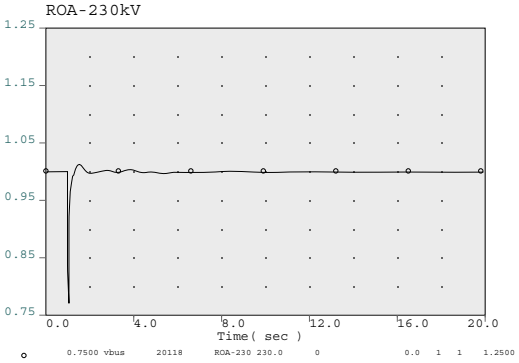
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

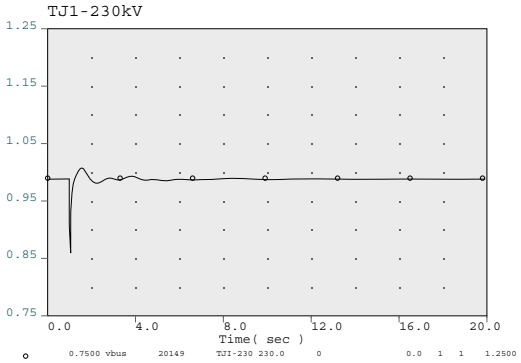
PAR/PID 230kV



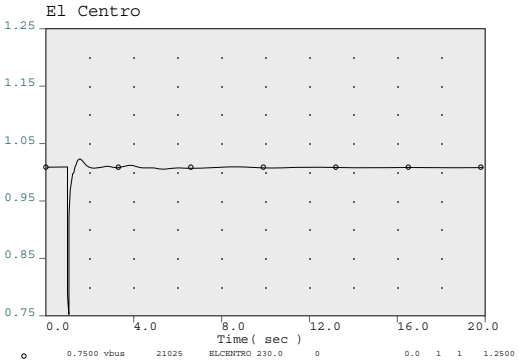
ROA-230kV



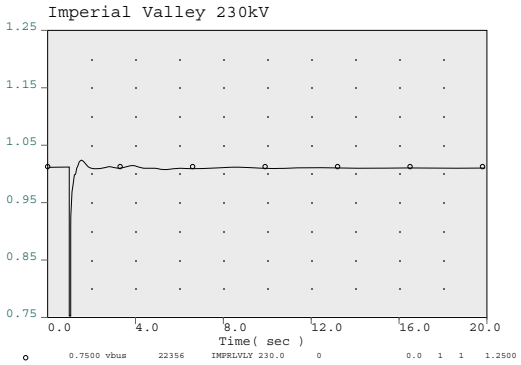
TJ1-230kV



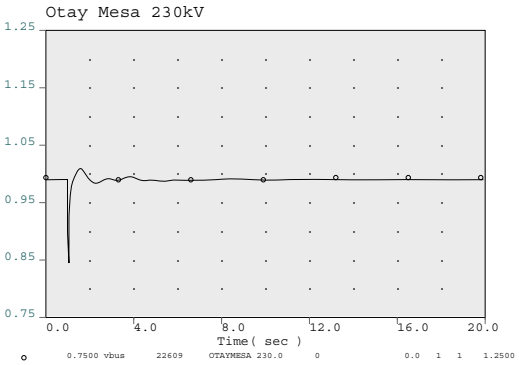
El Centro



Imperial Valley 230kV



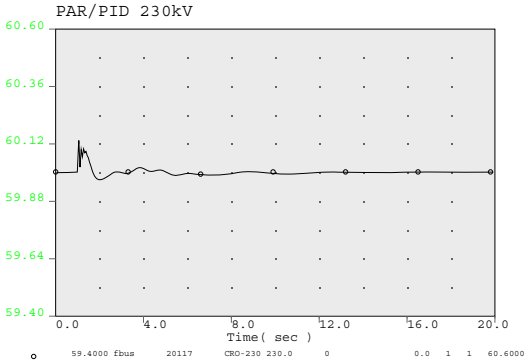
Otay Mesa 230kV



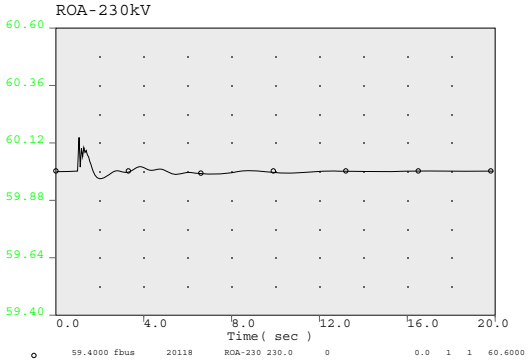
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Frequency Check and Comparison

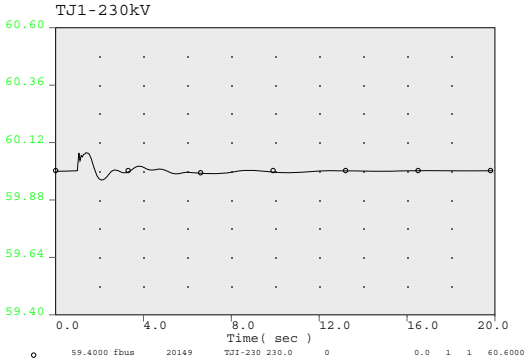
PAR/PID 230kV



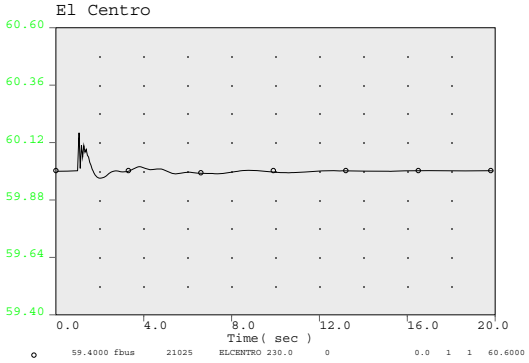
ROA-230kV



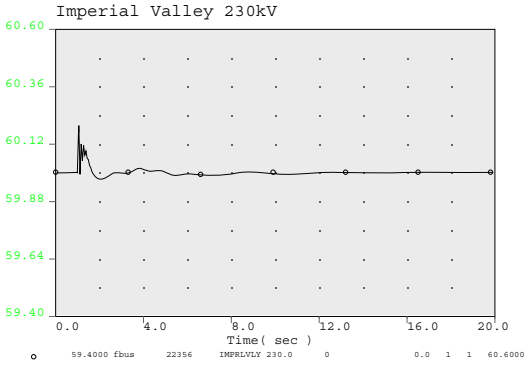
TJ1-230kV



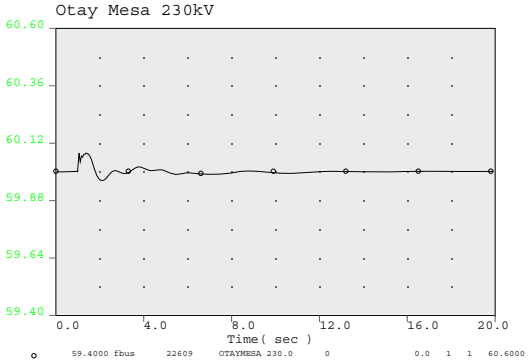
El Centro



Imperial Valley 230kV



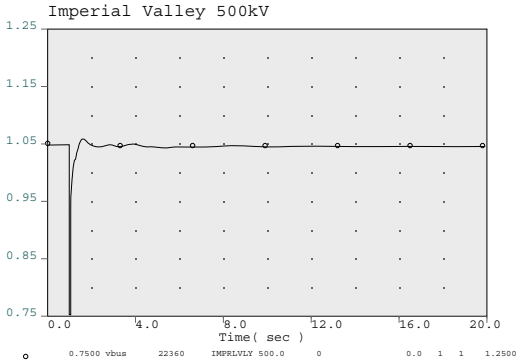
Otay Mesa 230kV



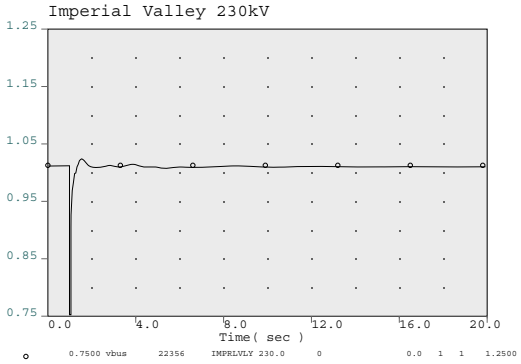
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Imperial Valley Area - VOLTAGE

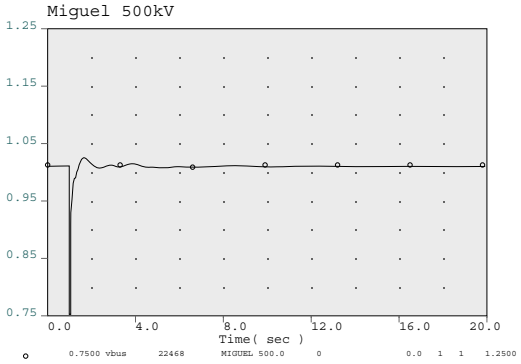
Imperial Valley 500kV



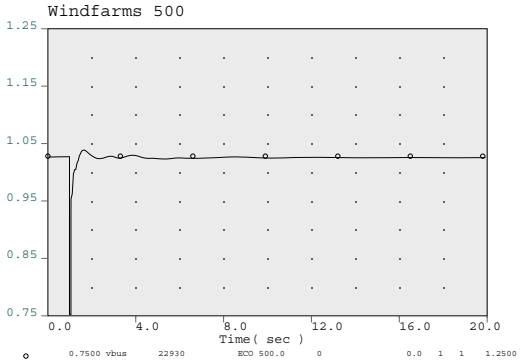
Imperial Valley 230kV



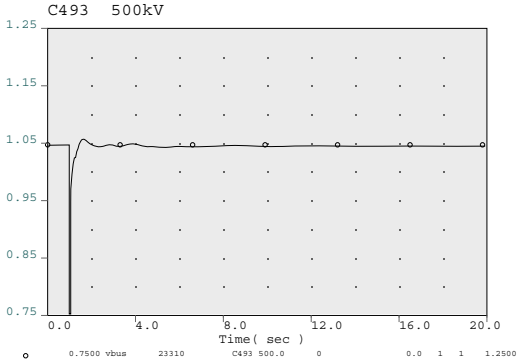
Miguel 500kV



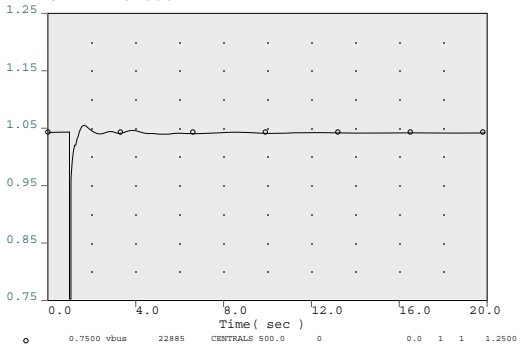
Windfarms 500



C493 500kV



CENTRALS 500kV



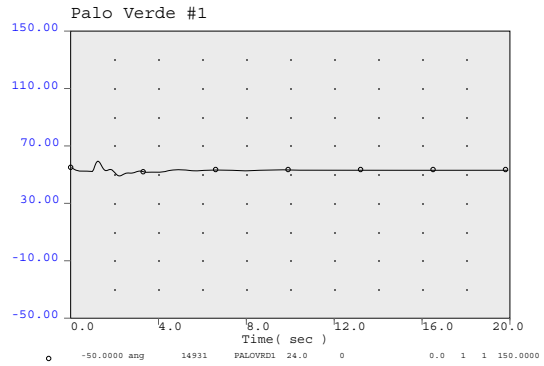
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

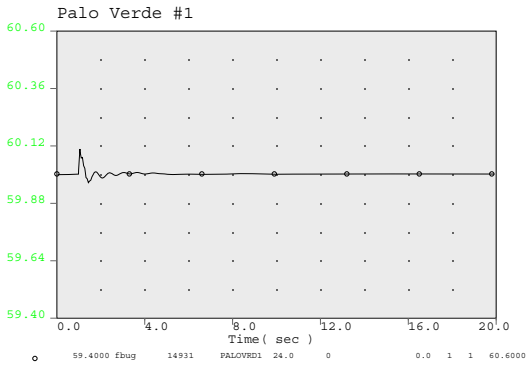
Imperial Valley Area - Frequency

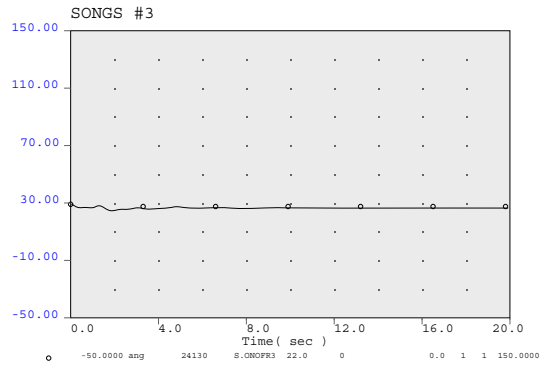


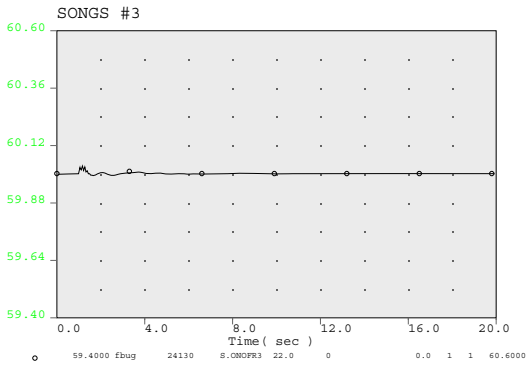
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

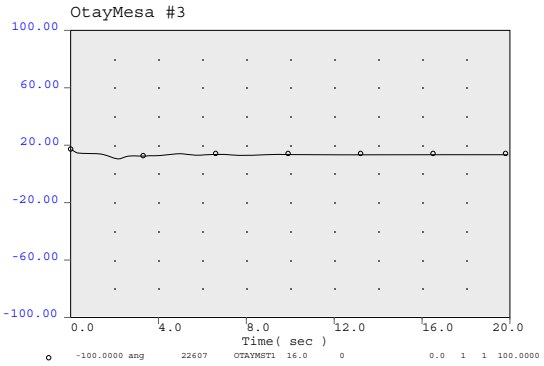
RELATIVE ROTOR ANGLE & FREQUENCY

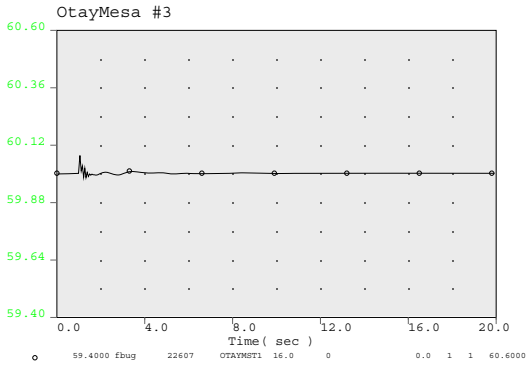










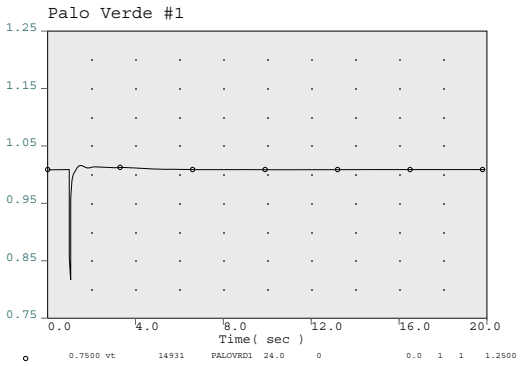


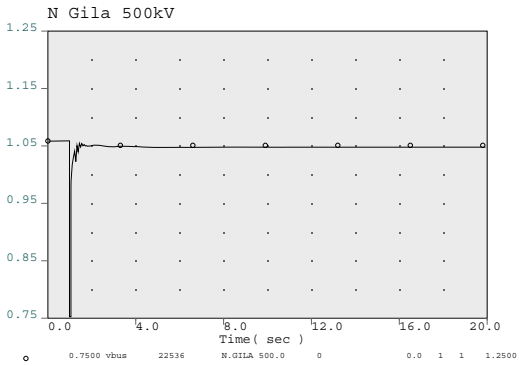
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

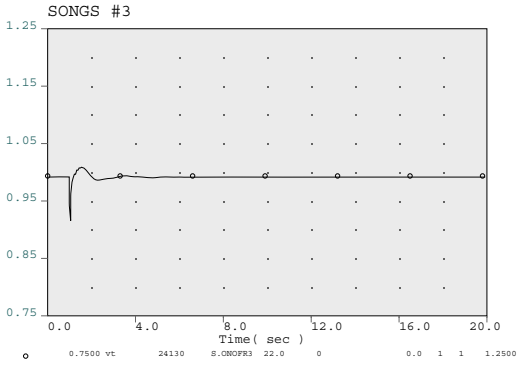
Page 1

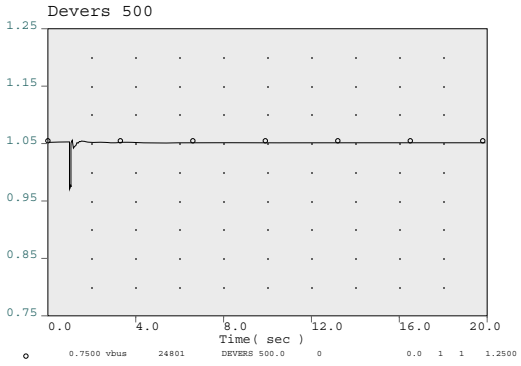
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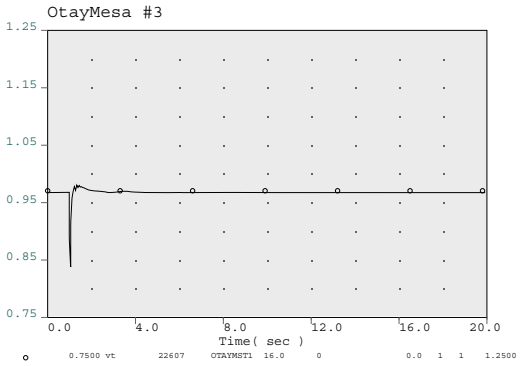
RELATIVE VOLTAGE

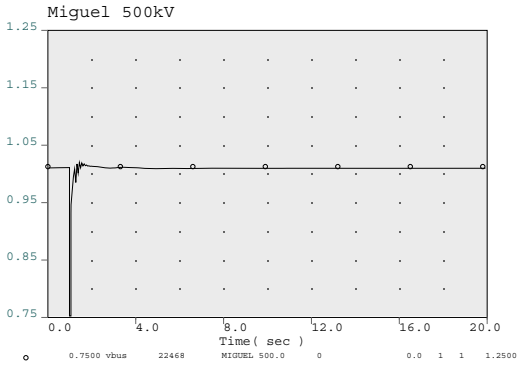








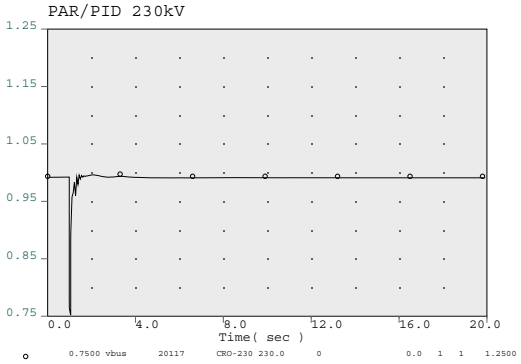




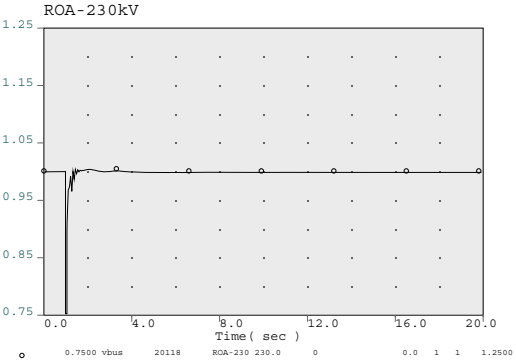
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

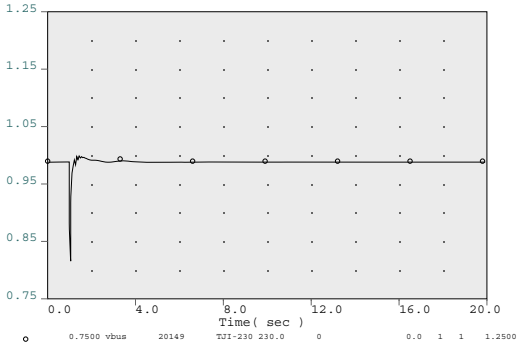
PAR/PID 230kV



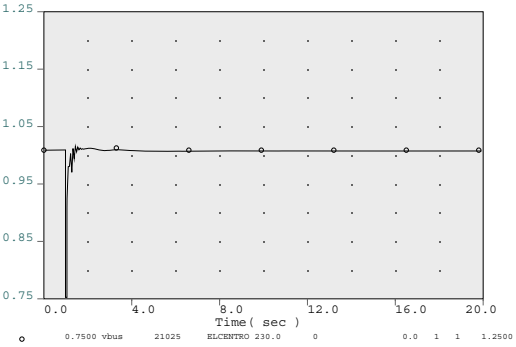
ROA-230kV



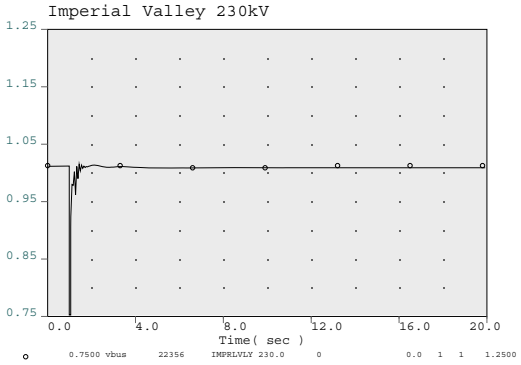
TJ1-230kV



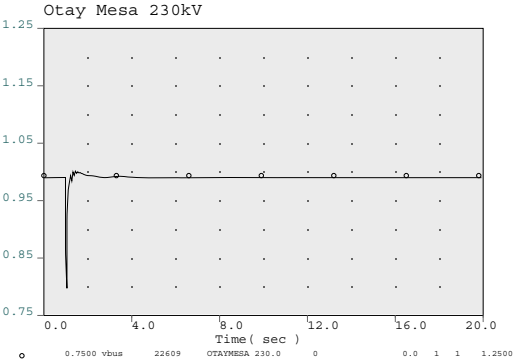
El Centro



Imperial Valley 230kV



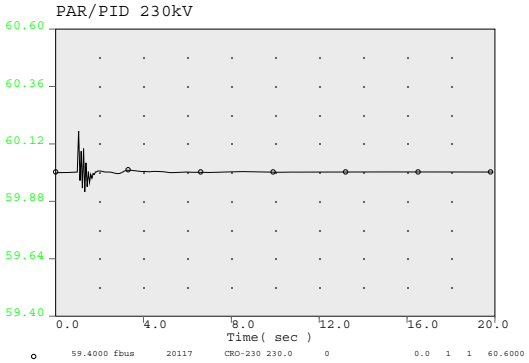
Otay Mesa 230kV



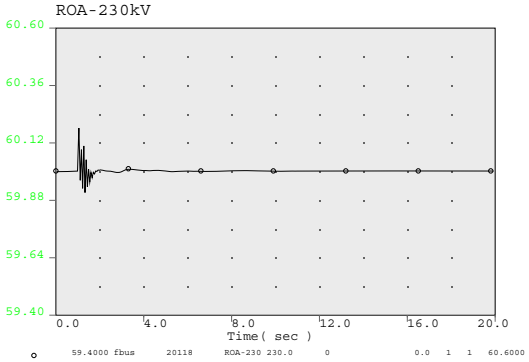
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

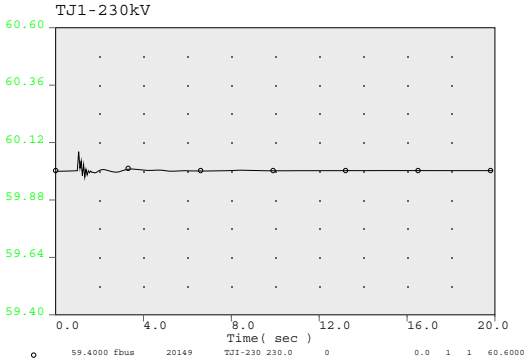
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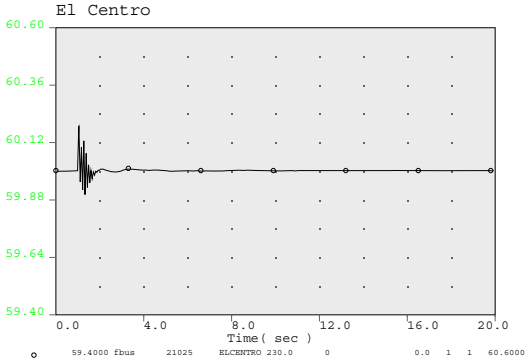
ROA-230kV



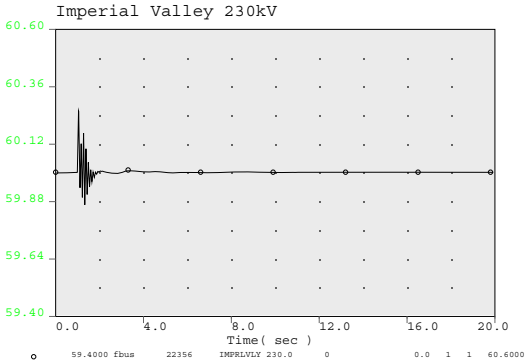
TJ1-230kV



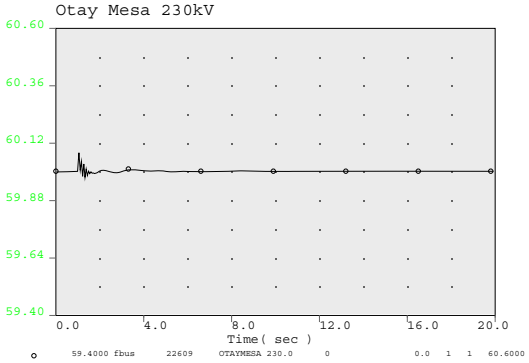
El Centro



Imperial Valley 230kV



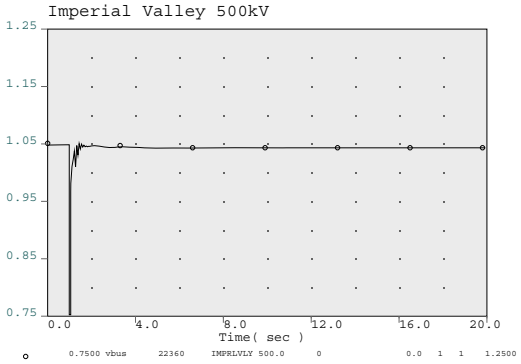
Otay Mesa 230kV



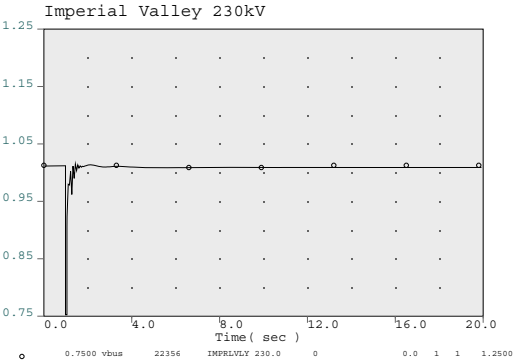
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

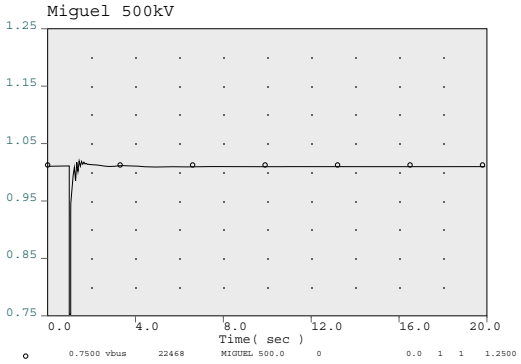
Imperial Valley 500kV



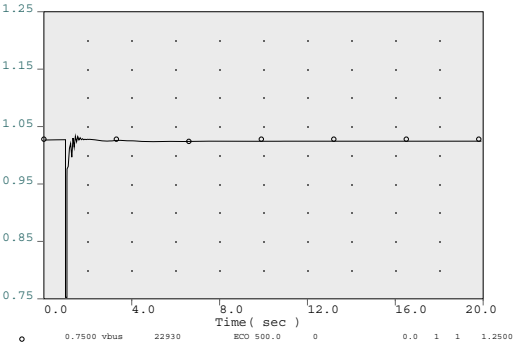
Imperial Valley 230kV



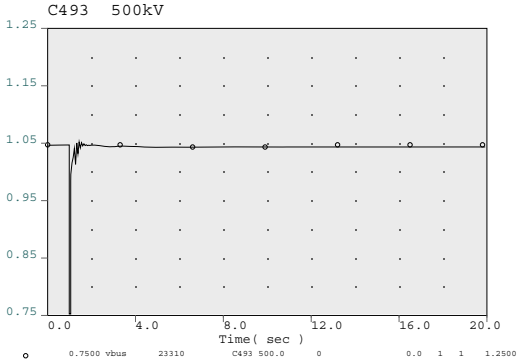
Miguel 500kV



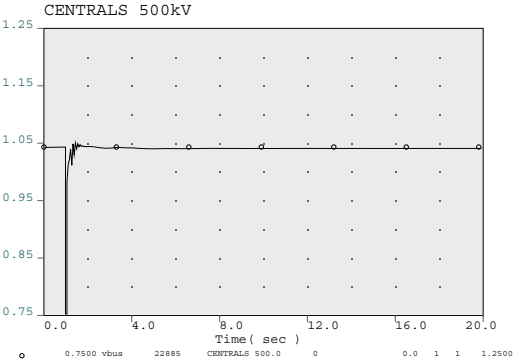
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - post
2014 Heavy Summer
T468-N.Gila 500 kV line

Page 5

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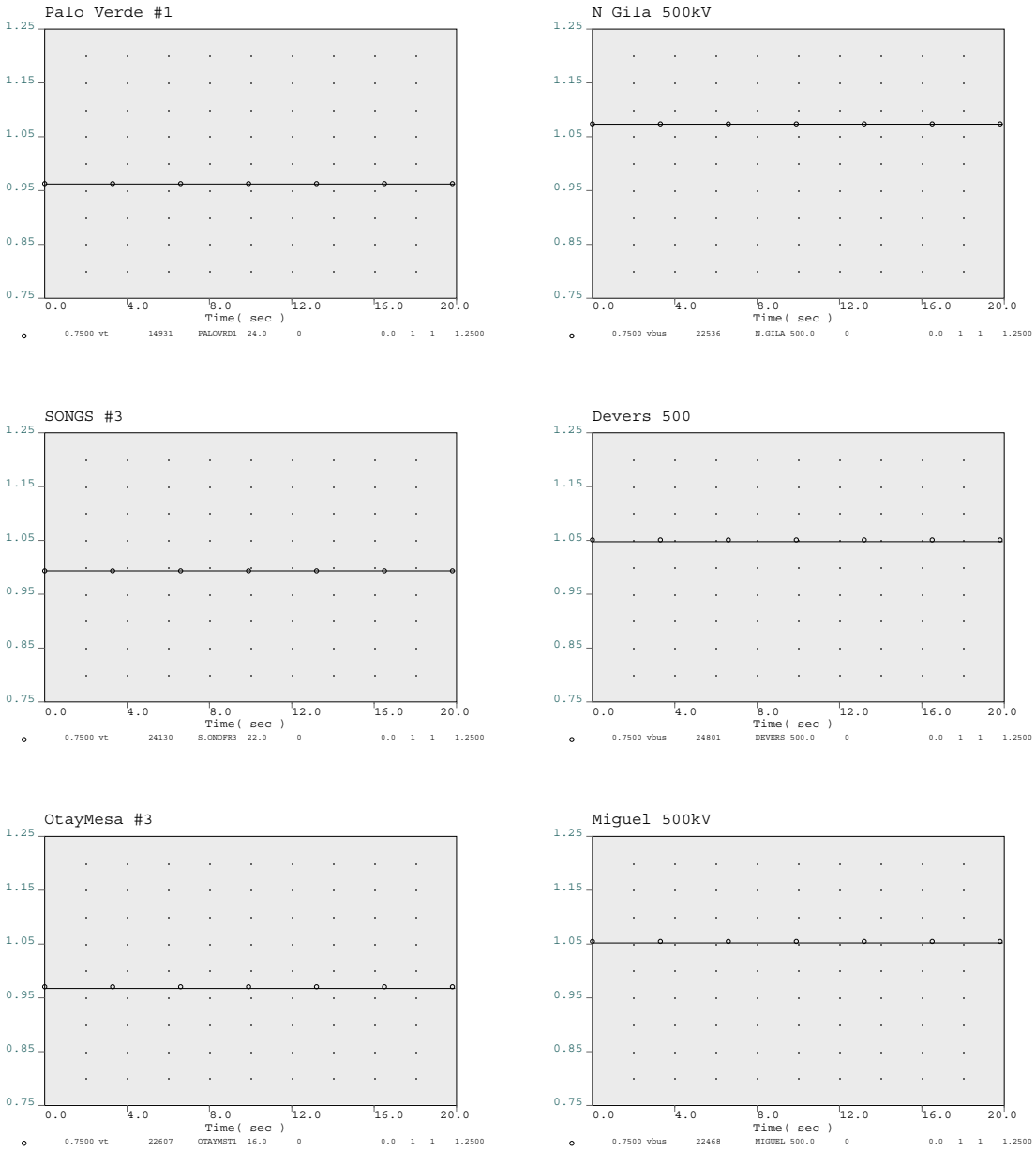
Appendix J-6

Transient Stability Analysis Plots

Boulevard Cluster

Light Load (Spring or Light Autumn) Post

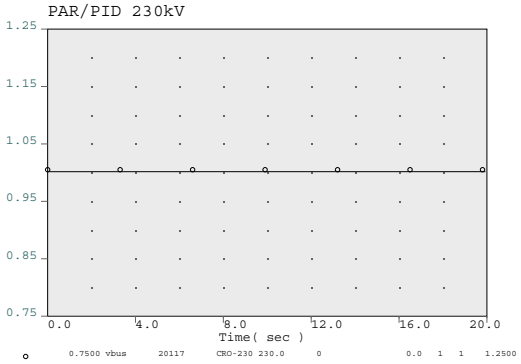
RELATIVE VOLTAGE



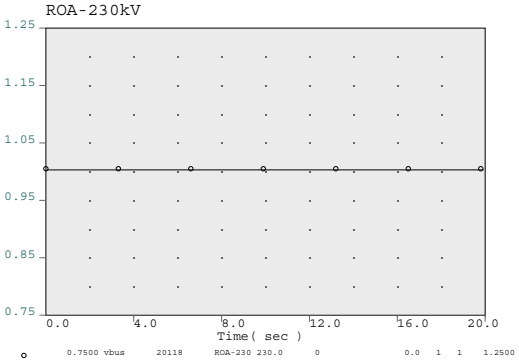
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Affected System Voltage Check and Comparison

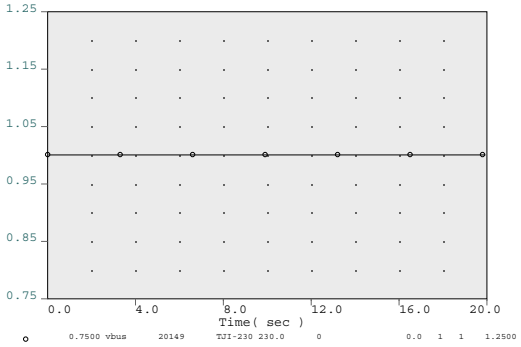
PAR/PID 230kV



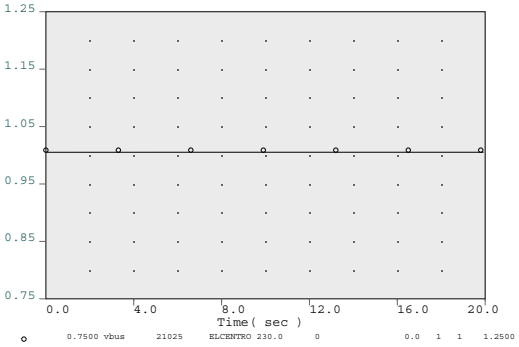
ROA-230kV



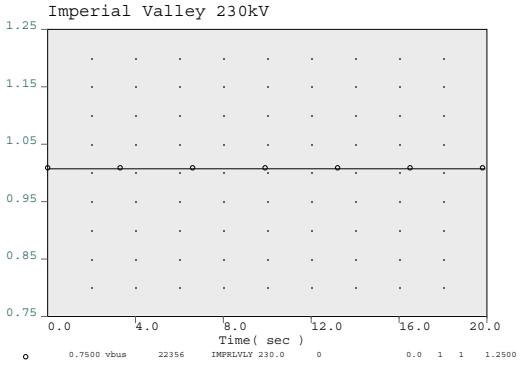
TJ1-230kV



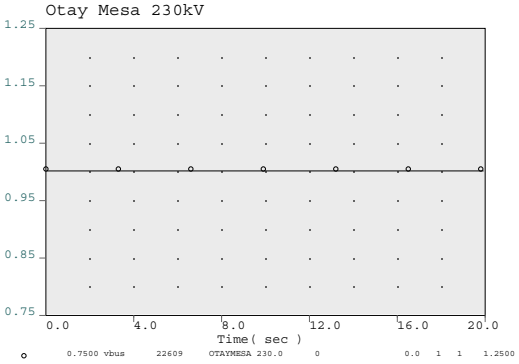
El Centro



Imperial Valley 230kV

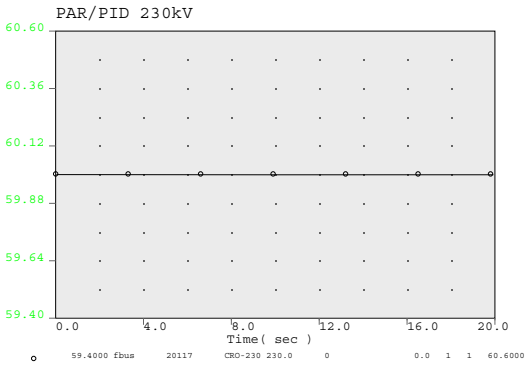


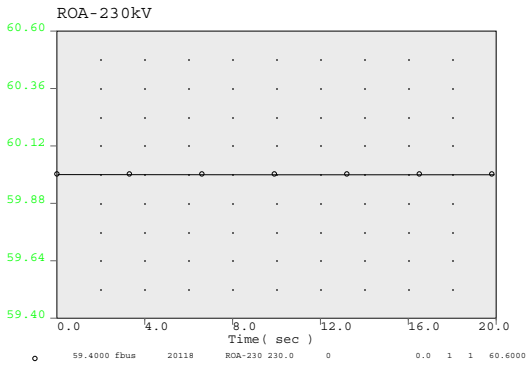
Otay Mesa 230kV

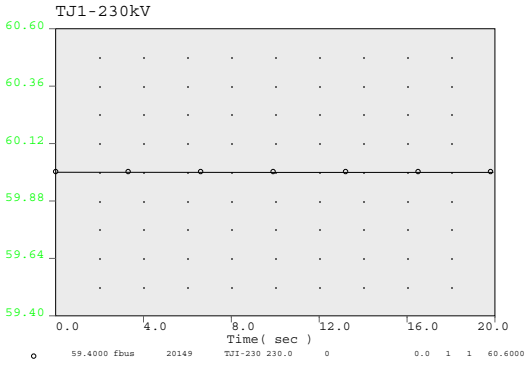


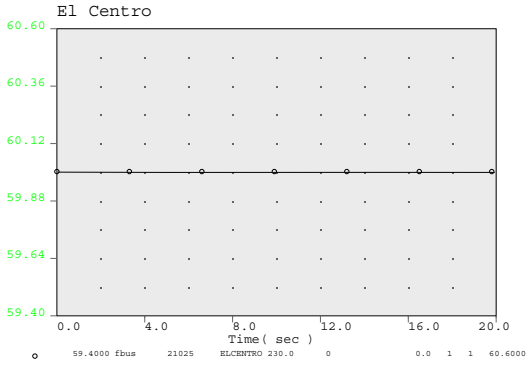
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

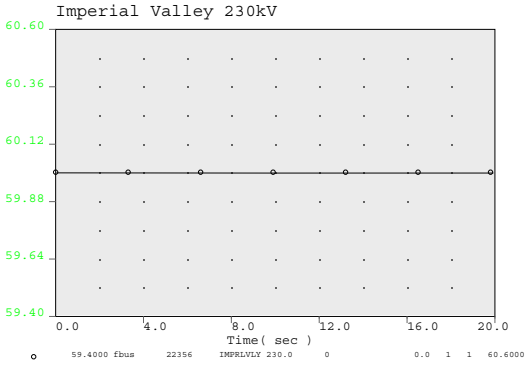
Affected System Frequency Check and Comparison

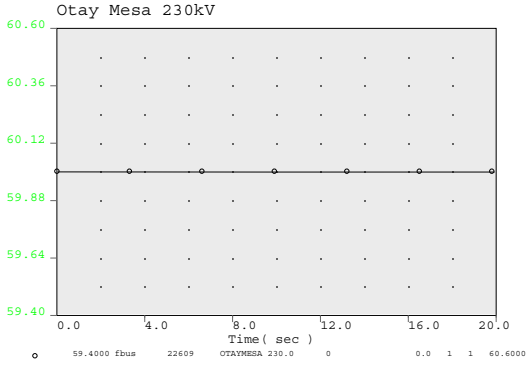










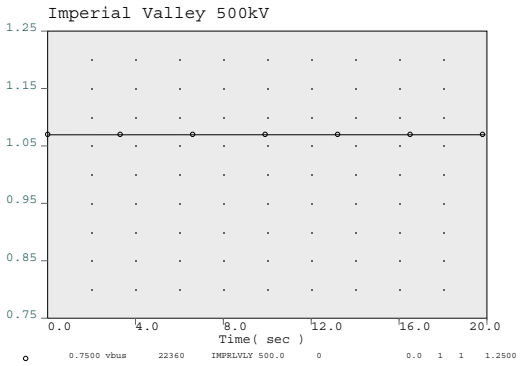


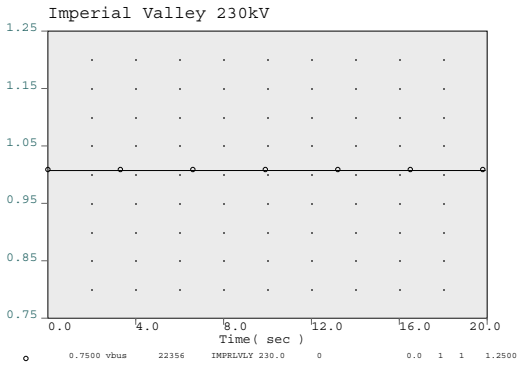
SDG&E Cluster 2 - post
2014 Light Autumn
Flat

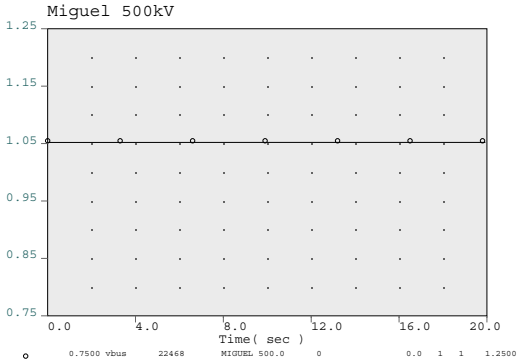
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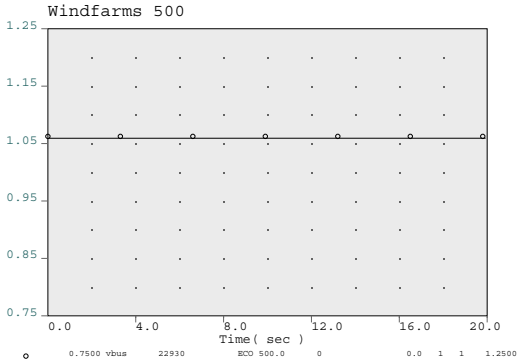
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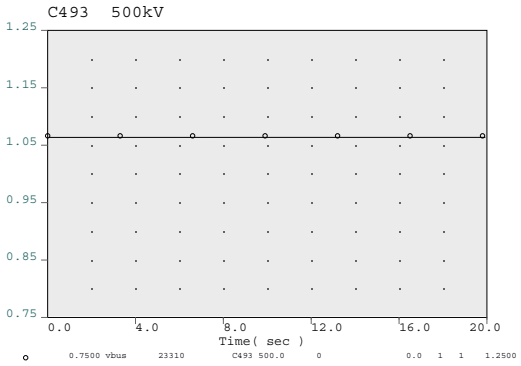
Imperial Valley Area - VOLTAGE

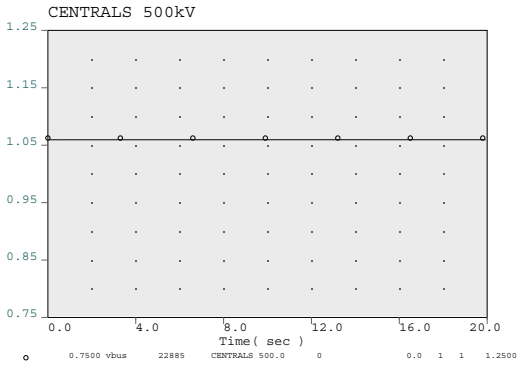










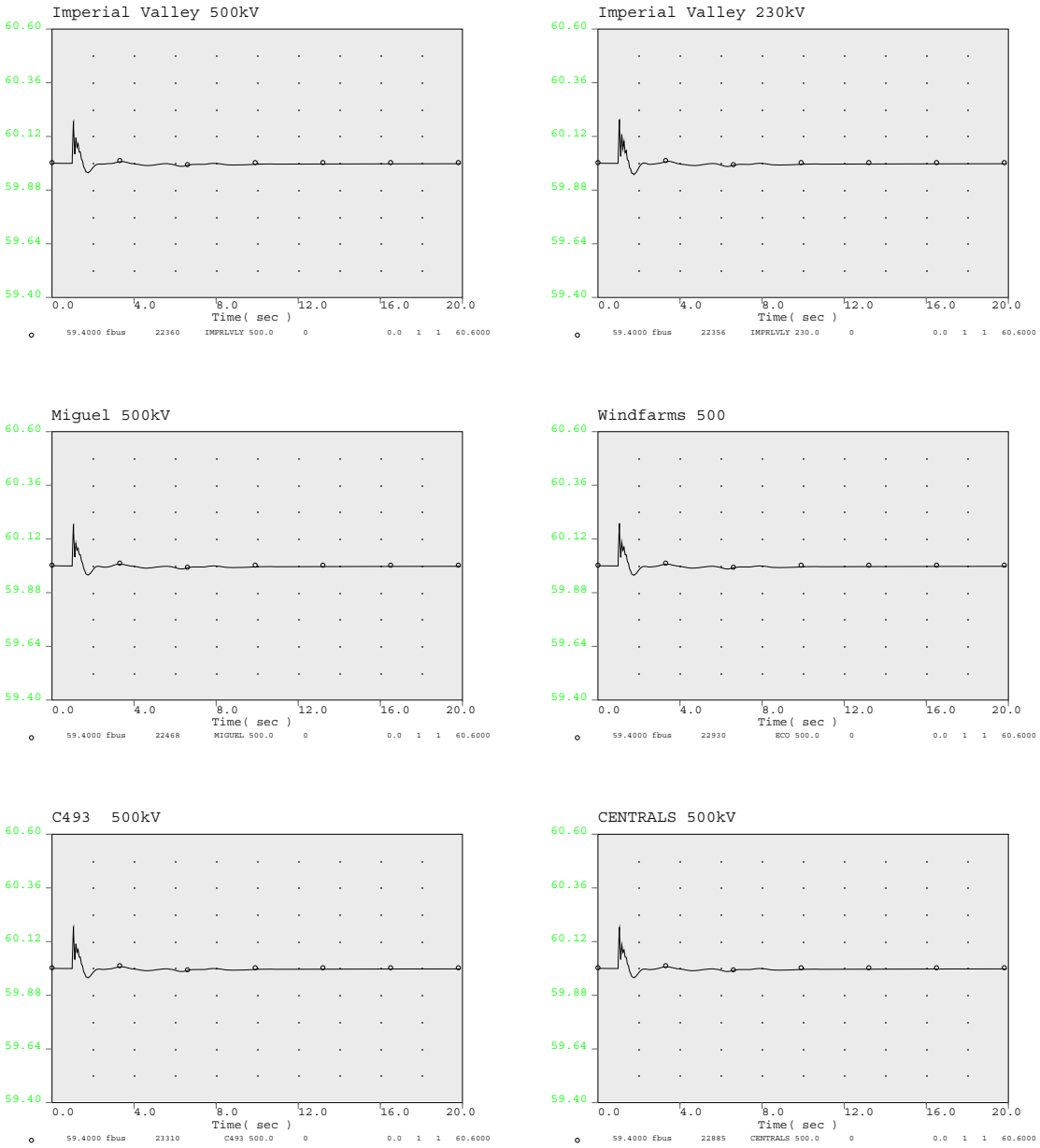


SDG&E Cluster 2 - post
2014 Light Autumn
Flat

Page 5

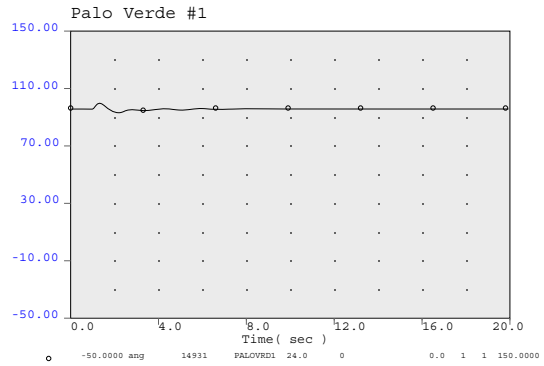
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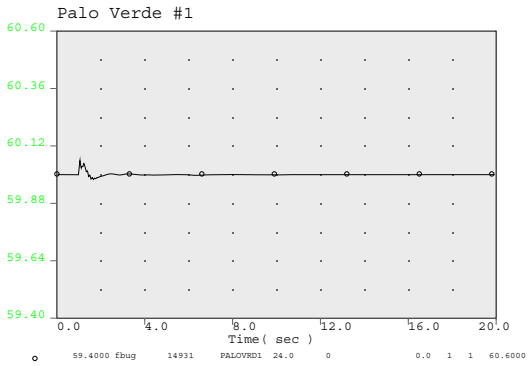
Imperial Valley Area - Frequency

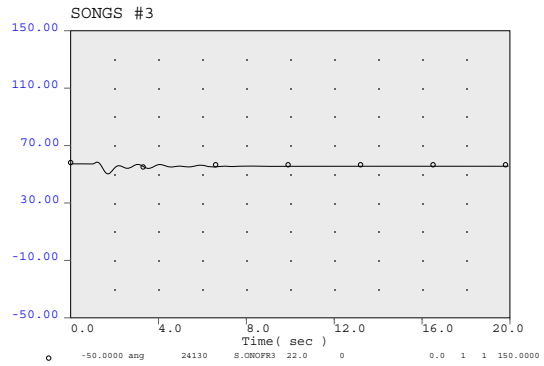


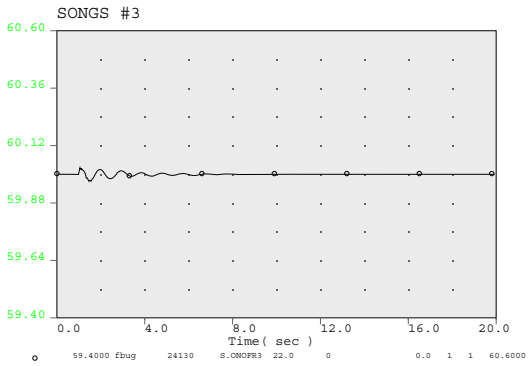
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

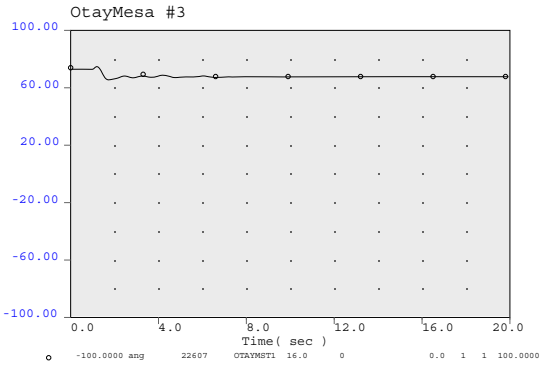
RELATIVE ROTOR ANGLE & FREQUENCY

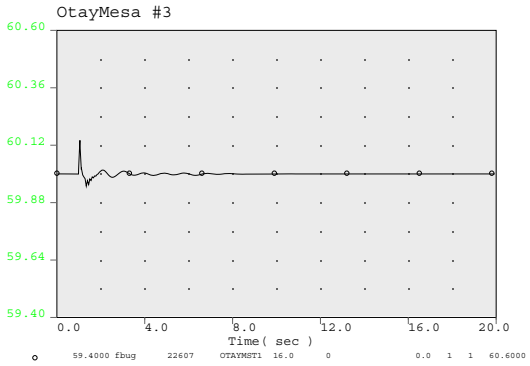












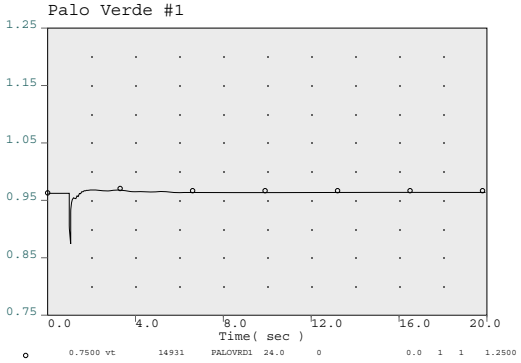
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Page 1

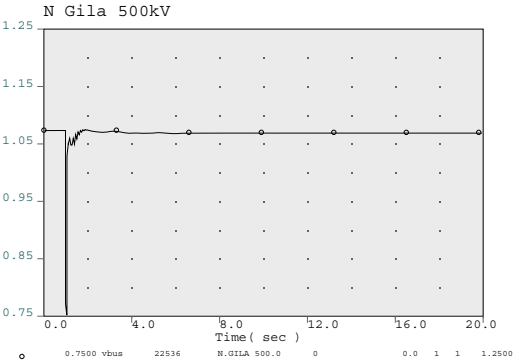
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RELATIVE VOLTAGE

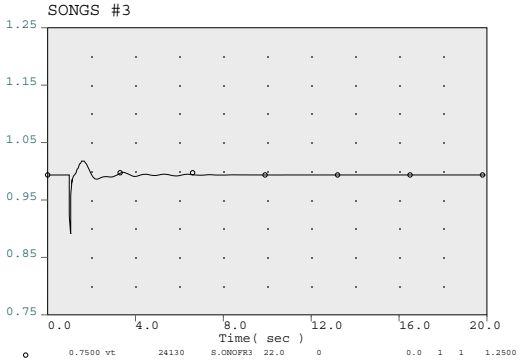
Palo Verde #1



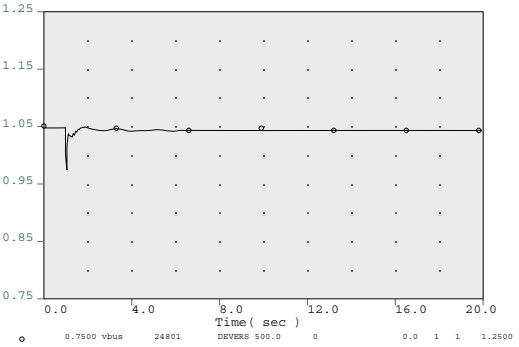
N Gila 500kV



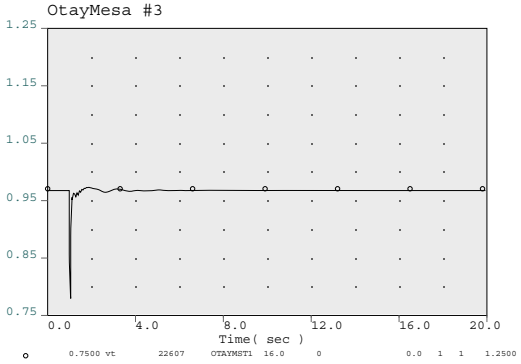
SONGS #3



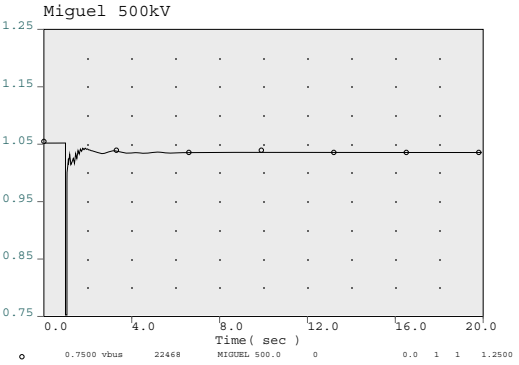
Devers 500



OtayMesa #3



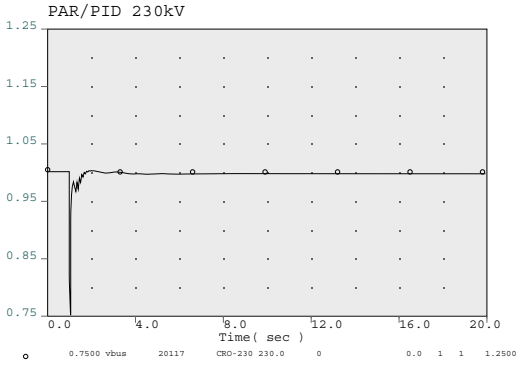
Miguel 500kV



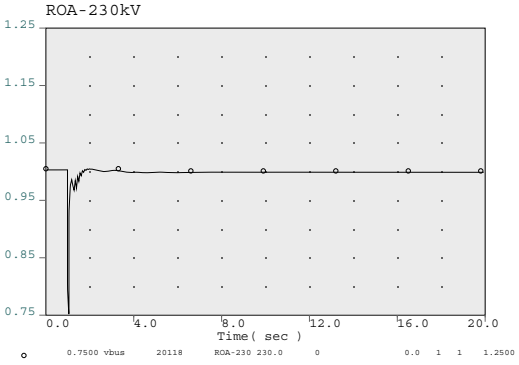
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

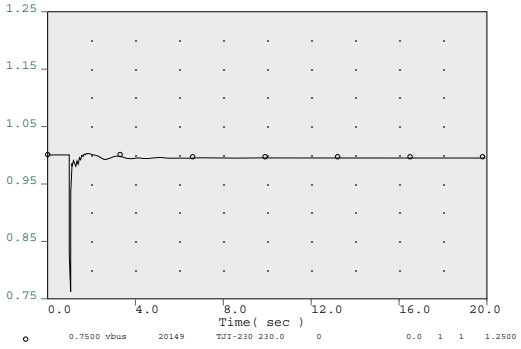
PAR/PID 230kV



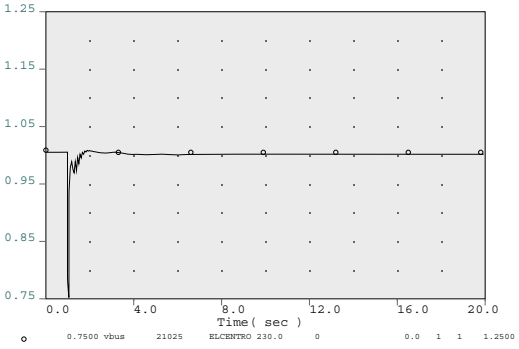
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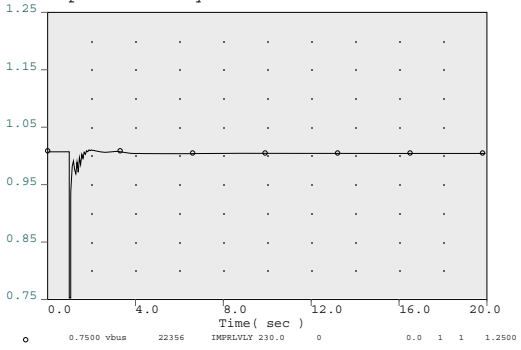
TJ1-230kV



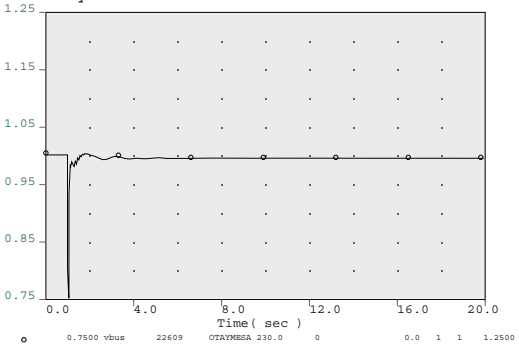
El Centro



Imperial Valley 230kV



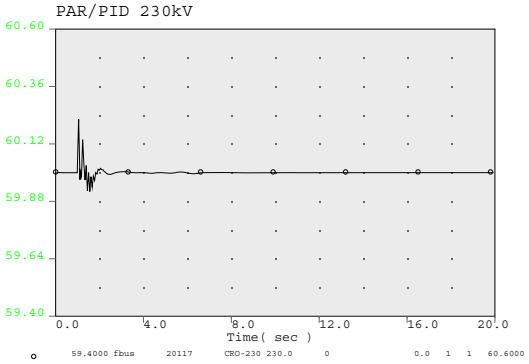
Otay Mesa 230kV



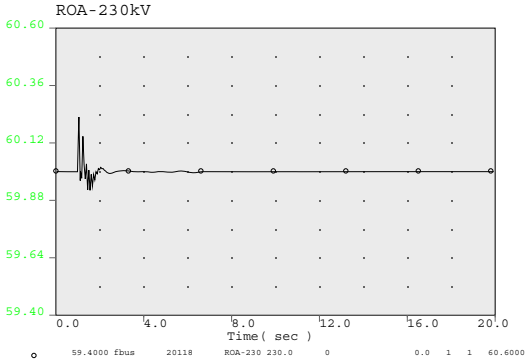
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Frequency Check and Comparison

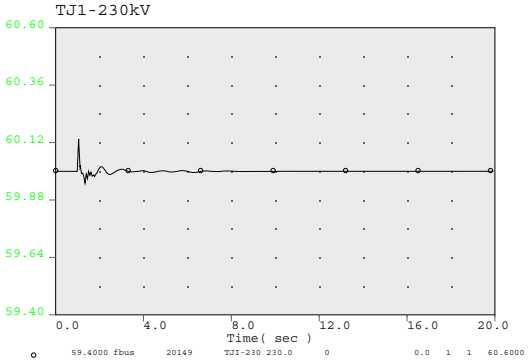
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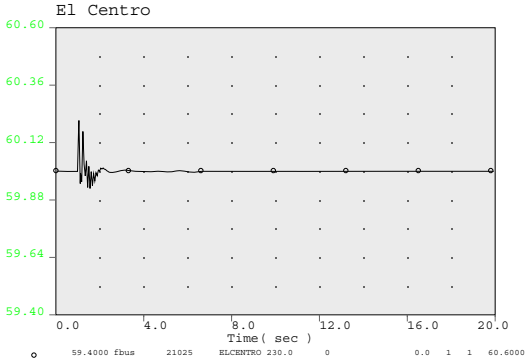
ROA-230kV



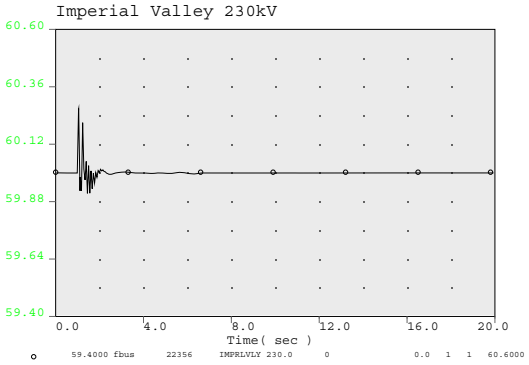
TJ1-230kV



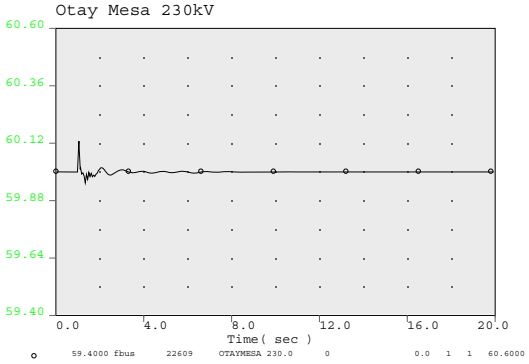
El Centro



Imperial Valley 230kV

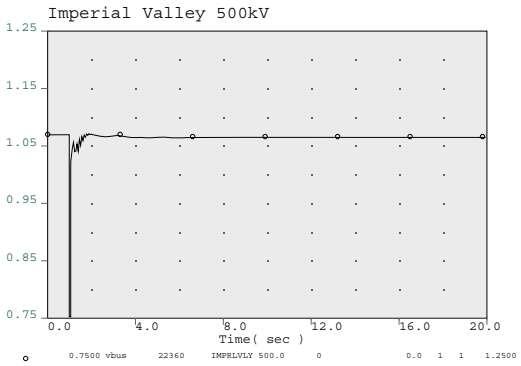


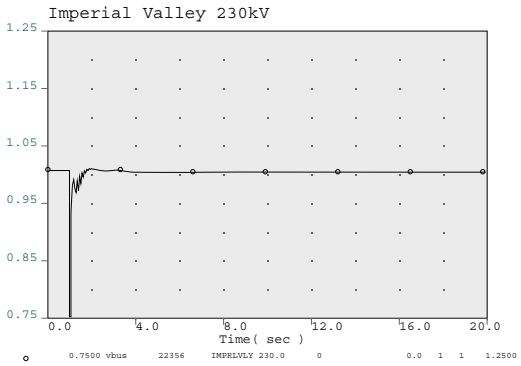
Otay Mesa 230kV

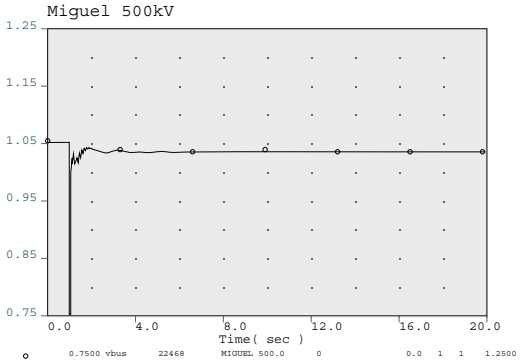


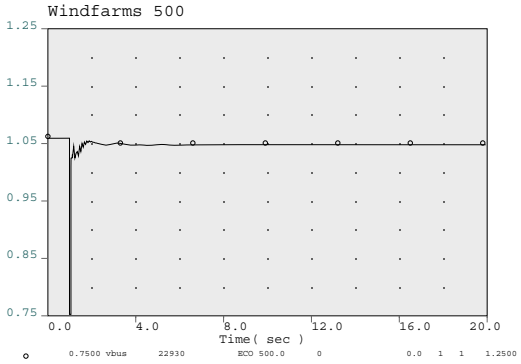
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

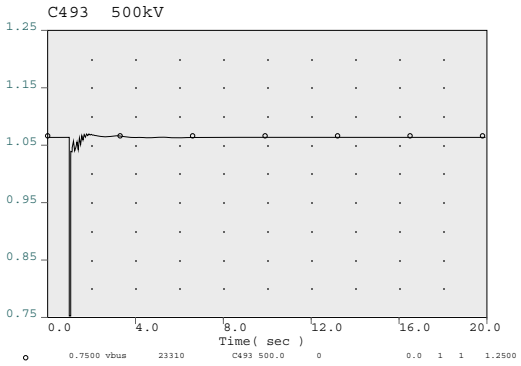
Imperial Valley Area - VOLTAGE

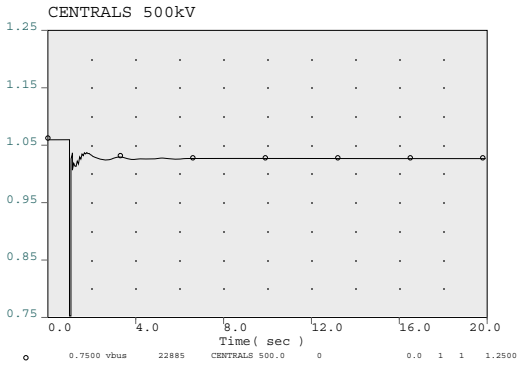






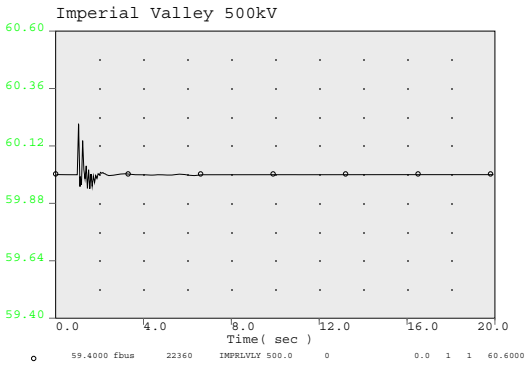


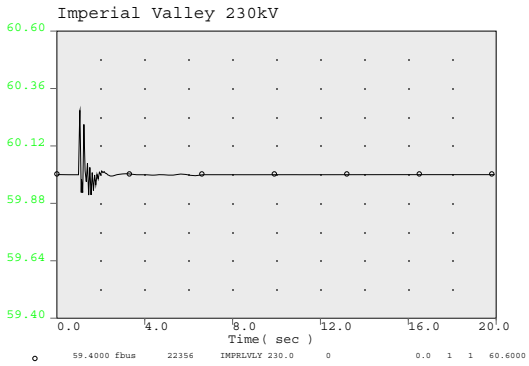


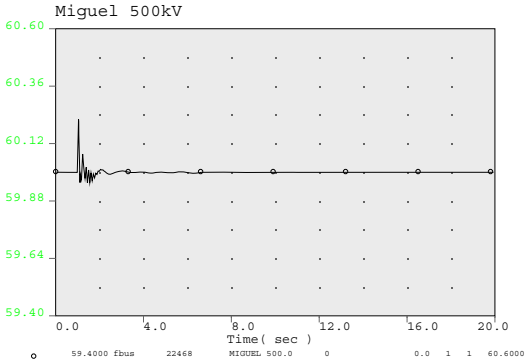


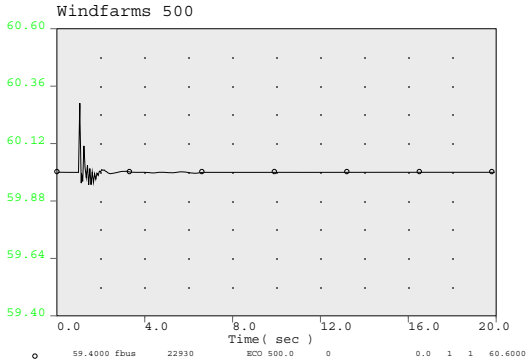
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

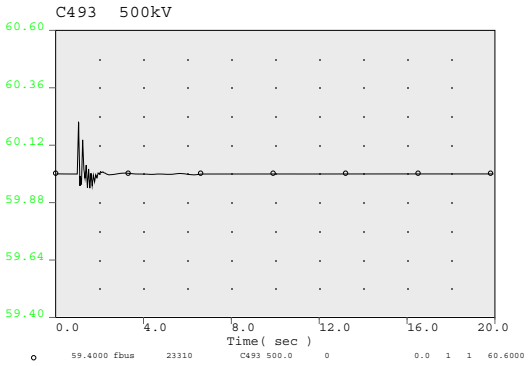
Imperial Valley Area - Frequency

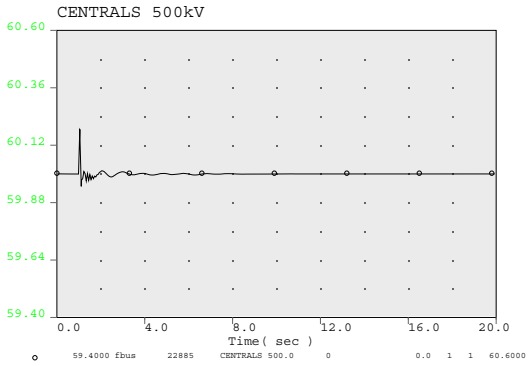






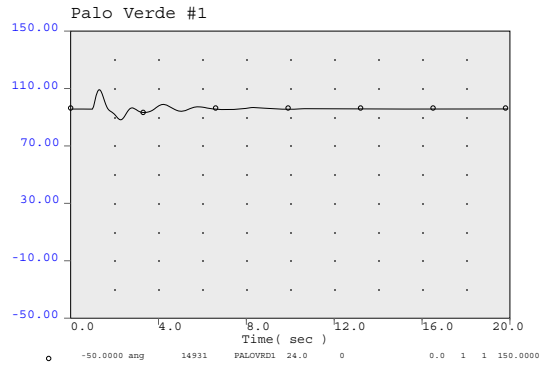


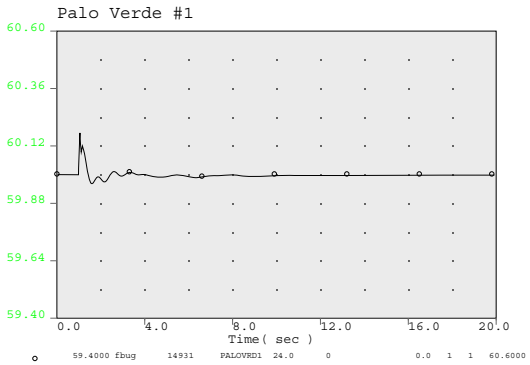


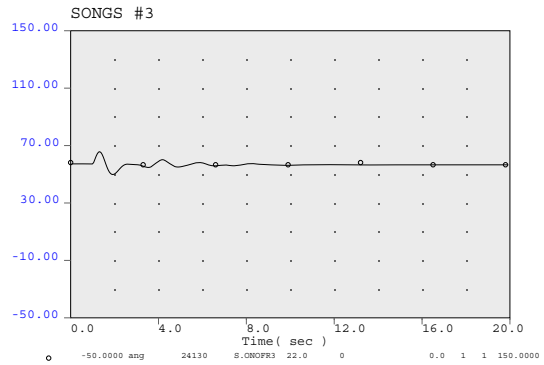


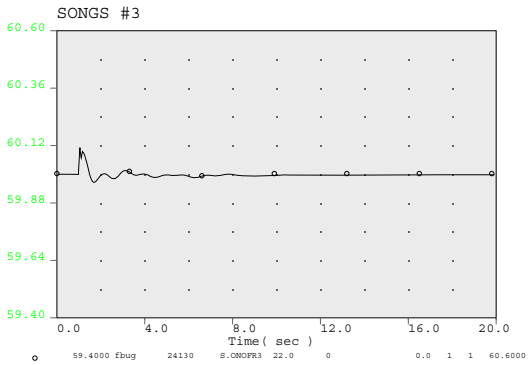
SDG&E Cluster 2 - post
2014 Light Autumn
C493 - CENTRALS 500kV line

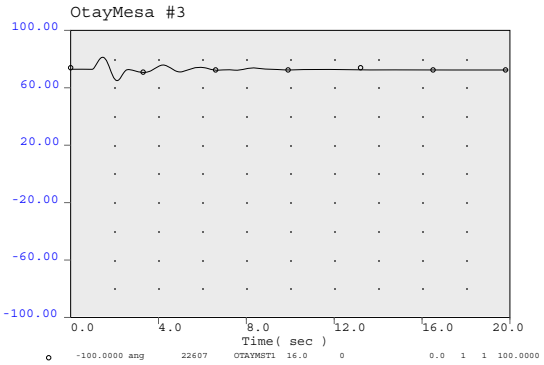
RELATIVE ROTOR ANGLE & FREQUENCY

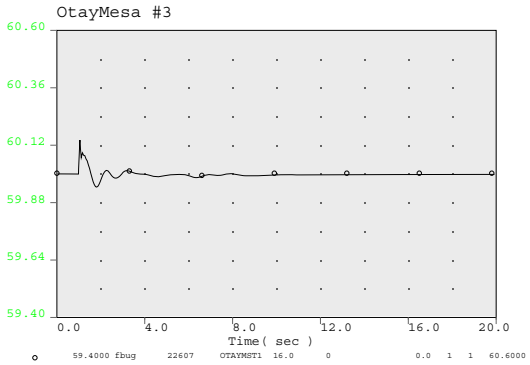










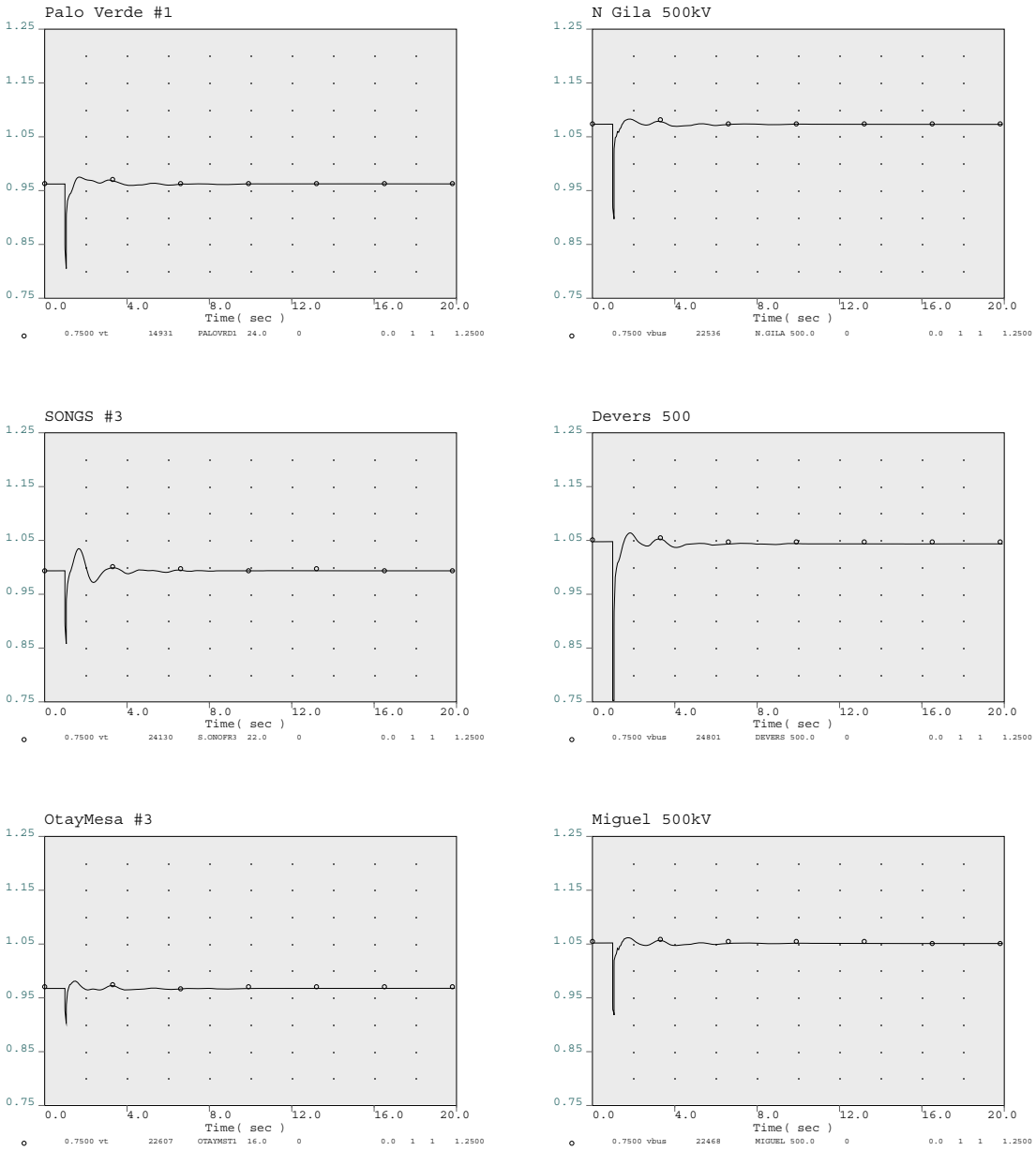


SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

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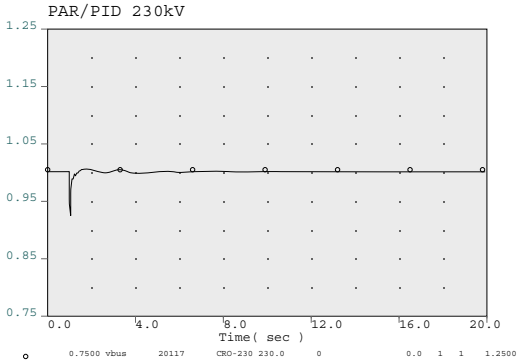
RELATIVE VOLTAGE



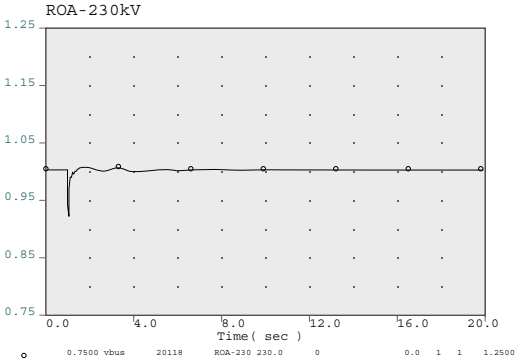
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

Affected System Voltage Check and Comparison

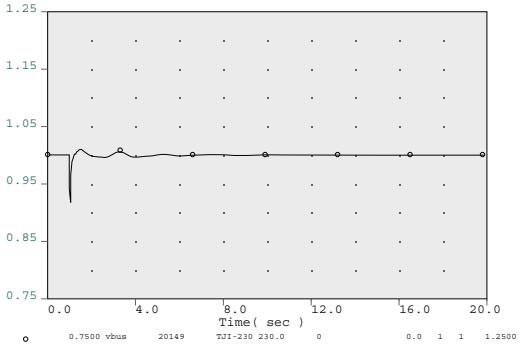
PAR/PID 230kV



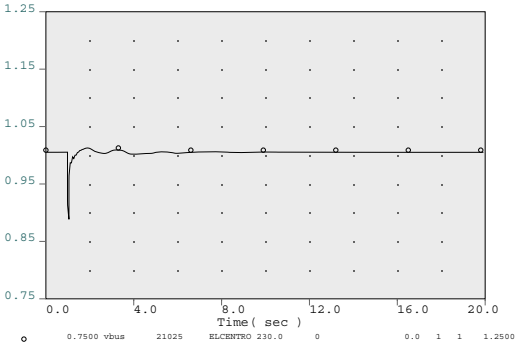
ROA-230kV



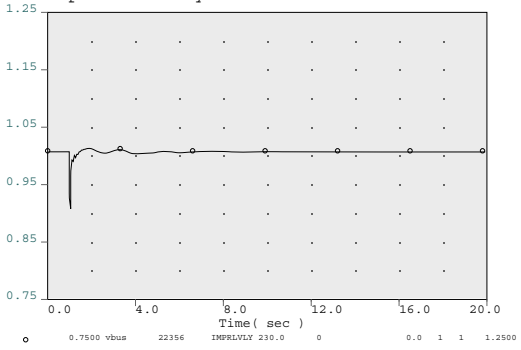
TJ1-230kV



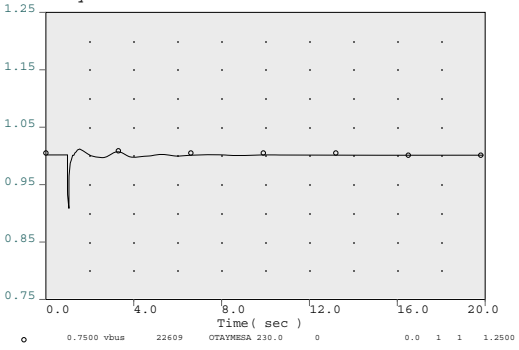
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

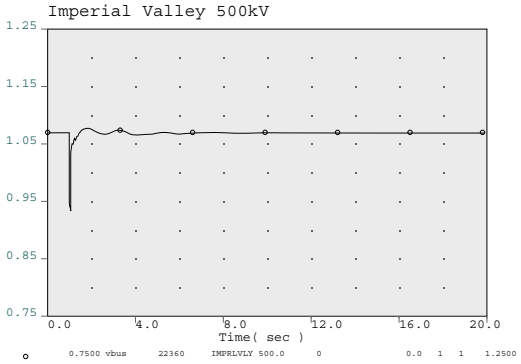
Affected System Frequency Check and Comparison



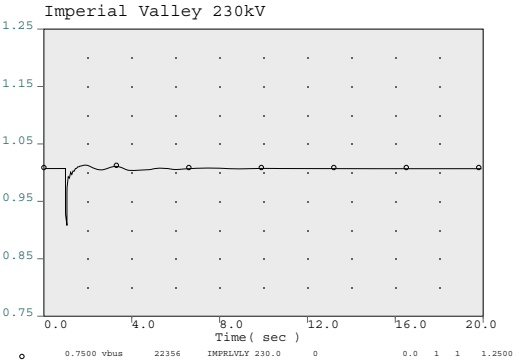
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

Imperial Valley Area - VOLTAGE

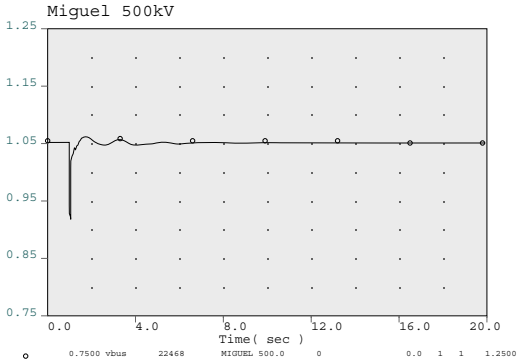
Imperial Valley 500kV



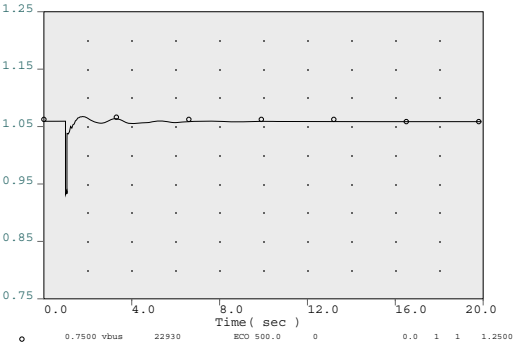
Imperial Valley 230kV



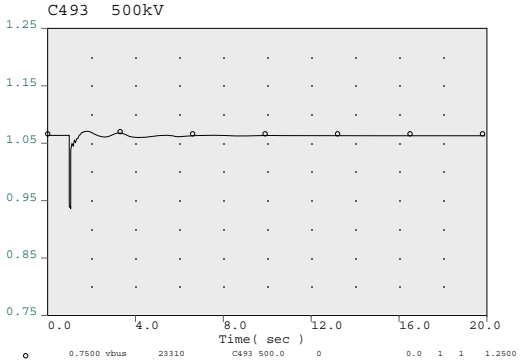
Miguel 500kV



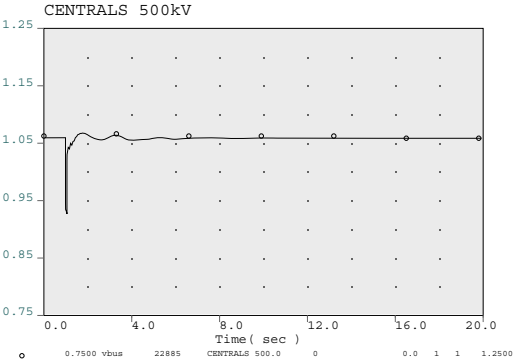
Windfarms 500



C493 500kV

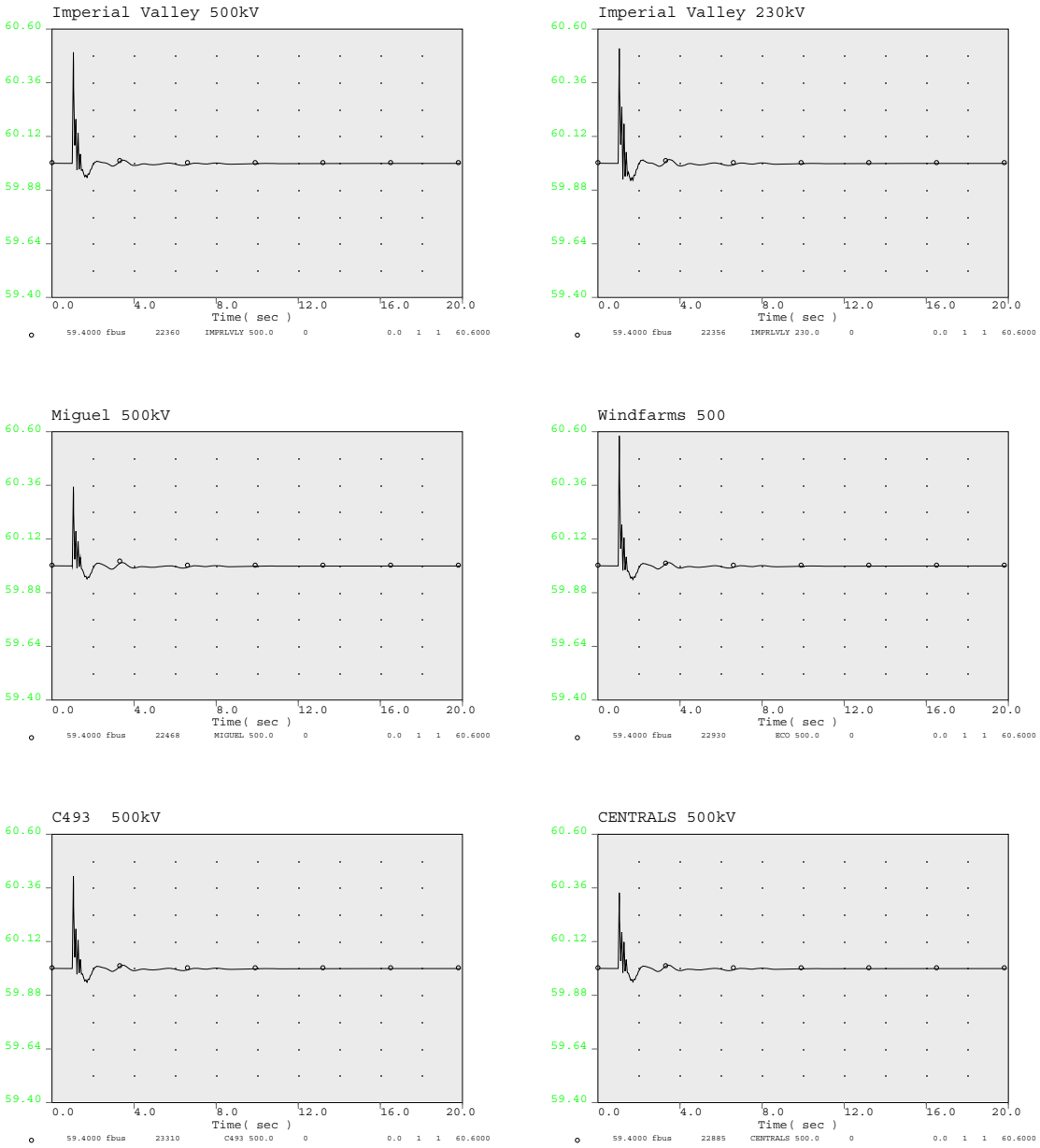


CENTRALS 500kV



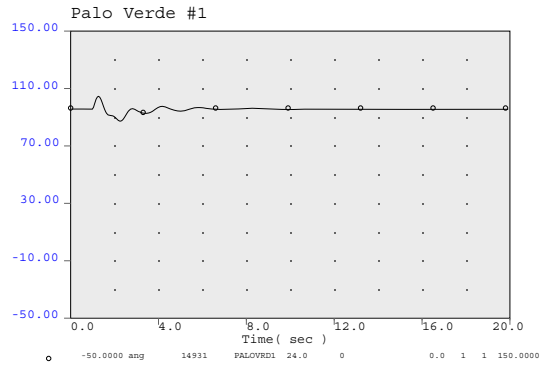
SDG&E Cluster 2 - post
2014 Light Autumn
Valley - Devers 500 kV line

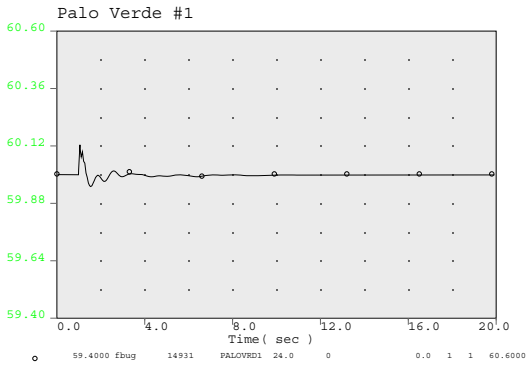
Imperial Valley Area - Frequency

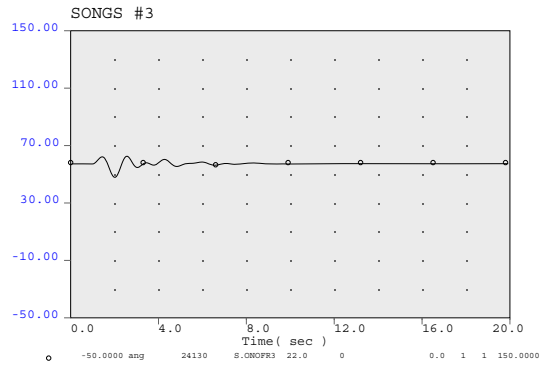


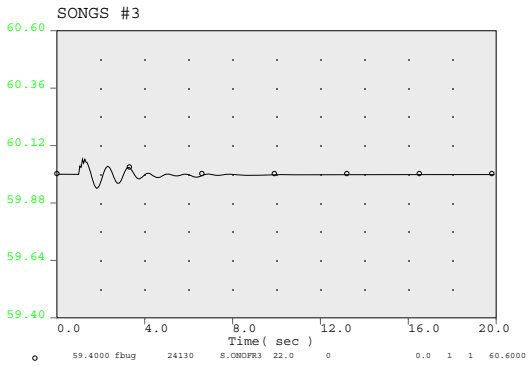
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

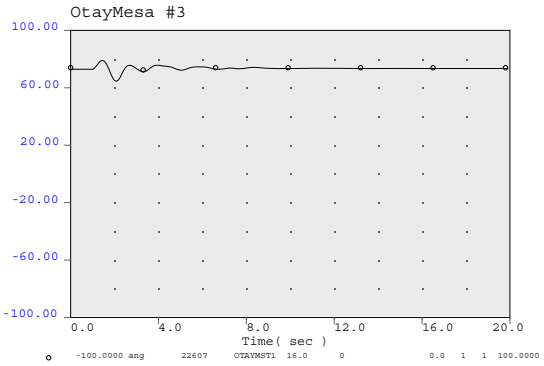
RELATIVE ROTOR ANGLE & FREQUENCY

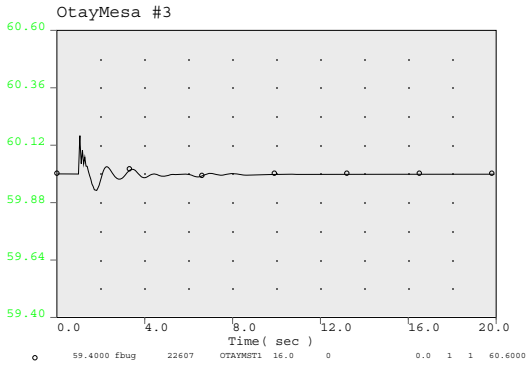












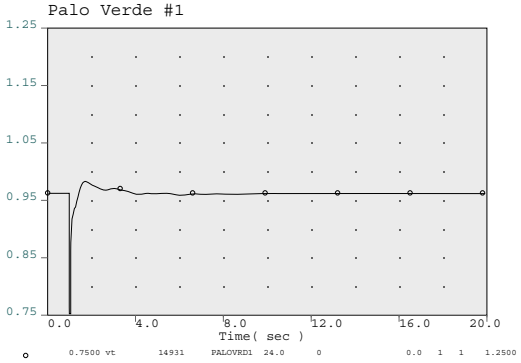
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Page 1

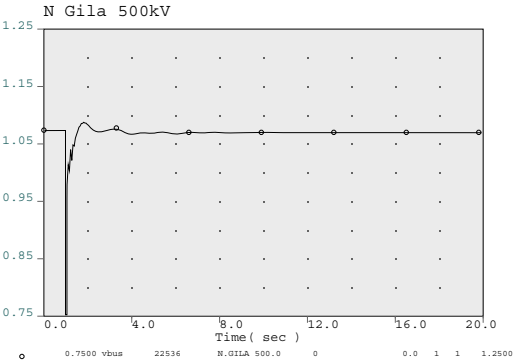
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RELATIVE VOLTAGE

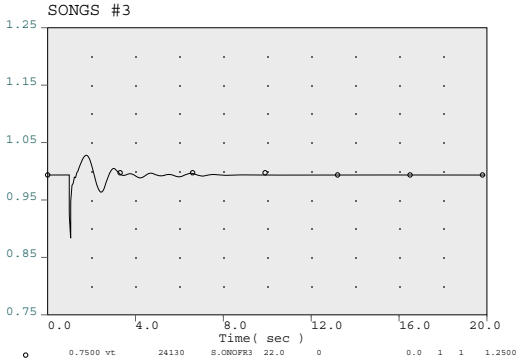
Palo Verde #1



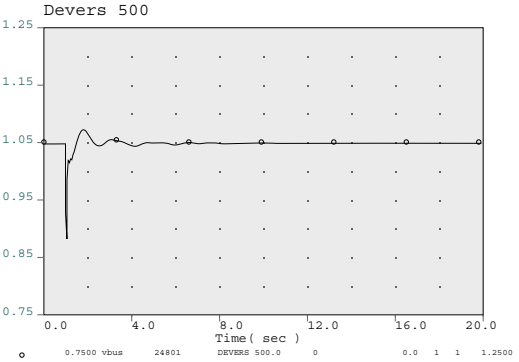
N Gila 500kV



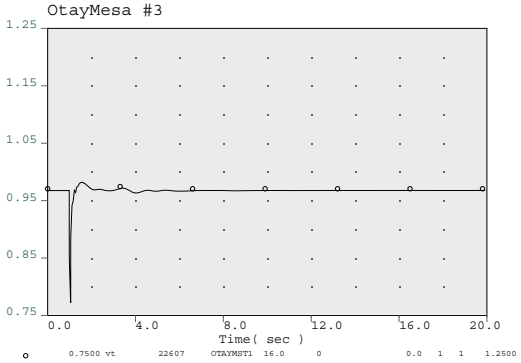
SONGS #3



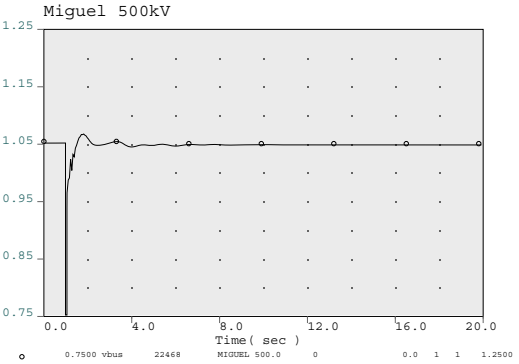
Devers 500



OtayMesa #3



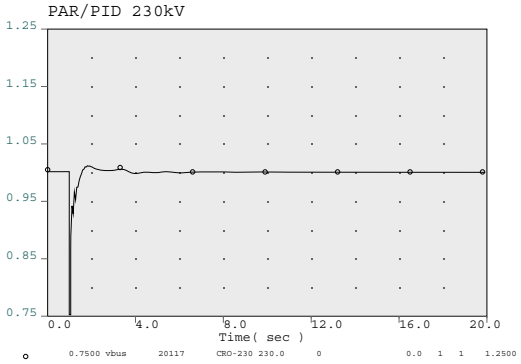
Miguel 500kV



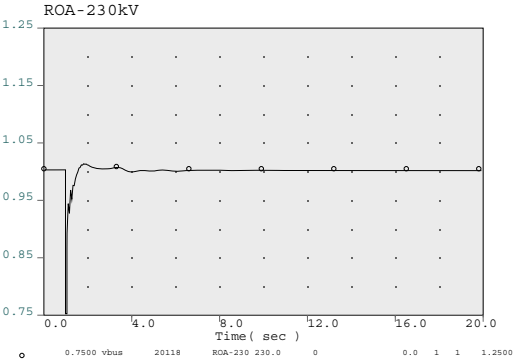
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

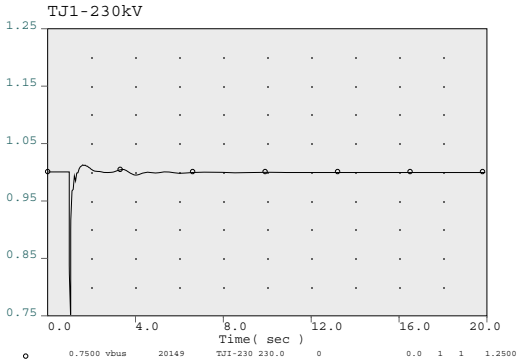
PAR/PID 230kV



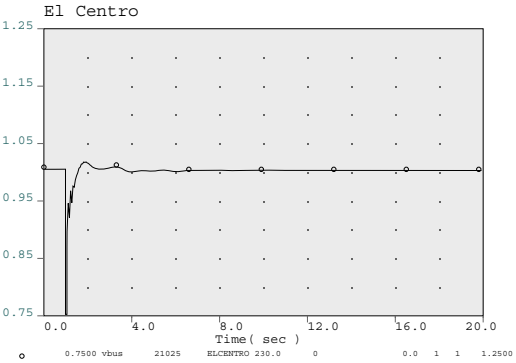
ROA-230kV



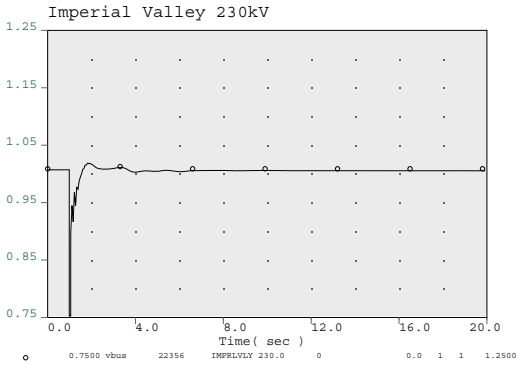
TJ1-230kV



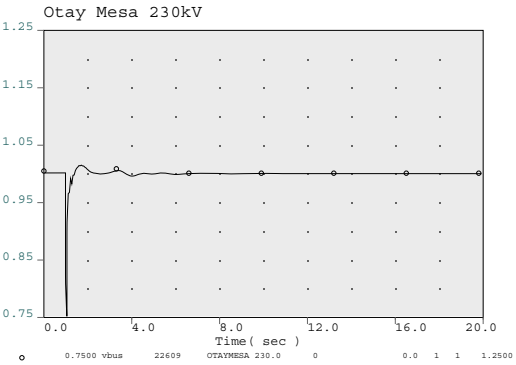
El Centro



Imperial Valley 230kV



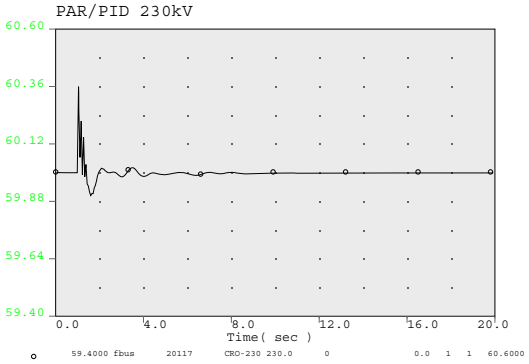
Otay Mesa 230kV



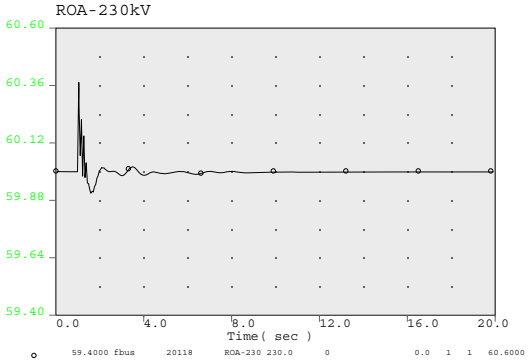
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Frequency Check and Comparison

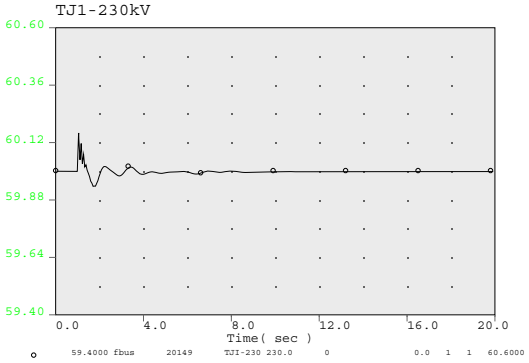
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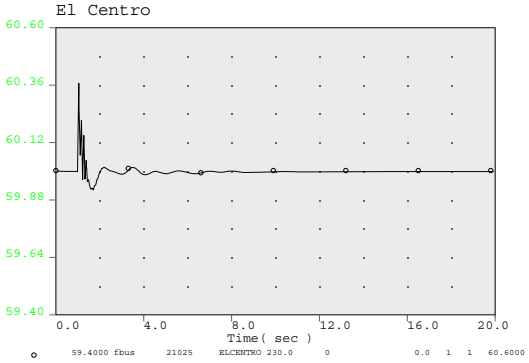
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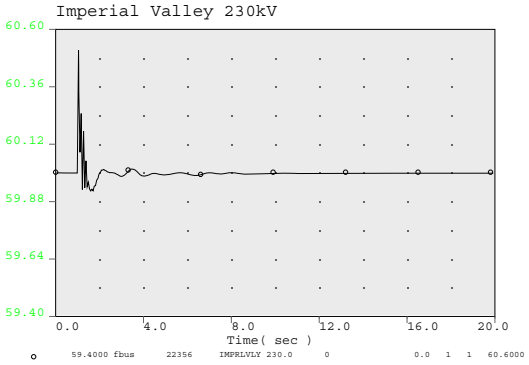
TJ1-230kV



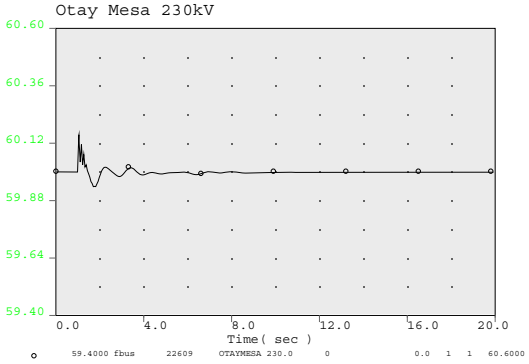
El Centro



Imperial Valley 230kV



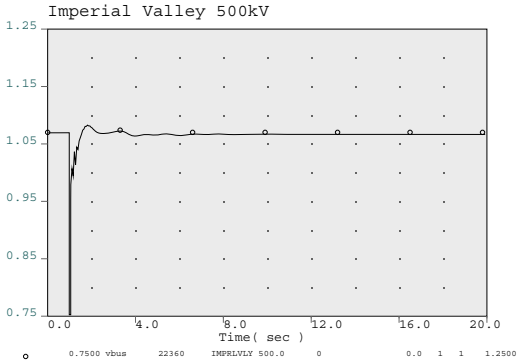
Otay Mesa 230kV



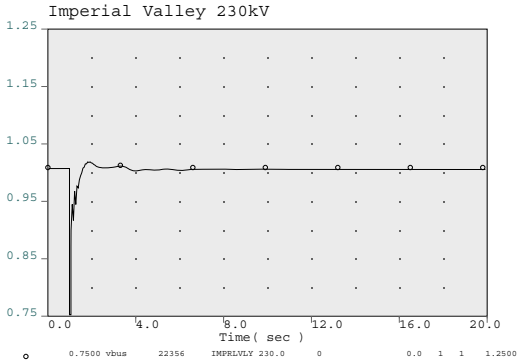
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

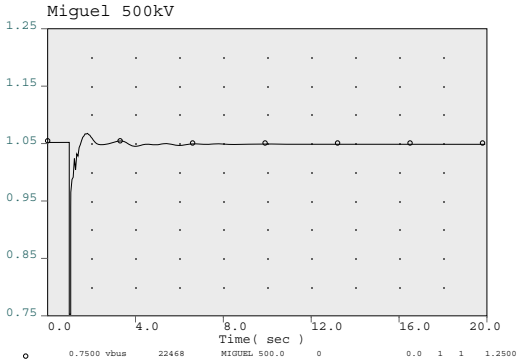
Imperial Valley 500kV



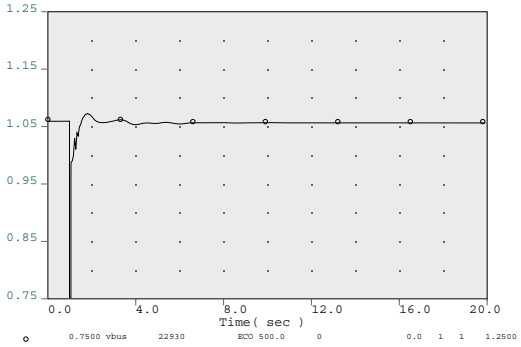
Imperial Valley 230kV



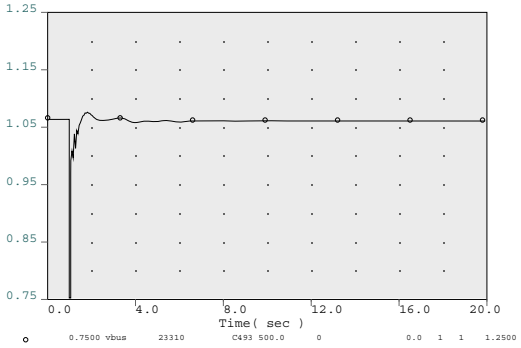
Miguel 500kV



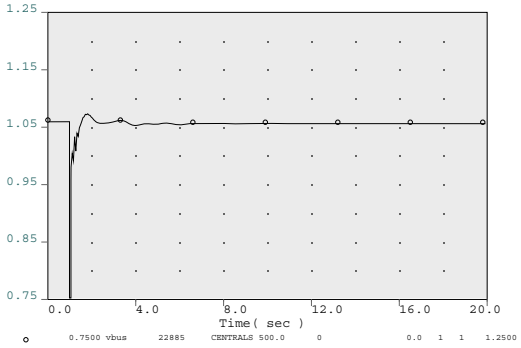
Windfarms 500



C493 500kV

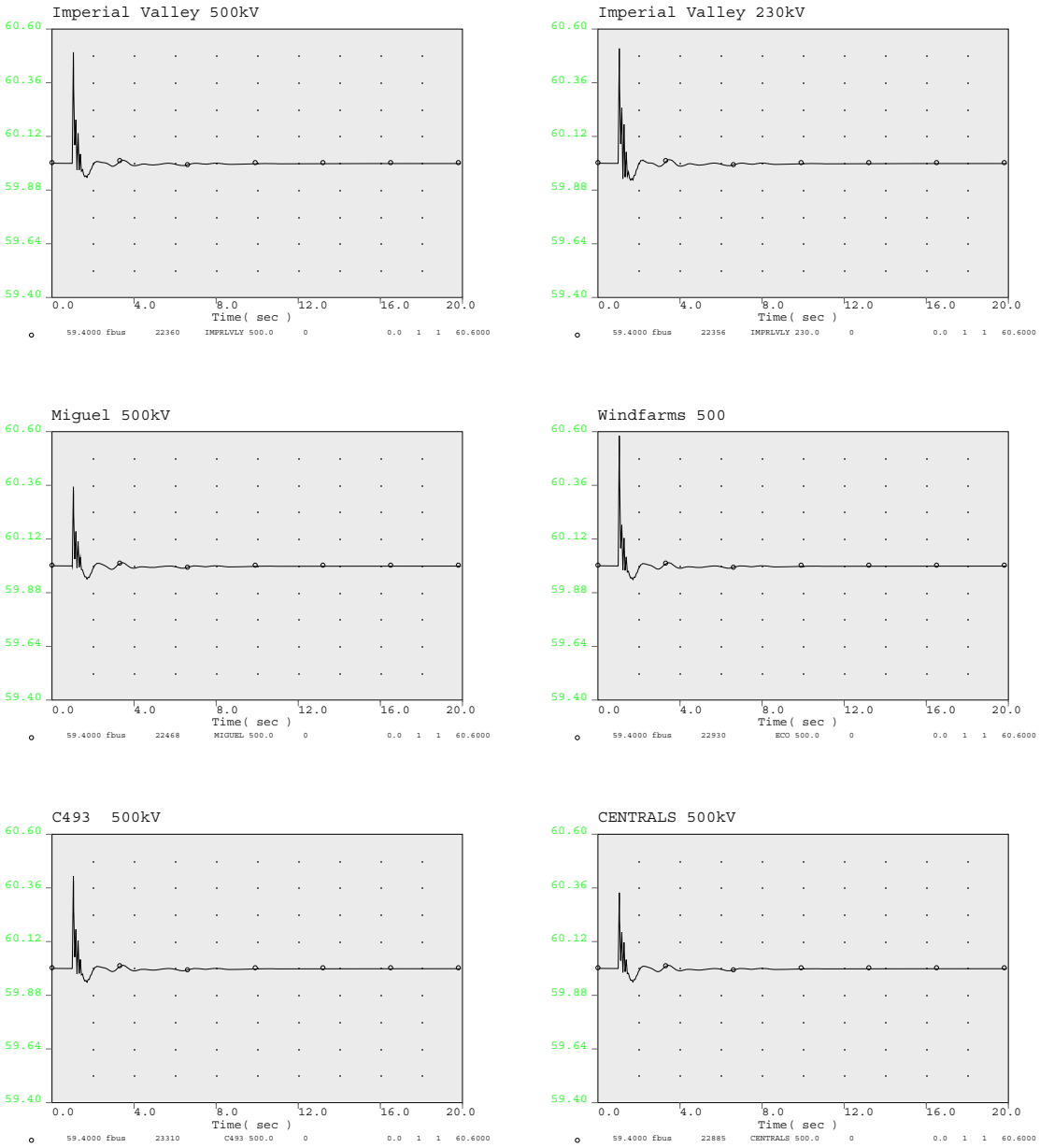


CENTRALS 500kV



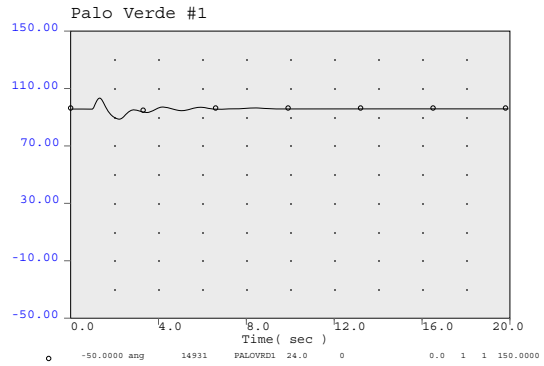
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

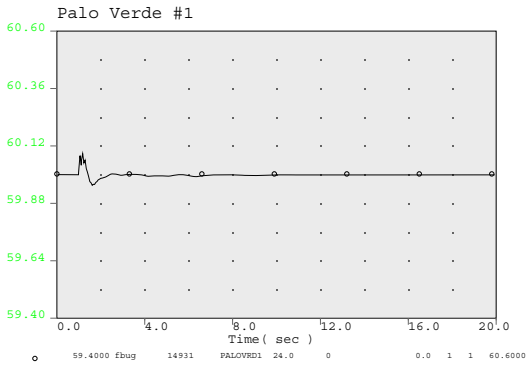
Imperial Valley Area - Frequency

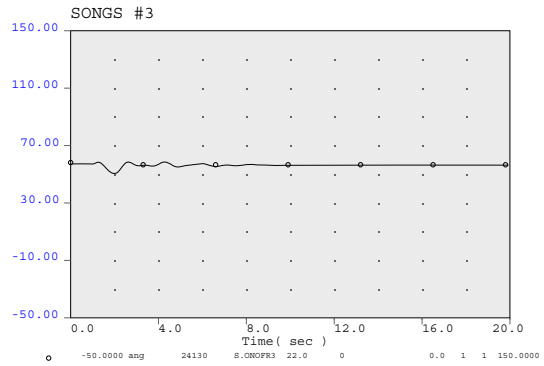


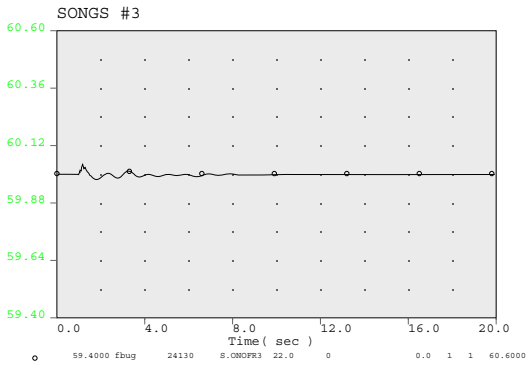
SDG&E Cluster 2 - post
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

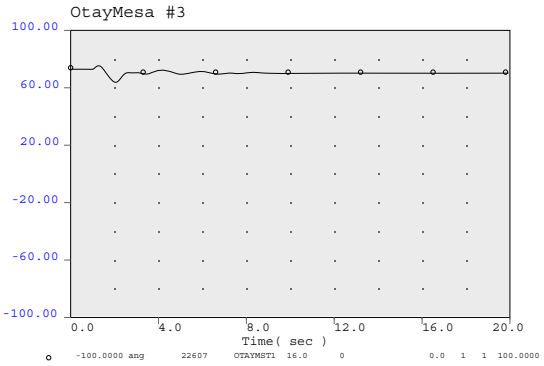
RELATIVE ROTOR ANGLE & FREQUENCY

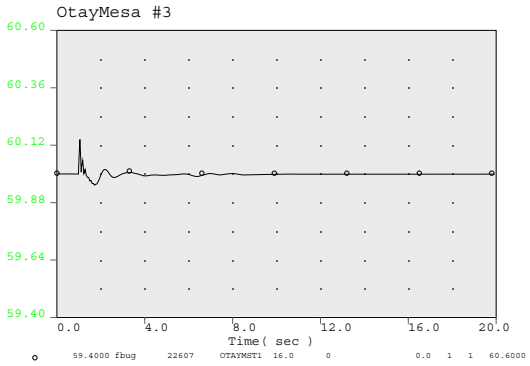










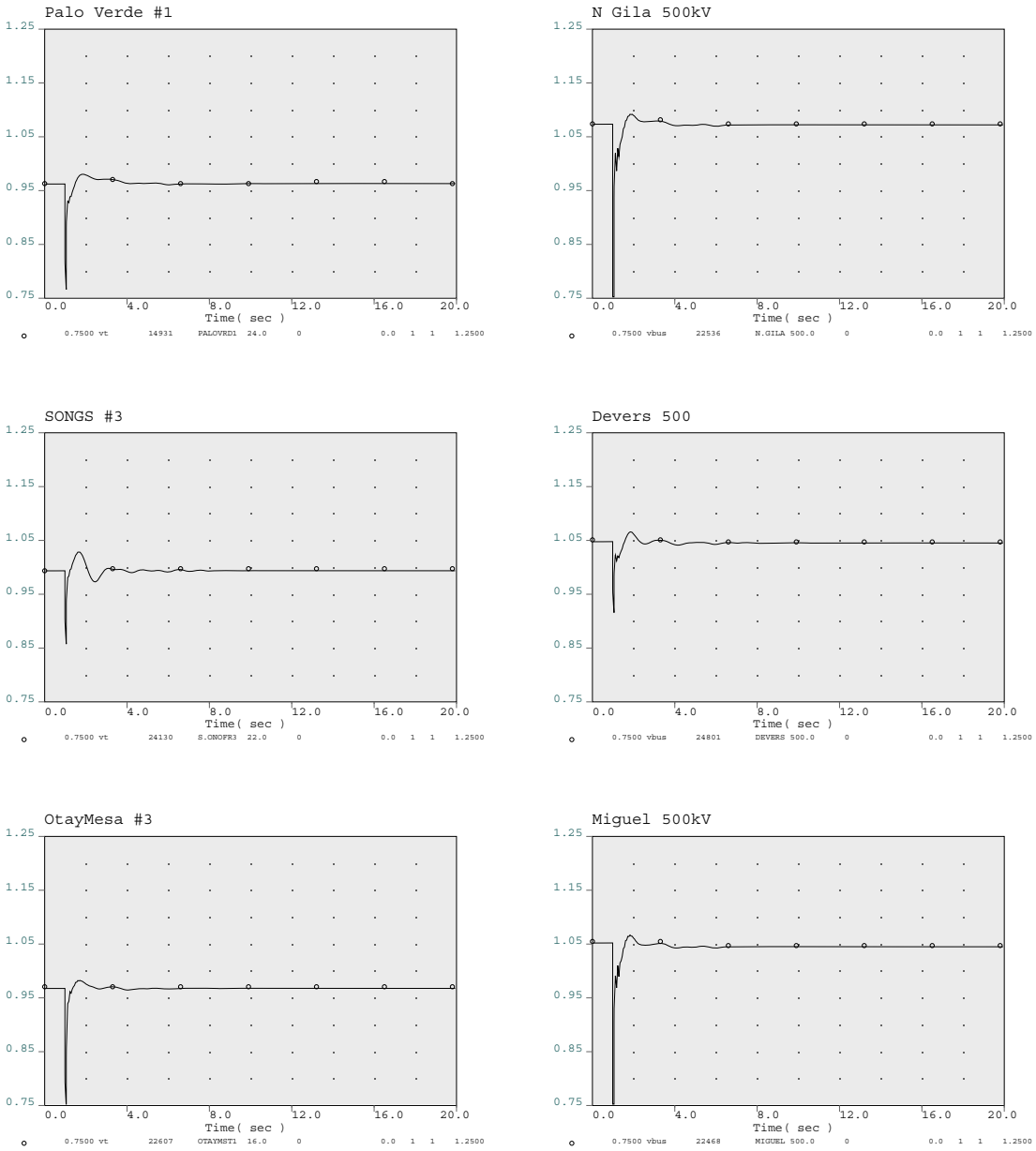


SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Page 1

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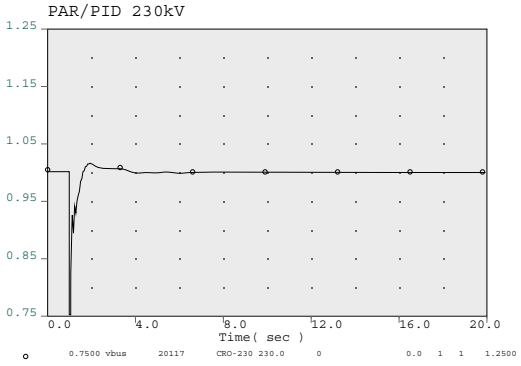
RELATIVE VOLTAGE



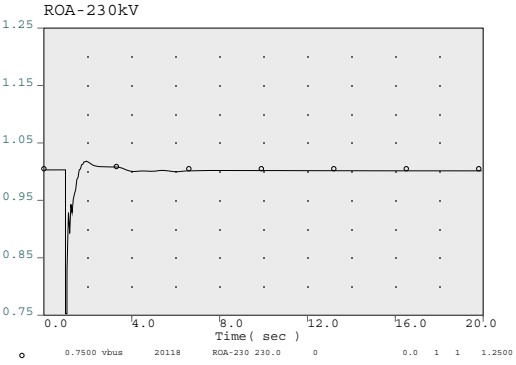
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

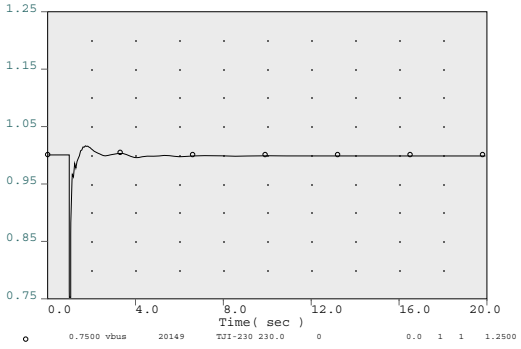
PAR/PID 230kV



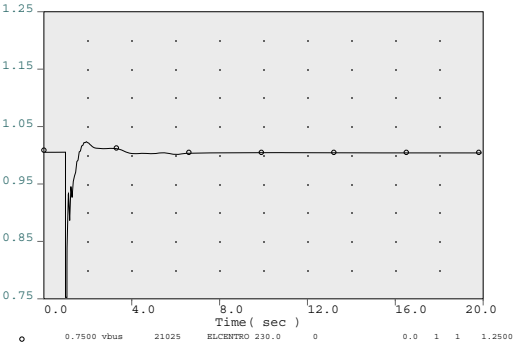
ROA-230kV



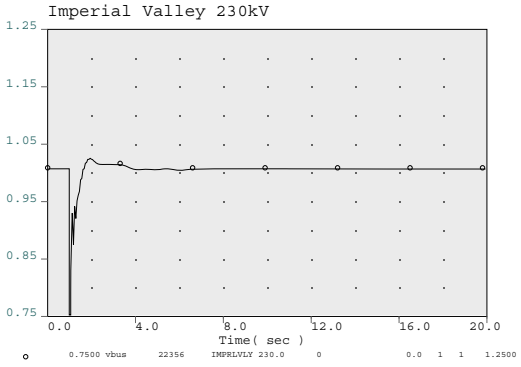
TJ1-230kV



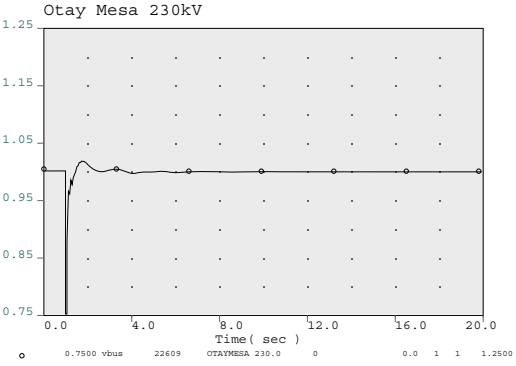
El Centro



Imperial Valley 230kV

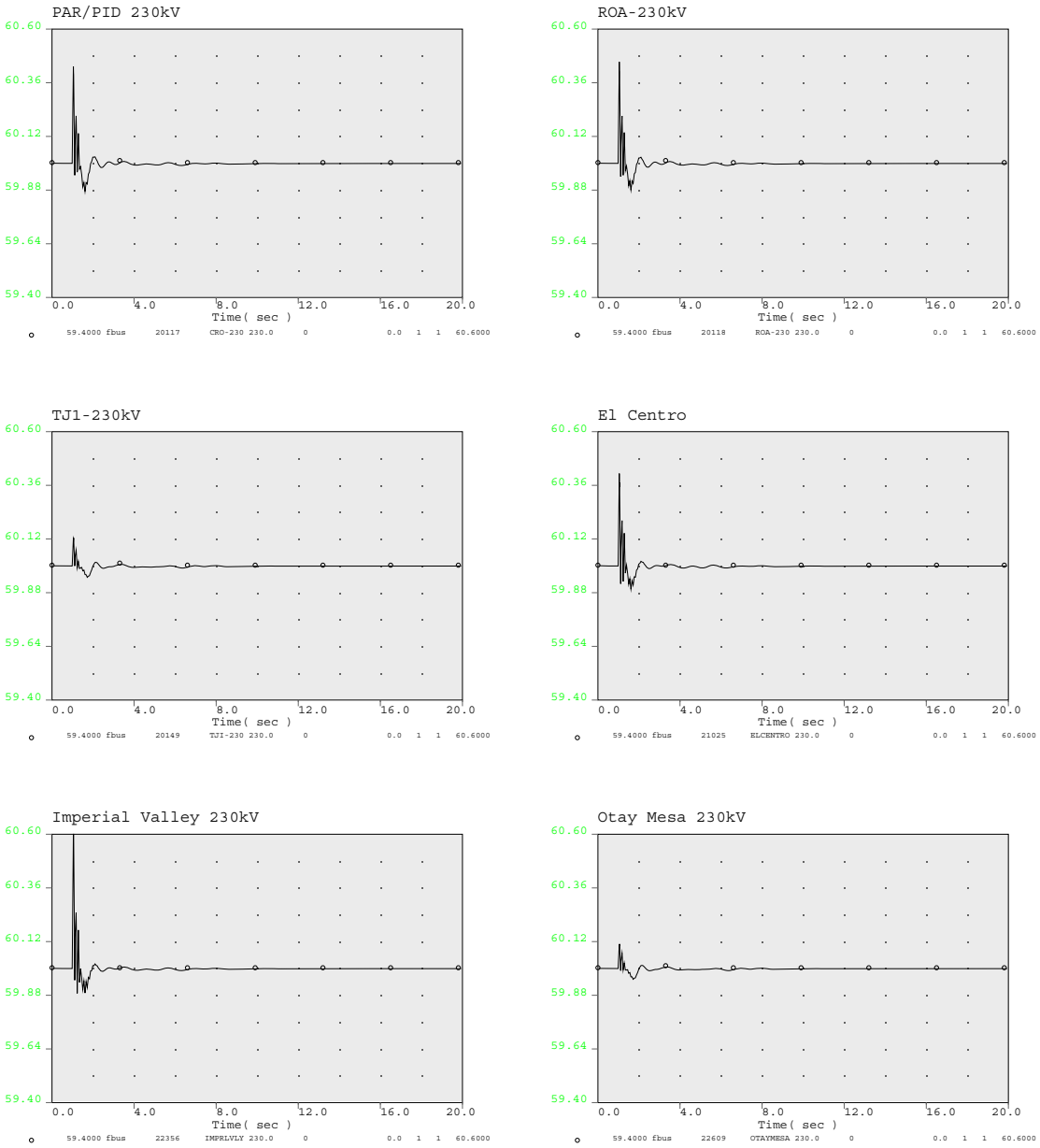


Otay Mesa 230kV



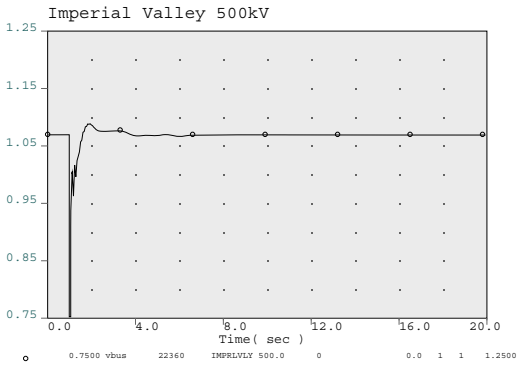
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

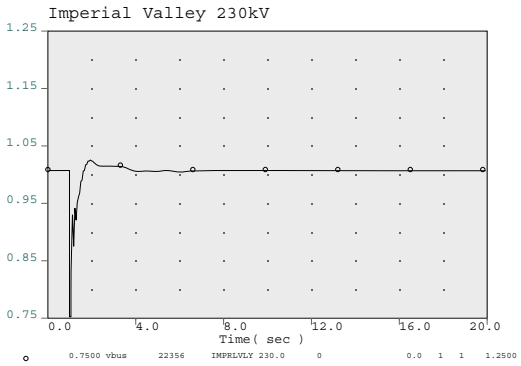
Affected System Frequency Check and Comparison

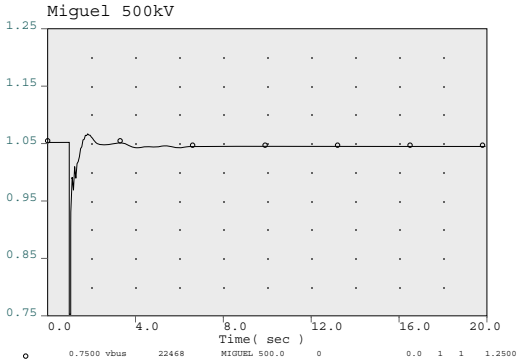


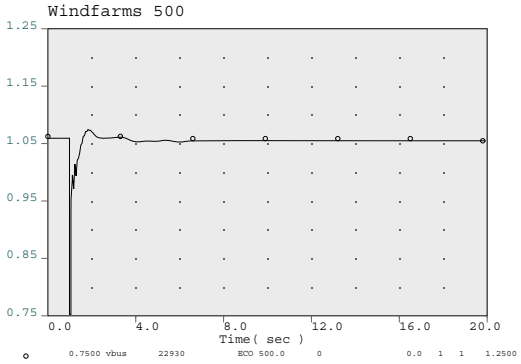
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

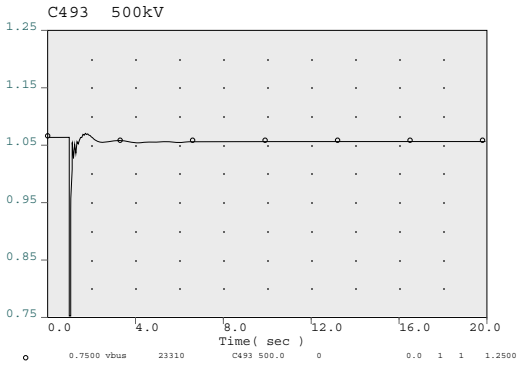
Imperial Valley Area - VOLTAGE

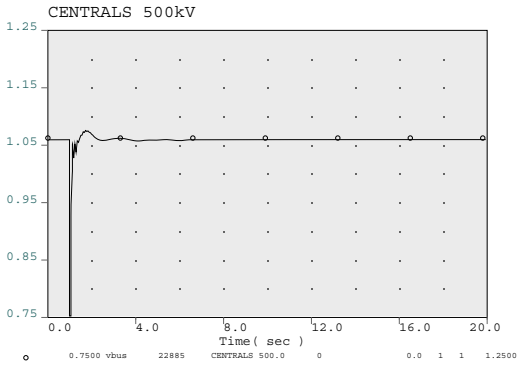






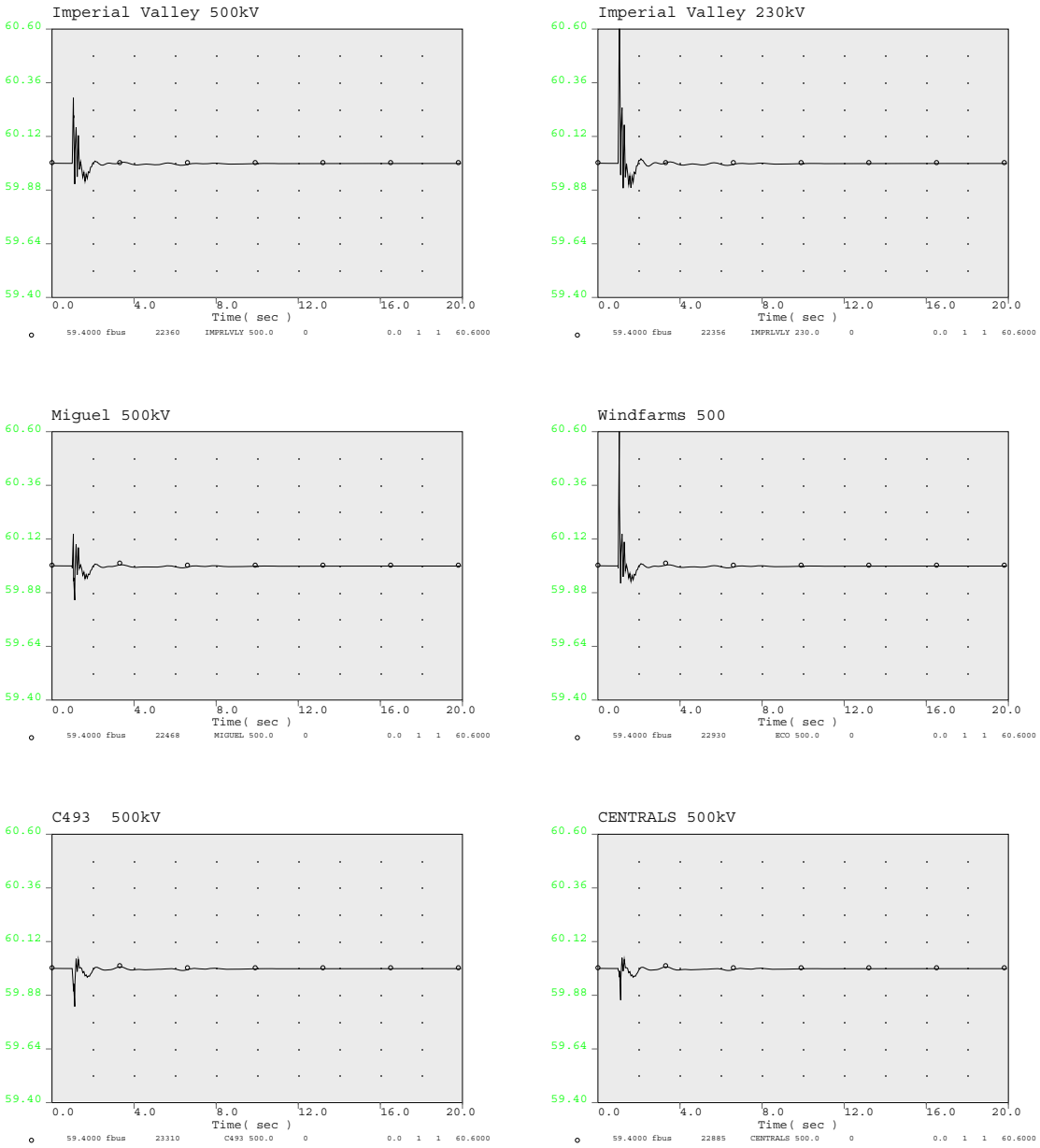






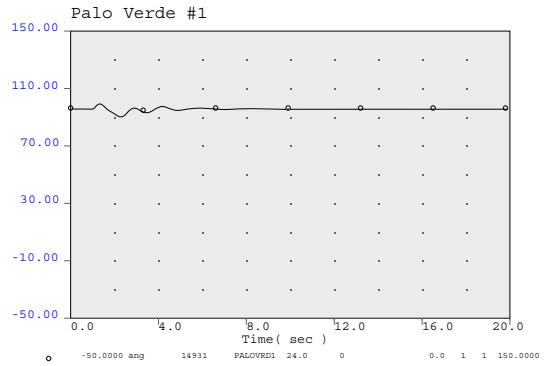
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

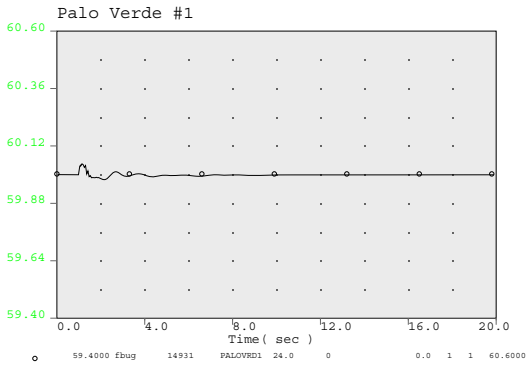
Imperial Valley Area - Frequency

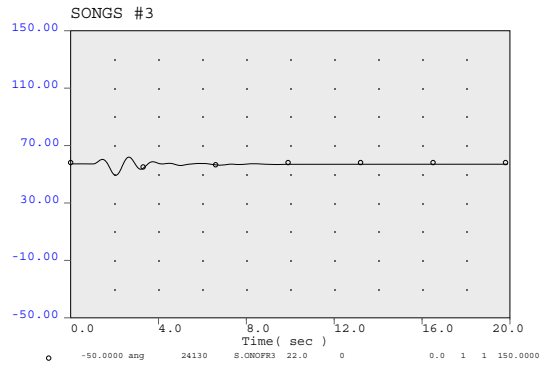


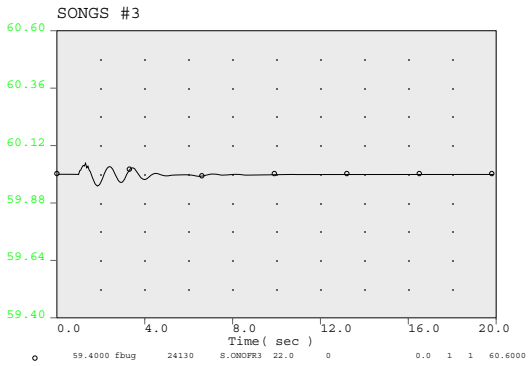
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley- C493 500kV line1

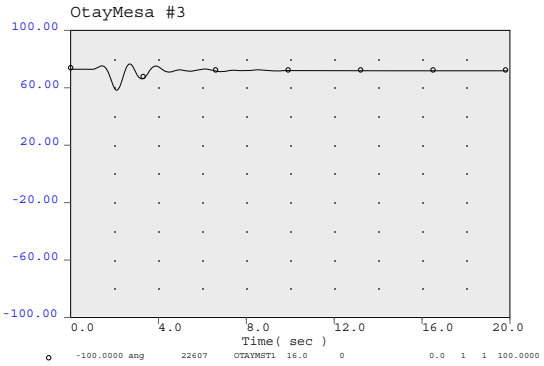
RELATIVE ROTOR ANGLE & FREQUENCY

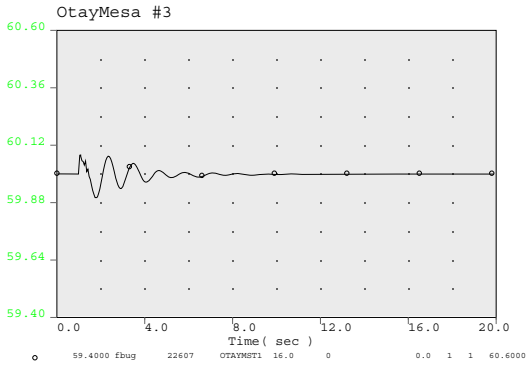










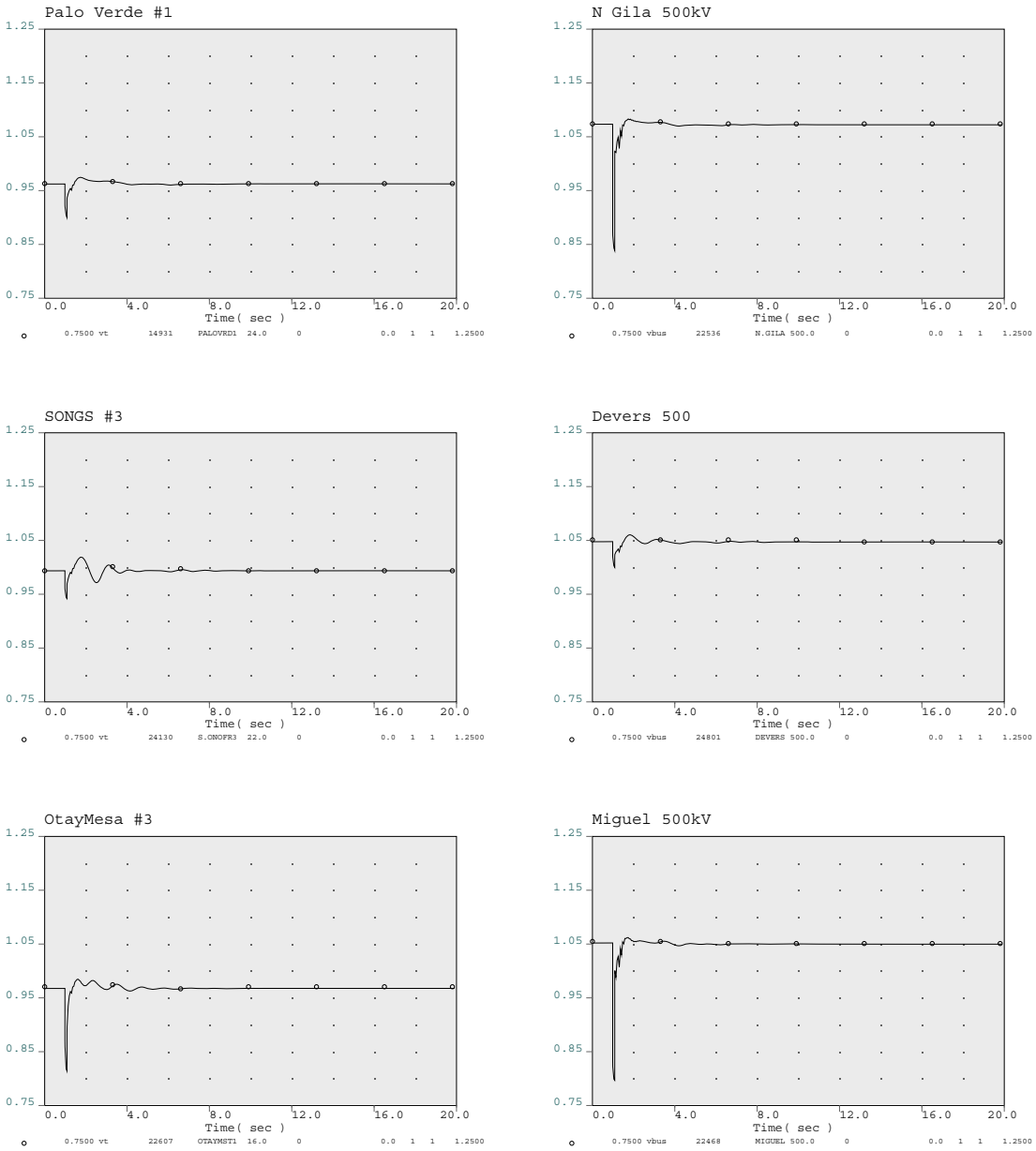


SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Page 1

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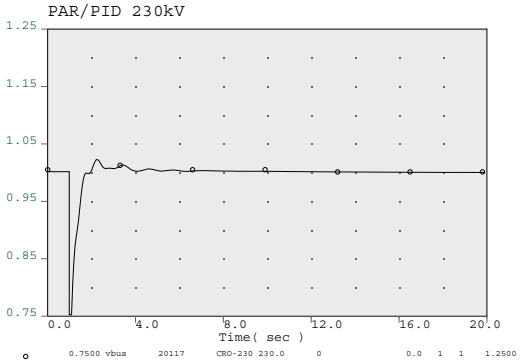
RELATIVE VOLTAGE



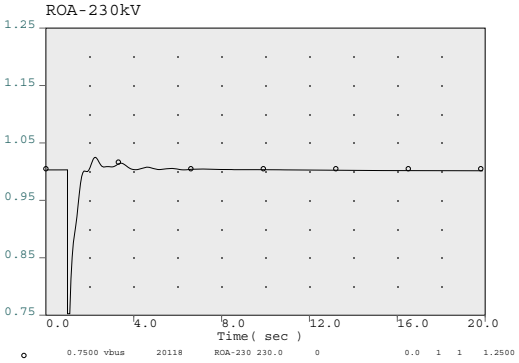
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

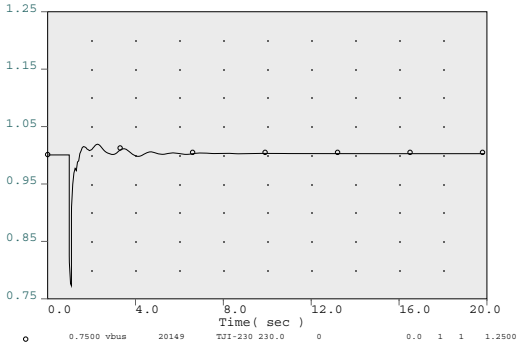
PAR/PID 230kV



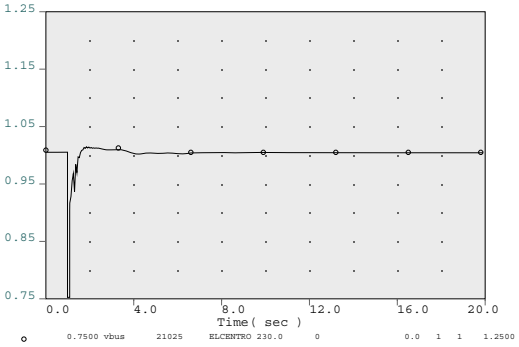
ROA-230kV



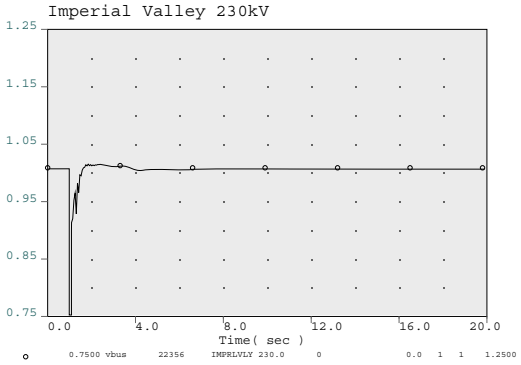
TJ1-230kV



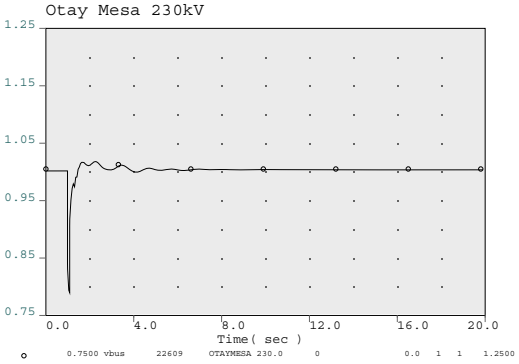
El Centro



Imperial Valley 230kV

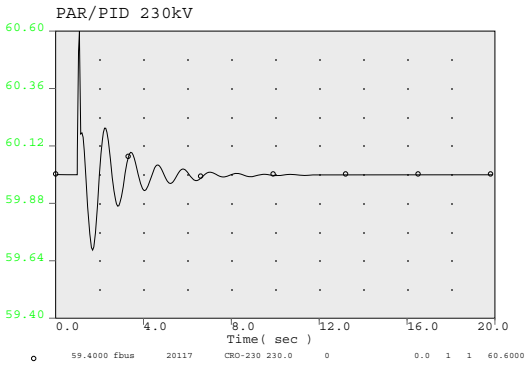


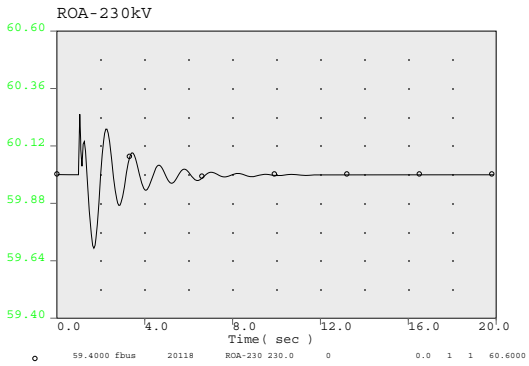
Otay Mesa 230kV

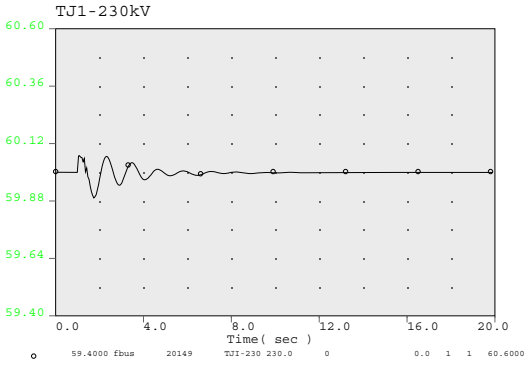


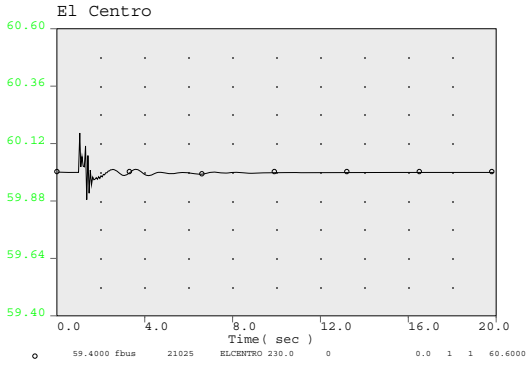
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

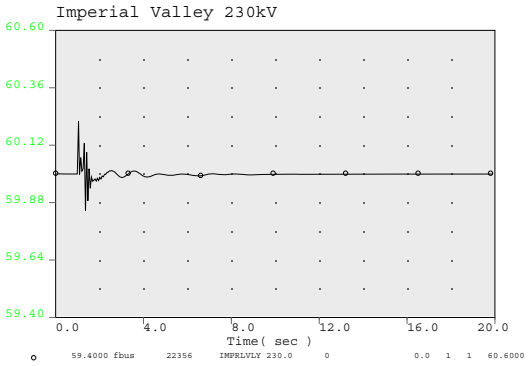
Affected System Frequency Check and Comparison

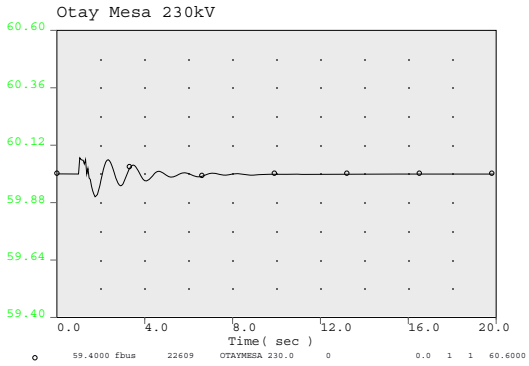








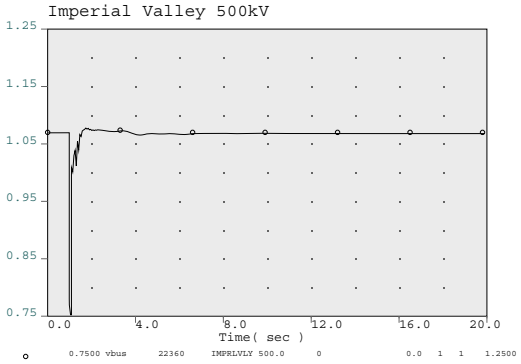




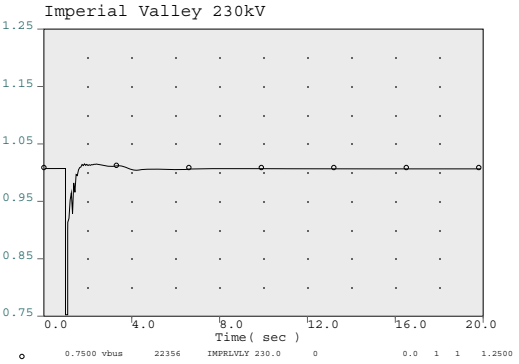
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

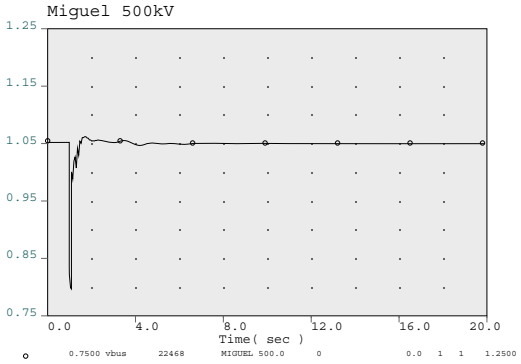
Imperial Valley 500kV



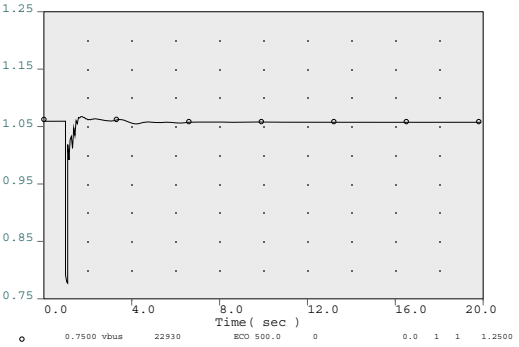
Imperial Valley 230kV



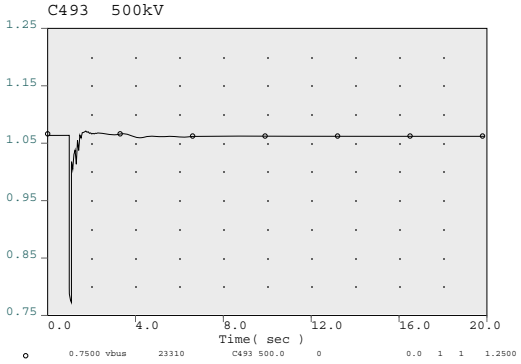
Miguel 500kV



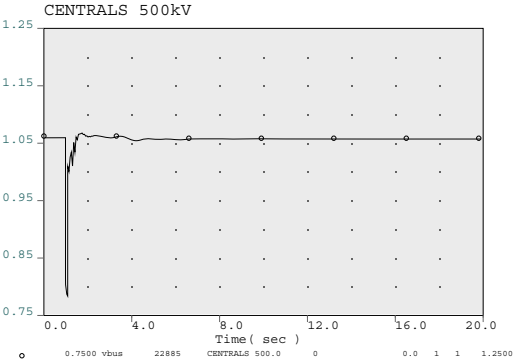
Windfarms 500



C493 500kV

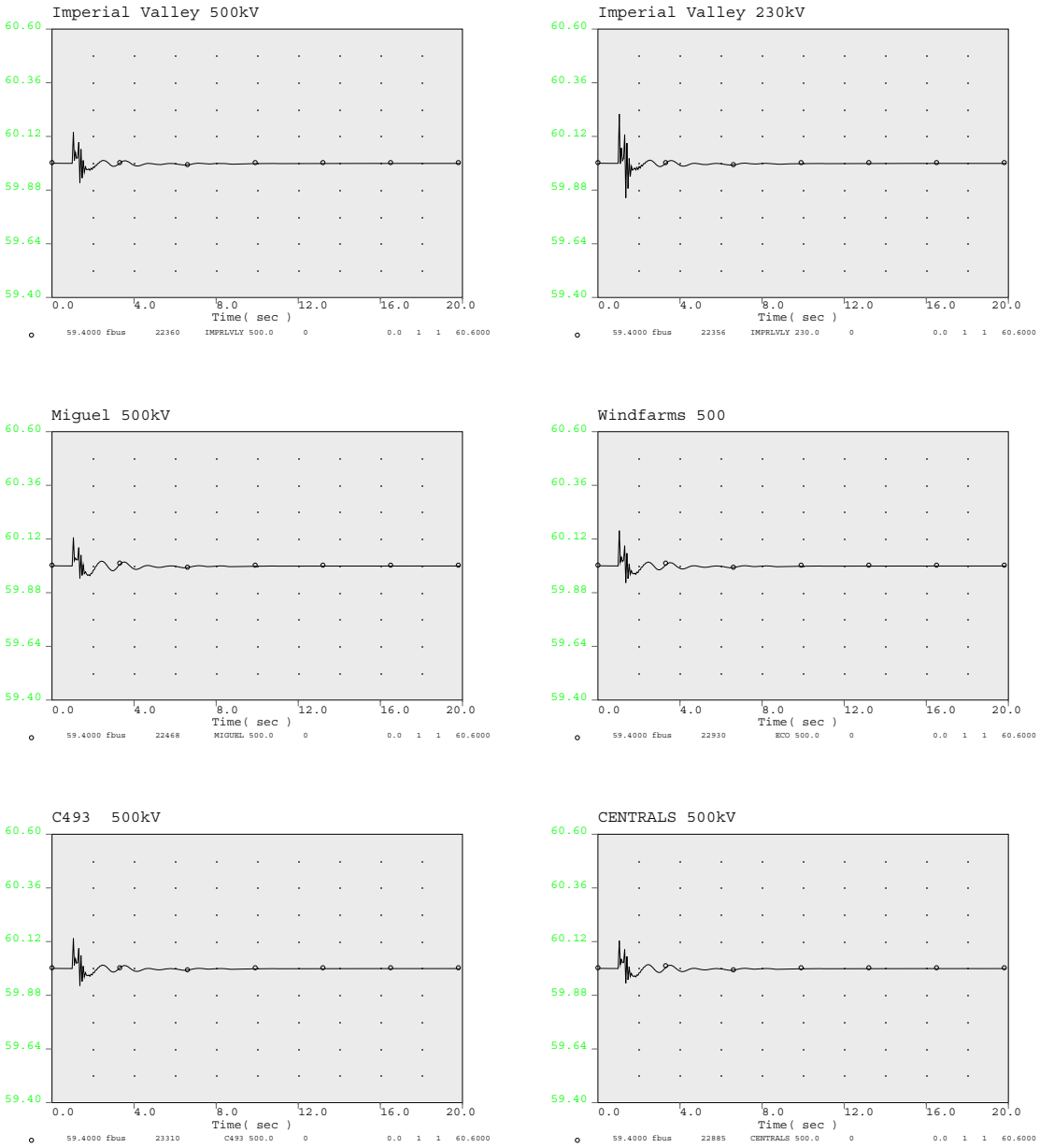


CENTRALS 500kV



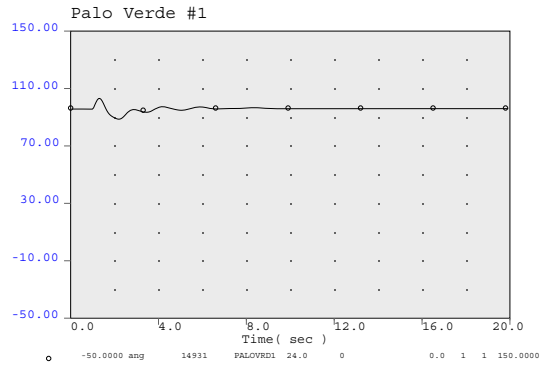
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

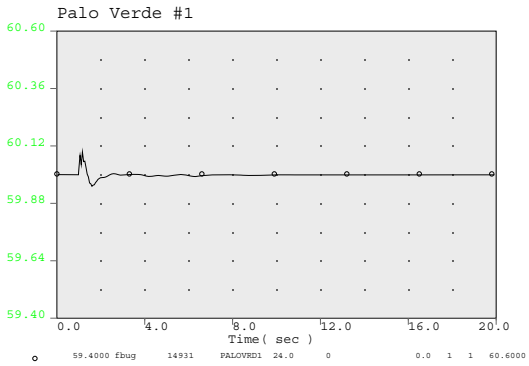
Imperial Valley Area - Frequency

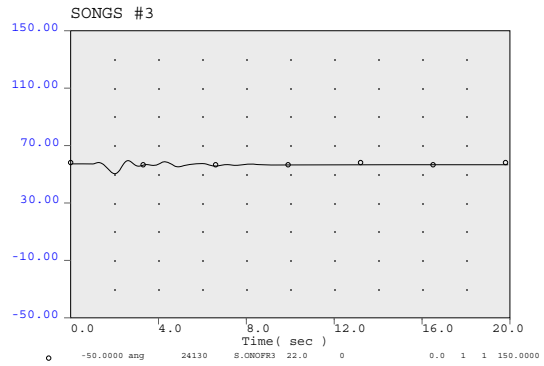


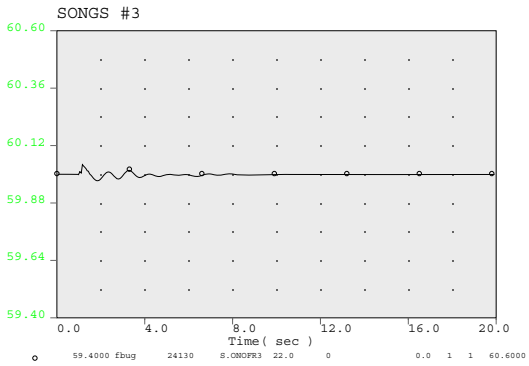
SDG&E Cluster 2 - post
2014 Light Autumn
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

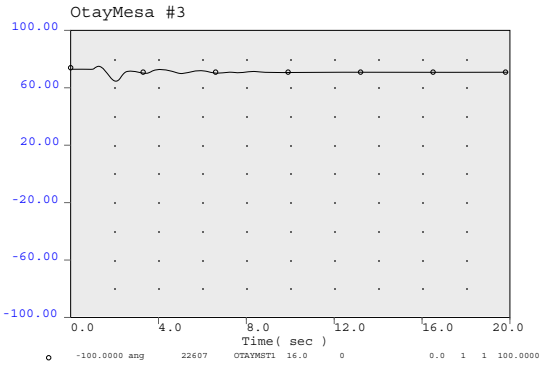
RELATIVE ROTOR ANGLE & FREQUENCY

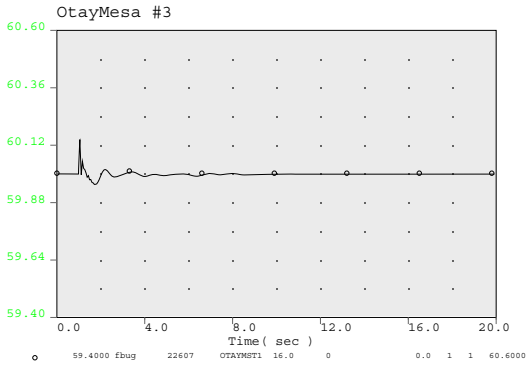










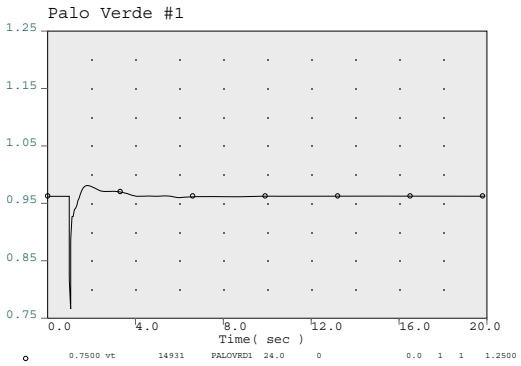


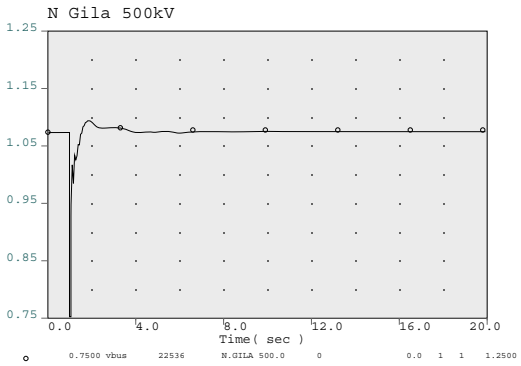
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

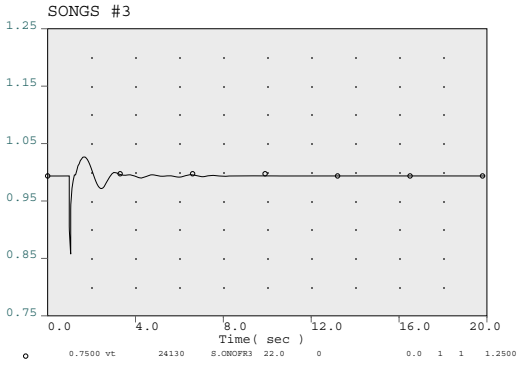
Page 1

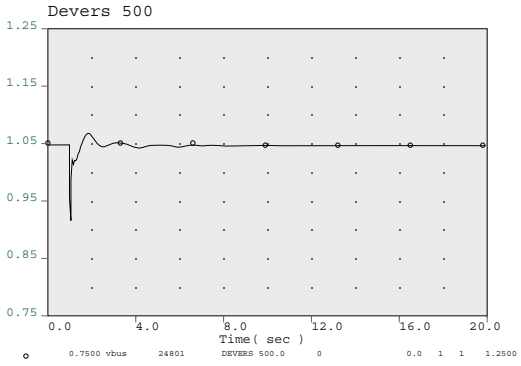
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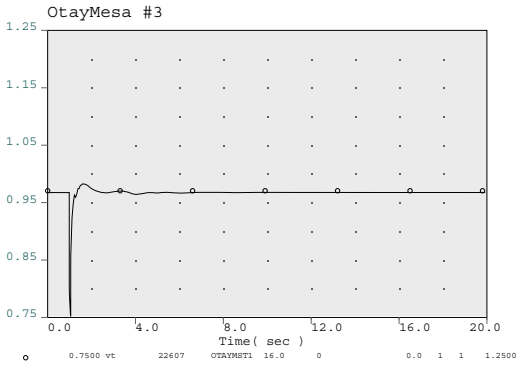
RELATIVE VOLTAGE

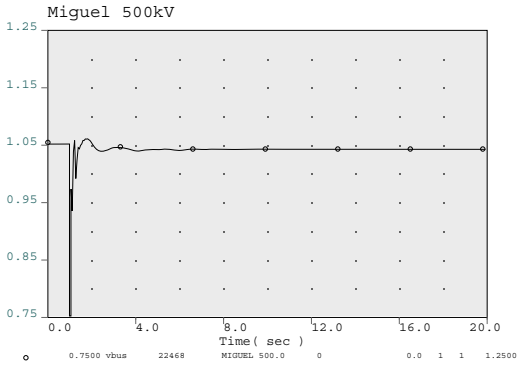








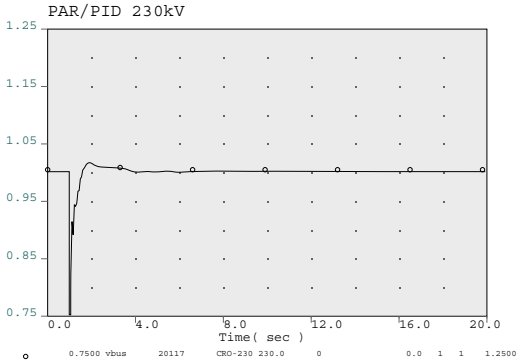




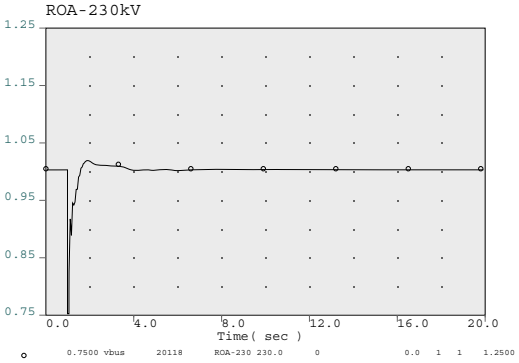
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

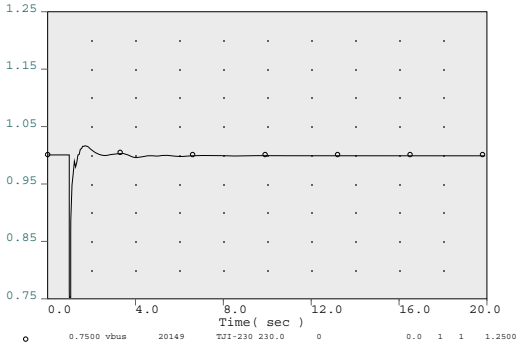
PAR/PID 230kV



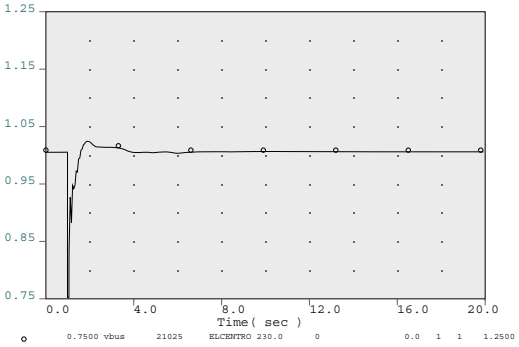
ROA-230kV



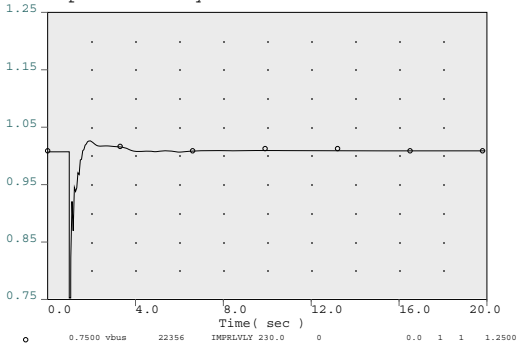
TJ1-230kV



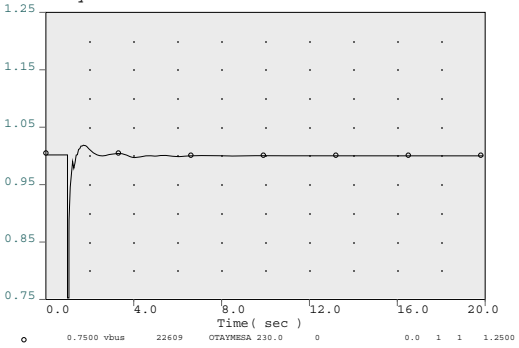
El Centro



Imperial Valley 230kV

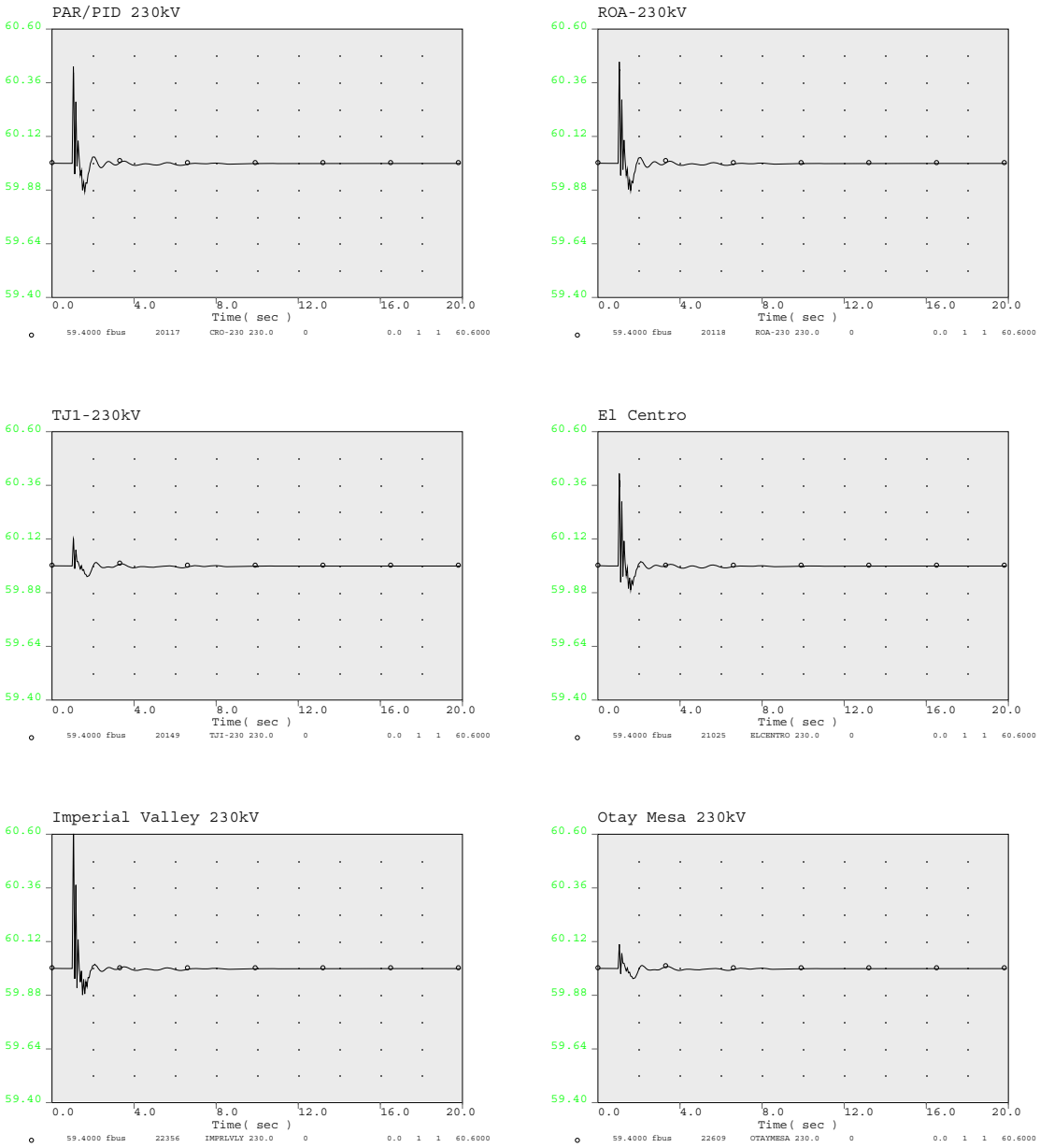


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

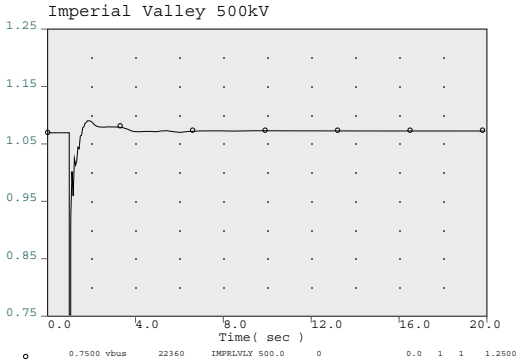
Affected System Frequency Check and Comparison



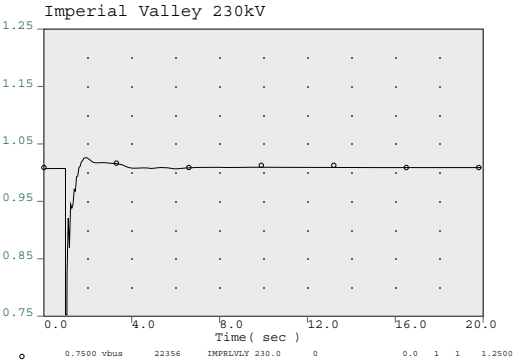
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

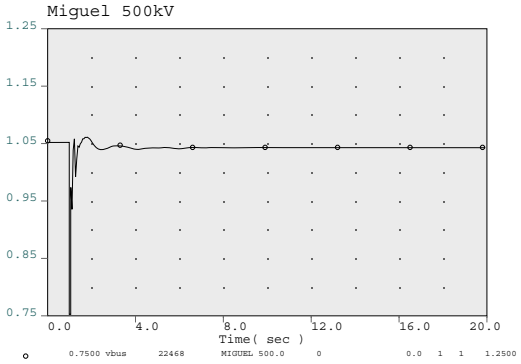
Imperial Valley 500kV



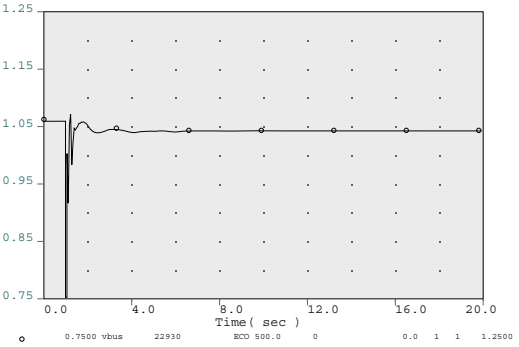
Imperial Valley 230kV



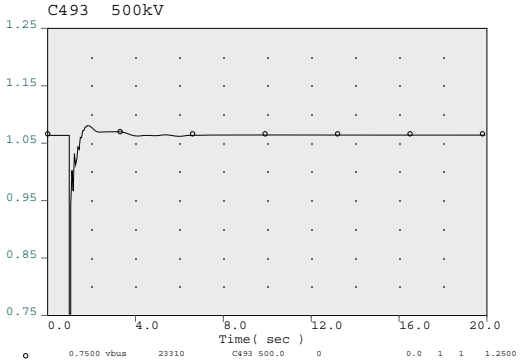
Miguel 500kV



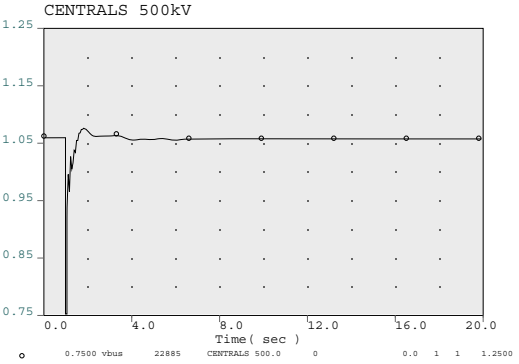
Windfarms 500



C493 500kV

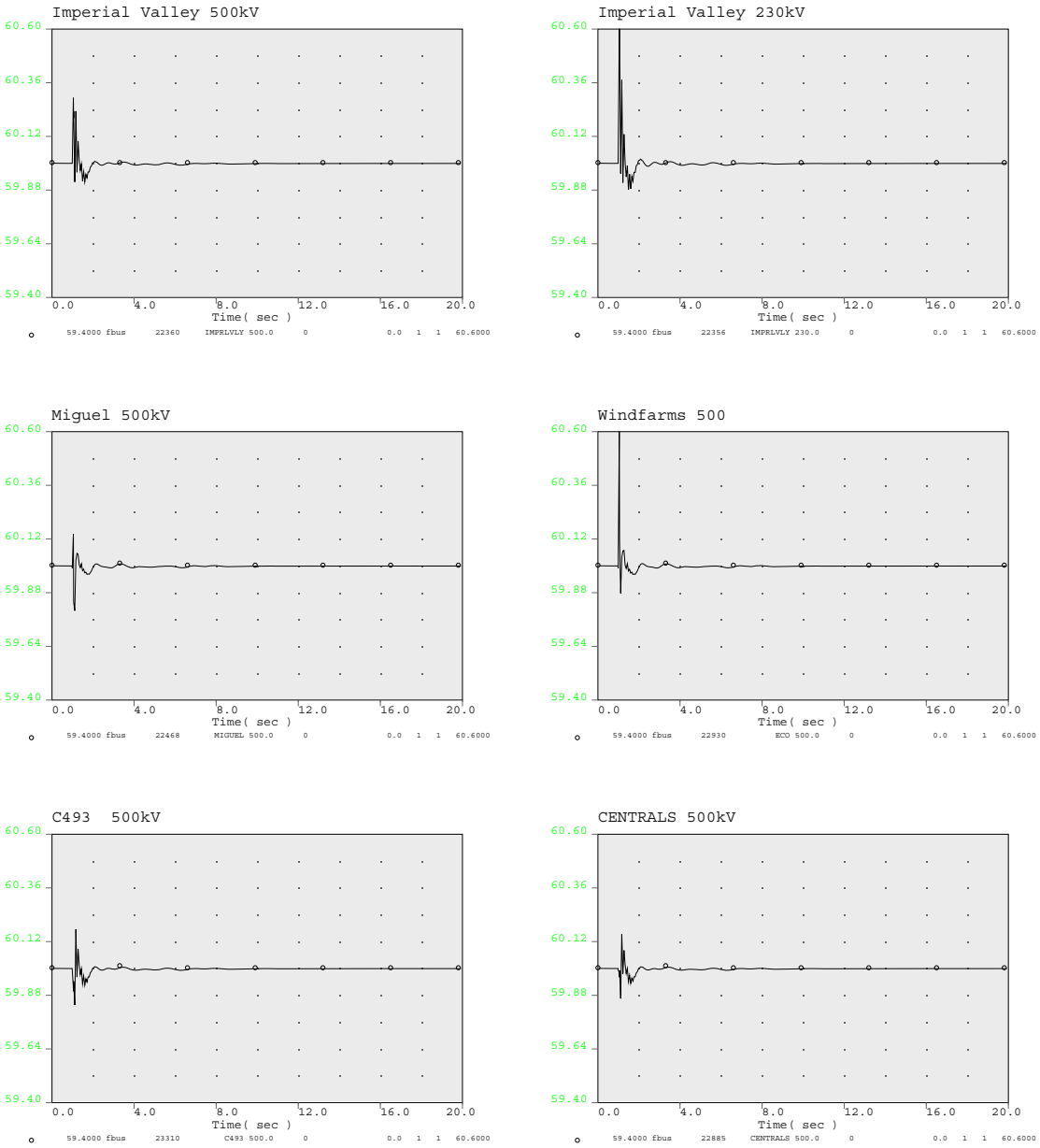


CENTRALS 500kV



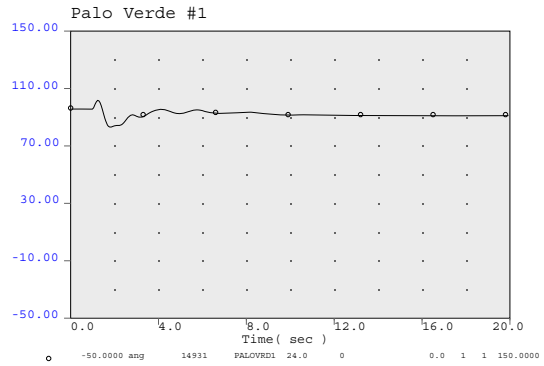
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

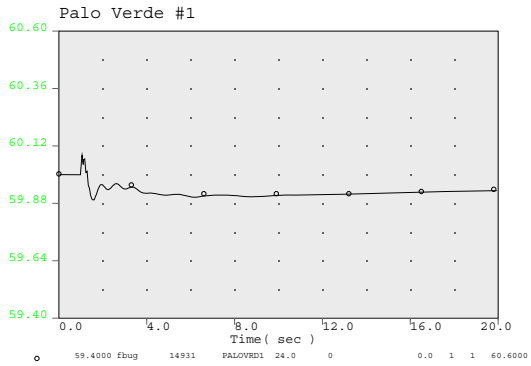
Imperial Valley Area - Frequency

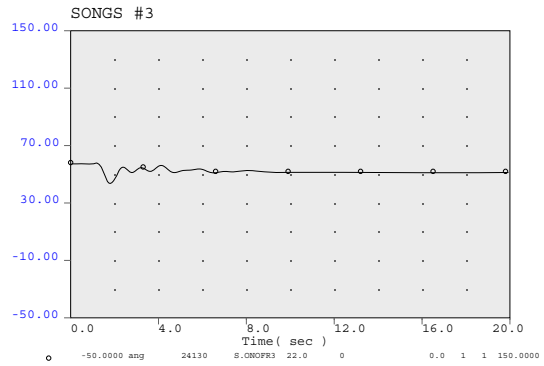


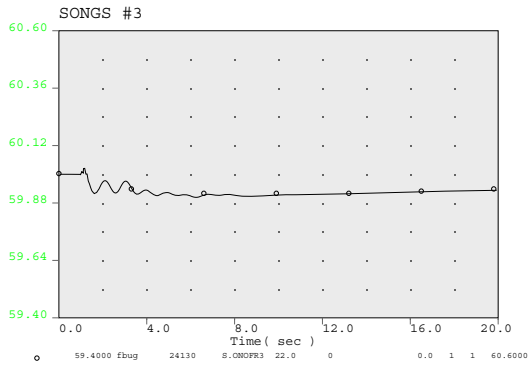
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

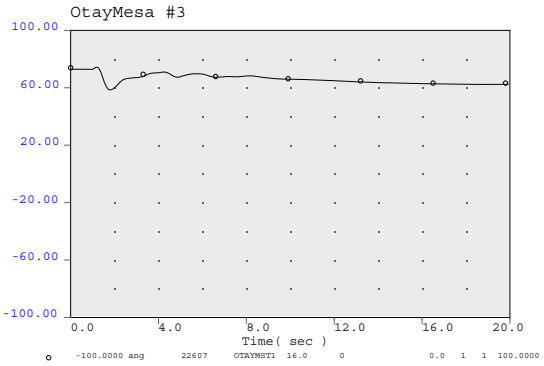
RELATIVE ROTOR ANGLE & FREQUENCY

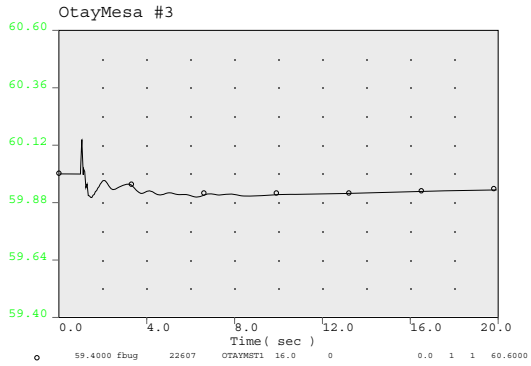












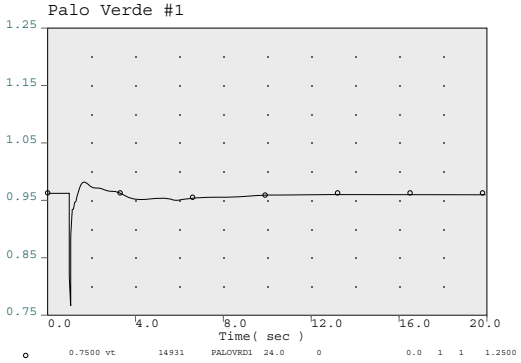
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

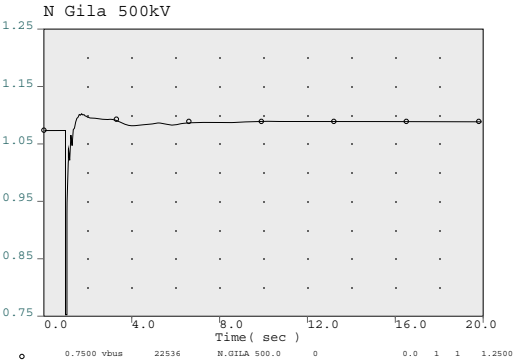
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RELATIVE VOLTAGE

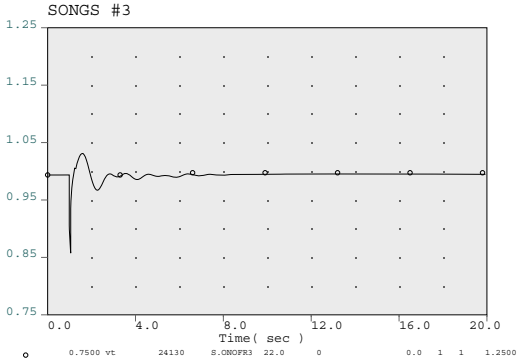
Palo Verde #1



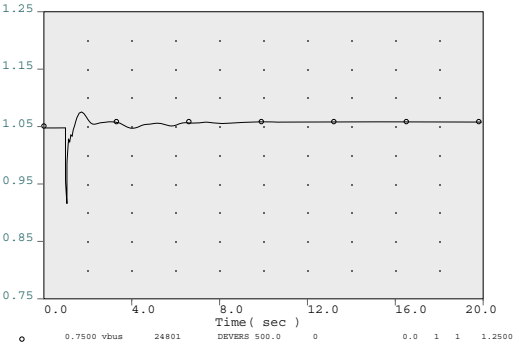
N Gila 500kV



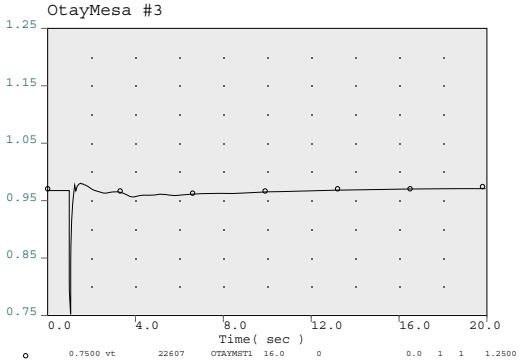
SONGS #3



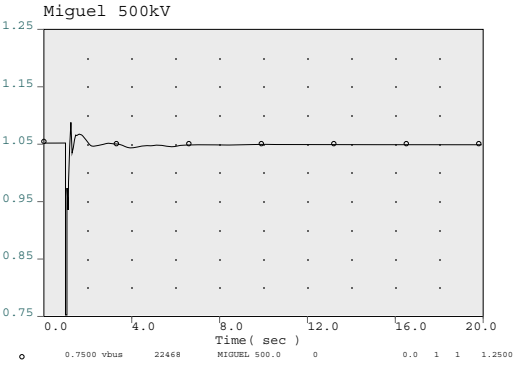
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OtayMesa #3



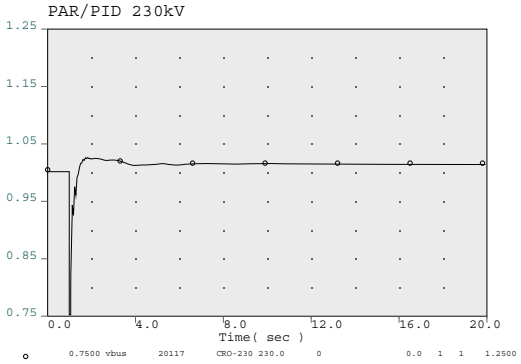
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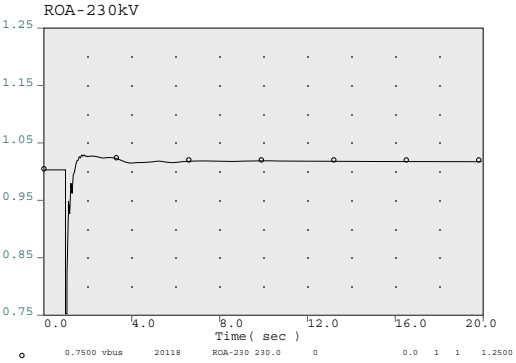
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

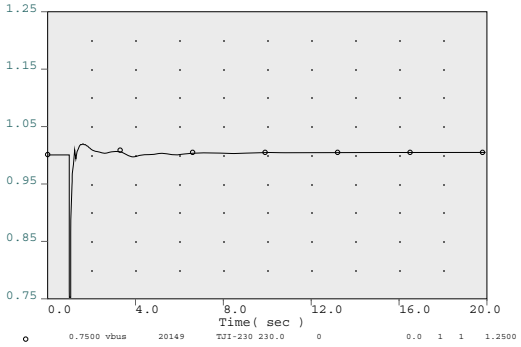
PAR/PID 230kV



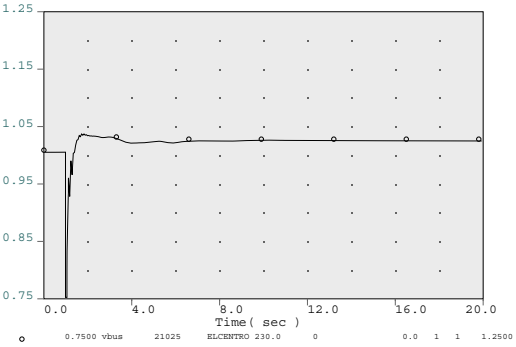
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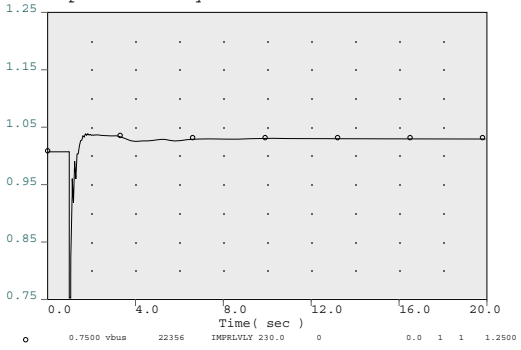
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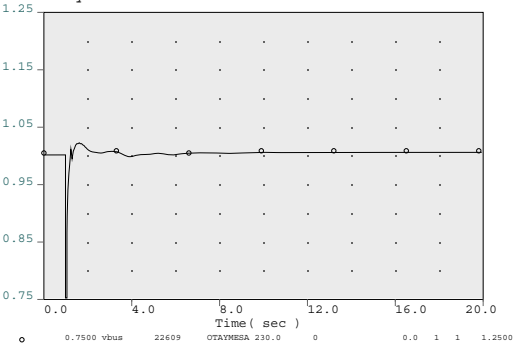
El Centro



Imperial Valley 230kV



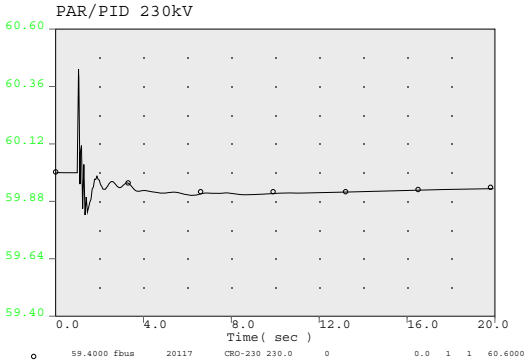
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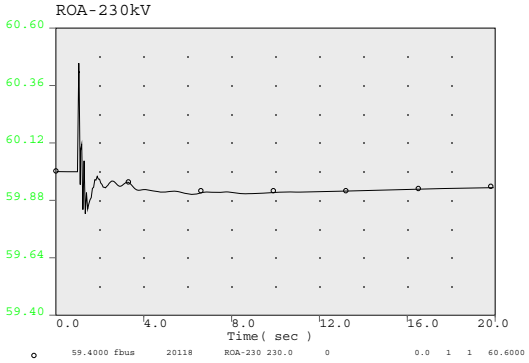
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

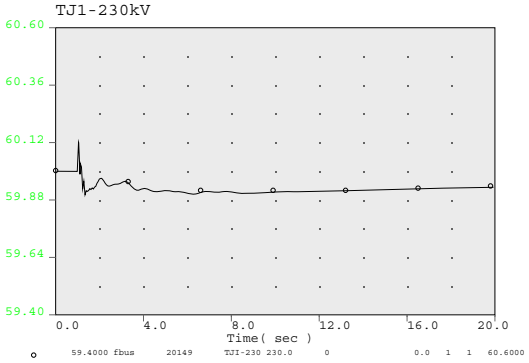
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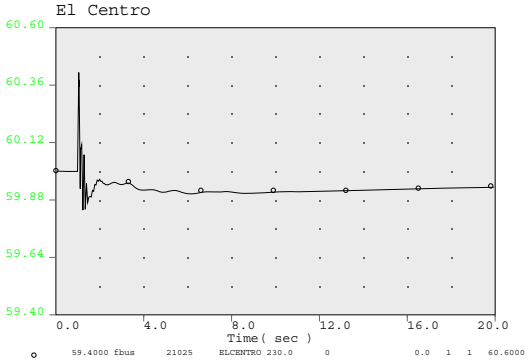
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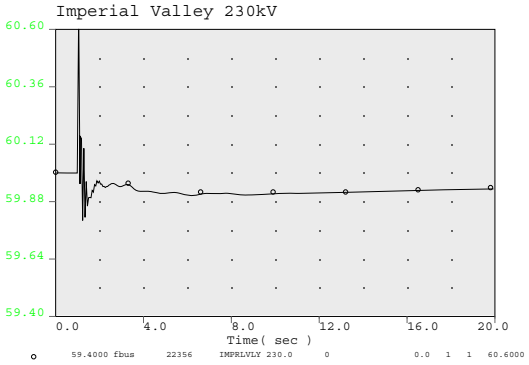
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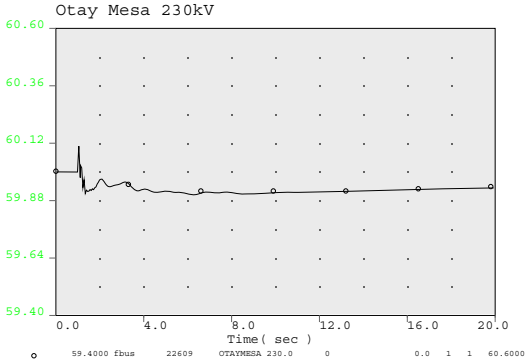
El Centro



Imperial Valley 230kV



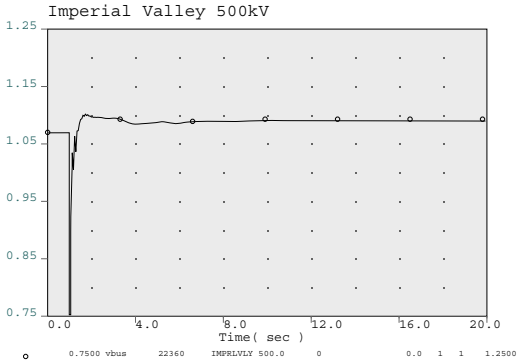
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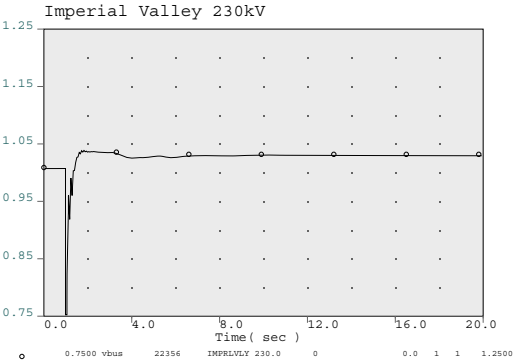
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

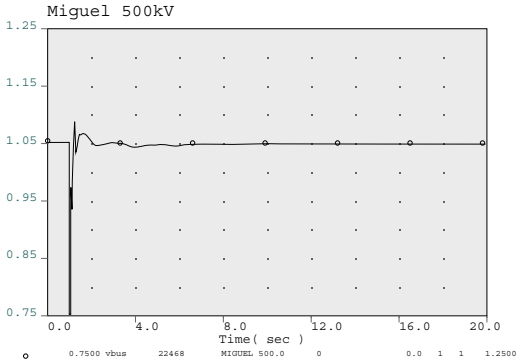
Imperial Valley 500kV



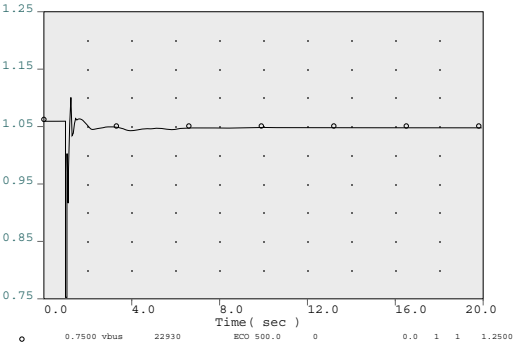
Imperial Valley 230kV



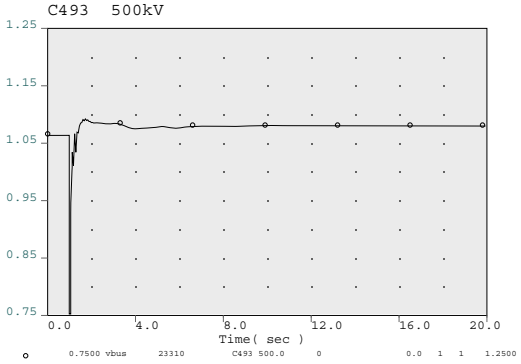
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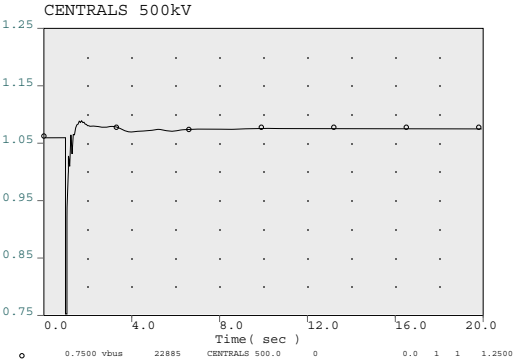
Windfarms 500



C493 500kV

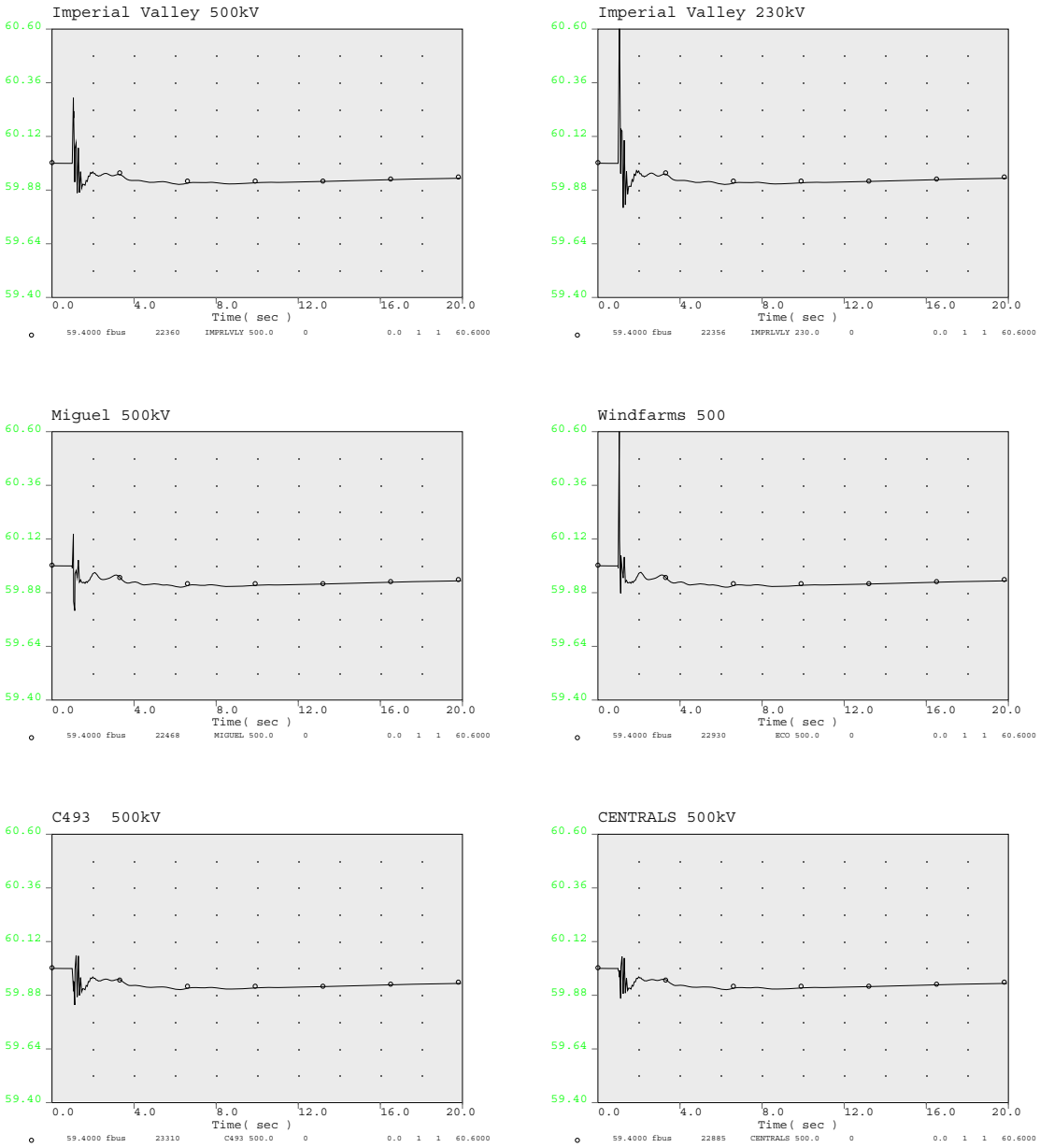


CENTRALS 500kV



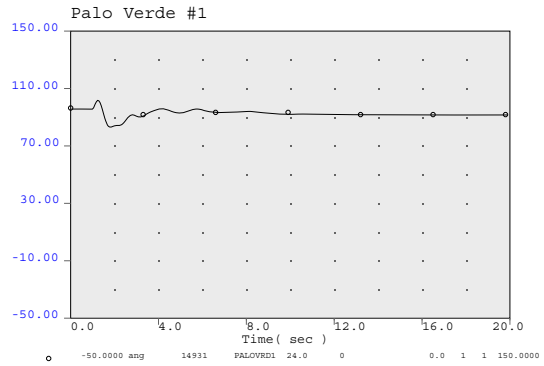
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

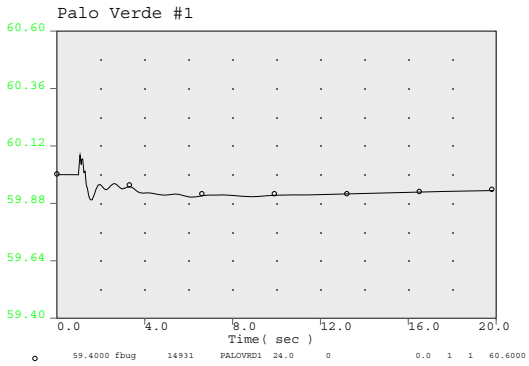
Imperial Valley Area - Frequency

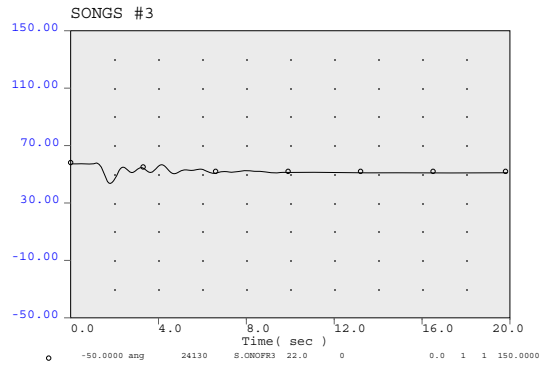


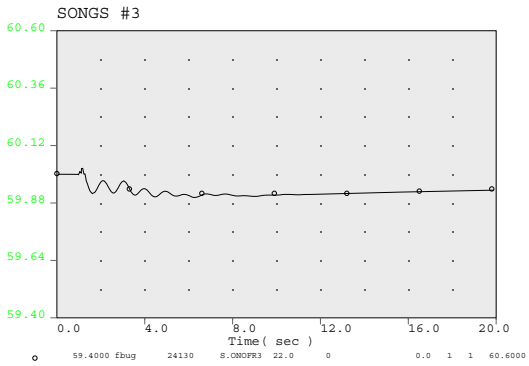
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

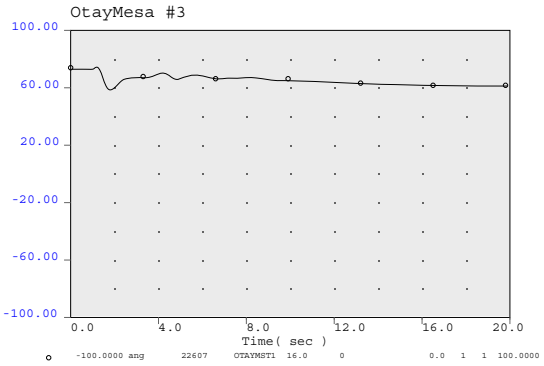
RELATIVE ROTOR ANGLE & FREQUENCY

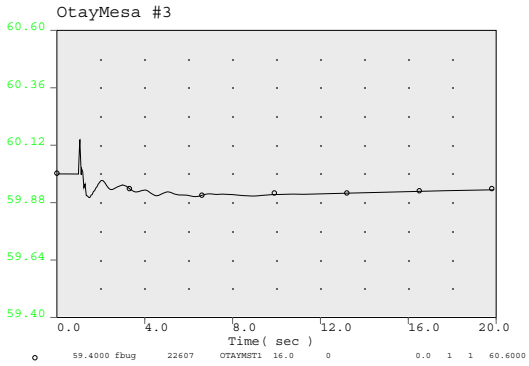










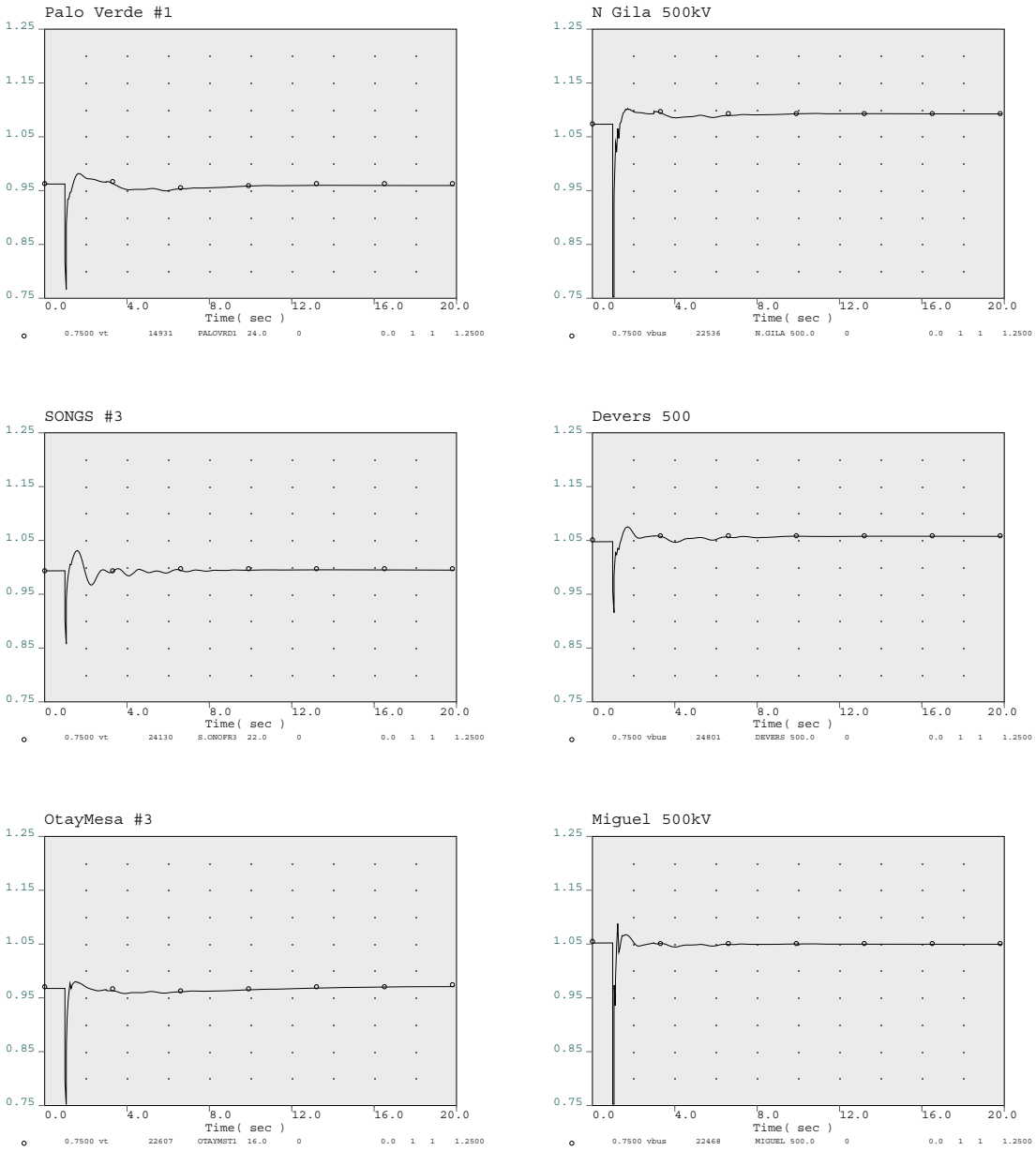


SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Page 1

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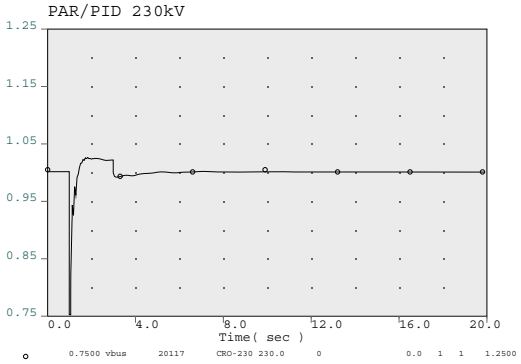
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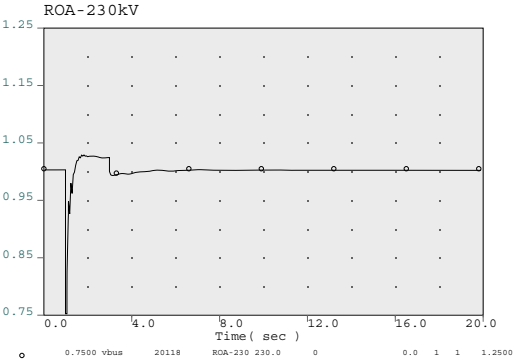
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2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

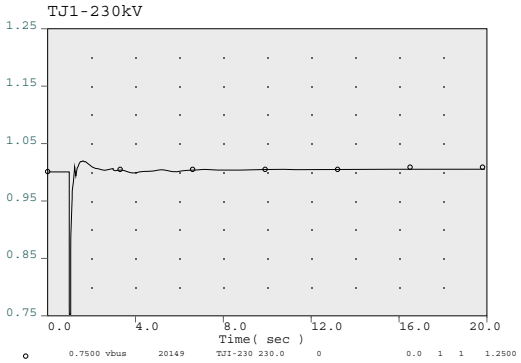
PAR/PID 230kV



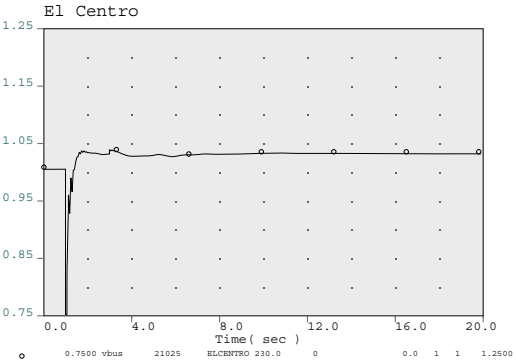
ROA-230kV



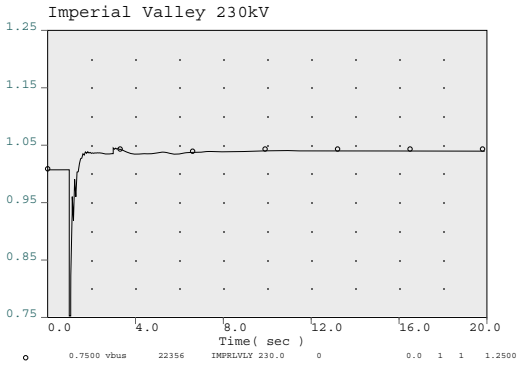
TJ1-230kV



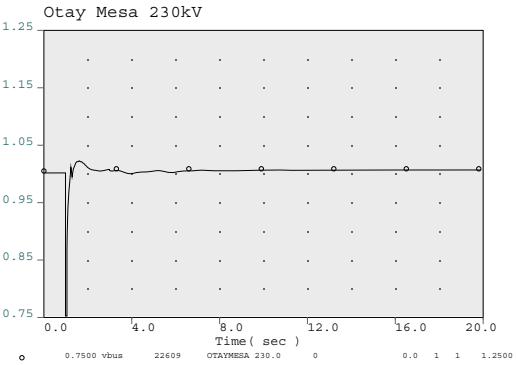
El Centro



Imperial Valley 230kV



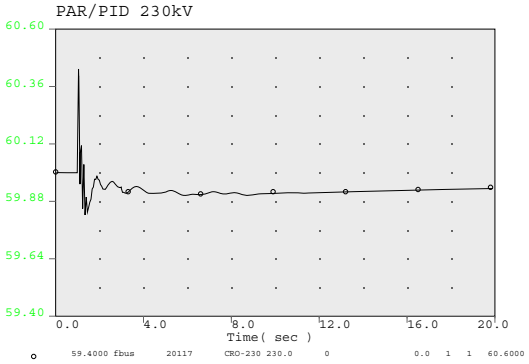
Otay Mesa 230kV



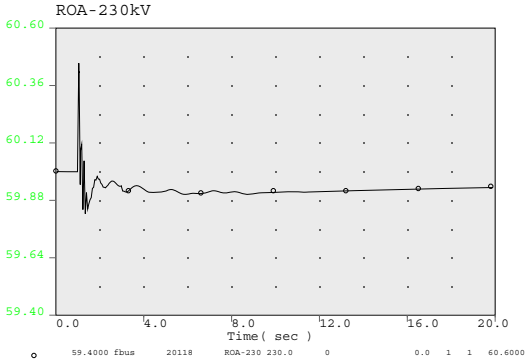
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

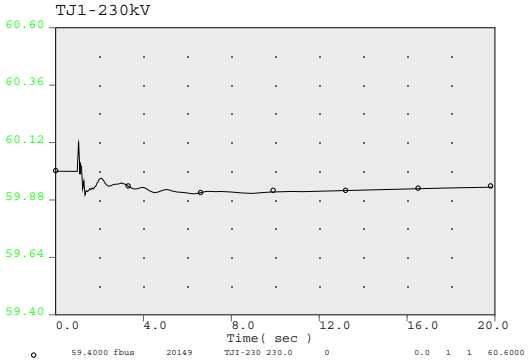
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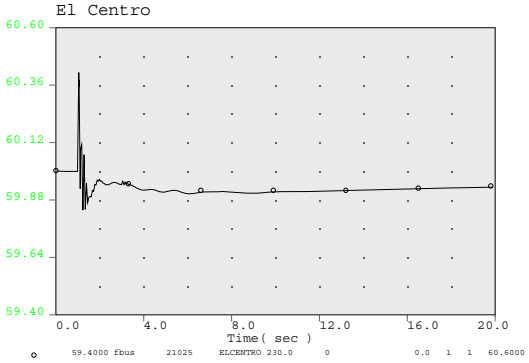
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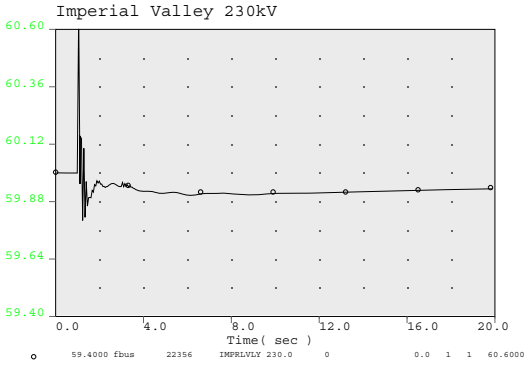
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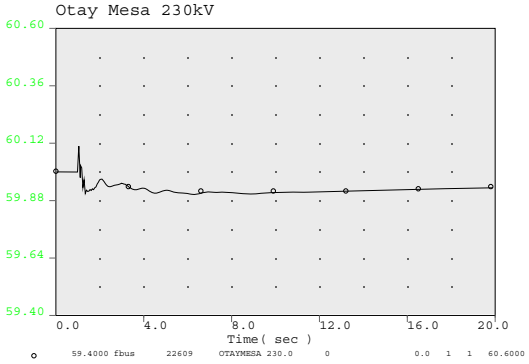
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



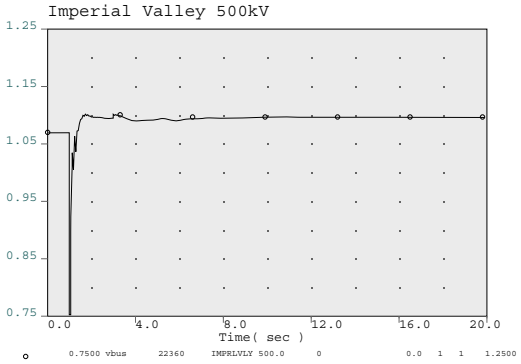
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

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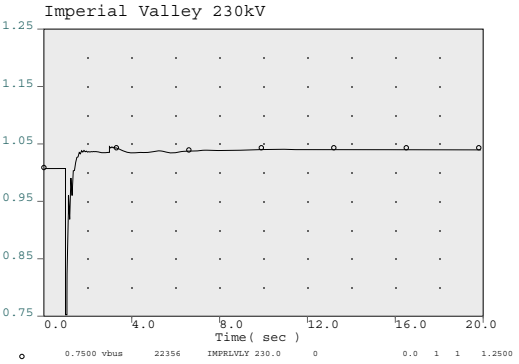
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Imperial Valley Area - VOLTAGE

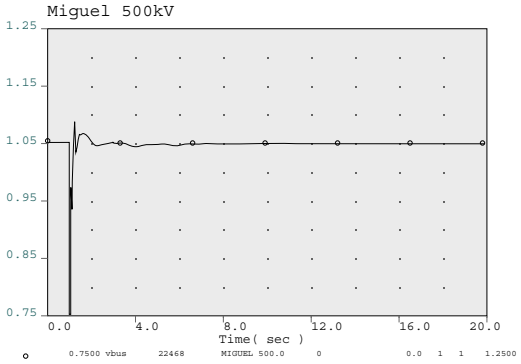
Imperial Valley 500kV



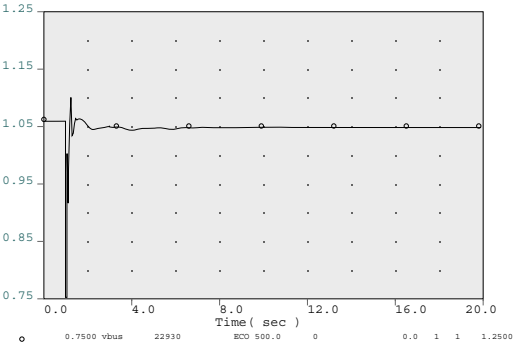
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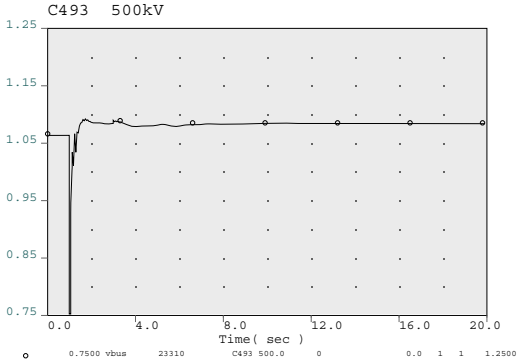
Miguel 500kV



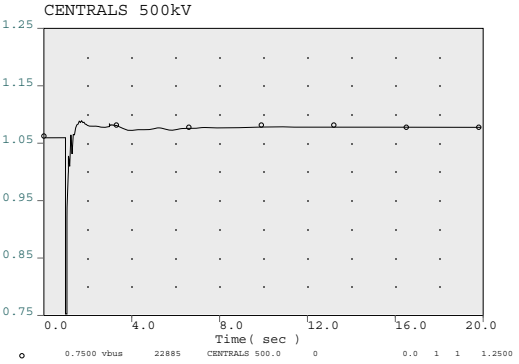
Windfarms 500



C493 500kV

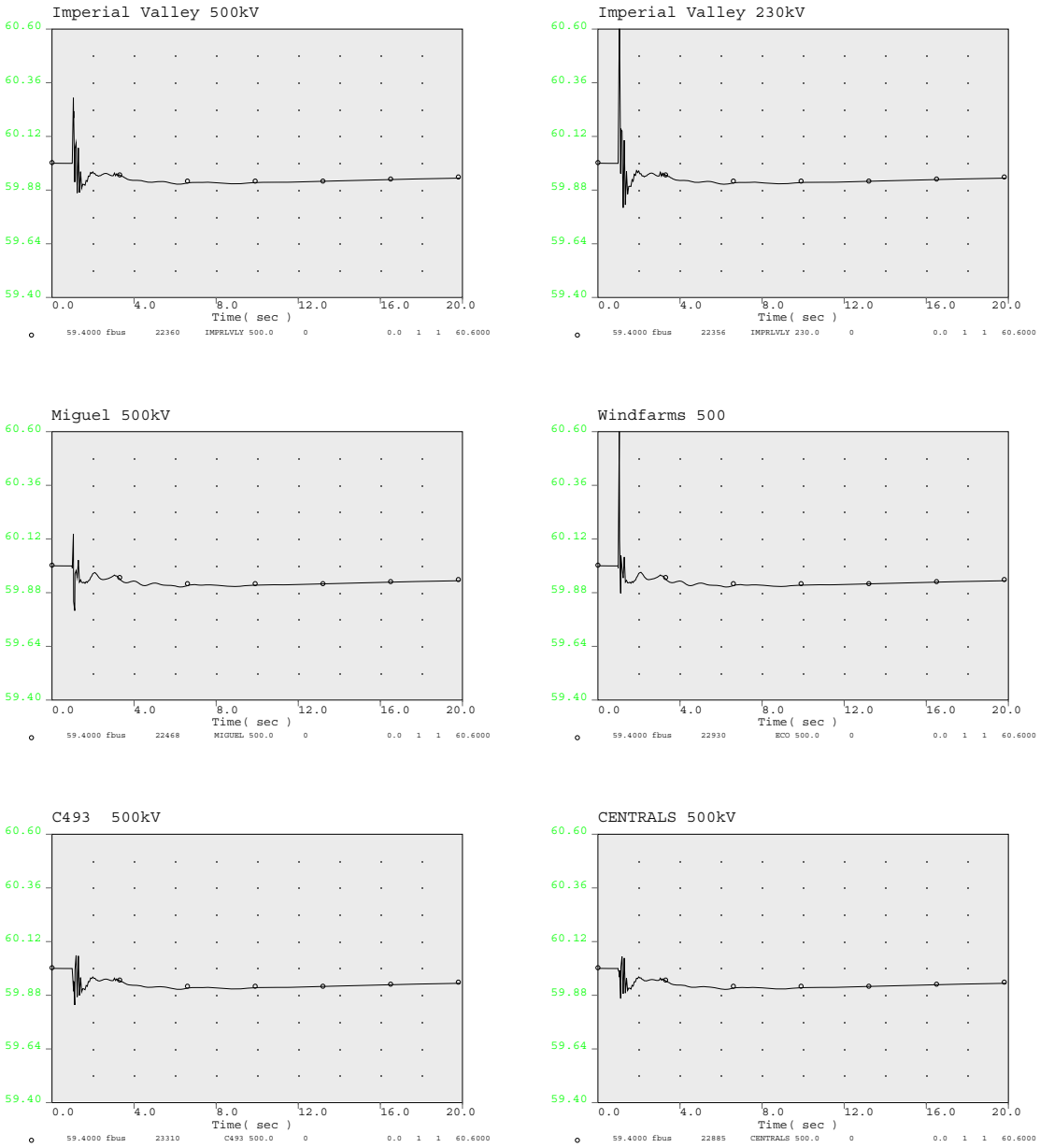


CENTRALS 500kV



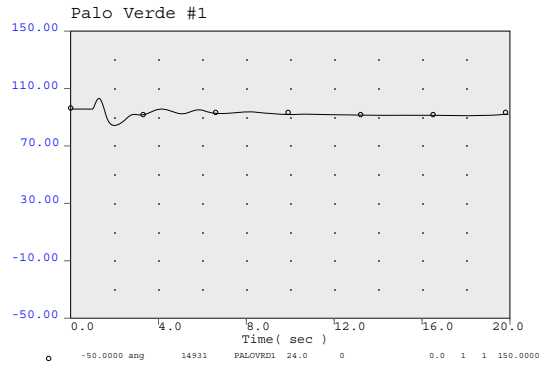
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

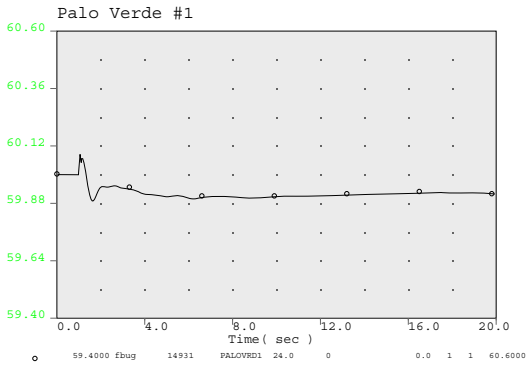
Imperial Valley Area - Frequency

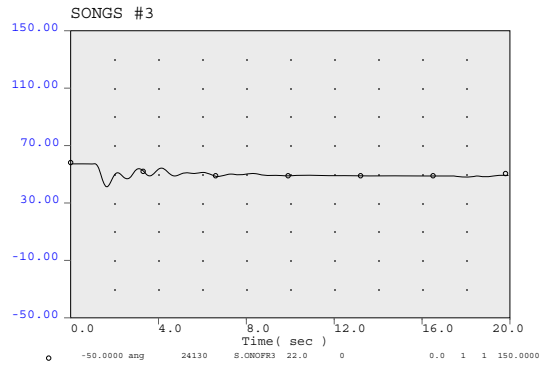


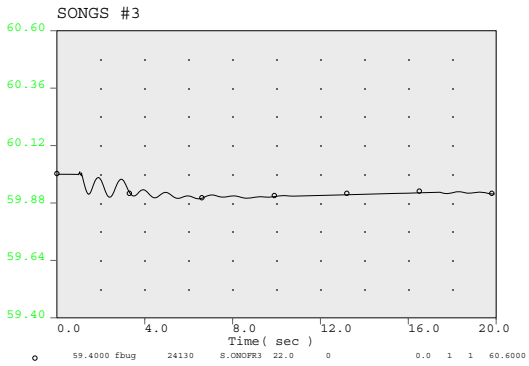
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-ECO 500 kV line1

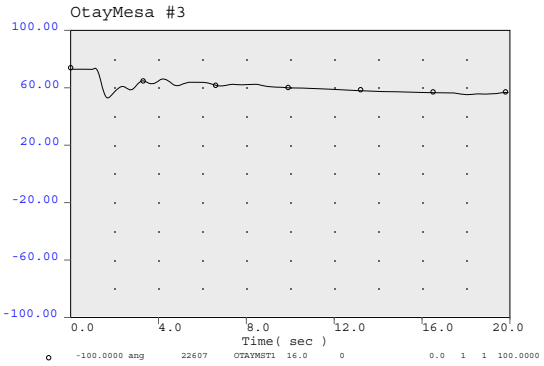
RELATIVE ROTOR ANGLE & FREQUENCY

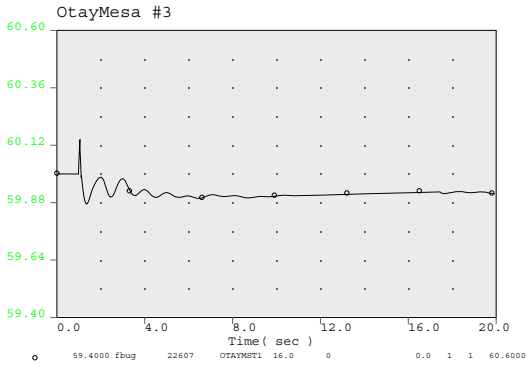










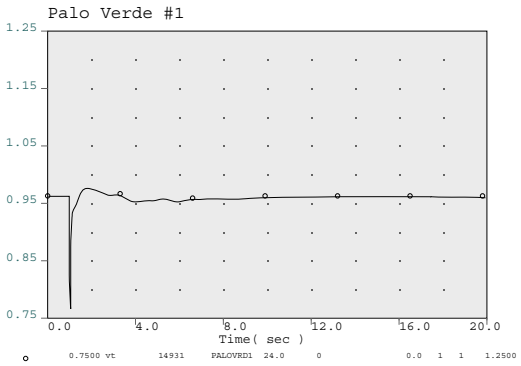


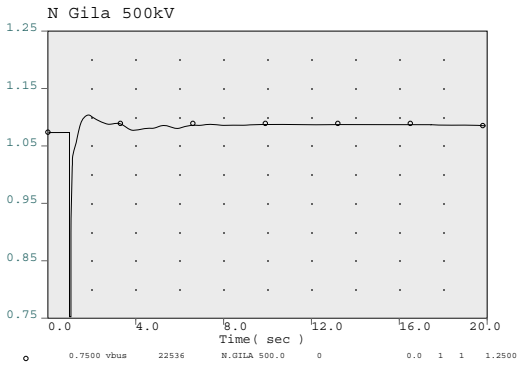
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

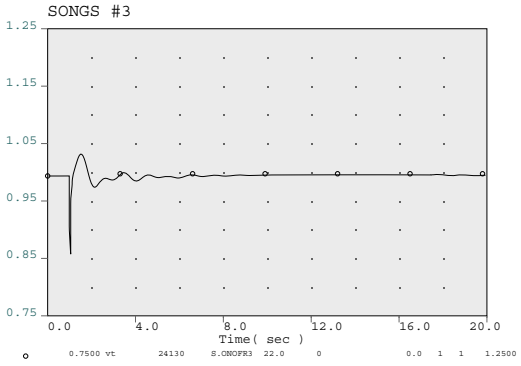
Page 1

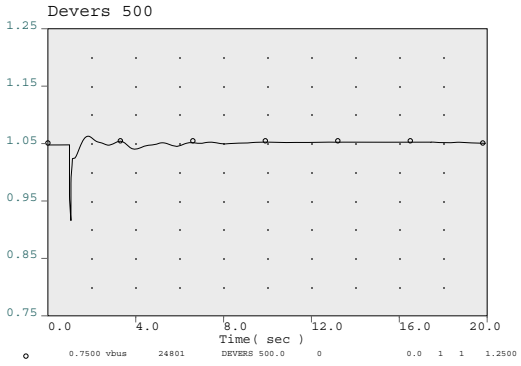
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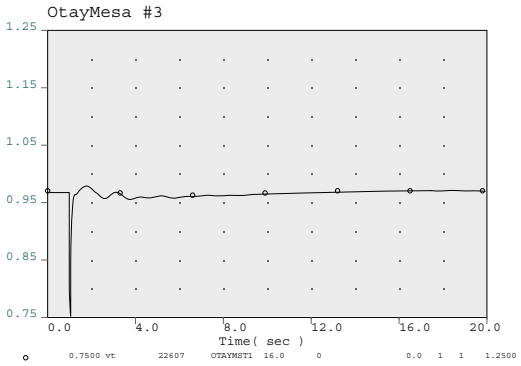
RELATIVE VOLTAGE

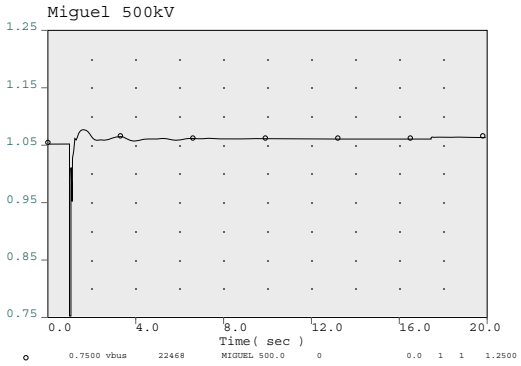








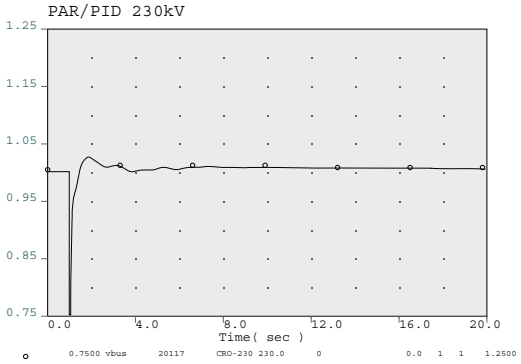




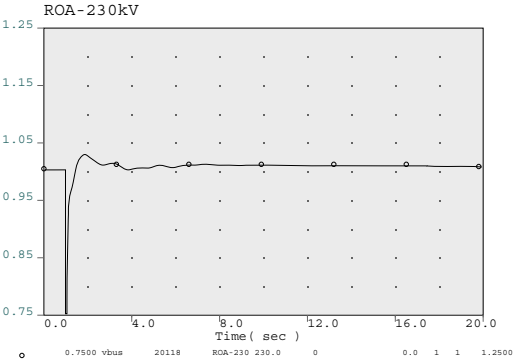
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

Affected System Voltage Check and Comparison

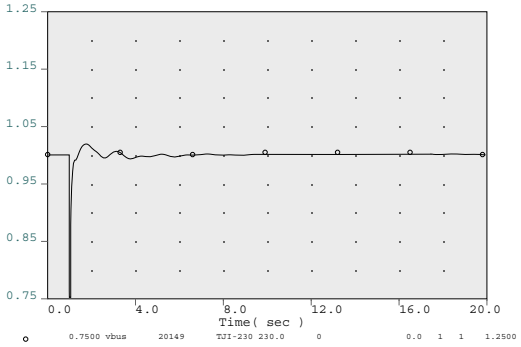
PAR/PID 230kV



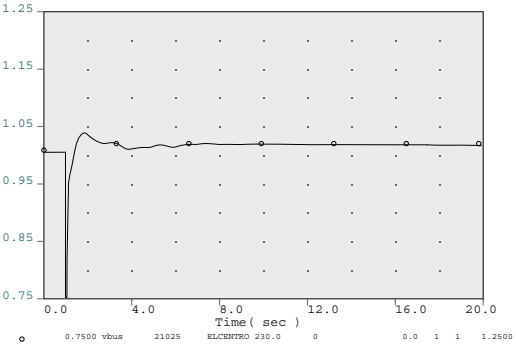
ROA-230kV



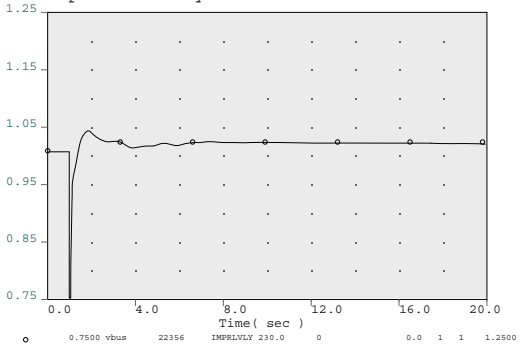
TJ1-230kV



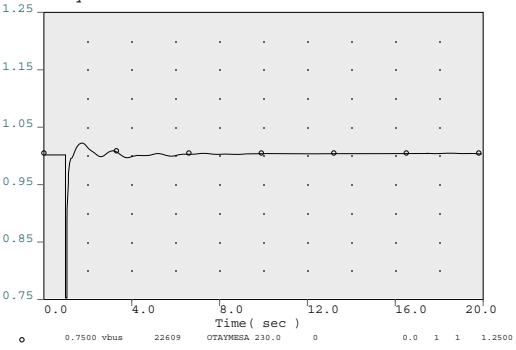
El Centro



Imperial Valley 230kV

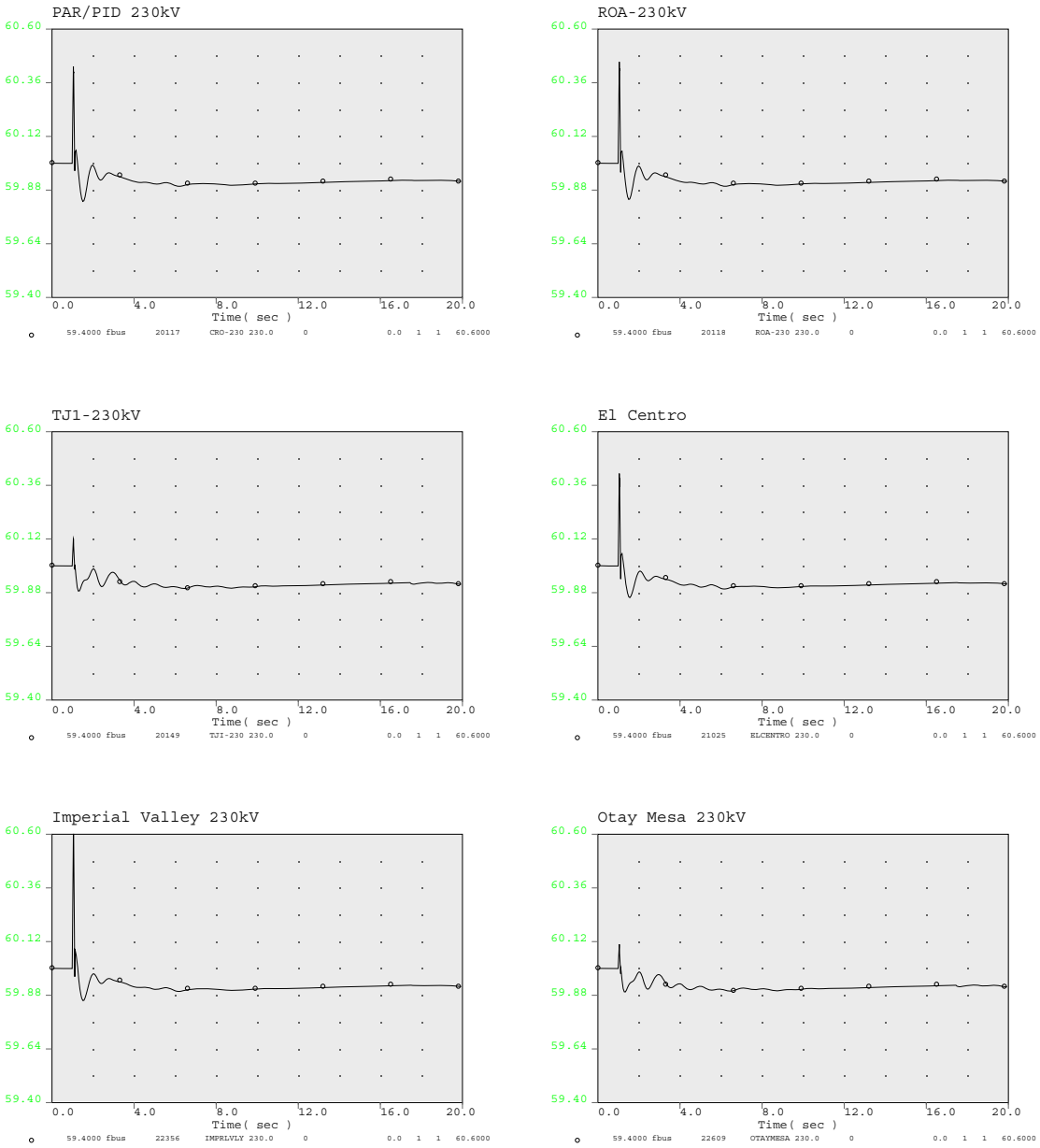


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

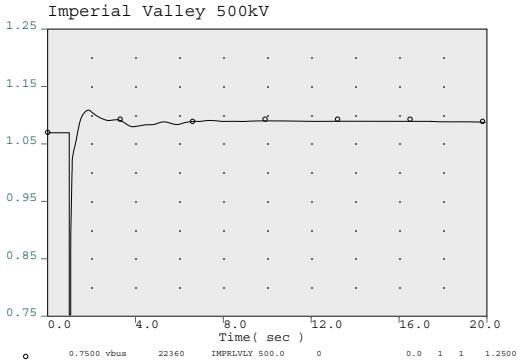
Affected System Frequency Check and Comparison



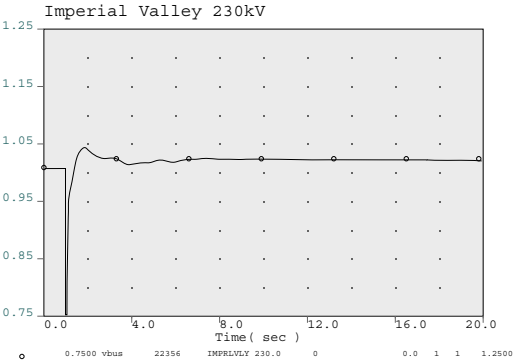
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

Imperial Valley Area - VOLTAGE

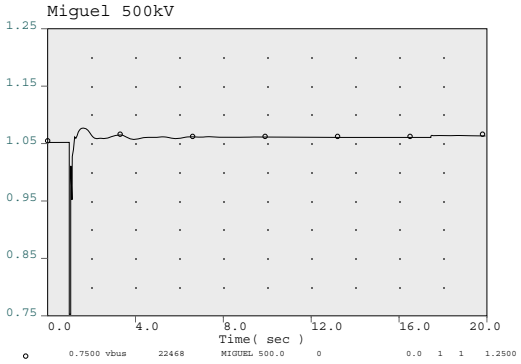
Imperial Valley 500kV



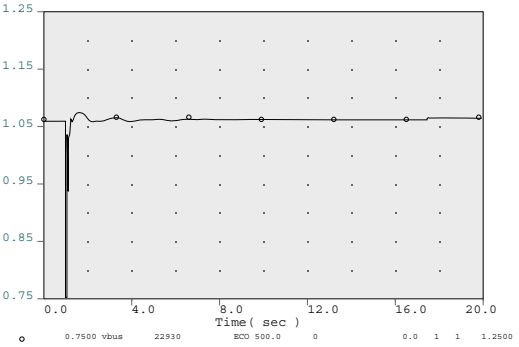
Imperial Valley 230kV



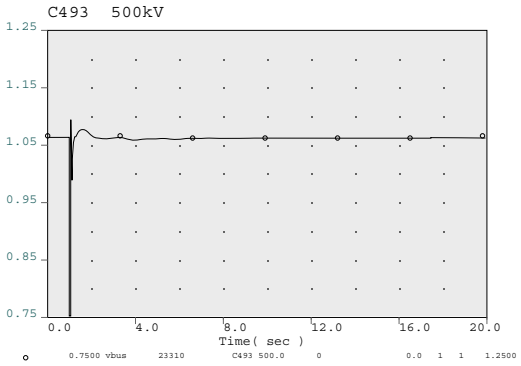
Miguel 500kV



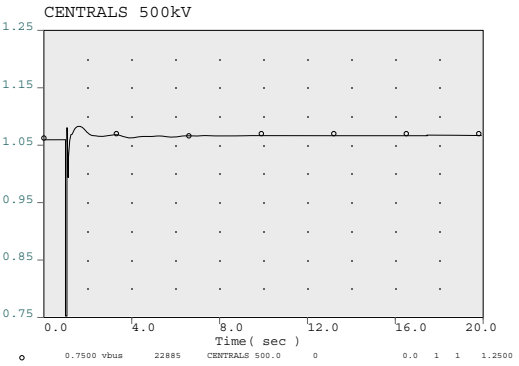
Windfarms 500



C493 500kV

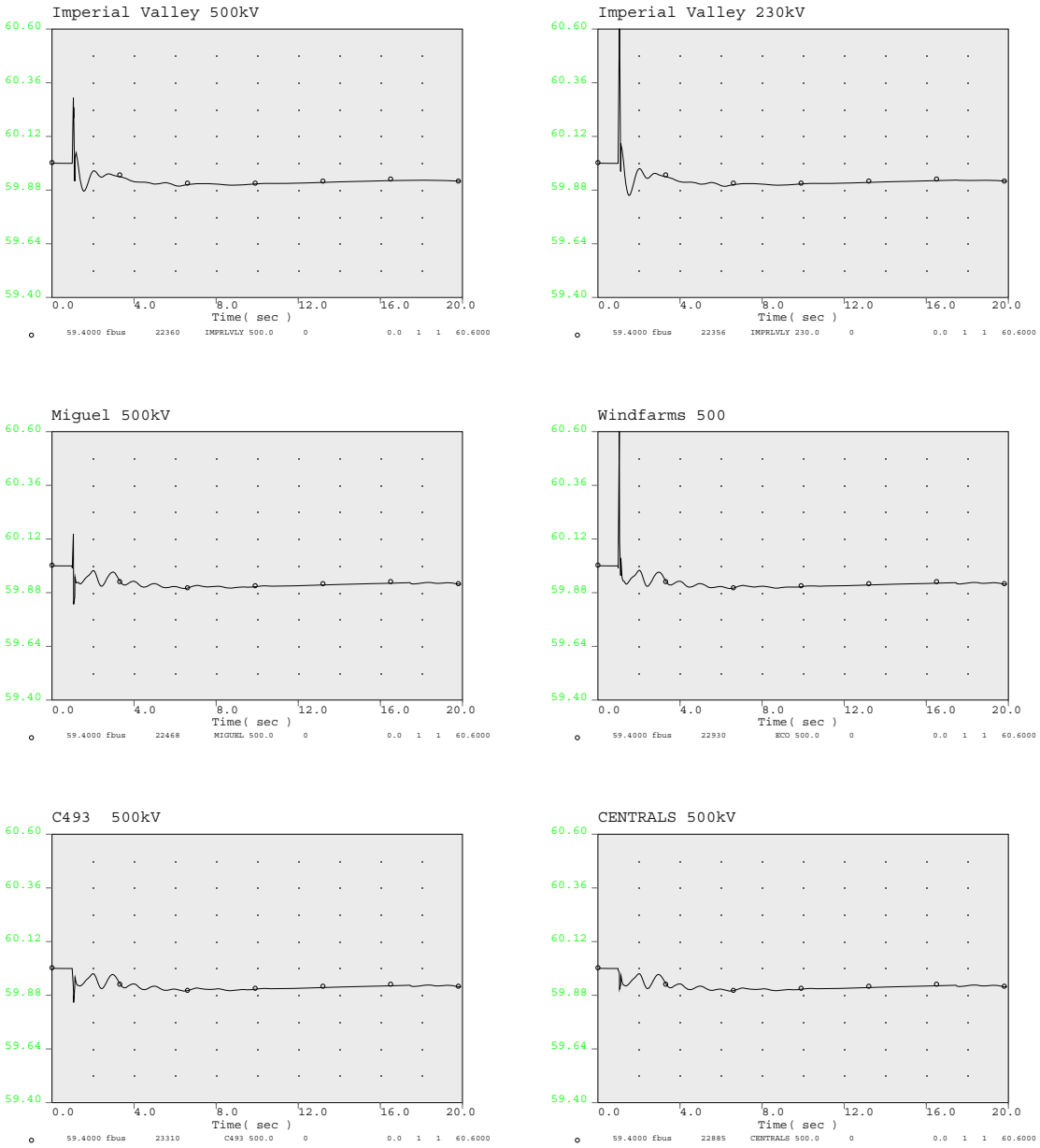


CENTRALS 500kV



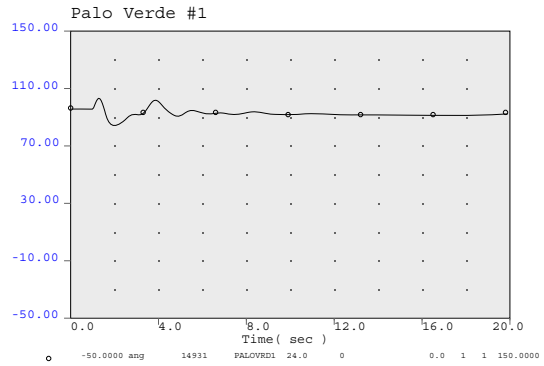
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

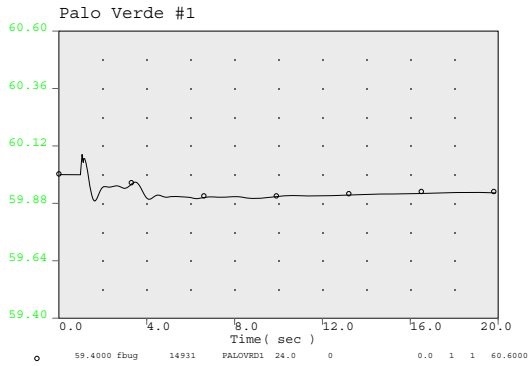
Imperial Valley Area - Frequency

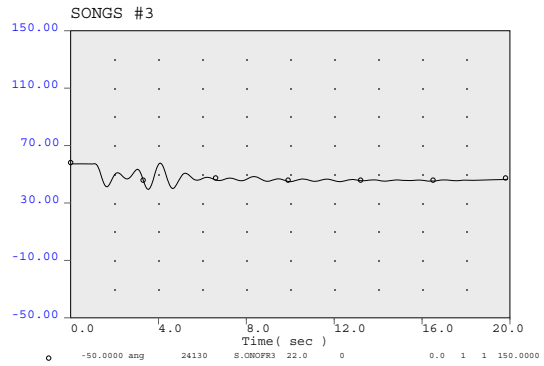


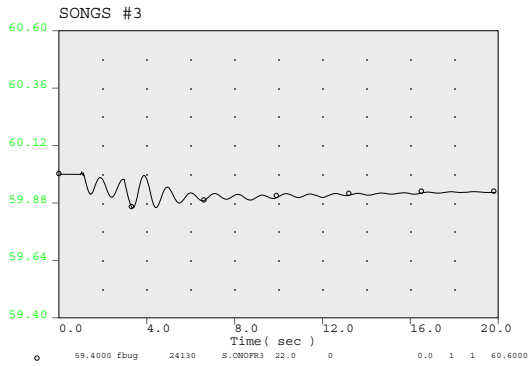
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage

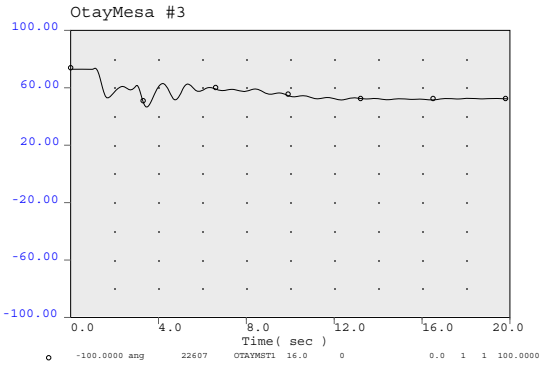
RELATIVE ROTOR ANGLE & FREQUENCY

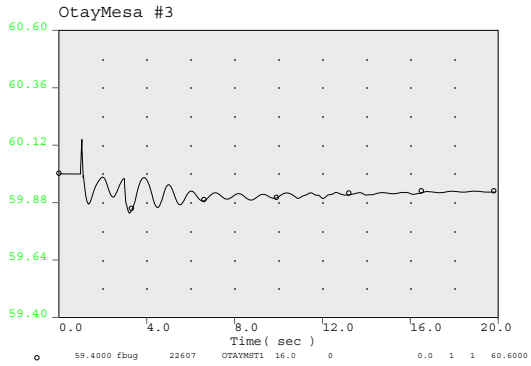












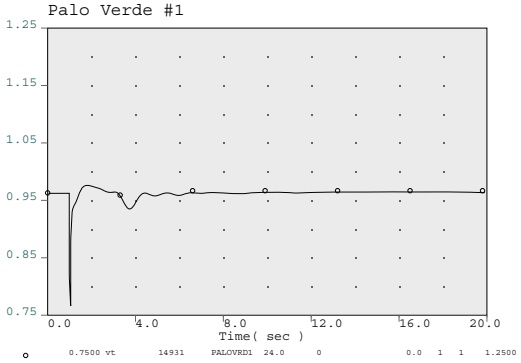
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Page 1

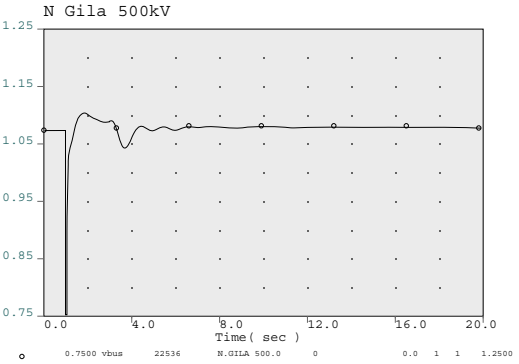
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RELATIVE VOLTAGE

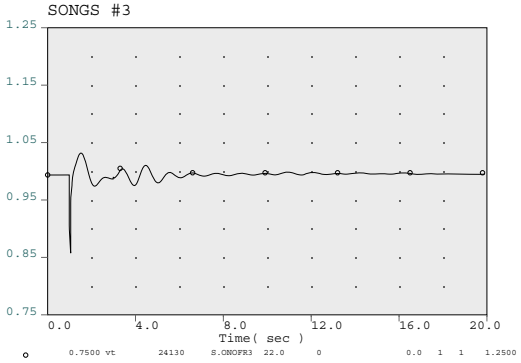
Palo Verde #1



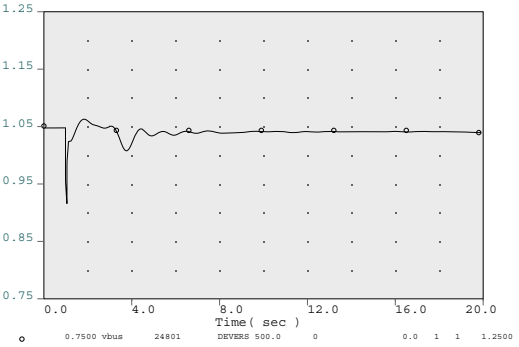
N Gila 500kV



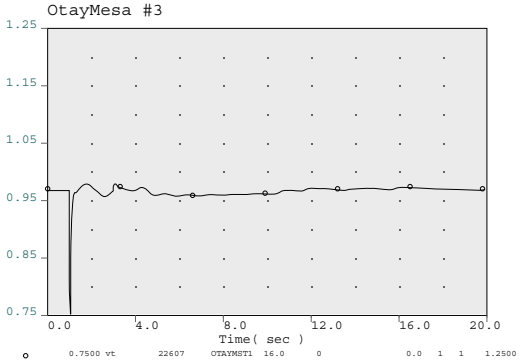
SONGS #3



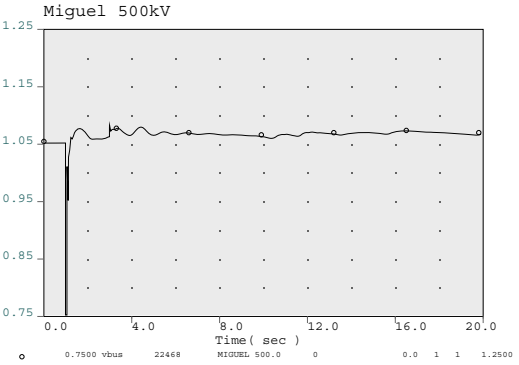
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OtayMesa #3



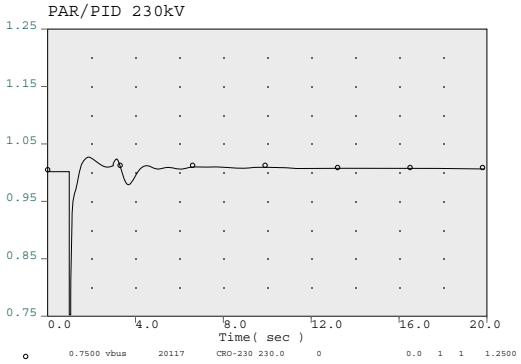
Miguel 500kV



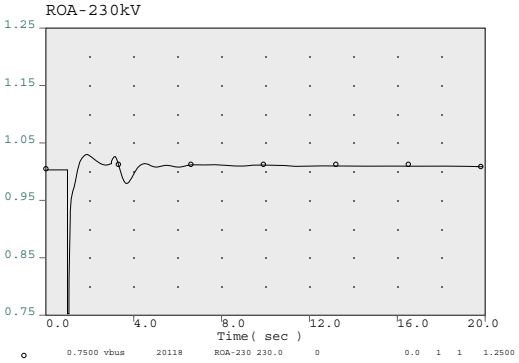
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Voltage Check and Comparison

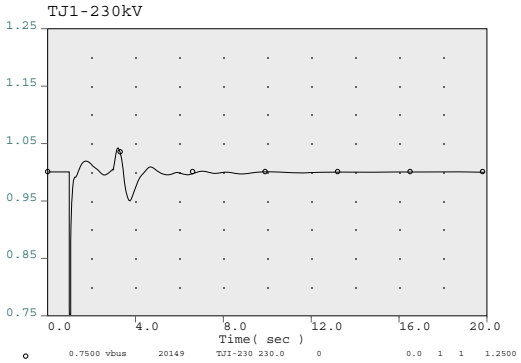
PAR/PID 230kV



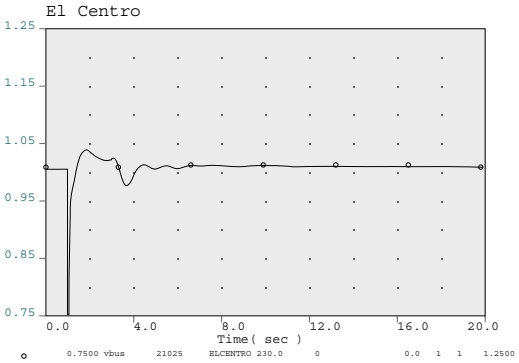
ROA-230kV



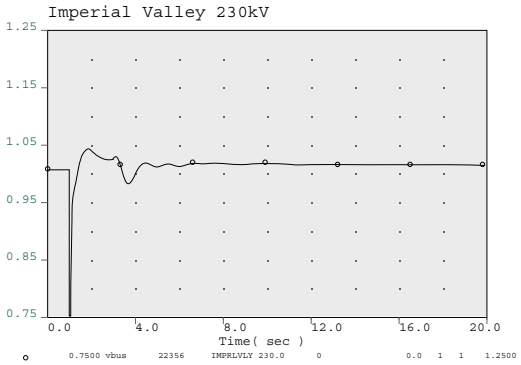
TJ1-230kV



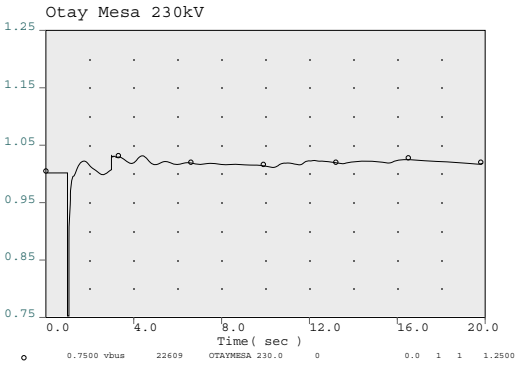
El Centro



Imperial Valley 230kV

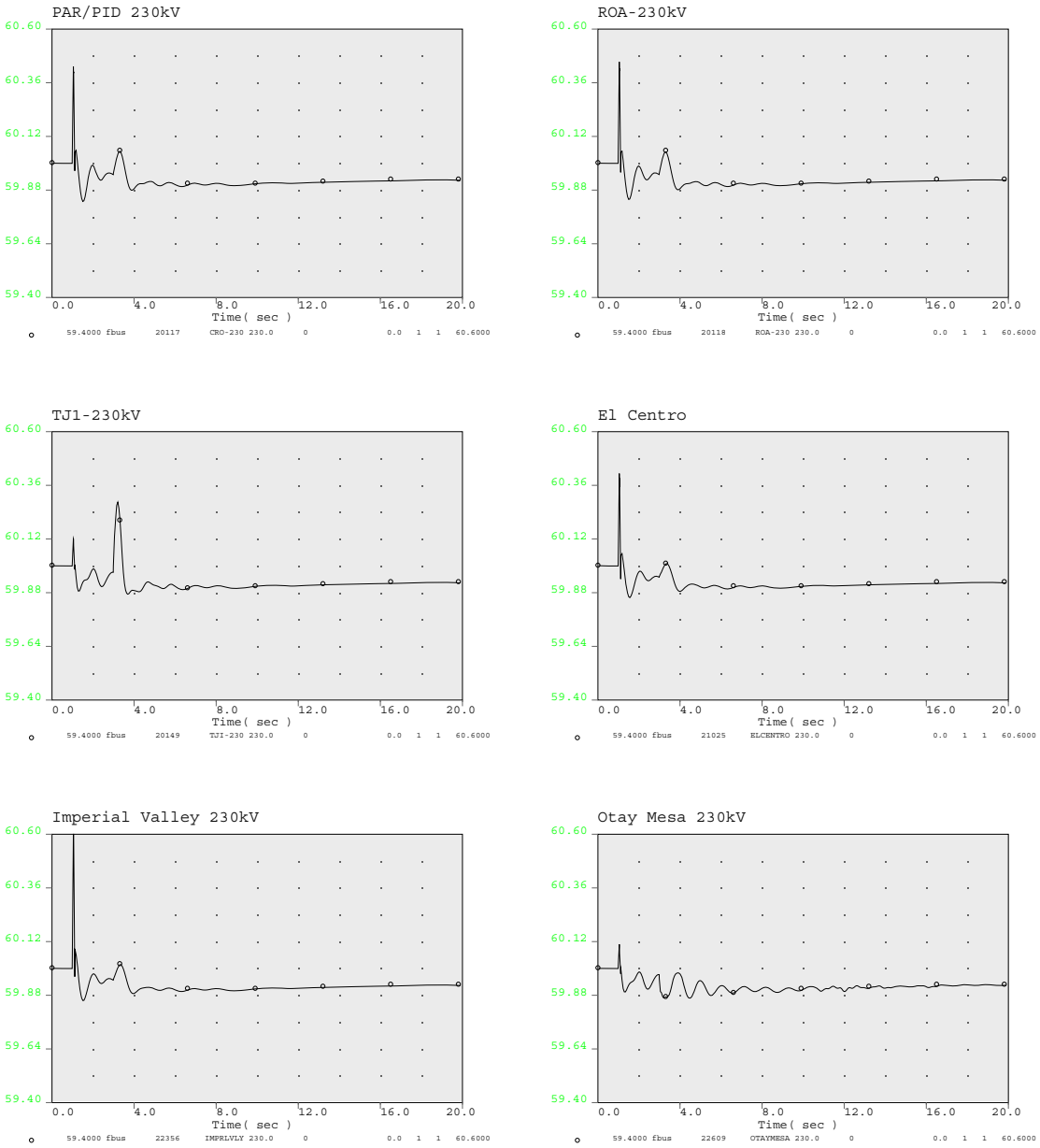


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Frequency Check and Comparison



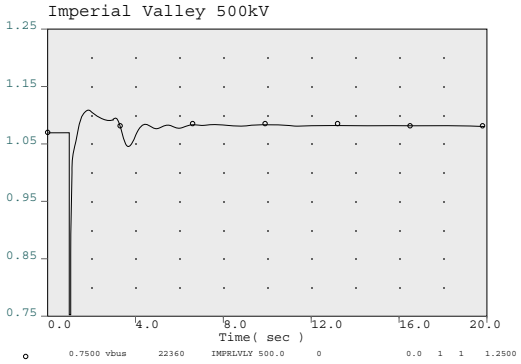
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Page 4

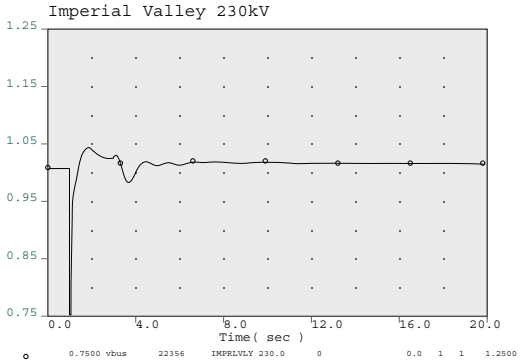
SDGE	IV_Wnd_dlo_RxR_pst_ll_bu.chf	2_p_i\ll\pst_bu\ws_pst_bu Tue Nov 02 07:27:44 2010

Imperial Valley Area - VOLTAGE

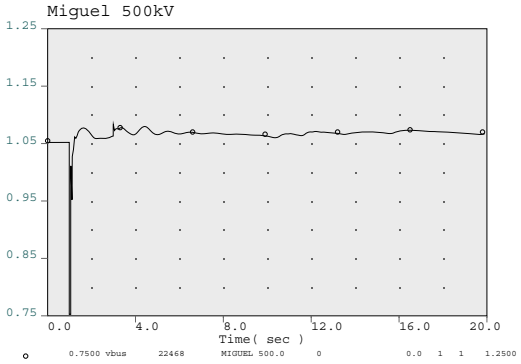
Imperial Valley 500kV



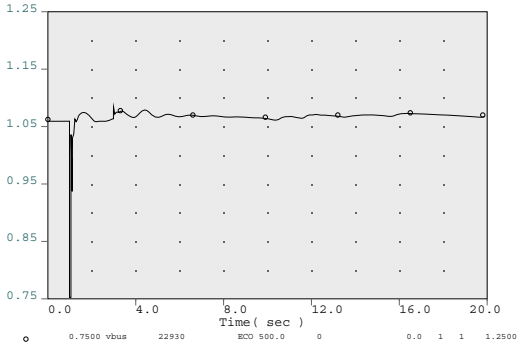
Imperial Valley 230kV



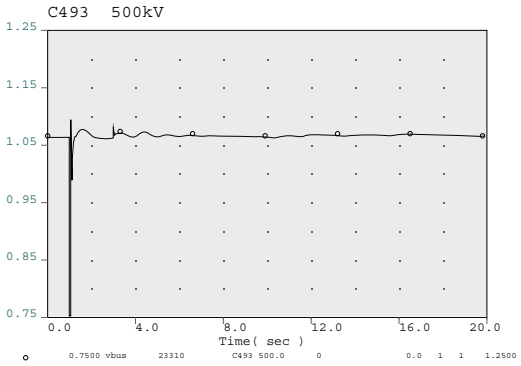
Miguel 500kV



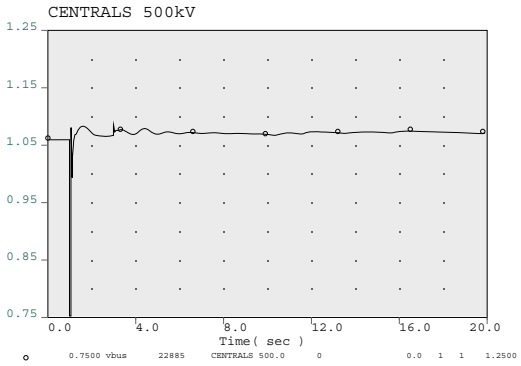
Windfarms 500



C493 500kV

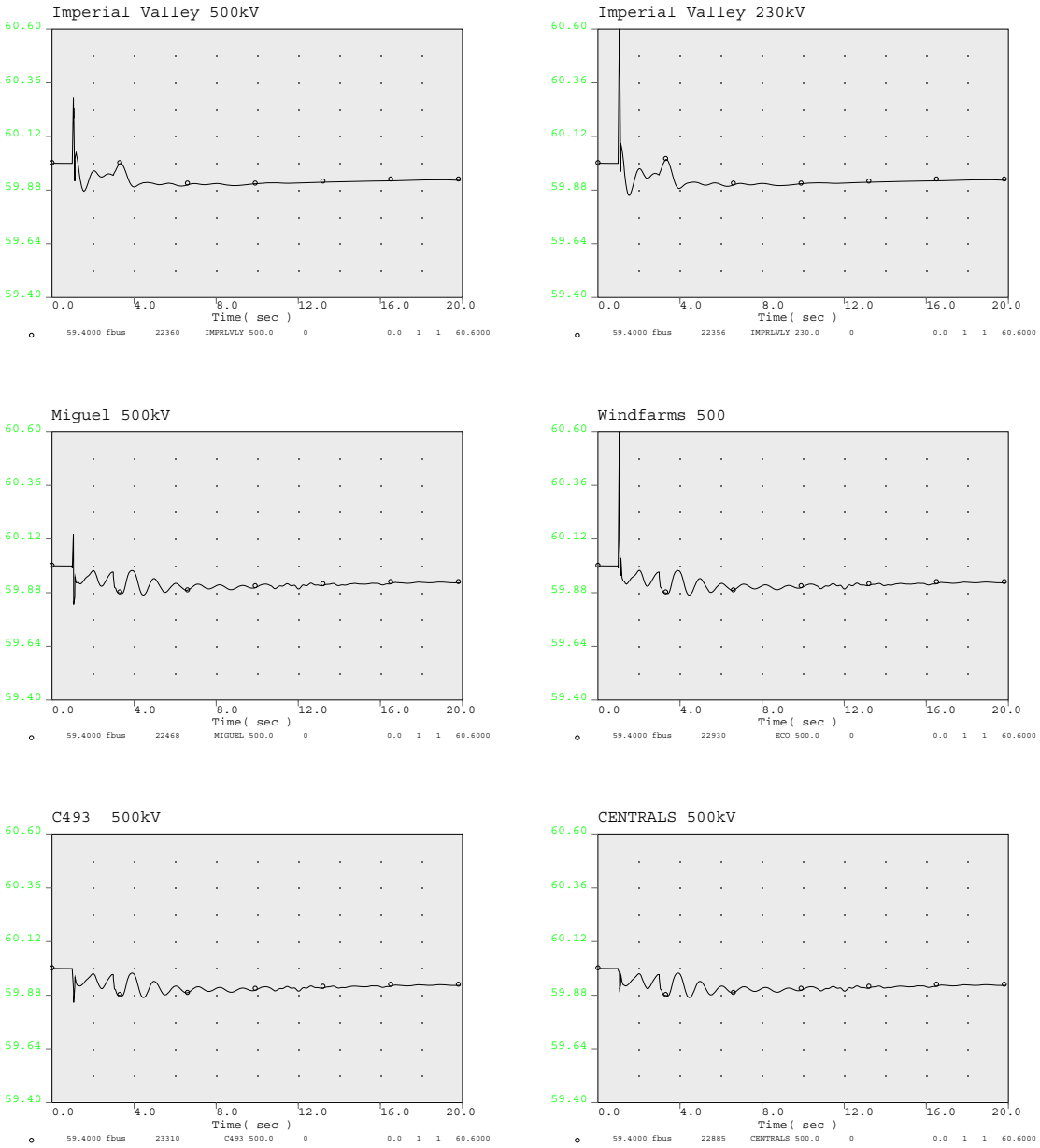


CENTRALS 500kV



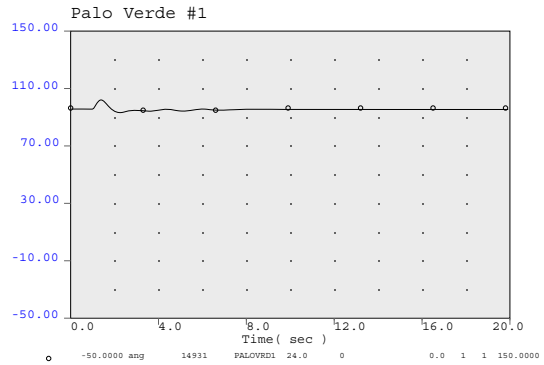
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

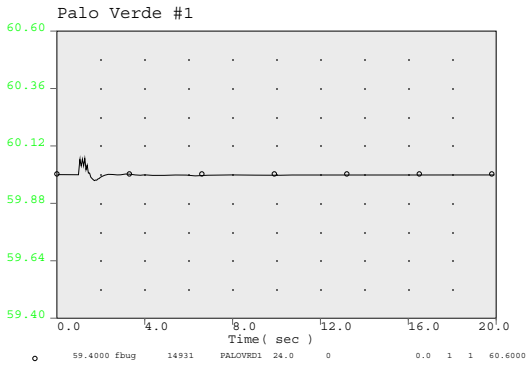
Imperial Valley Area - Frequency

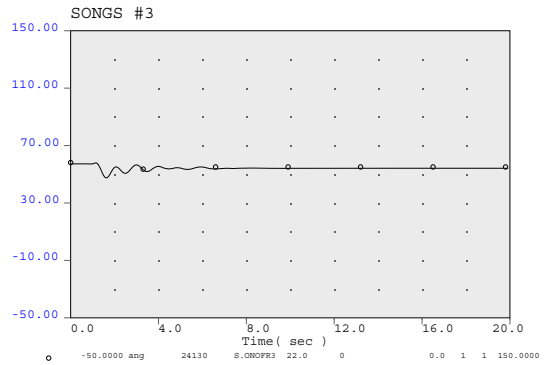


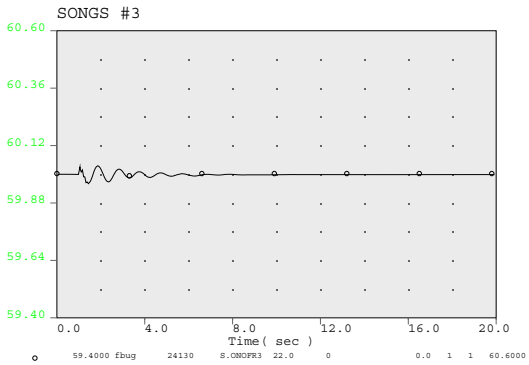
SDG&E Cluster 2 - post
2014 Light Autumn
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

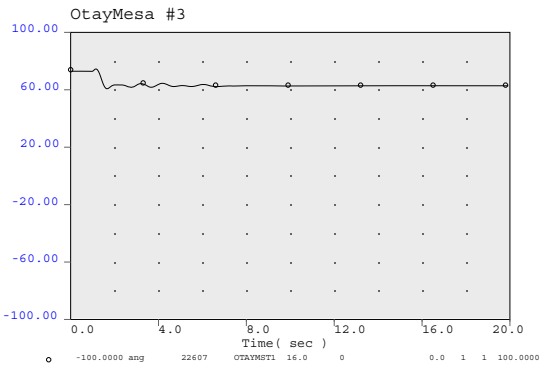
RELATIVE ROTOR ANGLE & FREQUENCY

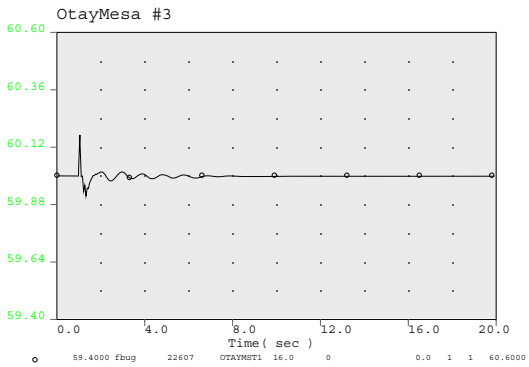






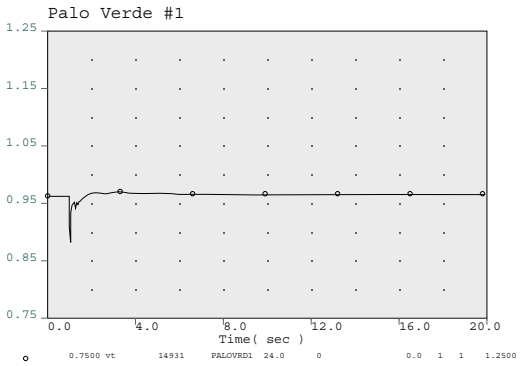


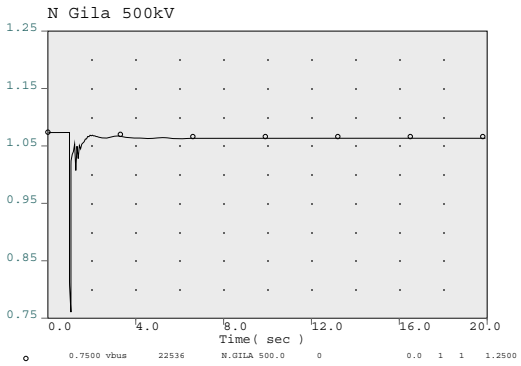


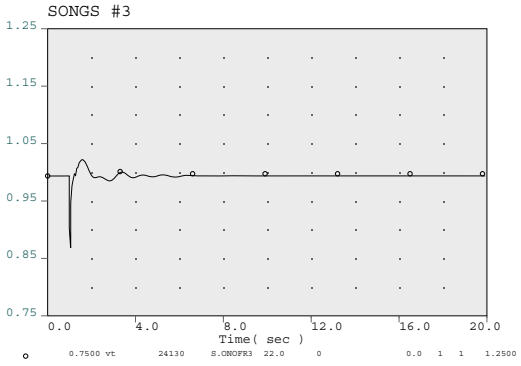


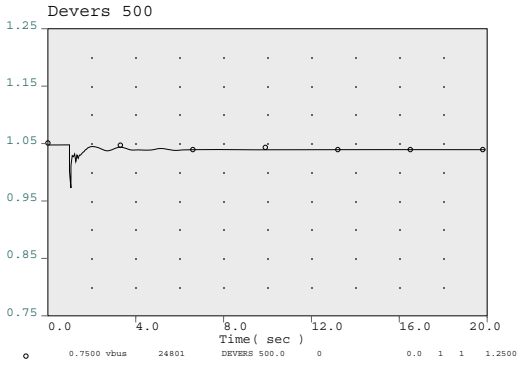
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

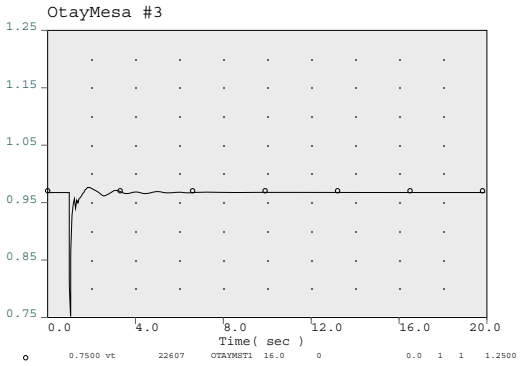
RELATIVE VOLTAGE

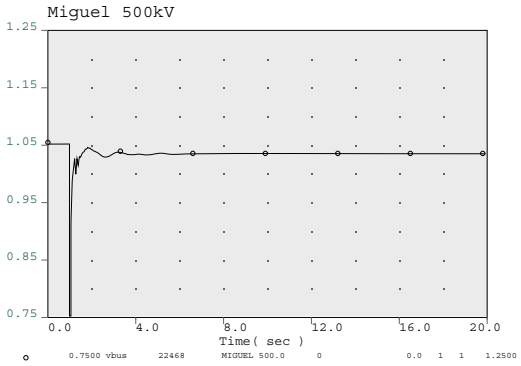








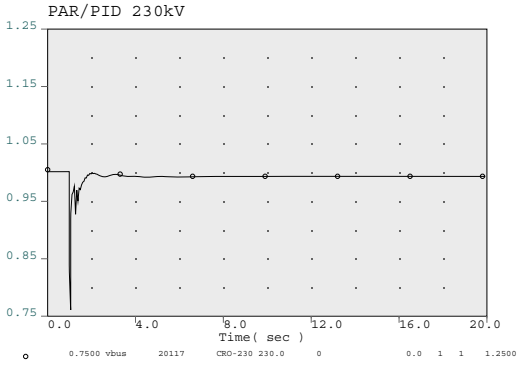




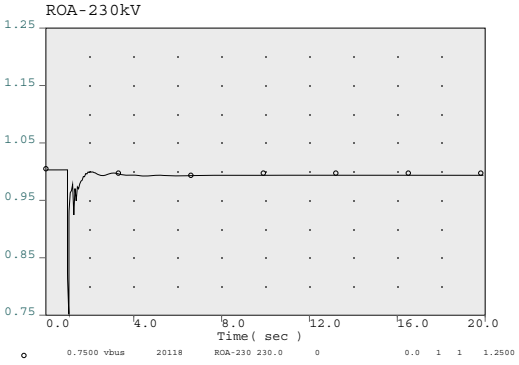
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

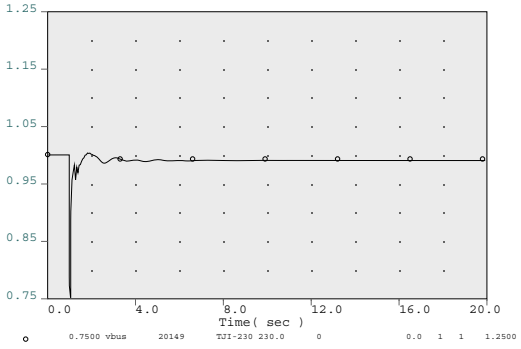
PAR/PID 230kV



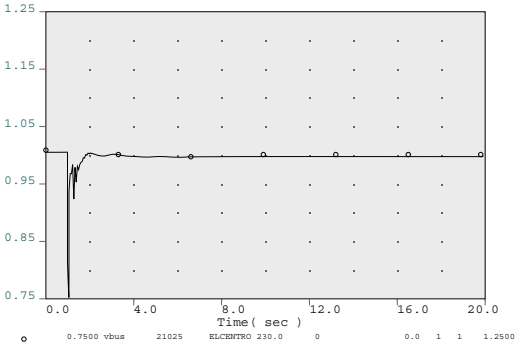
ROA-230kV



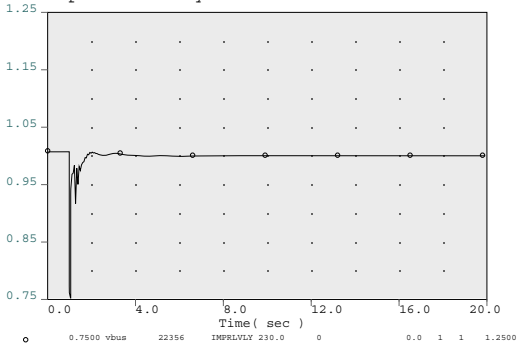
TJ1-230kV



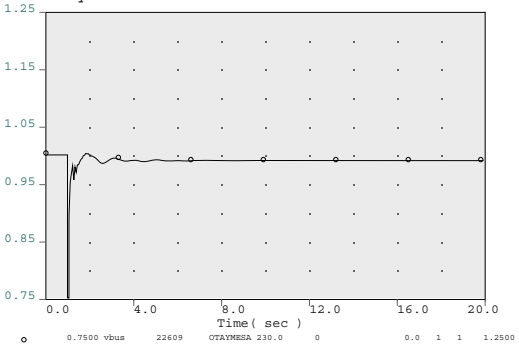
El Centro



Imperial Valley 230kV

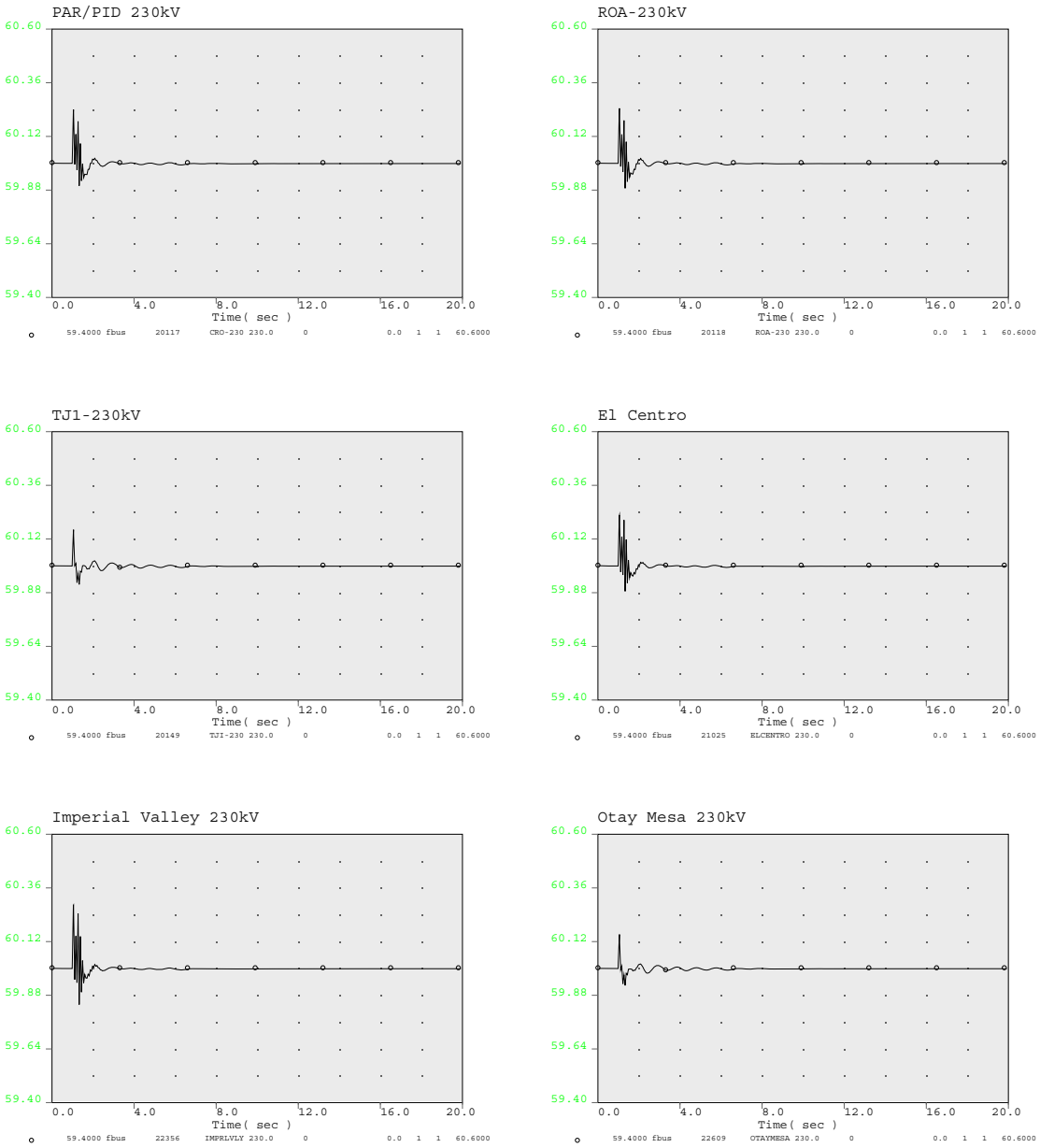


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

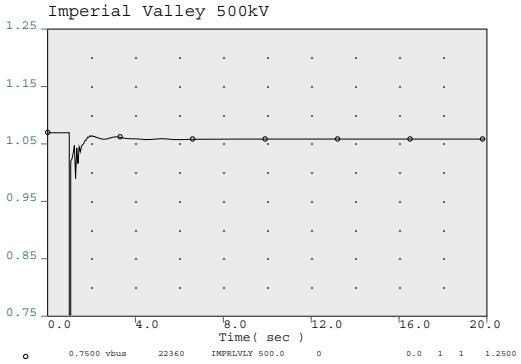
Affected System Frequency Check and Comparison



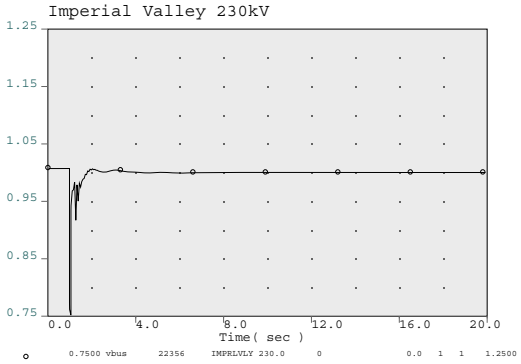
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

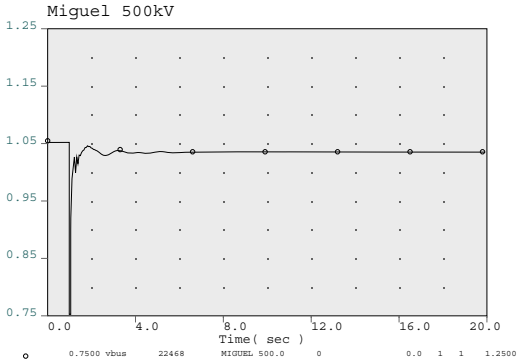
Imperial Valley 500kV



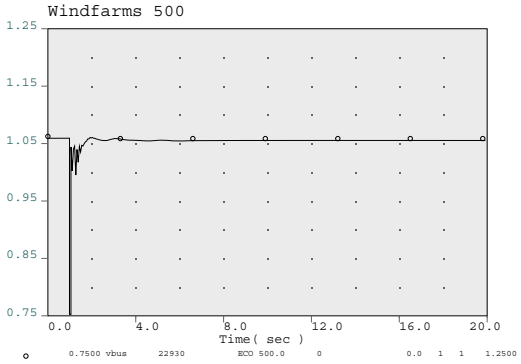
Imperial Valley 230kV



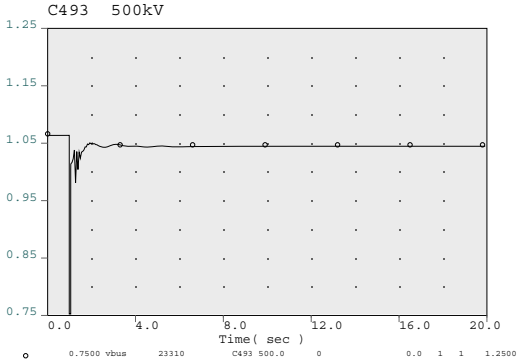
Miguel 500kV



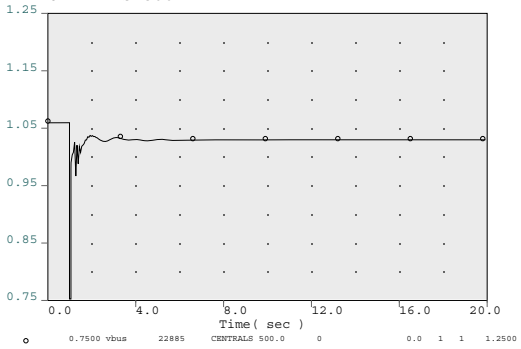
Windfarms 500



C493 500kV

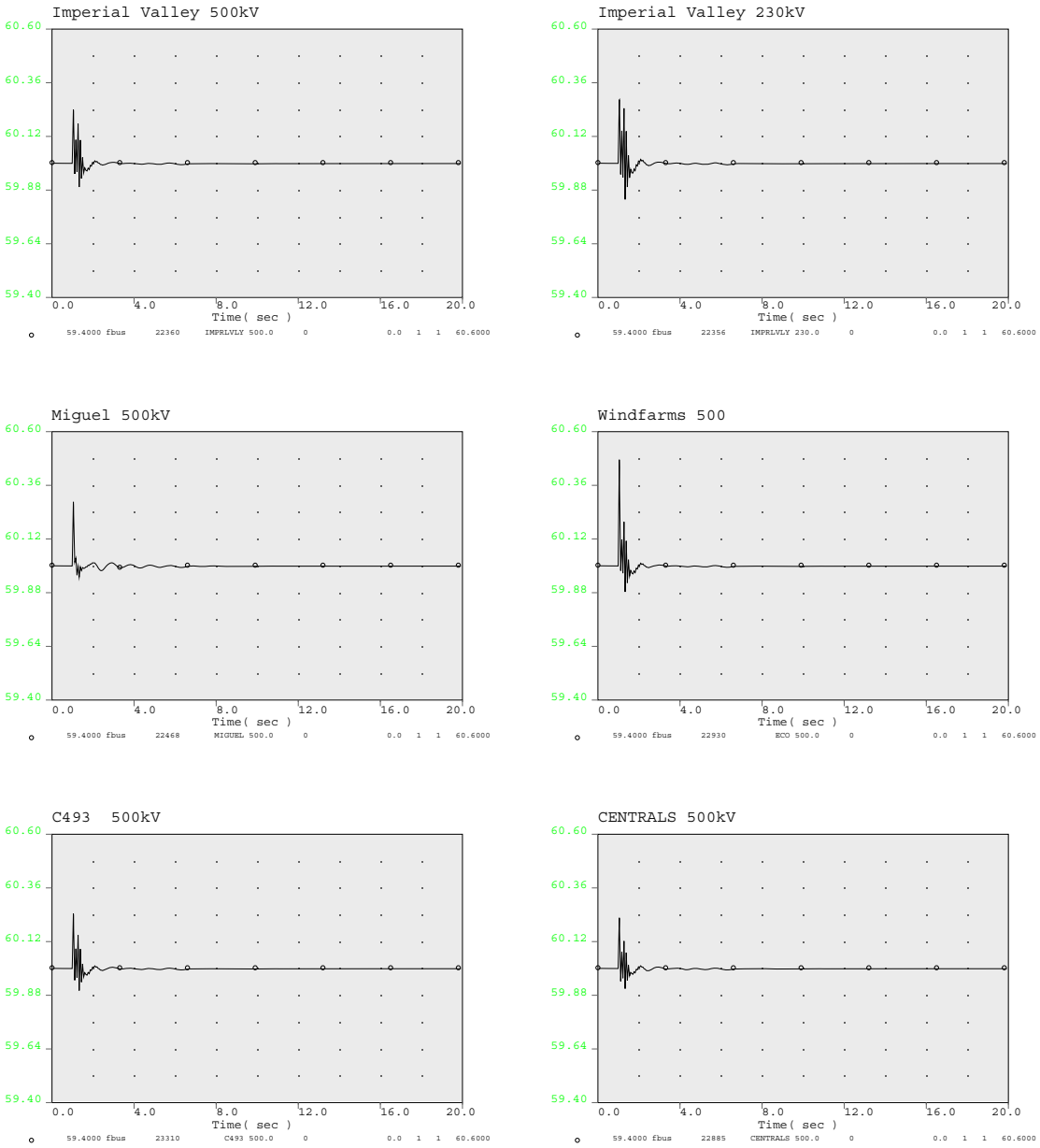


CENTRALS 500kV



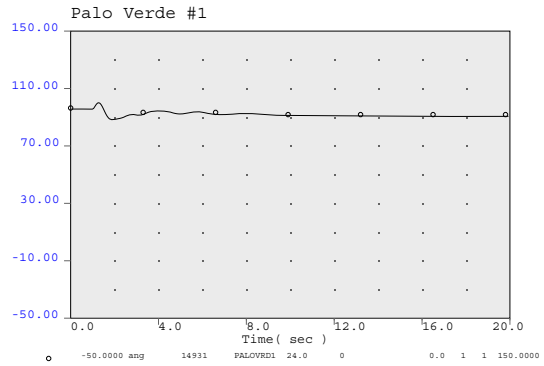
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

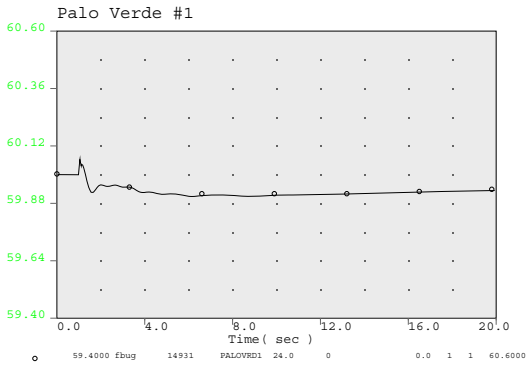
Imperial Valley Area - Frequency

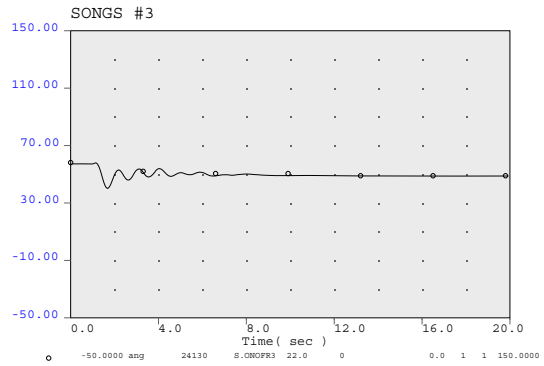


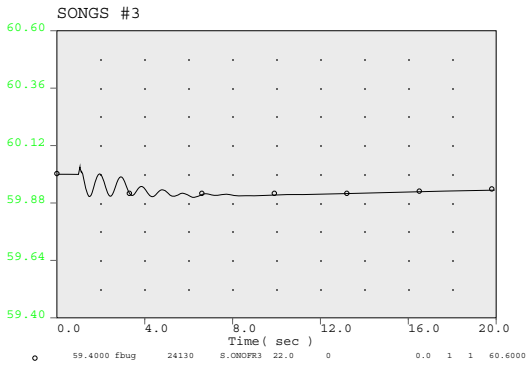
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

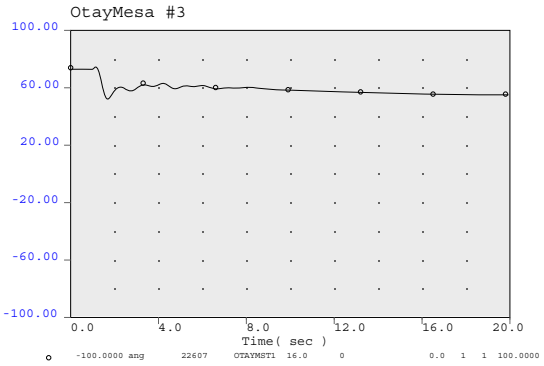
RELATIVE ROTOR ANGLE & FREQUENCY

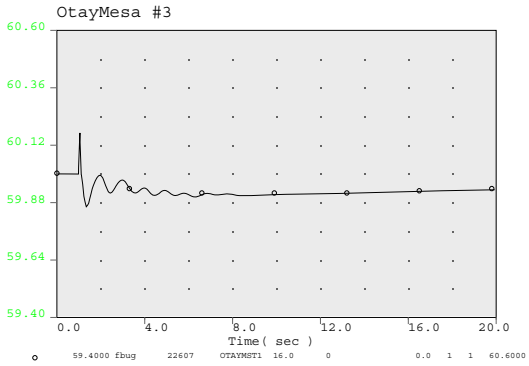










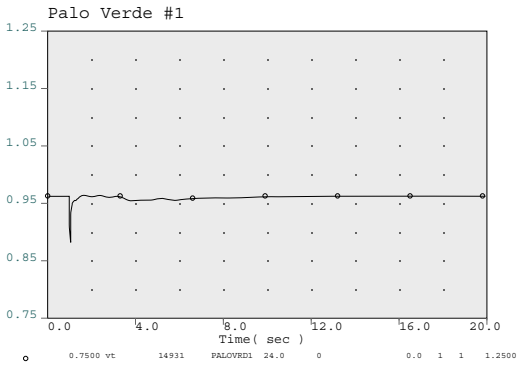


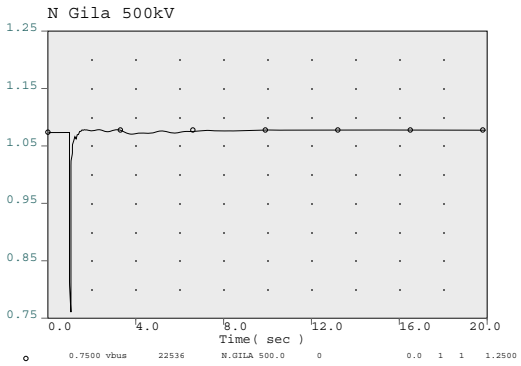
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

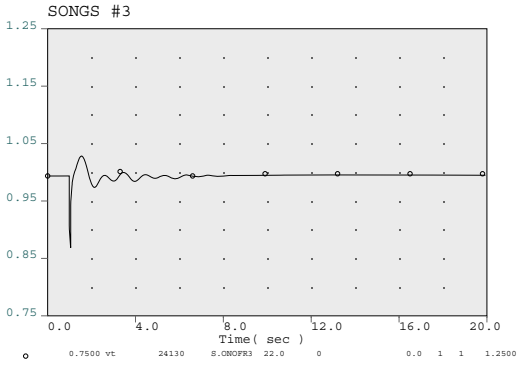
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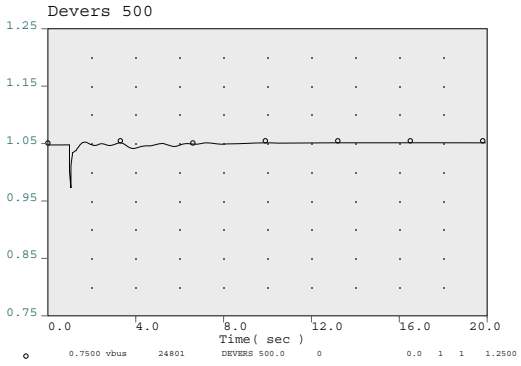
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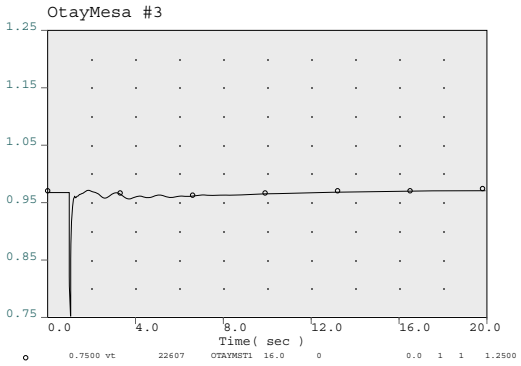
RELATIVE VOLTAGE

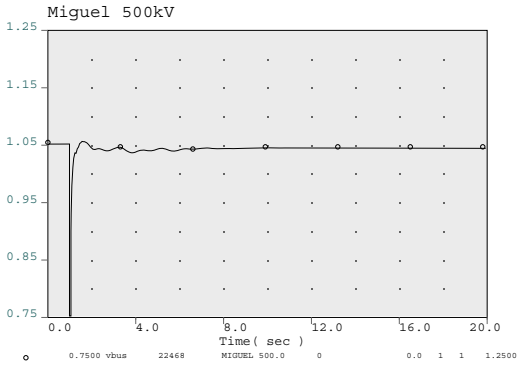








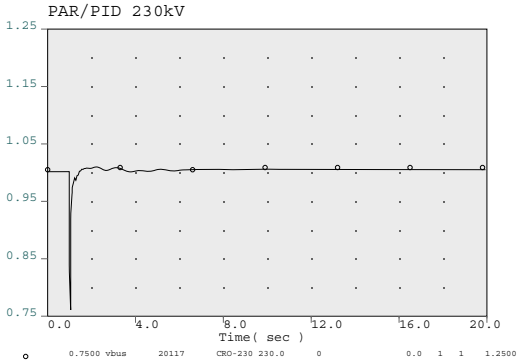




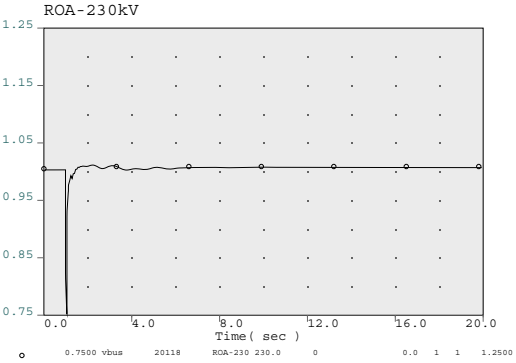
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

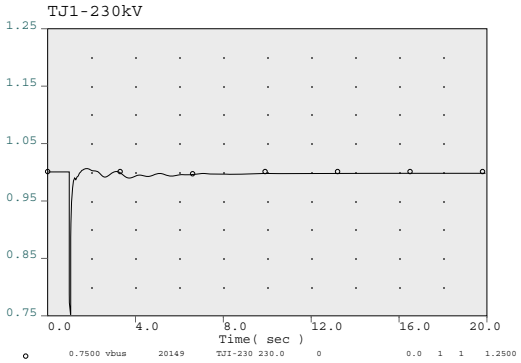
PAR/PID 230kV



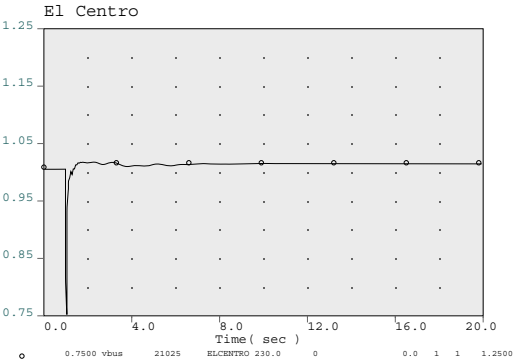
ROA-230kV



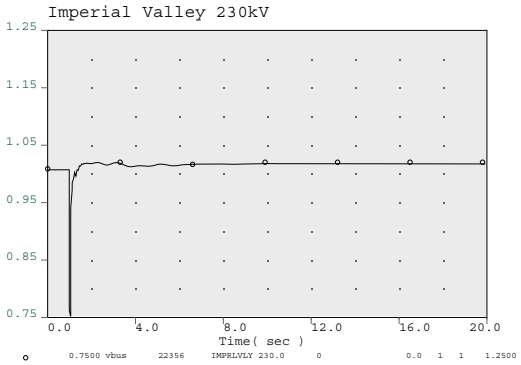
TJ1-230kV



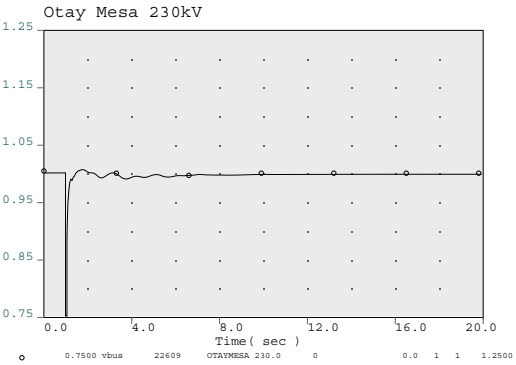
El Centro



Imperial Valley 230kV



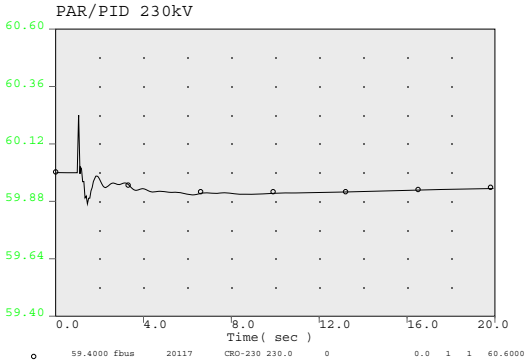
Otay Mesa 230kV



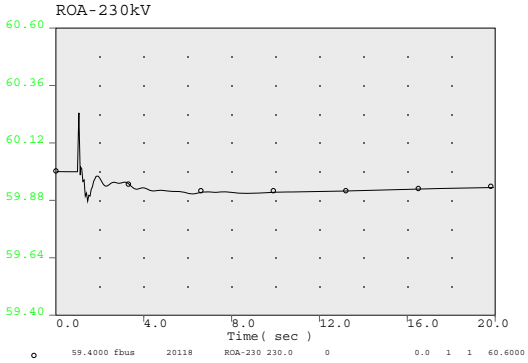
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

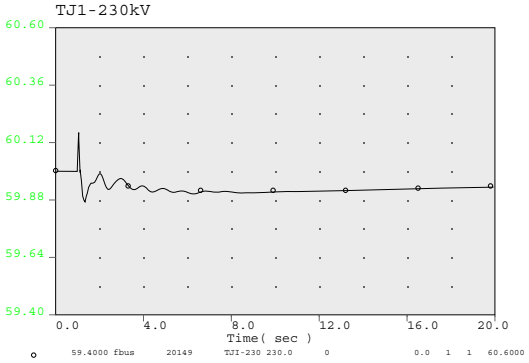
PAR/PID 230kV



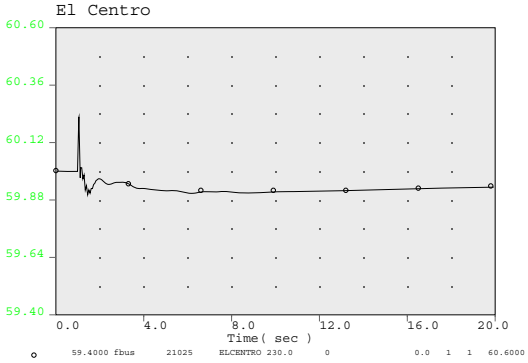
ROA-230kV



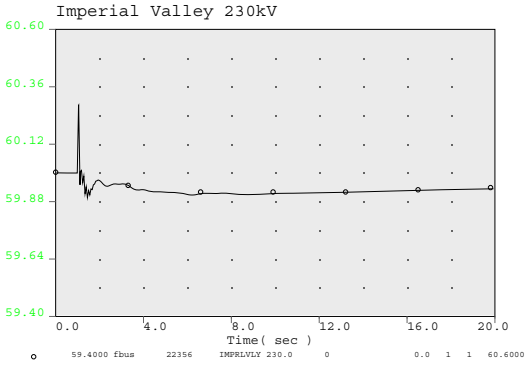
TJ1-230kV



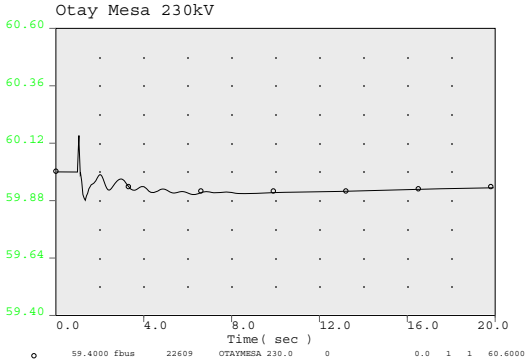
El Centro



Imperial Valley 230kV



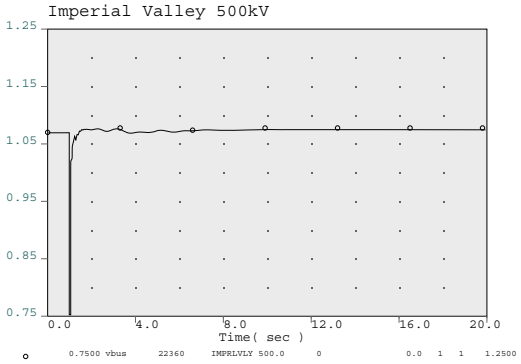
Otay Mesa 230kV



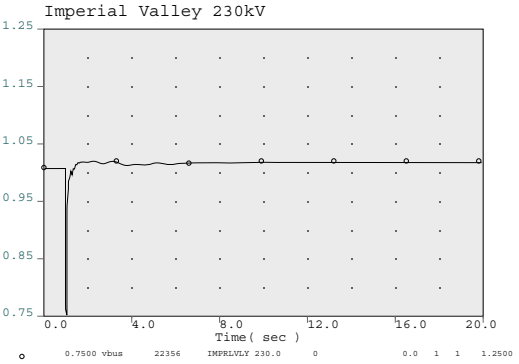
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

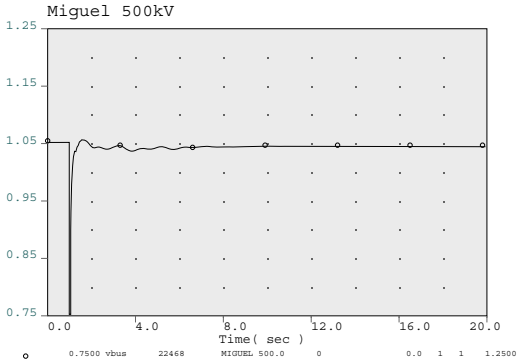
Imperial Valley 500kV



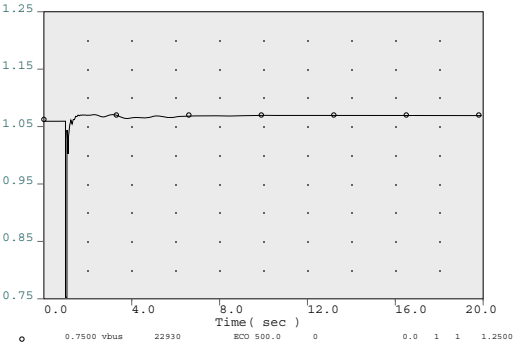
Imperial Valley 230kV



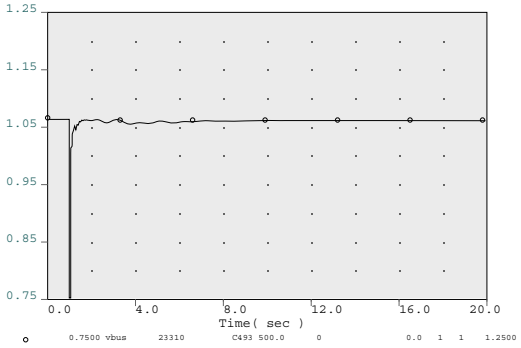
Miguel 500kV



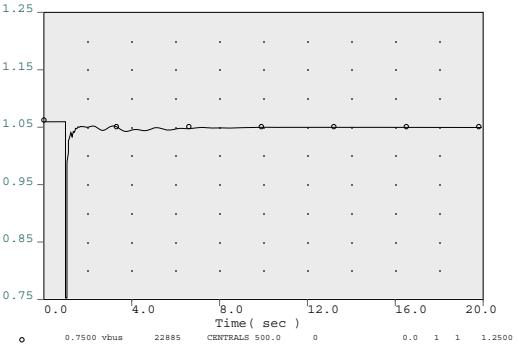
Windfarms 500



C493 500kV

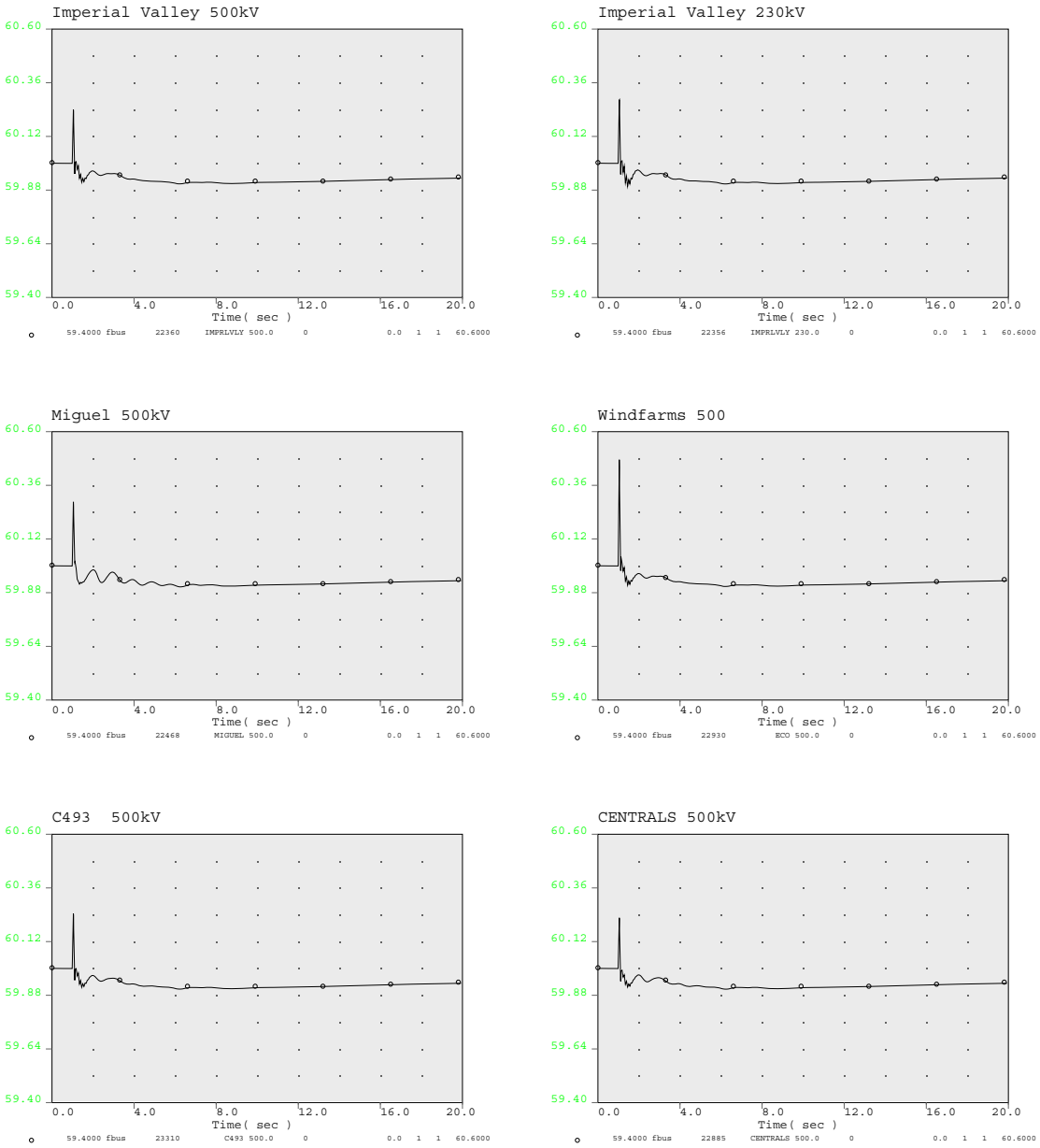


CENTRALS 500kV



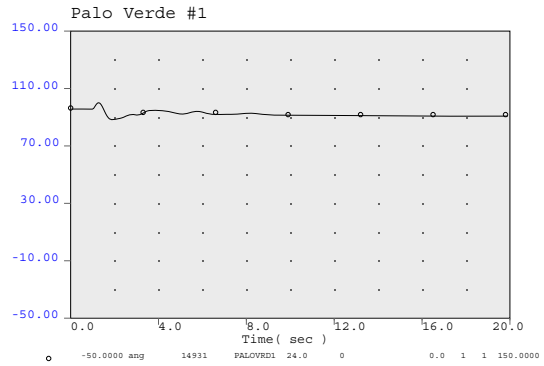
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

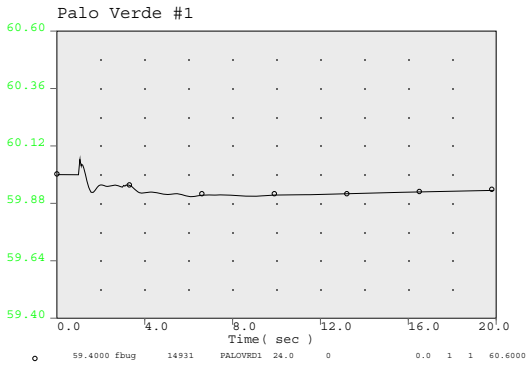
Imperial Valley Area - Frequency

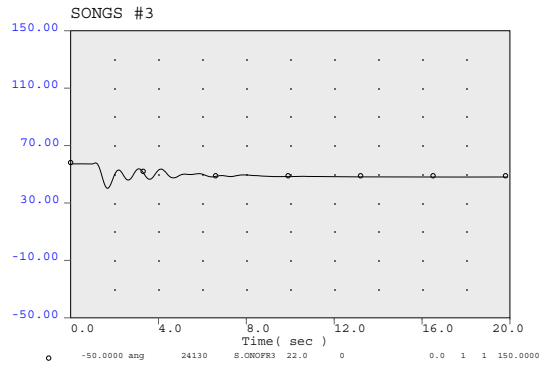


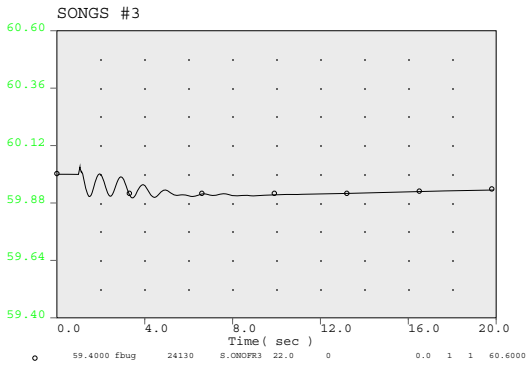
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

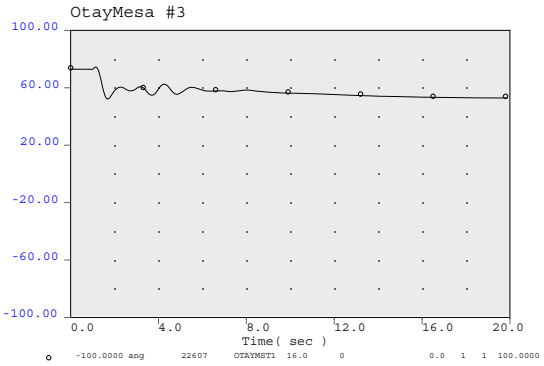
RELATIVE ROTOR ANGLE & FREQUENCY

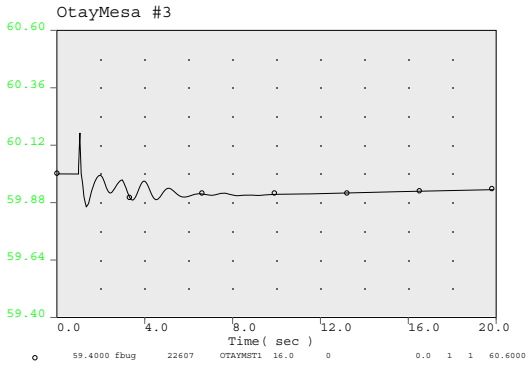






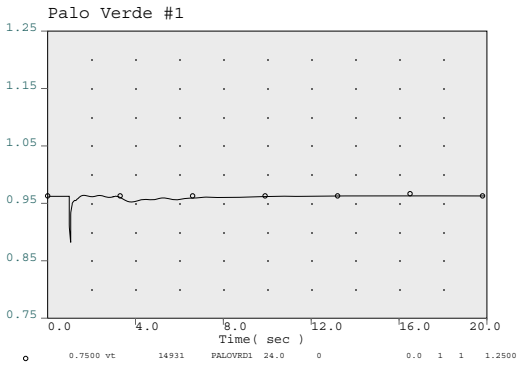


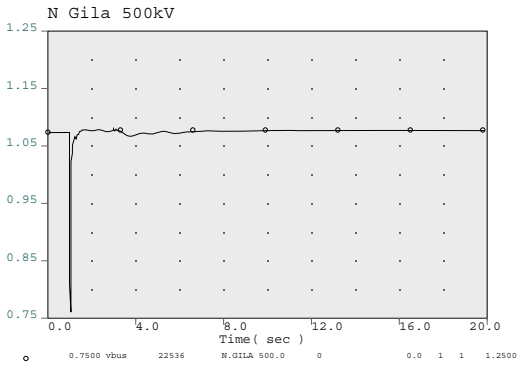


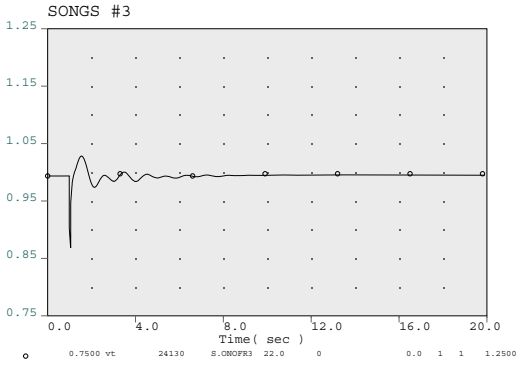


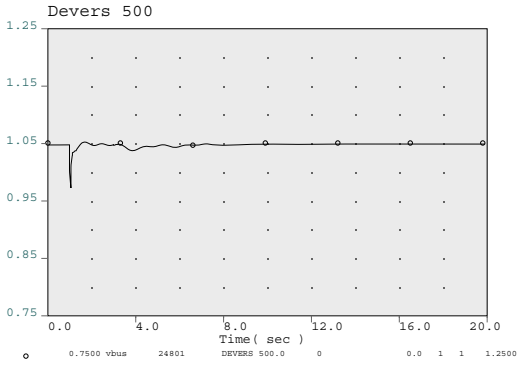
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

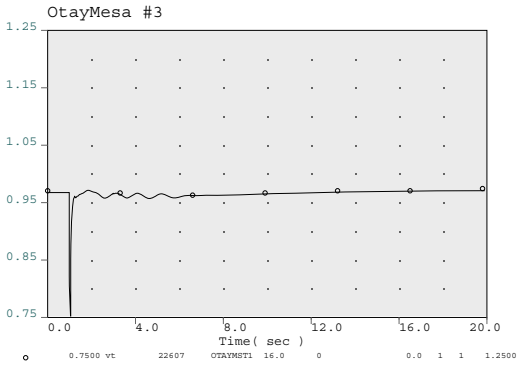
RELATIVE VOLTAGE

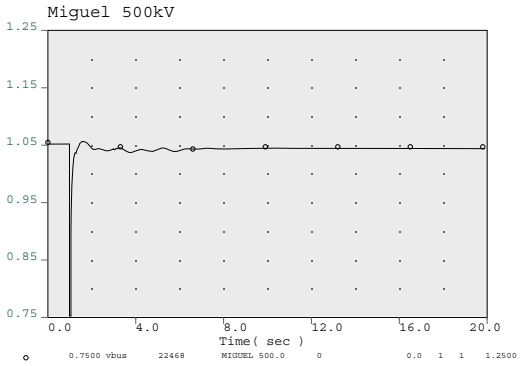








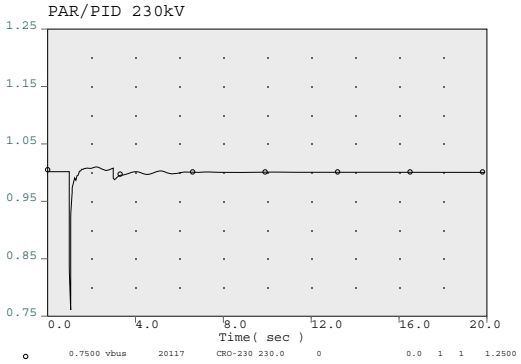




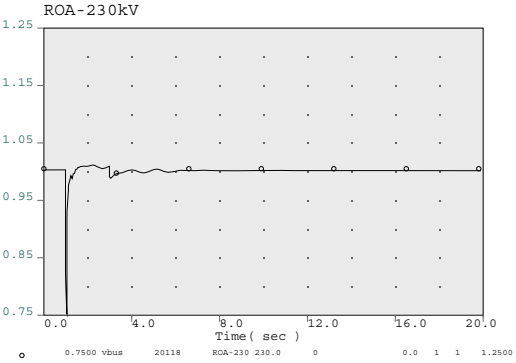
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

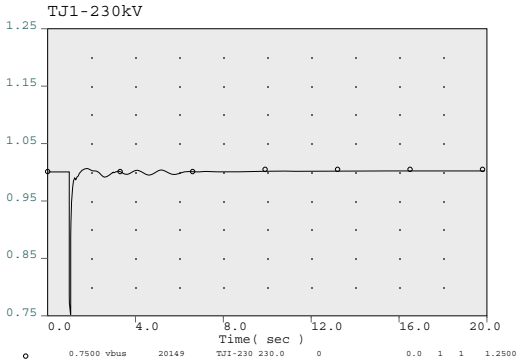
PAR/PID 230kV



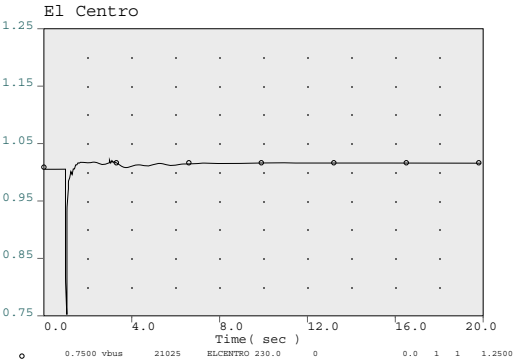
ROA-230kV



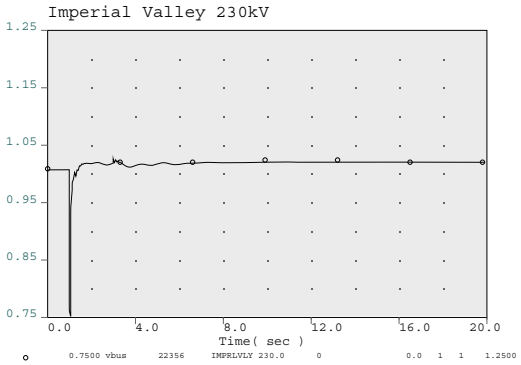
TJ1-230kV



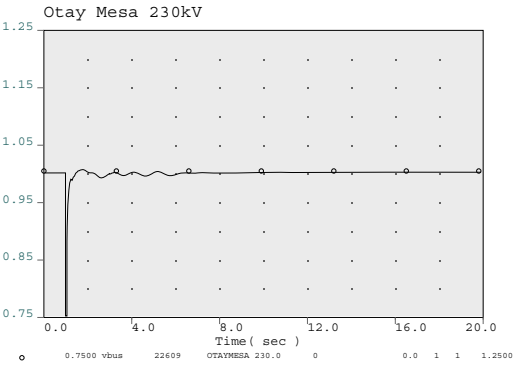
El Centro



Imperial Valley 230kV

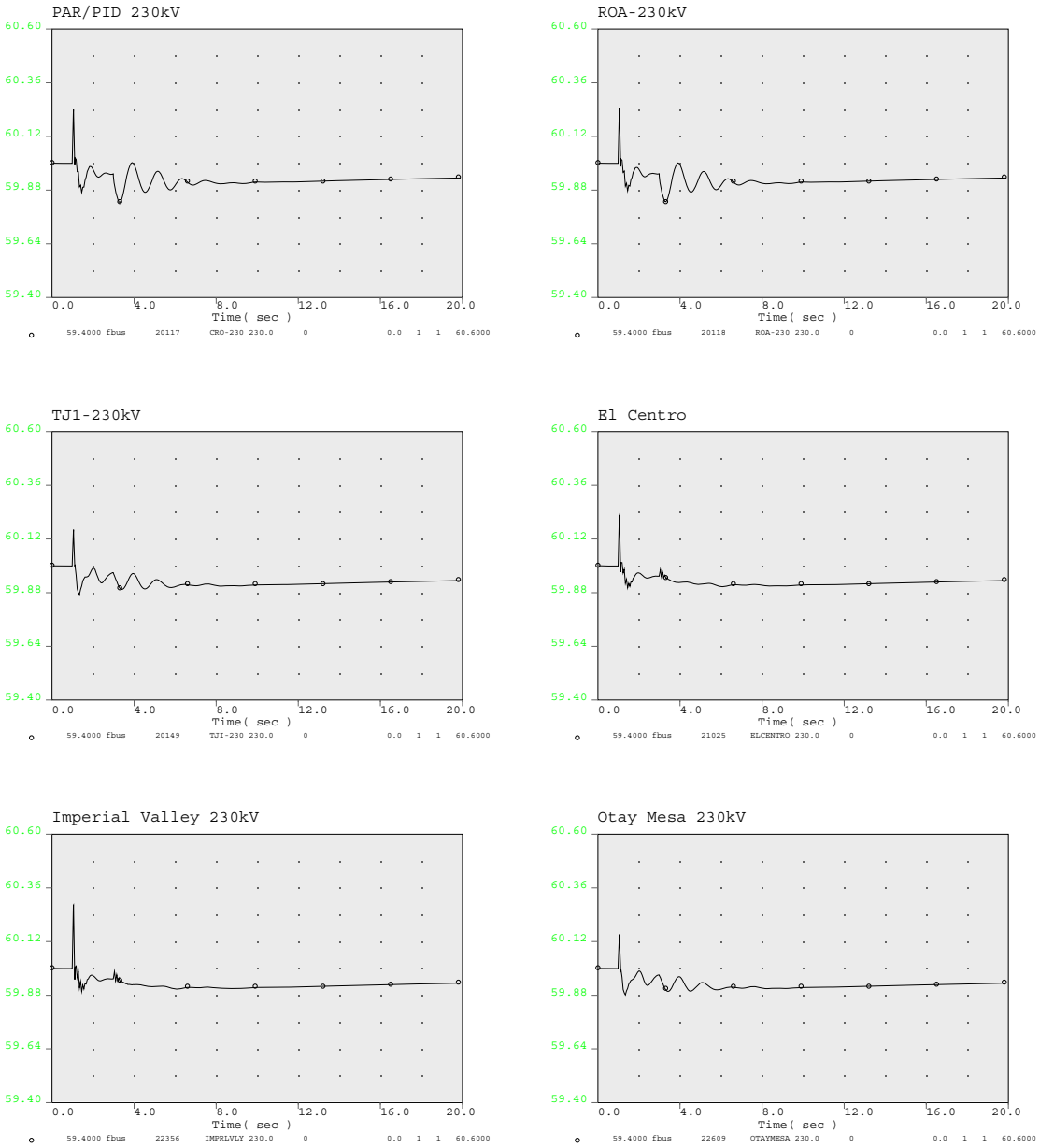


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

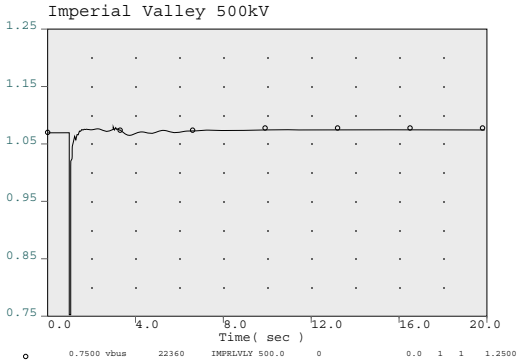
Affected System Frequency Check and Comparison



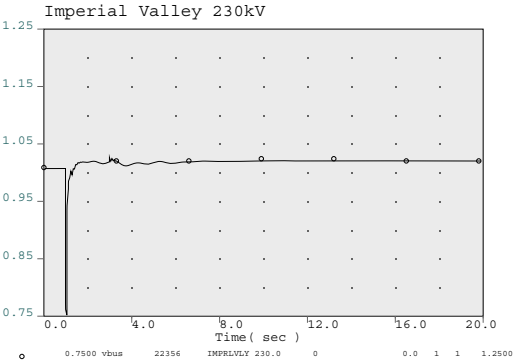
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

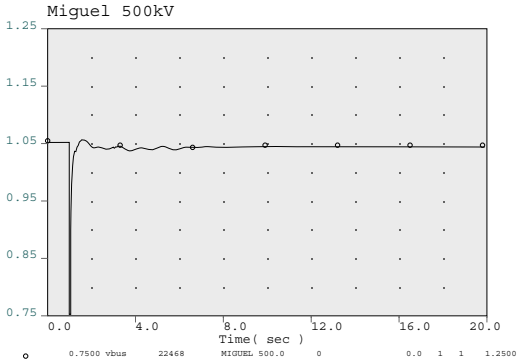
Imperial Valley 500kV



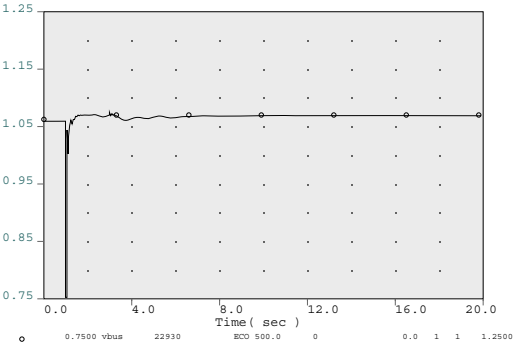
Imperial Valley 230kV



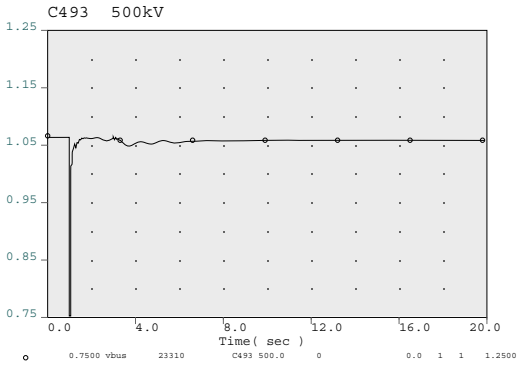
Miguel 500kV



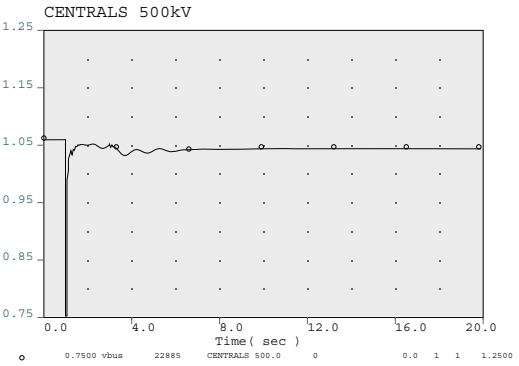
Windfarms 500



C493 500kV

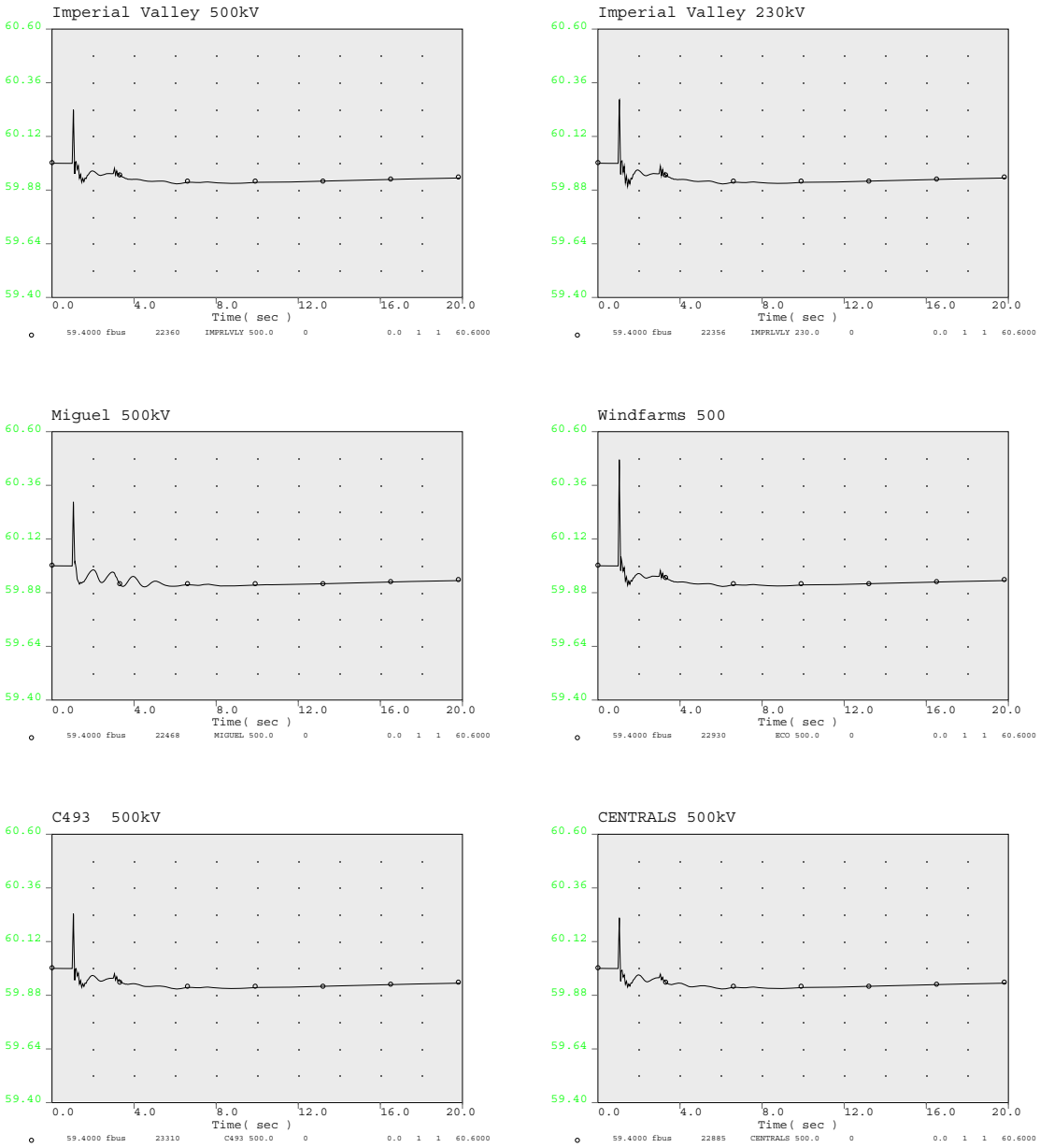


CENTRALS 500kV



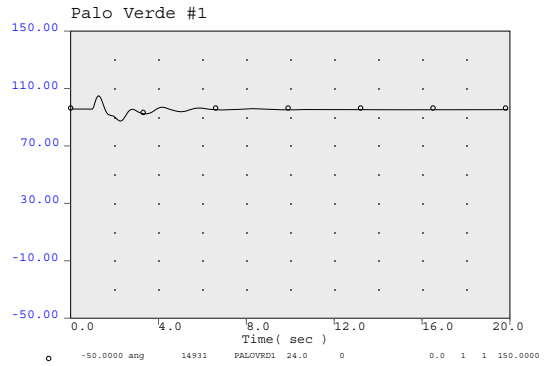
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

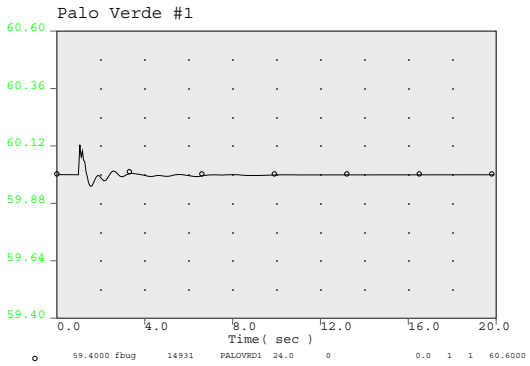
Imperial Valley Area - Frequency

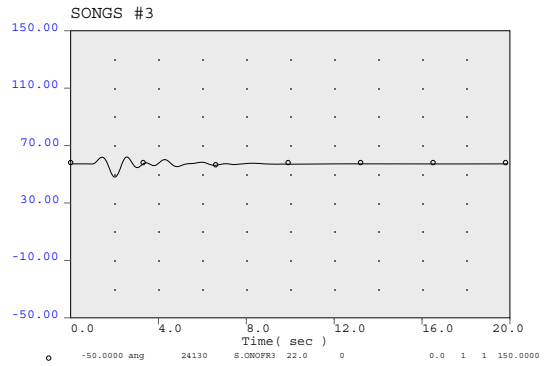


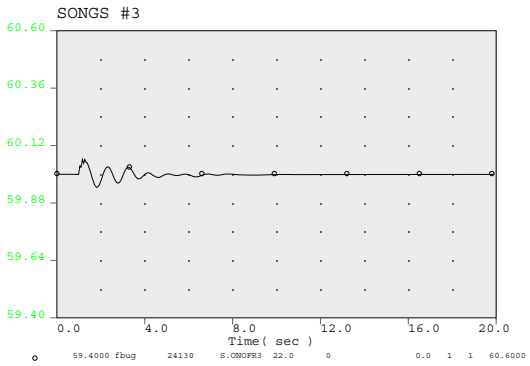
SDG&E Cluster 2 - post
2014 Light Autumn
Miguel-ECO 500 kV line

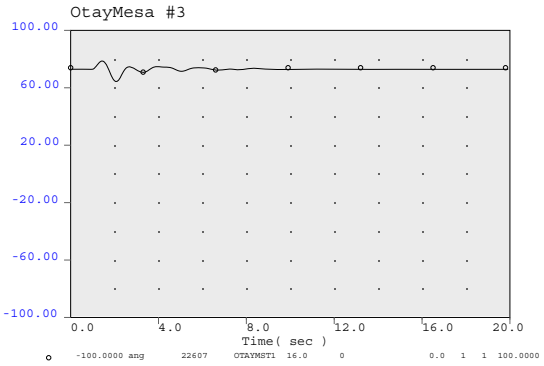
RELATIVE ROTOR ANGLE & FREQUENCY

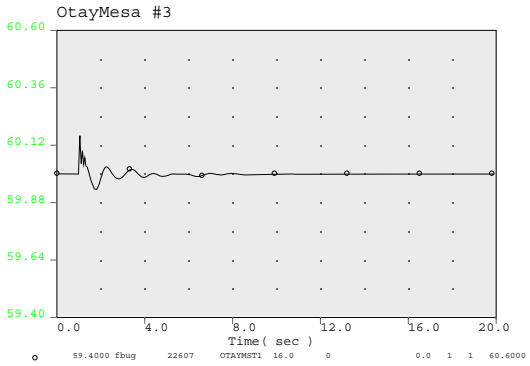










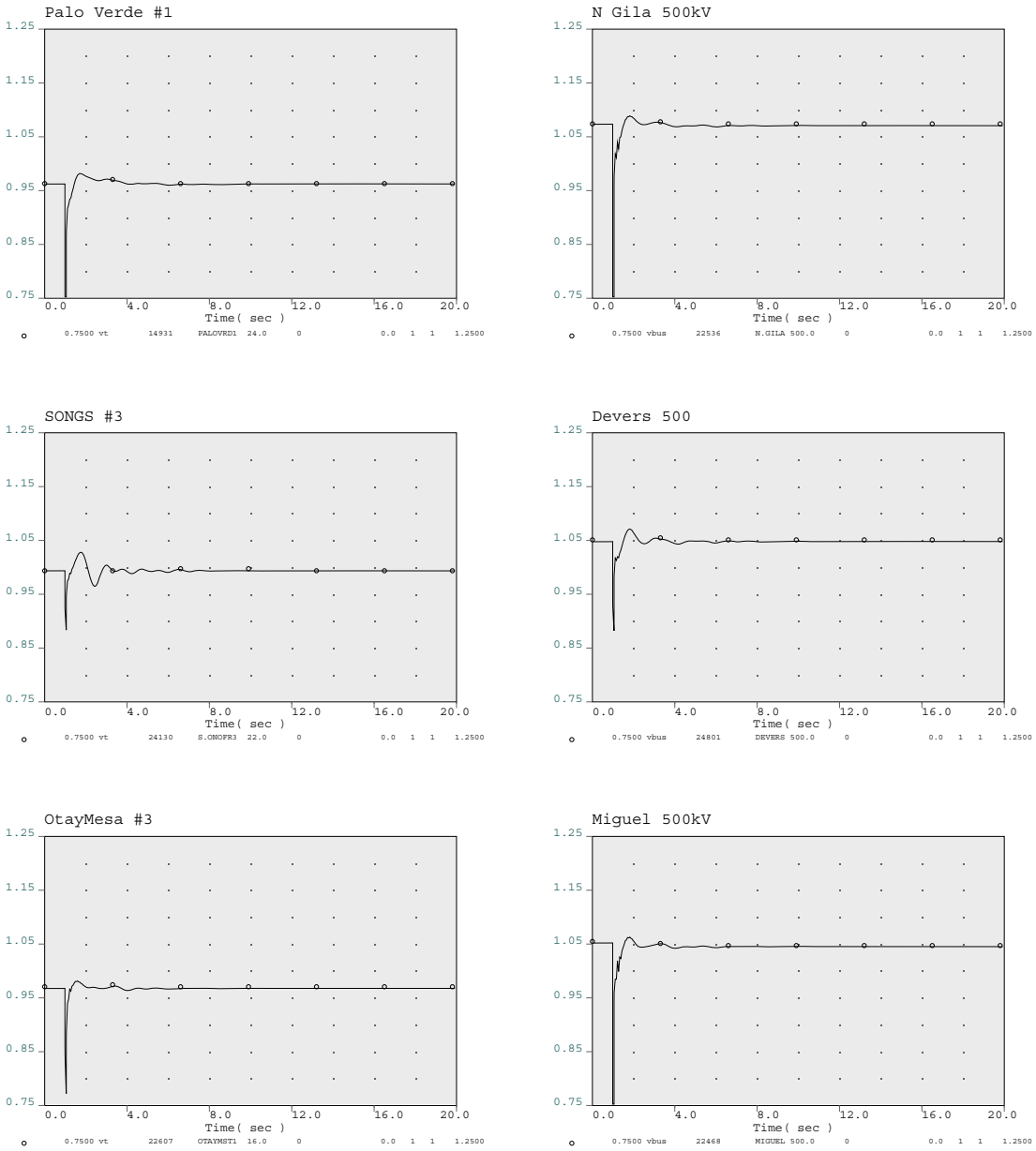


SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Page 1

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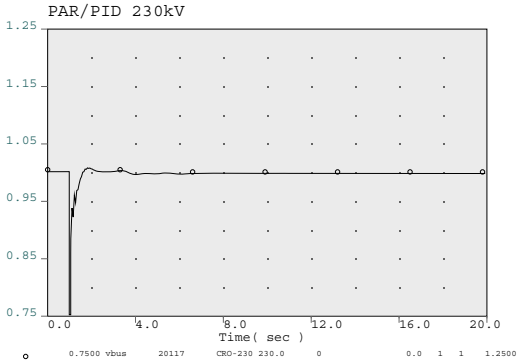
RELATIVE VOLTAGE



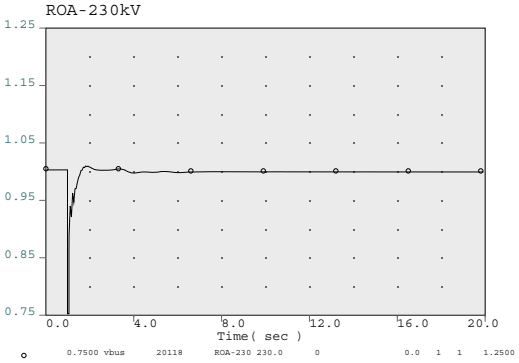
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

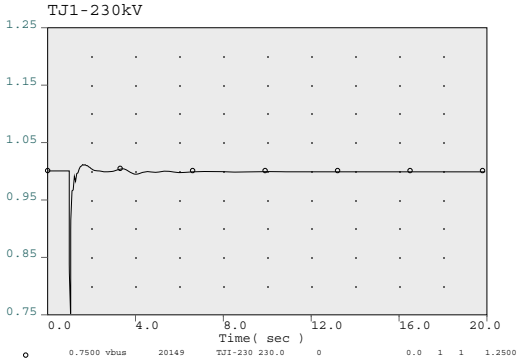
PAR/PID 230kV



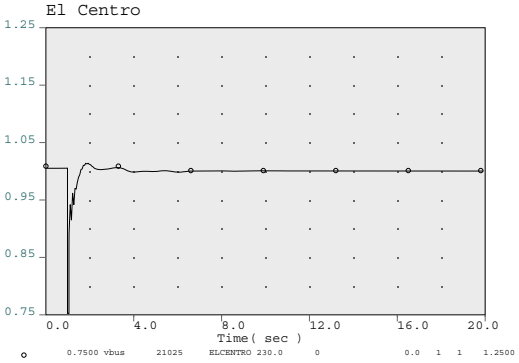
ROA-230kV



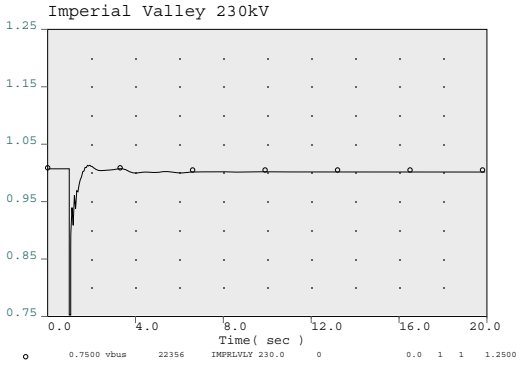
TJ1-230kV



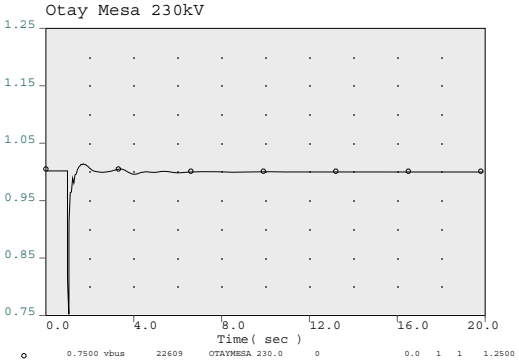
El Centro



Imperial Valley 230kV

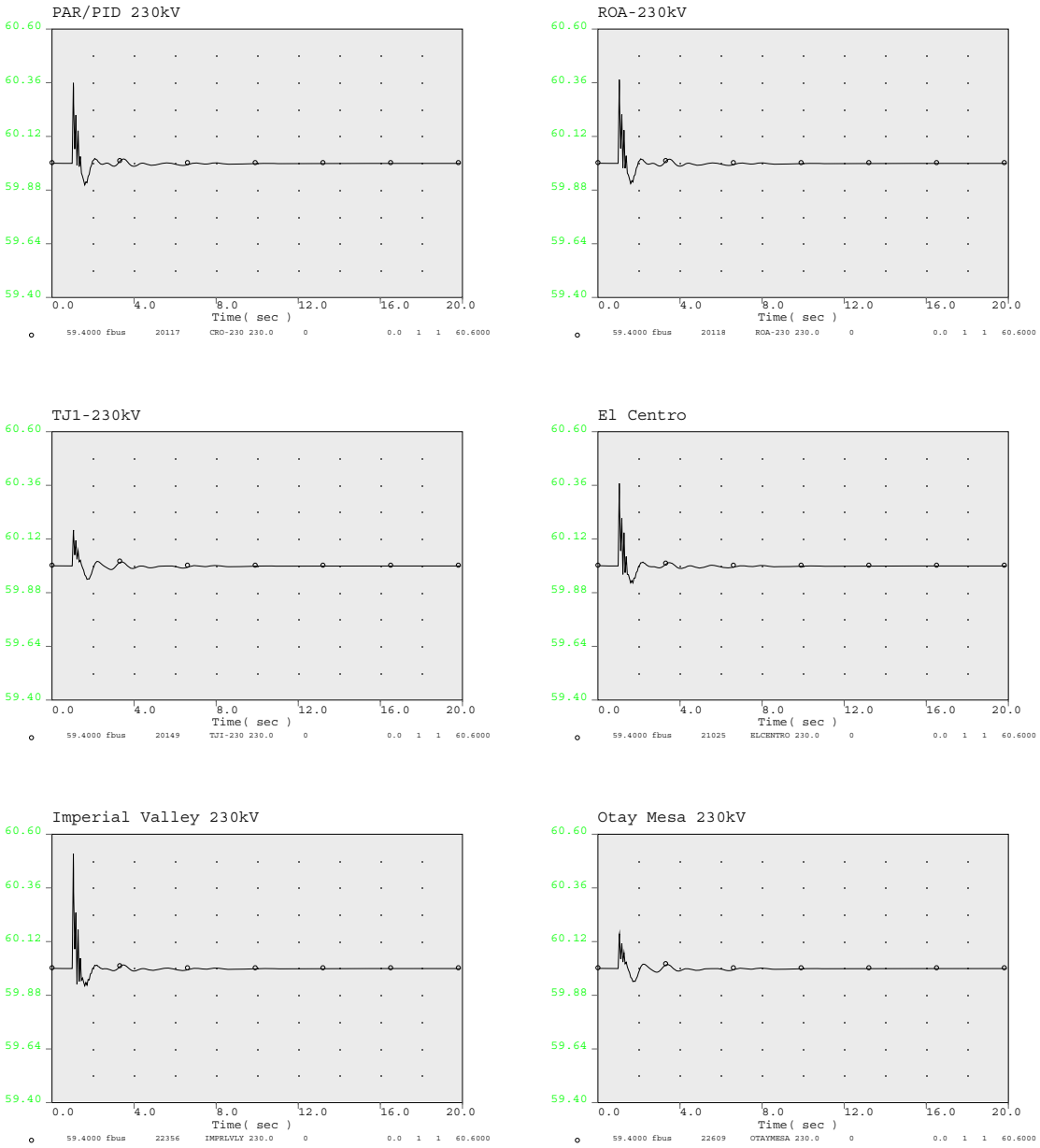


Otay Mesa 230kV



SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

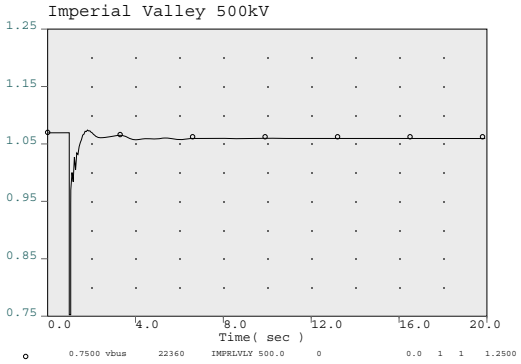
Affected System Frequency Check and Comparison



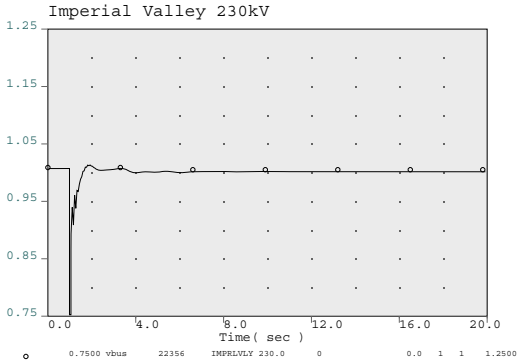
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

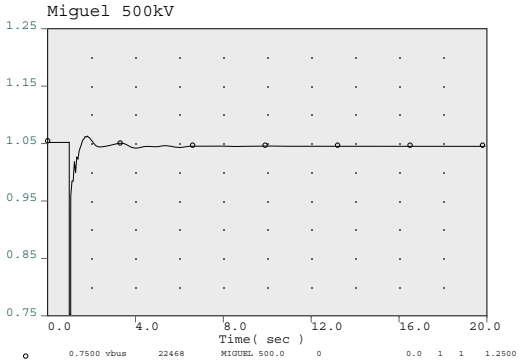
Imperial Valley 500kV



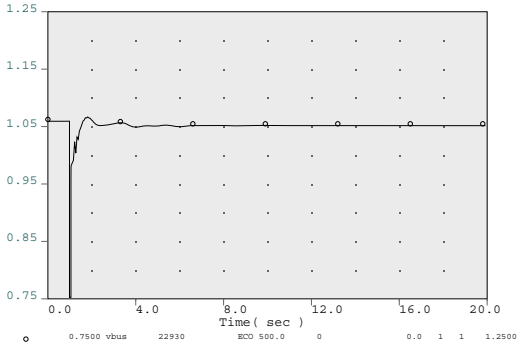
Imperial Valley 230kV



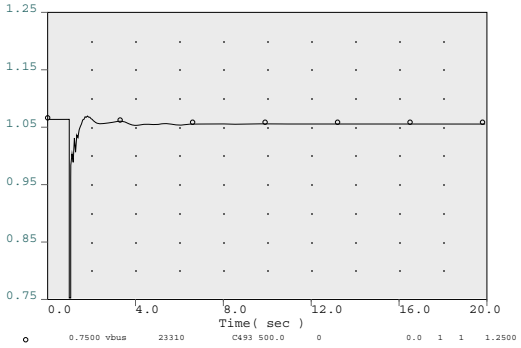
Miguel 500kV



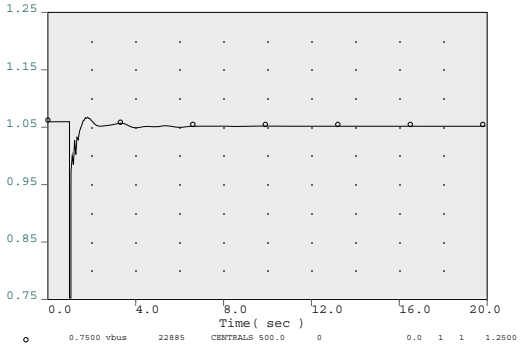
Windfarms 500



C493 500kV



CENTRALS 500kV



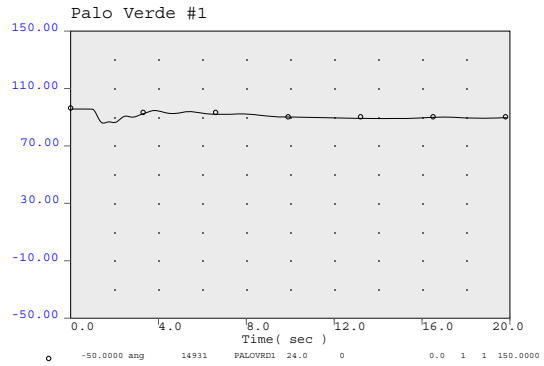
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

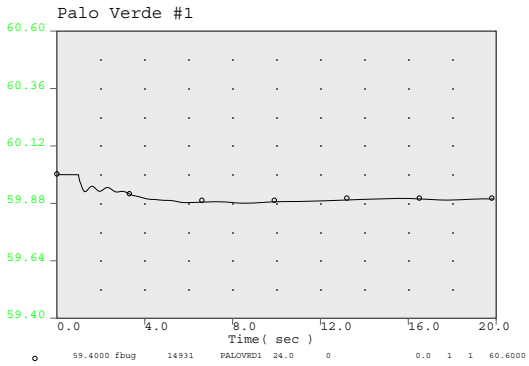
Imperial Valley Area - Frequency

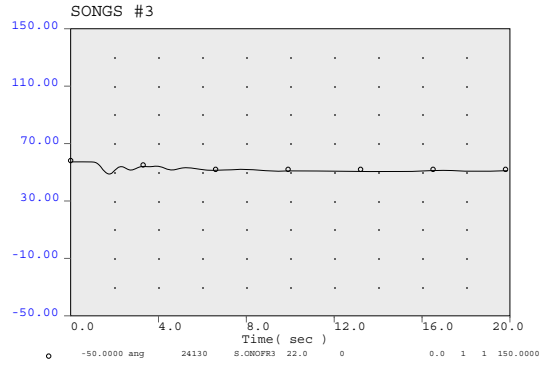


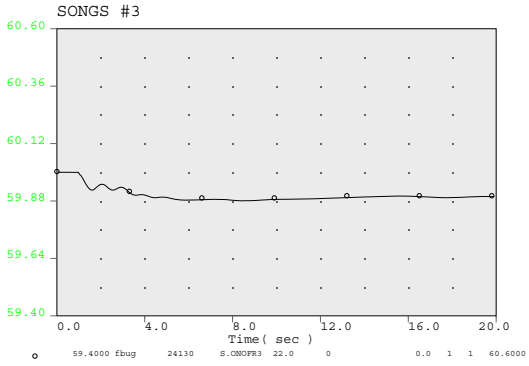
SDG&E Cluster 2 - post
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

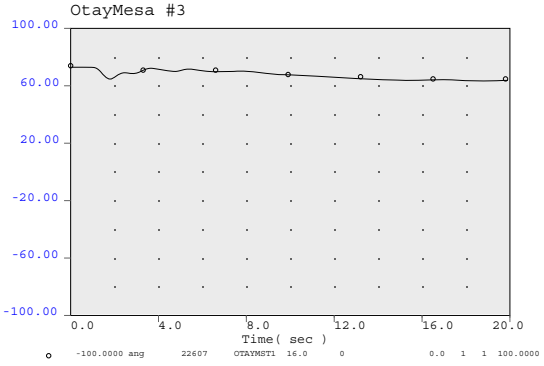
RELATIVE ROTOR ANGLE & FREQUENCY

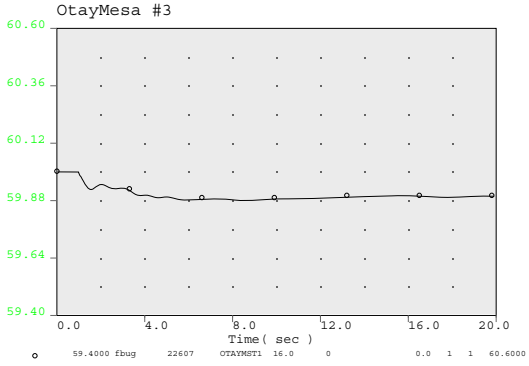












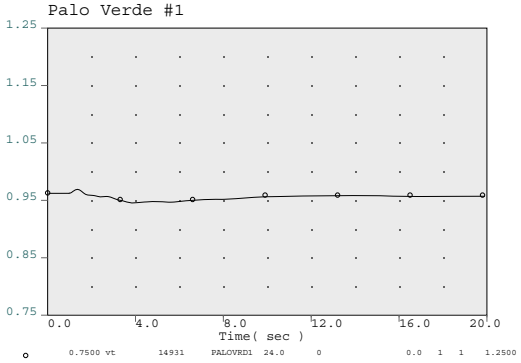
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Page 1

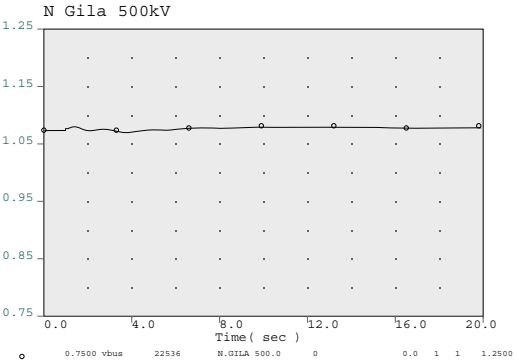
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RELATIVE VOLTAGE

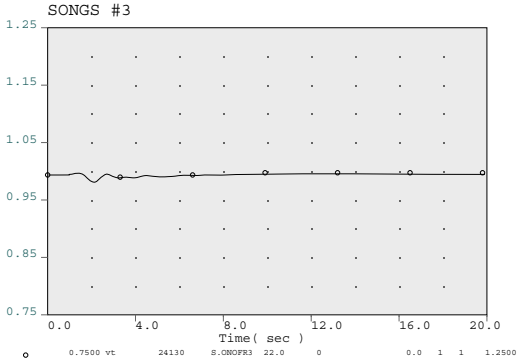
Palo Verde #1



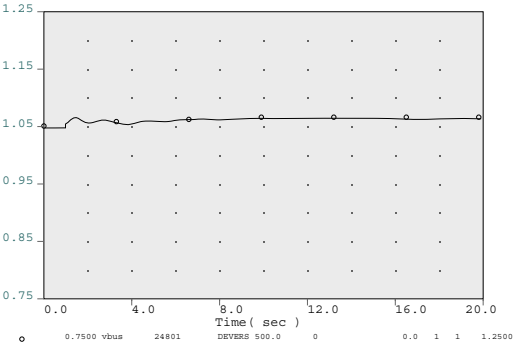
N Gila 500kV



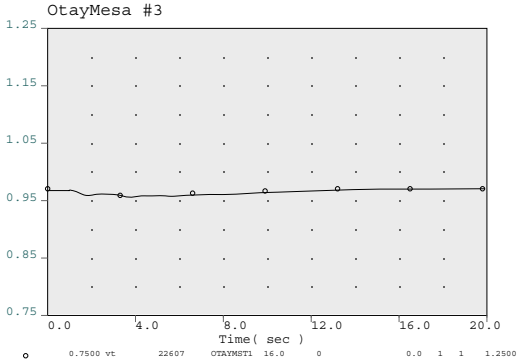
SONGS #3



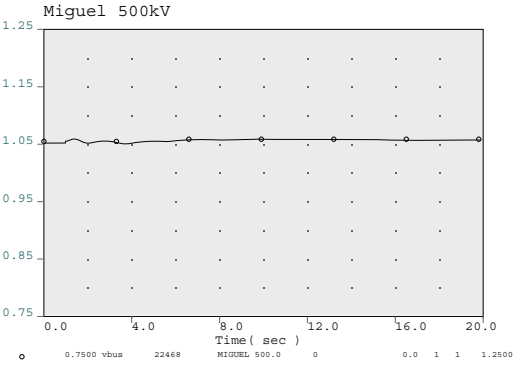
Devers 500



OtayMesa #3



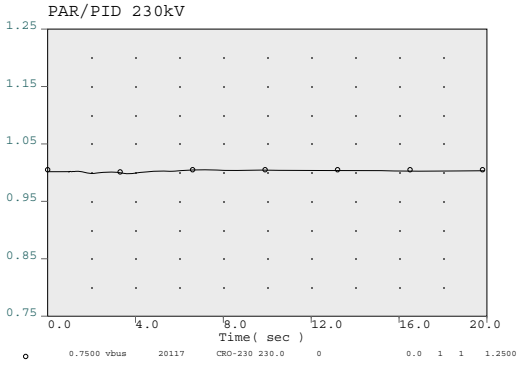
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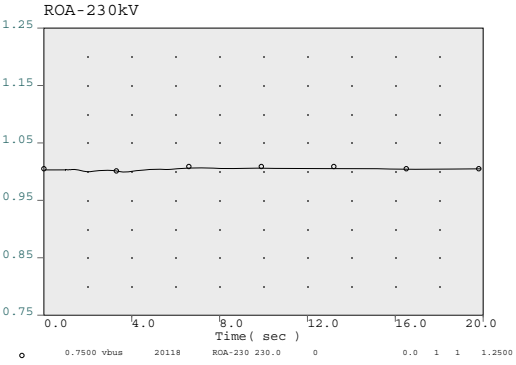
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

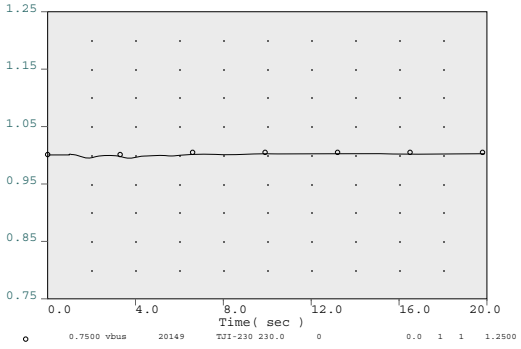
PAR/PID 230kV



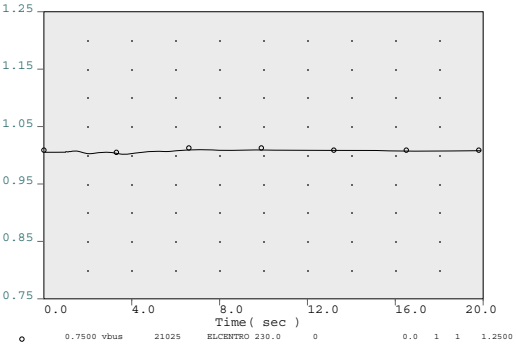
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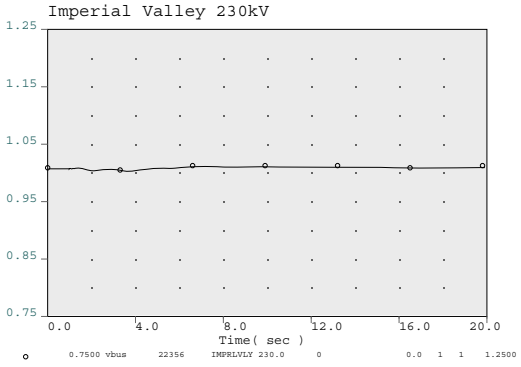
TJ1-230kV



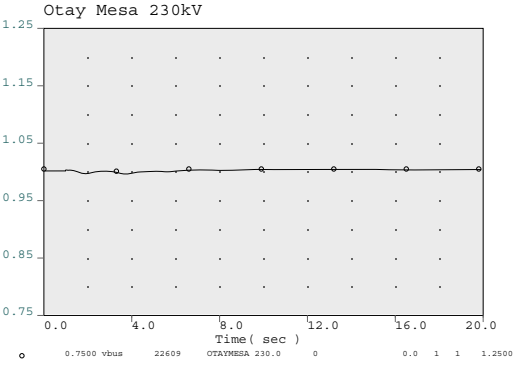
El Centro



Imperial Valley 230kV

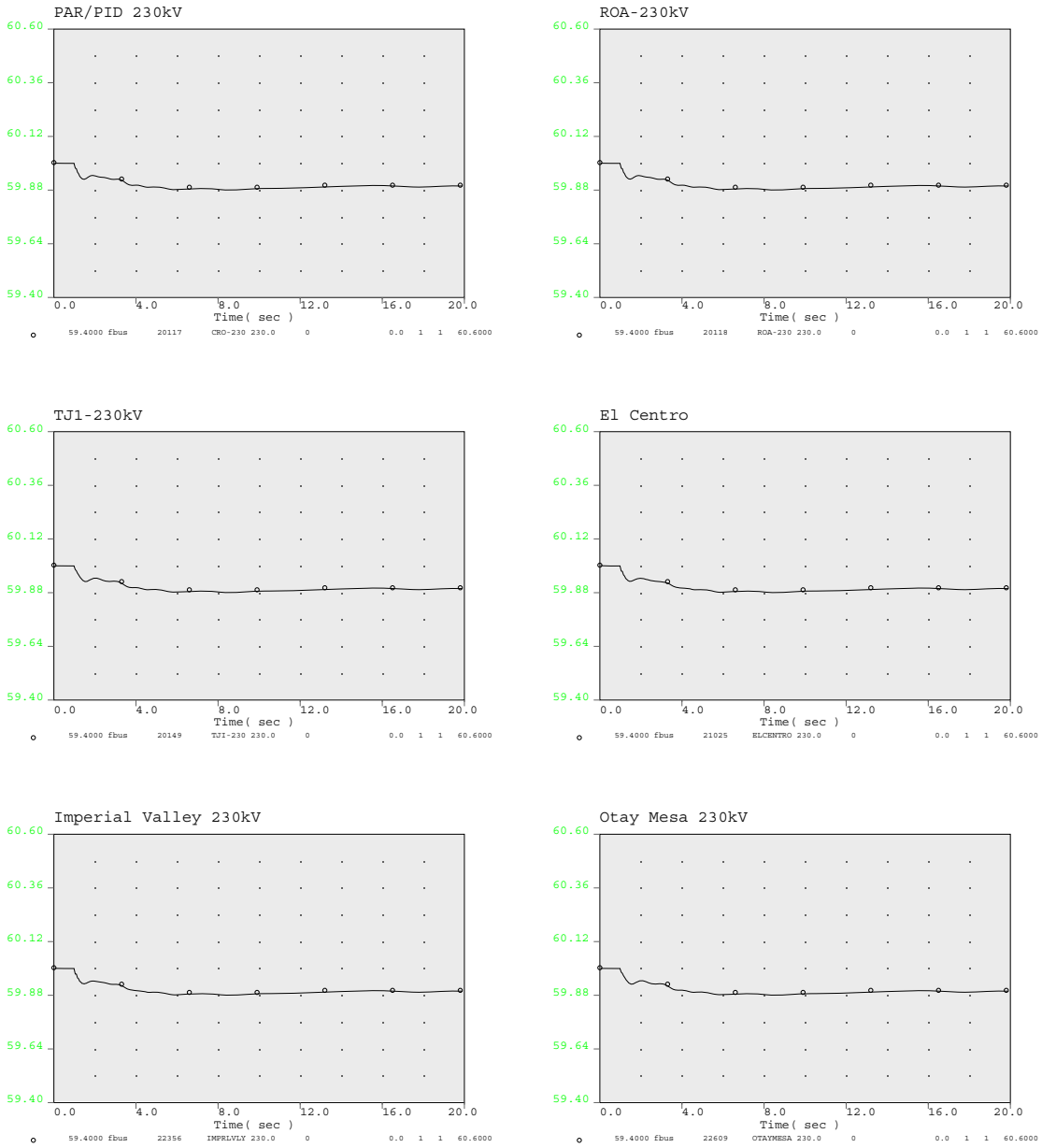


Otay Mesa 230kV



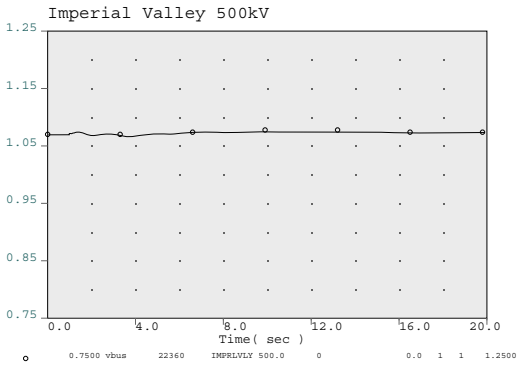
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

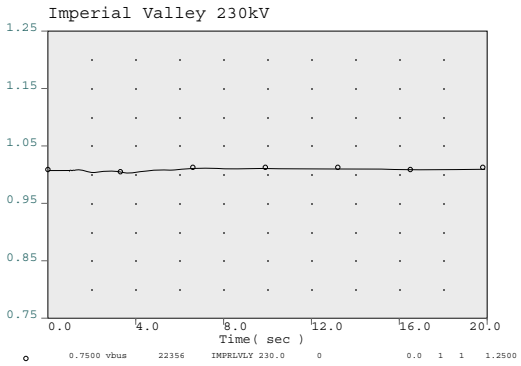
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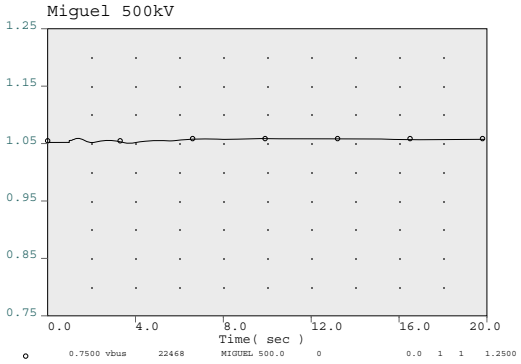


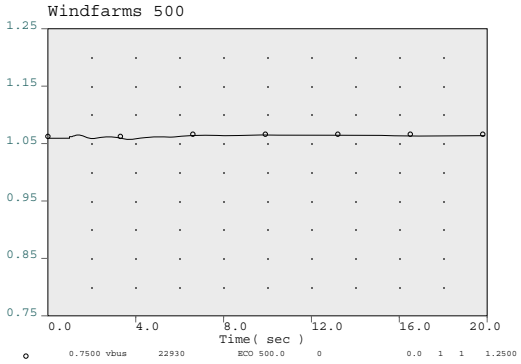
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

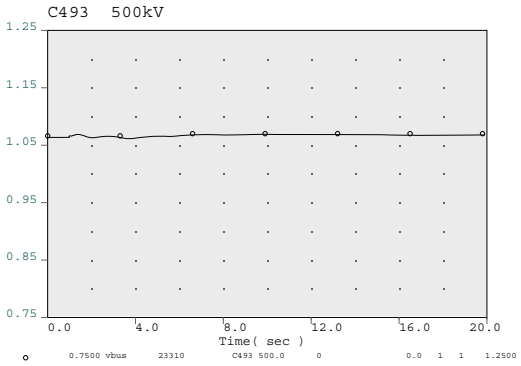
Imperial Valley Area - VOLTAGE

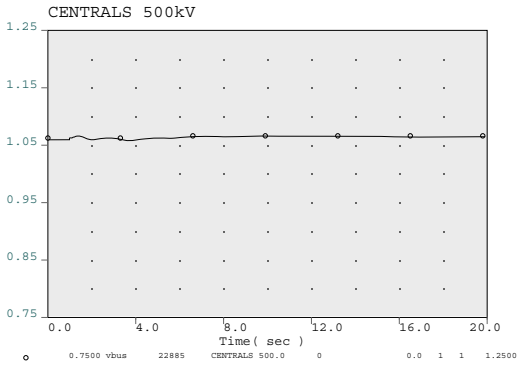






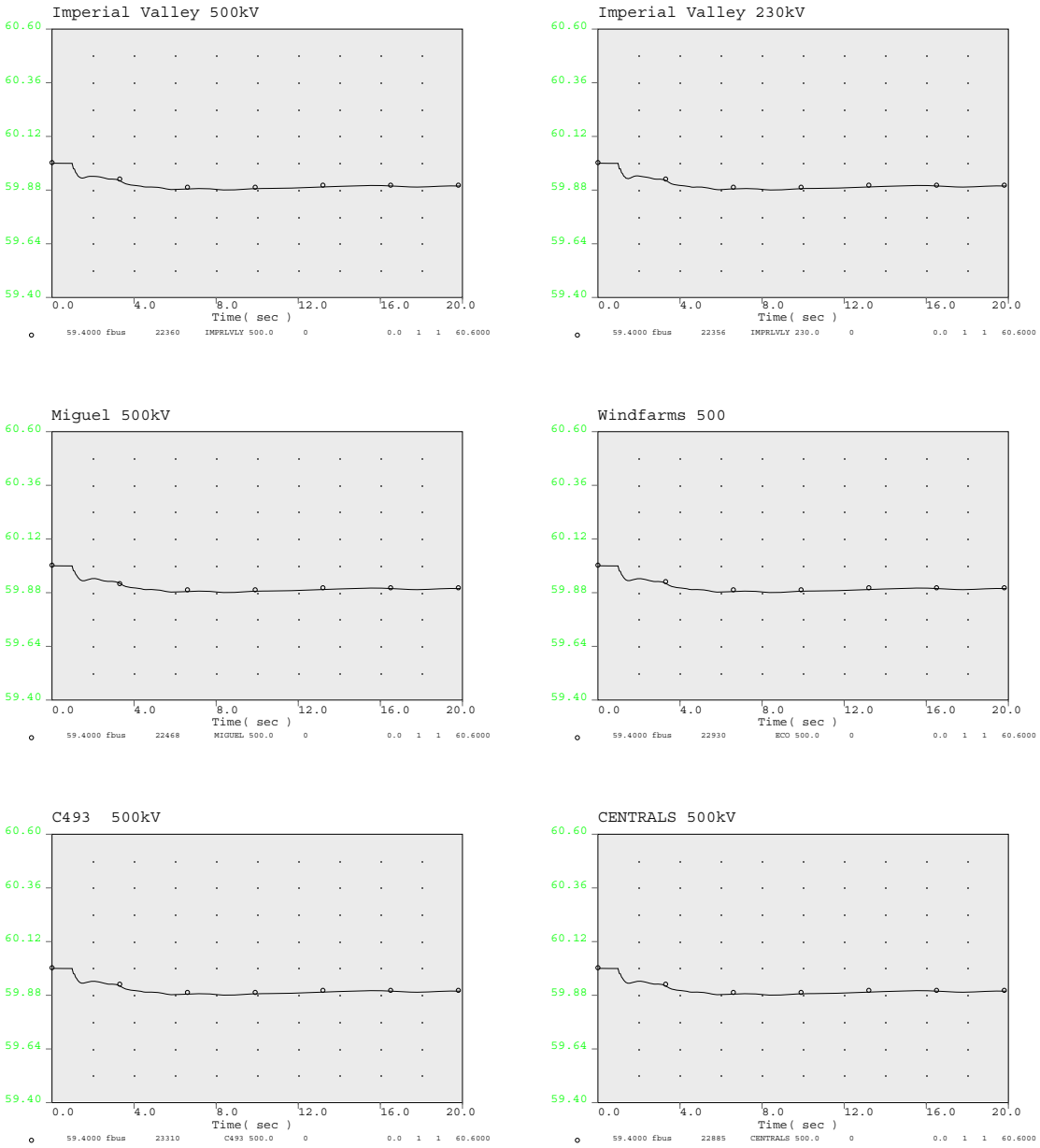






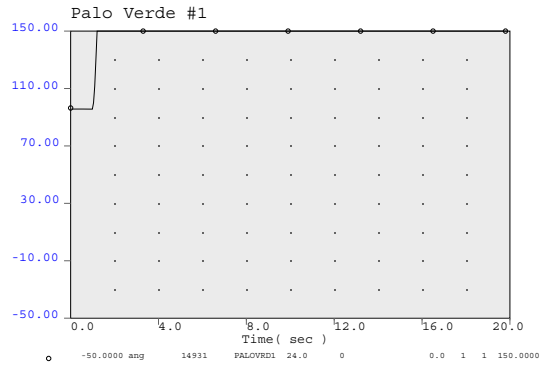
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

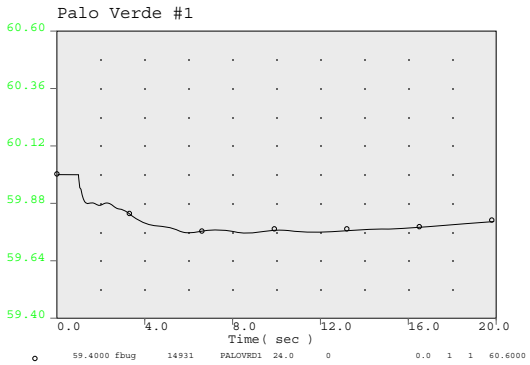
Imperial Valley Area - Frequency

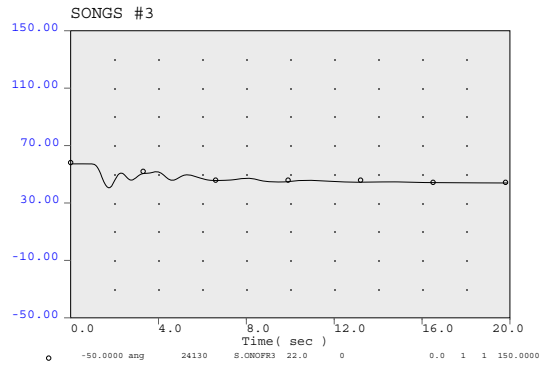


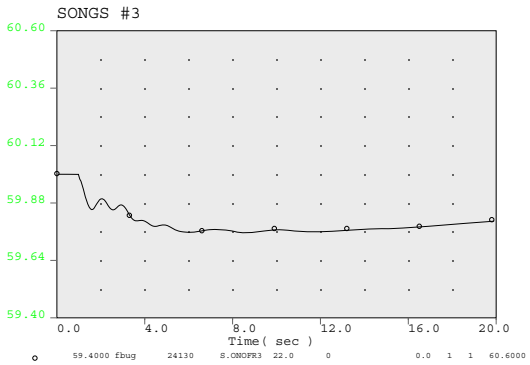
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generator #2

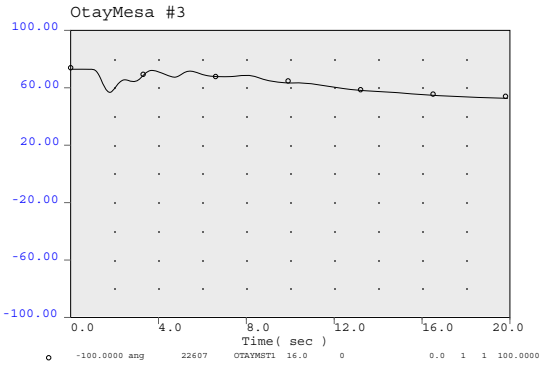
RELATIVE ROTOR ANGLE & FREQUENCY

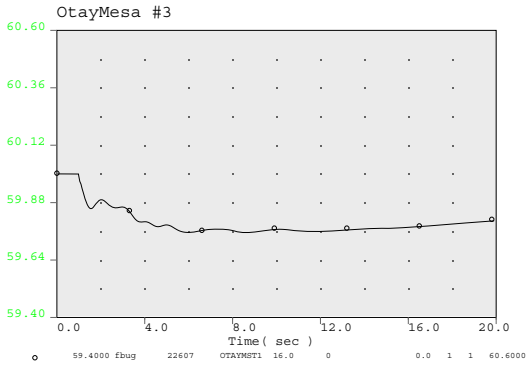










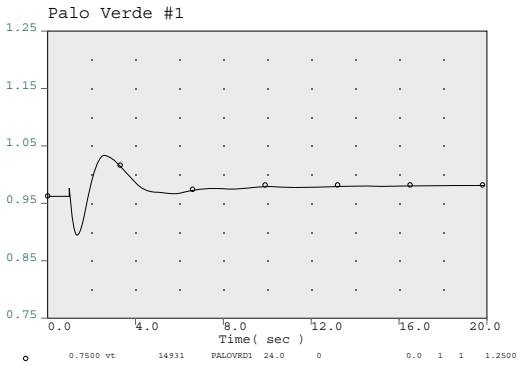


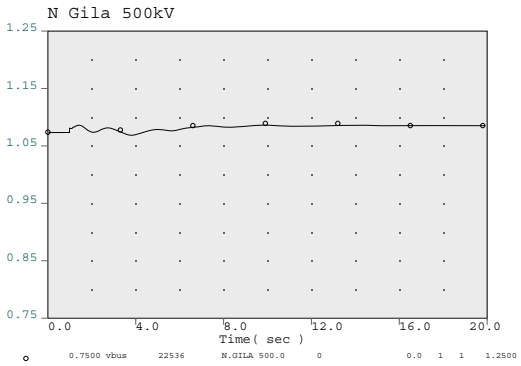
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

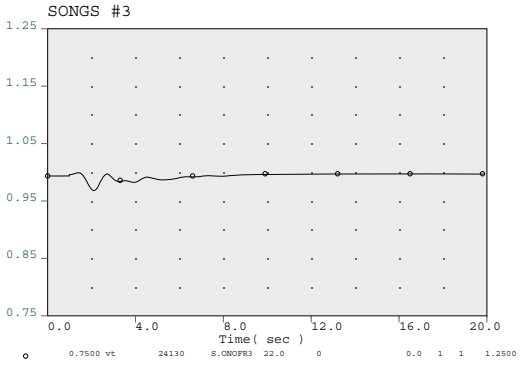
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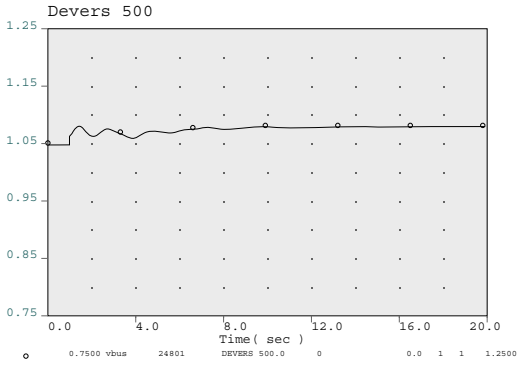
PaloVerde-g2_pst_ll_bu.chf | 2_p_i\ll\pst_bu\ws_pst_bu | Tue Nov 02 07:29:56 2010

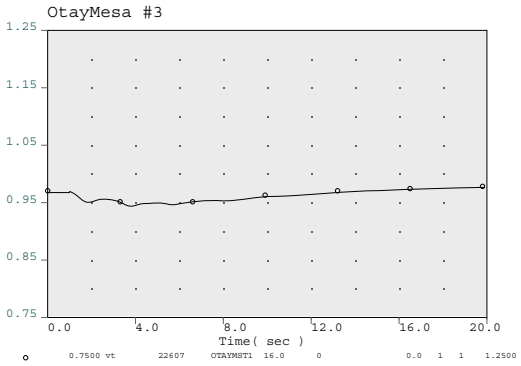
RELATIVE VOLTAGE

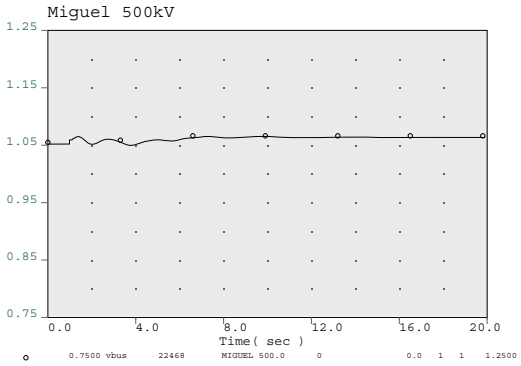








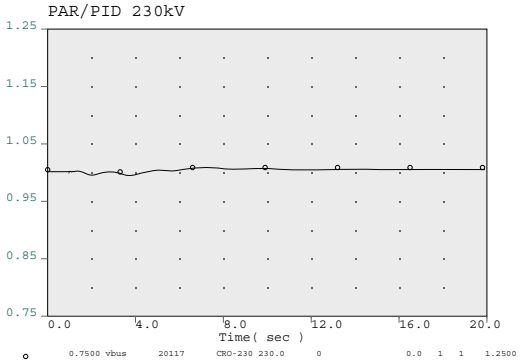




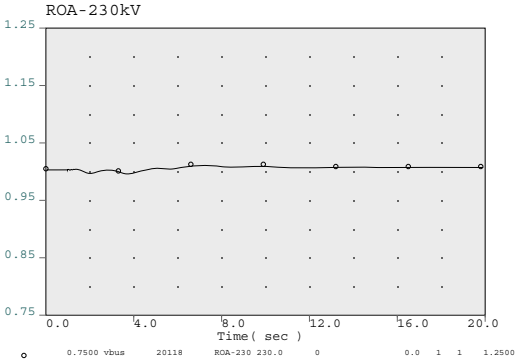
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

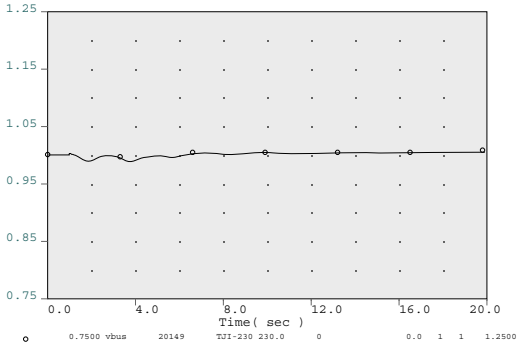
PAR/PID 230kV



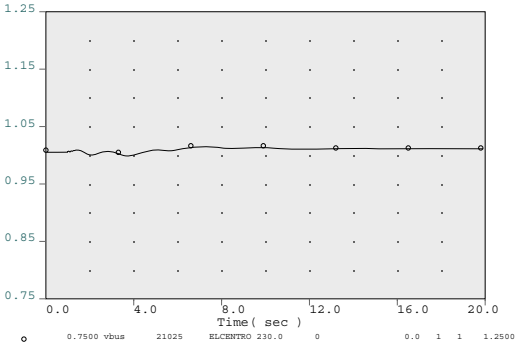
ROA-230kV



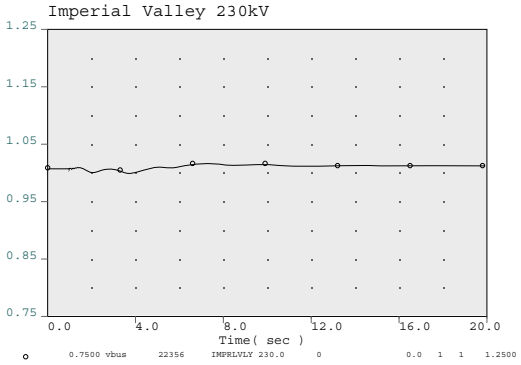
TJ1-230kV



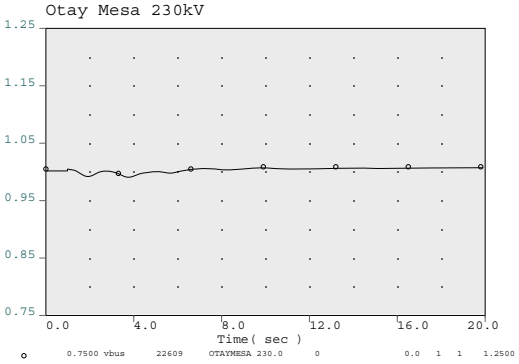
El Centro



Imperial Valley 230kV

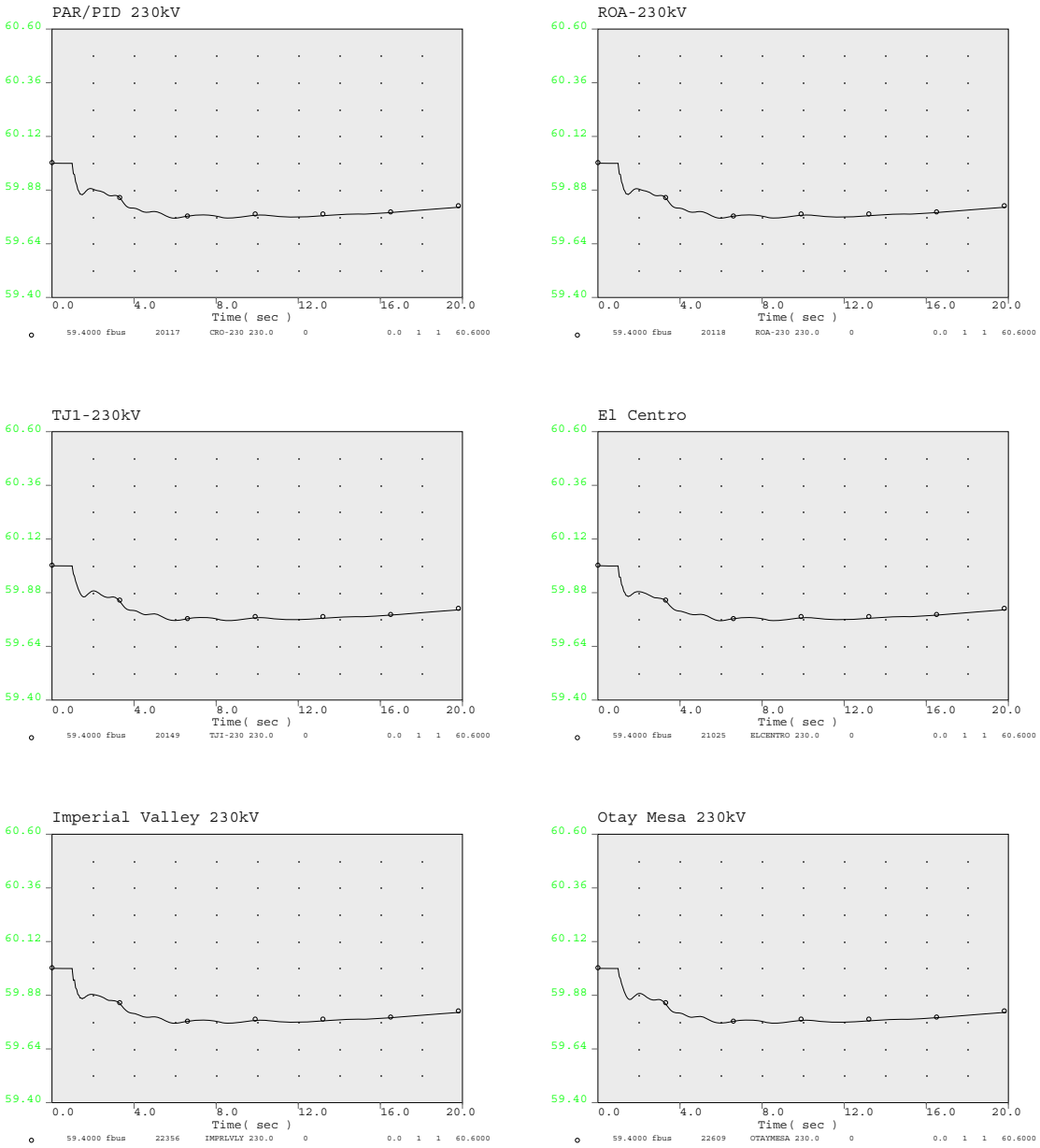


Otay Mesa 230kV



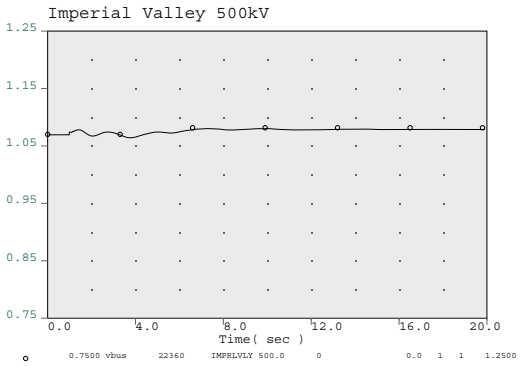
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

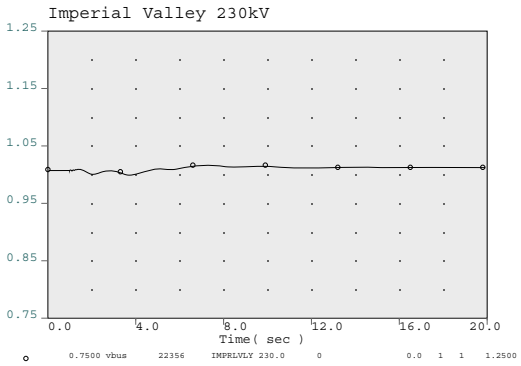
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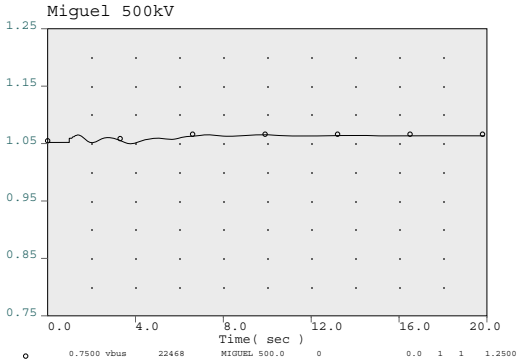


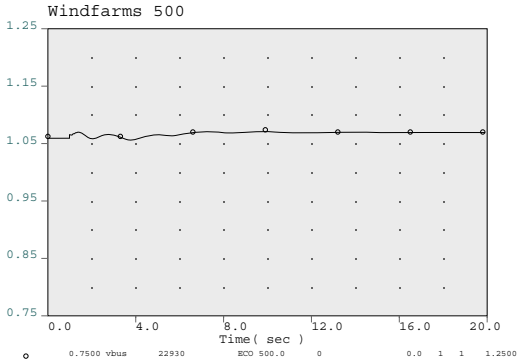
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

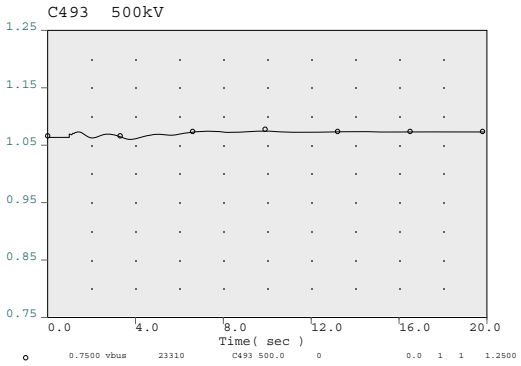
Imperial Valley Area - VOLTAGE

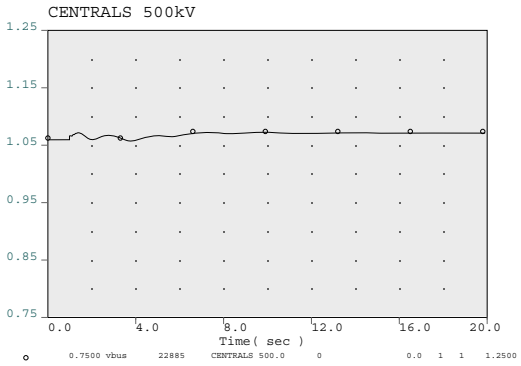






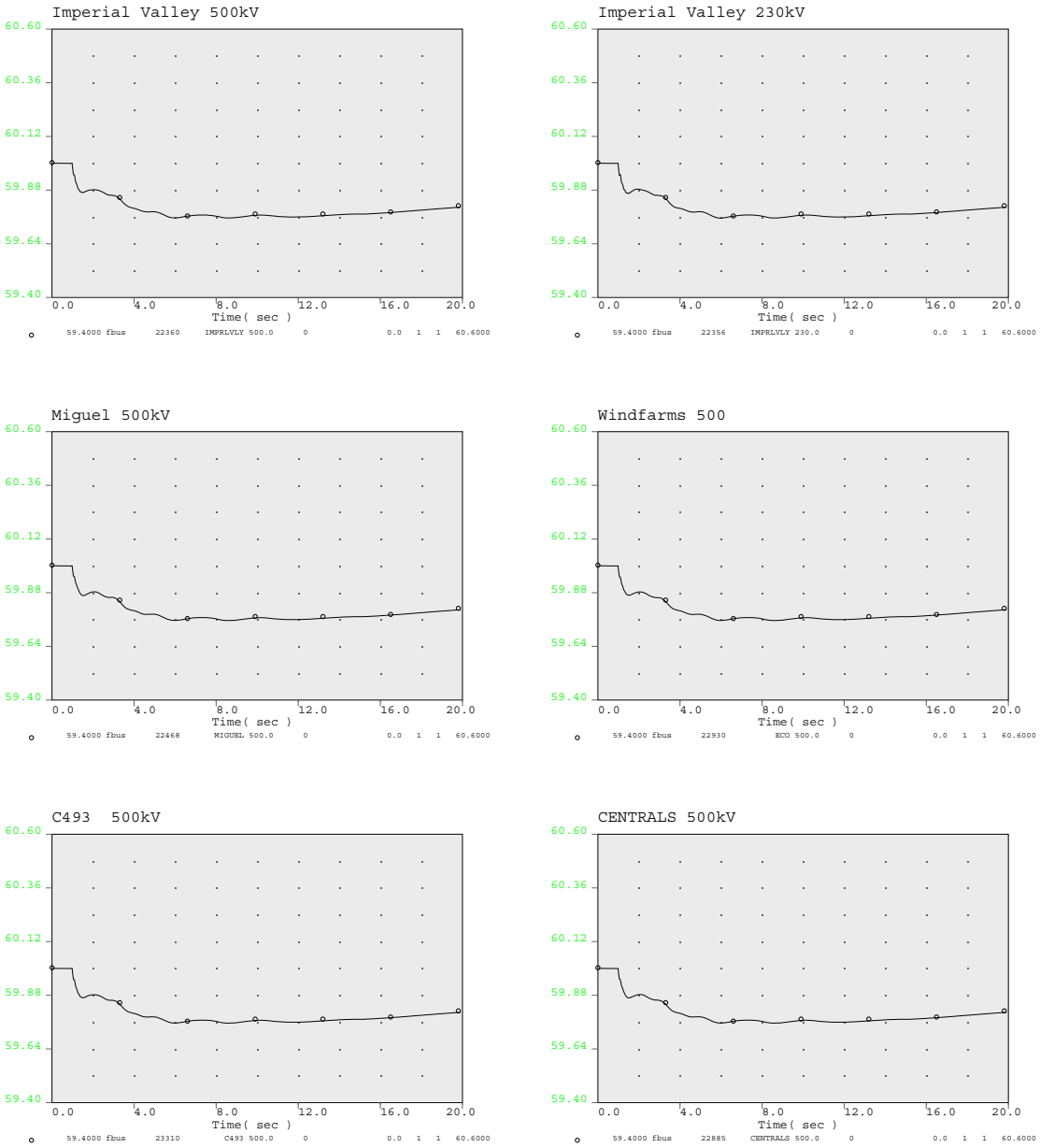






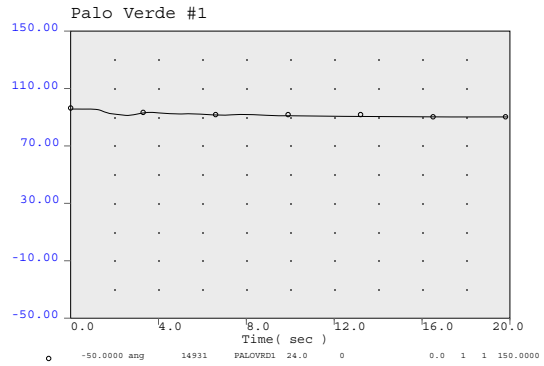
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

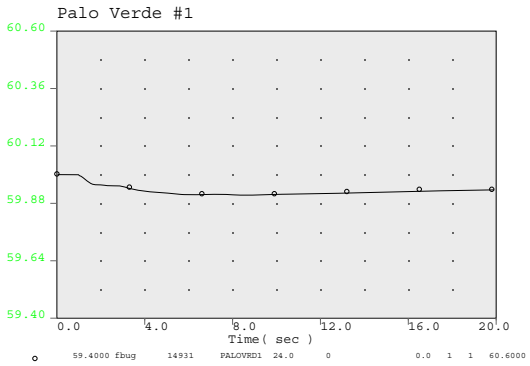
Imperial Valley Area - Frequency

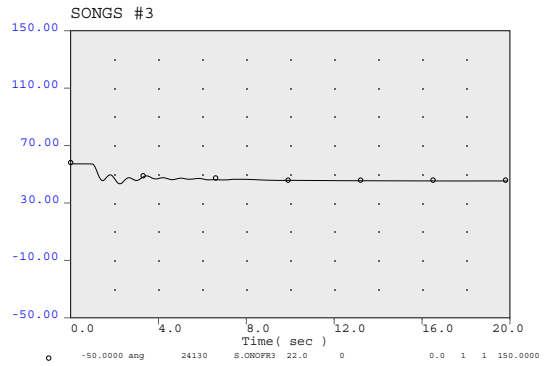


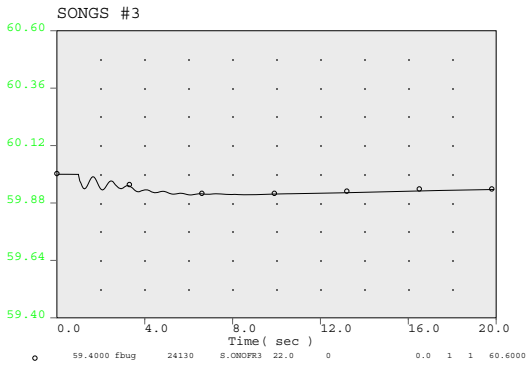
SDG&E Cluster 2 - post
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

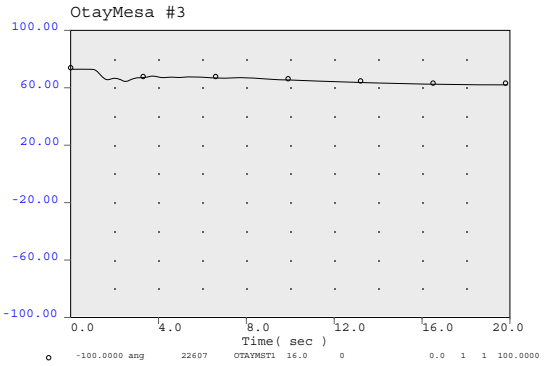
RELATIVE ROTOR ANGLE & FREQUENCY

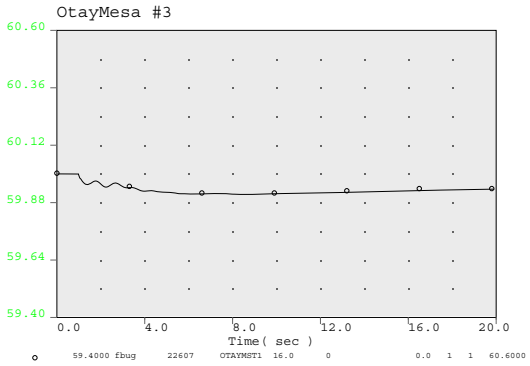










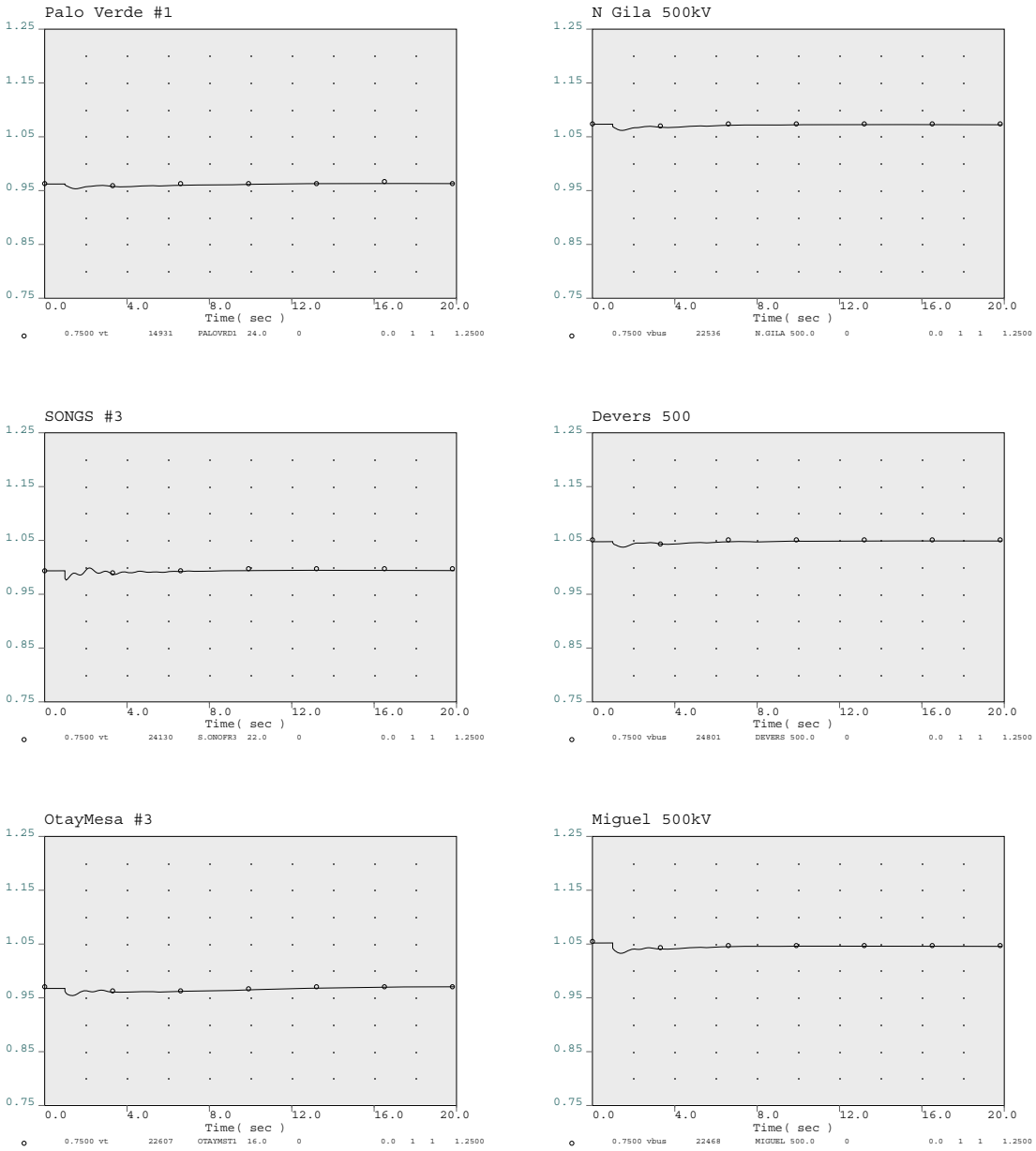


SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Page 1

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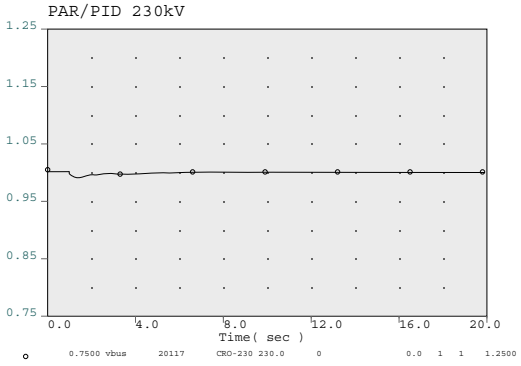
RELATIVE VOLTAGE



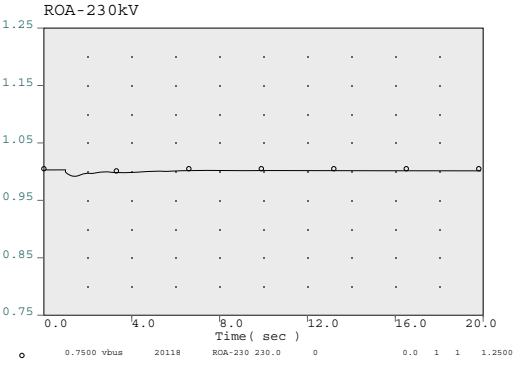
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

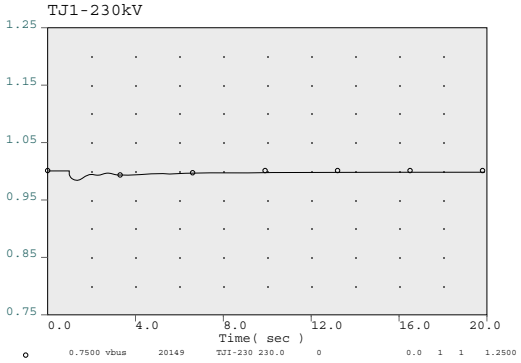
PAR/PID 230kV



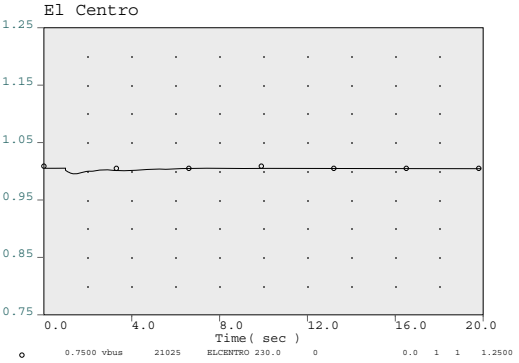
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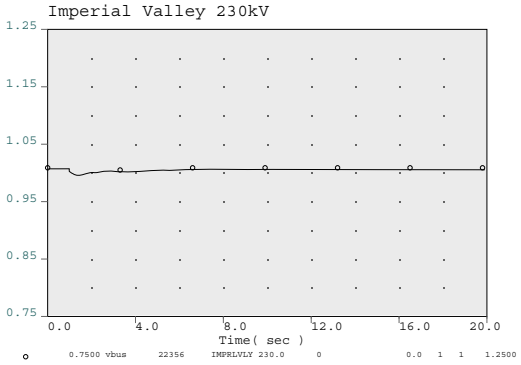
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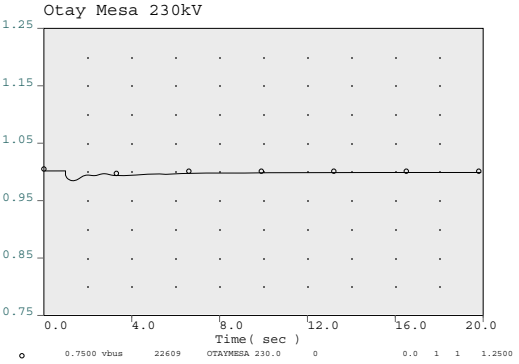
El Centro



Imperial Valley 230kV



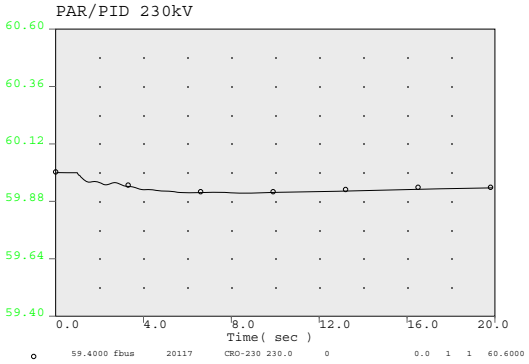
Otay Mesa 230kV



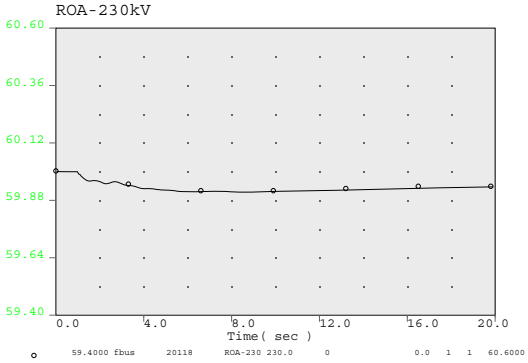
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison

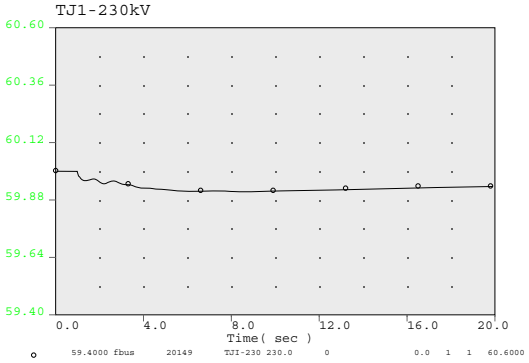
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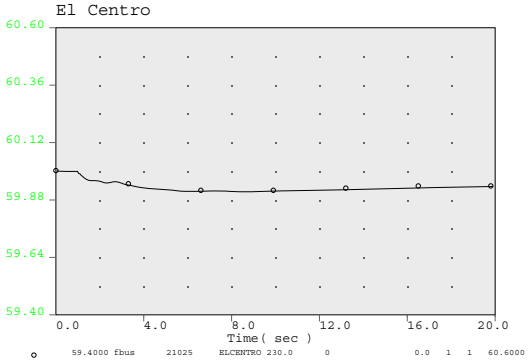
ROA-230kV



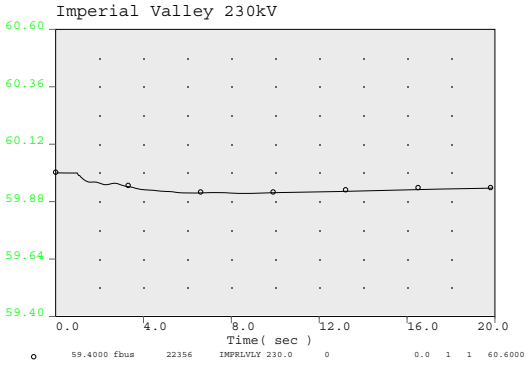
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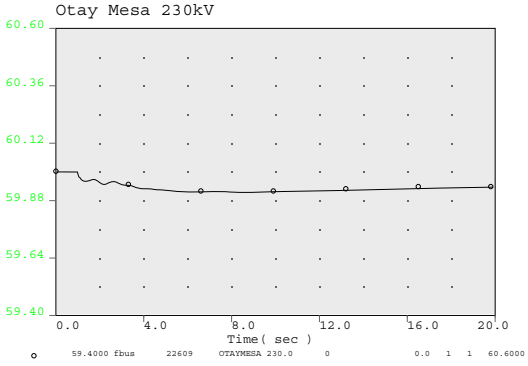
El Centro



Imperial Valley 230kV

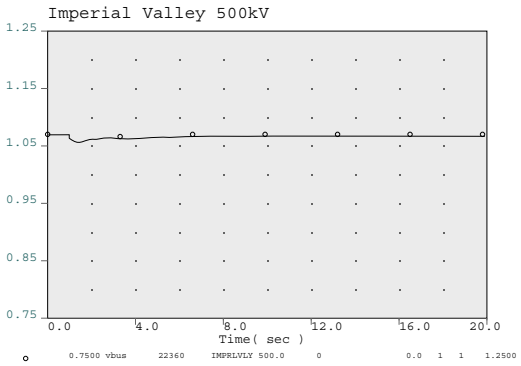


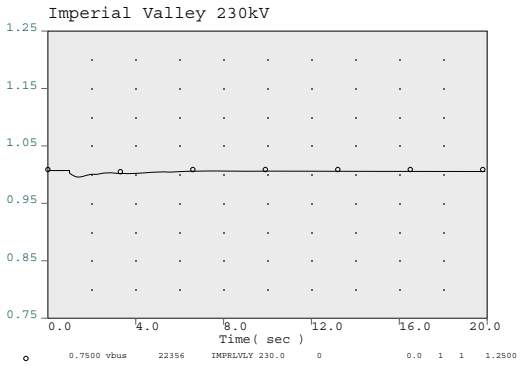
Otay Mesa 230kV

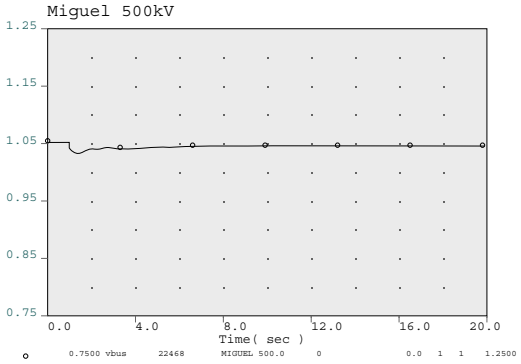


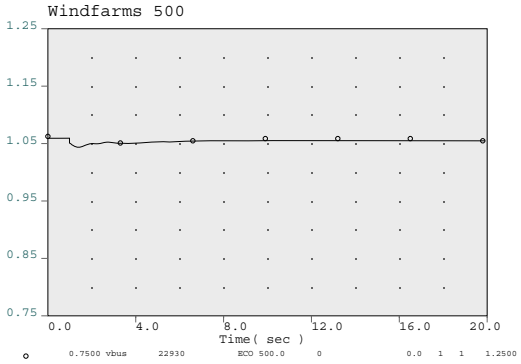
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

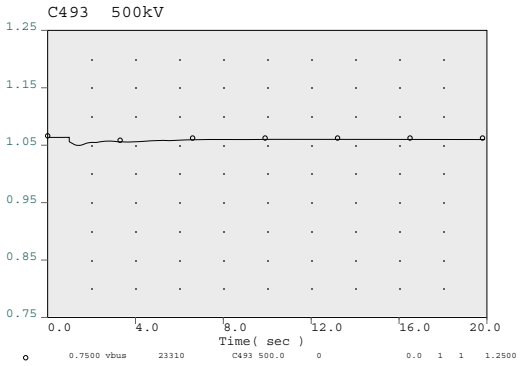
Imperial Valley Area - VOLTAGE

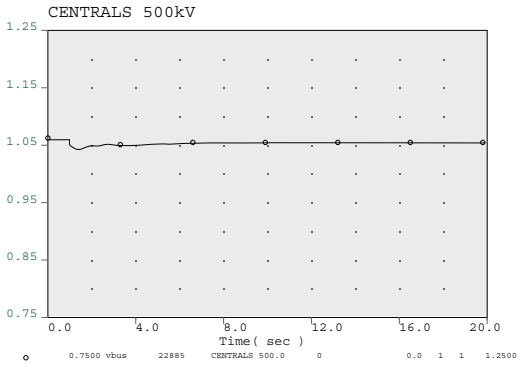






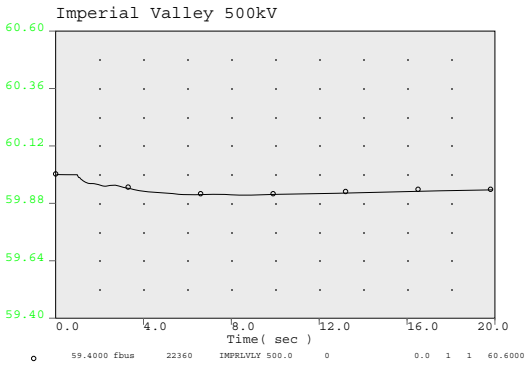


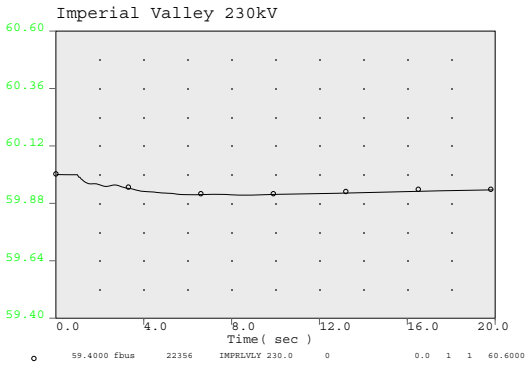


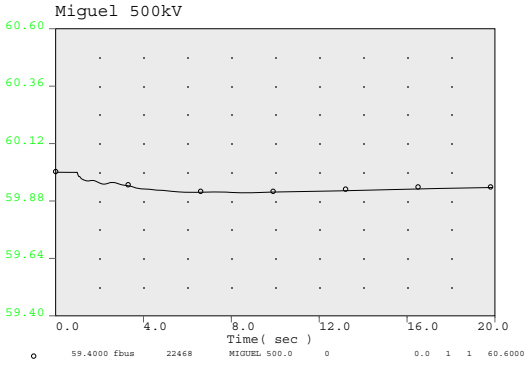


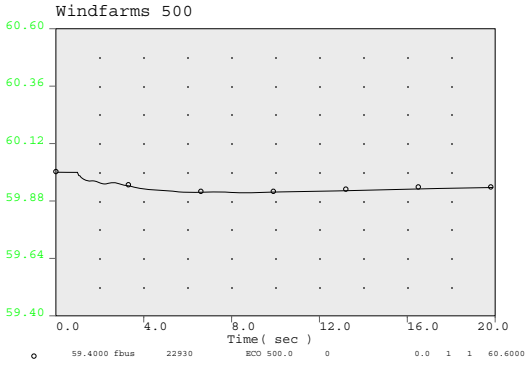
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

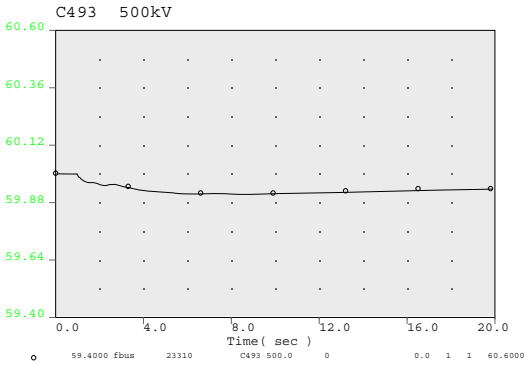
Imperial Valley Area - Frequency

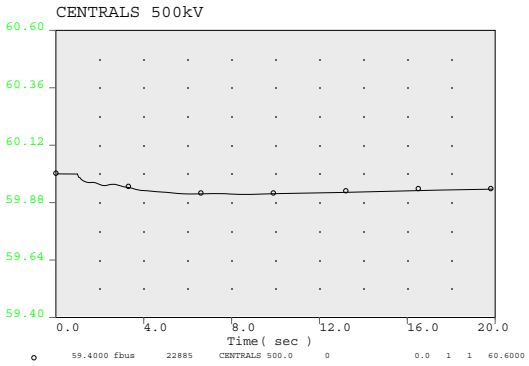






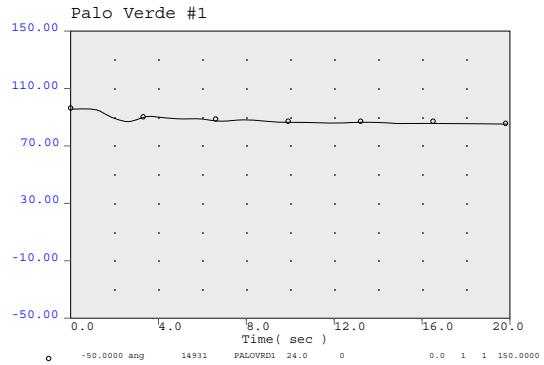


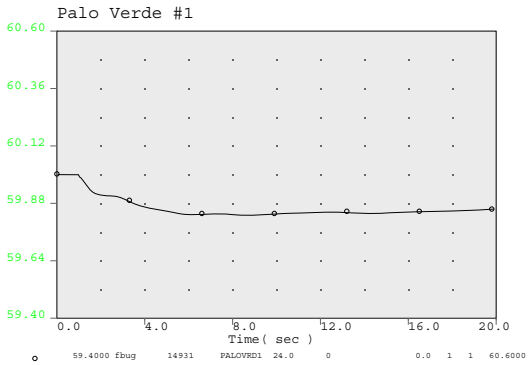


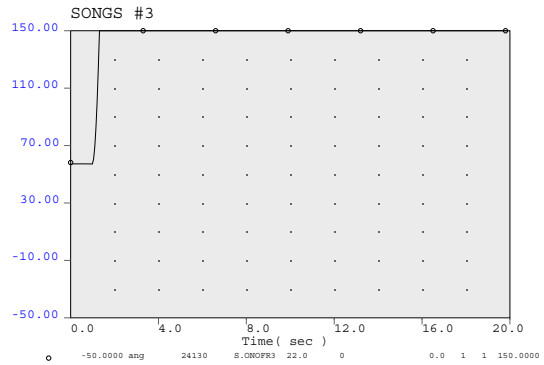


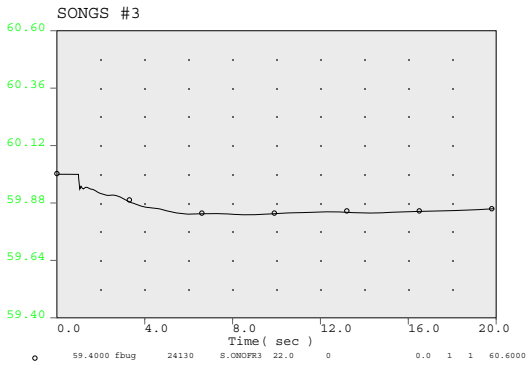
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generator #2

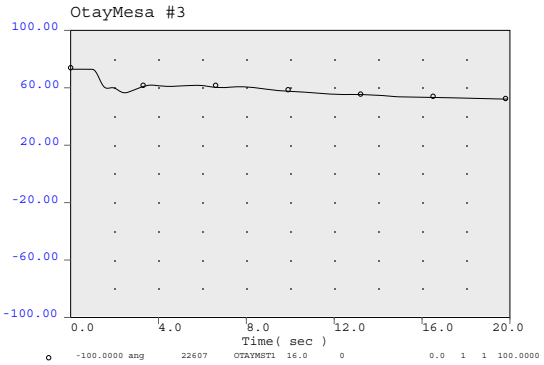
RELATIVE ROTOR ANGLE & FREQUENCY

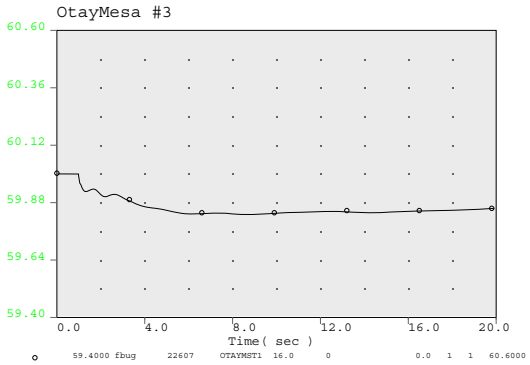












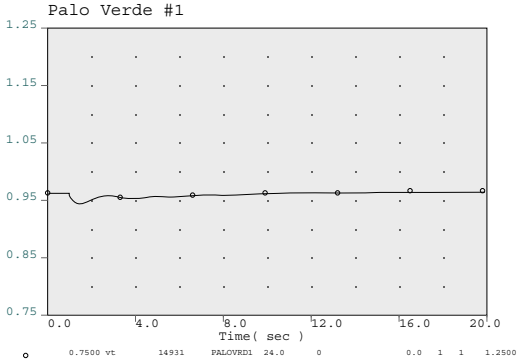
SDG&E Cluster 2 - post
2014 Light Autumn
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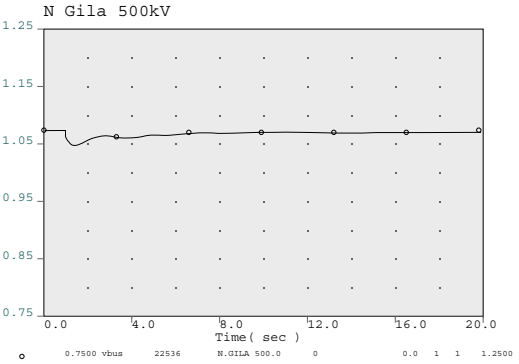
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RELATIVE VOLTAGE

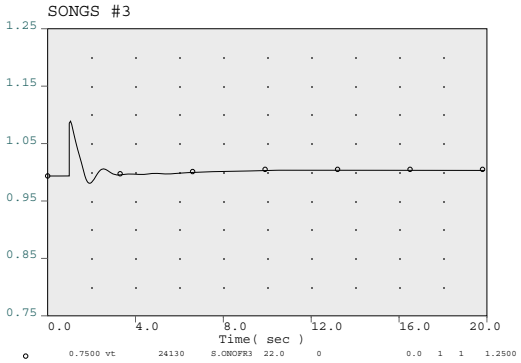
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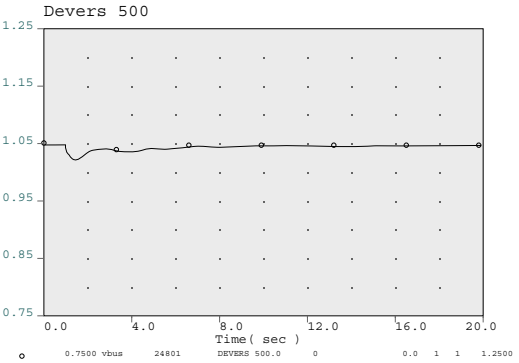
N Gila 500kV



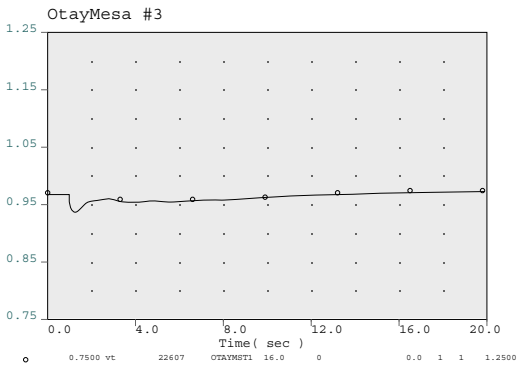
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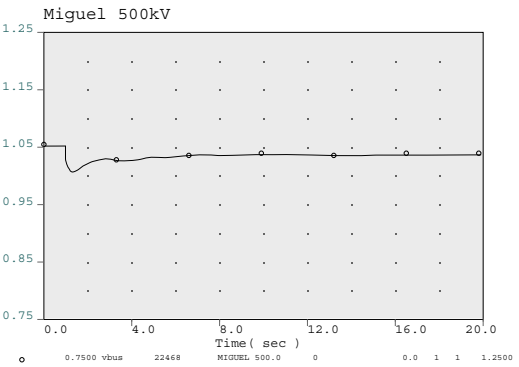
Devers 500



OtayMesa #3



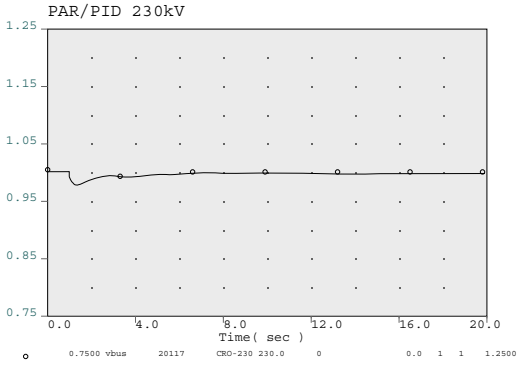
Miguel 500kV



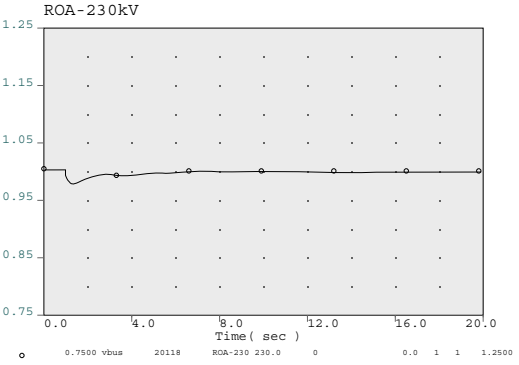
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

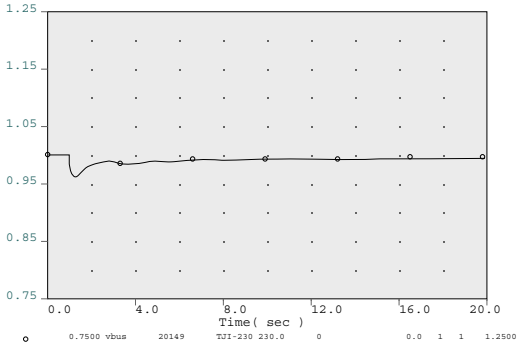
PAR/PID 230kV



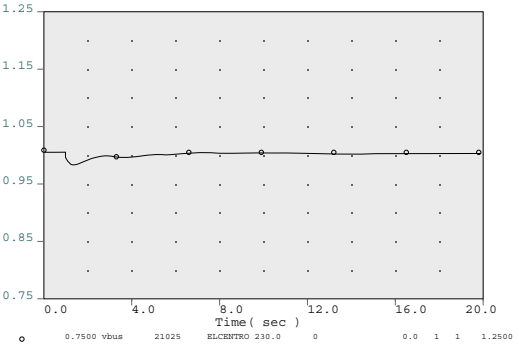
ROA-230kV



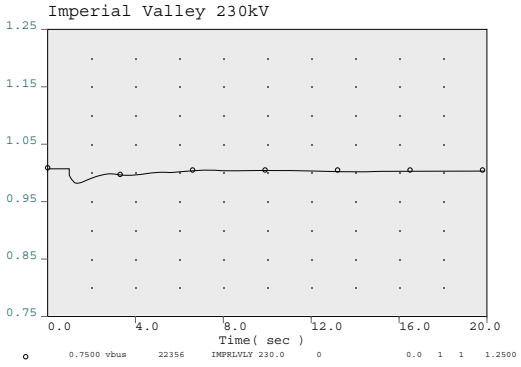
TJ1-230kV



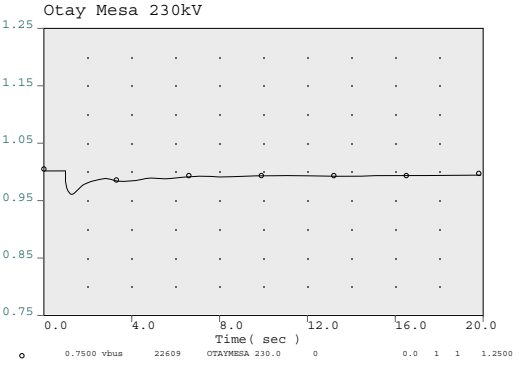
El Centro



Imperial Valley 230kV

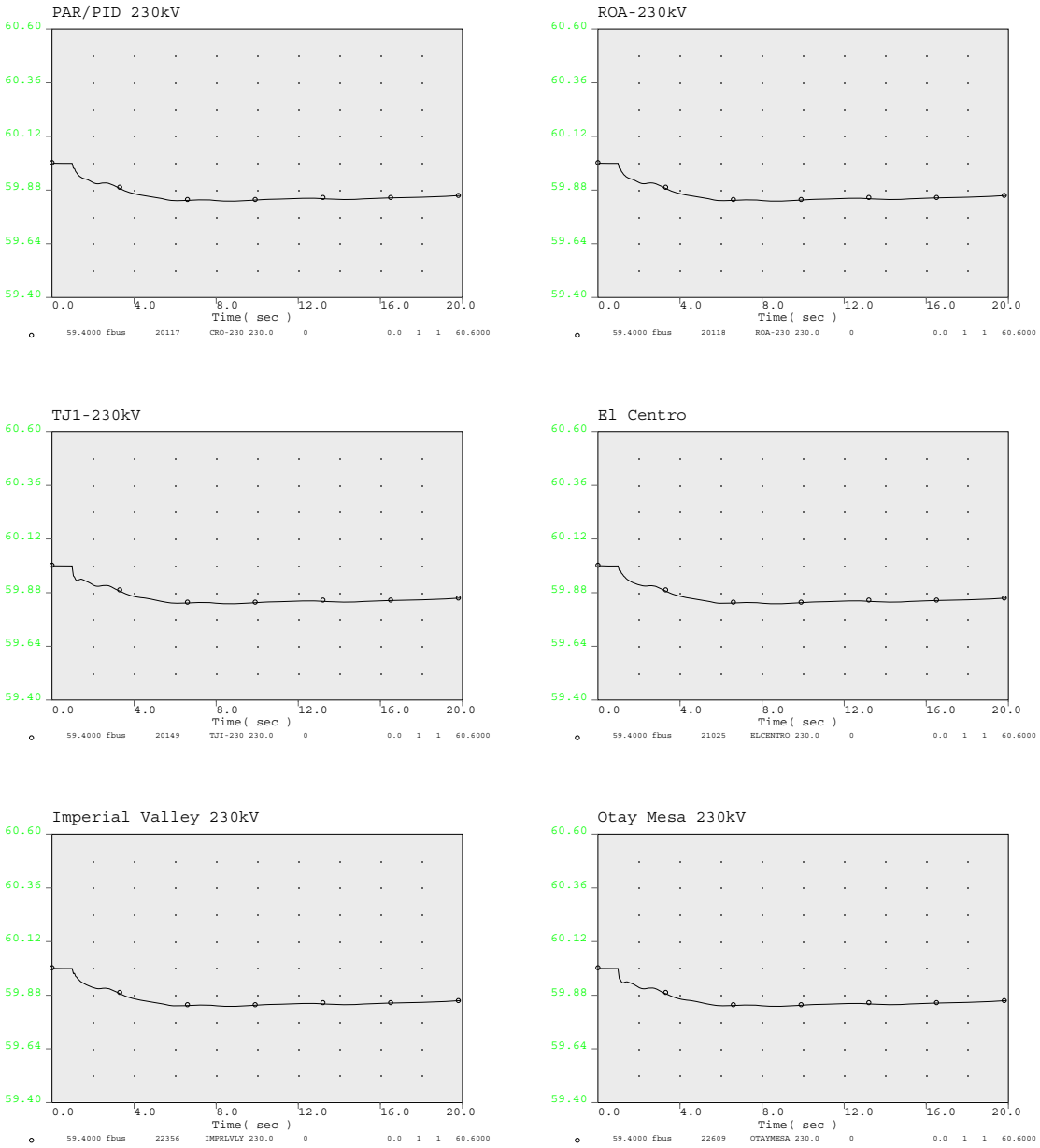


Otay Mesa 230kV



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2014 Light Autumn
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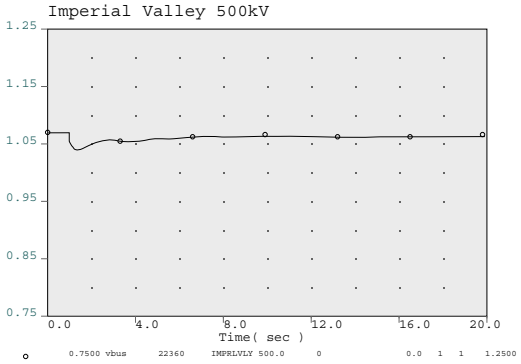
Affected System Frequency Check and Comparison



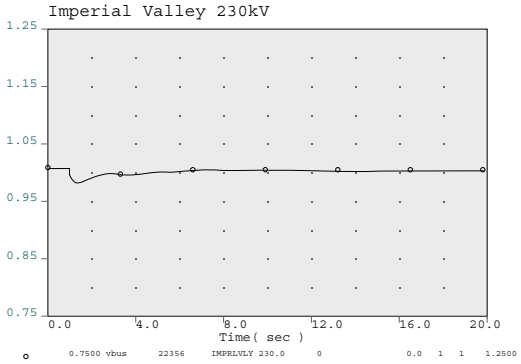
SDG&E Cluster 2 - post
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

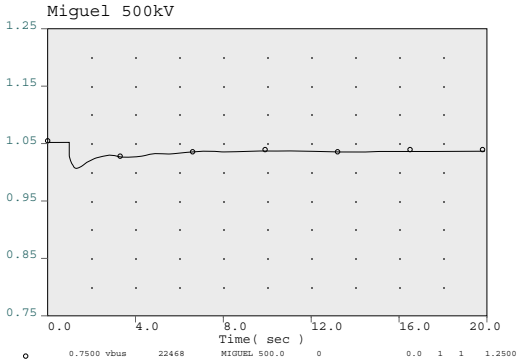
Imperial Valley 500kV



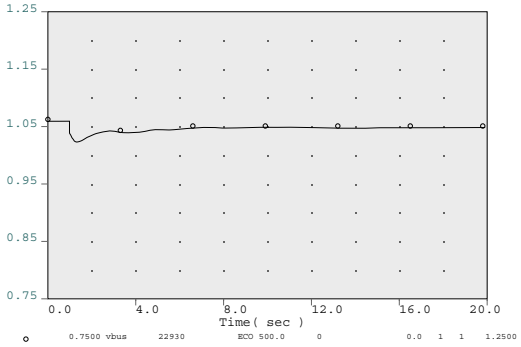
Imperial Valley 230kV



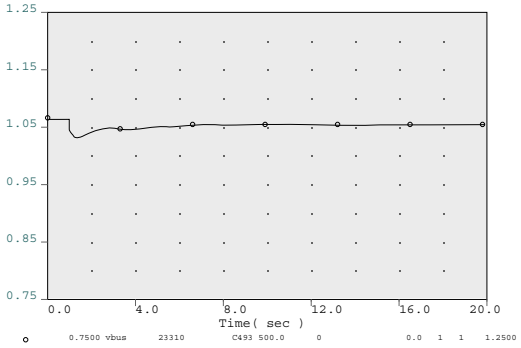
Miguel 500kV



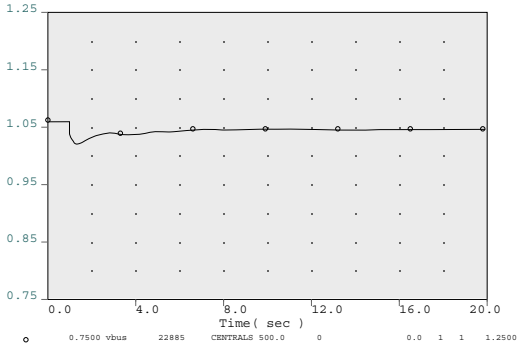
Windfarms 500



C493 500kV



CENTRALS 500kV

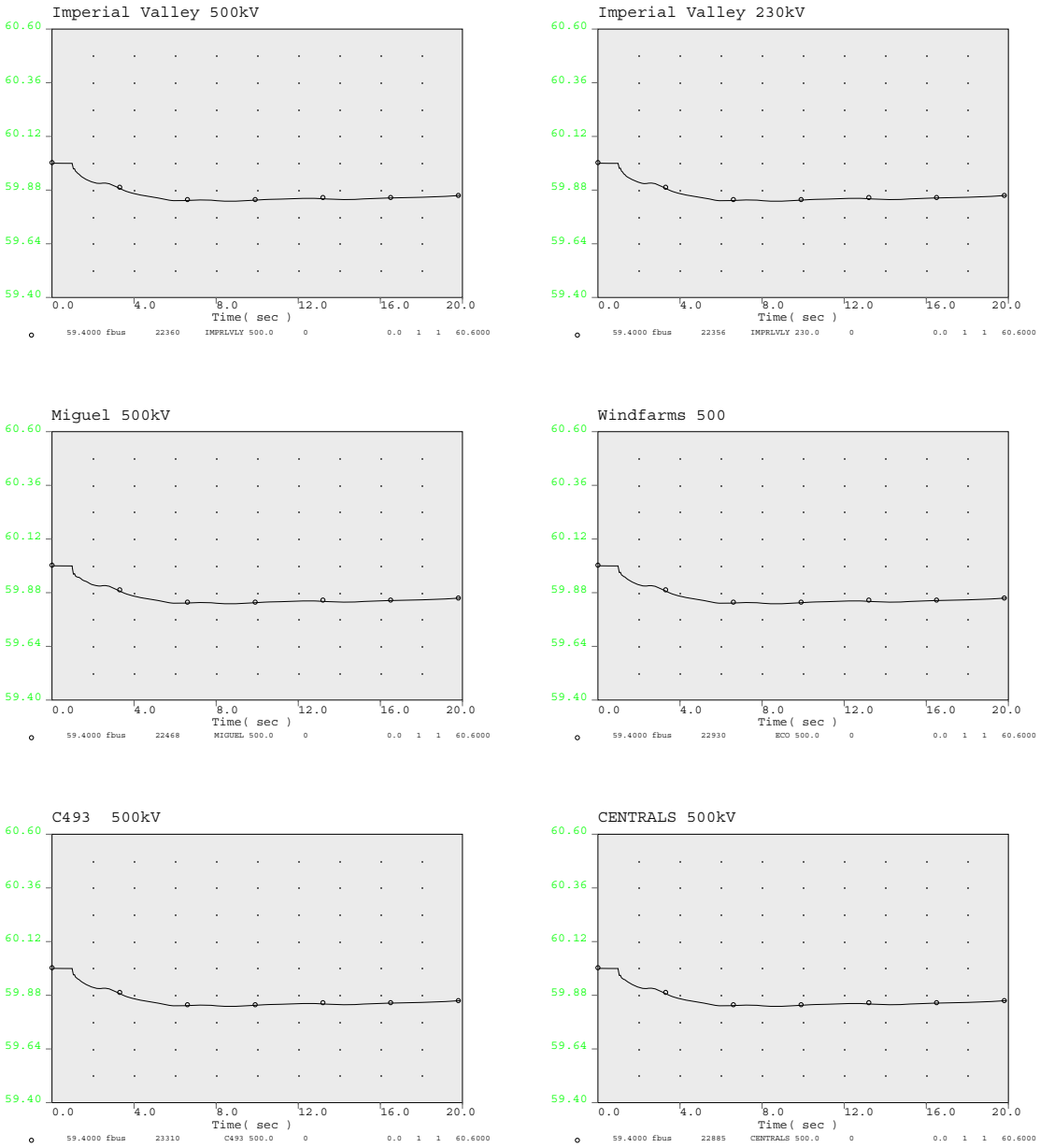


SDG&E Cluster 2 - post
2014 Light Autumn
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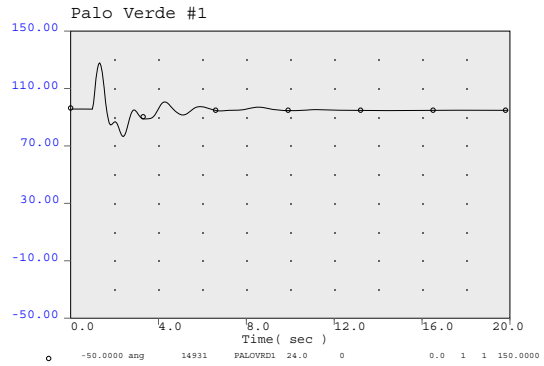
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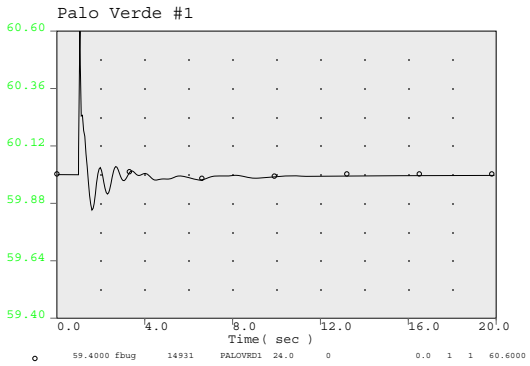
Imperial Valley Area - Frequency

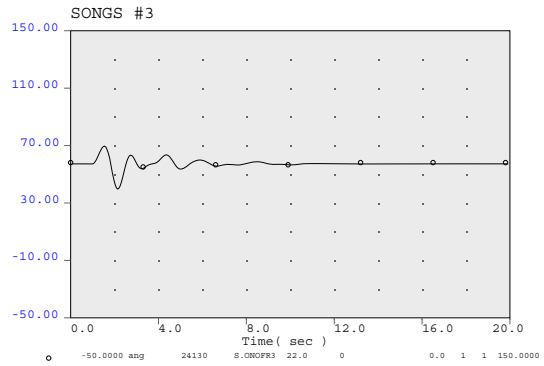


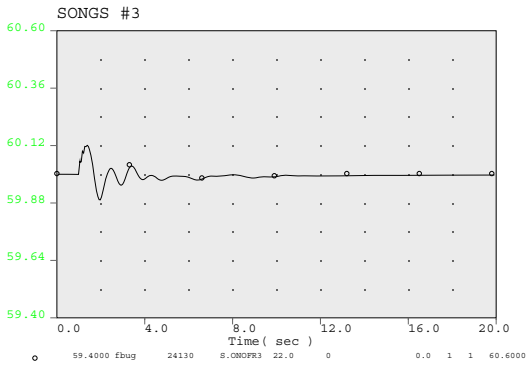
SDG&E Cluster 2 - post
2014 Light Autumn
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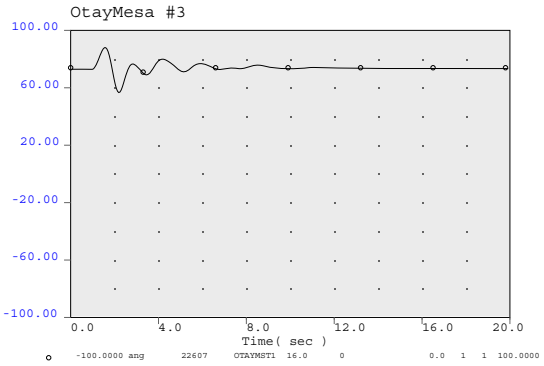
RELATIVE ROTOR ANGLE & FREQUENCY

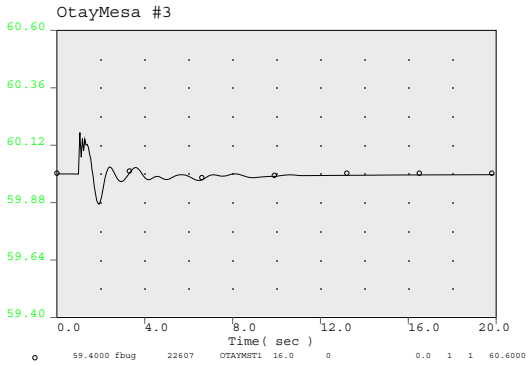












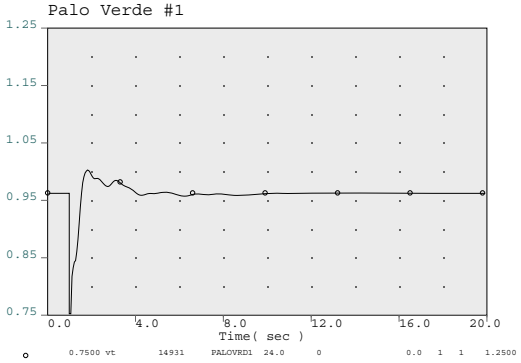
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Page 1

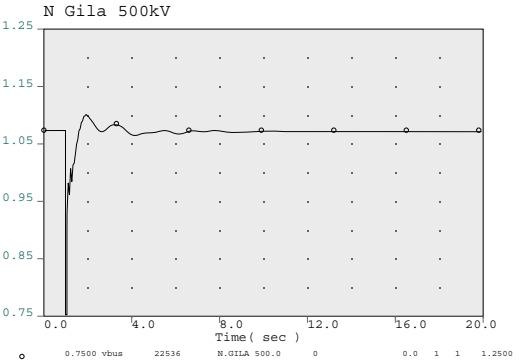
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RELATIVE VOLTAGE

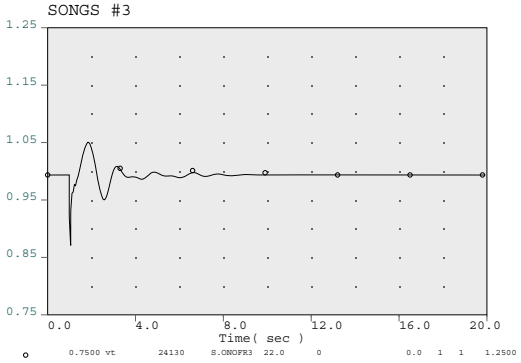
Palo Verde #1



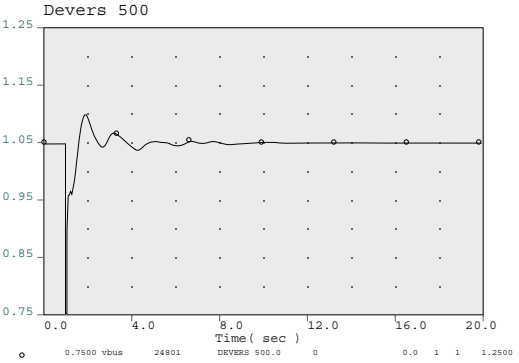
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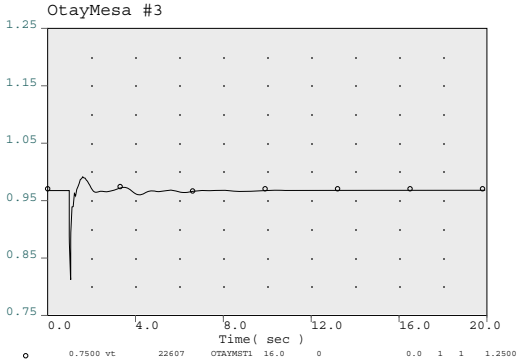
SONGS #3



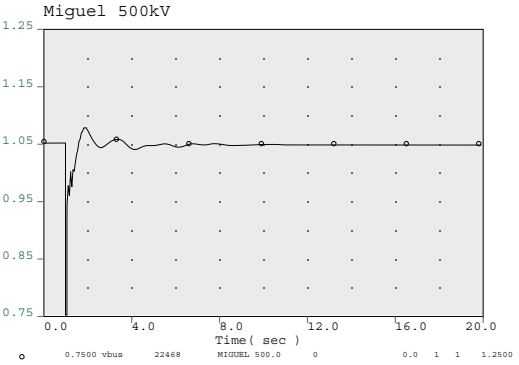
Devers 500



OtayMesa #3



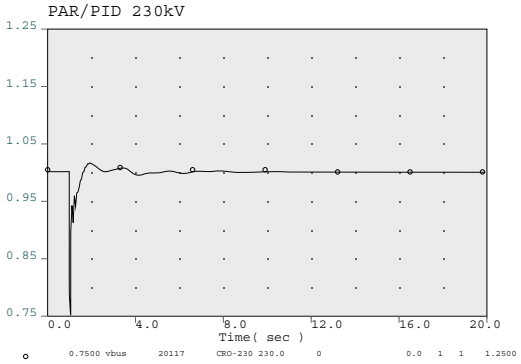
Miguel 500kV



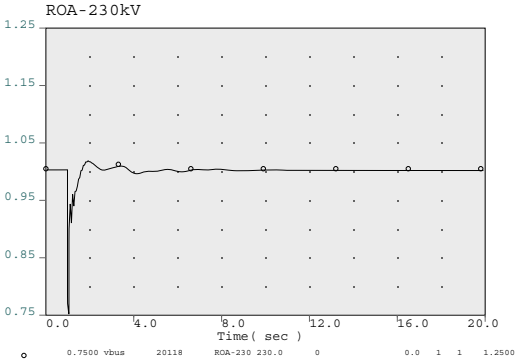
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

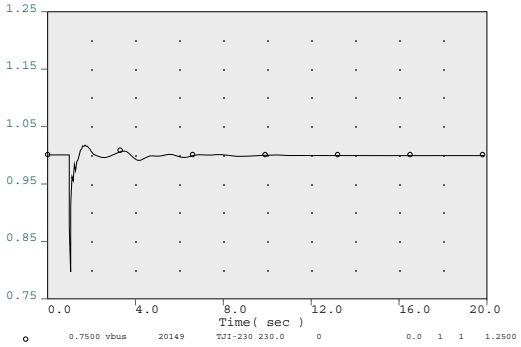
PAR/PID 230kV



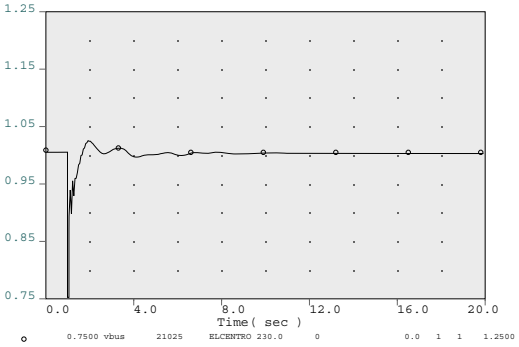
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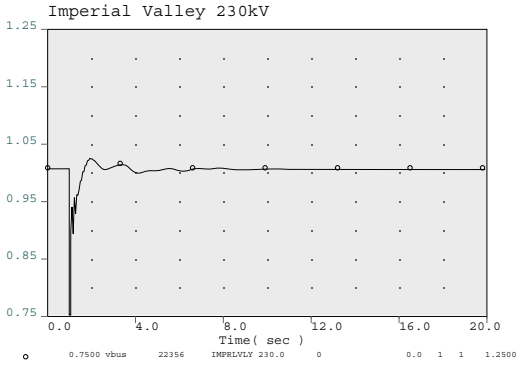
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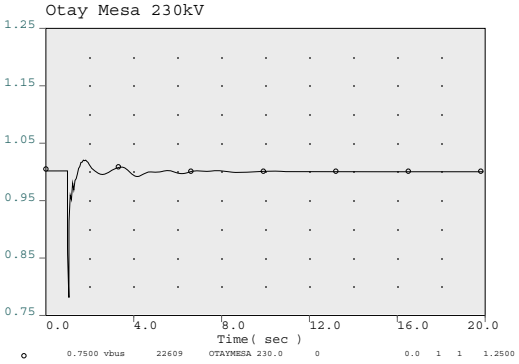
El Centro



Imperial Valley 230kV

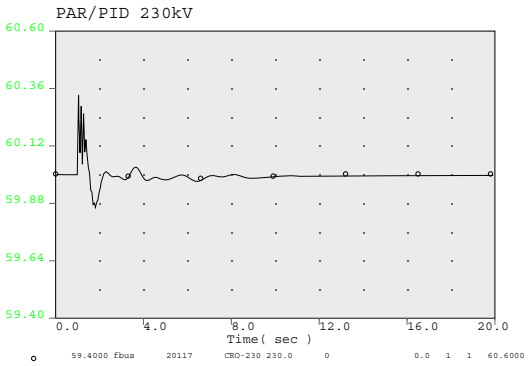


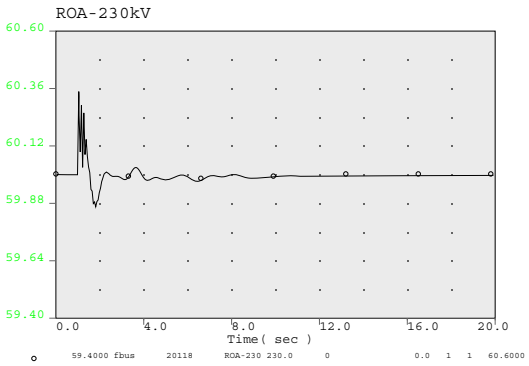
Otay Mesa 230kV

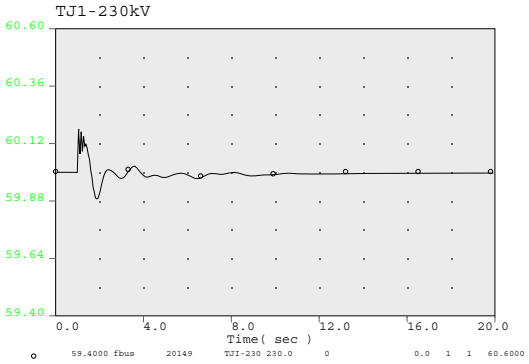


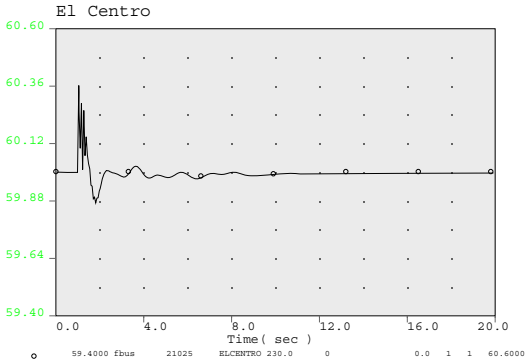
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

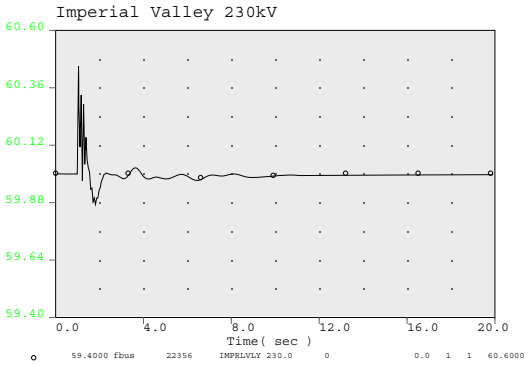
Affected System Frequency Check and Comparison

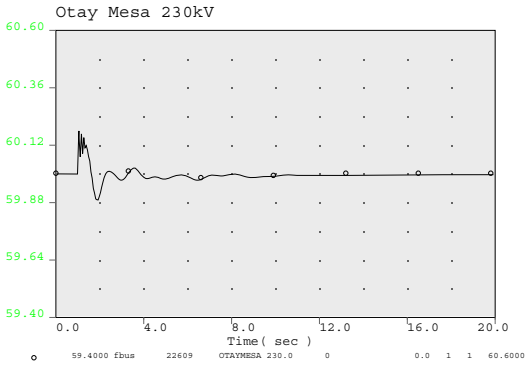








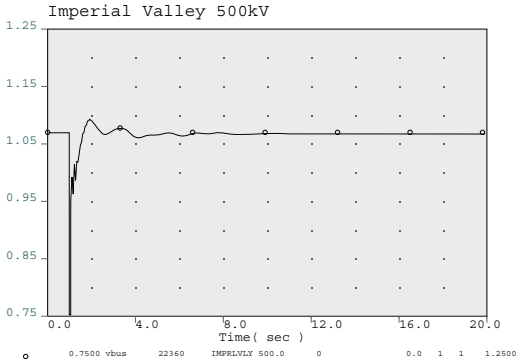




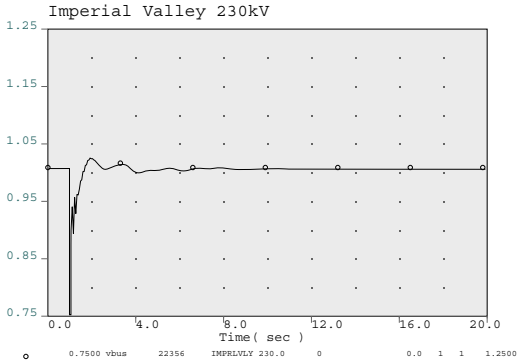
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

Imperial Valley Area - VOLTAGE

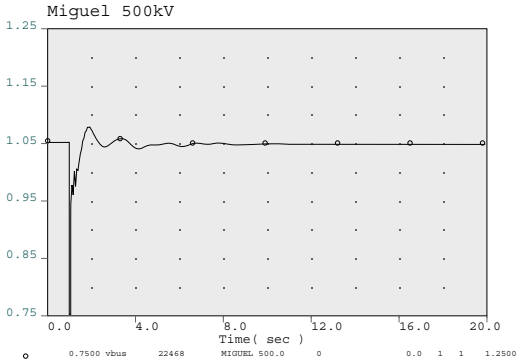
Imperial Valley 500kV



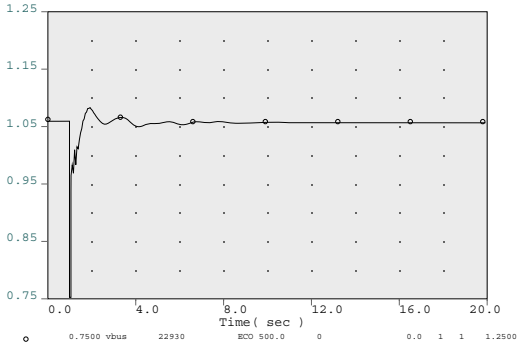
Imperial Valley 230kV



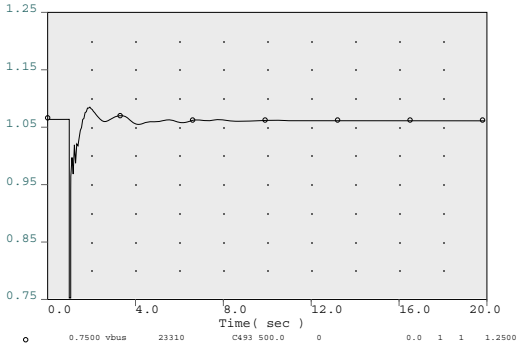
Miguel 500kV



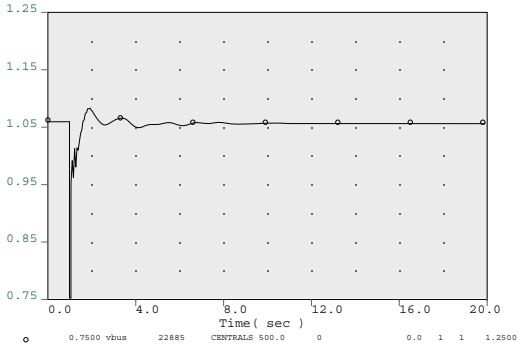
Windfarms 500



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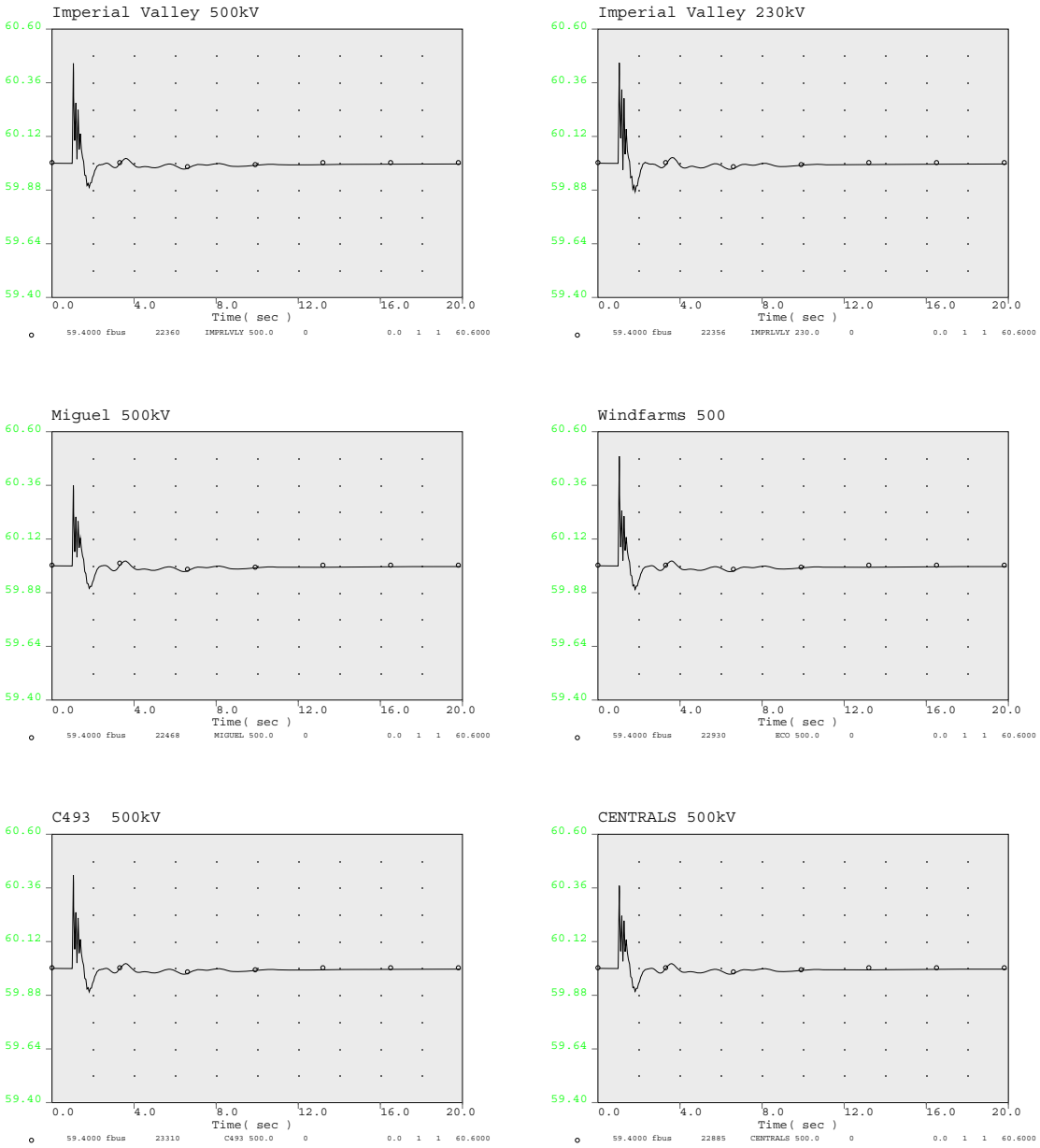


CENTRALS 500kV



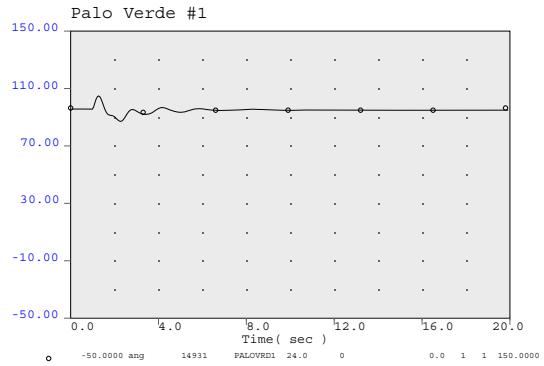
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

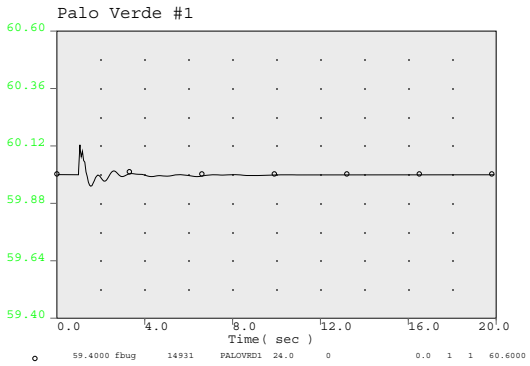
Imperial Valley Area - Frequency

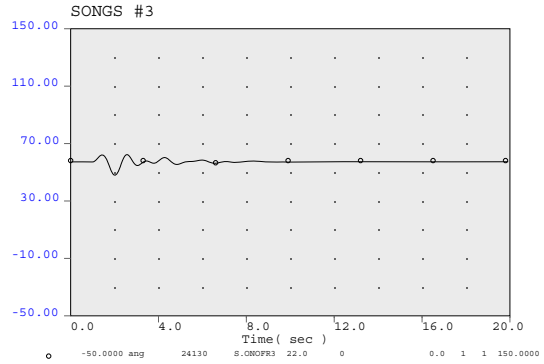


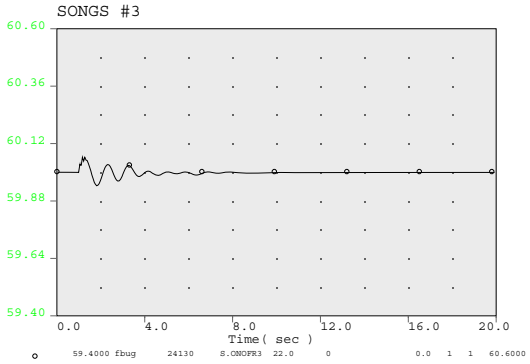
SDG&E Cluster 2 - post
2014 Light Autumn
T468-Hassyampa 500 kV line

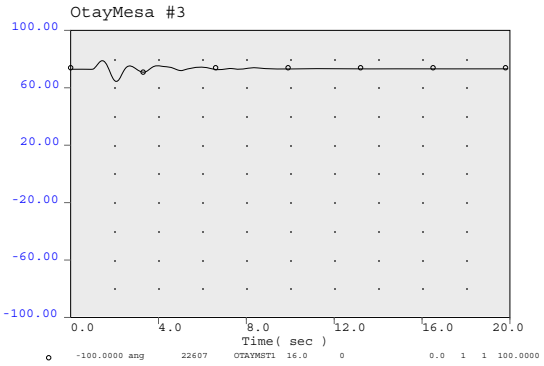
RELATIVE ROTOR ANGLE & FREQUENCY

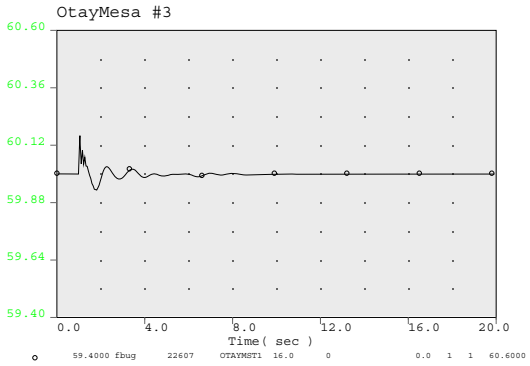












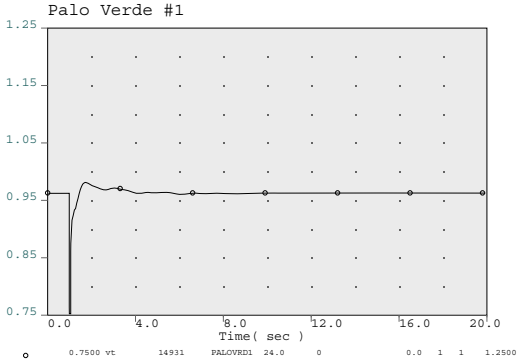
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Page 1

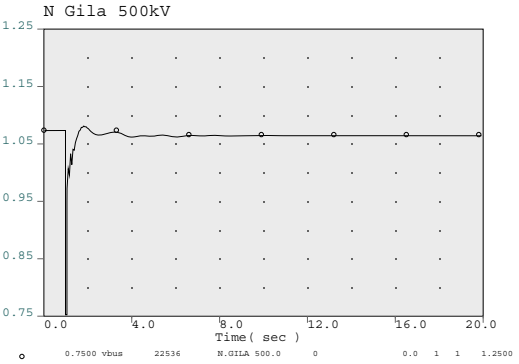
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RELATIVE VOLTAGE

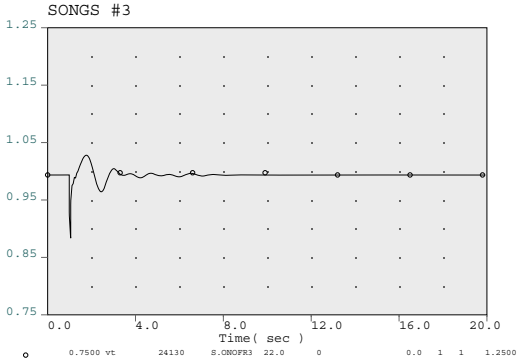
Palo Verde #1



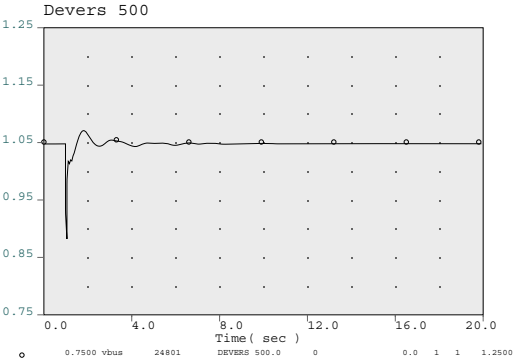
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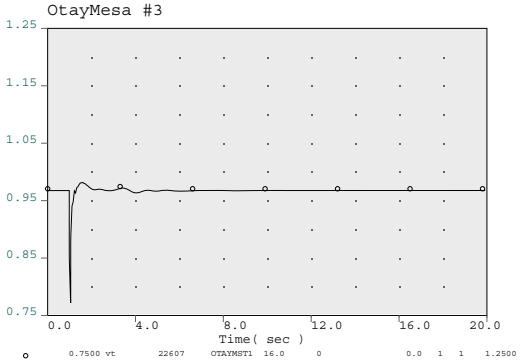
SONGS #3



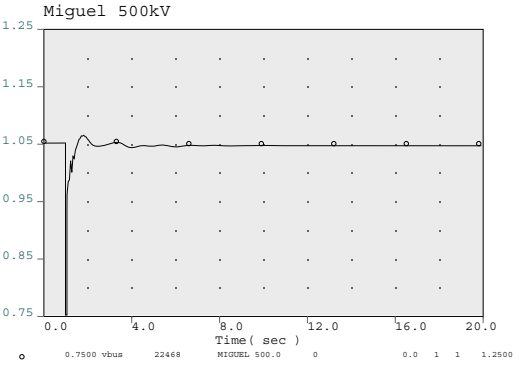
Devers 500



OtayMesa #3



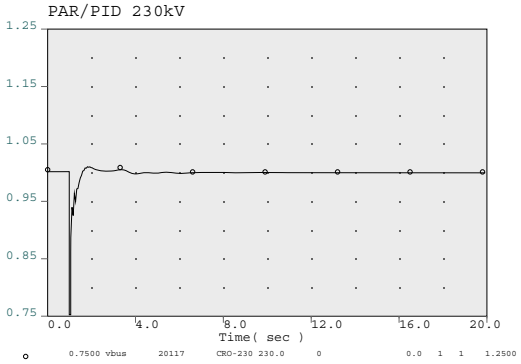
Miguel 500kV



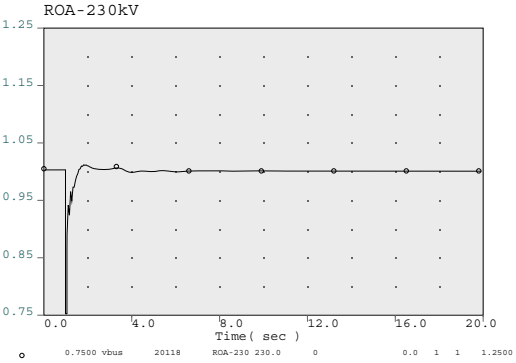
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

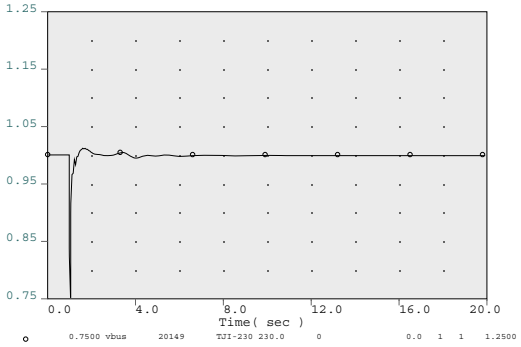
PAR/PID 230kV



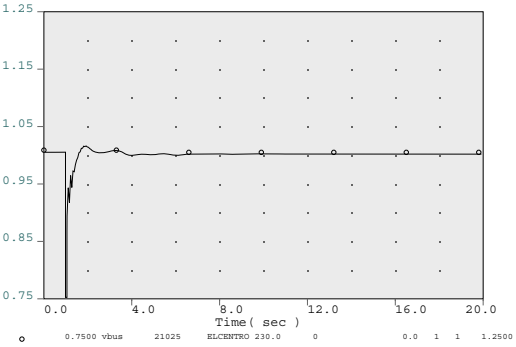
ROA-230kV



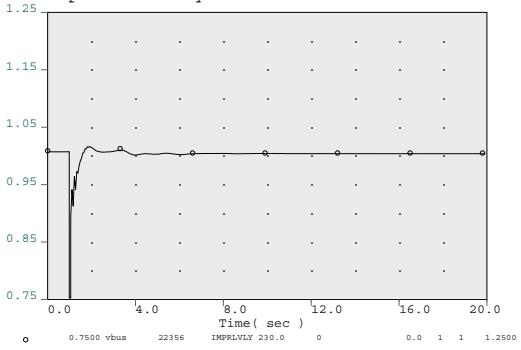
TJ1-230kV



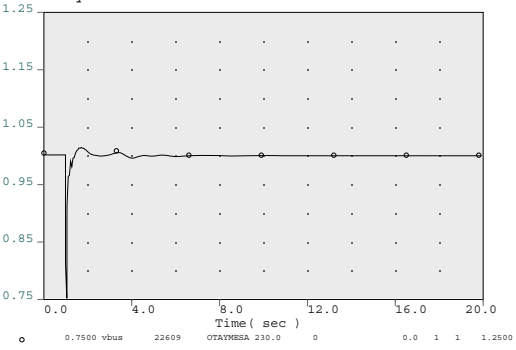
El Centro



Imperial Valley 230kV



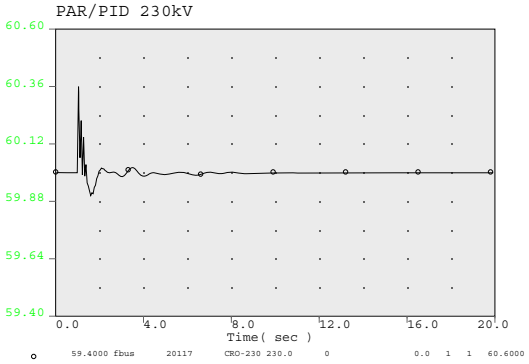
Otay Mesa 230kV



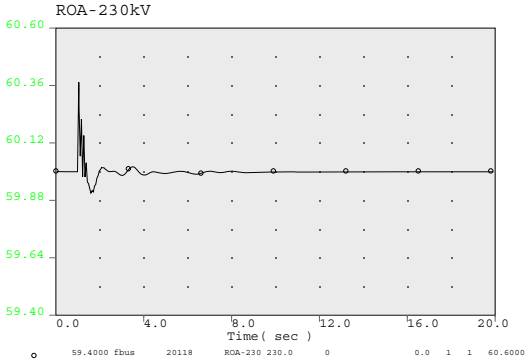
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

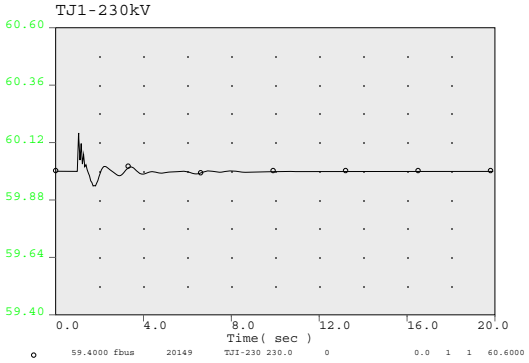
PAR/PID 230kV



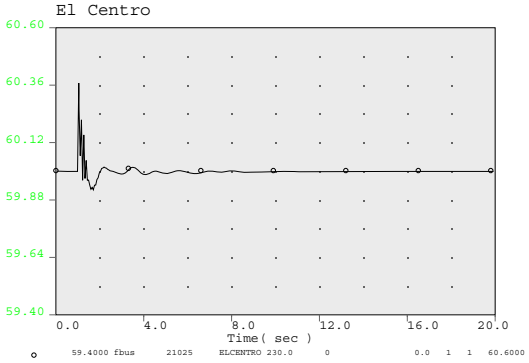
ROA-230kV



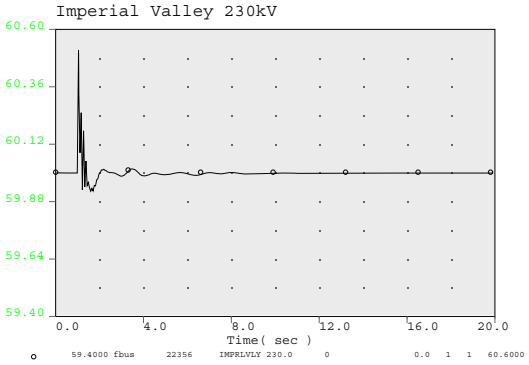
TJ1-230kV



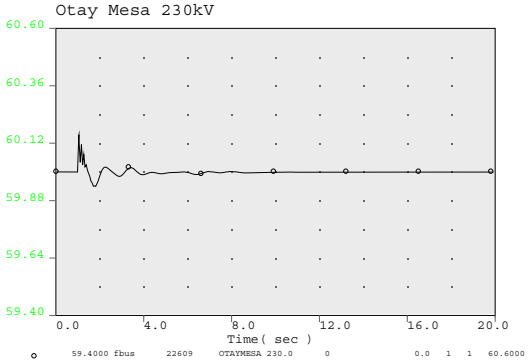
El Centro



Imperial Valley 230kV



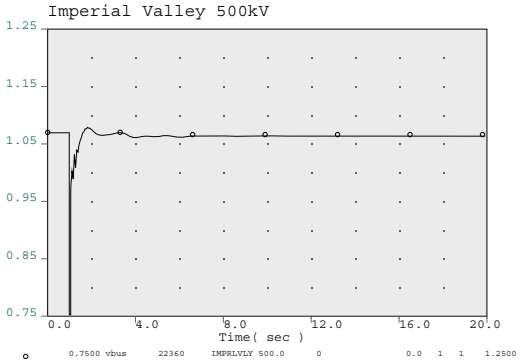
Otay Mesa 230kV



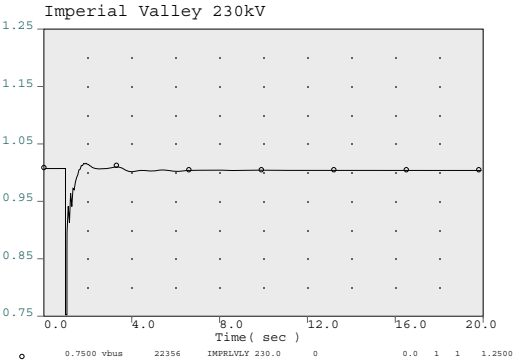
SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

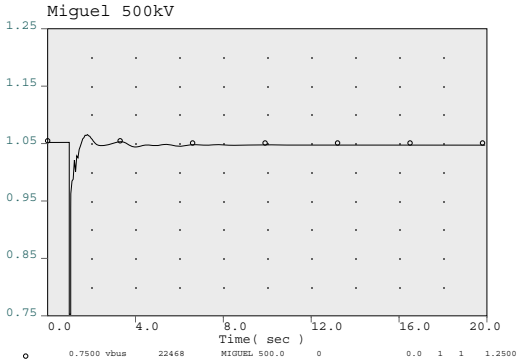
Imperial Valley 500kV



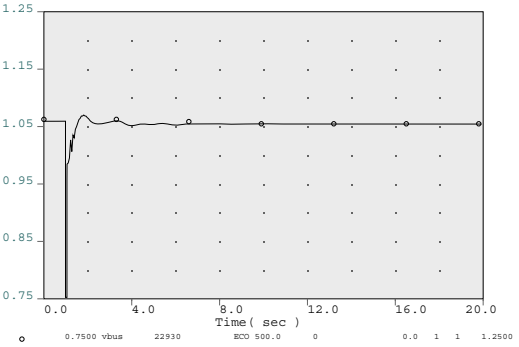
Imperial Valley 230kV



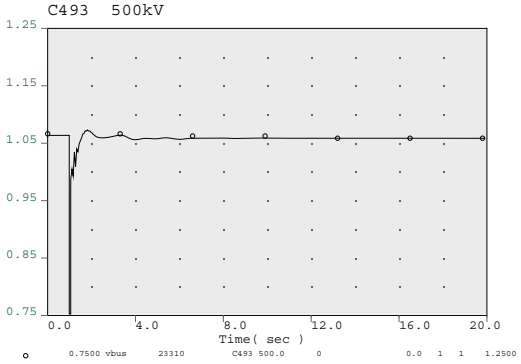
Miguel 500kV



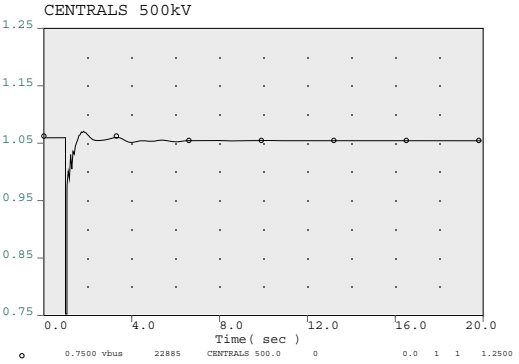
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - post
2014 Light Autumn
T468-N.Gila 500 kV line

Page 5

SDGE	T468_NGila_slo_pst_ll_bu.chf	2_p_i\ll\pst_bu\ws_pst_bu Tue Nov 02 07:31:42 2010

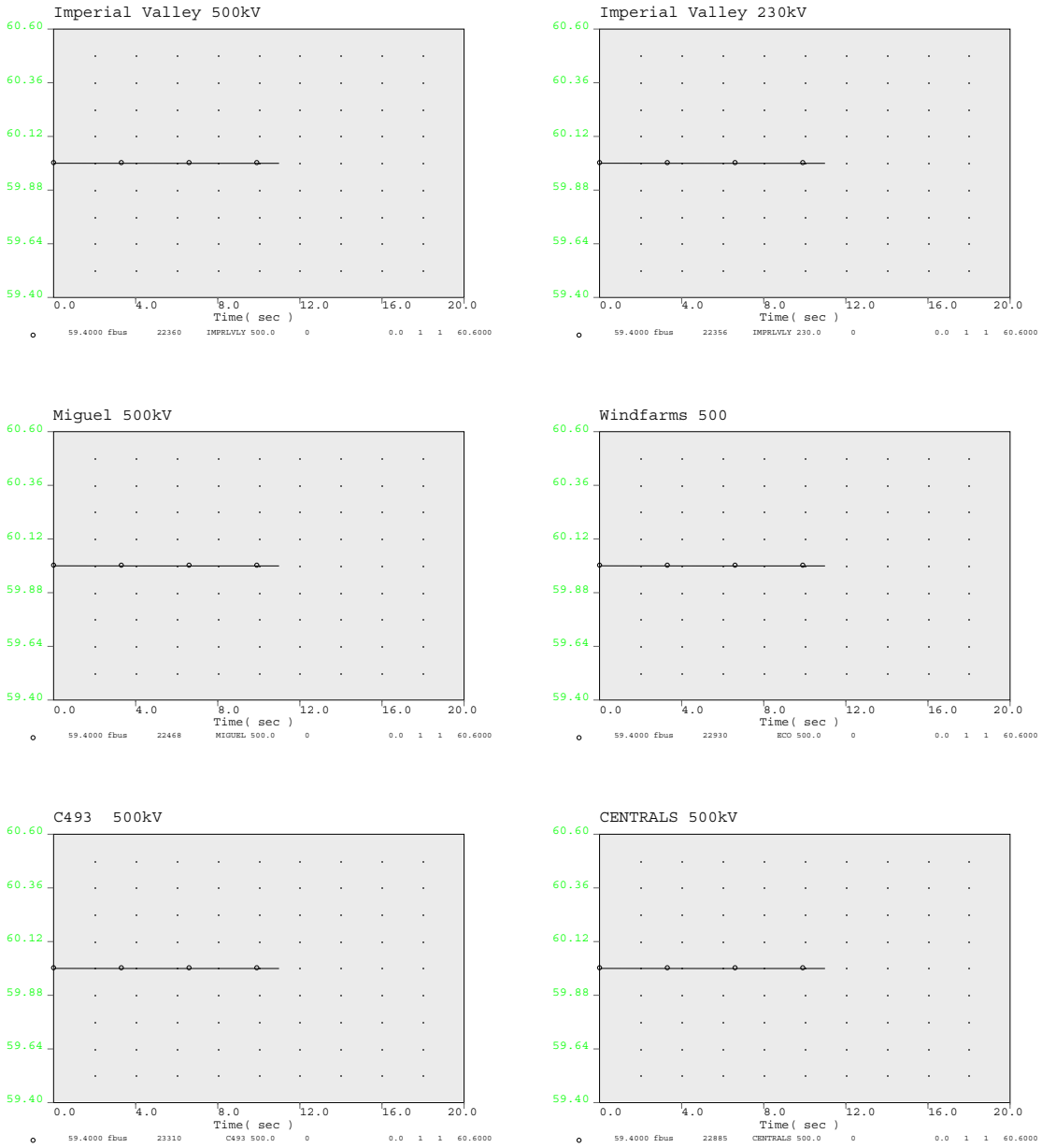
Appendix J-7

Transient Stability Analysis Plots

Internal Cluster

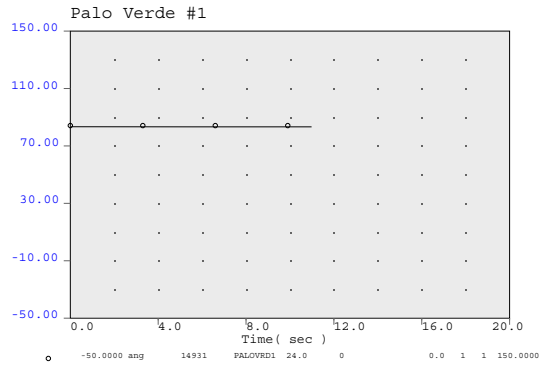
Heavy Summer Pre

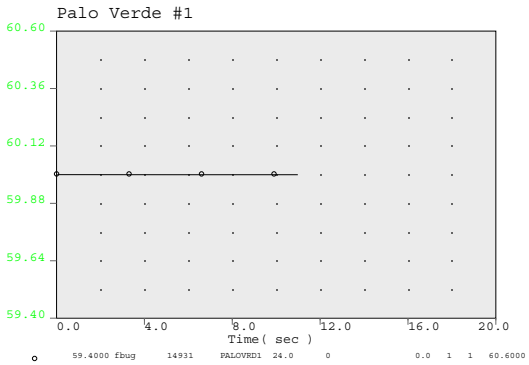
Imperial Valley Area - Frequency

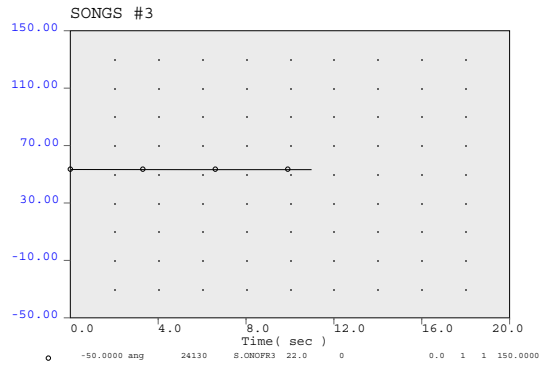


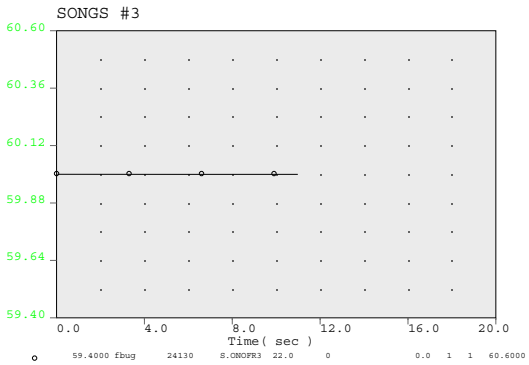
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

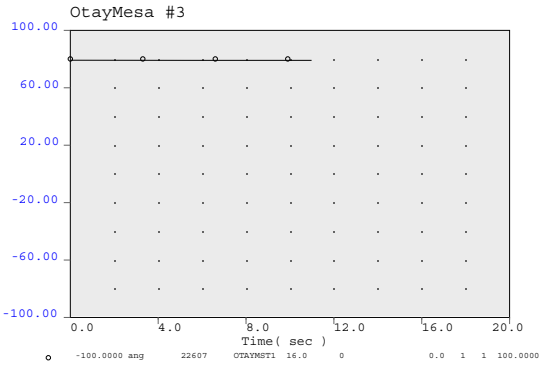
RELATIVE ROTOR ANGLE & FREQUENCY

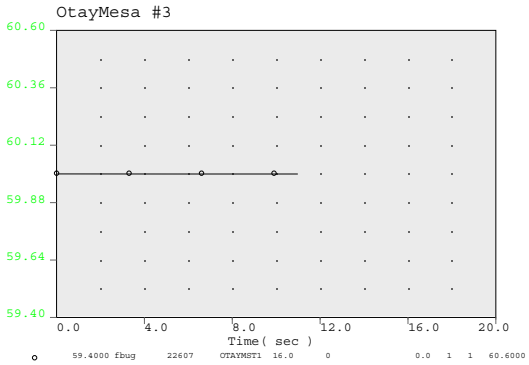






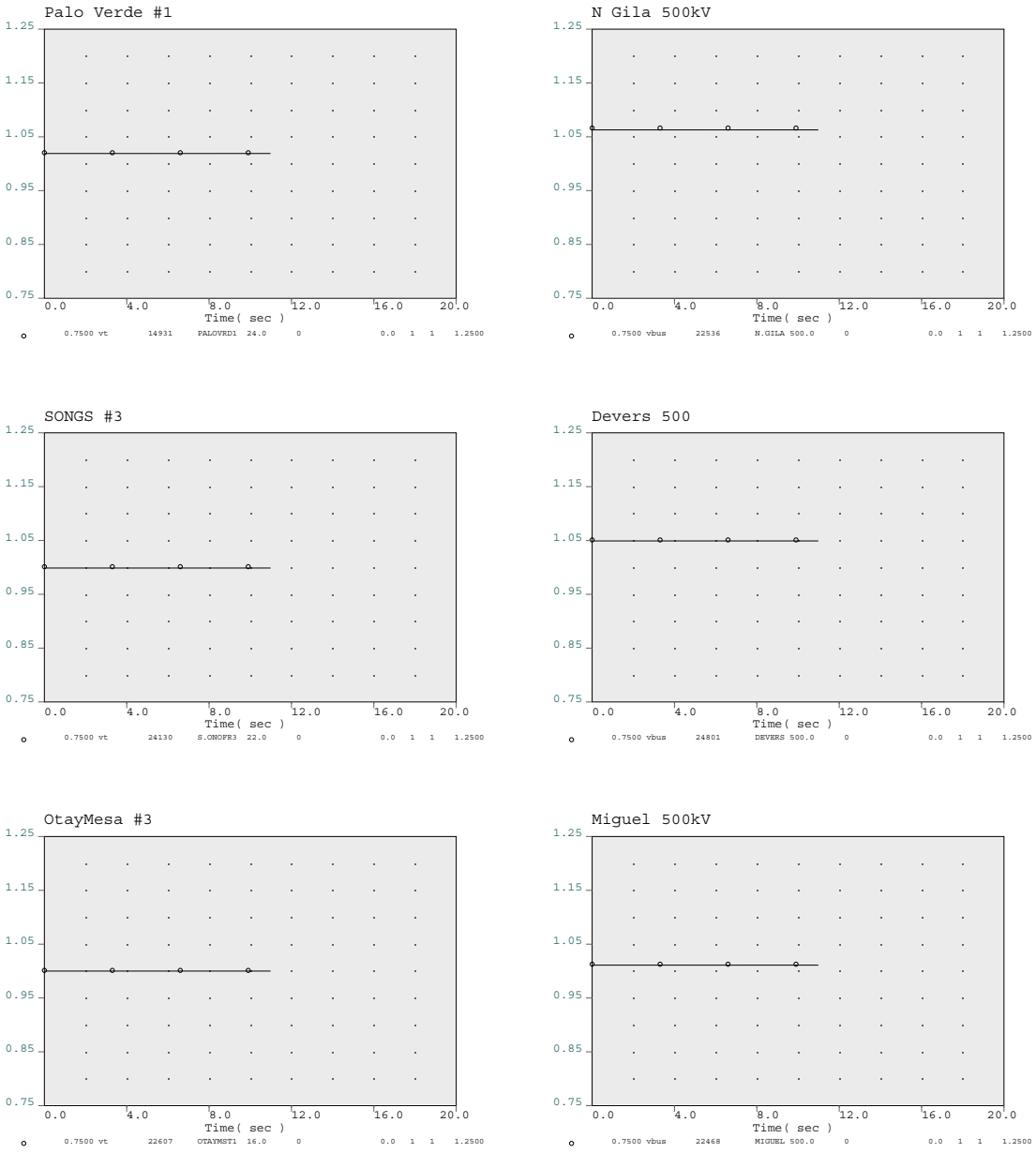






SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

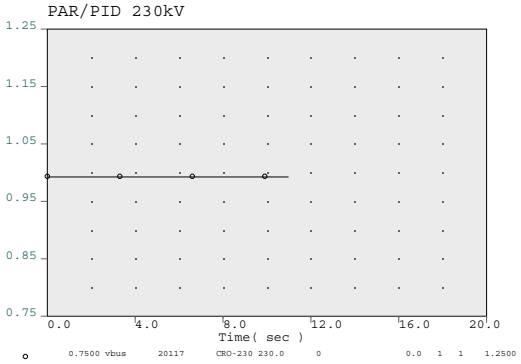
RELATIVE VOLTAGE



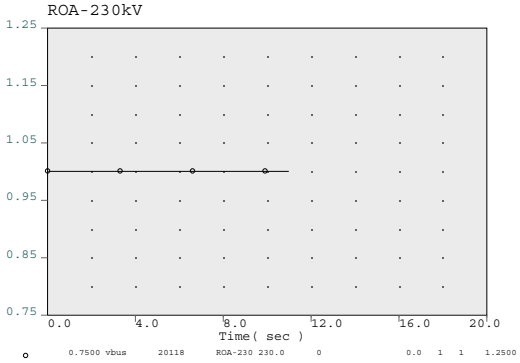
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

Affected System Voltage Check and Comparison

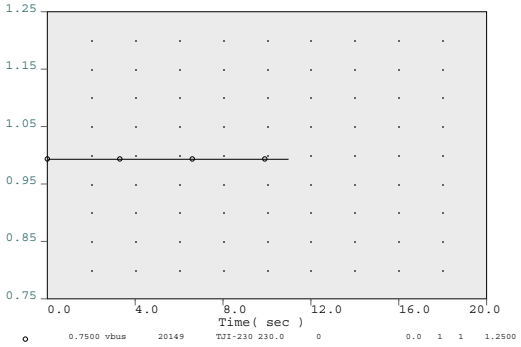
PAR/PID 230kV



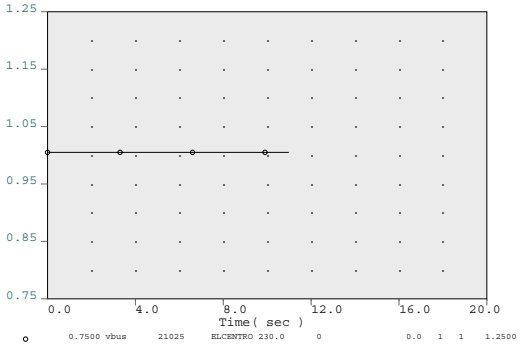
ROA-230kV



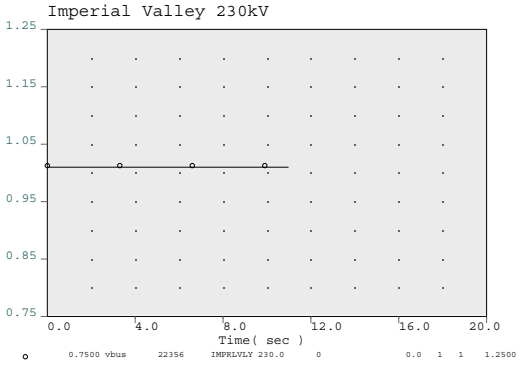
TJ1-230kV



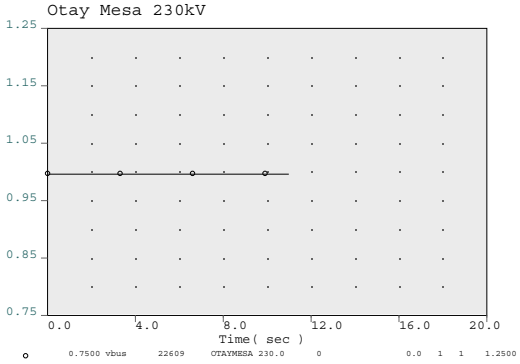
El Centro



Imperial Valley 230kV

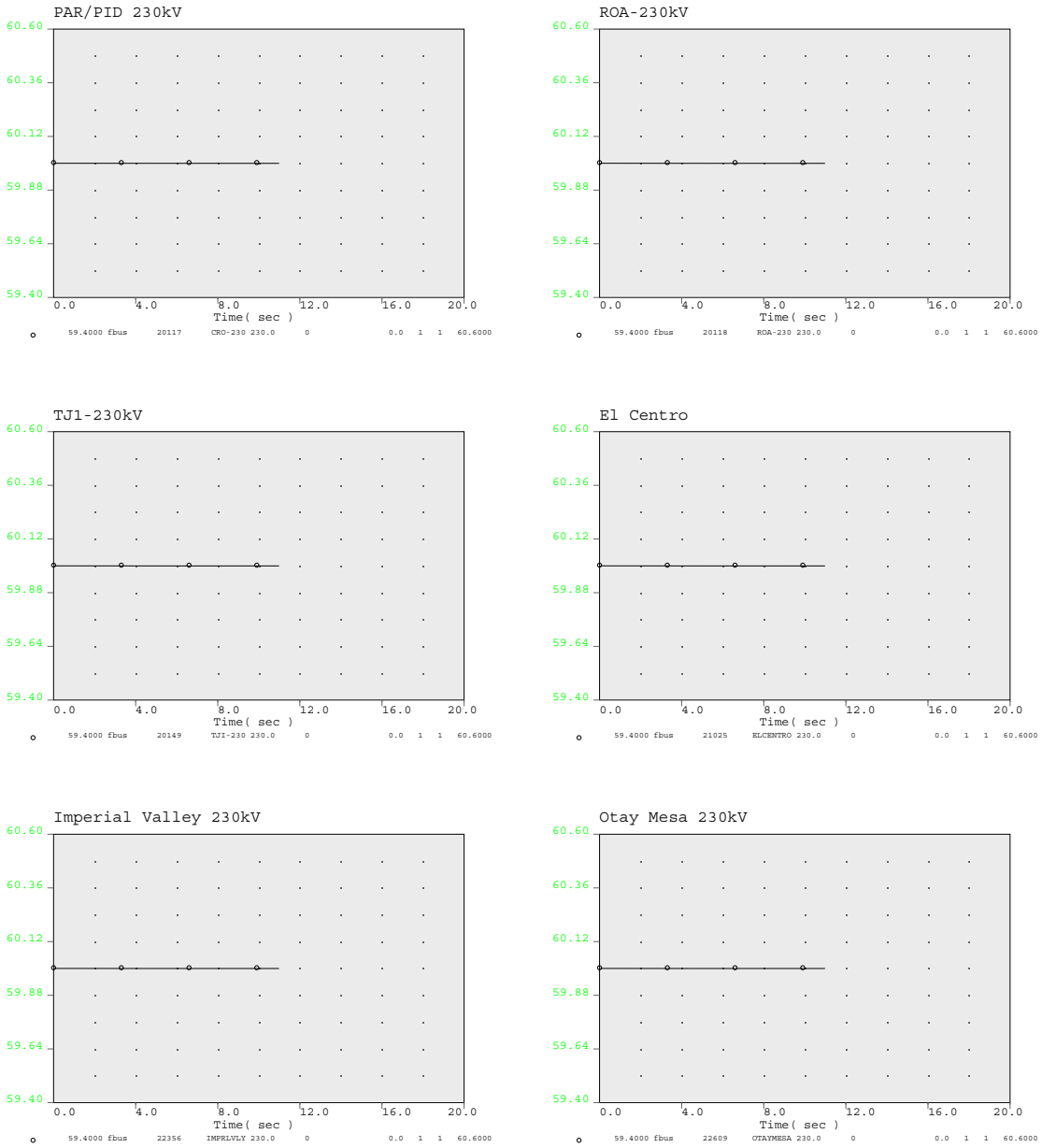


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

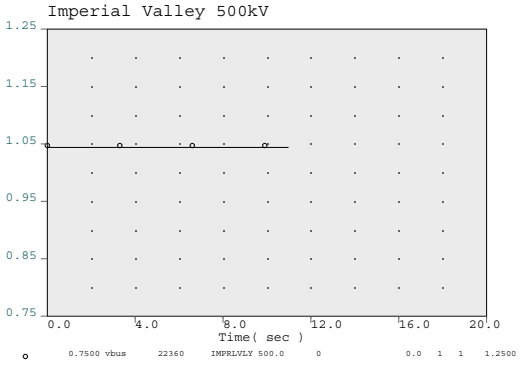
Affected System Frequency Check and Comparison



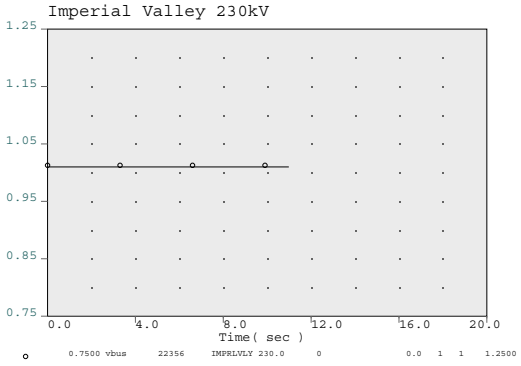
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

Imperial Valley Area - VOLTAGE

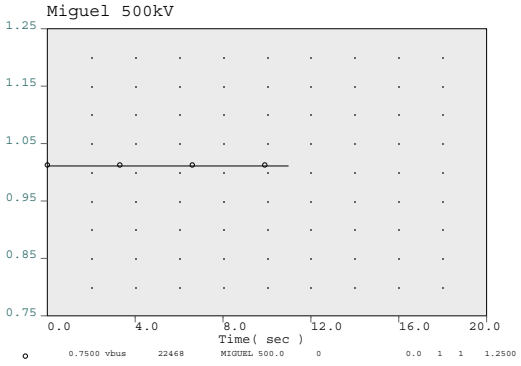
Imperial Valley 500kV



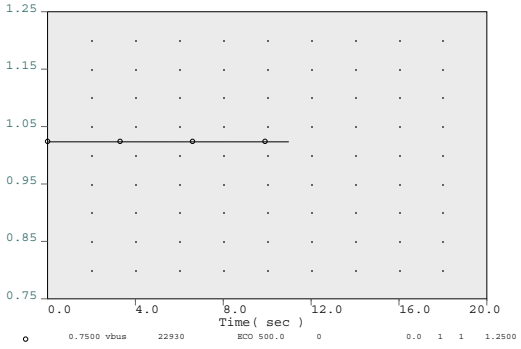
Imperial Valley 230kV



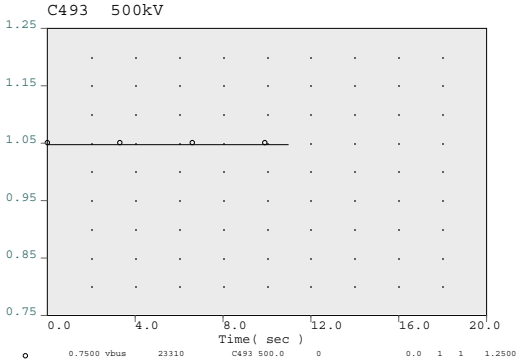
Miguel 500kV



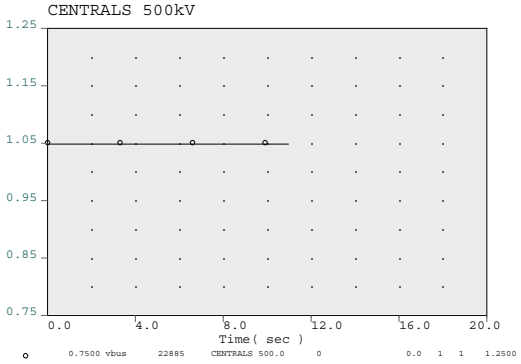
Windfarms 500



C493 500kV



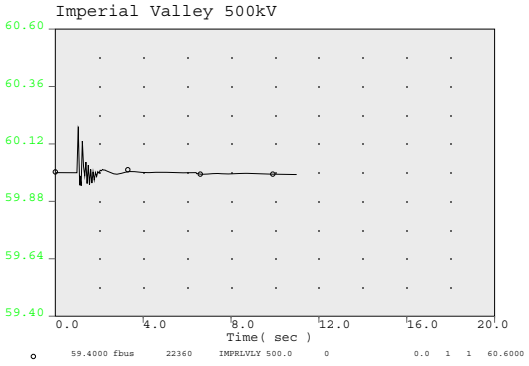
CENTRALS 500kV



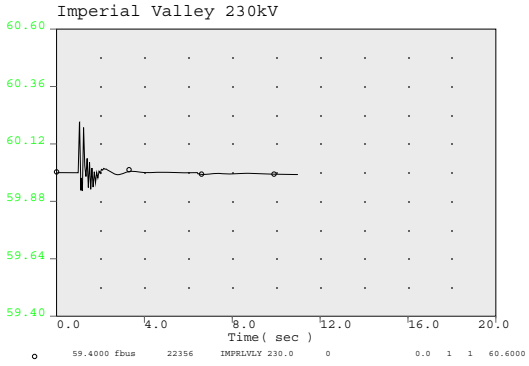
SDG&E Cluster 2 - pre
2014 Heavy Summer
Flat

Imperial Valley Area - Frequency

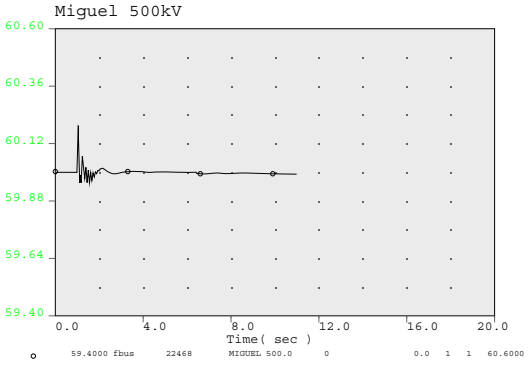
Imperial Valley 500kV



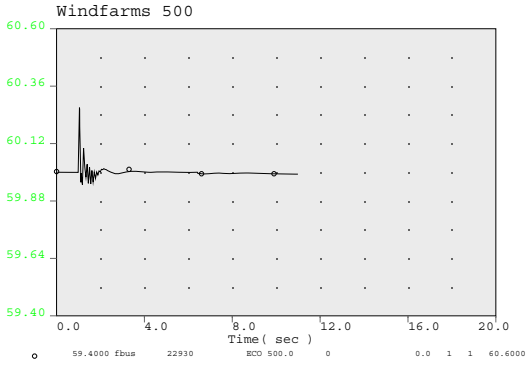
Imperial Valley 230kV



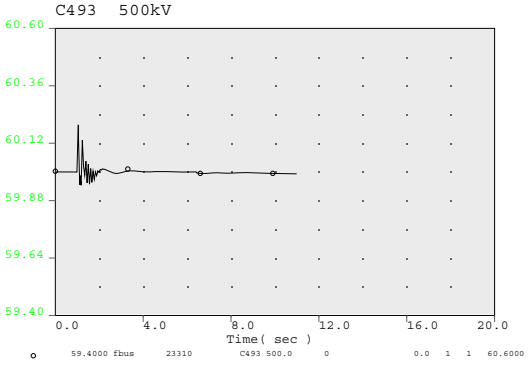
Miguel 500kV



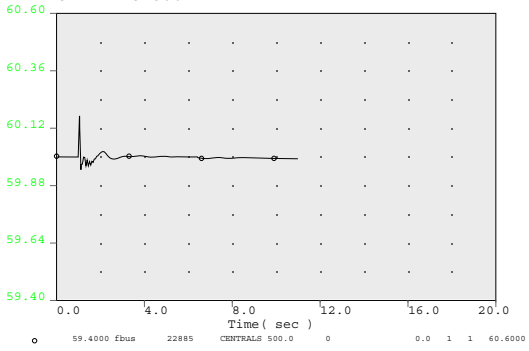
Windfarms 500



C493 500kV

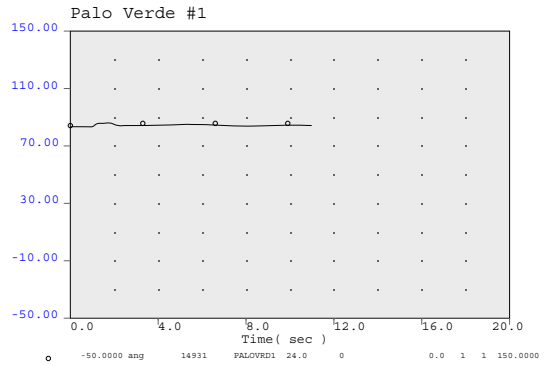


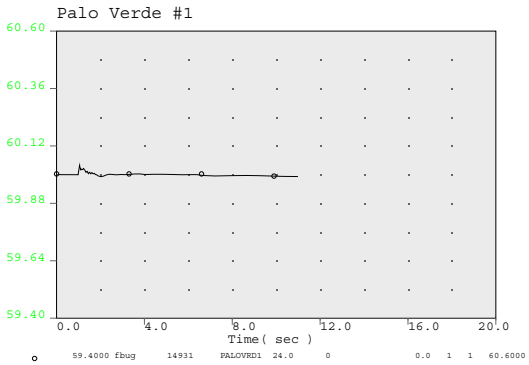
CENTRALS 500kV

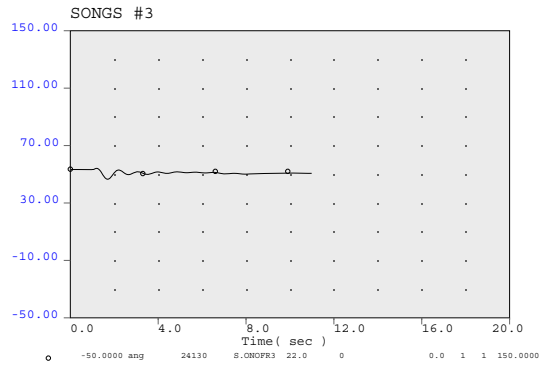


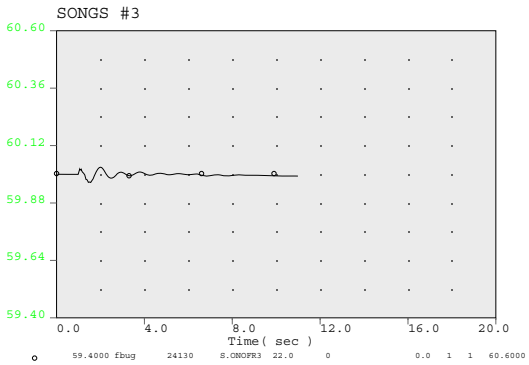
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

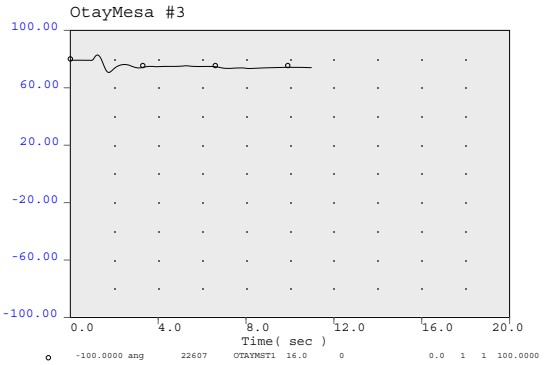
RELATIVE ROTOR ANGLE & FREQUENCY

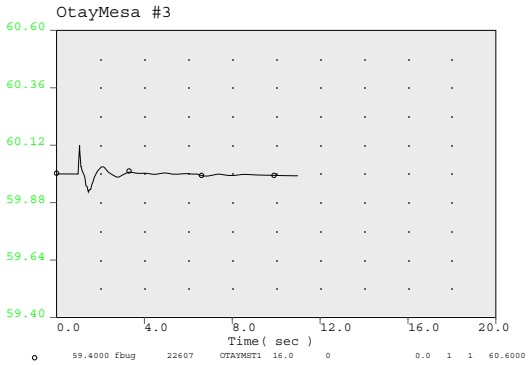








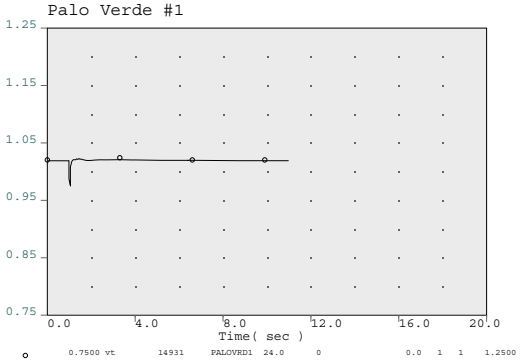




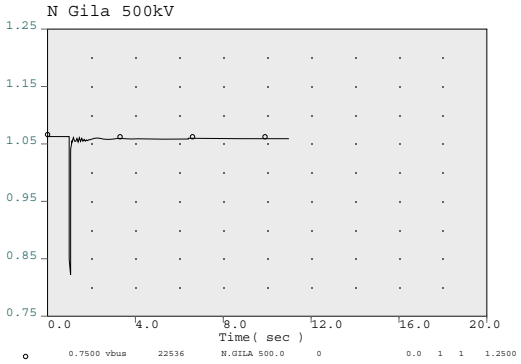
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

RELATIVE VOLTAGE

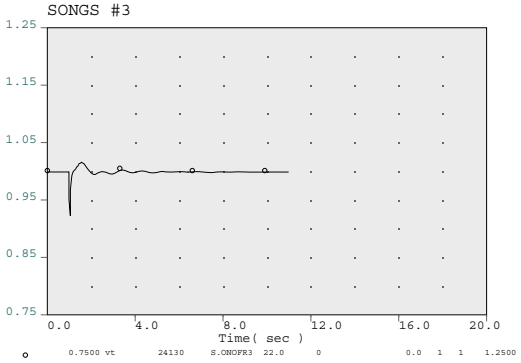
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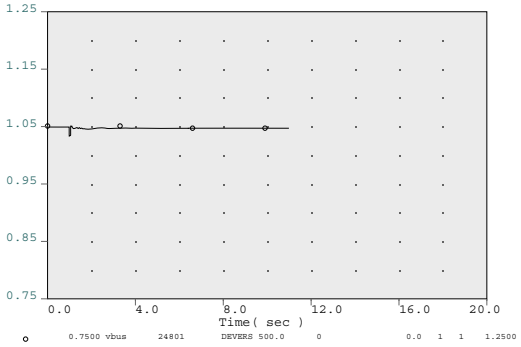
N Gila 500kV



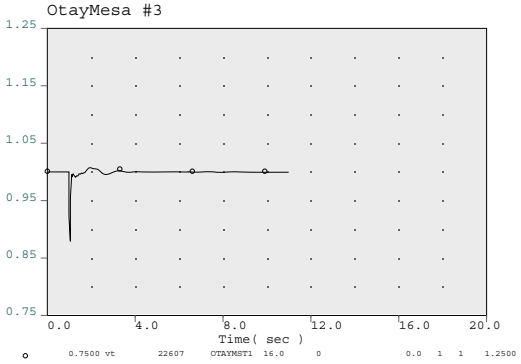
SONGS #3



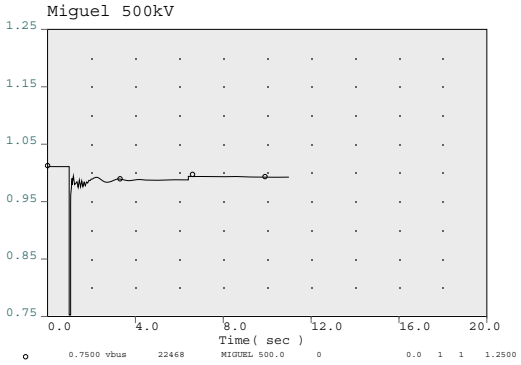
Devers 500



OtayMesa #3



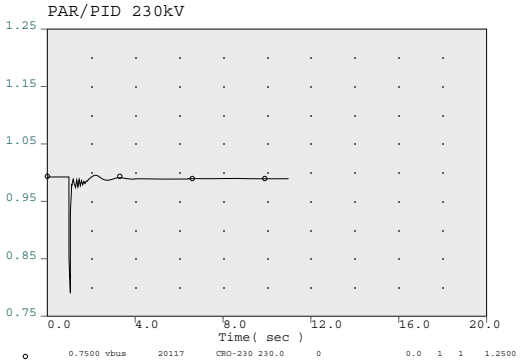
Miguel 500kV



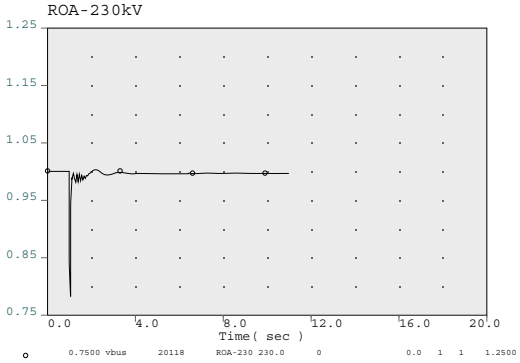
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

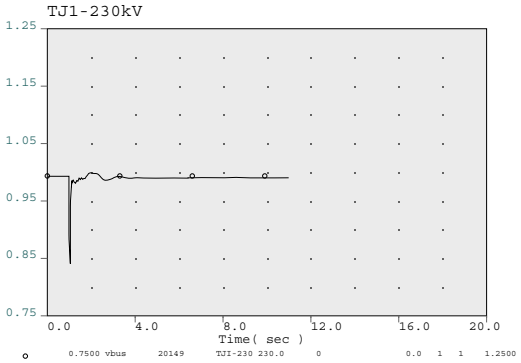
PAR/PID 230kV



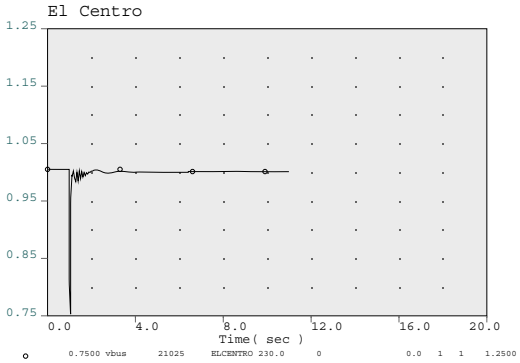
ROA-230kV



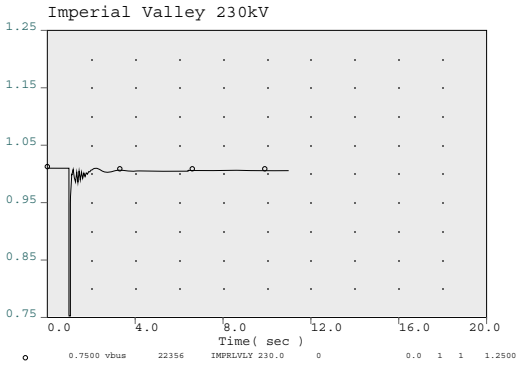
TJ1-230kV



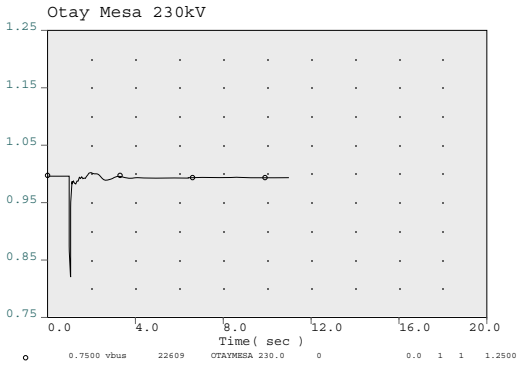
El Centro



Imperial Valley 230kV



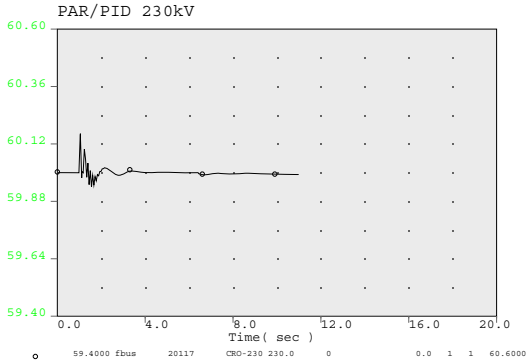
Otay Mesa 230kV



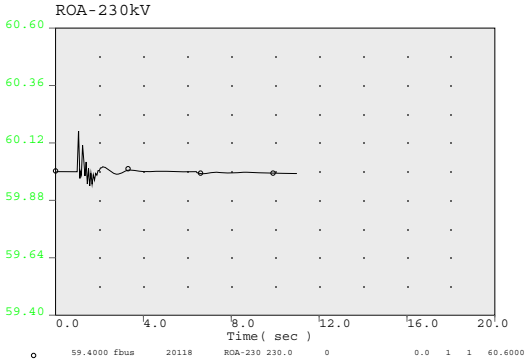
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Frequency Check and Comparison

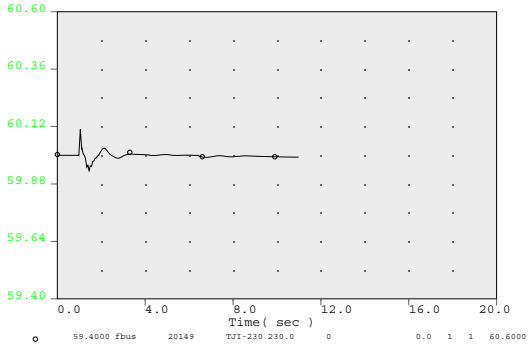
PAR/PID 230kV



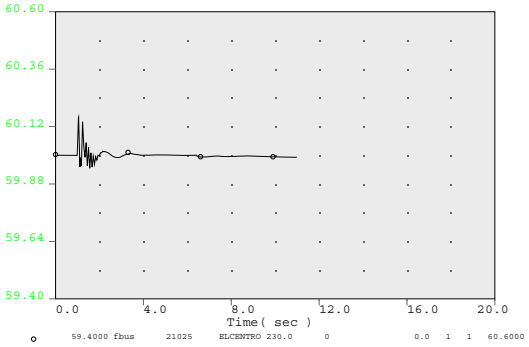
ROA-230kV



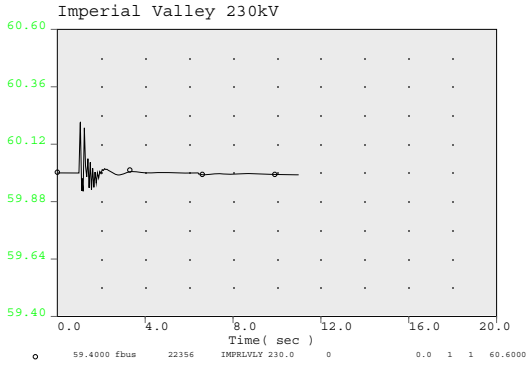
TJ1-230kV



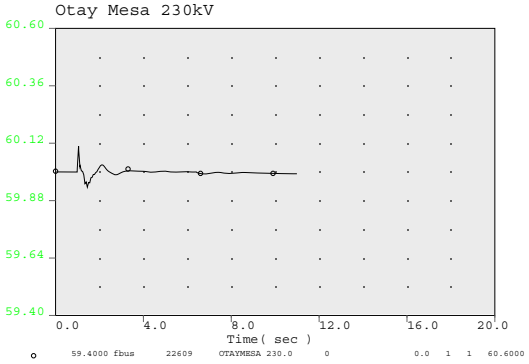
El Centro



Imperial Valley 230kV



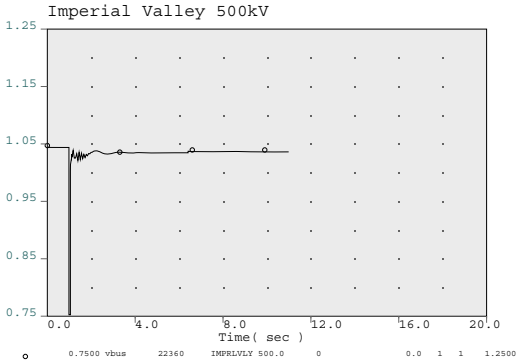
Otay Mesa 230kV



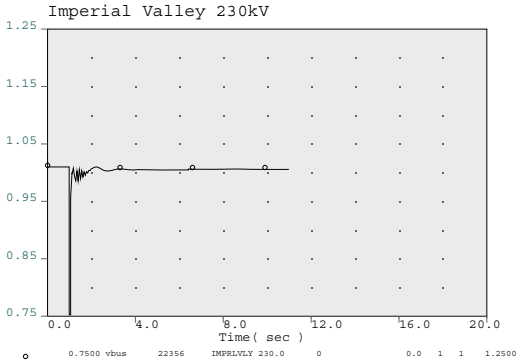
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

Imperial Valley Area - VOLTAGE

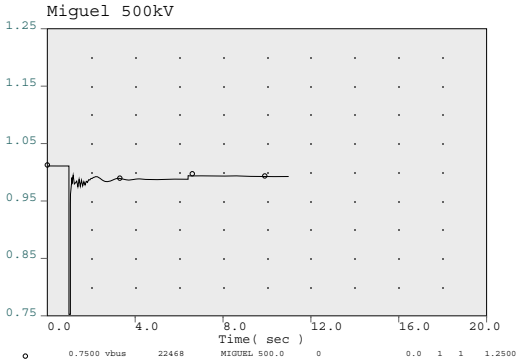
Imperial Valley 500kV



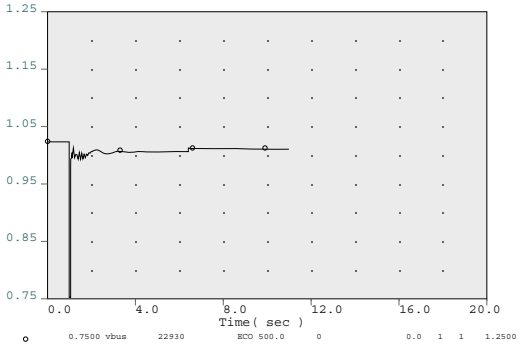
Imperial Valley 230kV



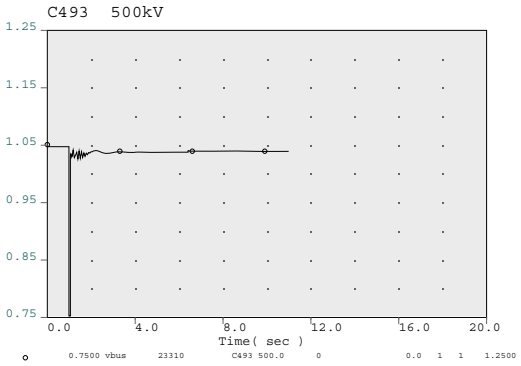
Miguel 500kV



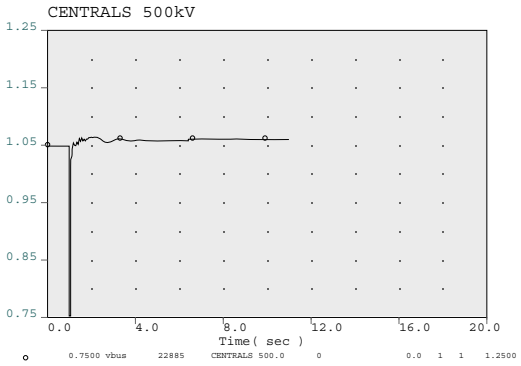
Windfarms 500



C493 500kV



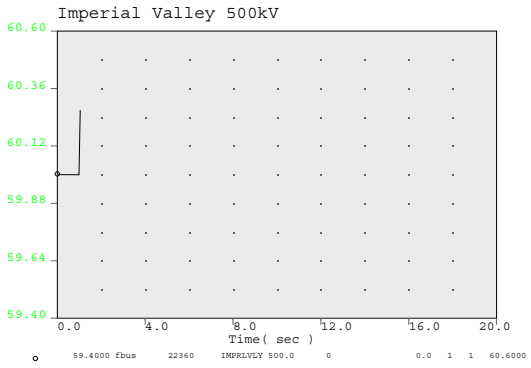
CENTRALS 500kV

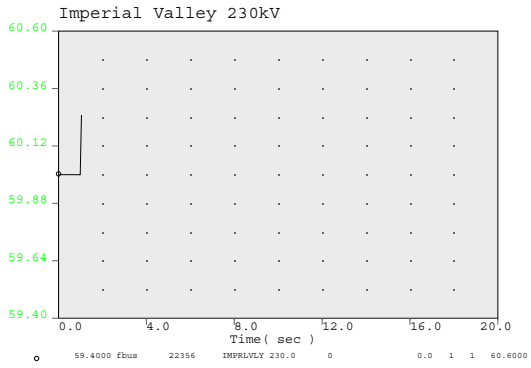


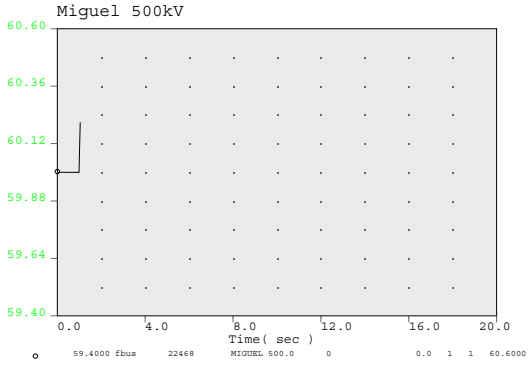
SDG&E Cluster 2 - pre
2014 Heavy Summer
C493 - CENTRALS 500kV line

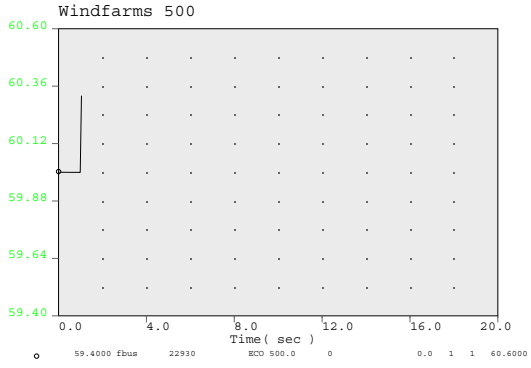
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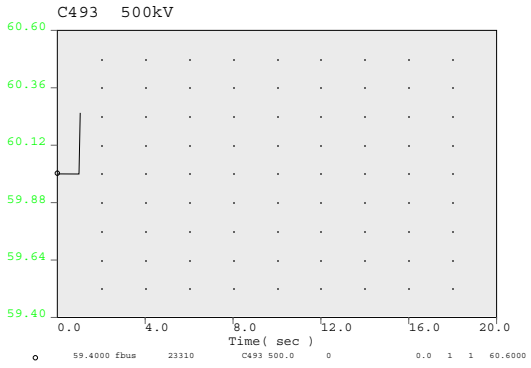
Imperial Valley Area - Frequency

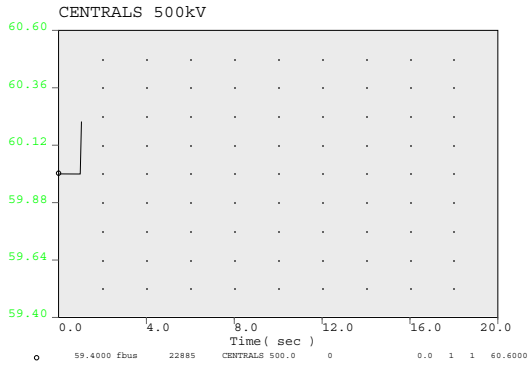






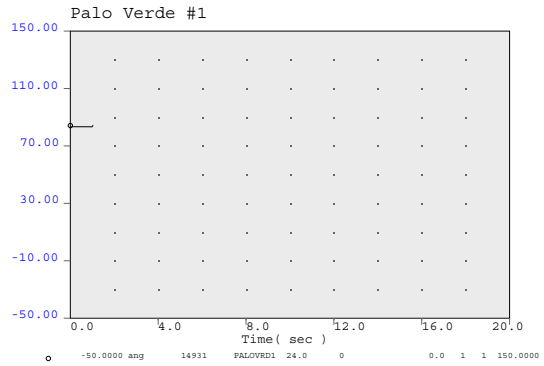


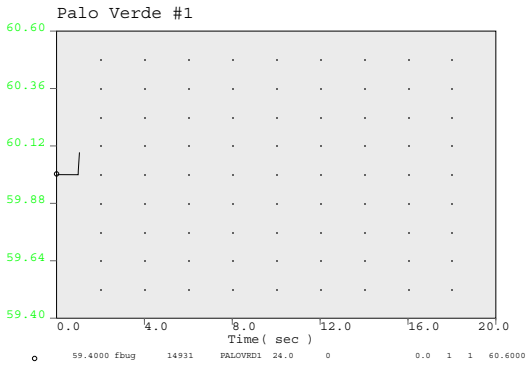


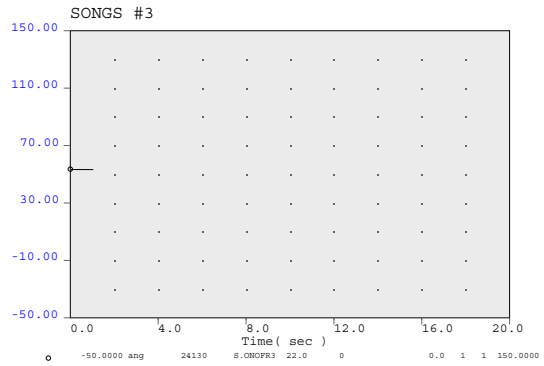


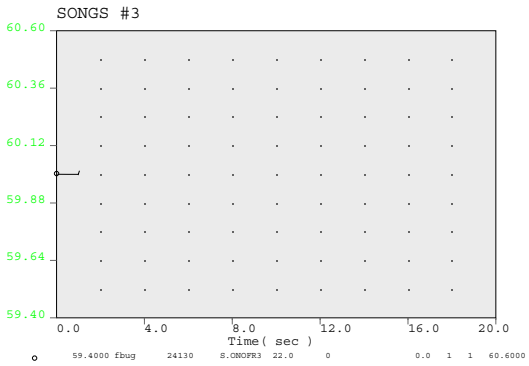
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

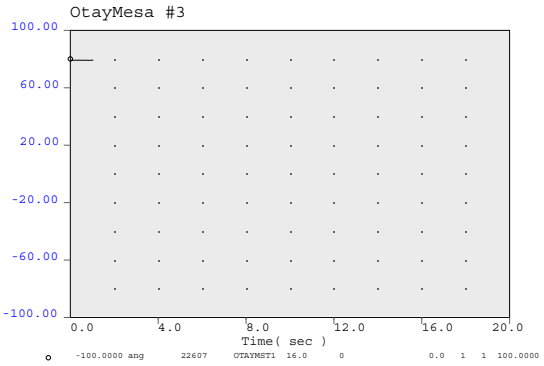
RELATIVE ROTOR ANGLE & FREQUENCY

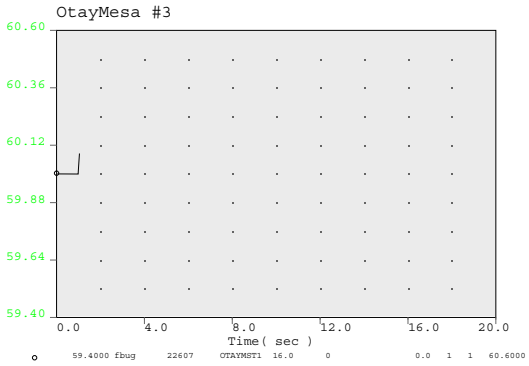












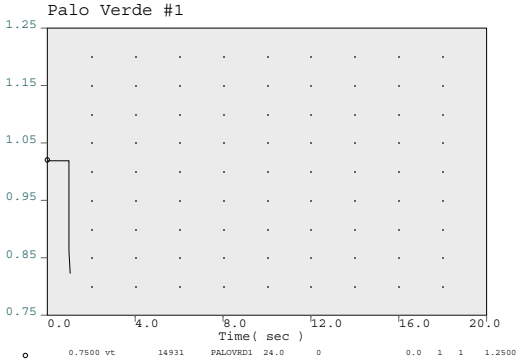
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Page 1

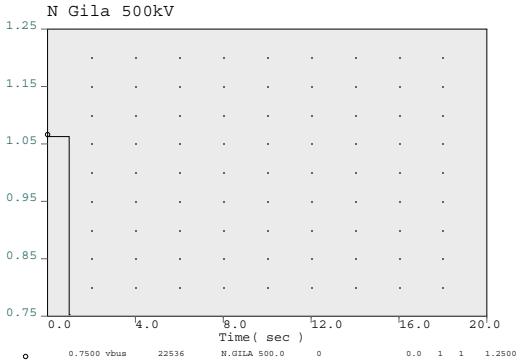
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RELATIVE VOLTAGE

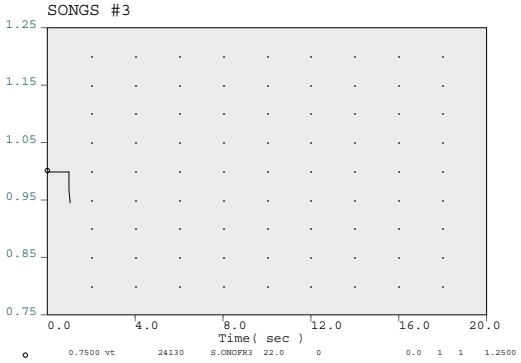
Palo Verde #1



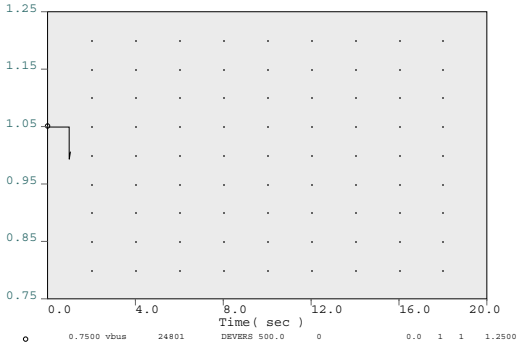
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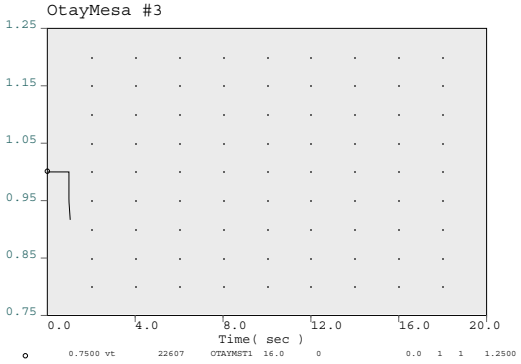
SONGS #3



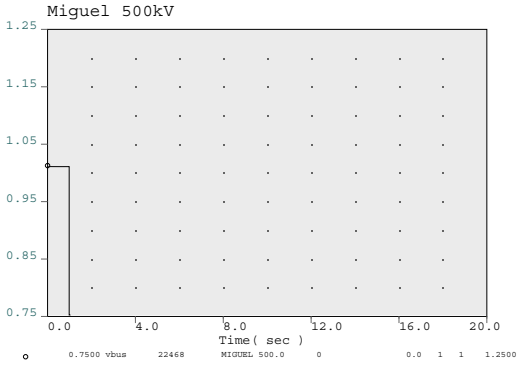
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OtayMesa #3



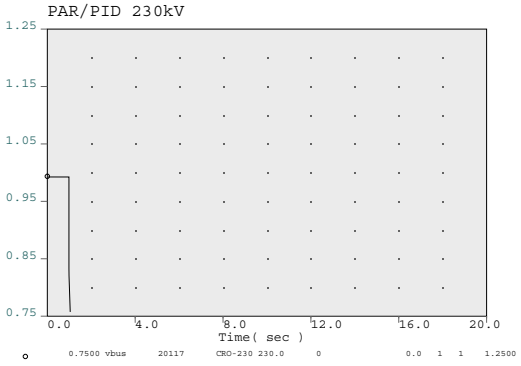
Miguel 500kV



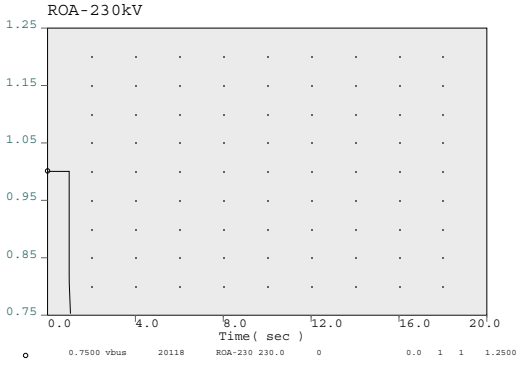
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Affected System Voltage Check and Comparison

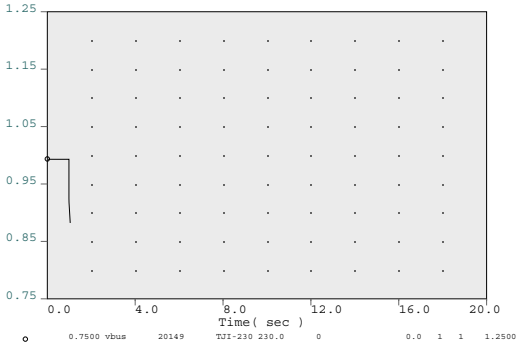
PAR/PID 230kV



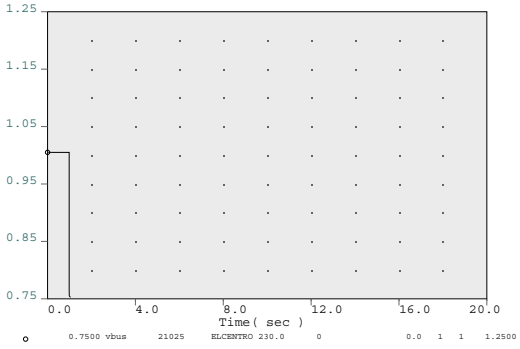
ROA-230kV



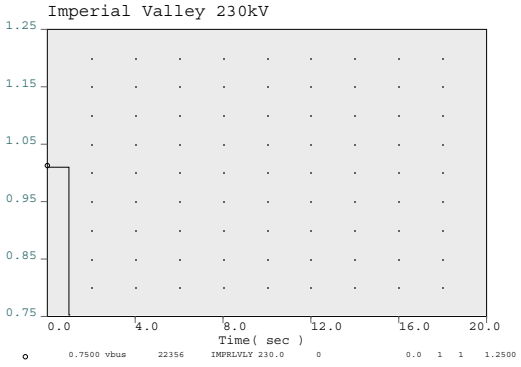
TJ1-230kV



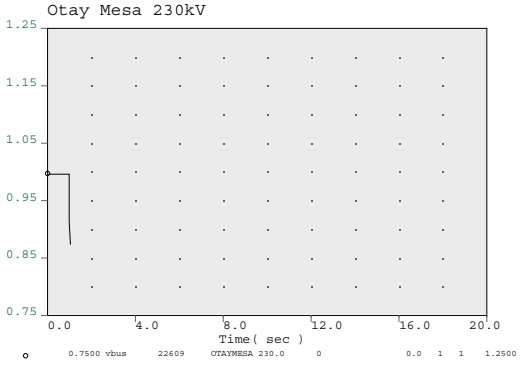
El Centro



Imperial Valley 230kV



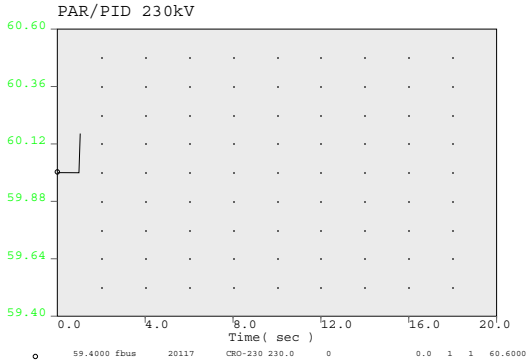
Otay Mesa 230kV



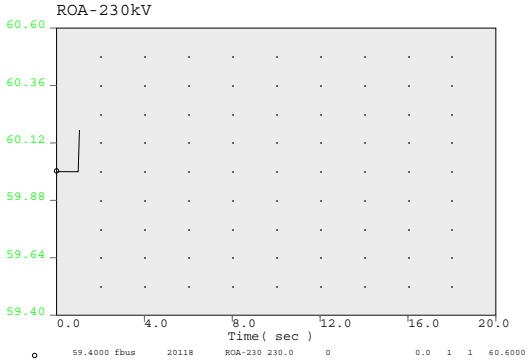
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Affected System Frequency Check and Comparison

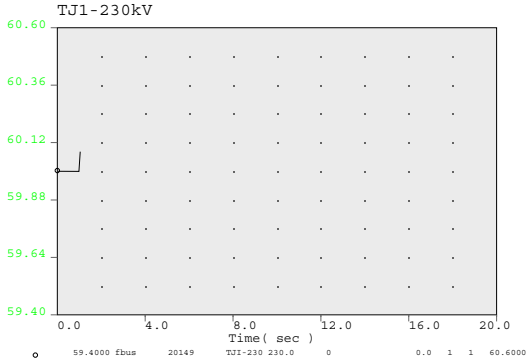
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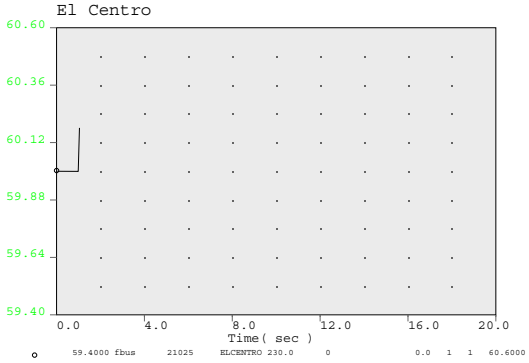
ROA-230kV



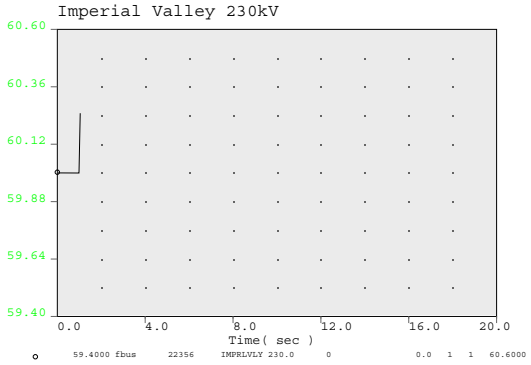
TJ1-230kV



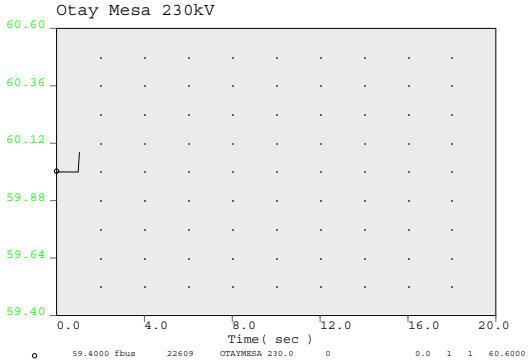
El Centro



Imperial Valley 230kV



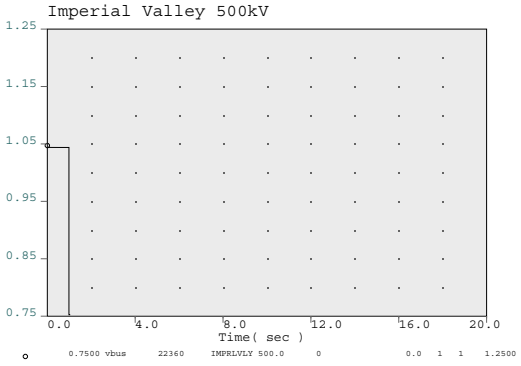
Otay Mesa 230kV



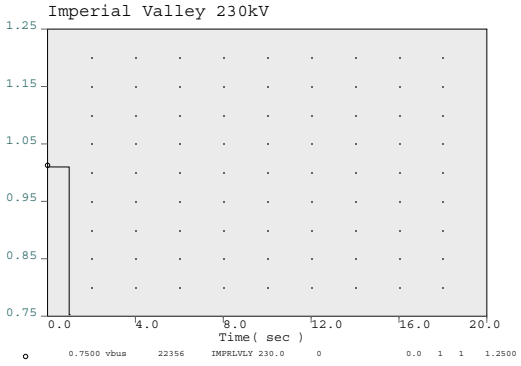
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Imperial Valley Area - VOLTAGE

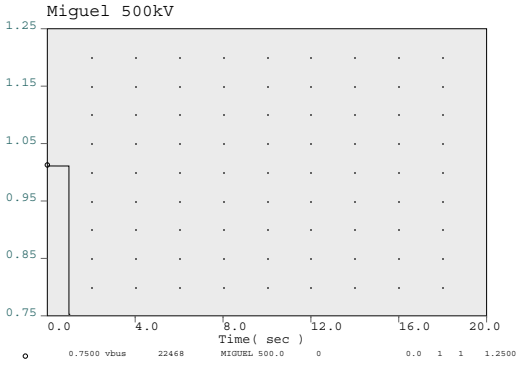
Imperial Valley 500kV



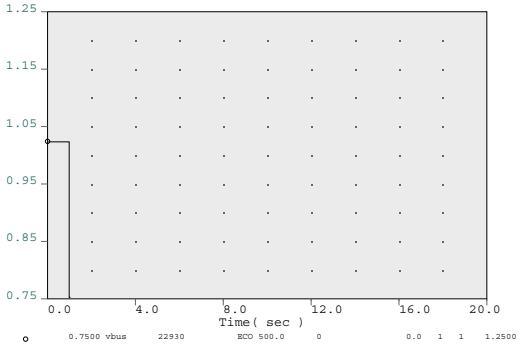
Imperial Valley 230kV



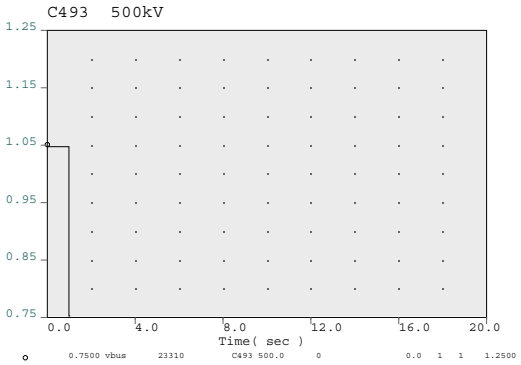
Miguel 500kV



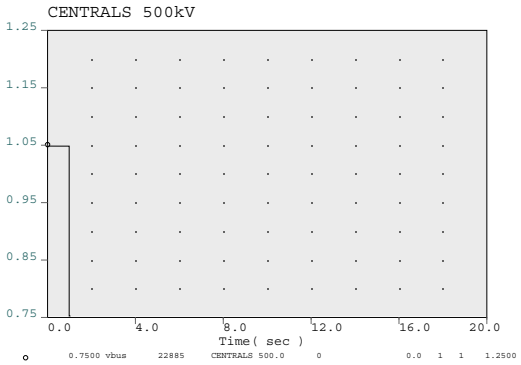
Windfarms 500



C493 500kV

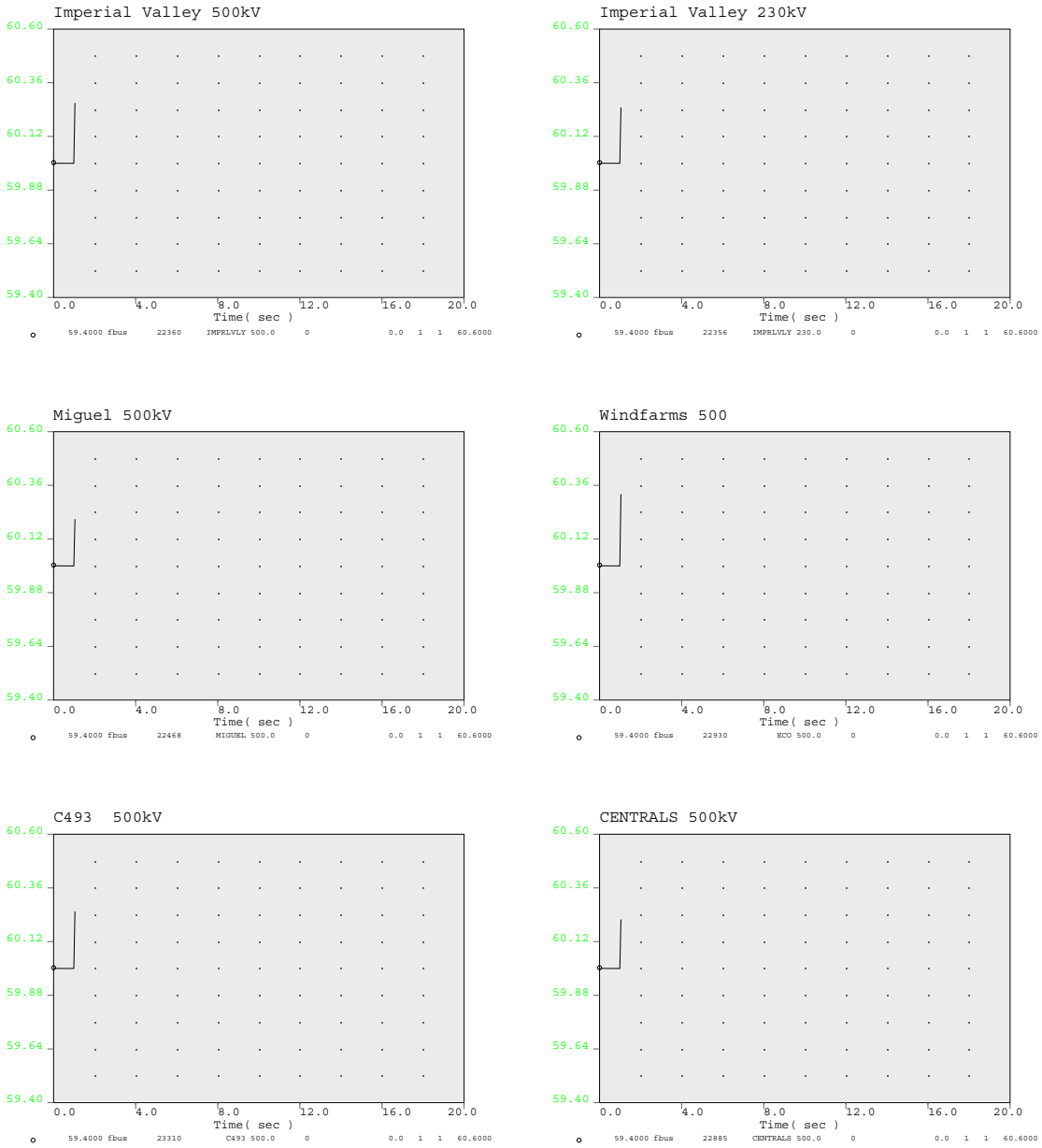


CENTRALS 500kV



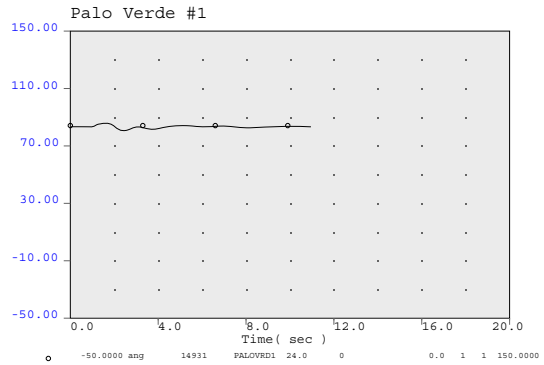
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

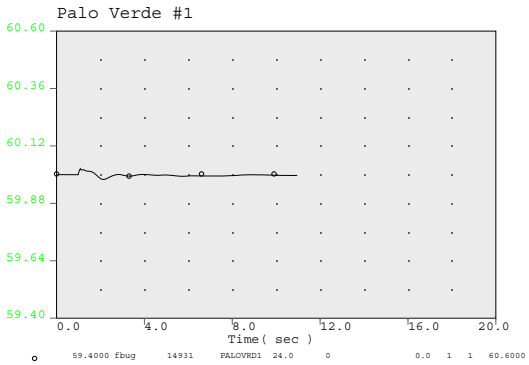
Imperial Valley Area - Frequency

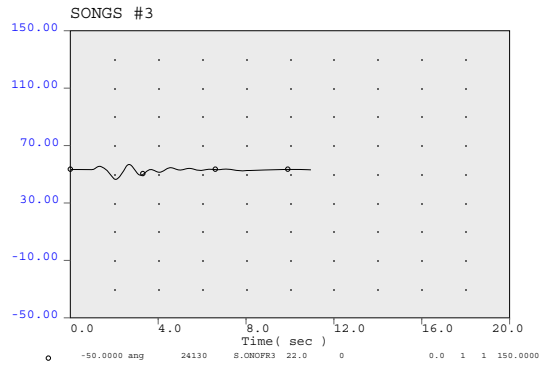


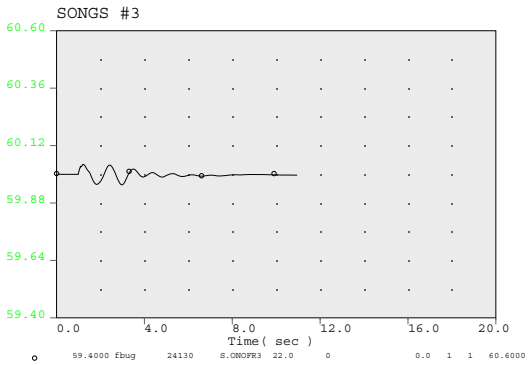
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

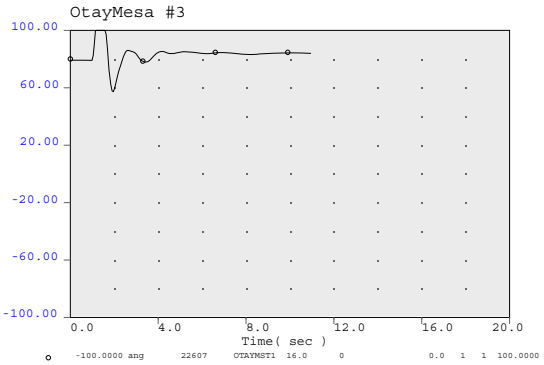
RELATIVE ROTOR ANGLE & FREQUENCY

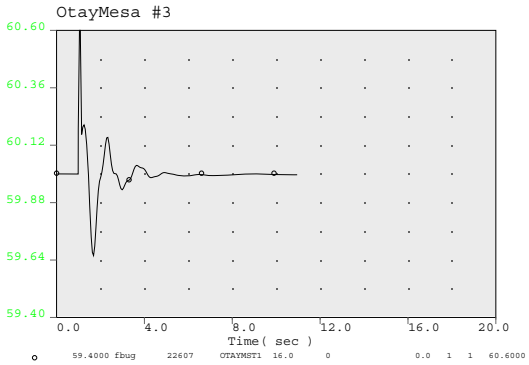






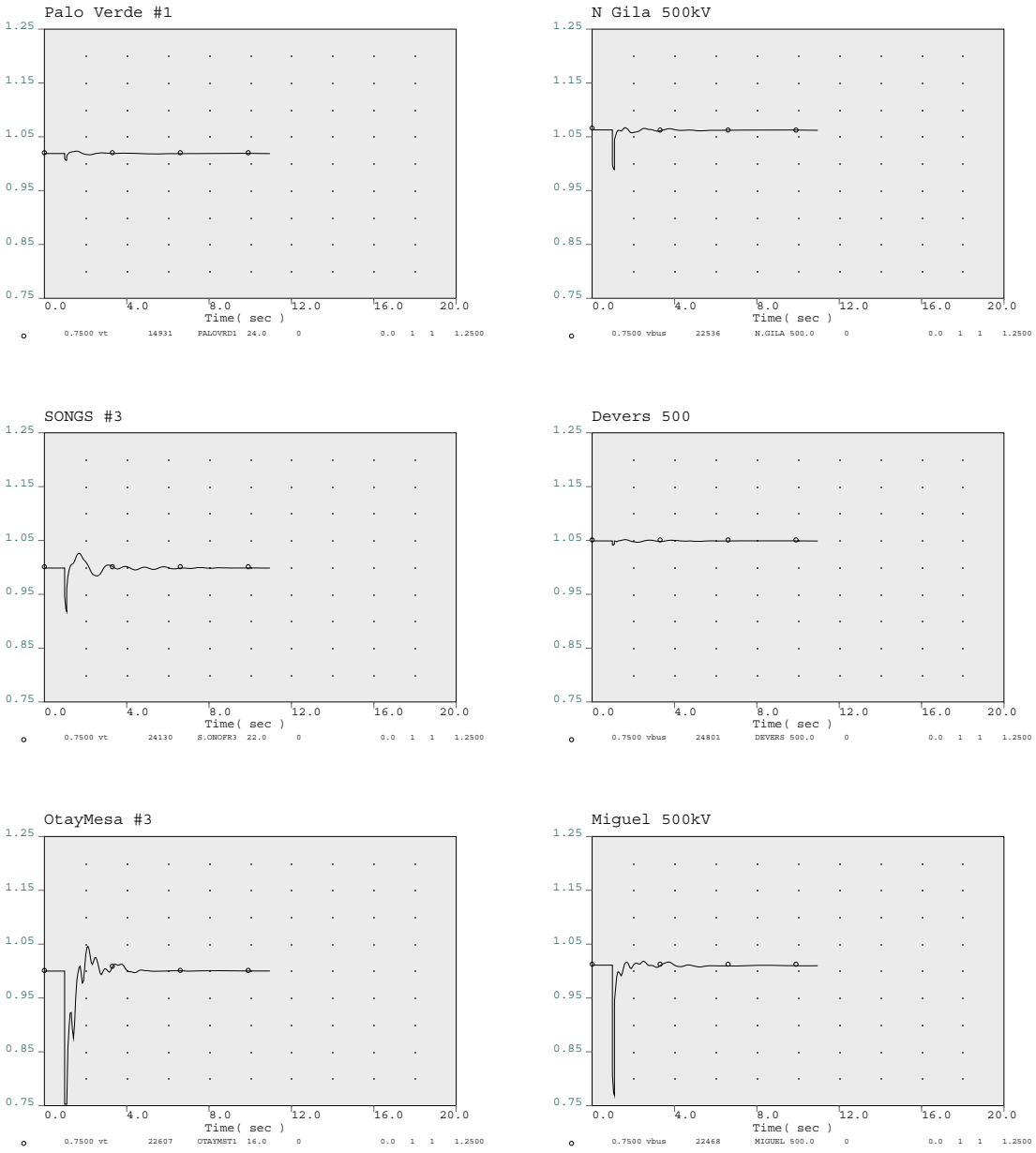






SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

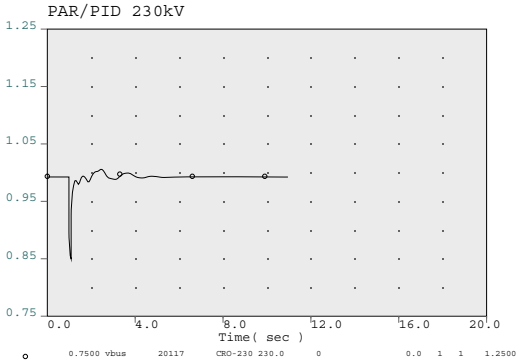
RELATIVE VOLTAGE



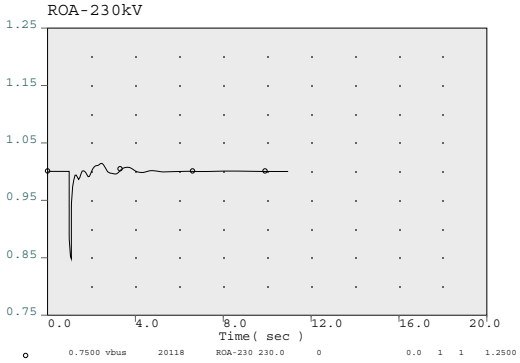
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Affected System Voltage Check and Comparison

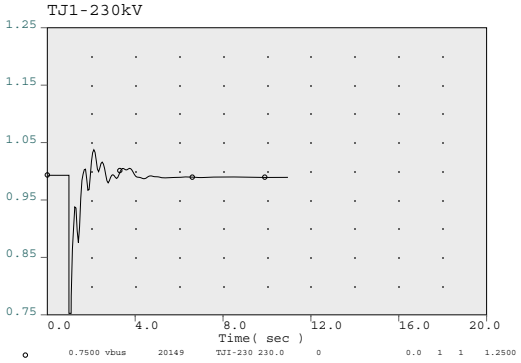
PAR/PID 230kV



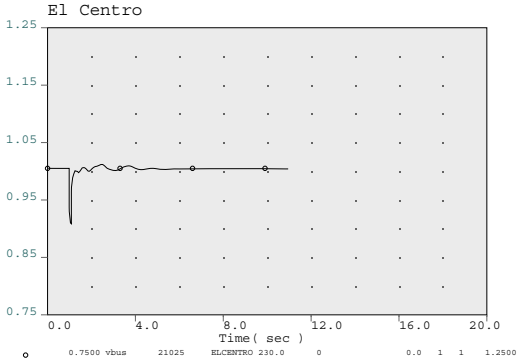
ROA-230kV



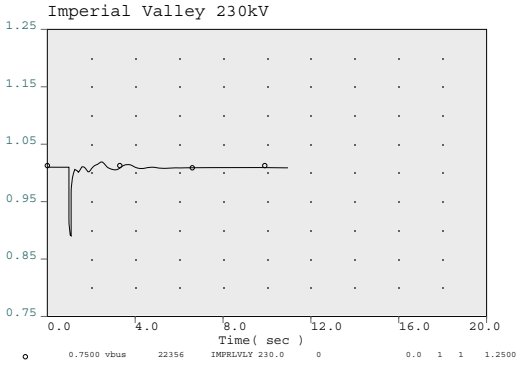
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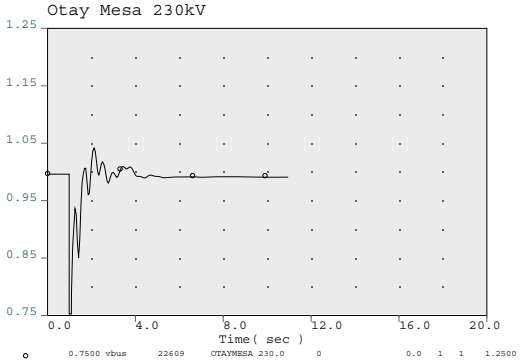
El Centro



Imperial Valley 230kV



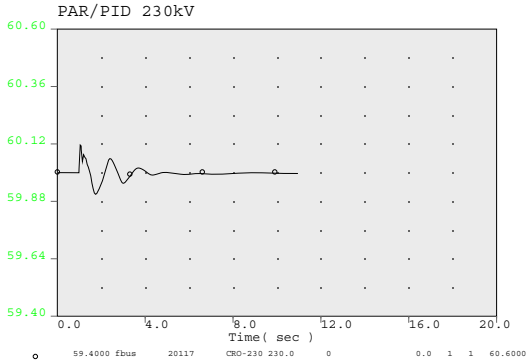
Otay Mesa 230kV



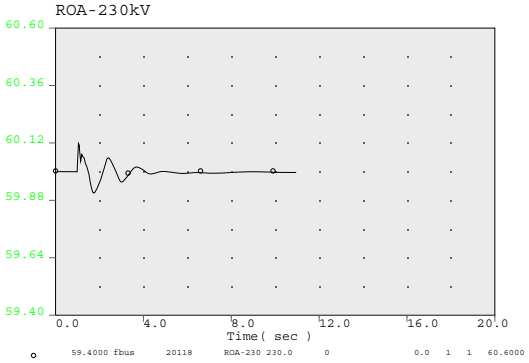
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Affected System Frequency Check and Comparison

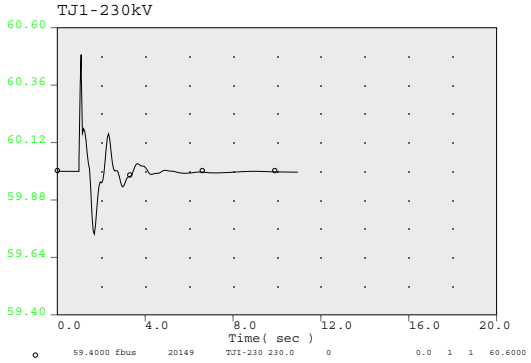
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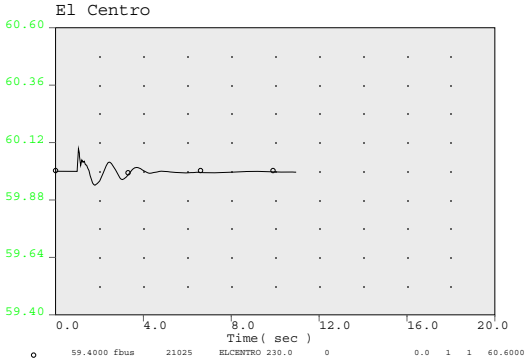
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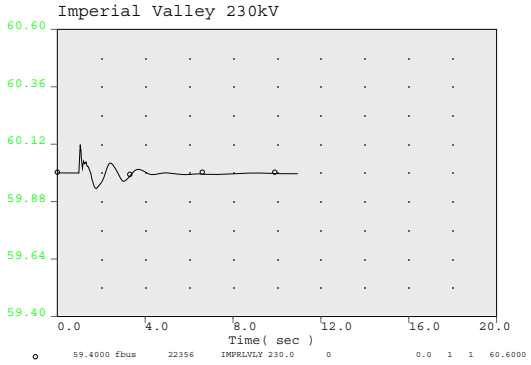
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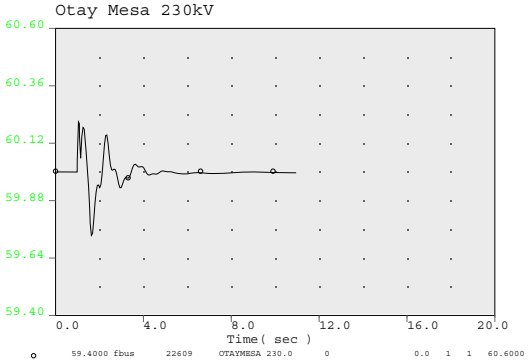
El Centro



Imperial Valley 230kV



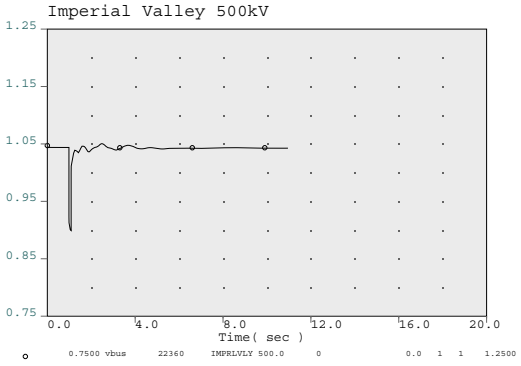
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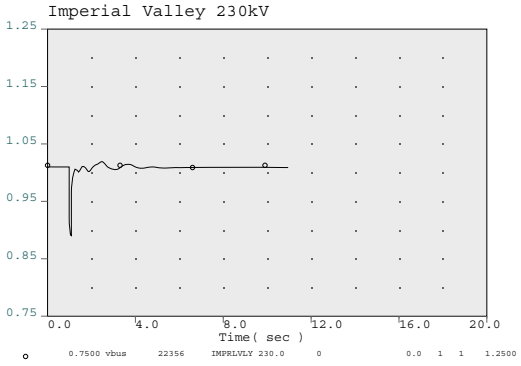
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Imperial Valley Area - VOLTAGE

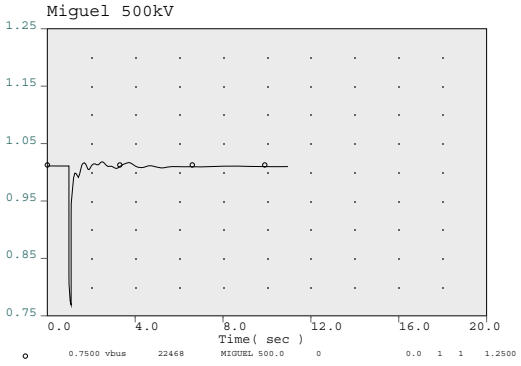
Imperial Valley 500kV



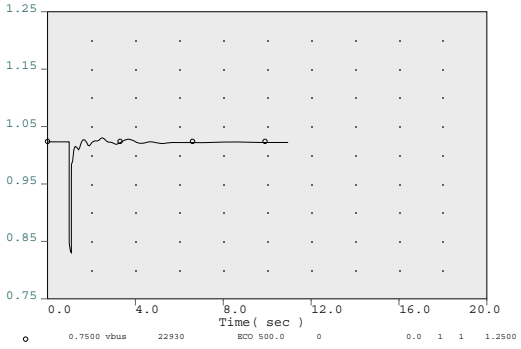
Imperial Valley 230kV



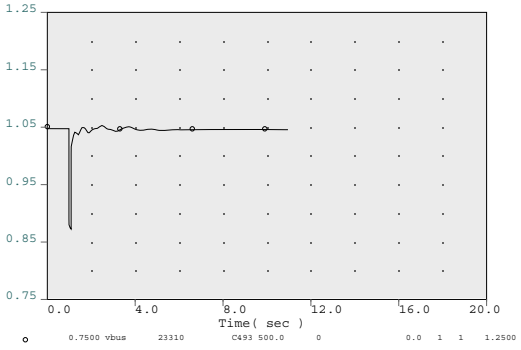
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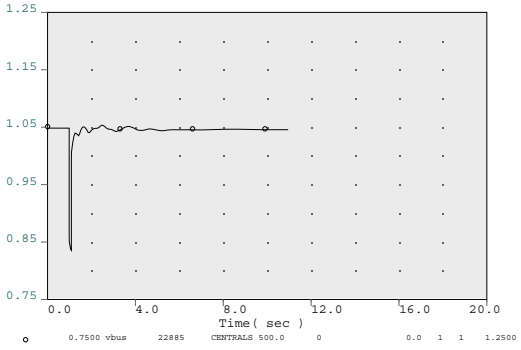
Windfarms 500



C493 500kV



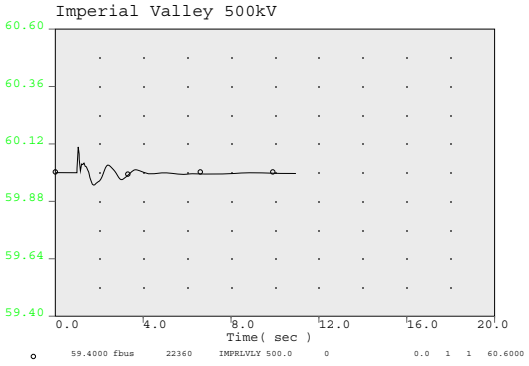
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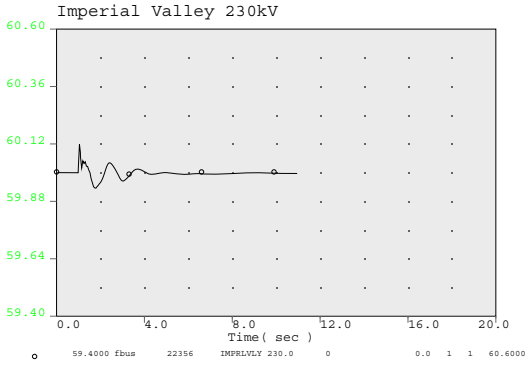
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

Imperial Valley Area - Frequency

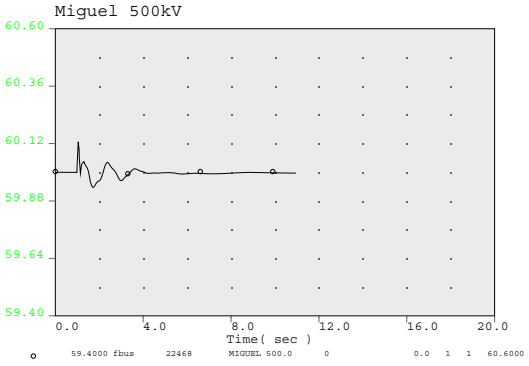
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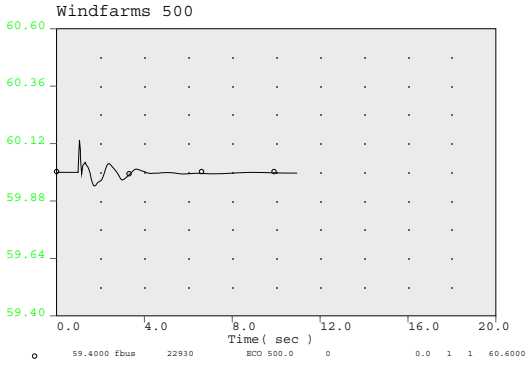
Imperial Valley 230kV



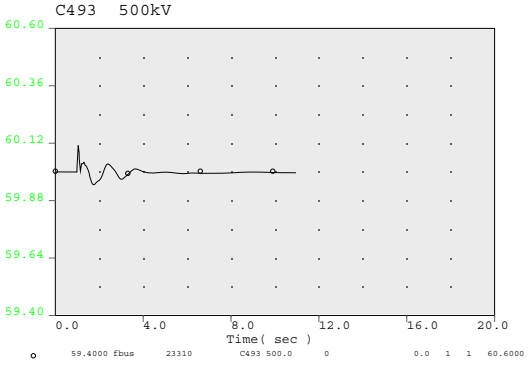
Miguel 500kV



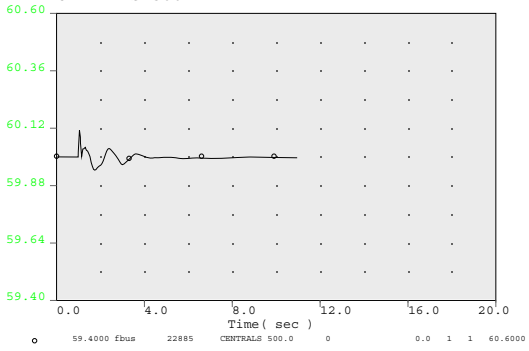
Windfarms 500



C493 500kV

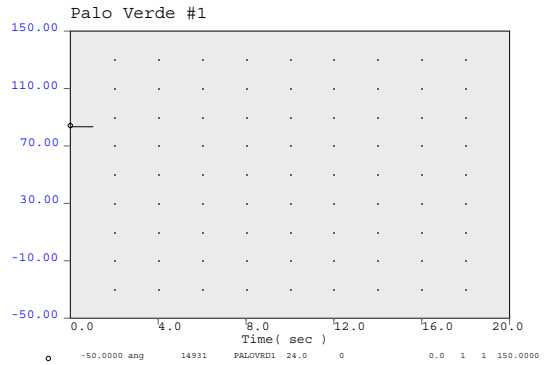


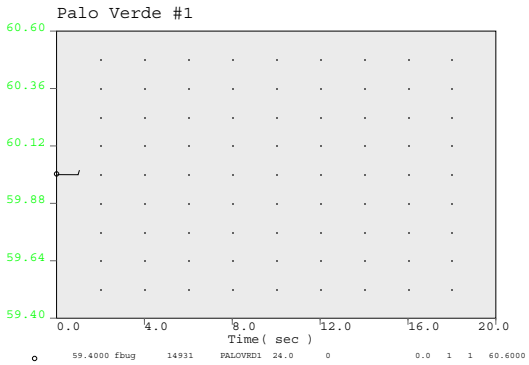
CENTRALS 500kV

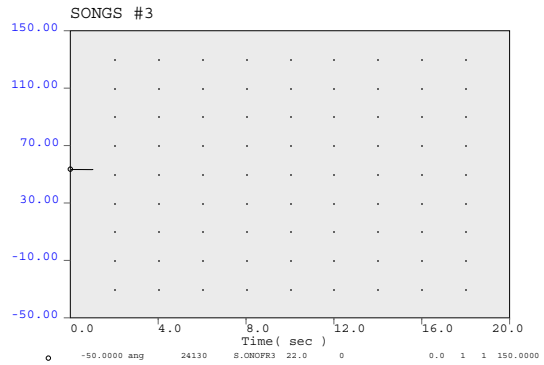


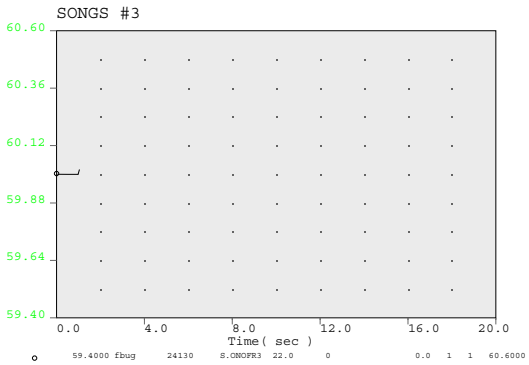
SDG&E Cluster 2 - pre int
2014 Heavy Summer
OM - SX 230 kV N-1

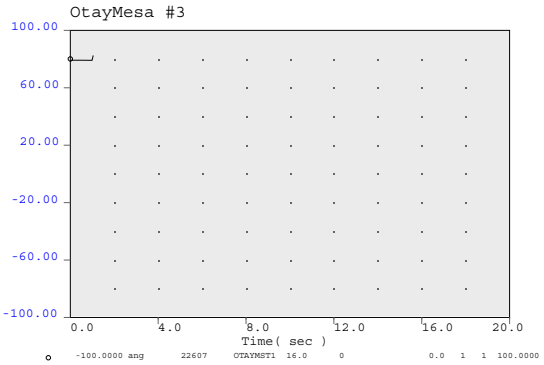
RELATIVE ROTOR ANGLE & FREQUENCY

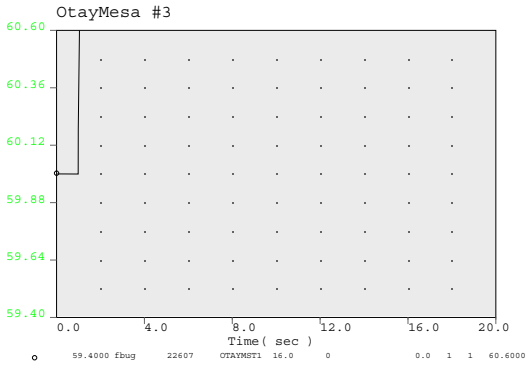












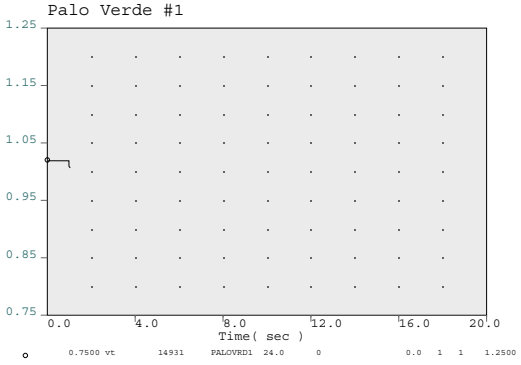
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Page 1

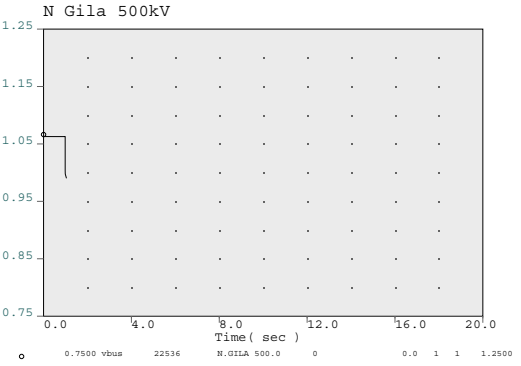
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RELATIVE VOLTAGE

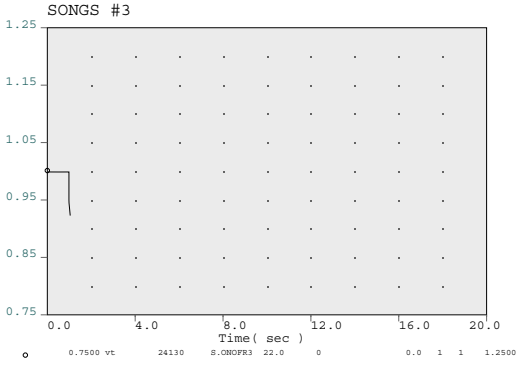
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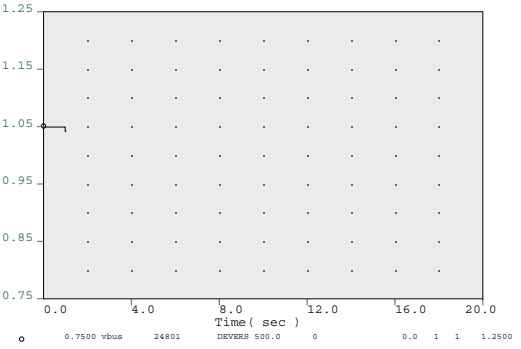
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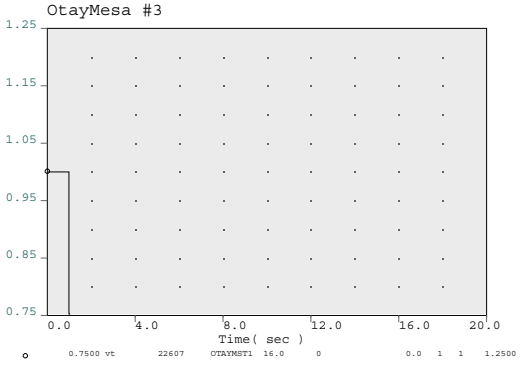
SONGS #3



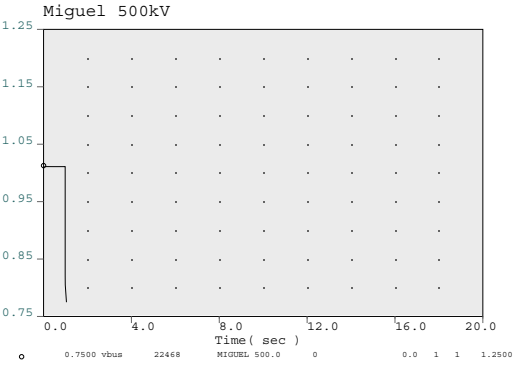
Devers 500



OtayMesa #3



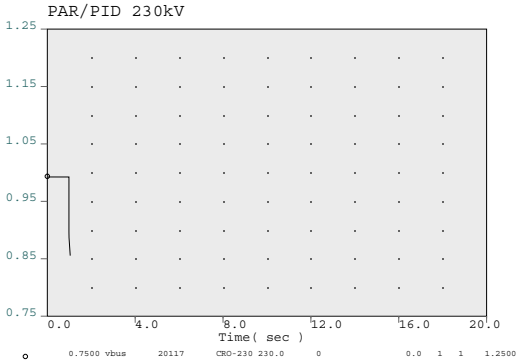
Miguel 500kV



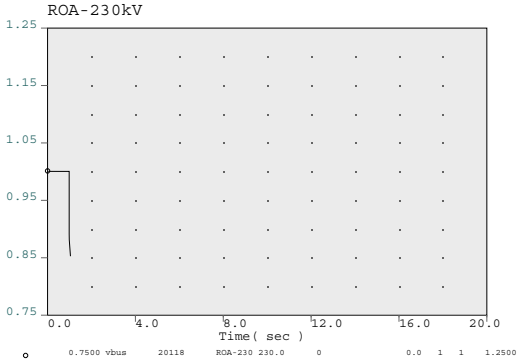
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Affected System Voltage Check and Comparison

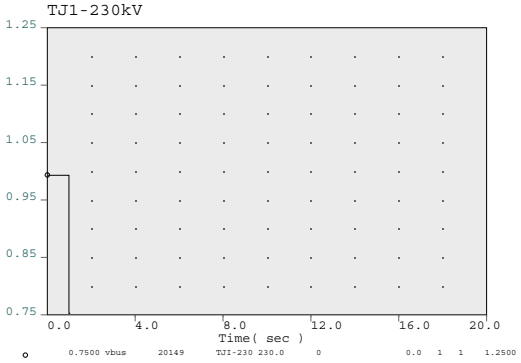
PAR/PID 230kV



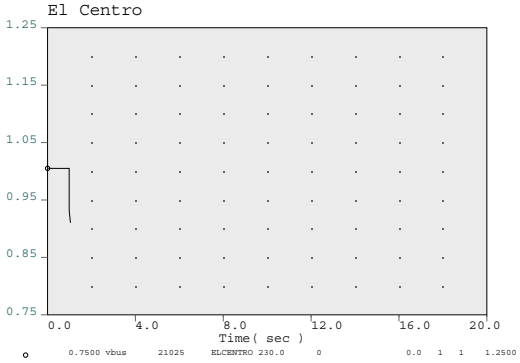
ROA-230kV



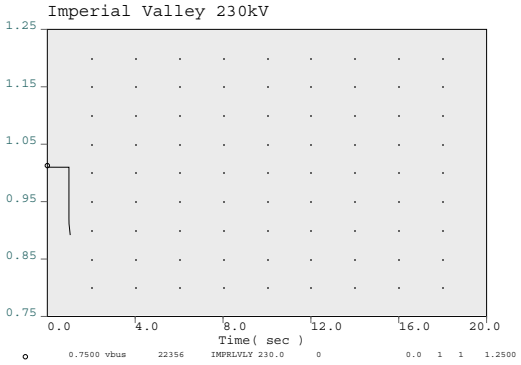
TJ1-230kV



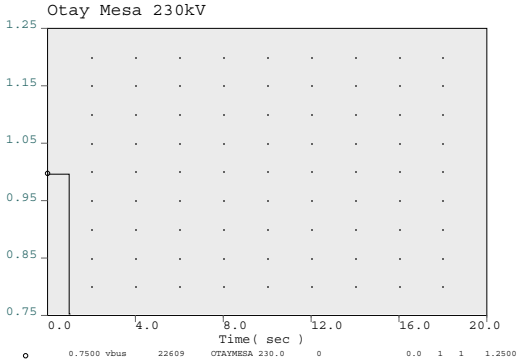
El Centro



Imperial Valley 230kV



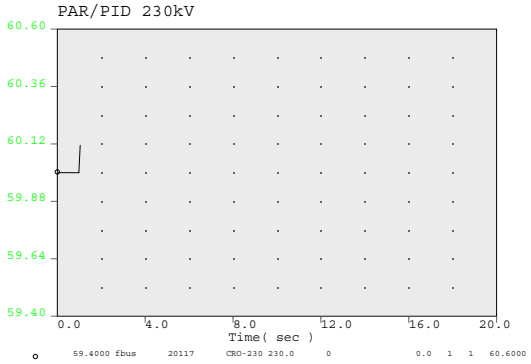
Otay Mesa 230kV



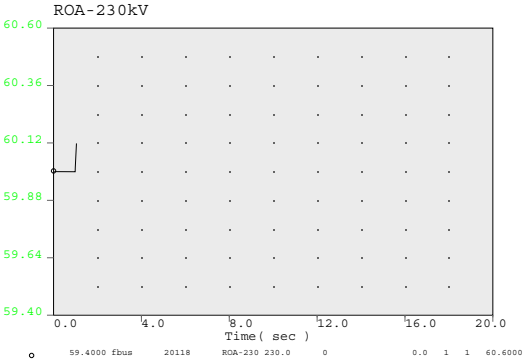
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Affected System Frequency Check and Comparison

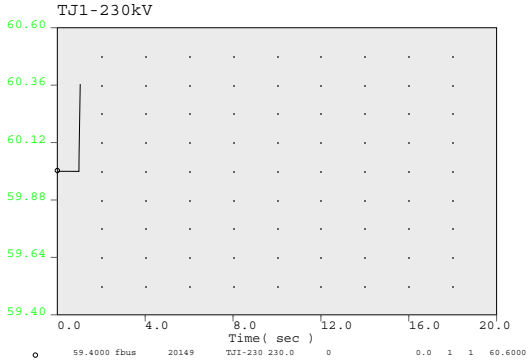
PAR/PID 230kV



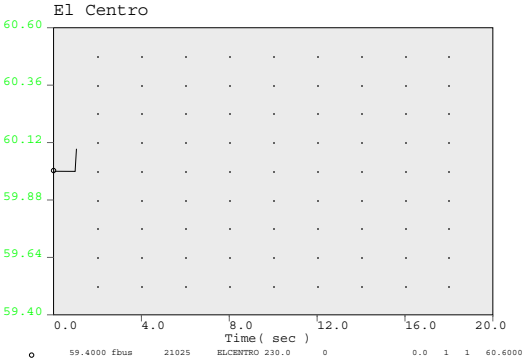
ROA-230kV



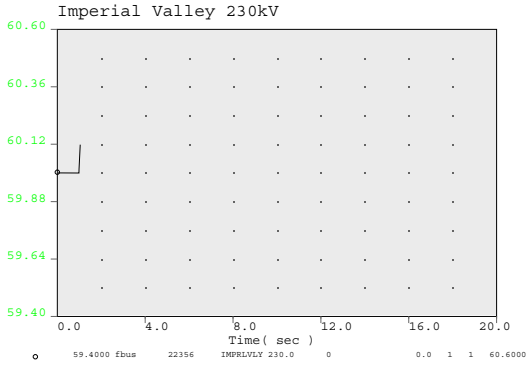
TJ1-230kV



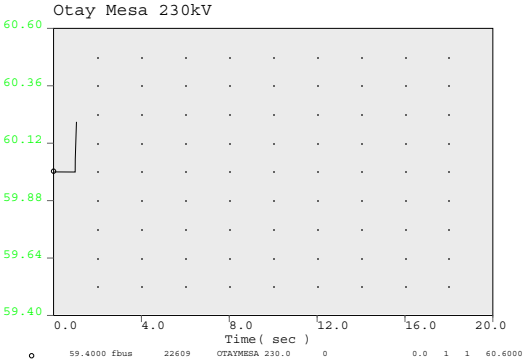
El Centro



Imperial Valley 230kV



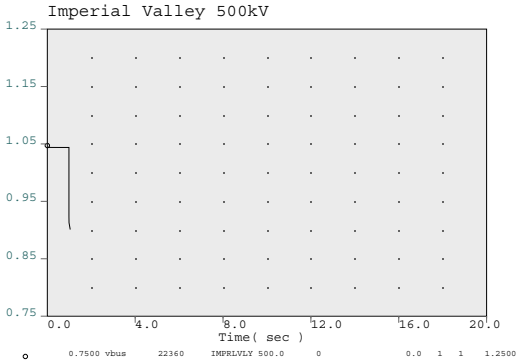
Otay Mesa 230kV



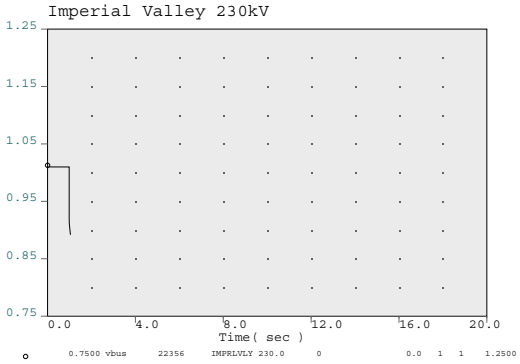
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Imperial Valley Area - VOLTAGE

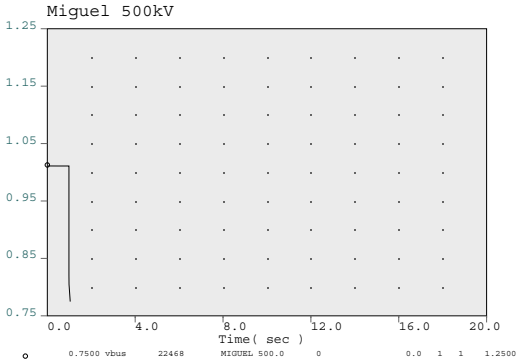
Imperial Valley 500kV



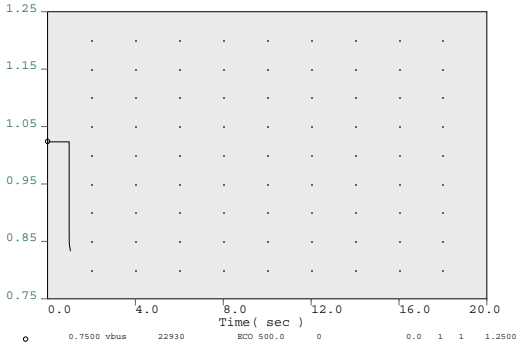
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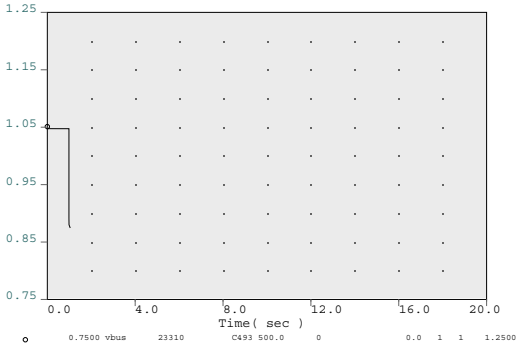
Miguel 500kV



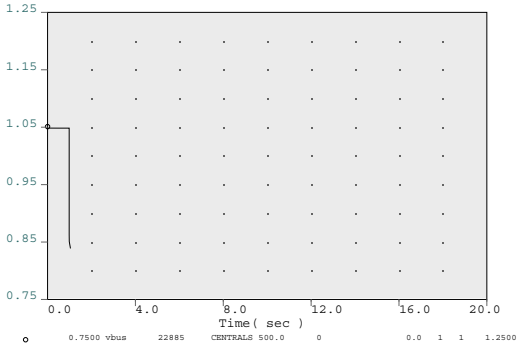
Windfarms 500



C493 500kV

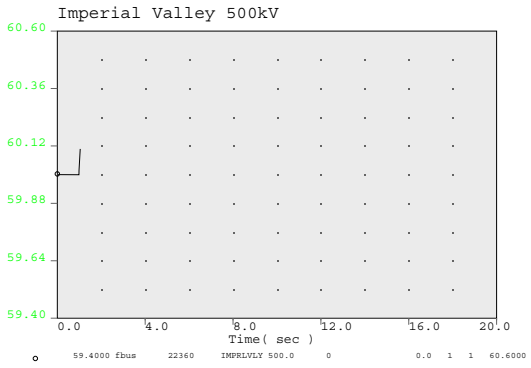


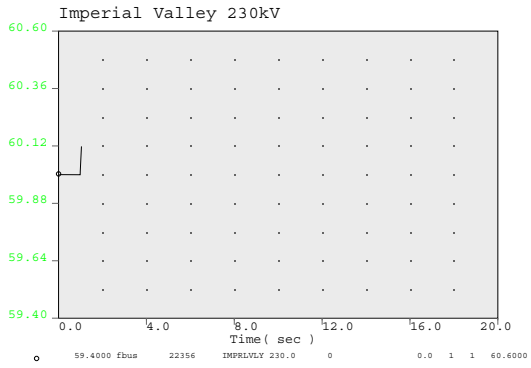
CENTRALS 500kV

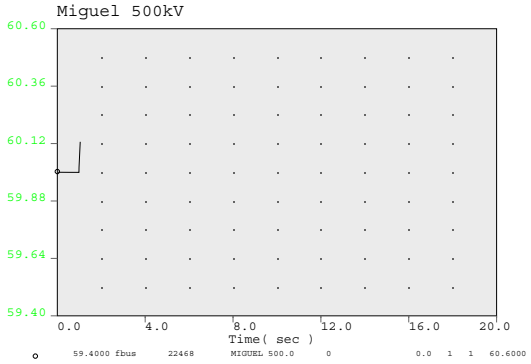


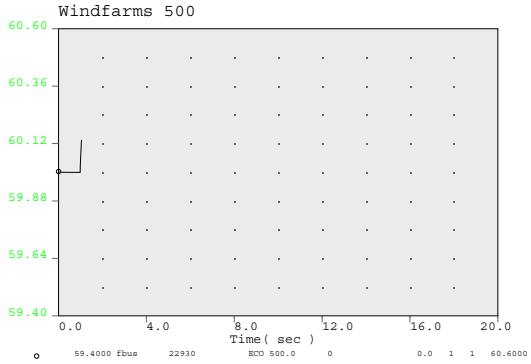
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

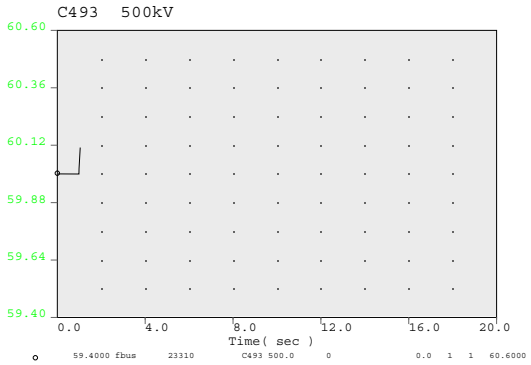
Imperial Valley Area - Frequency

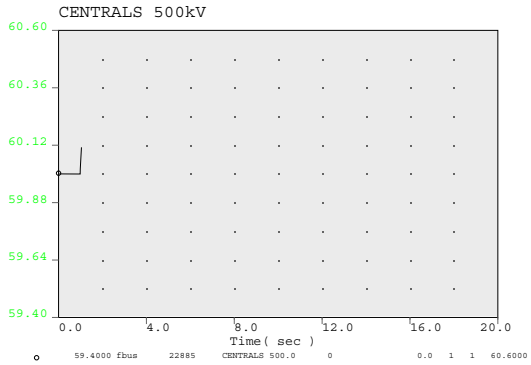






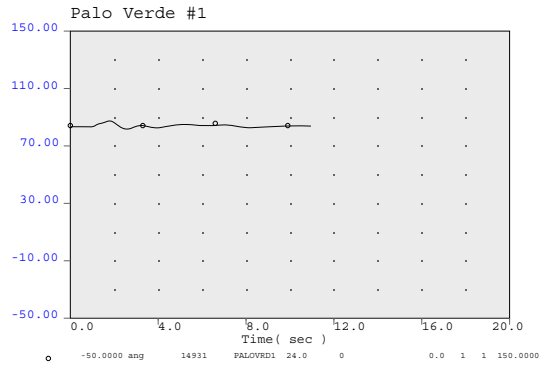


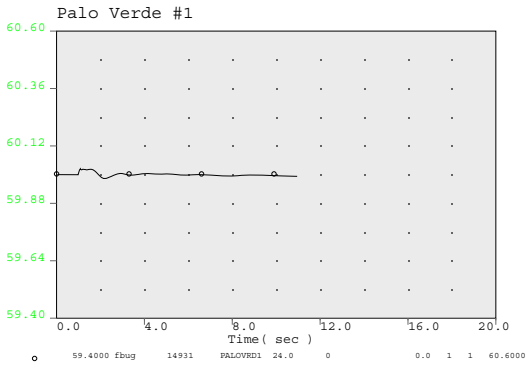


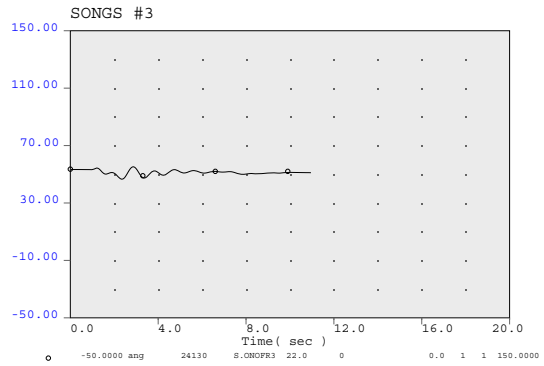


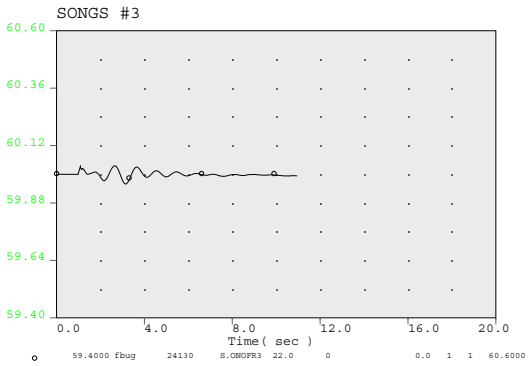
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

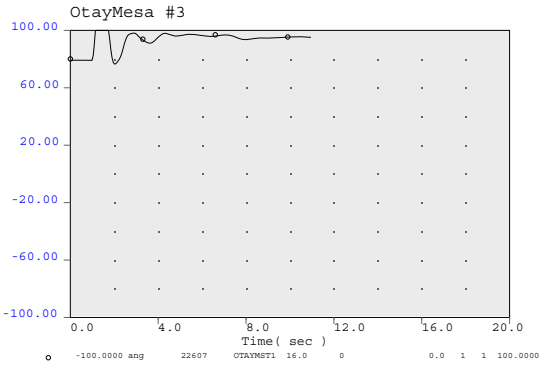
RELATIVE ROTOR ANGLE & FREQUENCY

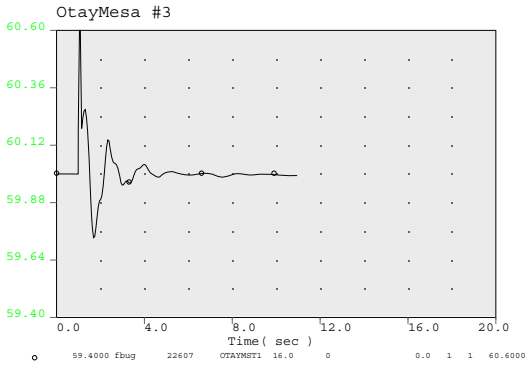












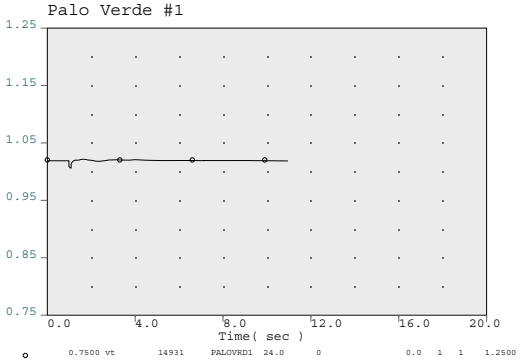
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Page 1

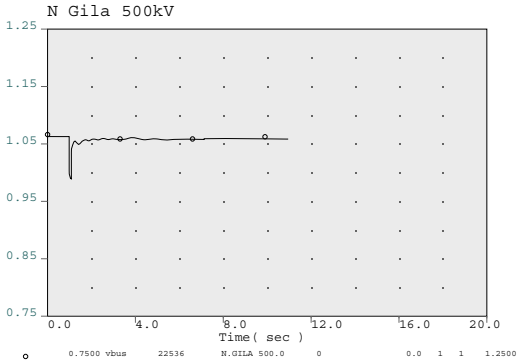
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RELATIVE VOLTAGE

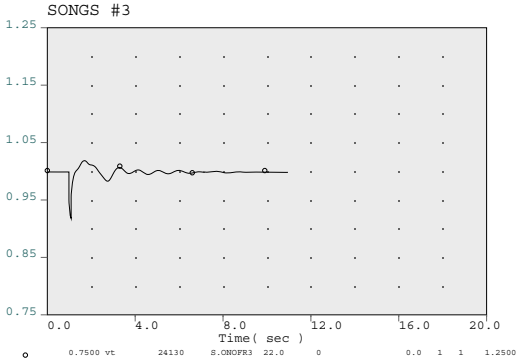
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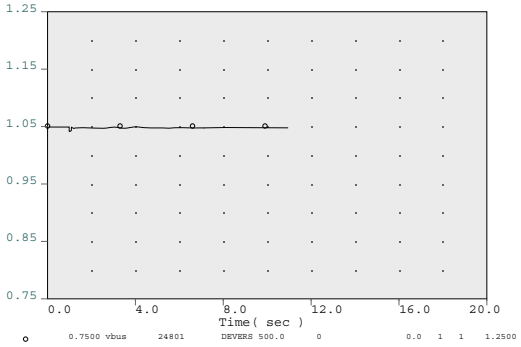
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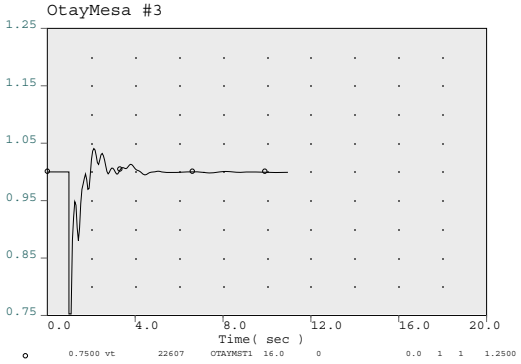
SONGS #3



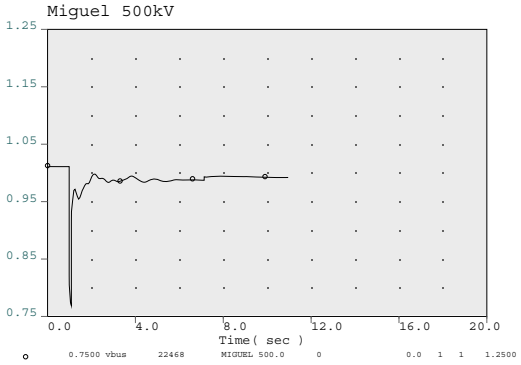
Devers 500



OtayMesa #3



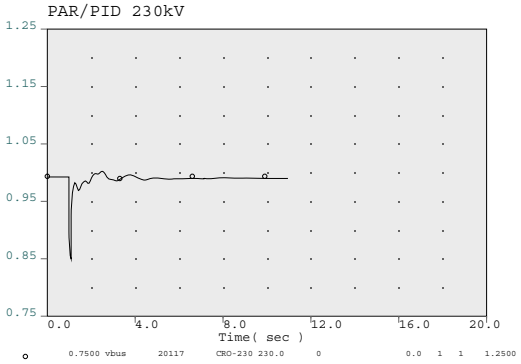
Miguel 500kV



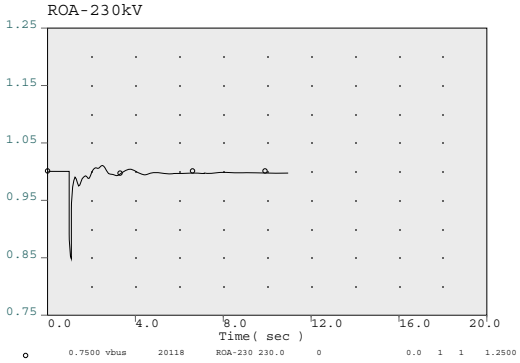
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Affected System Voltage Check and Comparison

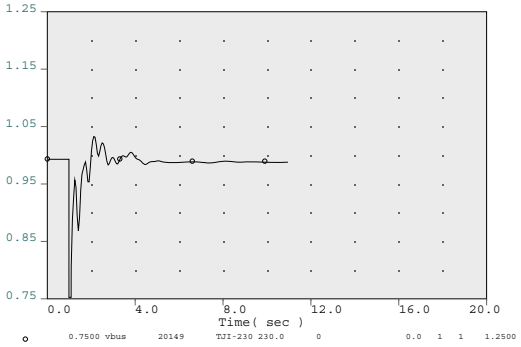
PAR/PID 230kV



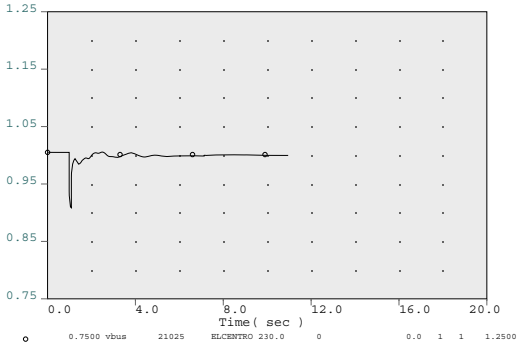
ROA-230kV



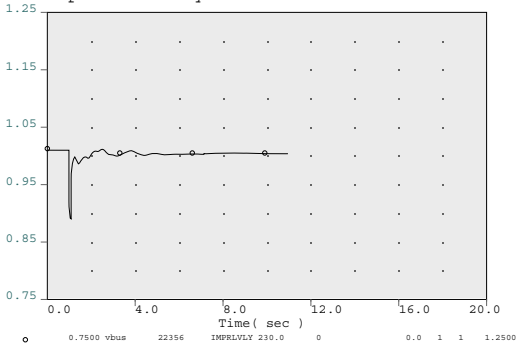
TJ1-230kV



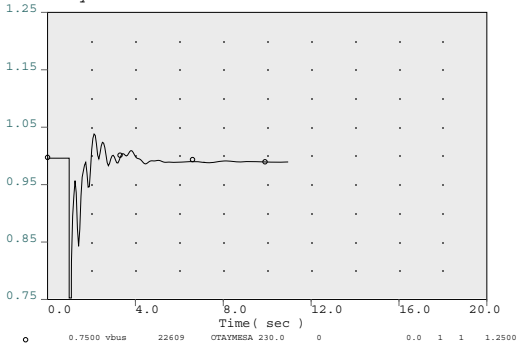
El Centro



Imperial Valley 230kV



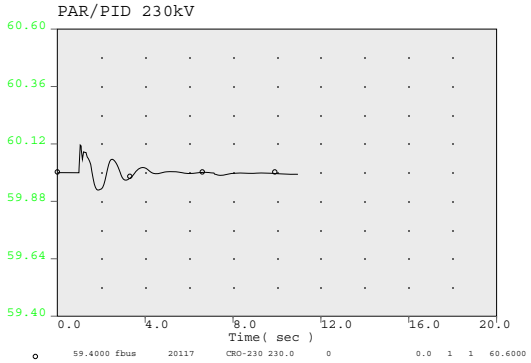
Otay Mesa 230kV



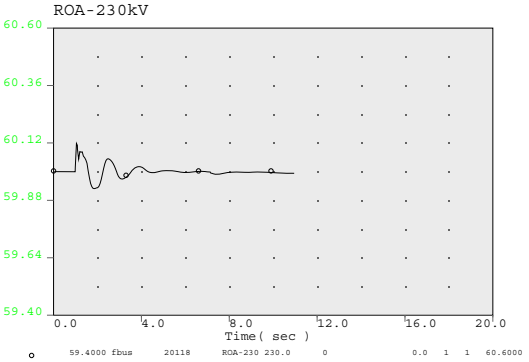
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Affected System Frequency Check and Comparison

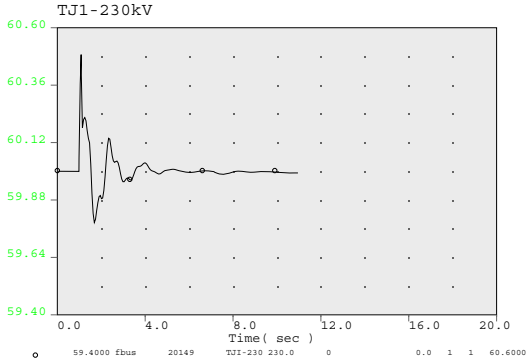
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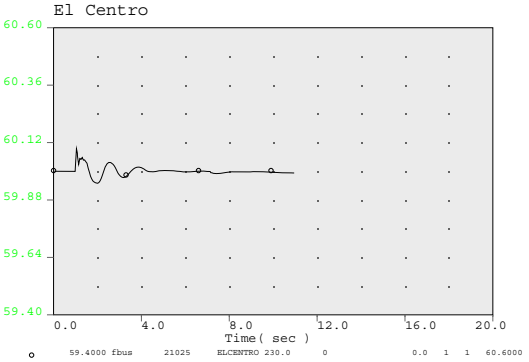
ROA-230kV



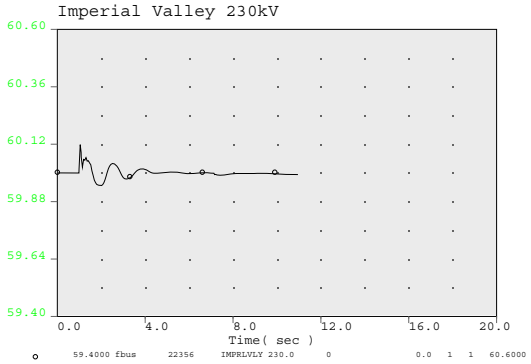
TJ1-230kV



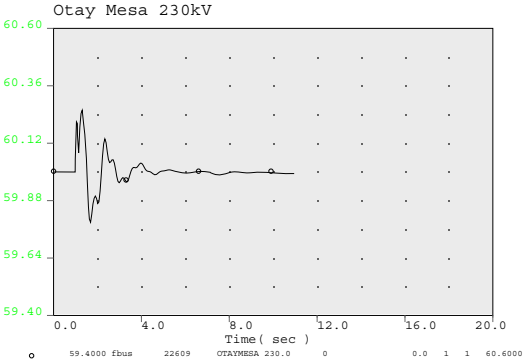
El Centro



Imperial Valley 230kV



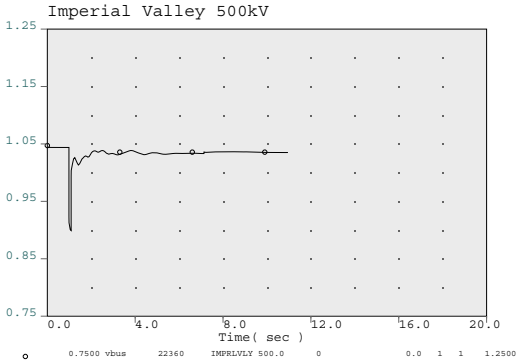
Otay Mesa 230kV



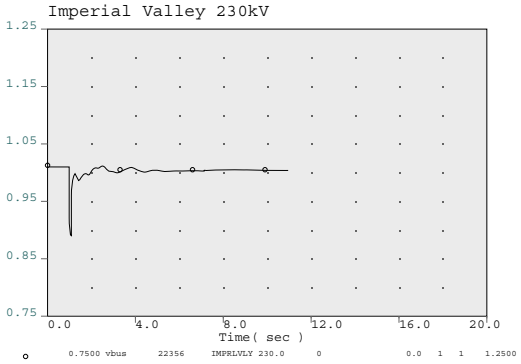
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

Imperial Valley Area - VOLTAGE

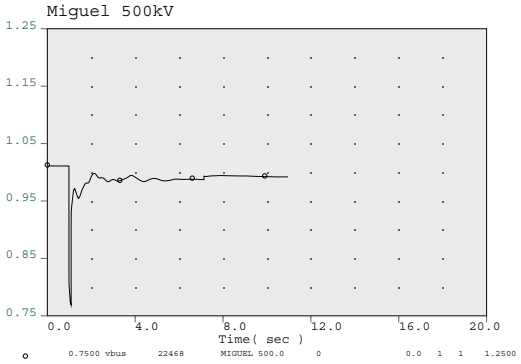
Imperial Valley 500kV



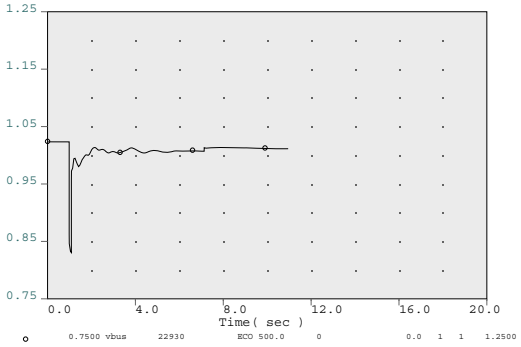
Imperial Valley 230kV



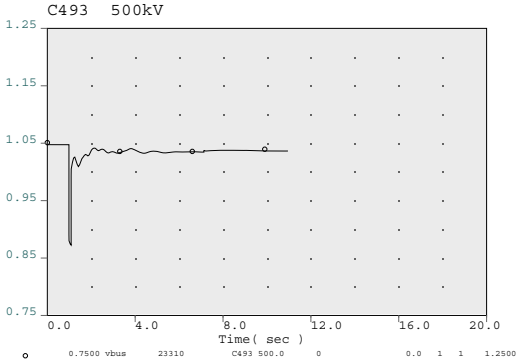
Miguel 500kV



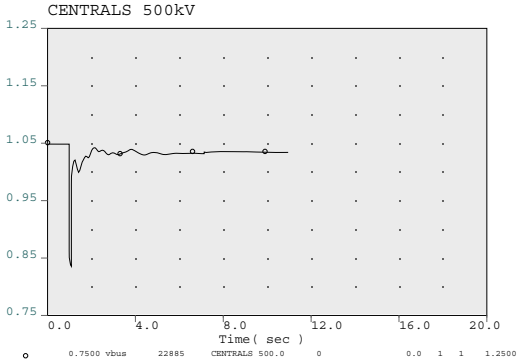
Windfarms 500



C493 500kV



CENTRALS 500kV



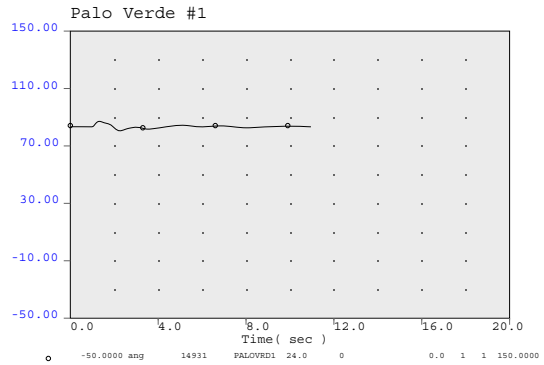
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

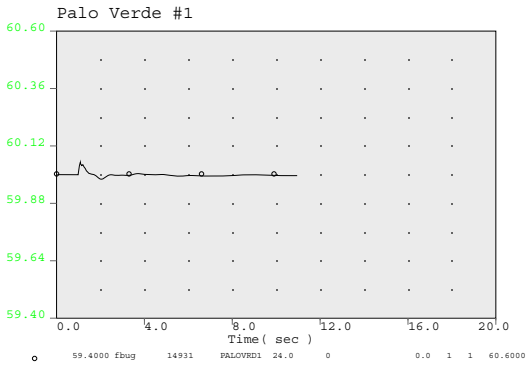
Imperial Valley Area - Frequency

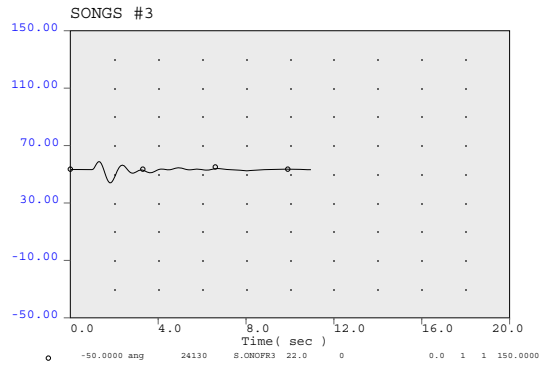


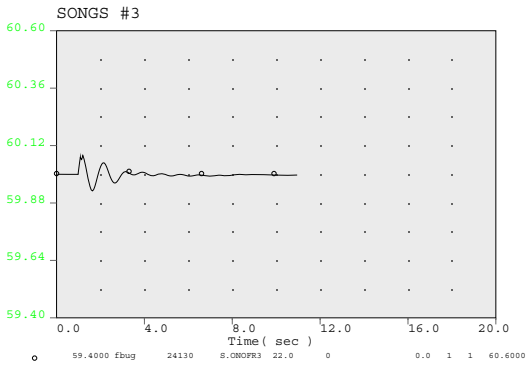
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Otay Mesa - Southbay 230 kV N-1

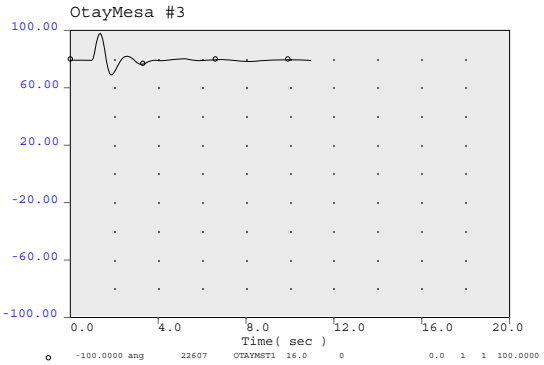
RELATIVE ROTOR ANGLE & FREQUENCY

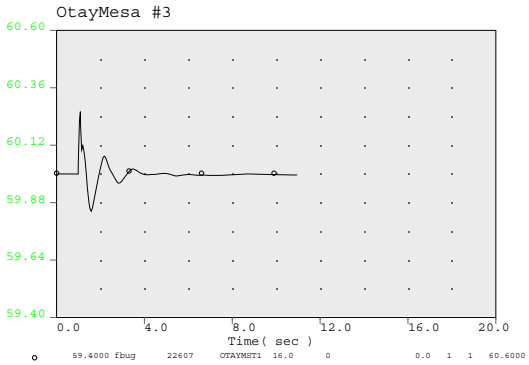






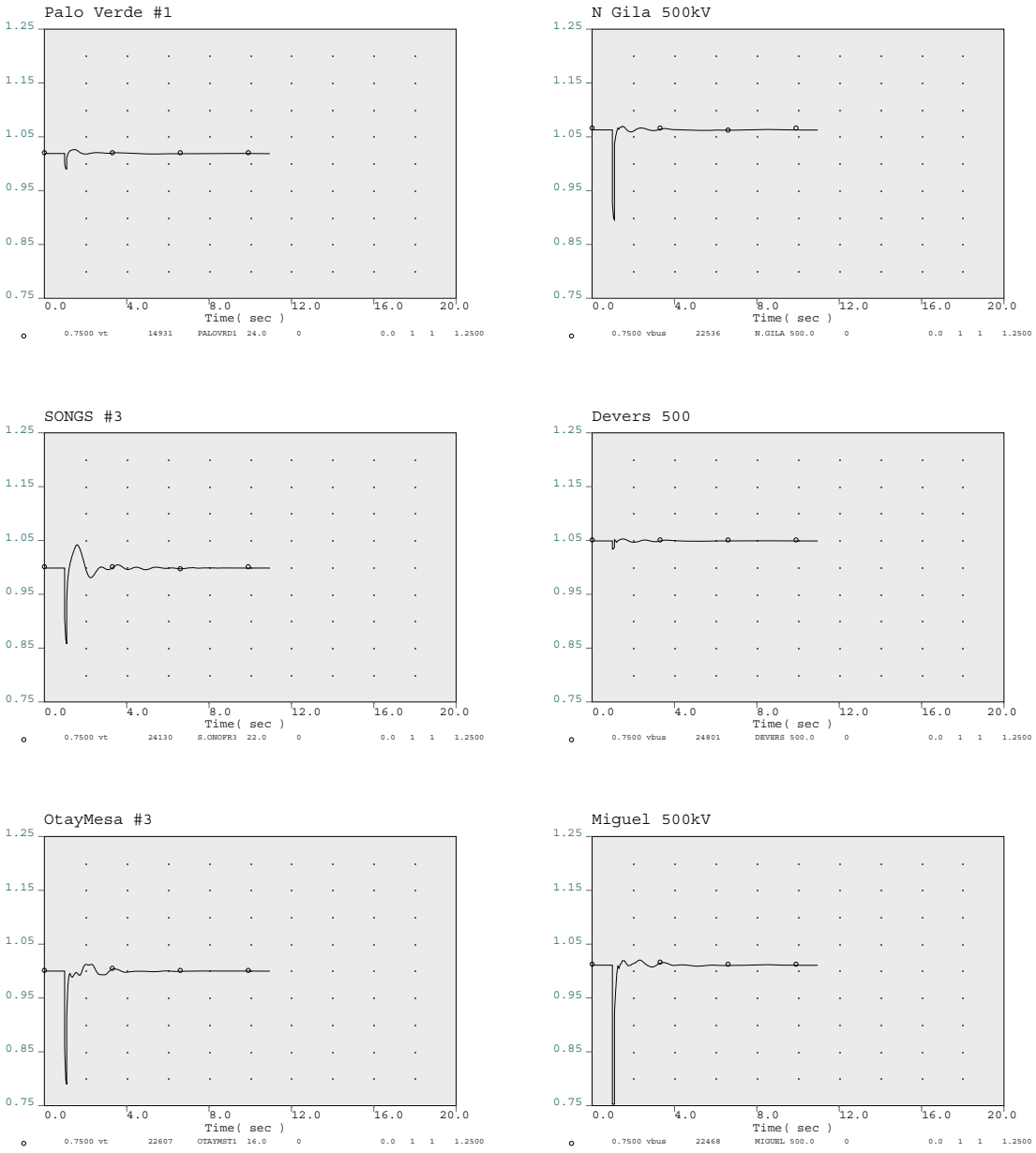






SDG&E Cluster 2 - pre int
2014 Heavy Summer
Sycamore - Miguel 230 kV N-1

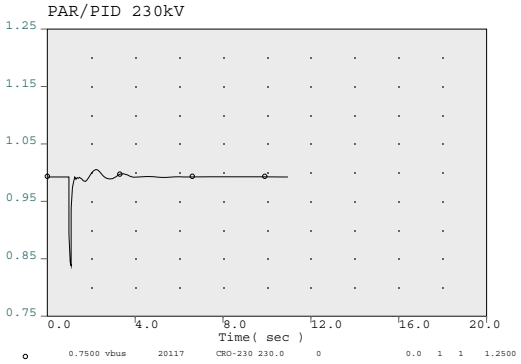
RELATIVE VOLTAGE



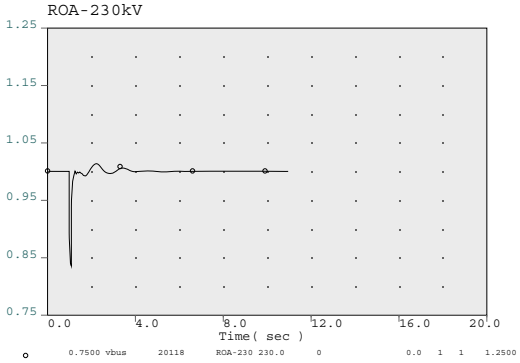
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Sycamore - Miguel 230 kV N-1

Affected System Voltage Check and Comparison

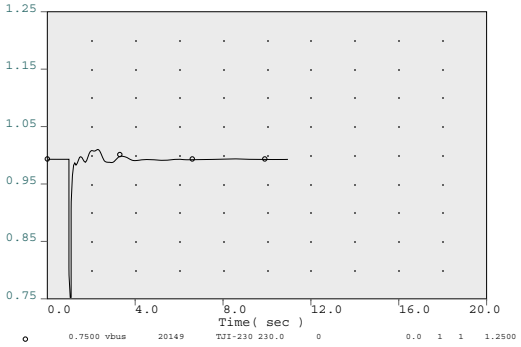
PAR/PID 230kV



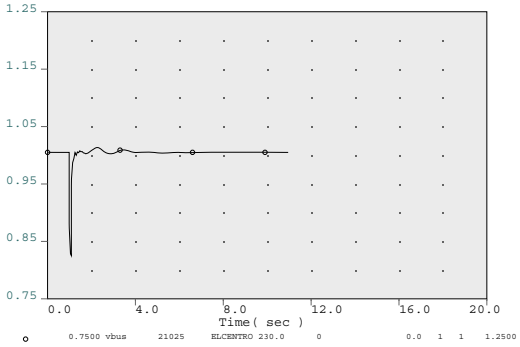
ROA-230kV



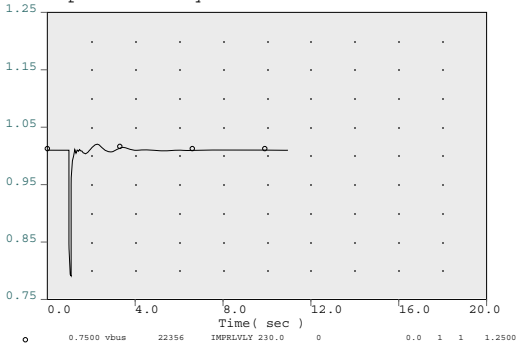
TJ1-230kV



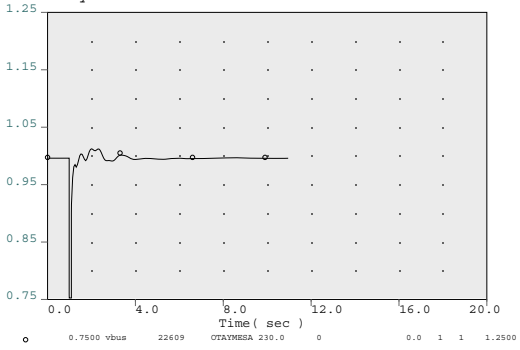
El Centro



Imperial Valley 230kV



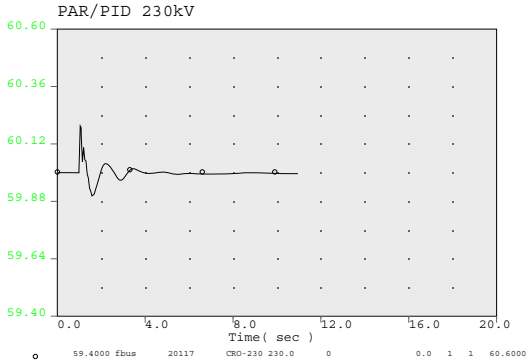
Otay Mesa 230kV



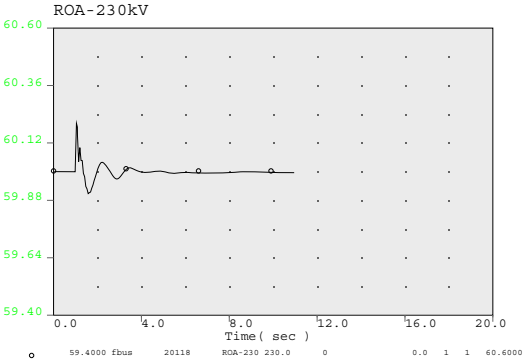
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Sycamore - Miguel 230 kV N-1

Affected System Frequency Check and Comparison

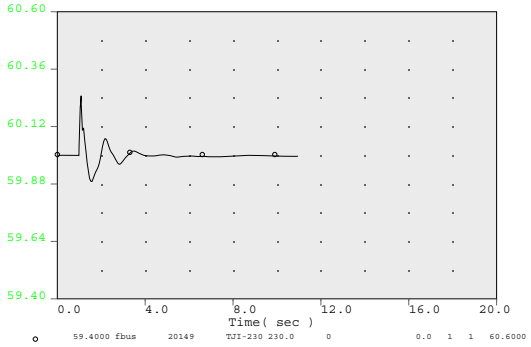
PAR/PID 230kV



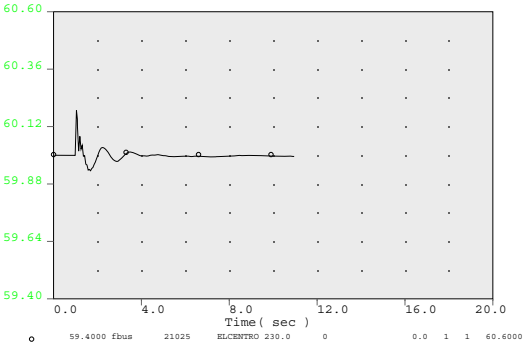
ROA-230kV



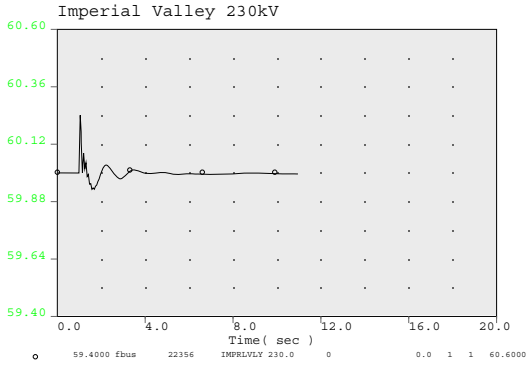
TJ1-230kV



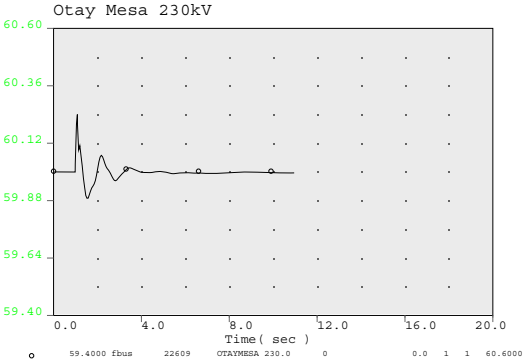
El Centro



Imperial Valley 230kV



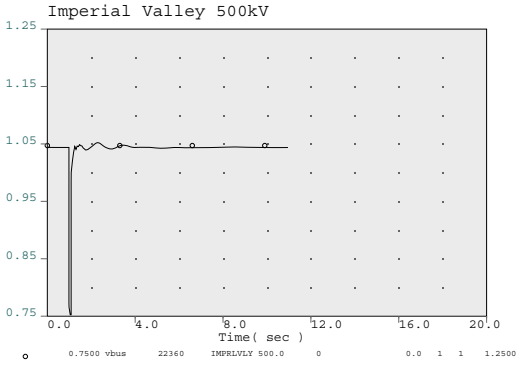
Otay Mesa 230kV



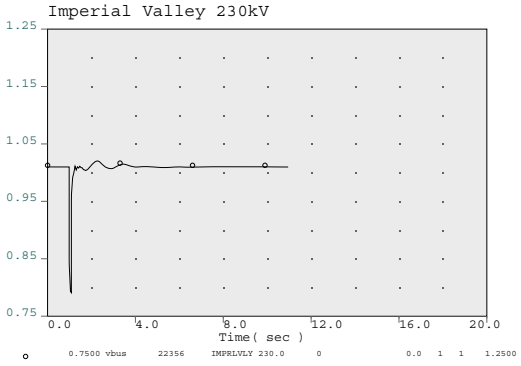
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Sycamore - Miguel 230 kV N-1

Imperial Valley Area - VOLTAGE

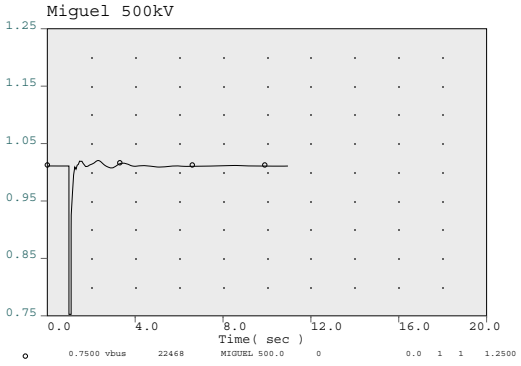
Imperial Valley 500kV



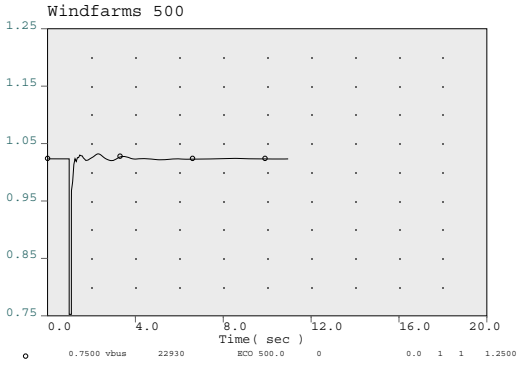
Imperial Valley 230kV



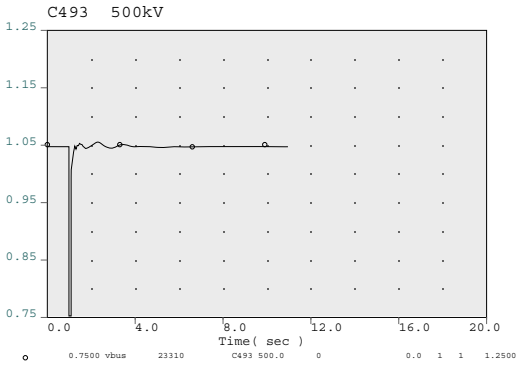
Miguel 500kV



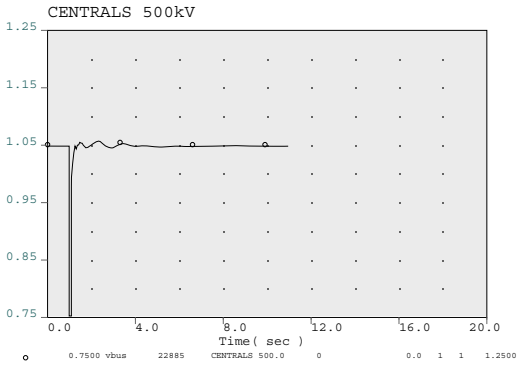
Windfarms 500



C493 500kV

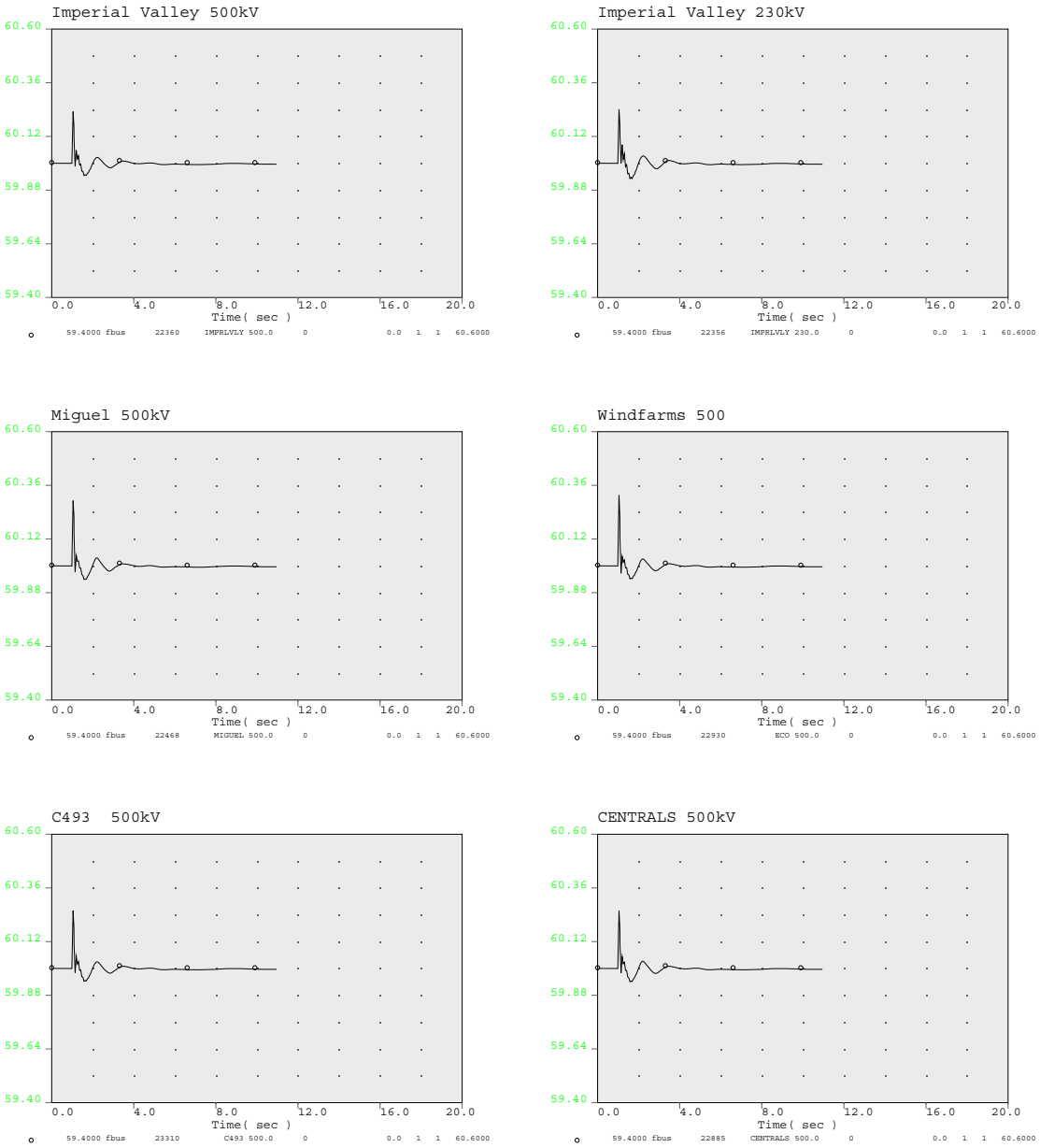


CENTRALS 500kV



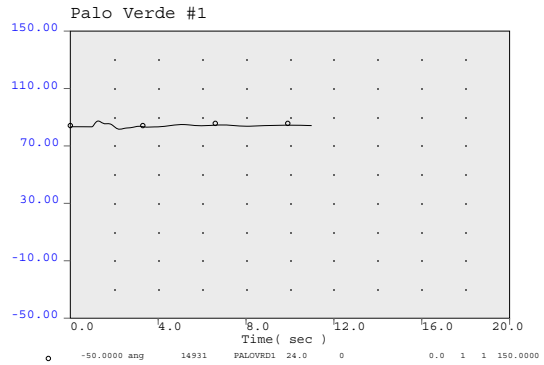
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Sycamore - Miguel 230 kV N-1

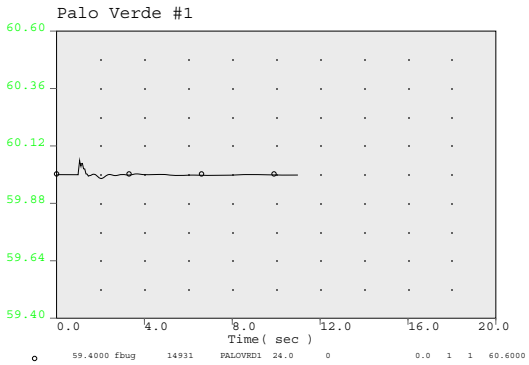
Imperial Valley Area - Frequency

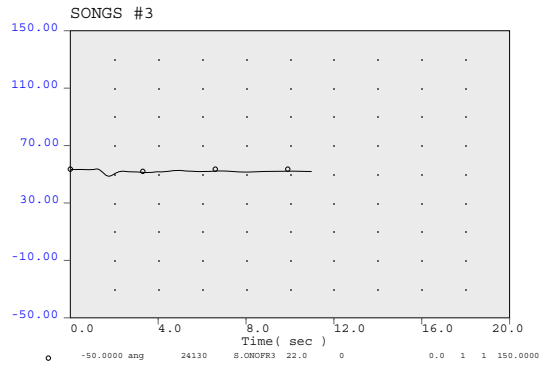


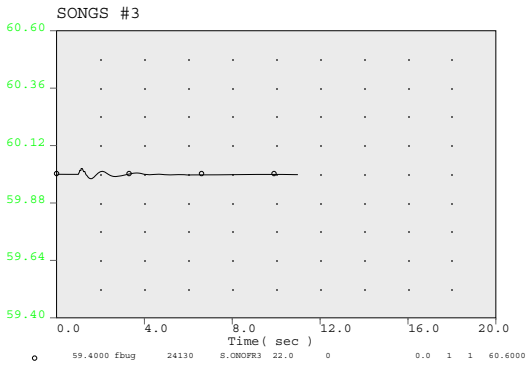
SDG&E Cluster 2 - pre int
2014 Heavy Summer
Sycamore - Miguel 230 kV N-1

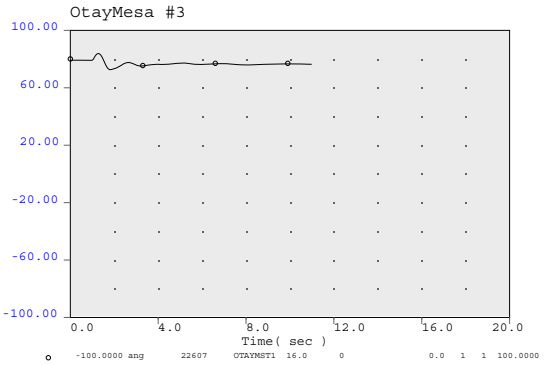
RELATIVE ROTOR ANGLE & FREQUENCY

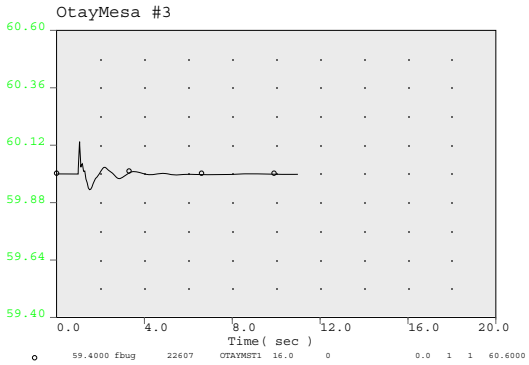








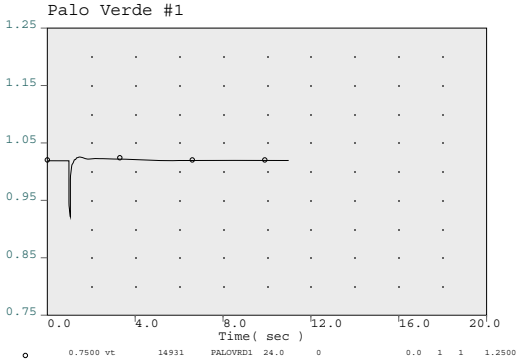




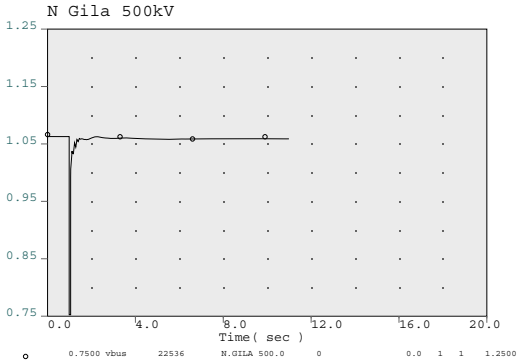
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

RELATIVE VOLTAGE

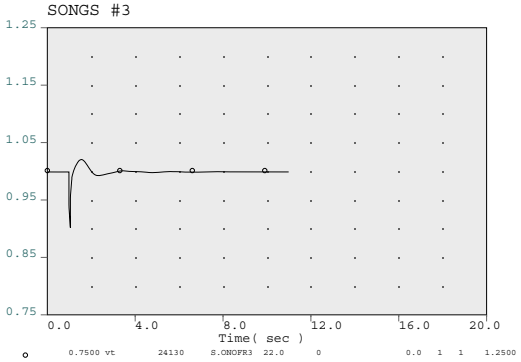
Palo Verde #1



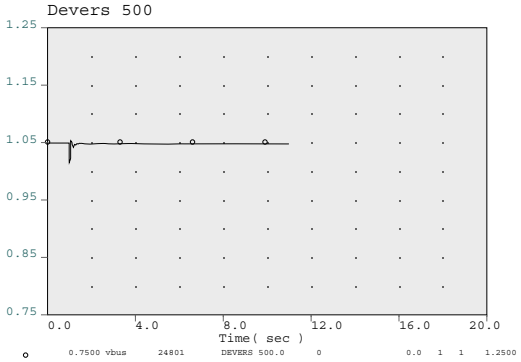
N Gila 500kV



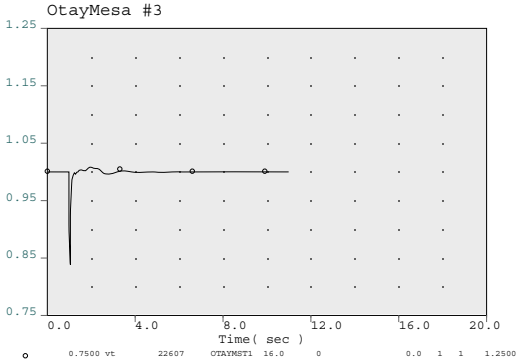
SONGS #3



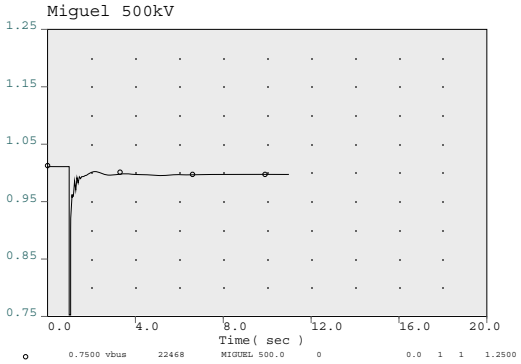
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OtayMesa #3



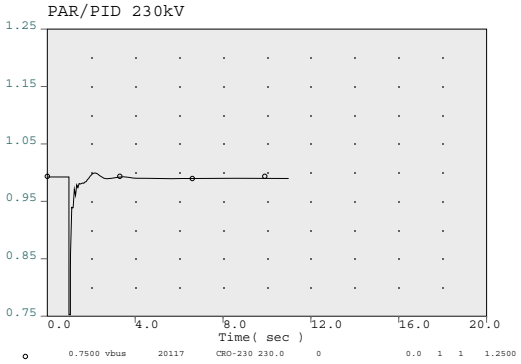
Miguel 500kV



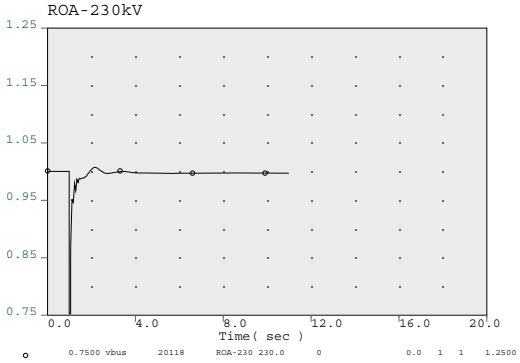
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

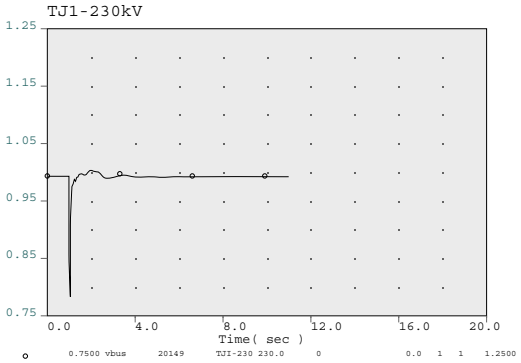
PAR/PID 230kV



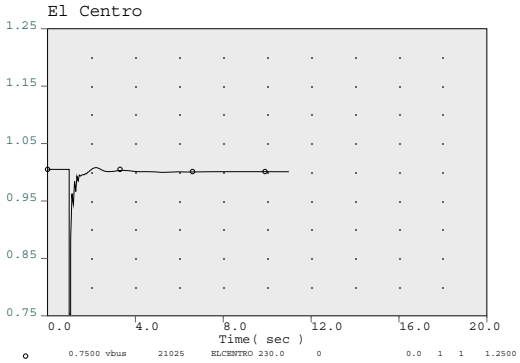
ROA-230kV



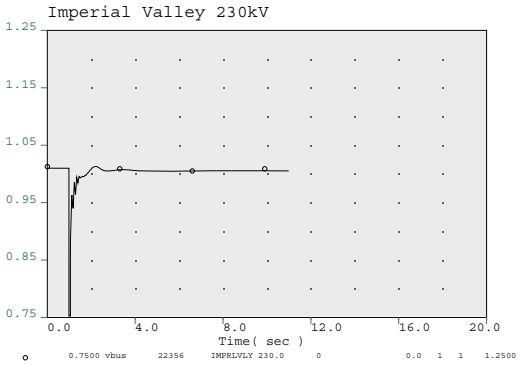
TJ1-230kV



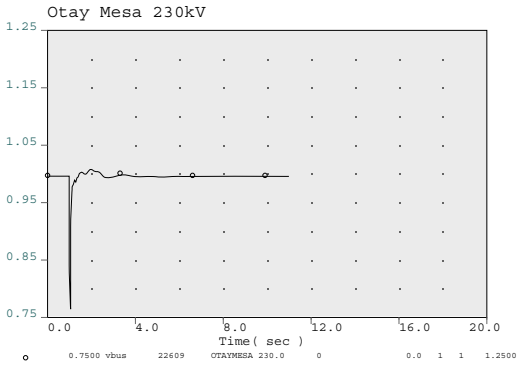
El Centro



Imperial Valley 230kV



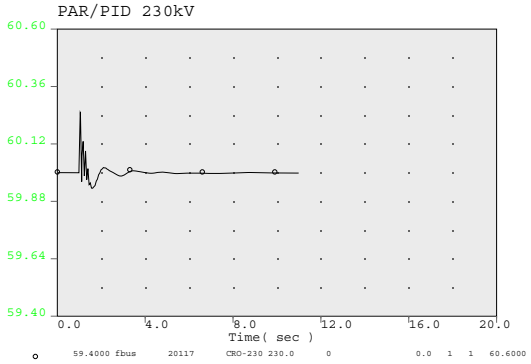
Otay Mesa 230kV



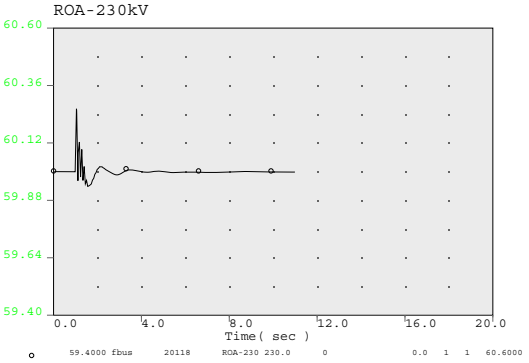
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

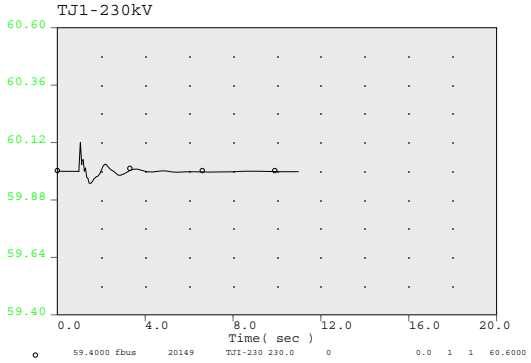
PAR/PID 230kV



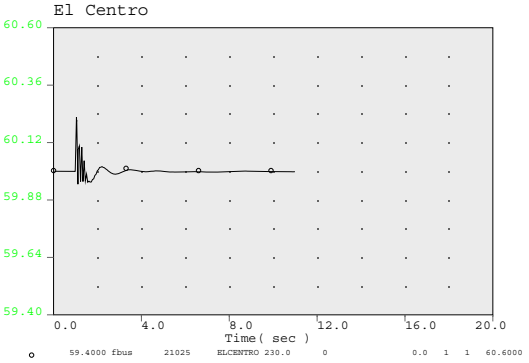
ROA-230kV



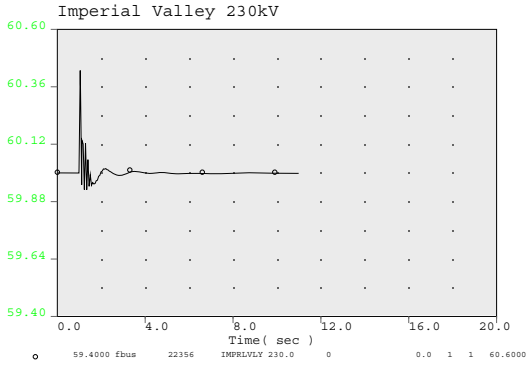
TJ1-230kV



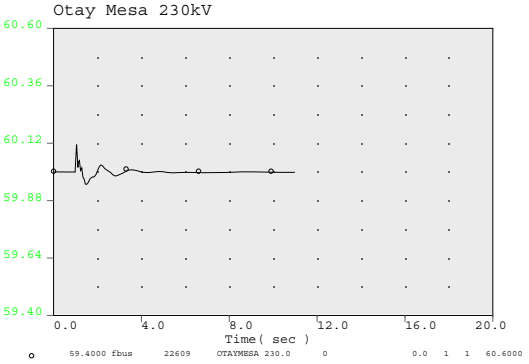
El Centro



Imperial Valley 230kV



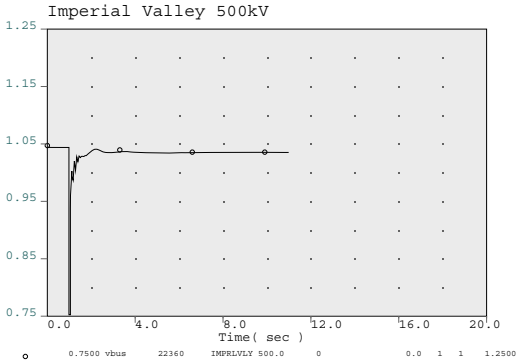
Otay Mesa 230kV



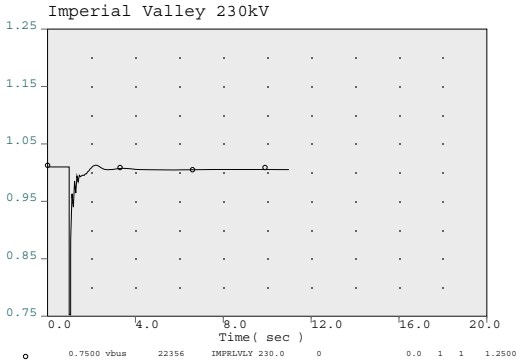
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Imperial Valley Area - VOLTAGE

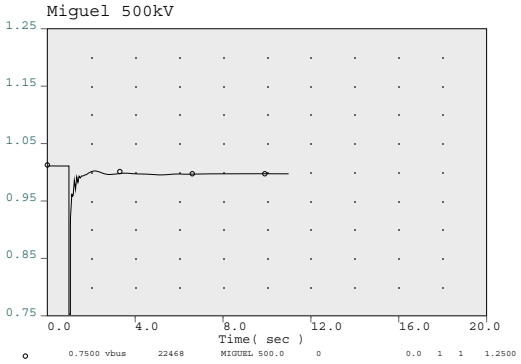
Imperial Valley 500kV



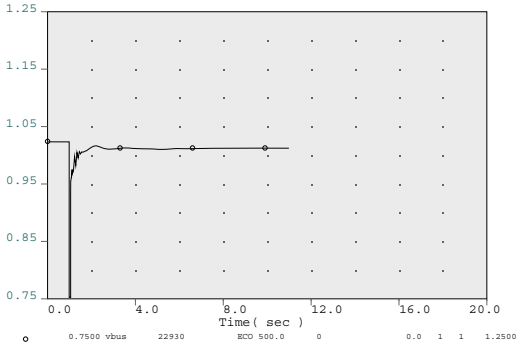
Imperial Valley 230kV



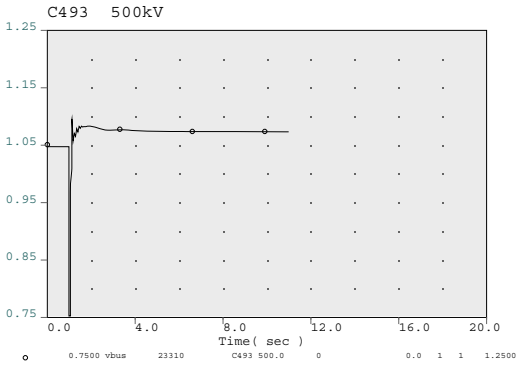
Miguel 500kV



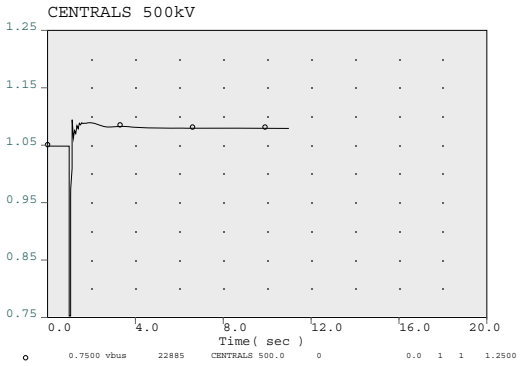
Windfarms 500



C493 500kV



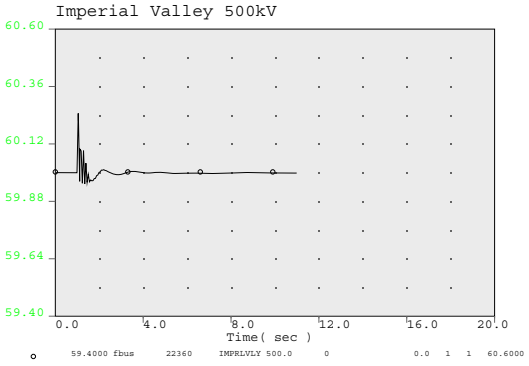
CENTRALS 500kV



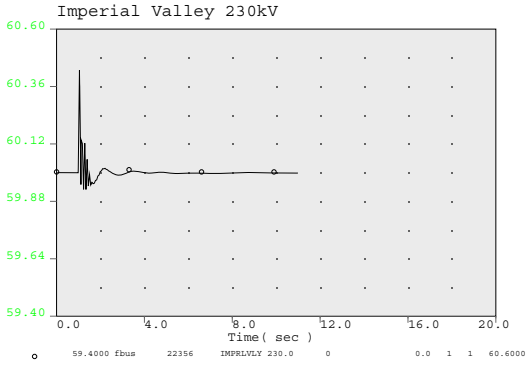
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Imperial Valley Area - Frequency

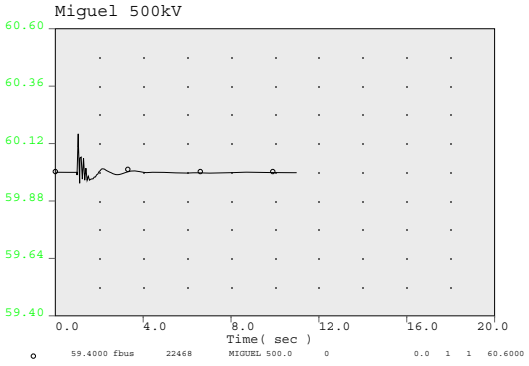
Imperial Valley 500kV



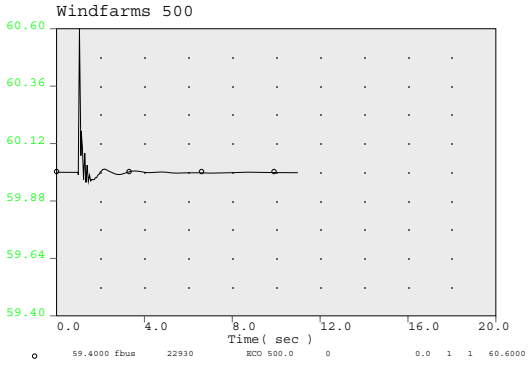
Imperial Valley 230kV



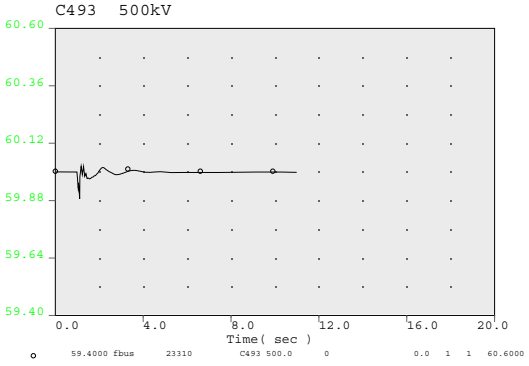
Miguel 500kV



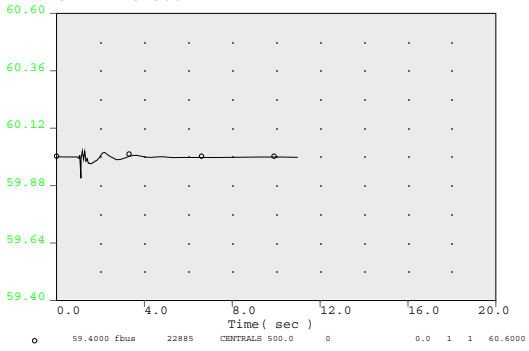
Windfarms 500



C493 500kV

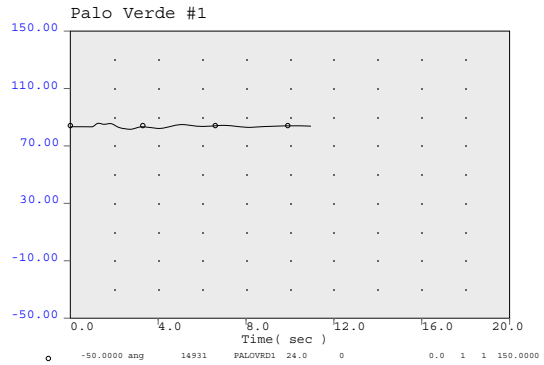


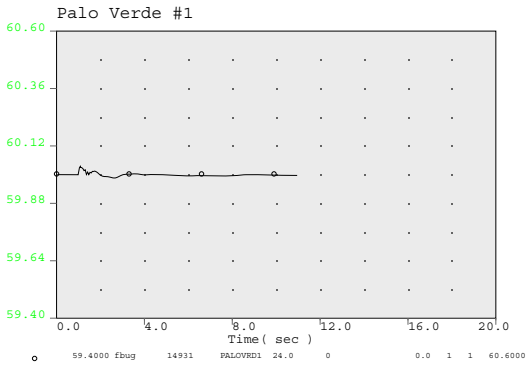
CENTRALS 500kV

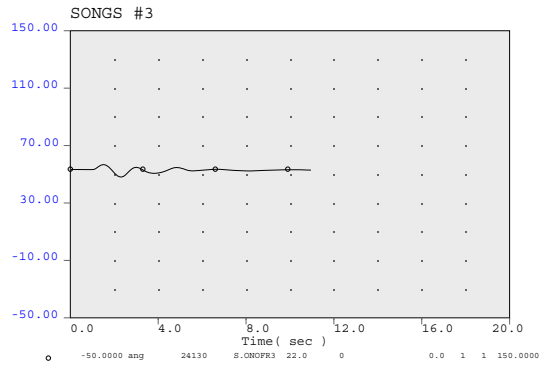


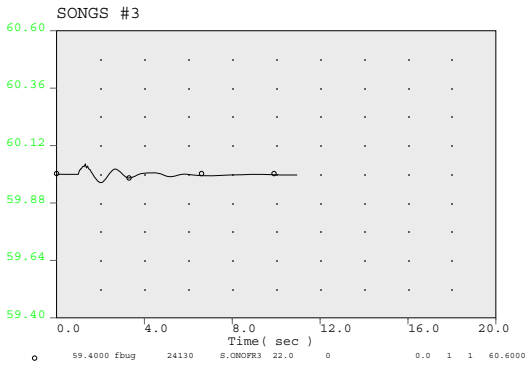
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley- C493 500kV line1

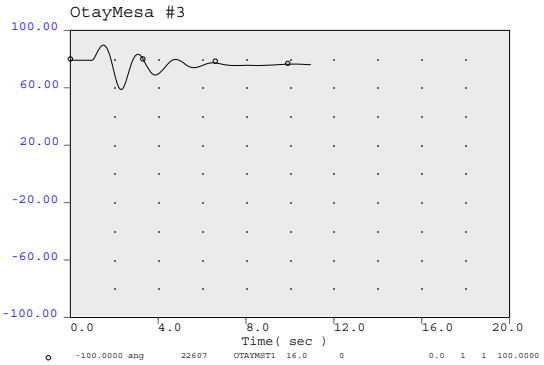
RELATIVE ROTOR ANGLE & FREQUENCY

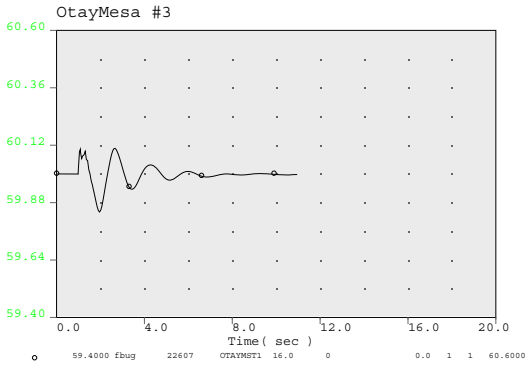












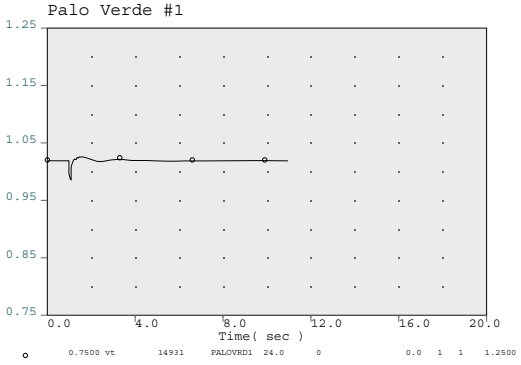
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Page 1

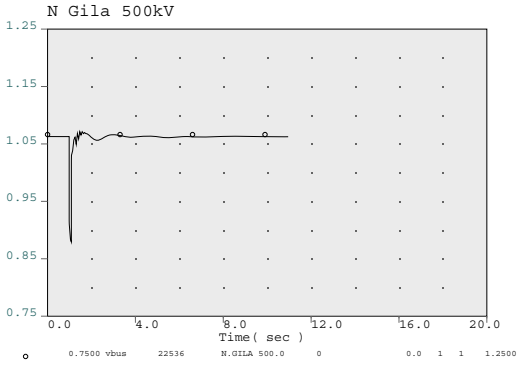
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RELATIVE VOLTAGE

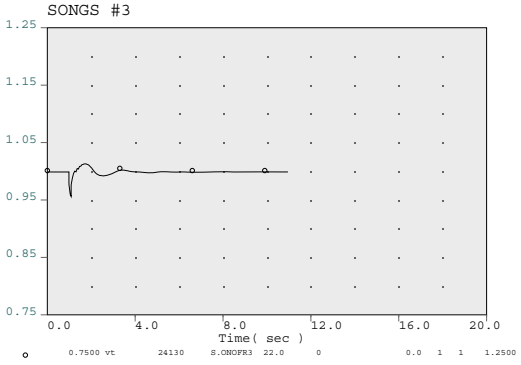
Palo Verde #1



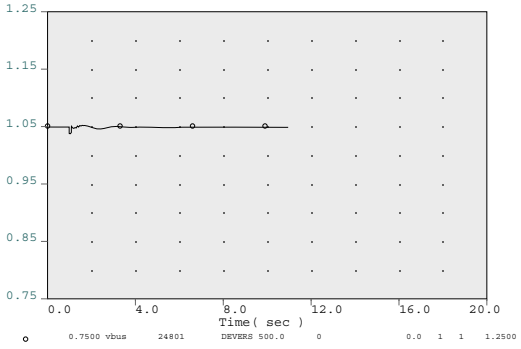
N Gila 500kV



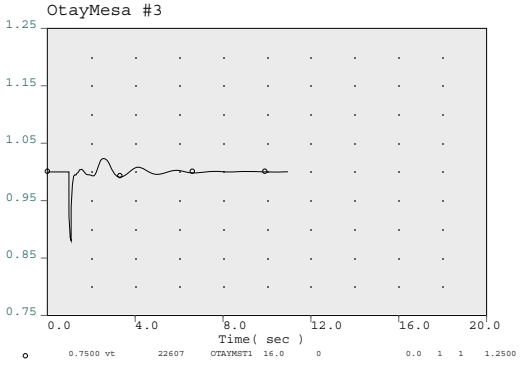
SONGS #3



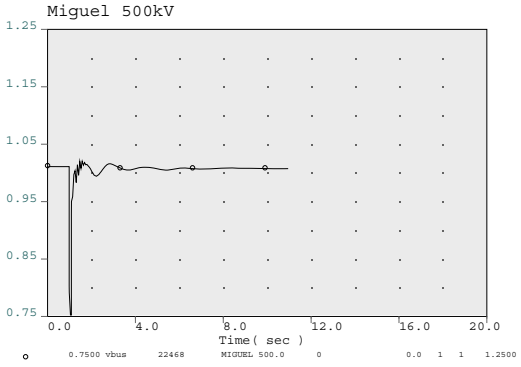
Devers 500



OtayMesa #3



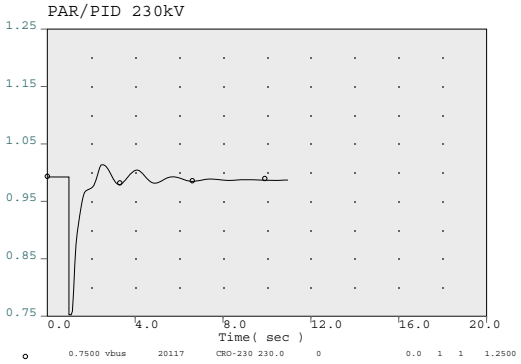
Miguel 500kV



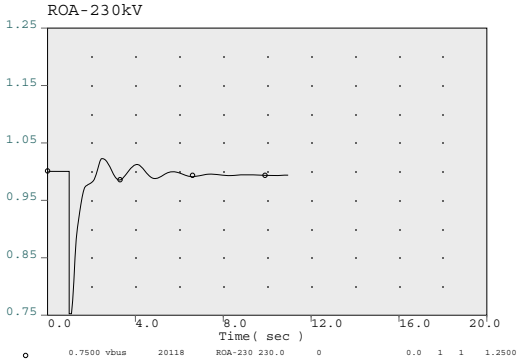
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

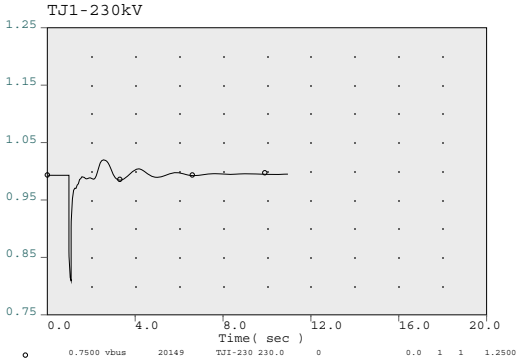
PAR/PID 230kV



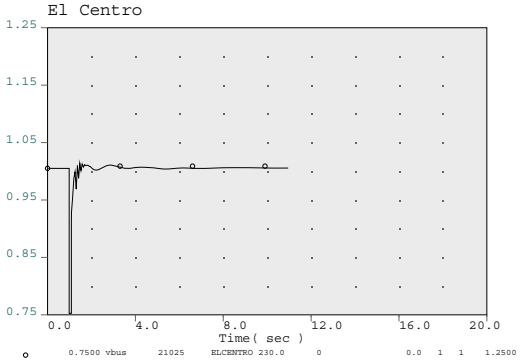
ROA-230kV



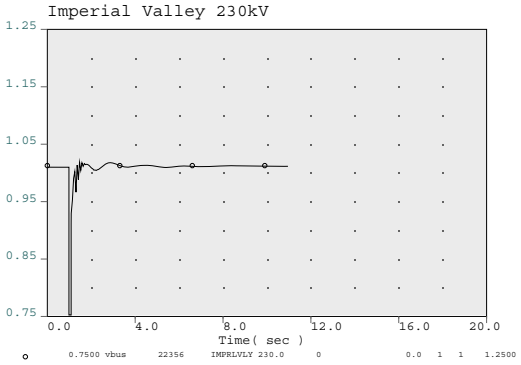
TJ1-230kV



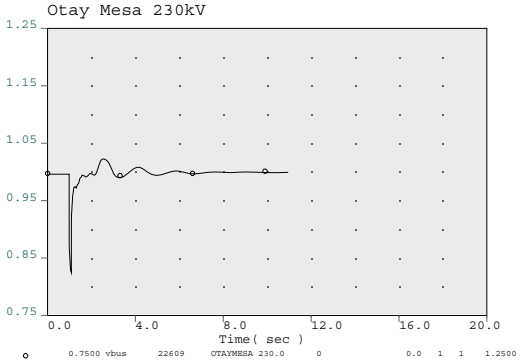
El Centro



Imperial Valley 230kV



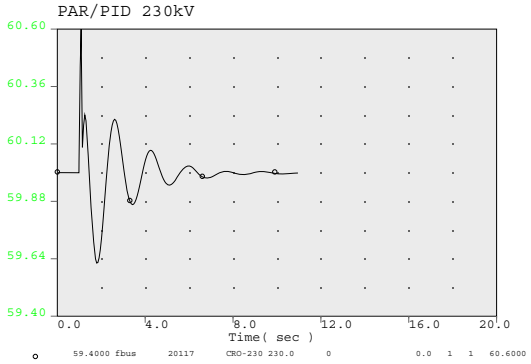
Otay Mesa 230kV



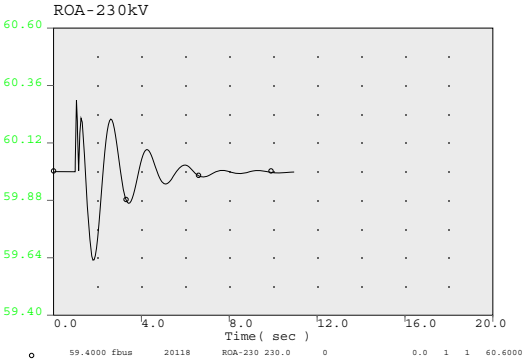
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Affected System Frequency Check and Comparison

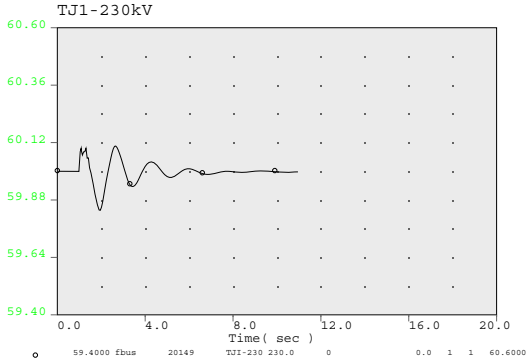
PAR/PID 230kV



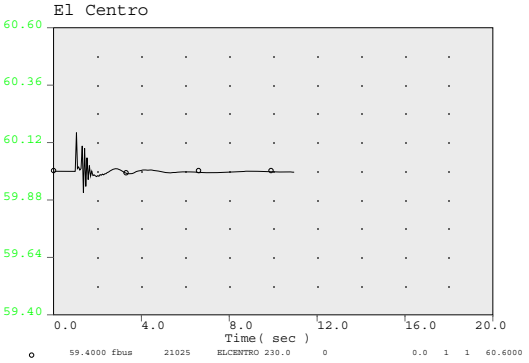
ROA-230kV



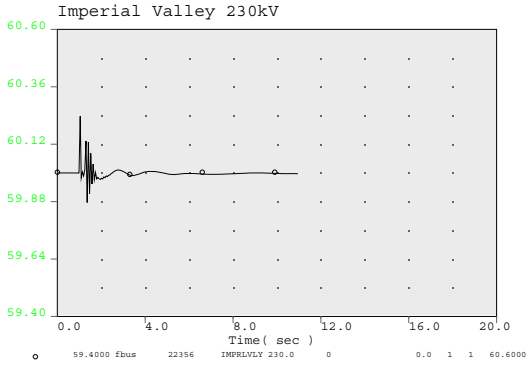
TJ1-230kV



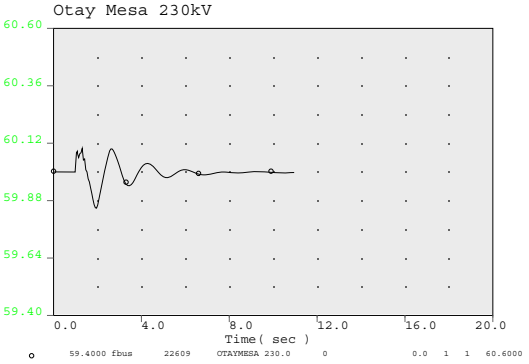
El Centro



Imperial Valley 230kV



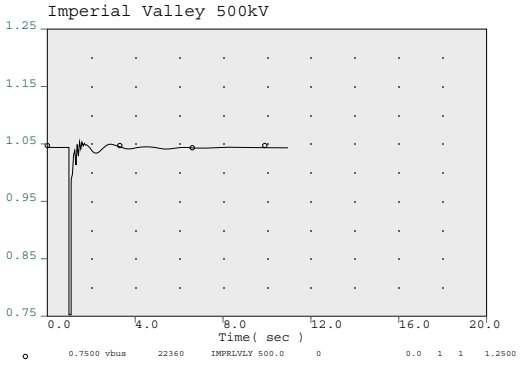
Otay Mesa 230kV



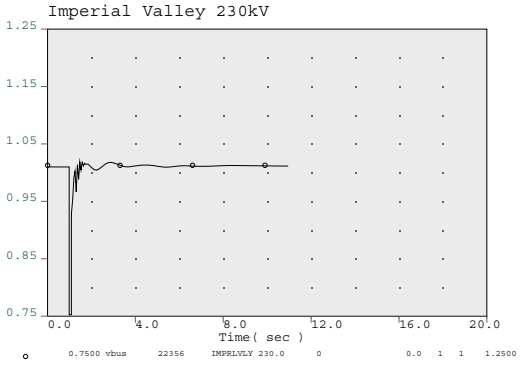
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

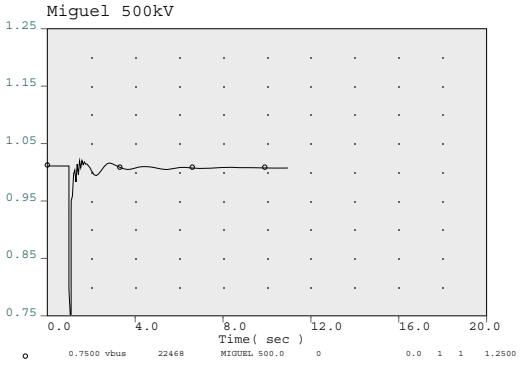
Imperial Valley 500kV



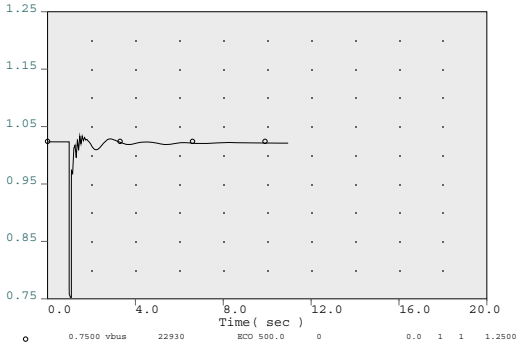
Imperial Valley 230kV



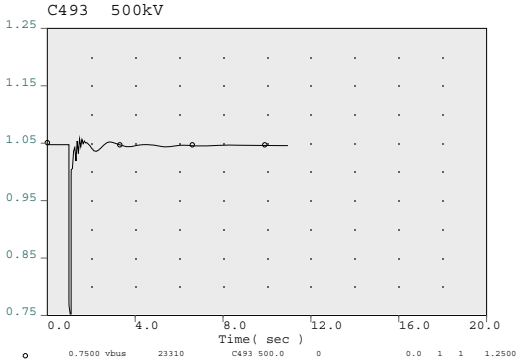
Miguel 500kV



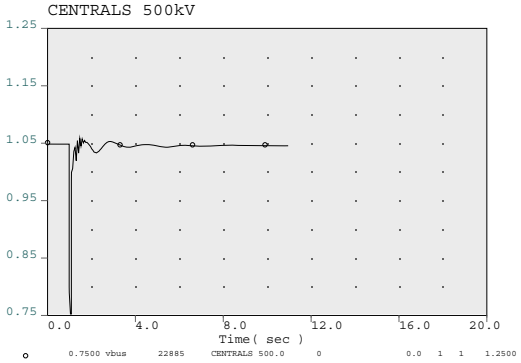
Windfarms 500



C493 500kV

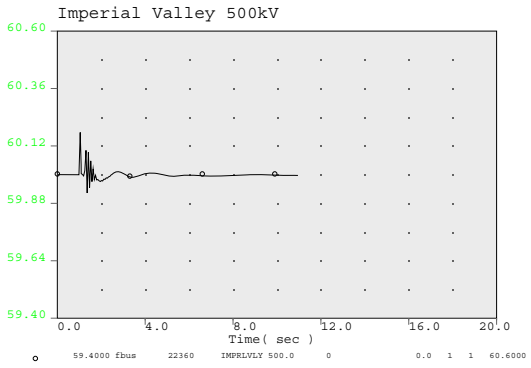


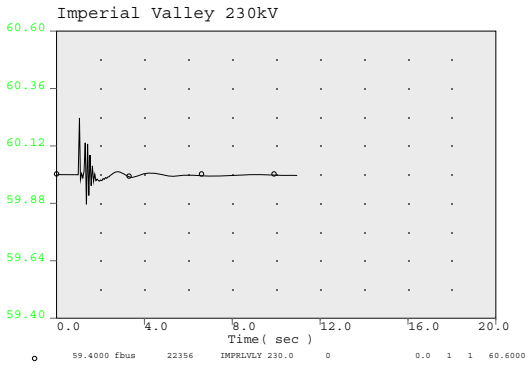
CENTRALS 500kV

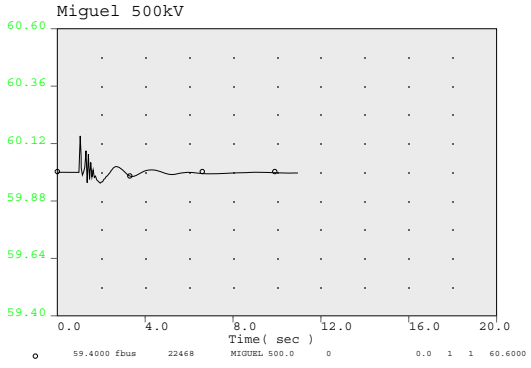


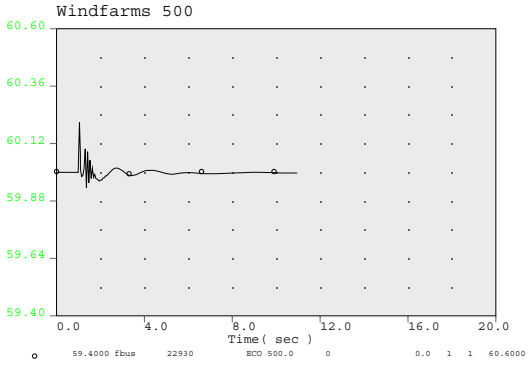
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

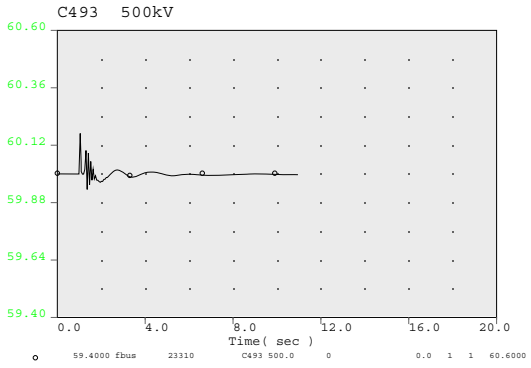
Imperial Valley Area - Frequency

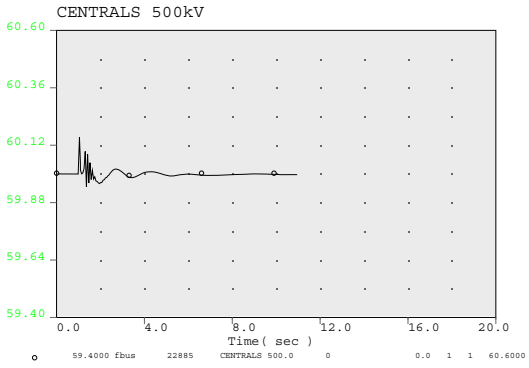






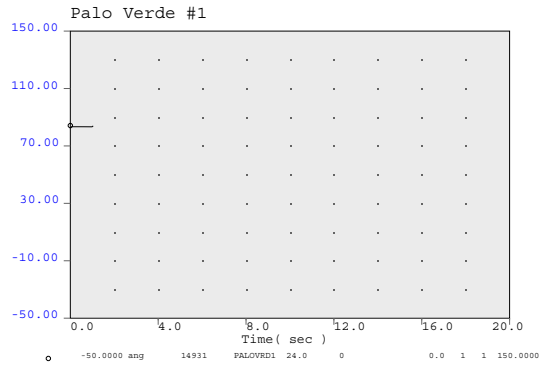


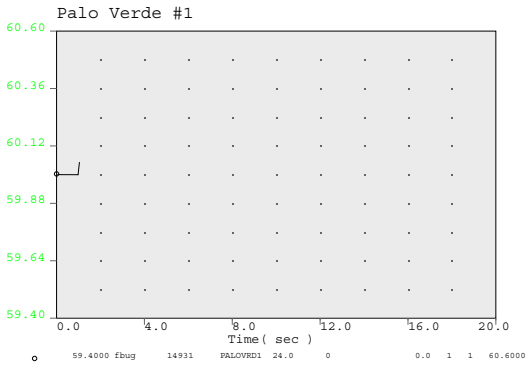


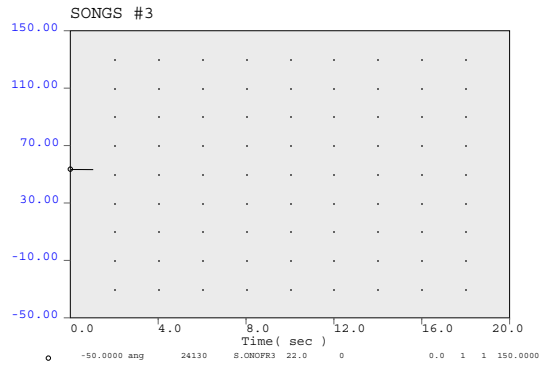


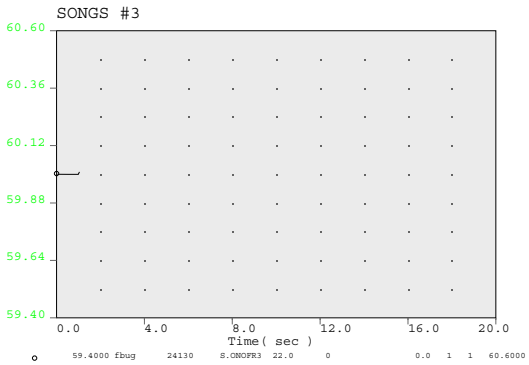
SDG&E Cluster 2 - pre
2014 Heavy Summer
Loss of IV-ROA 230 kV SLO

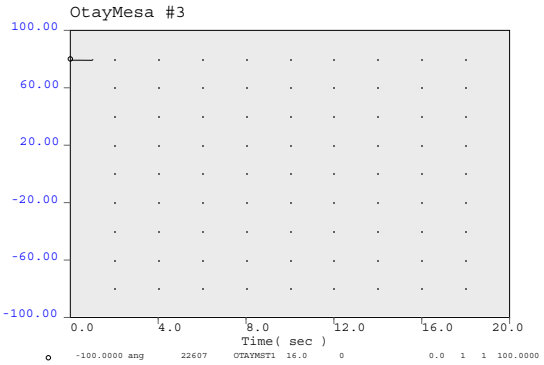
RELATIVE ROTOR ANGLE & FREQUENCY

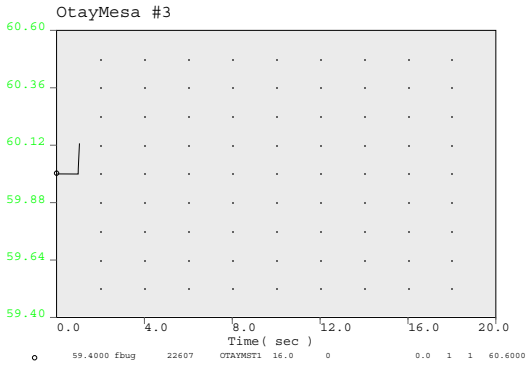












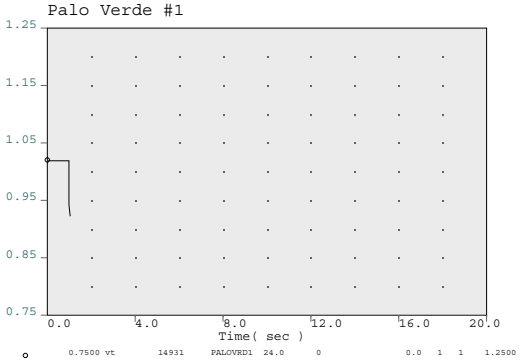
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-Windfarms 500 kV line1

Page 1

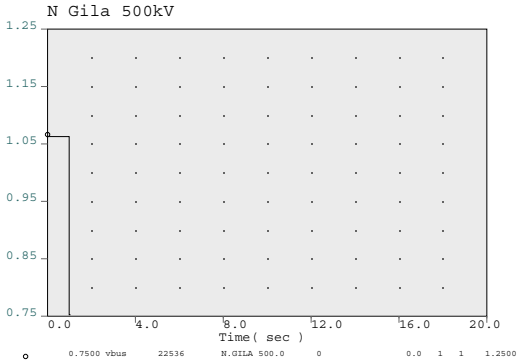
SDGE	IV_Wnd1_noRAS_pre_int9_hs.chf	i\hs\pre_int9\ws_pre_int9 Mon Oct 11 08:23:46 2010

RELATIVE VOLTAGE

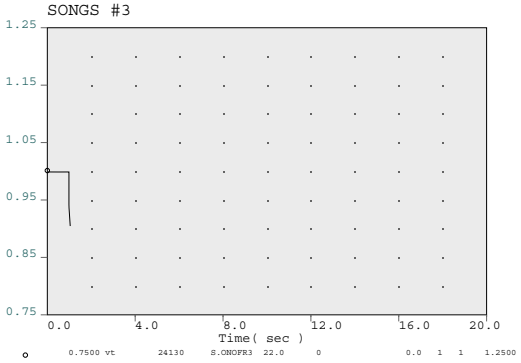
Palo Verde #1



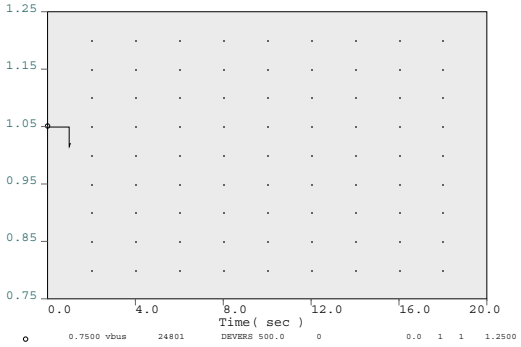
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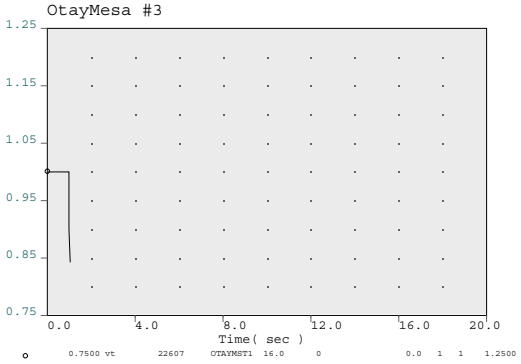
SONGS #3



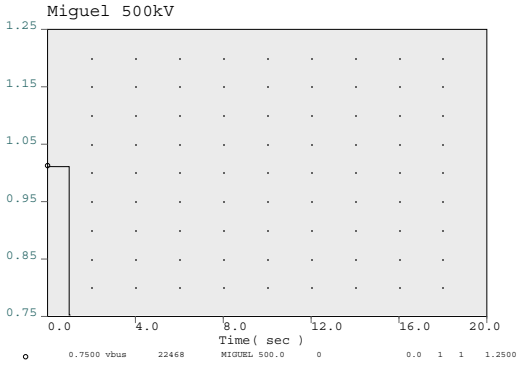
Devers 500



OtayMesa #3



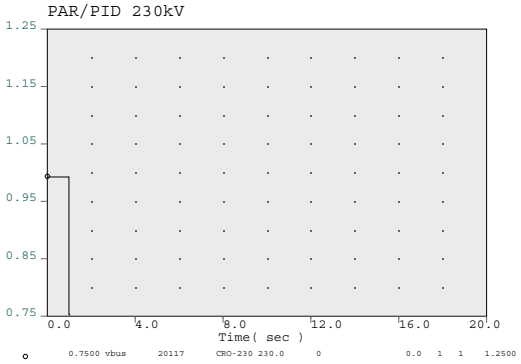
Miguel 500kV



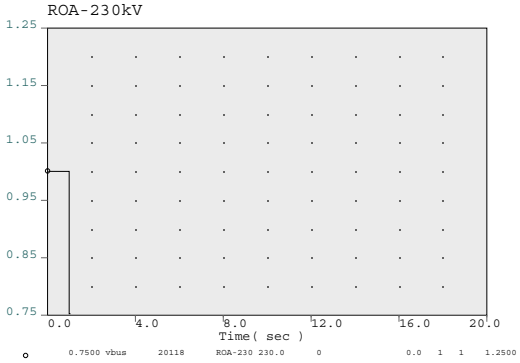
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-Windfarms 500 kV line1

Affected System Voltage Check and Comparison

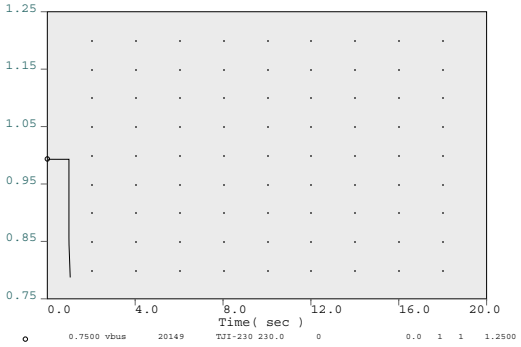
PAR/PID 230kV



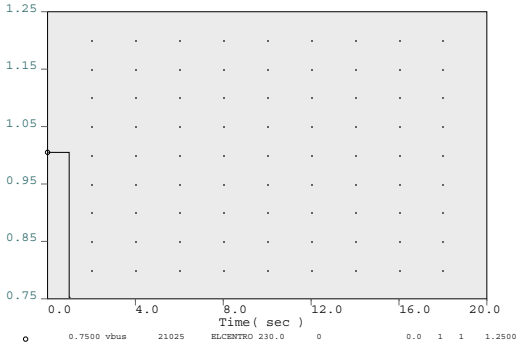
ROA-230kV



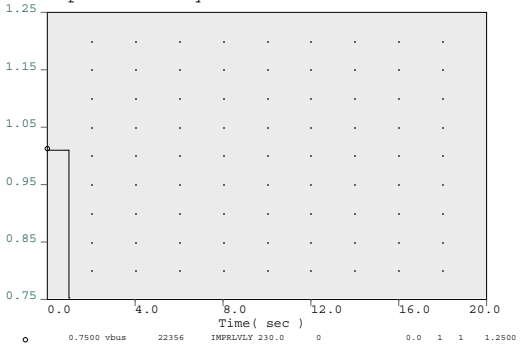
TJ1-230kV



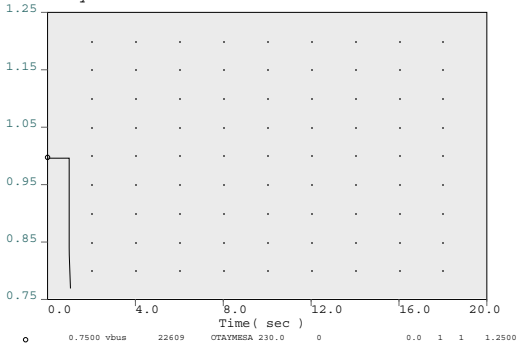
El Centro



Imperial Valley 230kV



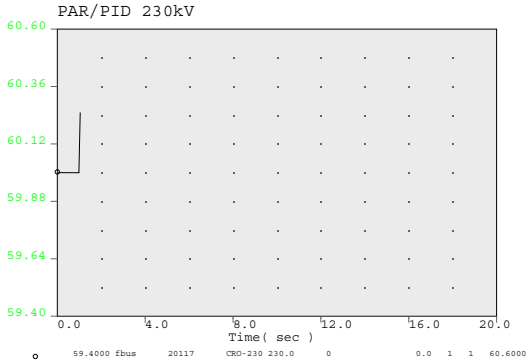
Otay Mesa 230kV



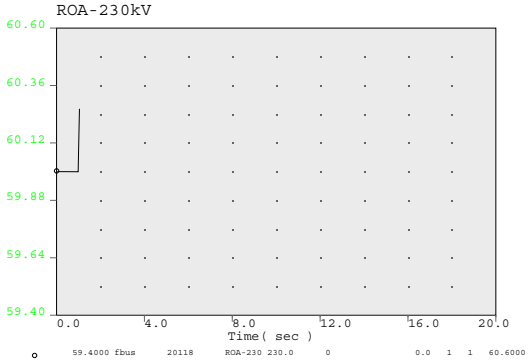
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-Windfarms 500 kV line1

Affected System Frequency Check and Comparison

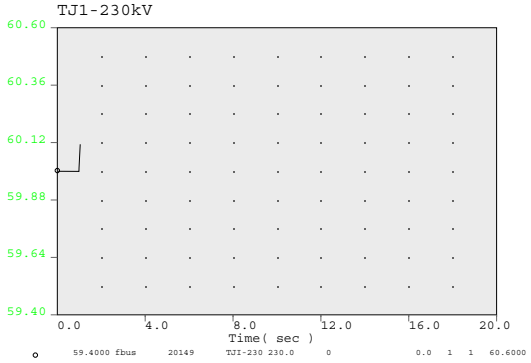
PAR/PID 230kV



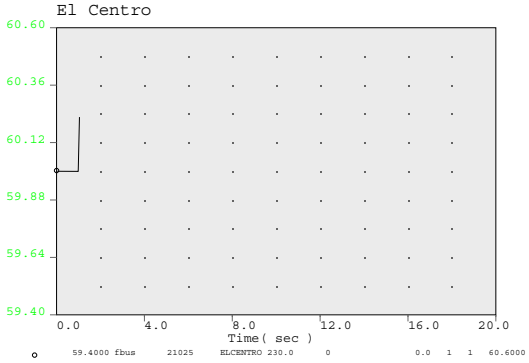
ROA-230kV



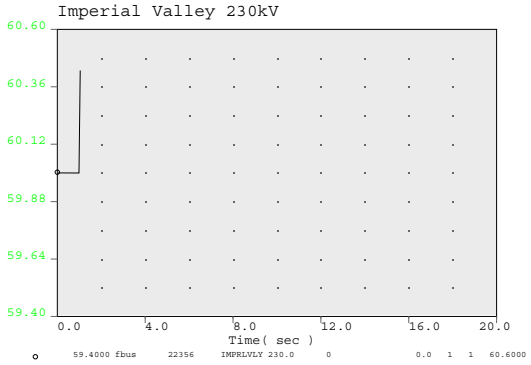
TJ1-230kV



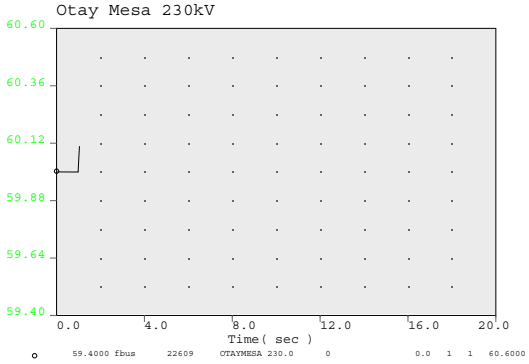
El Centro



Imperial Valley 230kV

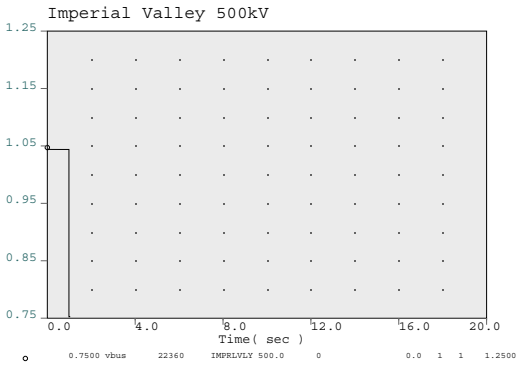


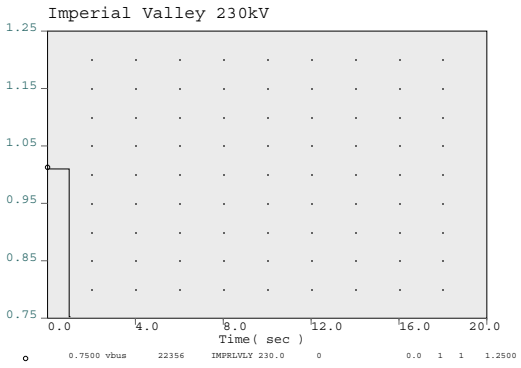
Otay Mesa 230kV

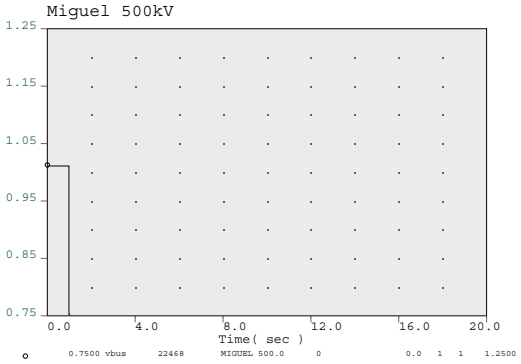


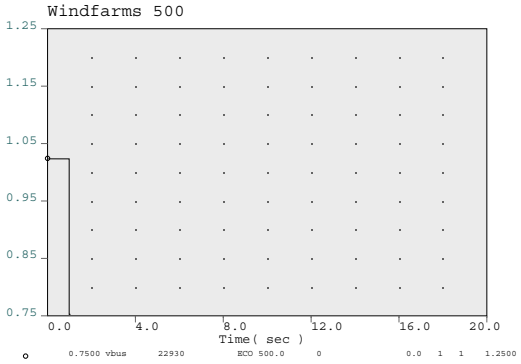
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-Windfarms 500 kV line1

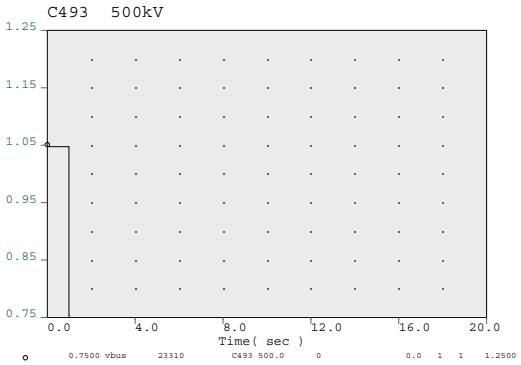
Imperial Valley Area - VOLTAGE

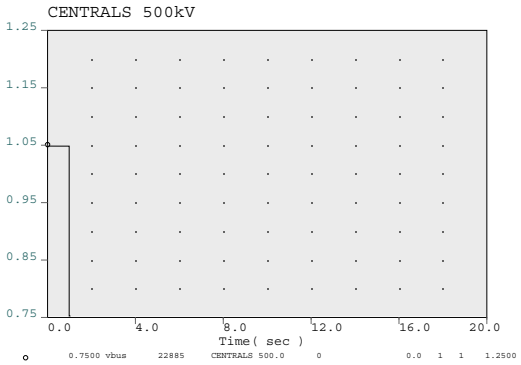






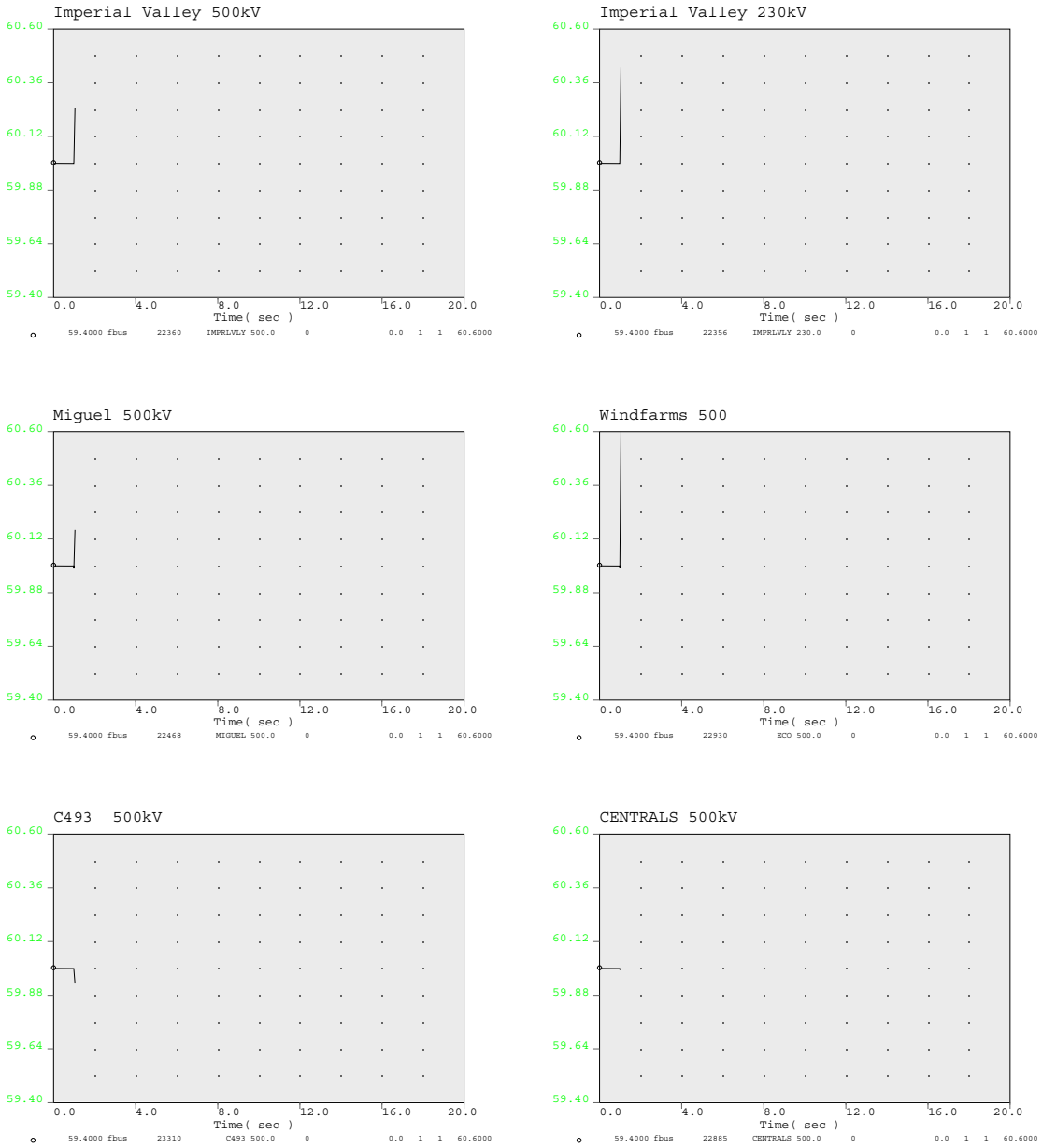






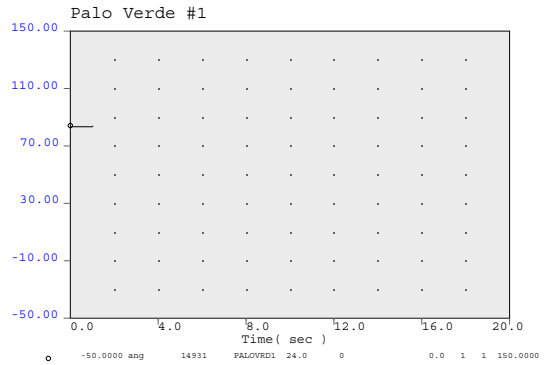
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-Windfarms 500 kV line1

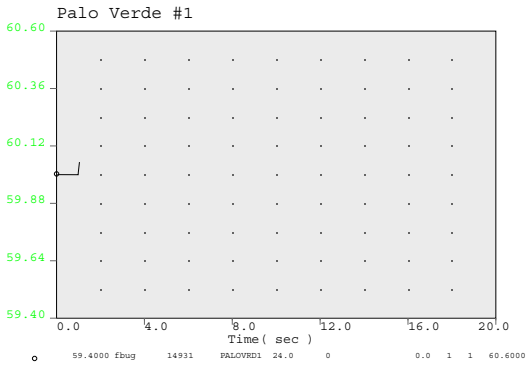
Imperial Valley Area - Frequency

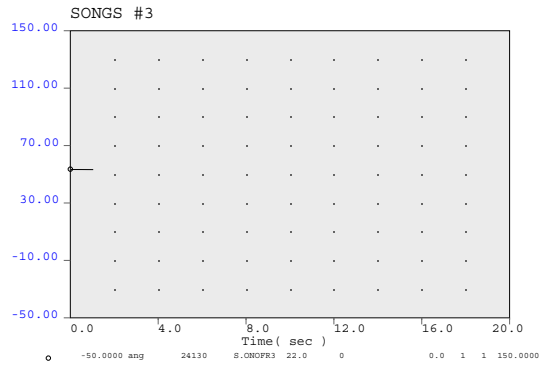


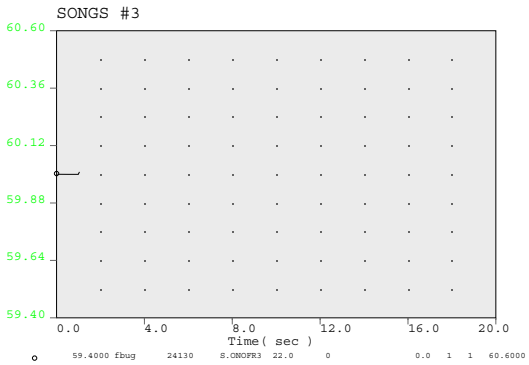
SDG&E Cluster 2 - pre
2014 Heavy Summer
Imperial Valley-Windfarms 500 kV line1

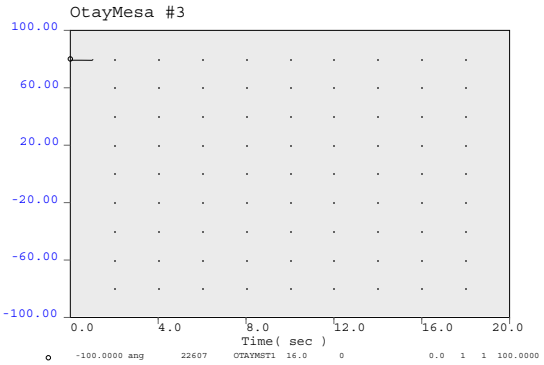
RELATIVE ROTOR ANGLE & FREQUENCY

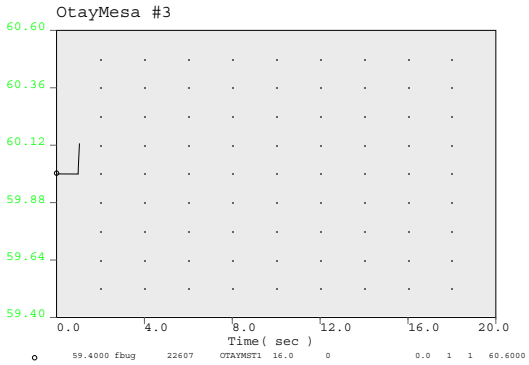








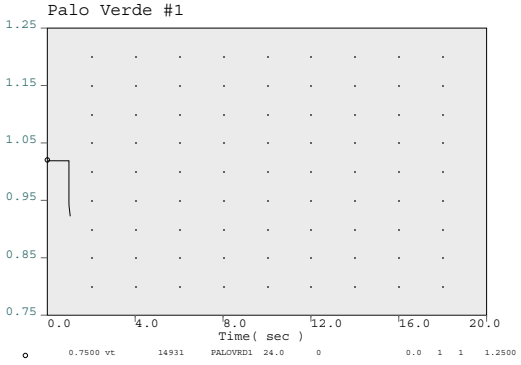




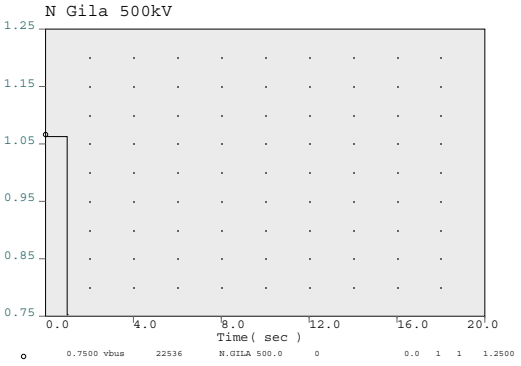
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

RELATIVE VOLTAGE

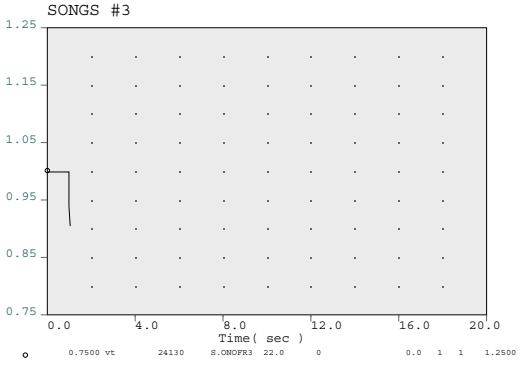
Palo Verde #1



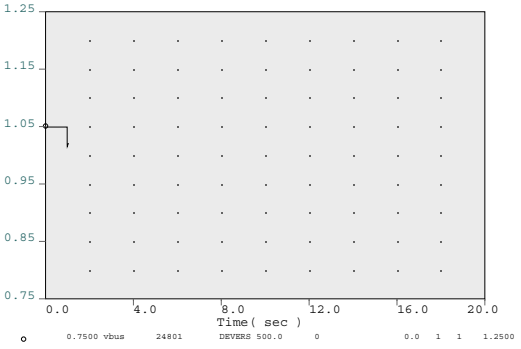
N Gila 500kV



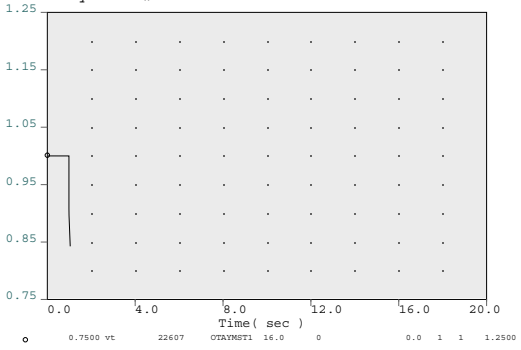
SONGS #3



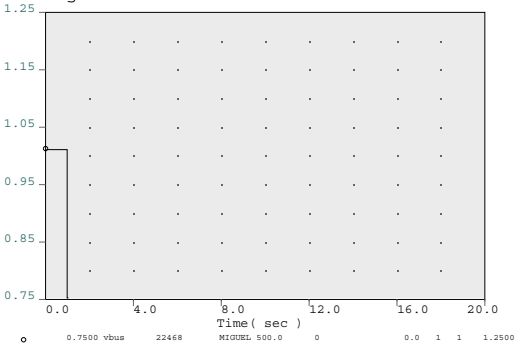
Devers 500



OtayMesa #3



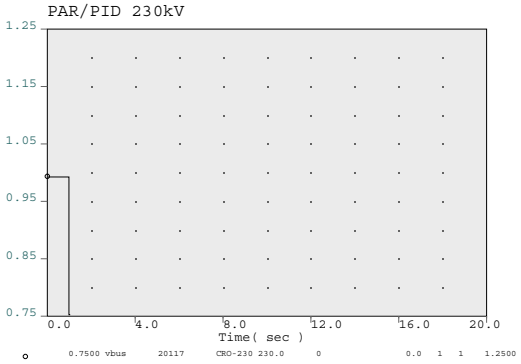
Miguel 500kV



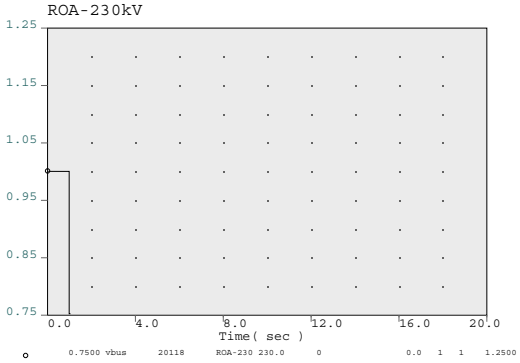
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Voltage Check and Comparison

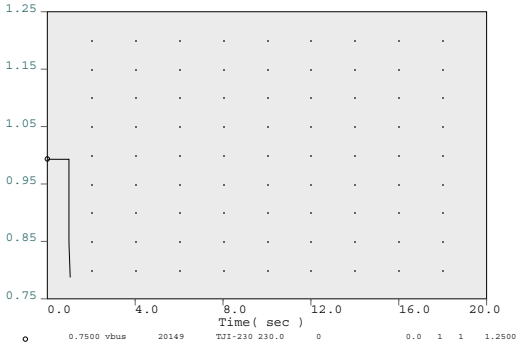
PAR/PID 230kV



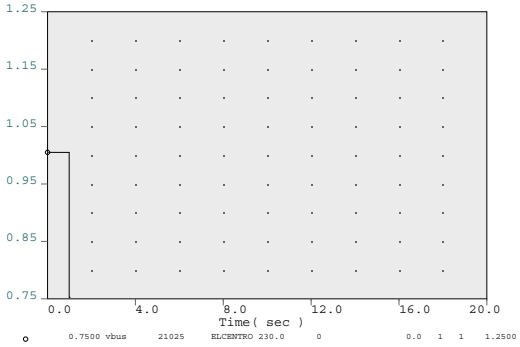
ROA-230kV



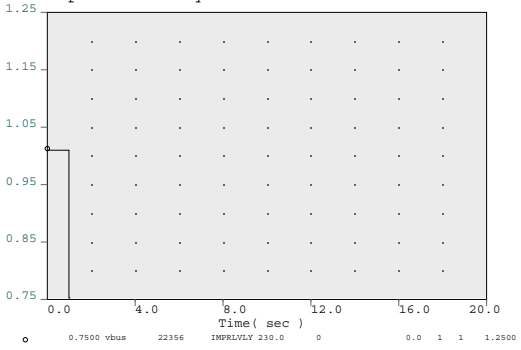
TJ1-230kV



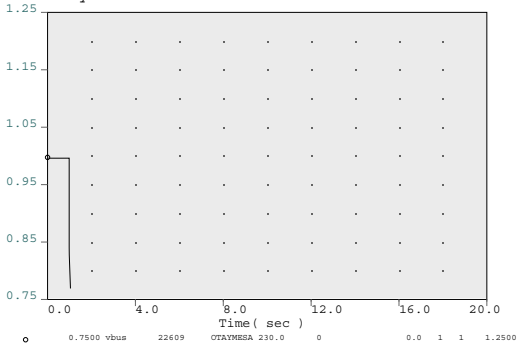
El Centro



Imperial Valley 230kV



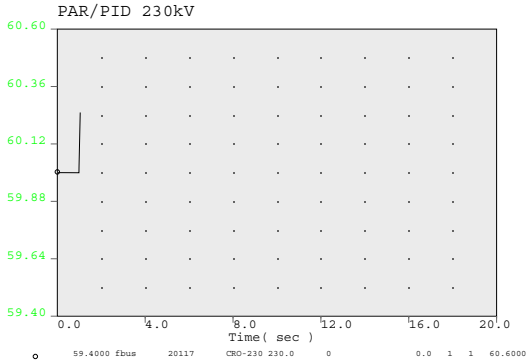
Otay Mesa 230kV



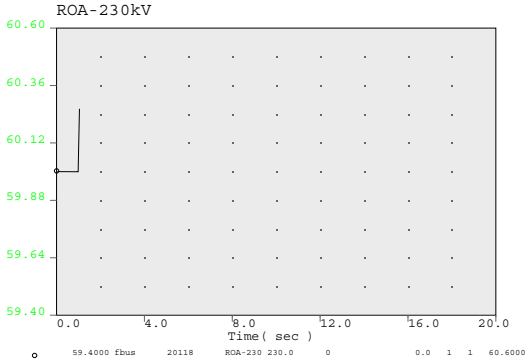
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Frequency Check and Comparison

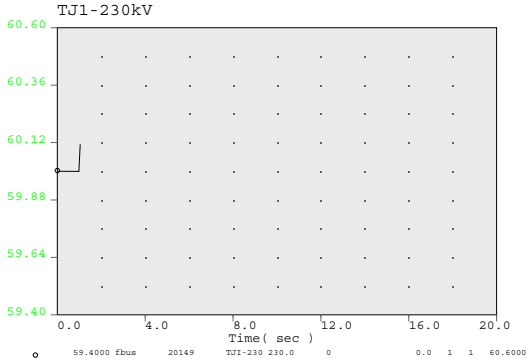
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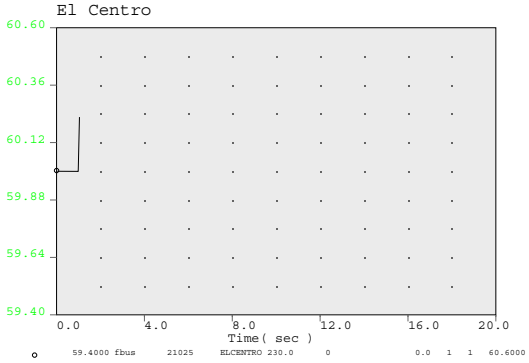
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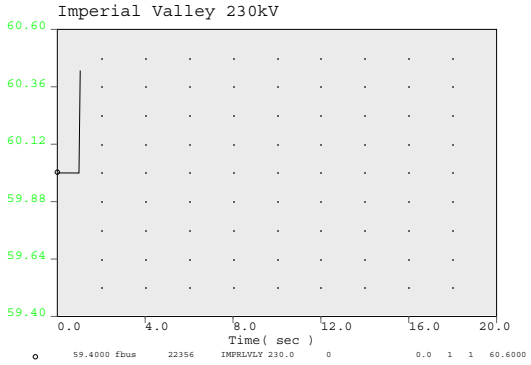
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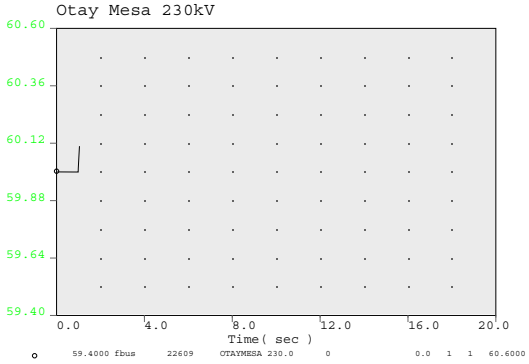
El Centro



Imperial Valley 230kV



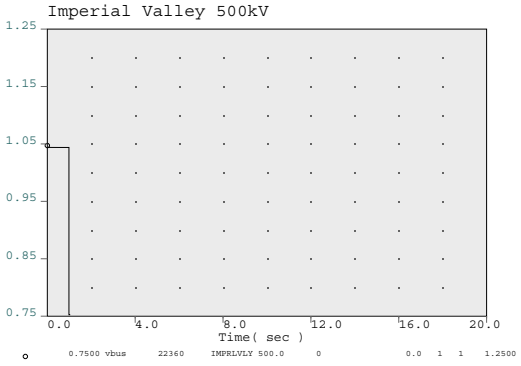
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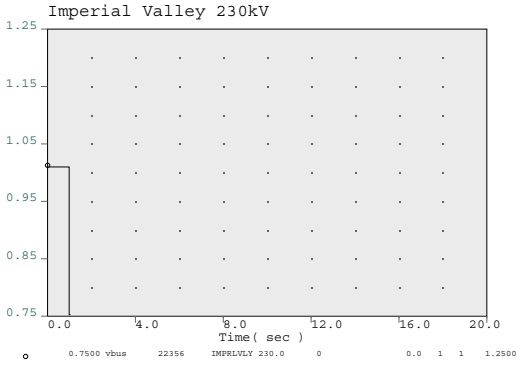
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Imperial Valley Area - VOLTAGE

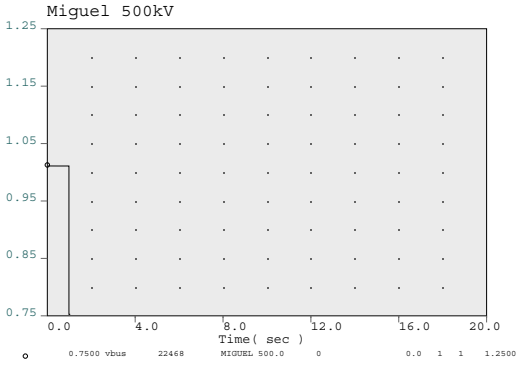
Imperial Valley 500kV



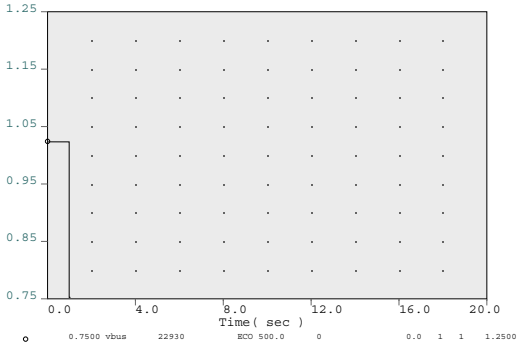
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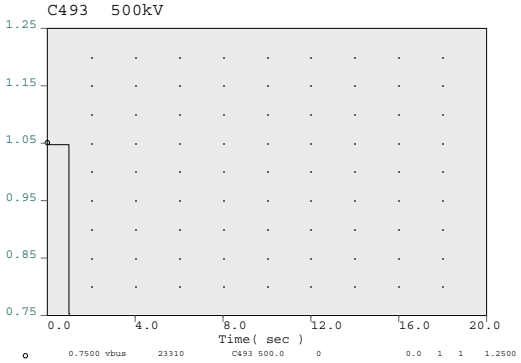
Miguel 500kV



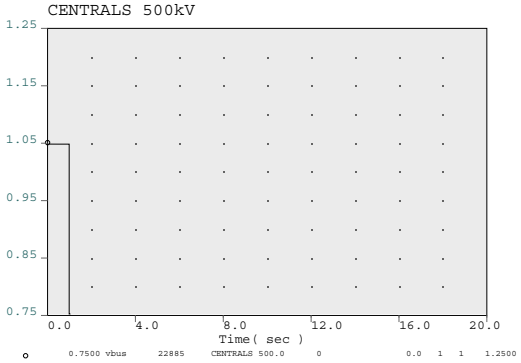
Windfarms 500



C493 500kV

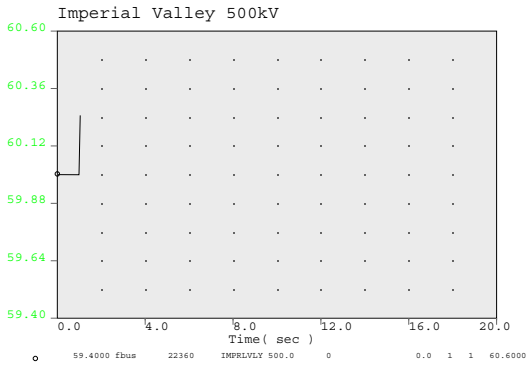


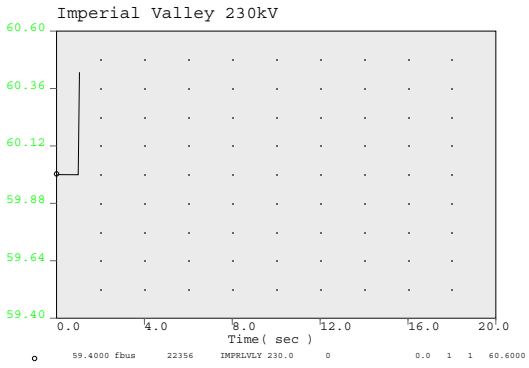
CENTRALS 500kV

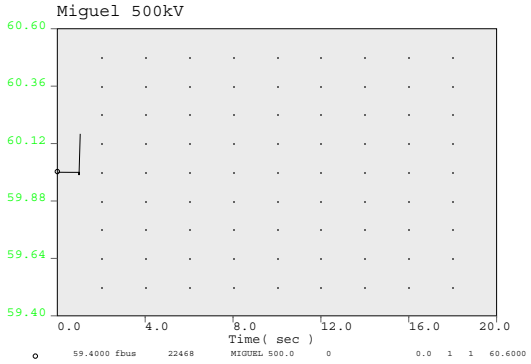


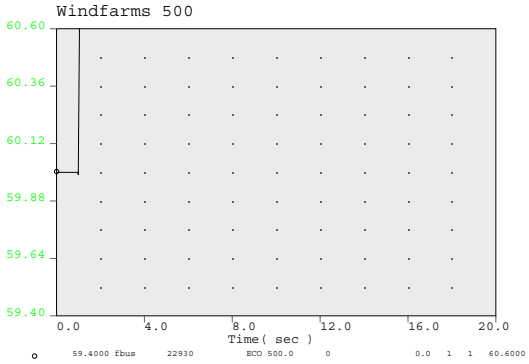
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

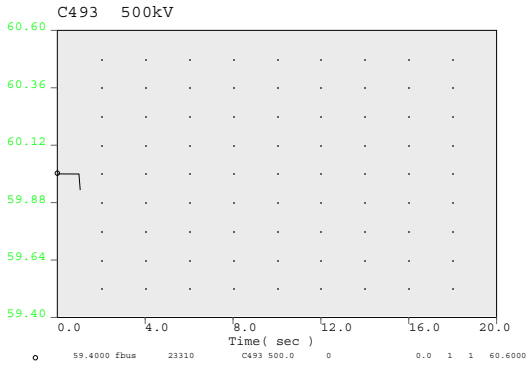
Imperial Valley Area - Frequency

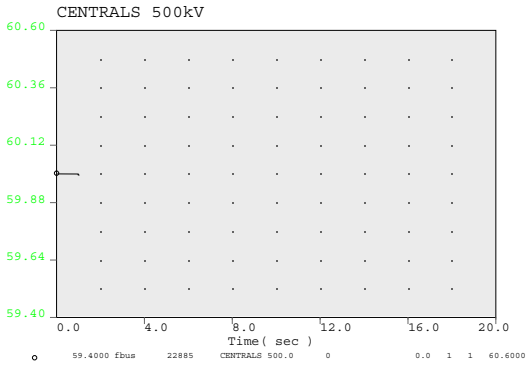






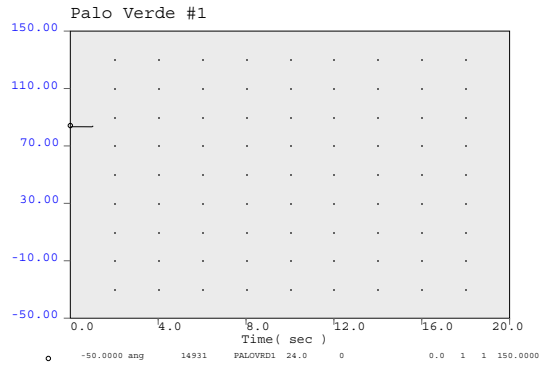


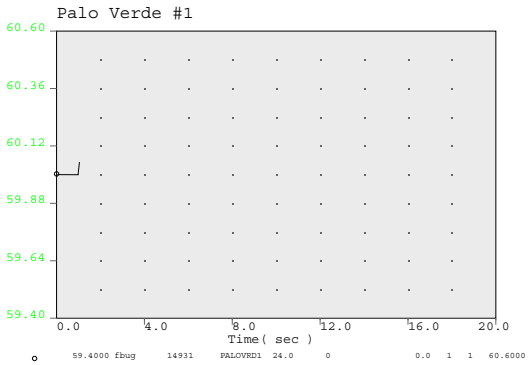


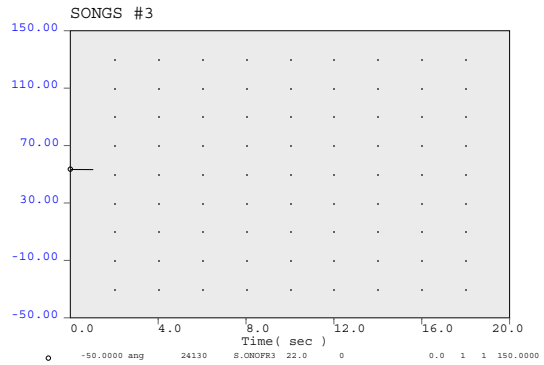


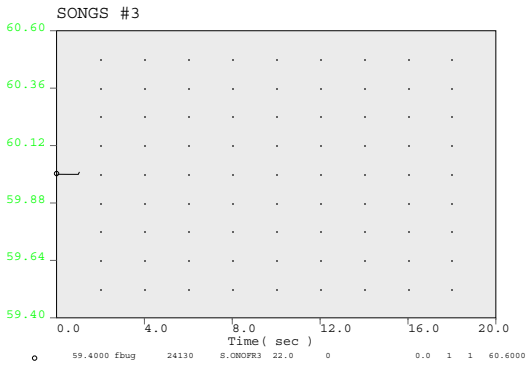
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

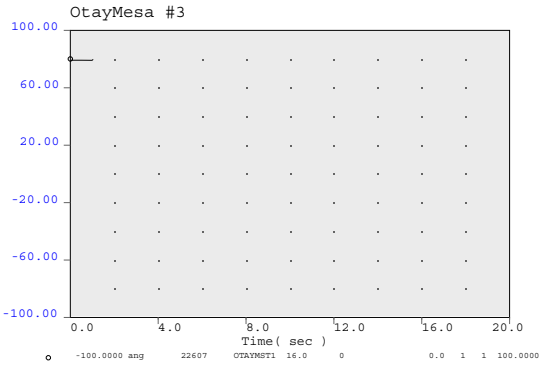
RELATIVE ROTOR ANGLE & FREQUENCY

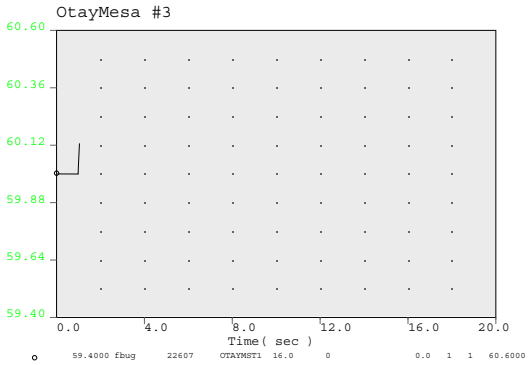












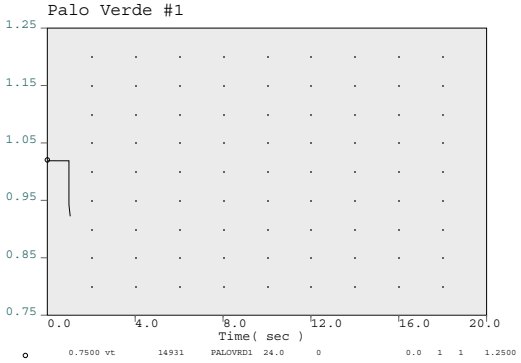
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Page 1

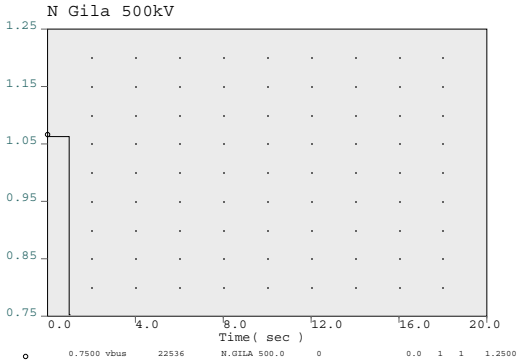
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RELATIVE VOLTAGE

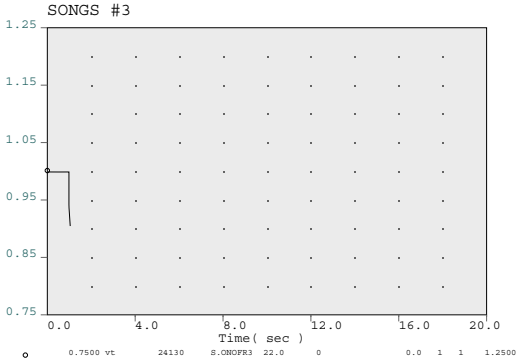
Palo Verde #1



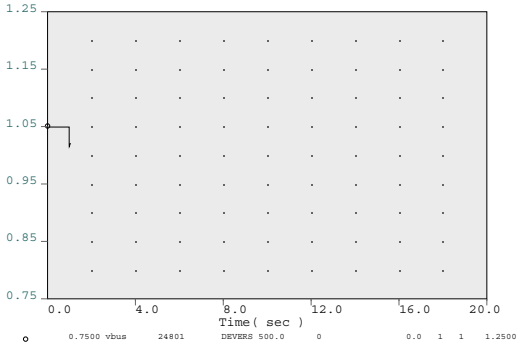
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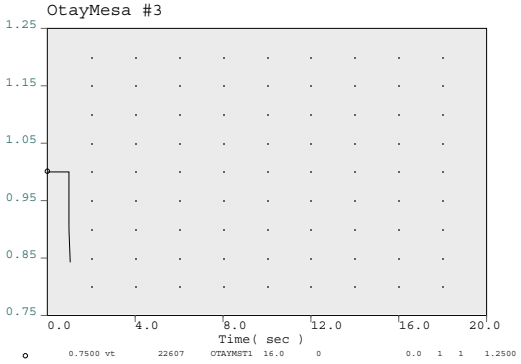
SONGS #3



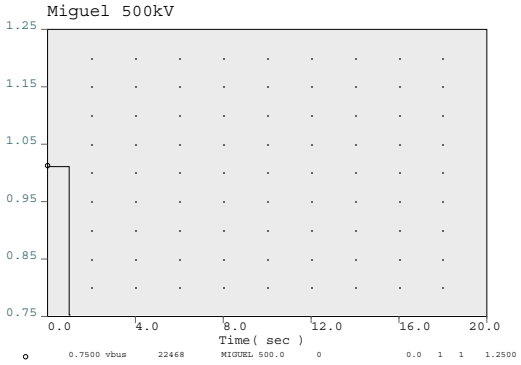
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OtayMesa #3



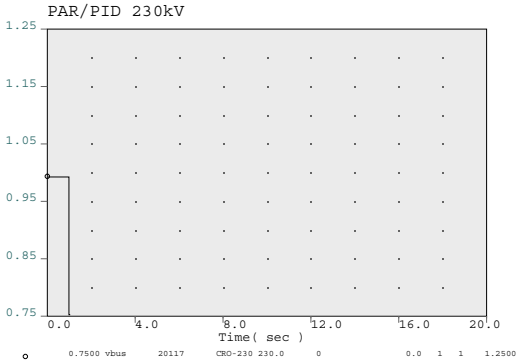
Miguel 500kV



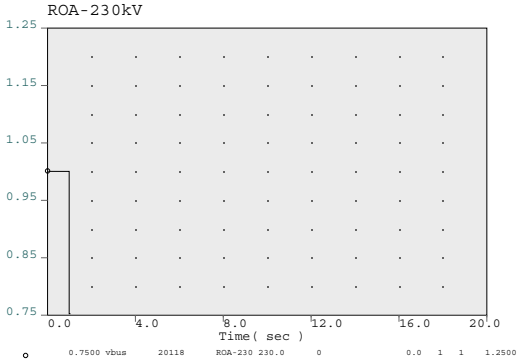
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Voltage Check and Comparison

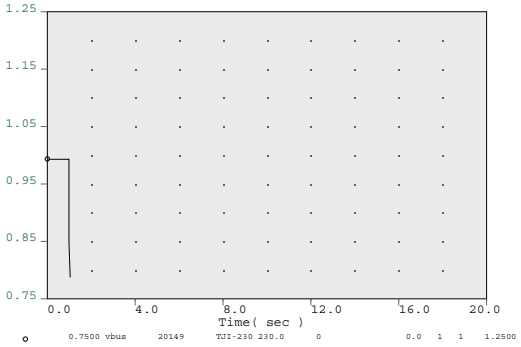
PAR/PID 230kV



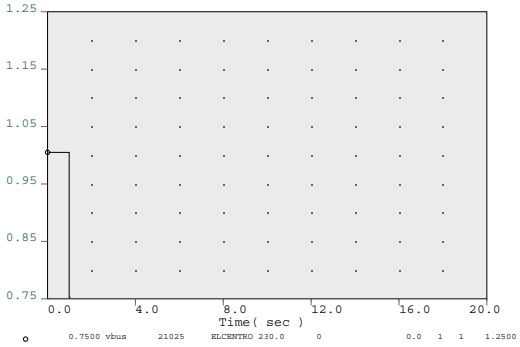
ROA-230kV



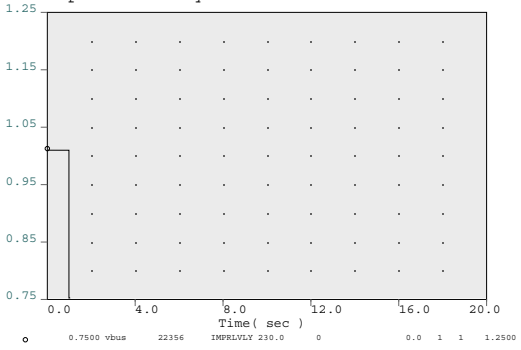
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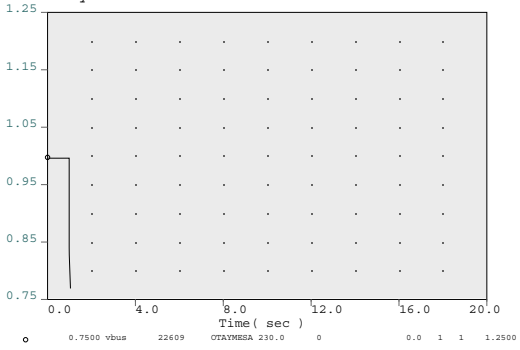
El Centro



Imperial Valley 230kV



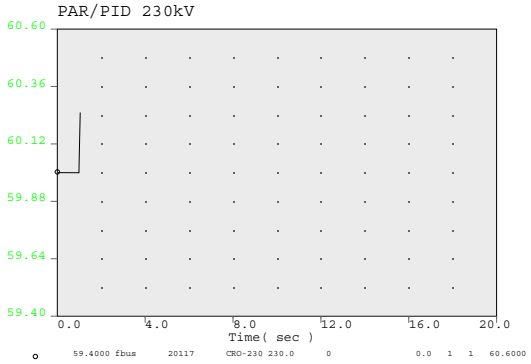
Otay Mesa 230kV



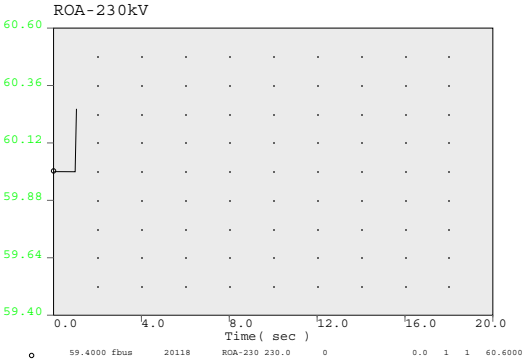
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Frequency Check and Comparison

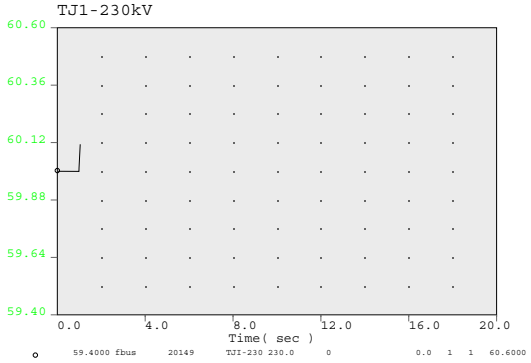
PAR/PID 230kV



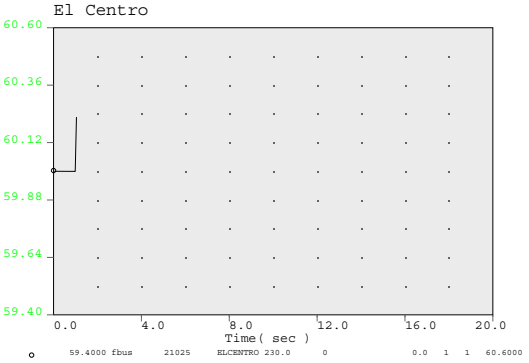
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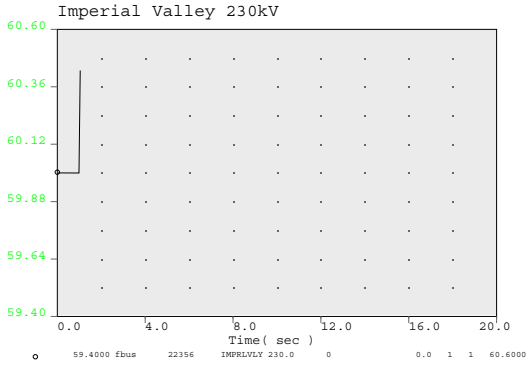
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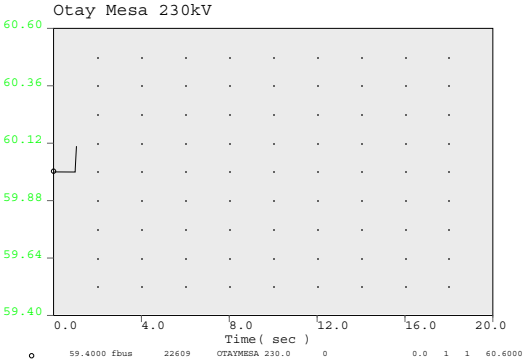
El Centro



Imperial Valley 230kV



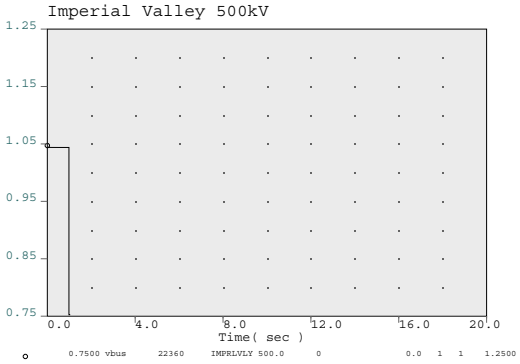
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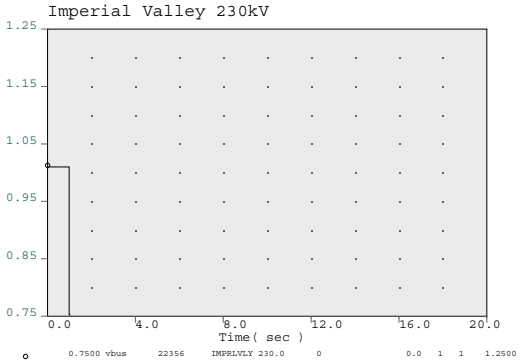
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Imperial Valley Area - VOLTAGE

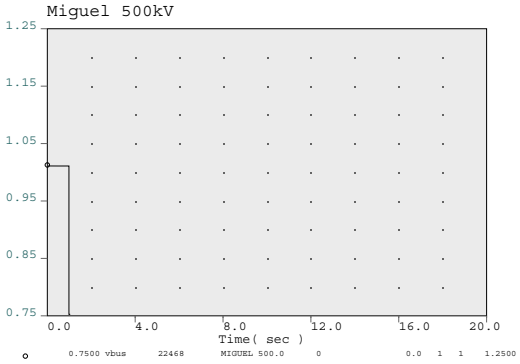
Imperial Valley 500kV



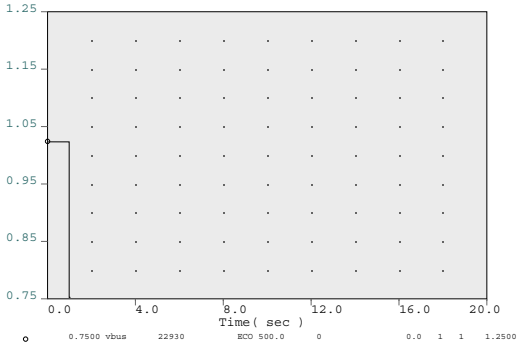
Imperial Valley 230kV



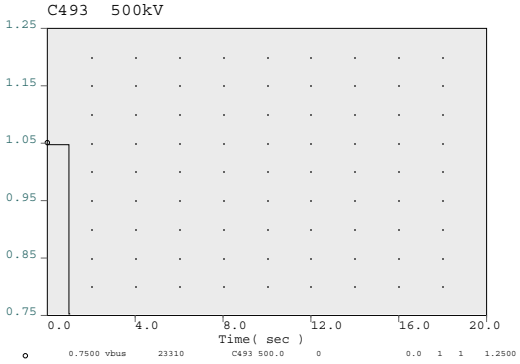
Miguel 500kV



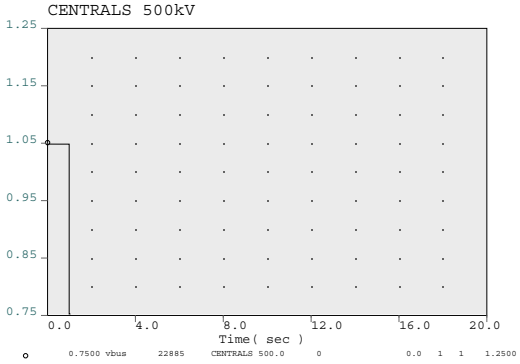
Windfarms 500



C493 500kV

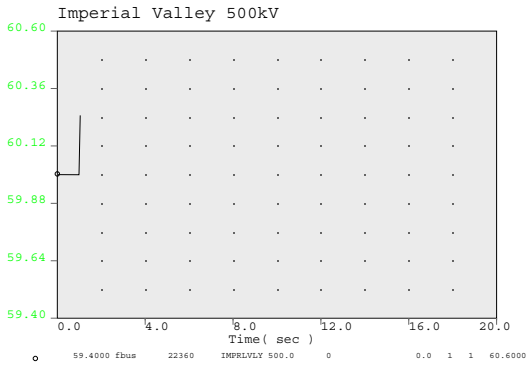


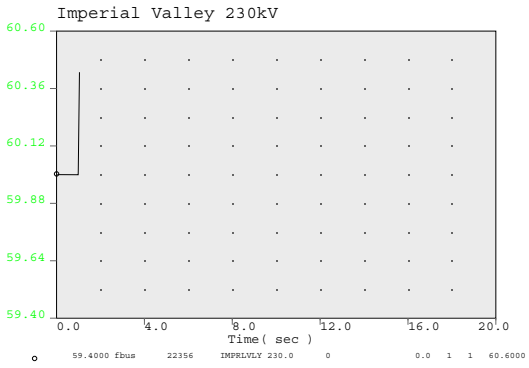
CENTRALS 500kV

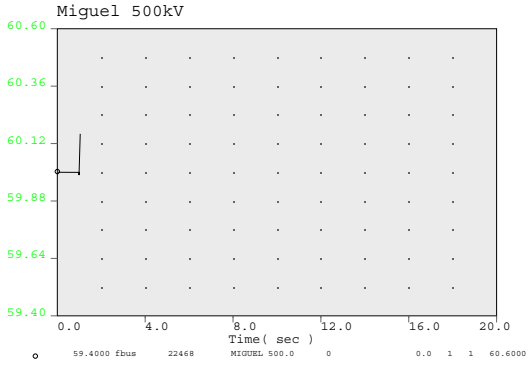


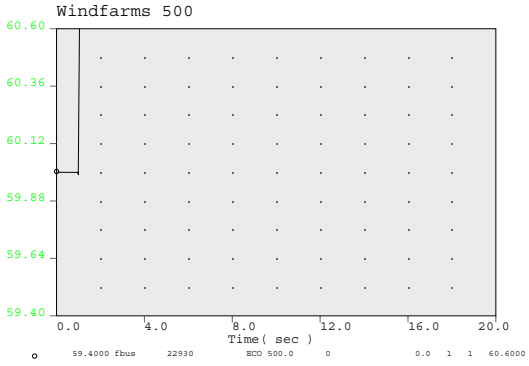
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

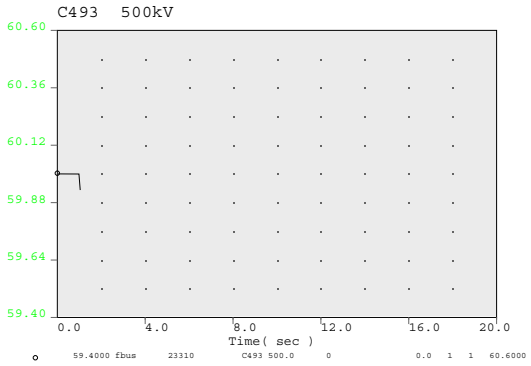
Imperial Valley Area - Frequency

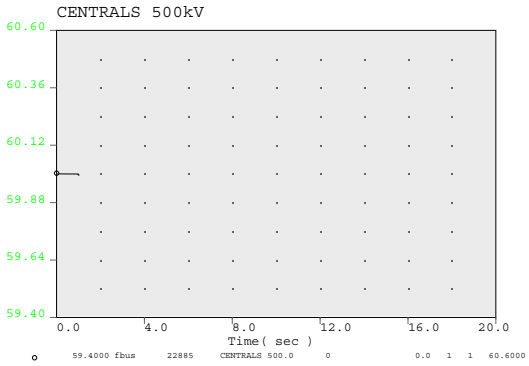






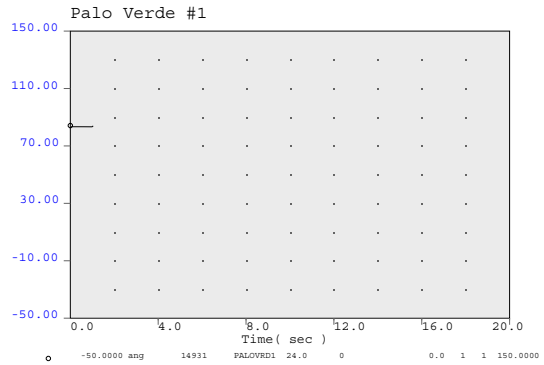


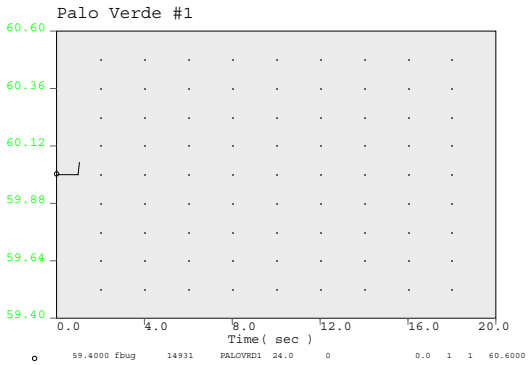


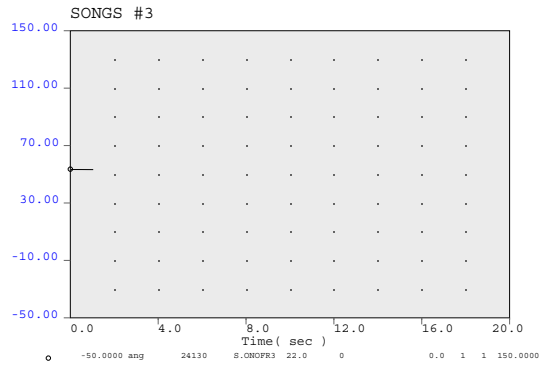


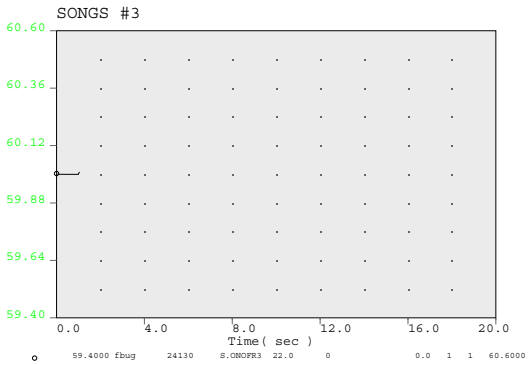
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

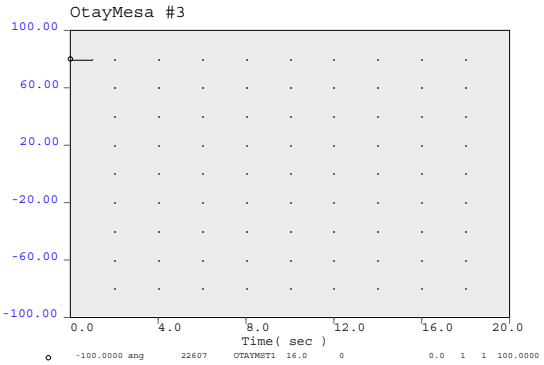
RELATIVE ROTOR ANGLE & FREQUENCY

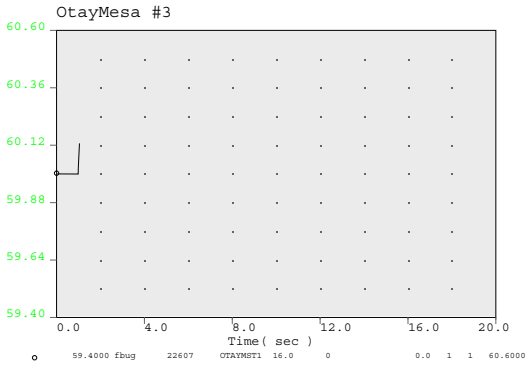












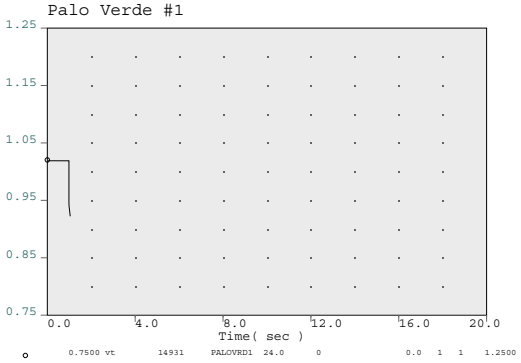
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Page 1

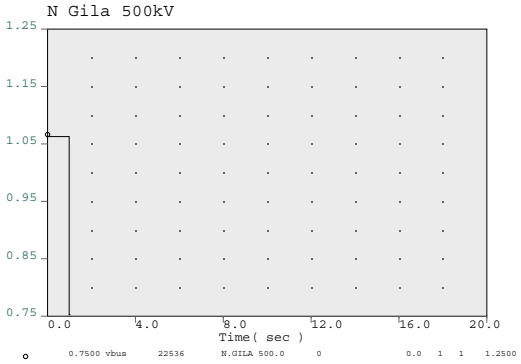
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RELATIVE VOLTAGE

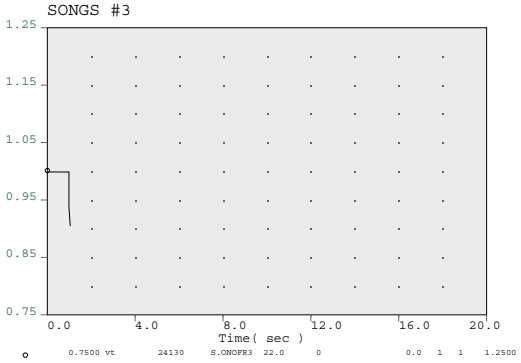
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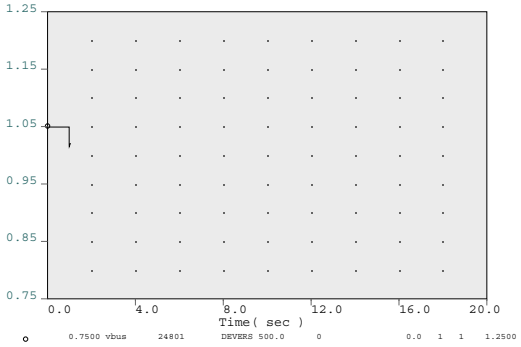
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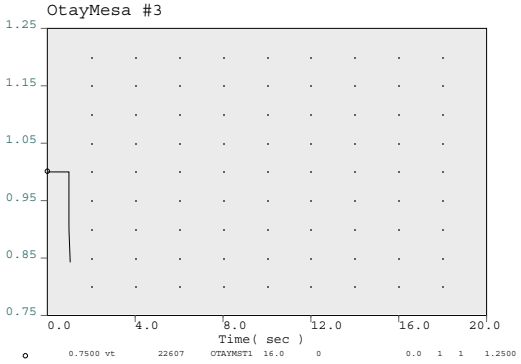
SONGS #3



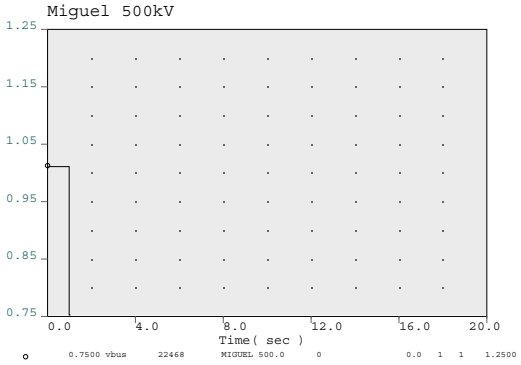
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OtayMesa #3



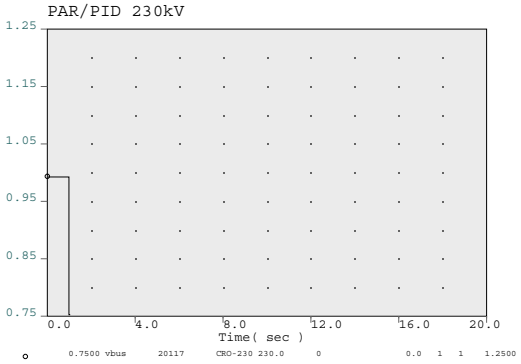
Miguel 500kV



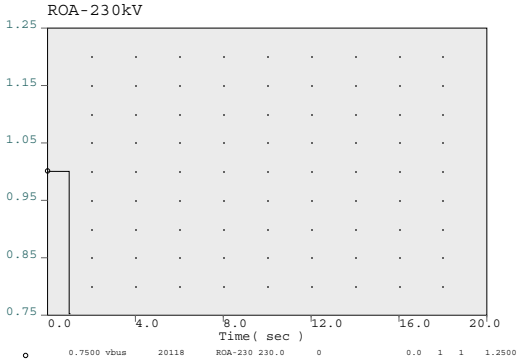
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Voltage Check and Comparison

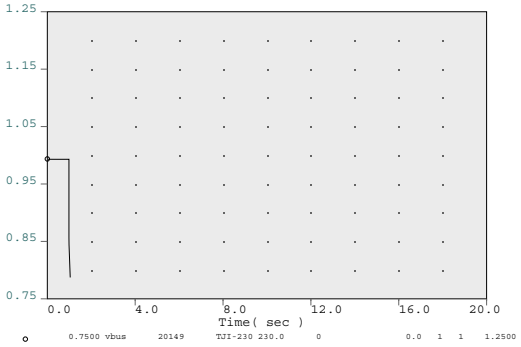
PAR/PID 230kV



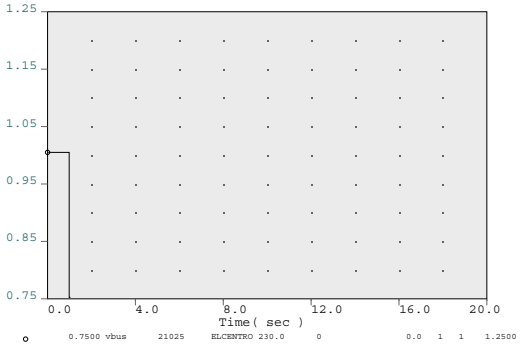
ROA-230kV



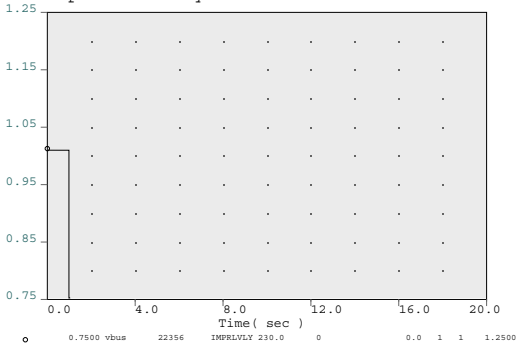
TJ1-230kV



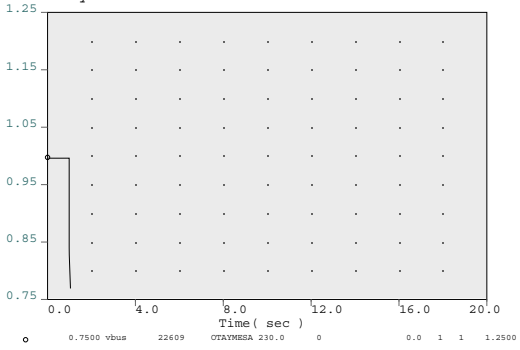
El Centro



Imperial Valley 230kV



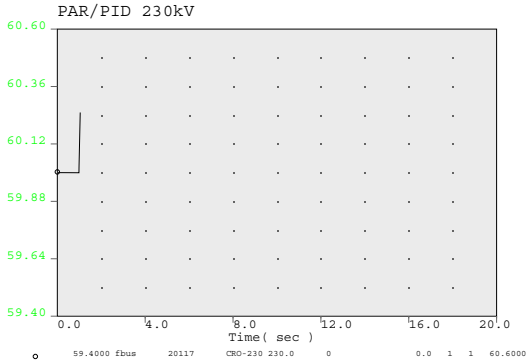
Otay Mesa 230kV



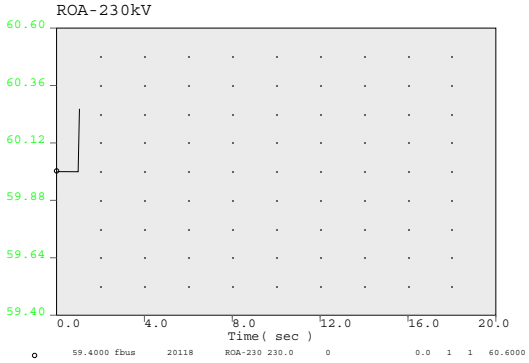
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Frequency Check and Comparison

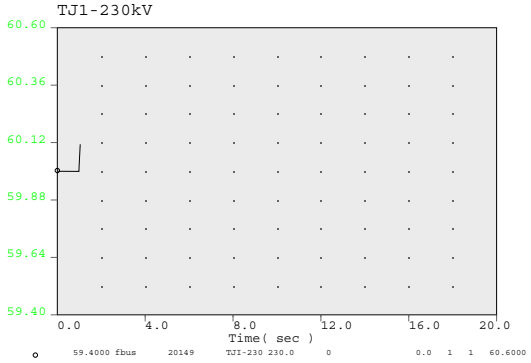
PAR/PID 230kV



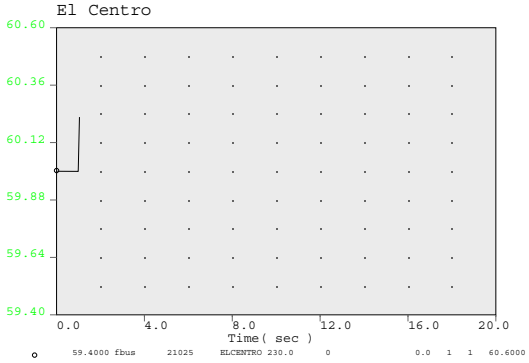
ROA-230kV



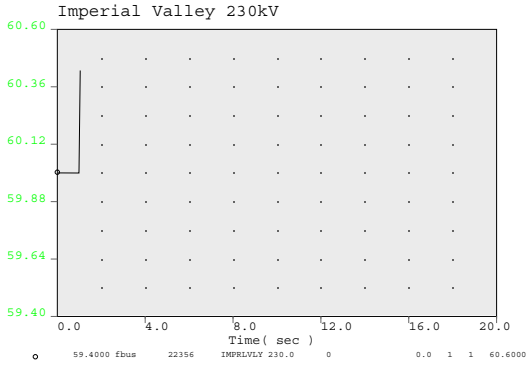
TJ1-230kV



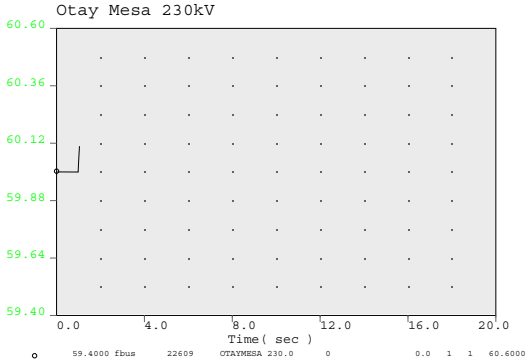
El Centro



Imperial Valley 230kV



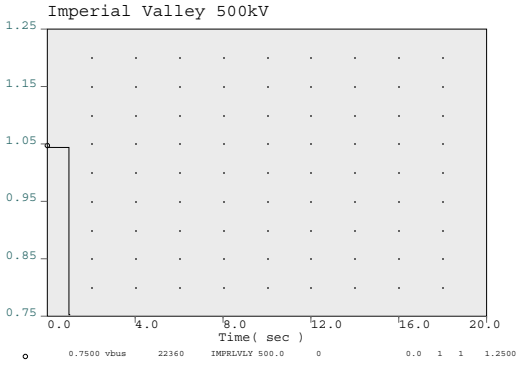
Otay Mesa 230kV



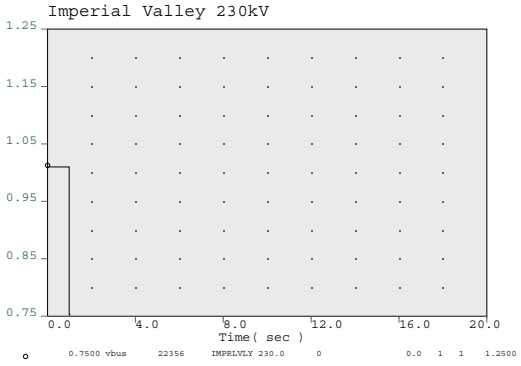
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Imperial Valley Area - VOLTAGE

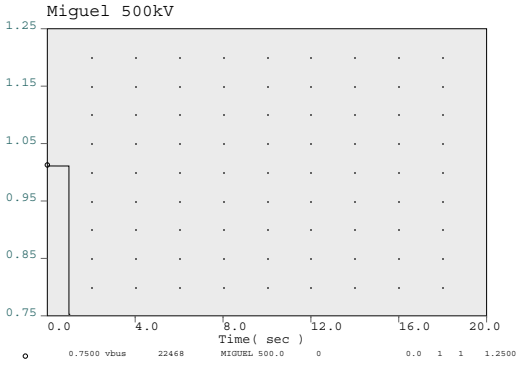
Imperial Valley 500kV



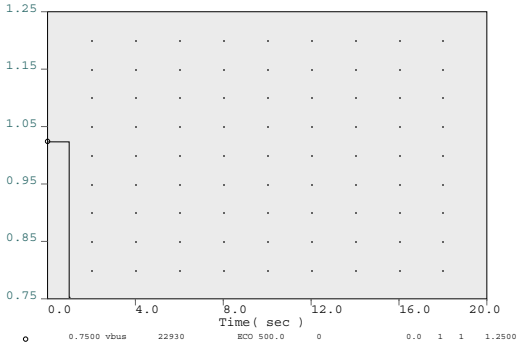
Imperial Valley 230kV



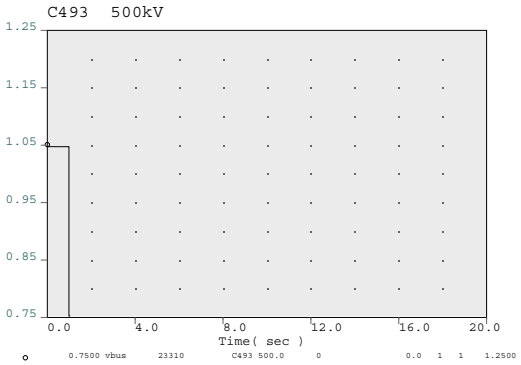
Miguel 500kV



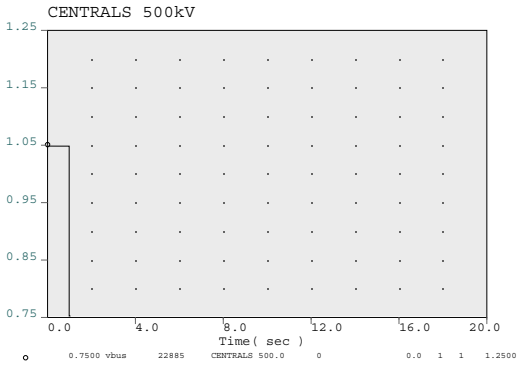
Windfarms 500



C493 500kV

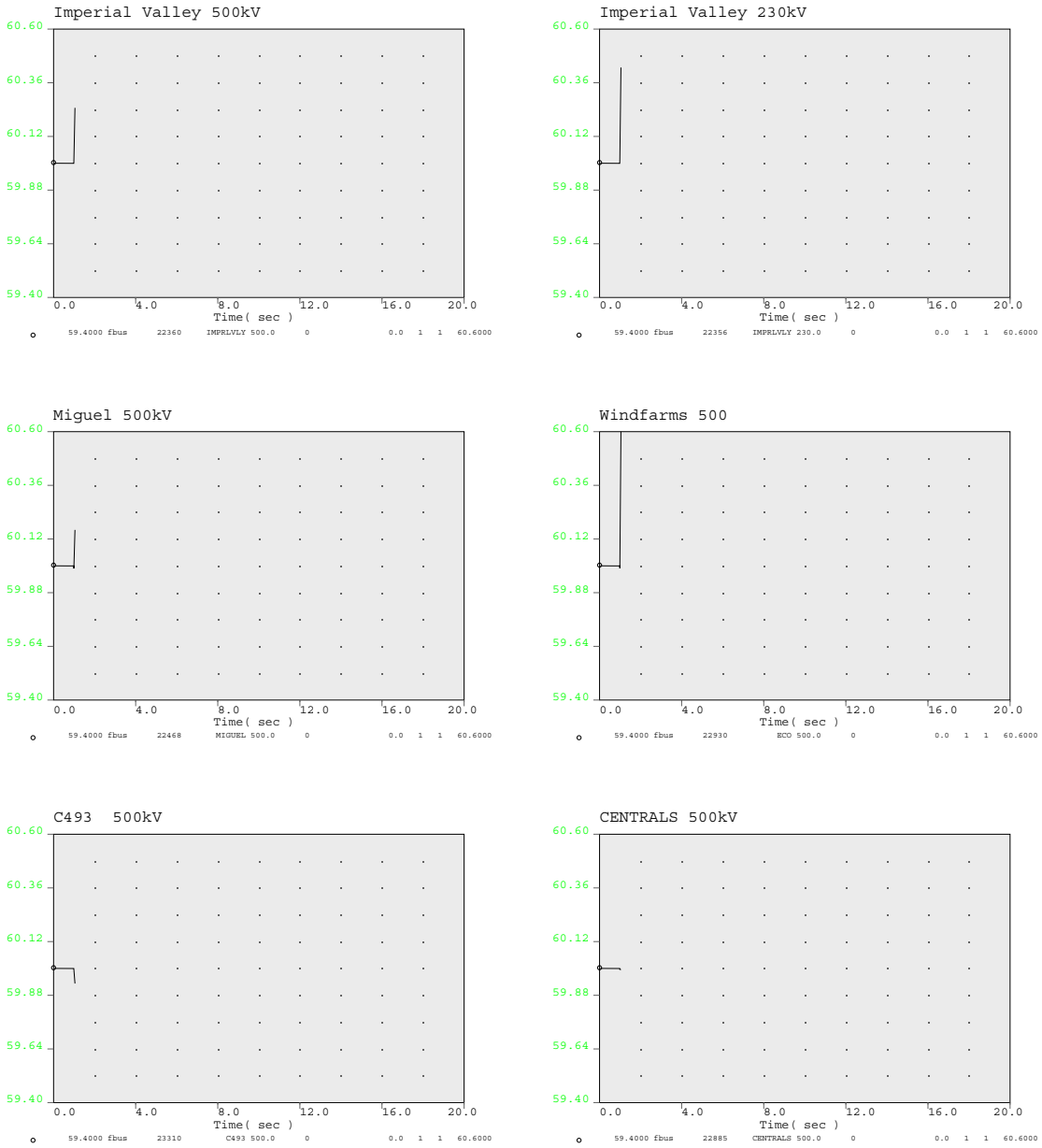


CENTRALS 500kV



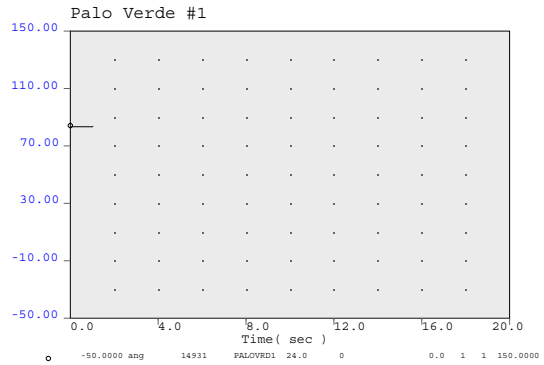
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

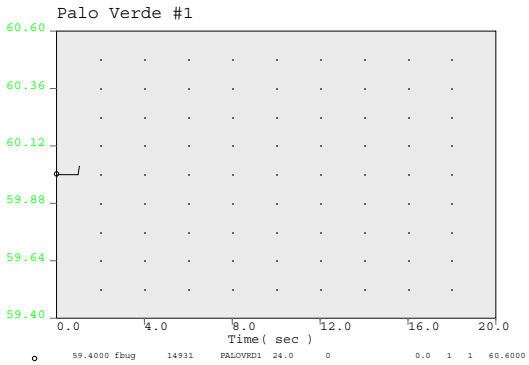
Imperial Valley Area - Frequency

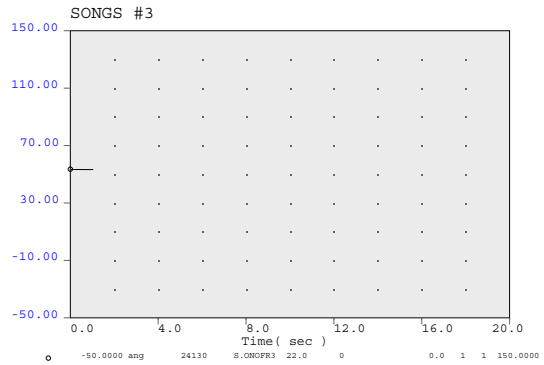


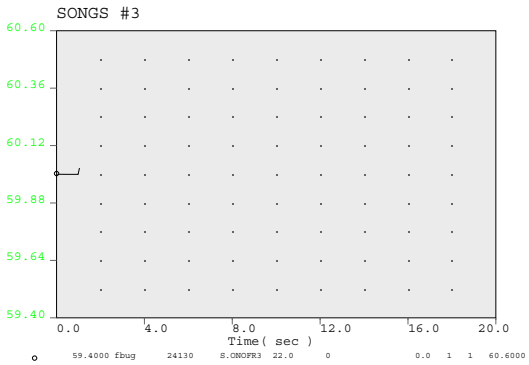
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

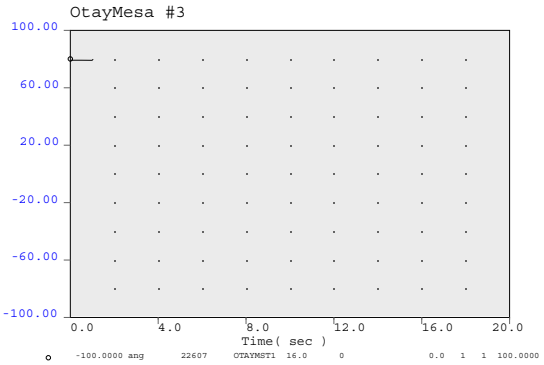
RELATIVE ROTOR ANGLE & FREQUENCY

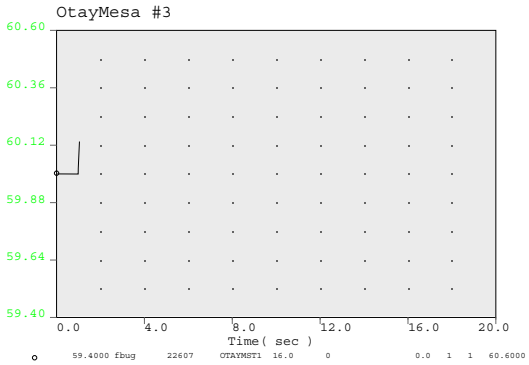












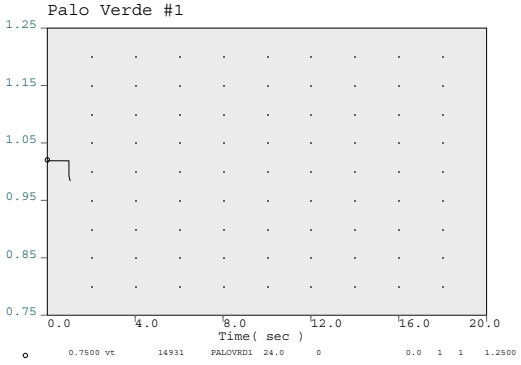
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Page 1

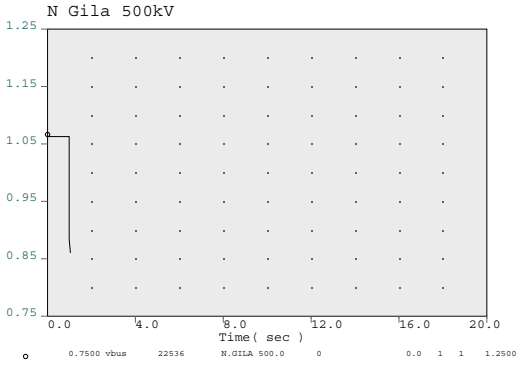
SDGE	ML_Wnd_RAS_pre_int9_hs.chf	i\hs\pre_int9\ws_pre_int9 Mon Oct 11 08:23:53 2010

RELATIVE VOLTAGE

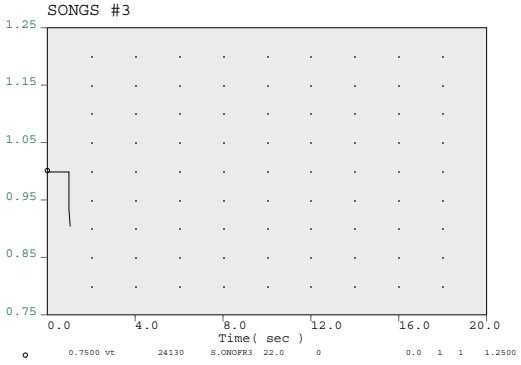
Palo Verde #1



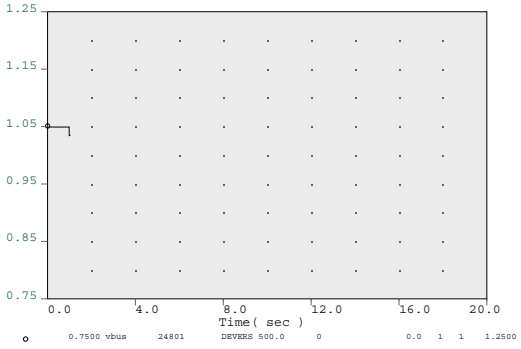
N Gila 500kV



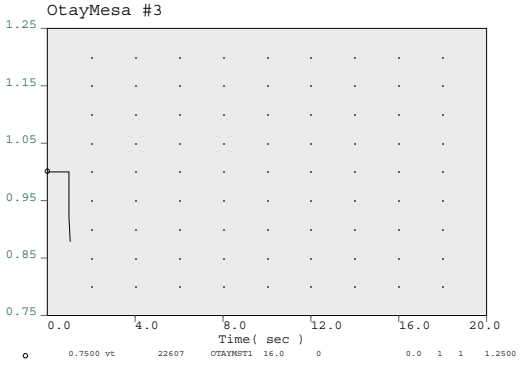
SONGS #3



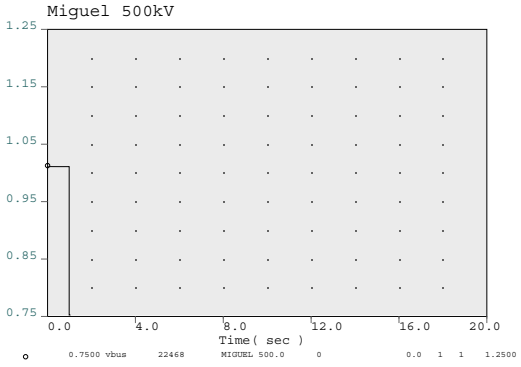
Devers 500



OtayMesa #3



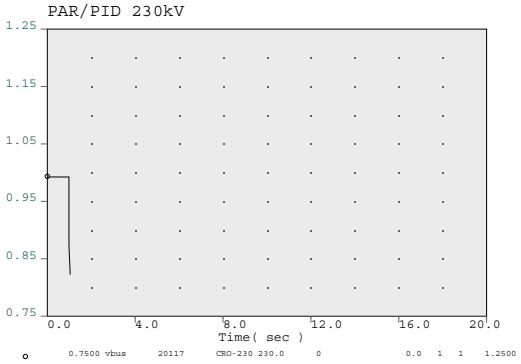
Miguel 500kV



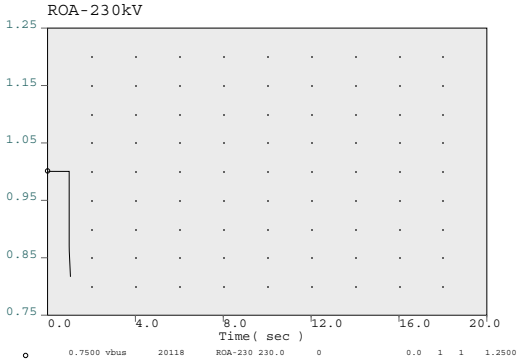
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

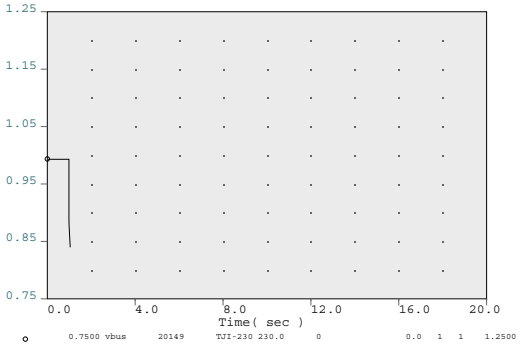
PAR/PID 230kV



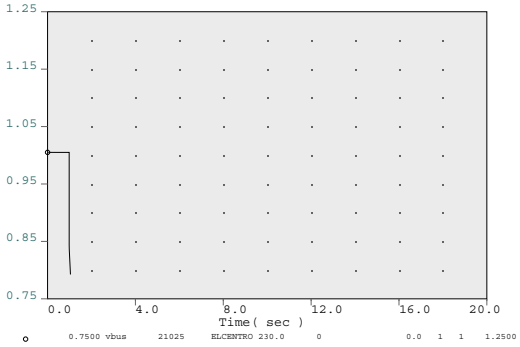
ROA-230kV



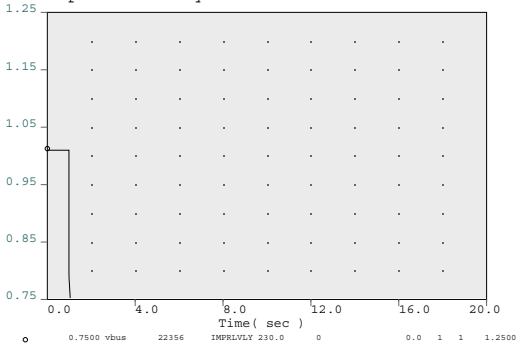
TJ1-230kV



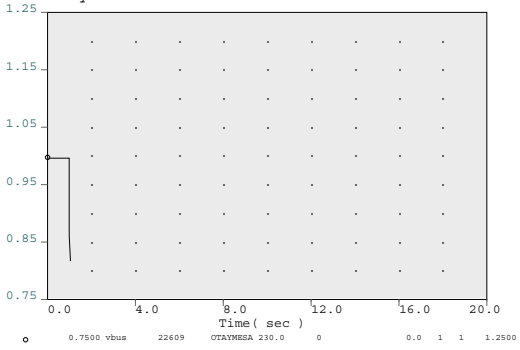
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



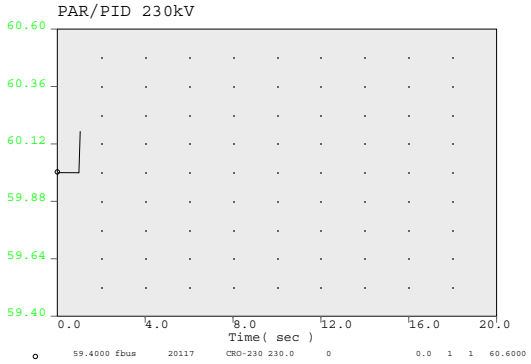
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

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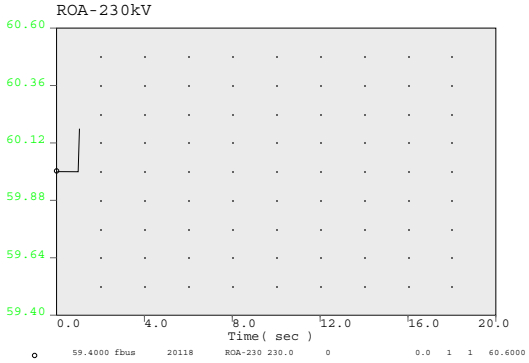
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Affected System Frequency Check and Comparison

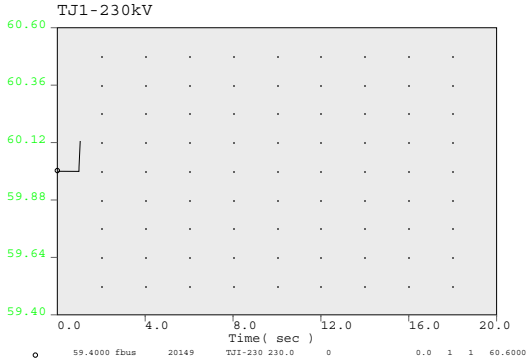
PAR/PID 230kV



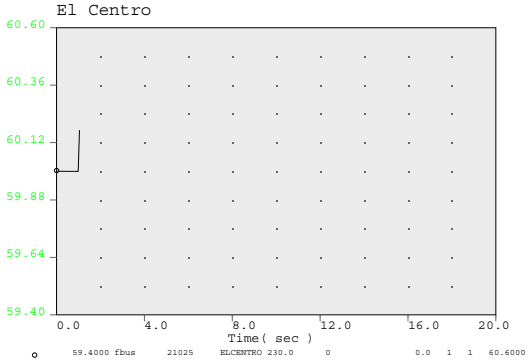
ROA-230kV



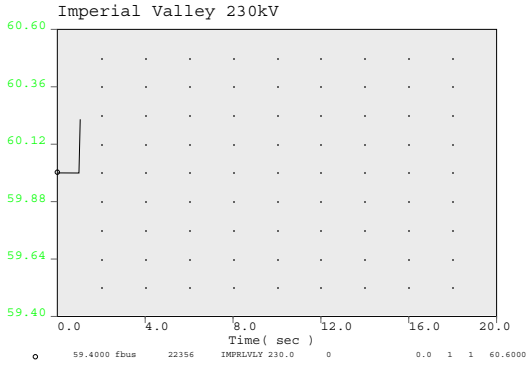
TJ1-230kV



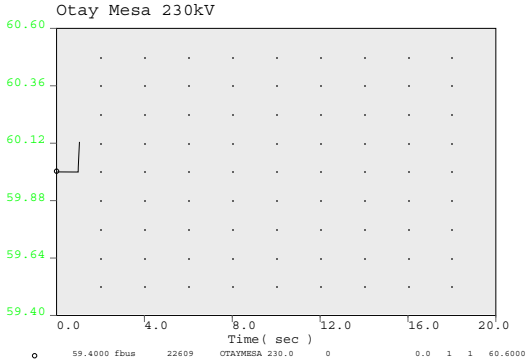
El Centro



Imperial Valley 230kV



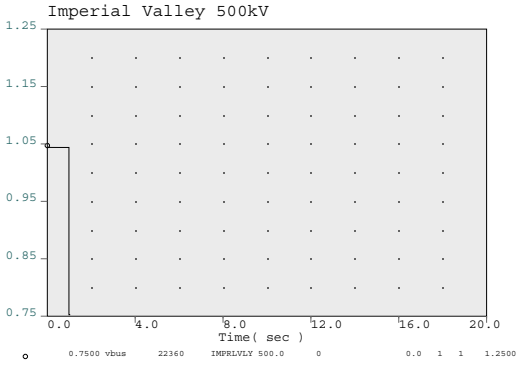
Otay Mesa 230kV



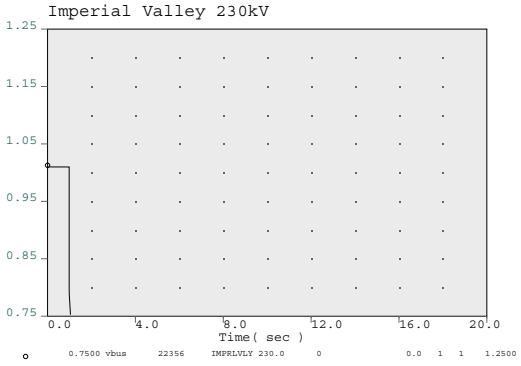
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

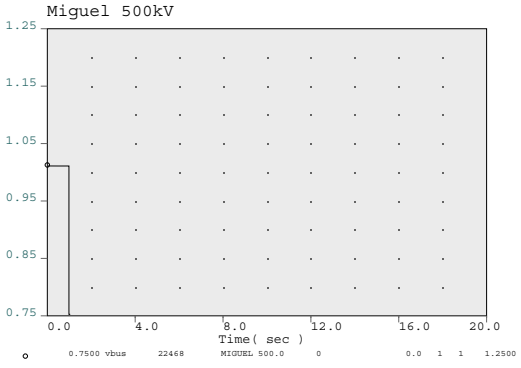
Imperial Valley 500kV



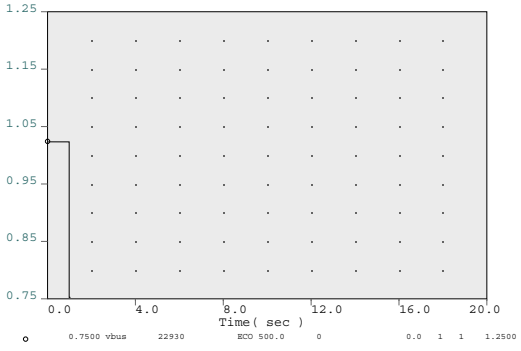
Imperial Valley 230kV



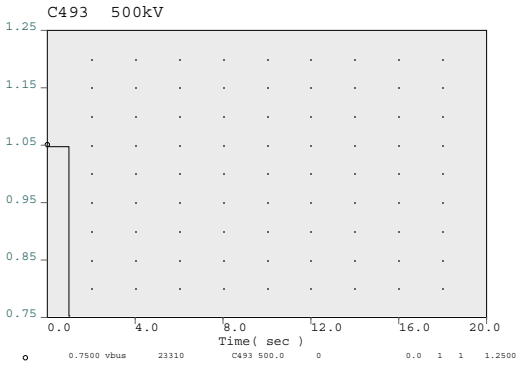
Miguel 500kV



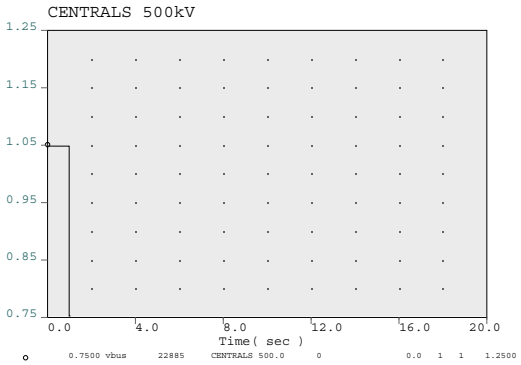
Windfarms 500



C493 500kV

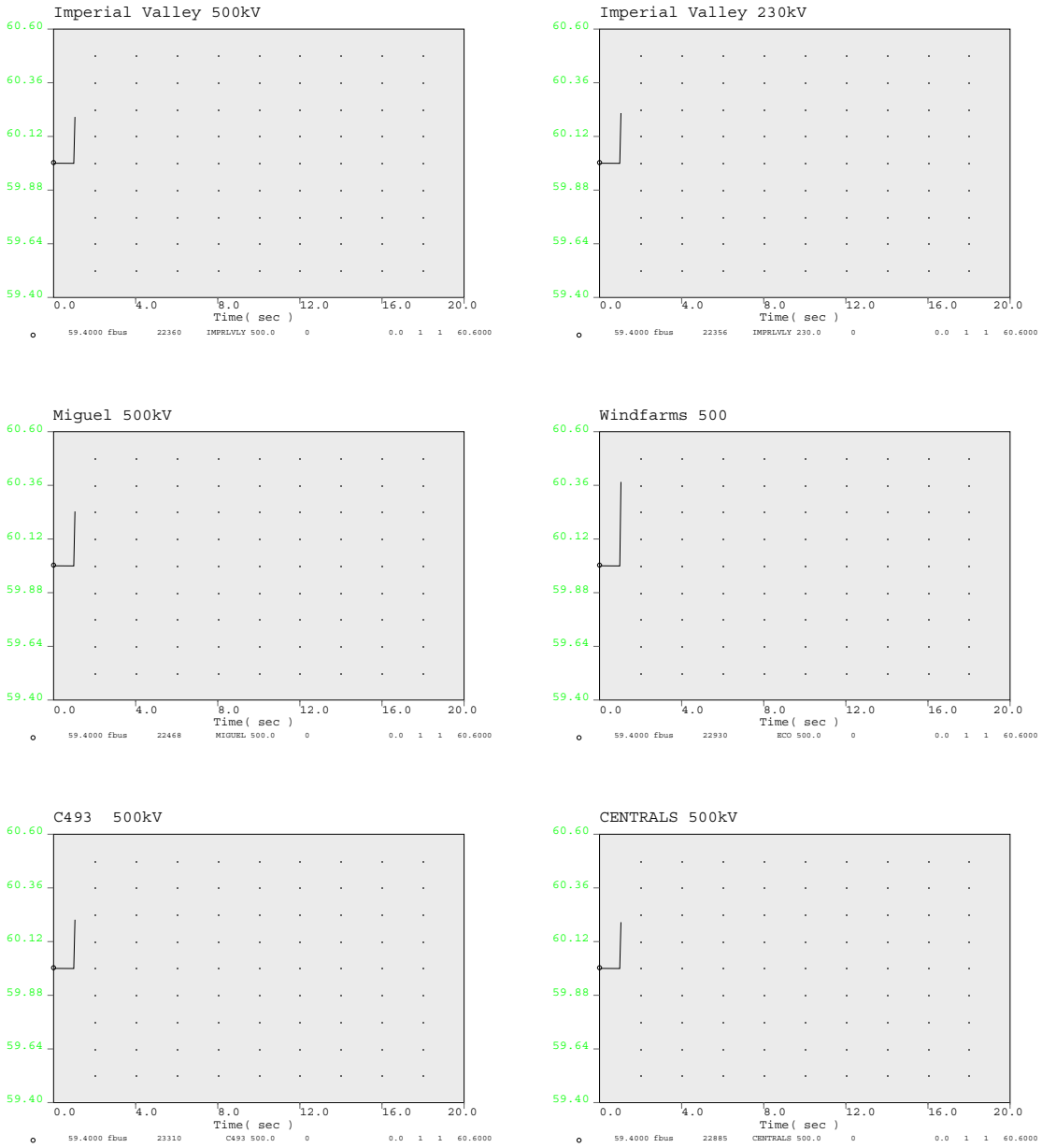


CENTRALS 500kV



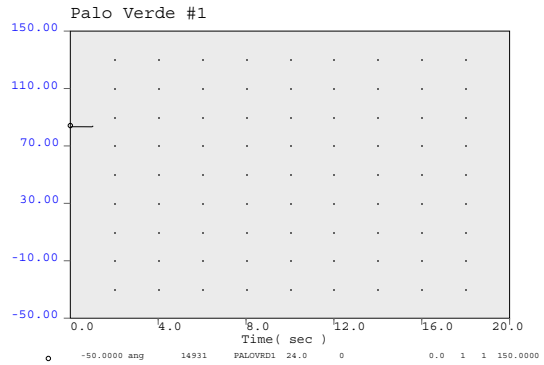
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

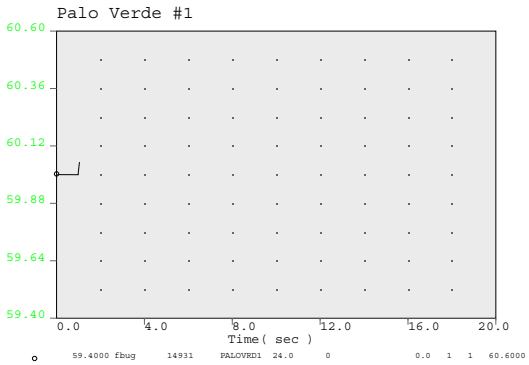
Imperial Valley Area - Frequency

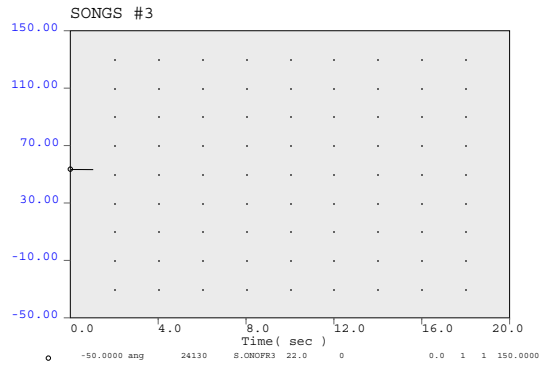


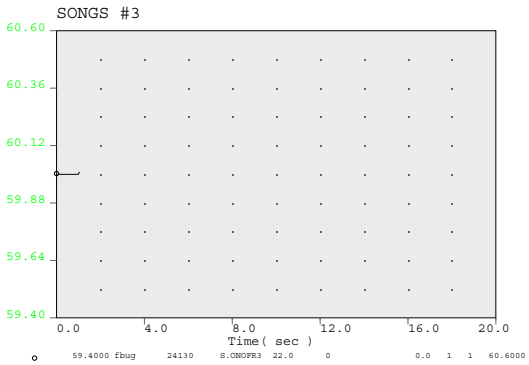
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

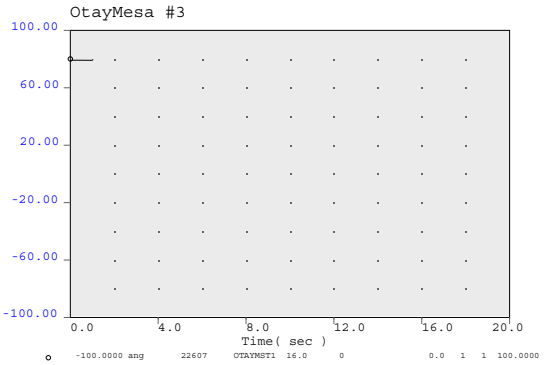
RELATIVE ROTOR ANGLE & FREQUENCY

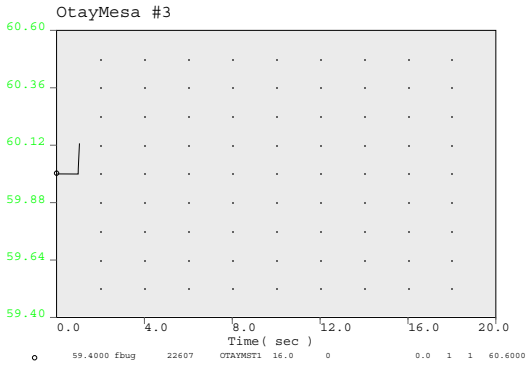












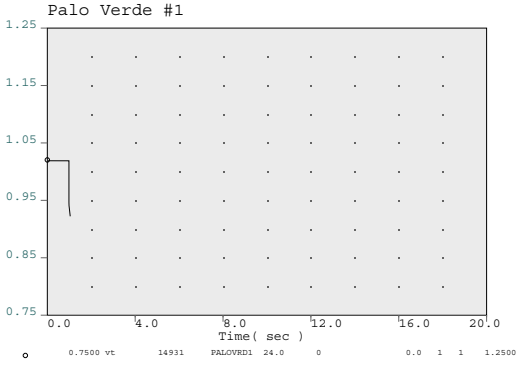
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Page 1

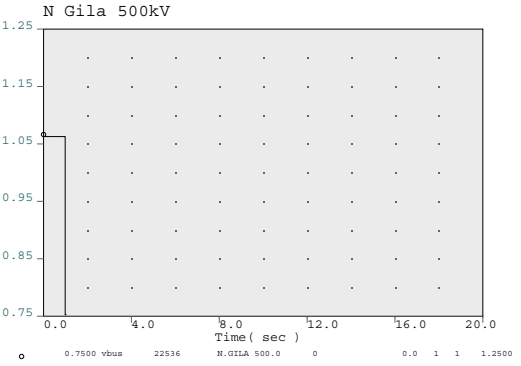
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RELATIVE VOLTAGE

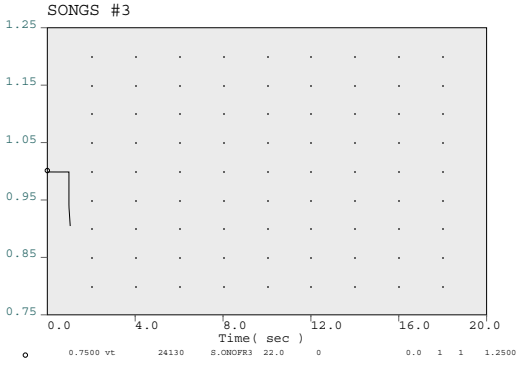
Palo Verde #1



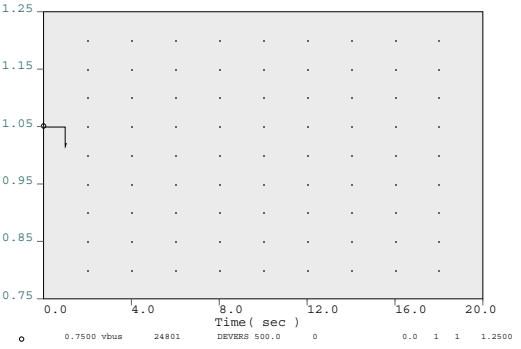
N Gila 500kV



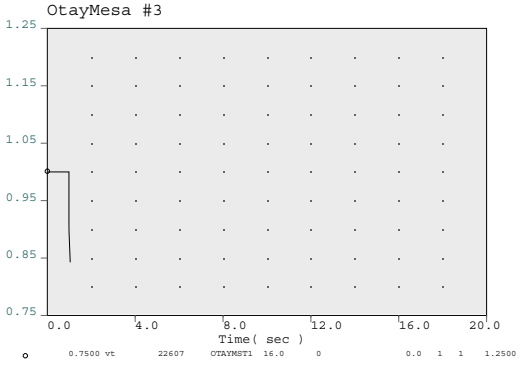
SONGS #3



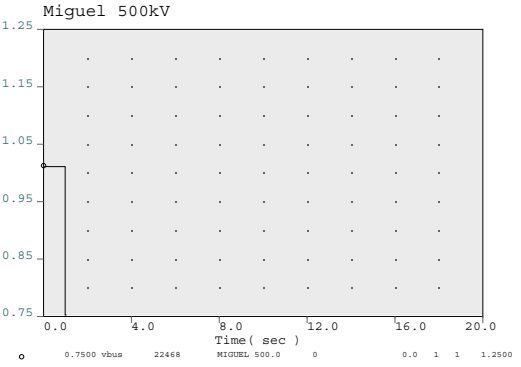
Devers 500



OtayMesa #3



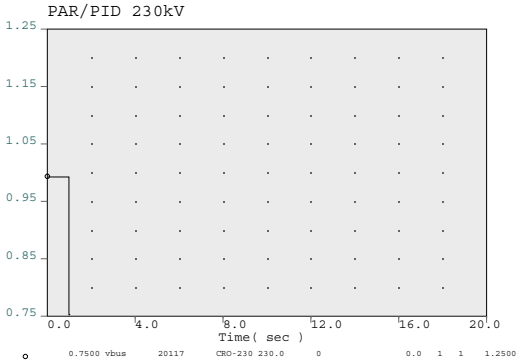
Miguel 500kV



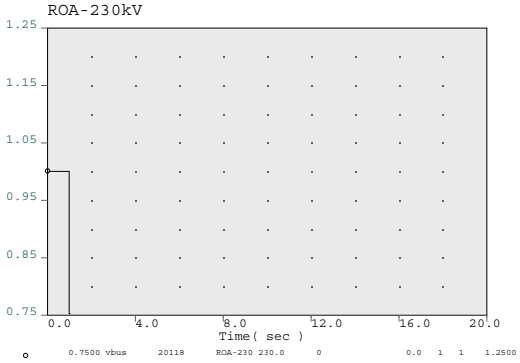
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Voltage Check and Comparison

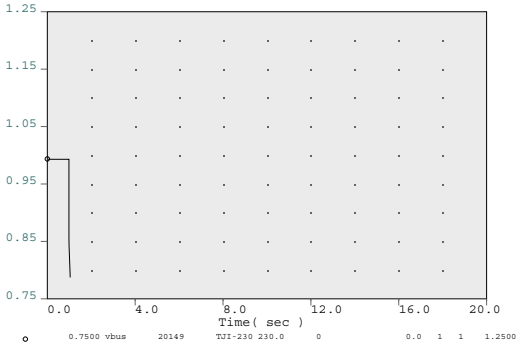
PAR/PID 230kV



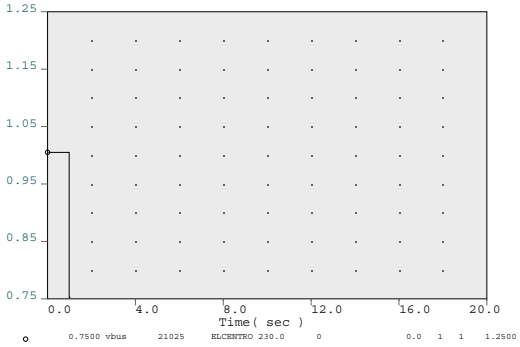
ROA-230kV



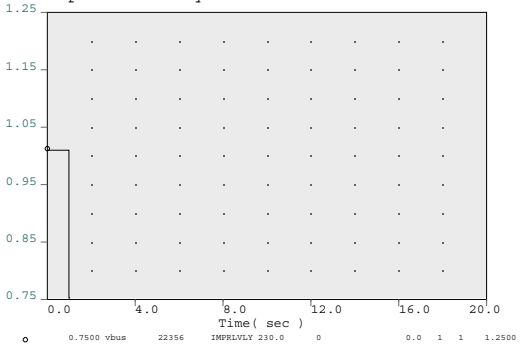
TJ1-230kV



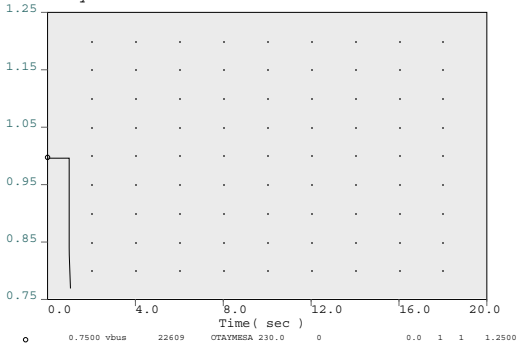
El Centro



Imperial Valley 230kV



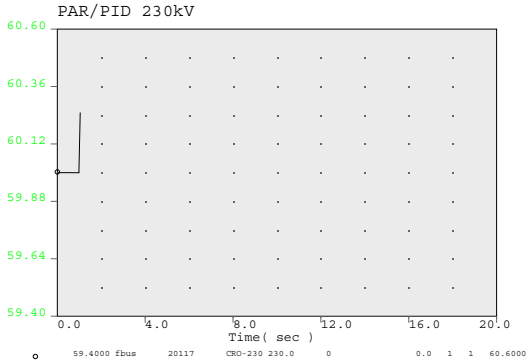
Otay Mesa 230kV



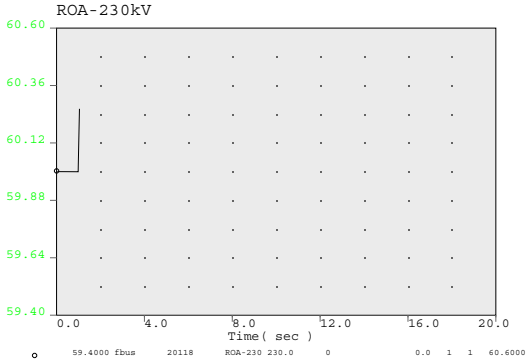
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Affected System Frequency Check and Comparison

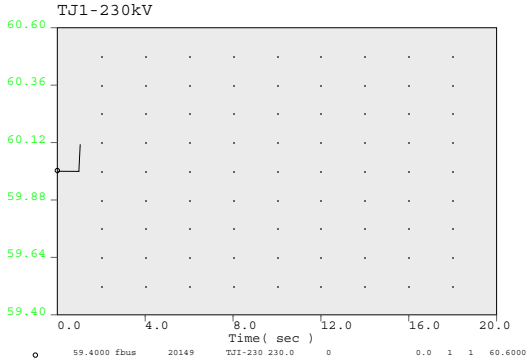
PAR/PID 230kV



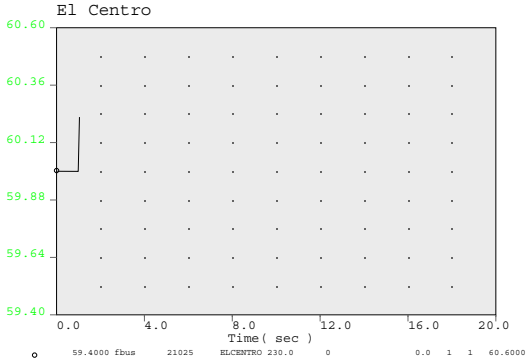
ROA-230kV



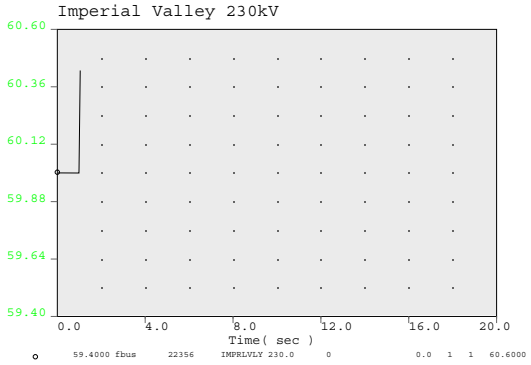
TJ1-230kV



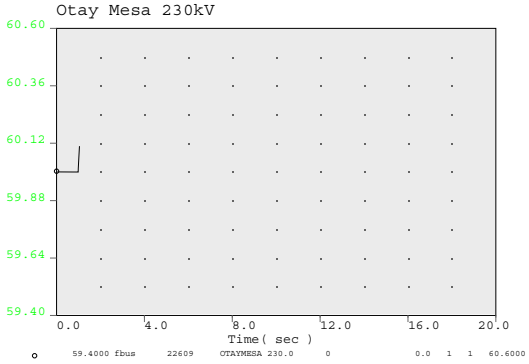
El Centro



Imperial Valley 230kV



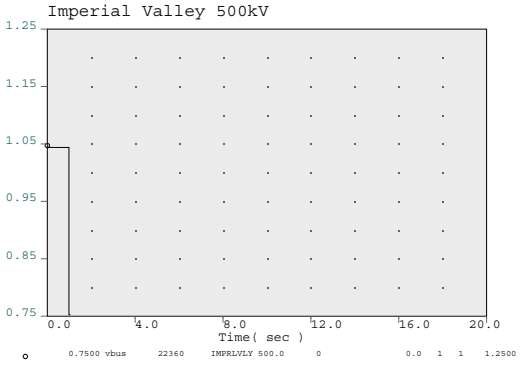
Otay Mesa 230kV



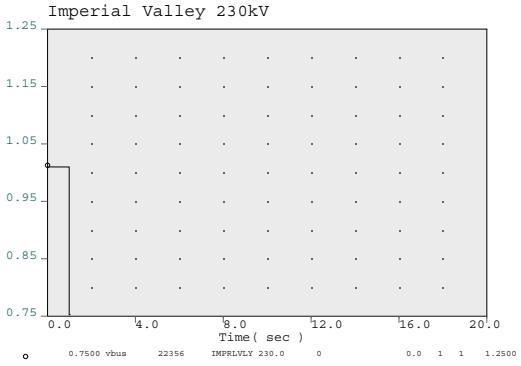
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

Imperial Valley Area - VOLTAGE

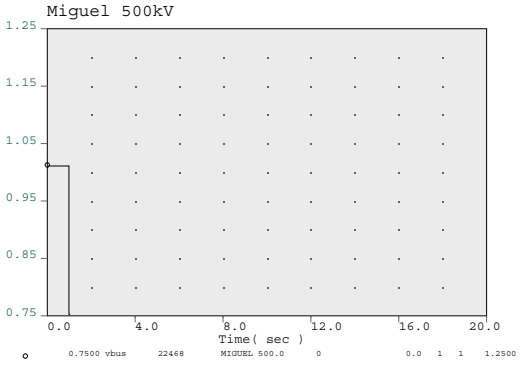
Imperial Valley 500kV



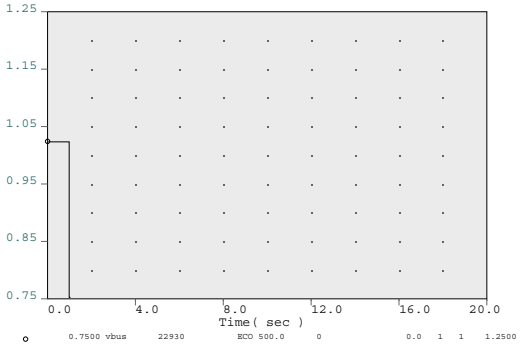
Imperial Valley 230kV



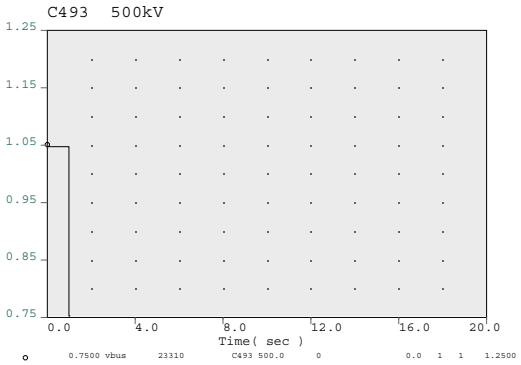
Miguel 500kV



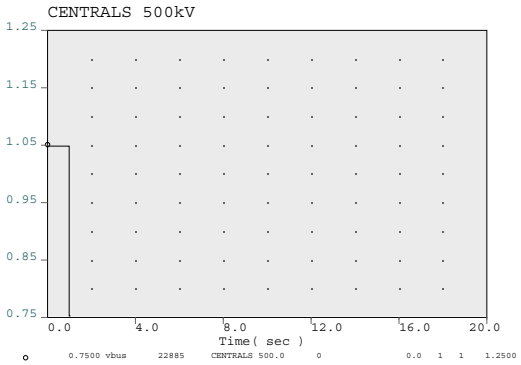
Windfarms 500



C493 500kV



CENTRALS 500kV

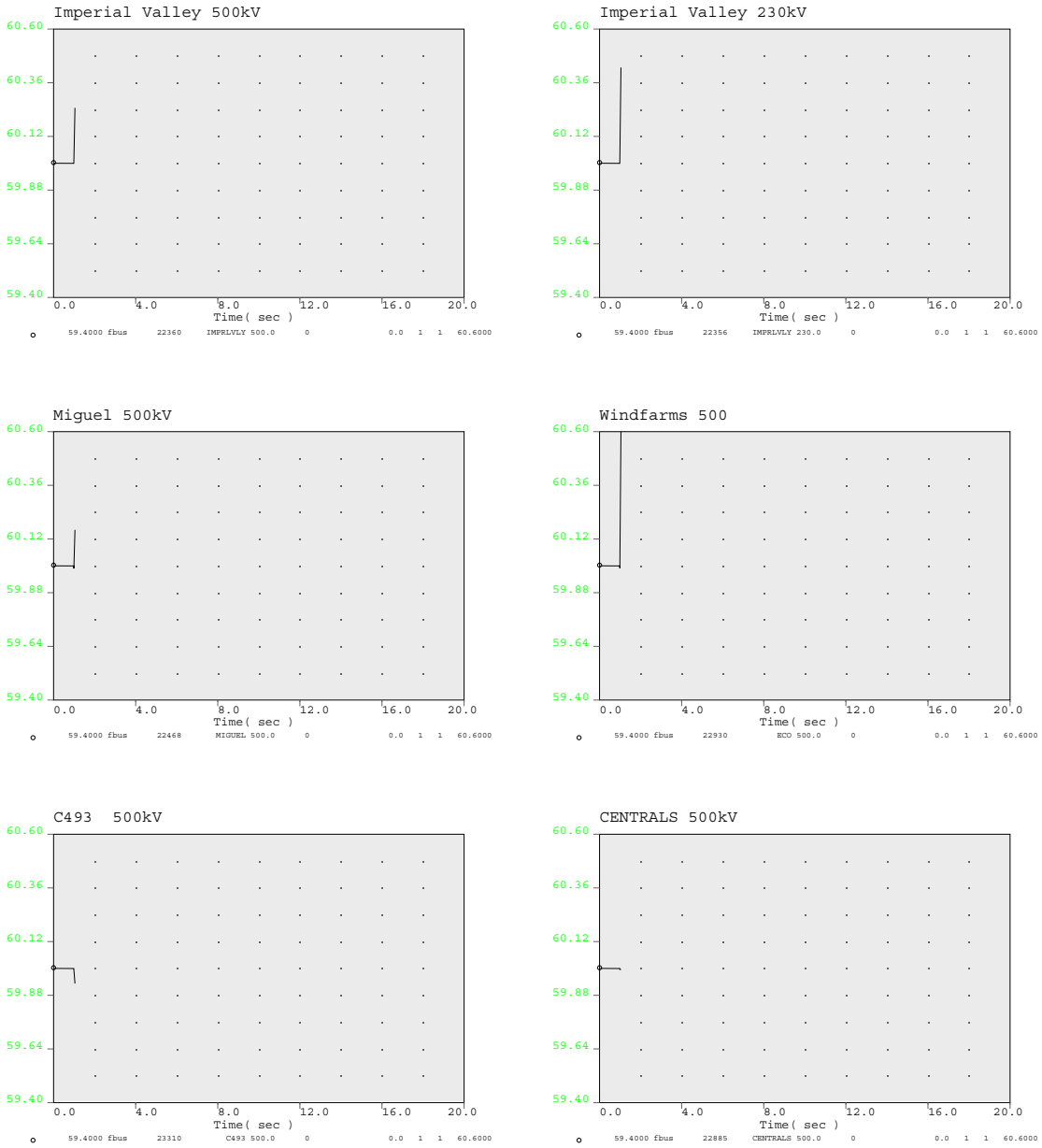


SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

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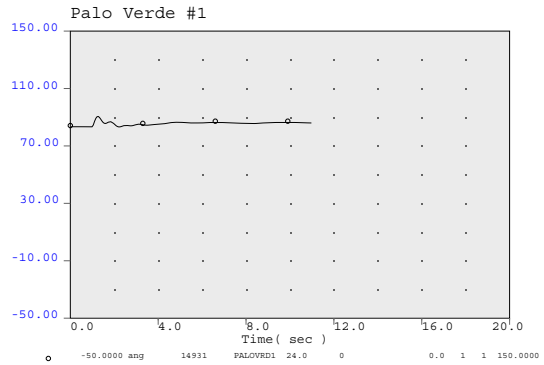
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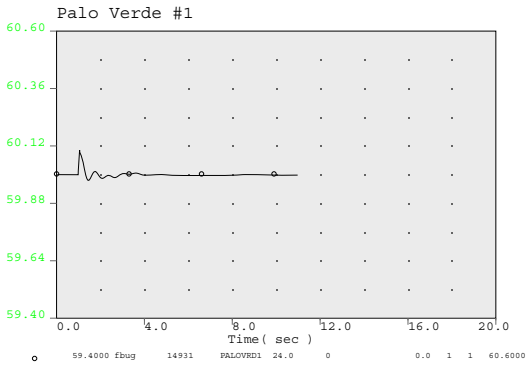
Imperial Valley Area - Frequency

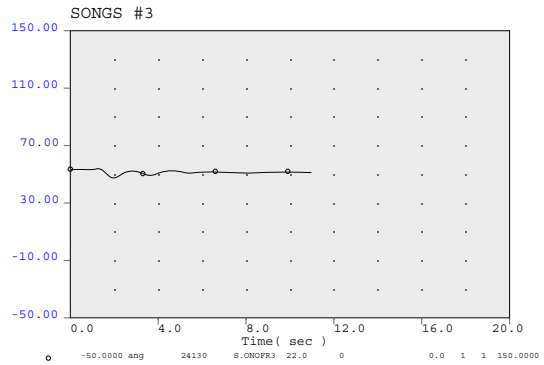


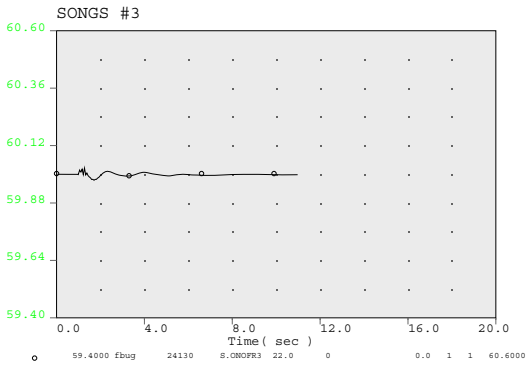
SDG&E Cluster 2 - pre
2014 Heavy Summer
Miguel-Windfarms 500 kV line

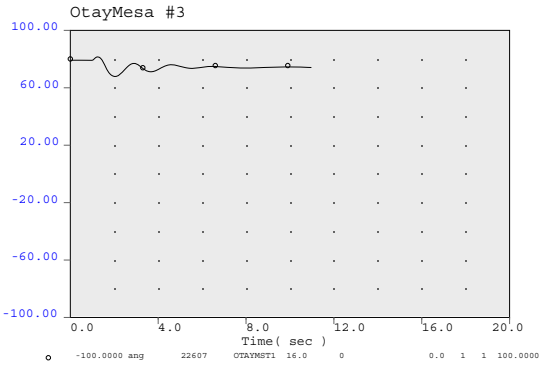
RELATIVE ROTOR ANGLE & FREQUENCY

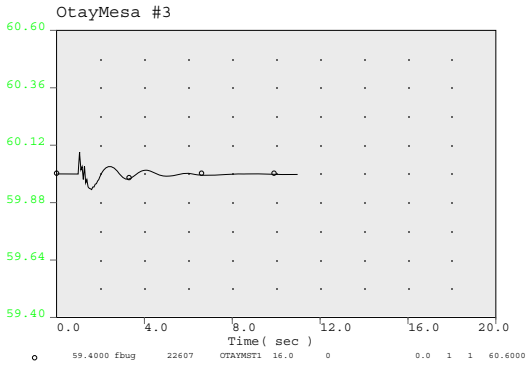












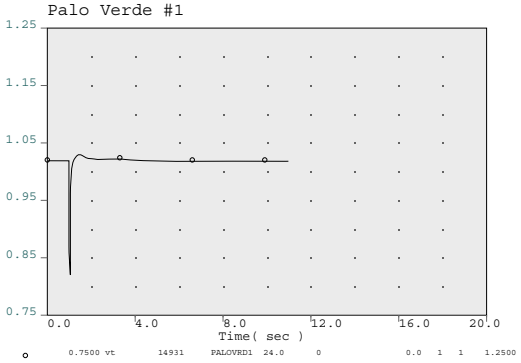
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Page 1

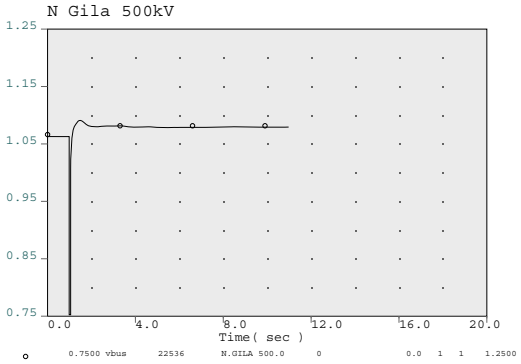
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RELATIVE VOLTAGE

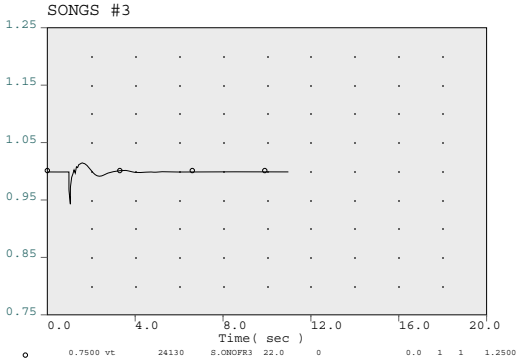
Palo Verde #1



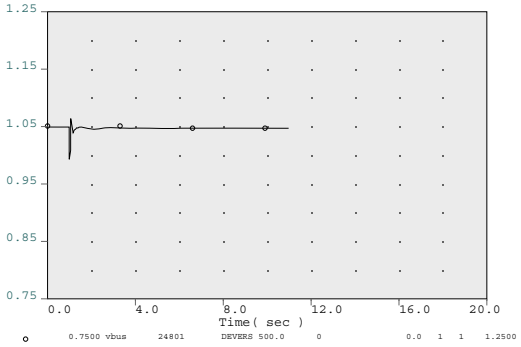
N Gila 500kV



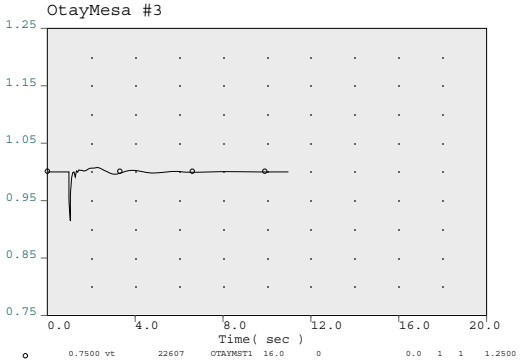
SONGS #3



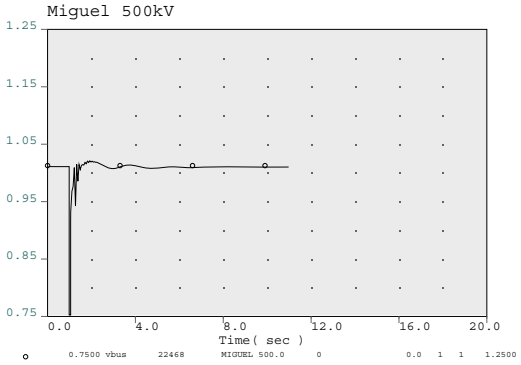
Devers 500



OtayMesa #3



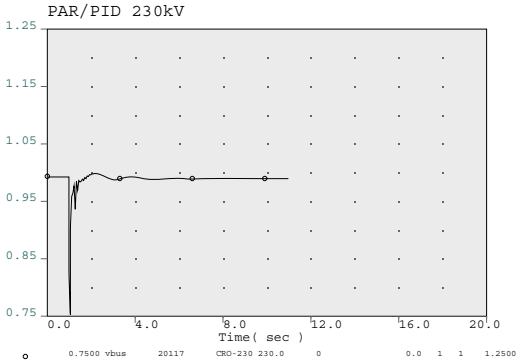
Miguel 500kV



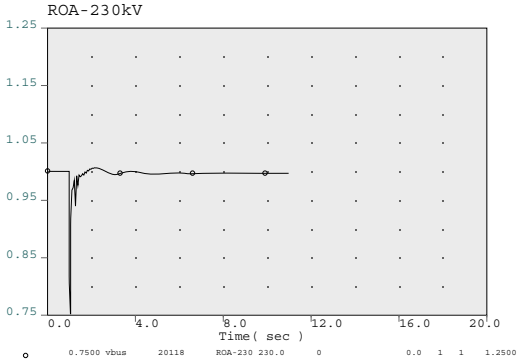
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

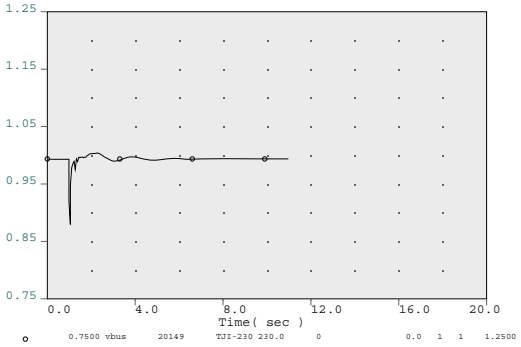
PAR/PID 230kV



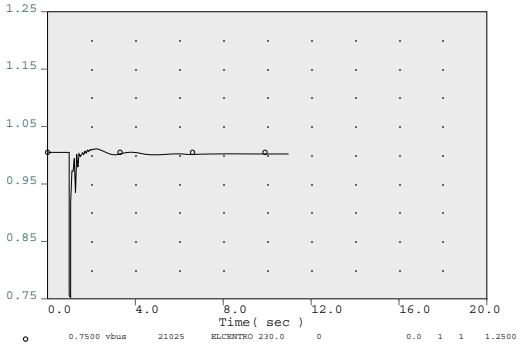
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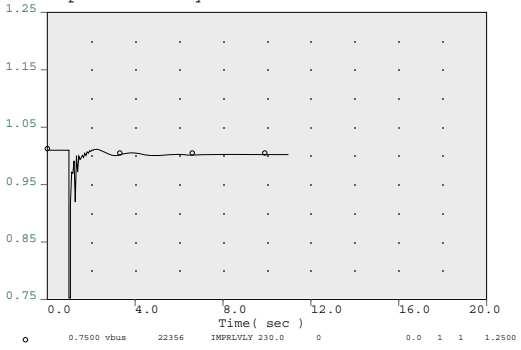
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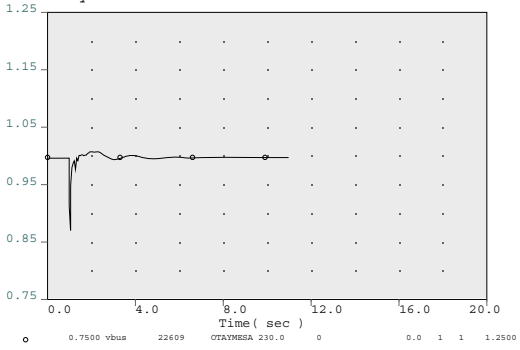
El Centro



Imperial Valley 230kV



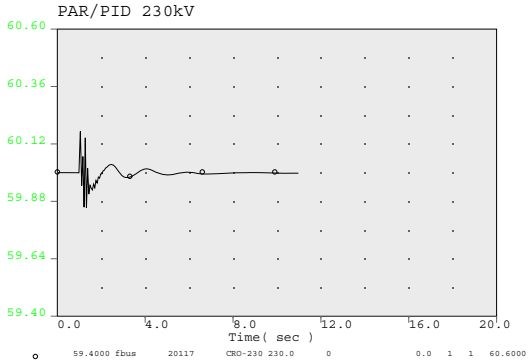
Otay Mesa 230kV



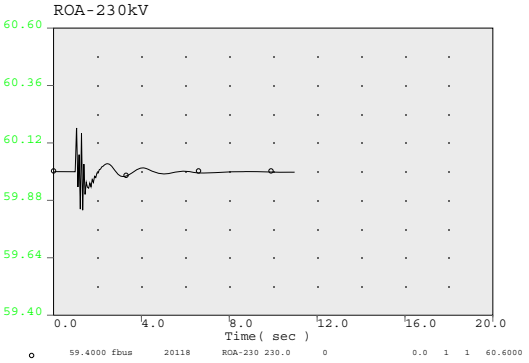
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

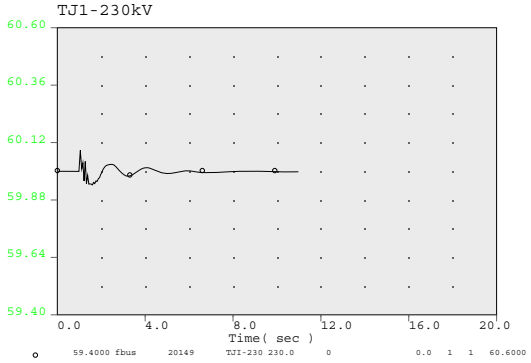
PAR/PID 230kV



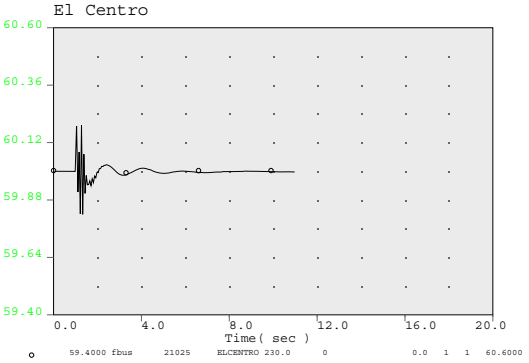
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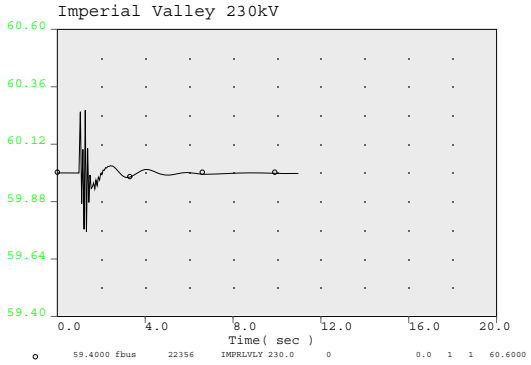
TJ1-230kV



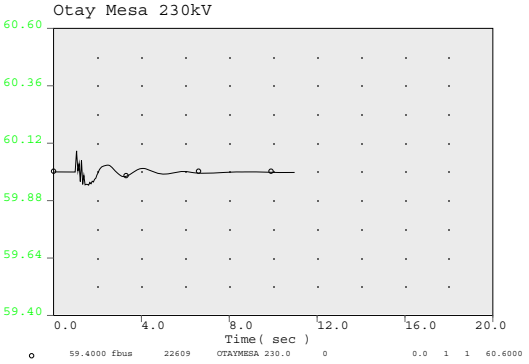
El Centro



Imperial Valley 230kV



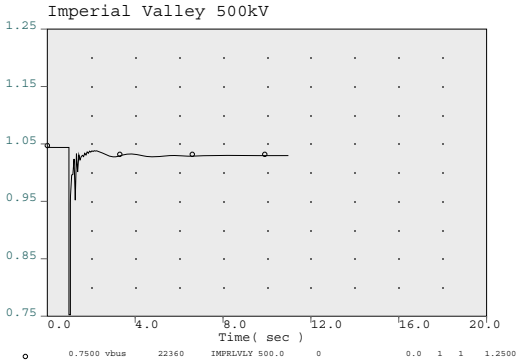
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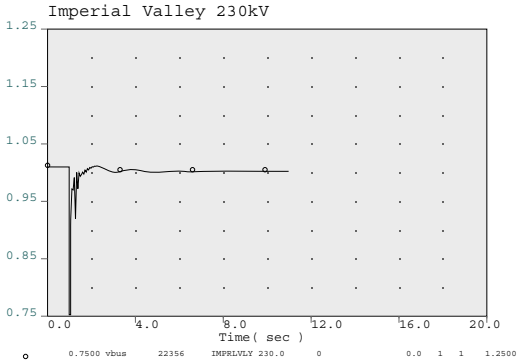
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

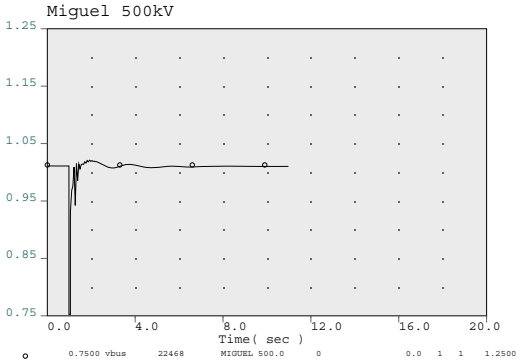
Imperial Valley 500kV



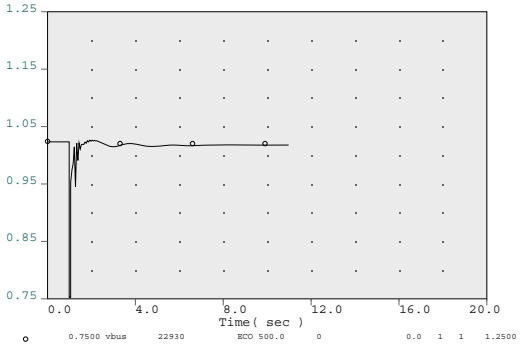
Imperial Valley 230kV



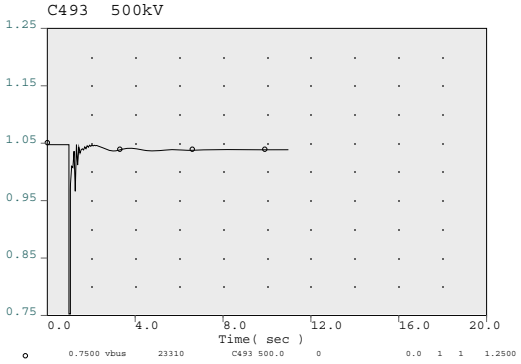
Miguel 500kV



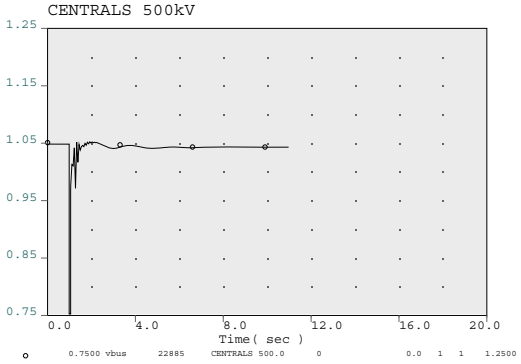
Windfarms 500



C493 500kV



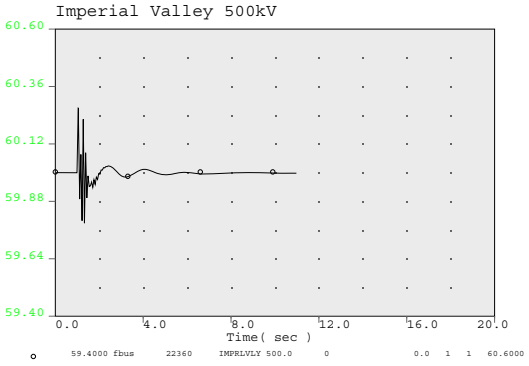
CENTRALS 500kV



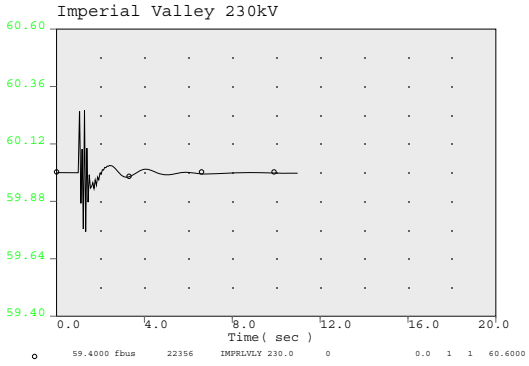
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - Frequency

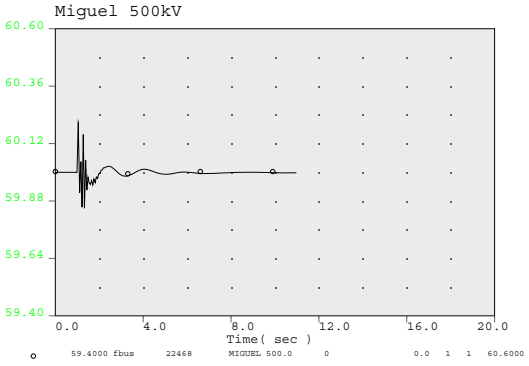
Imperial Valley 500kV



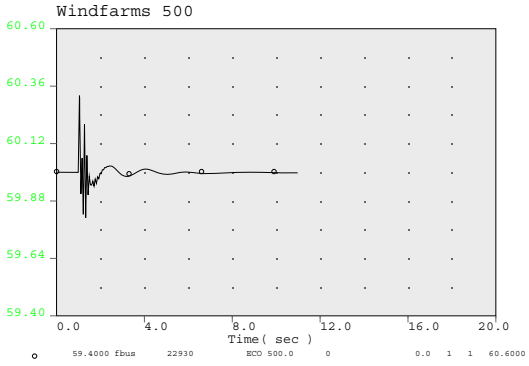
Imperial Valley 230kV



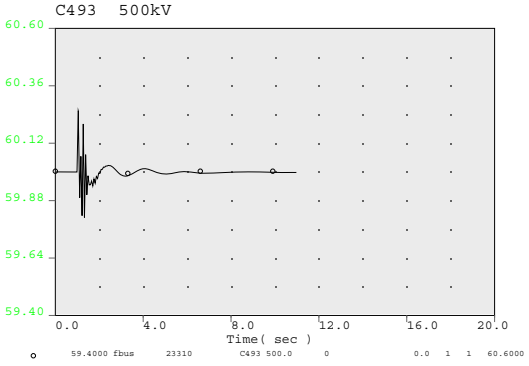
Miguel 500kV



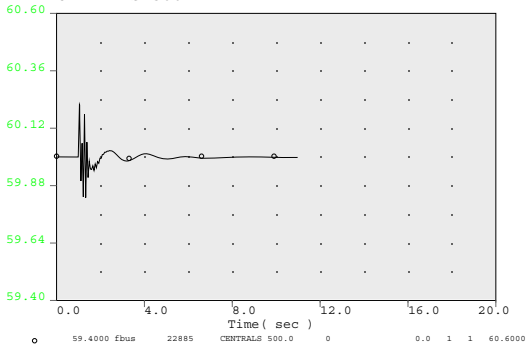
Windfarms 500



C493 500kV

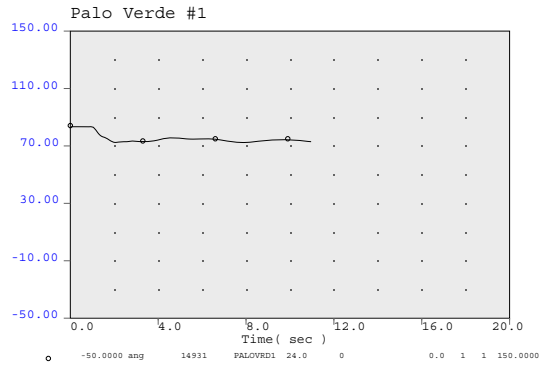


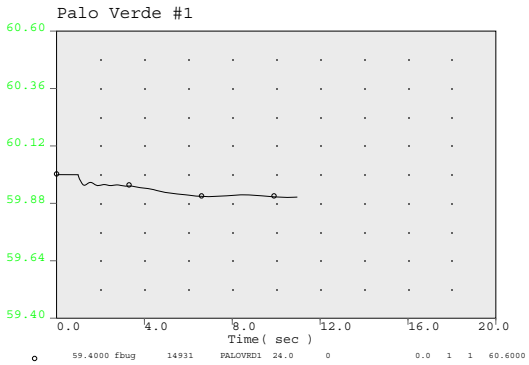
CENTRALS 500kV

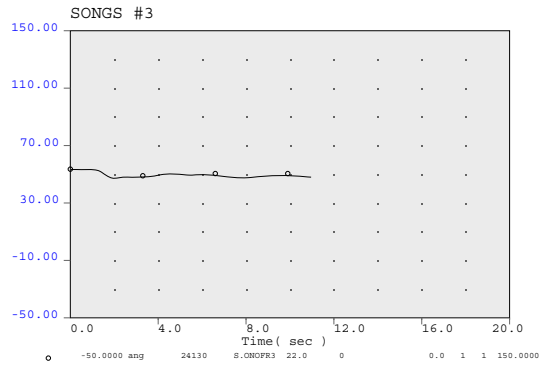


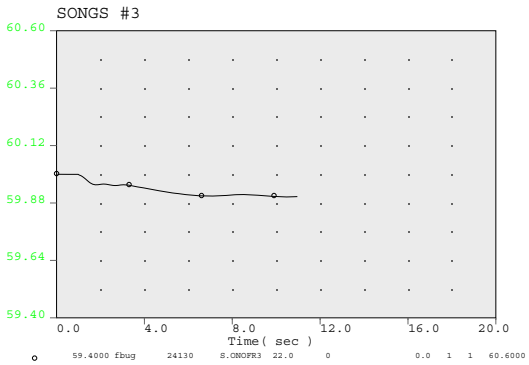
SDG&E Cluster 2 - pre
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

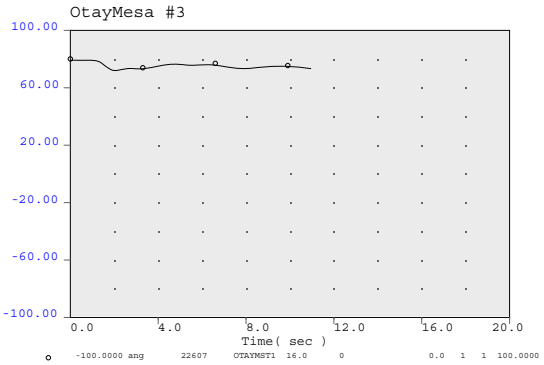
RELATIVE ROTOR ANGLE & FREQUENCY

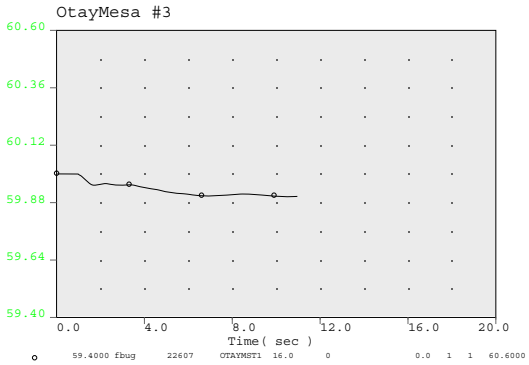










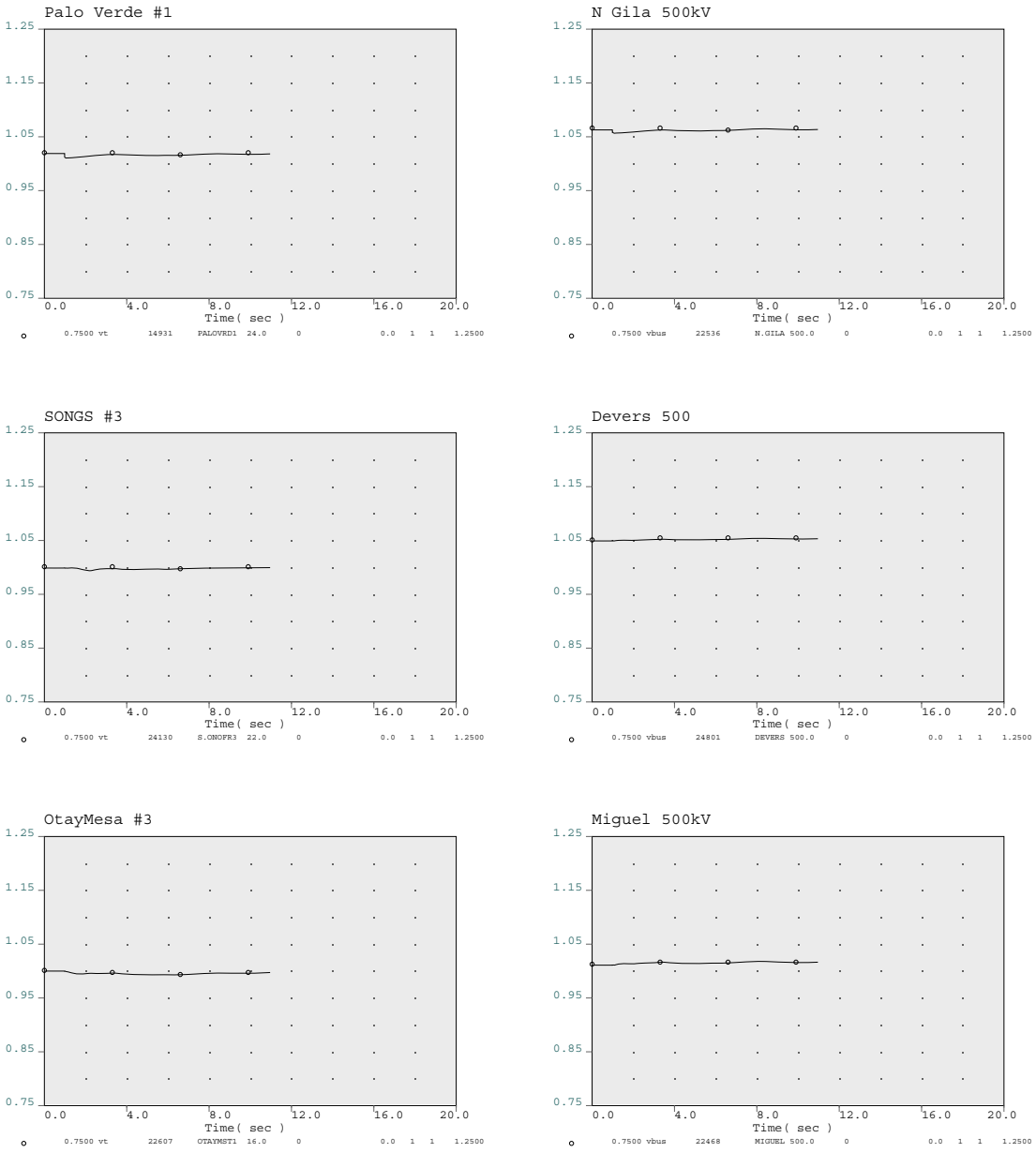


SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

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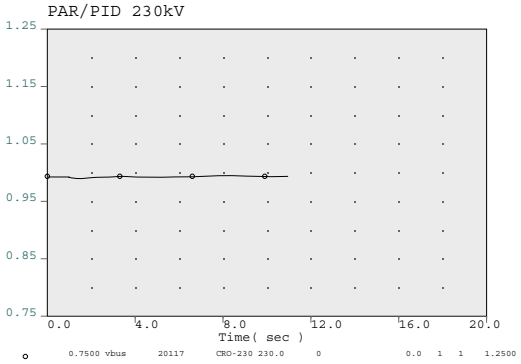
RELATIVE VOLTAGE



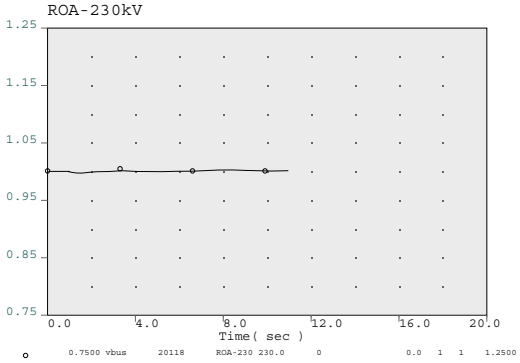
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

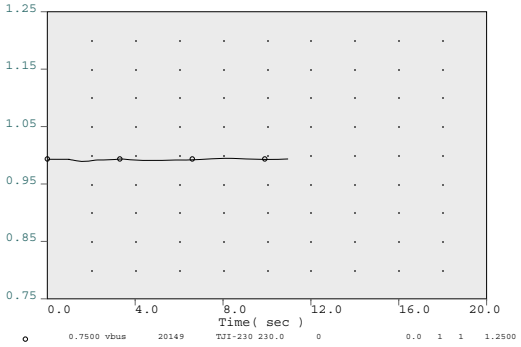
PAR/PID 230kV



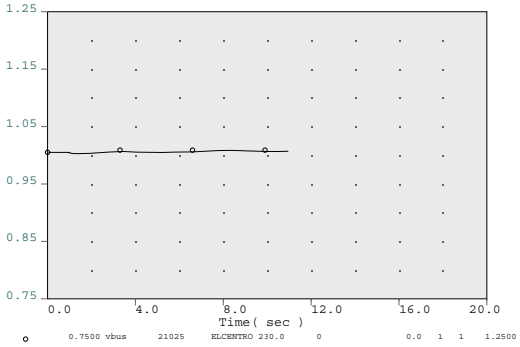
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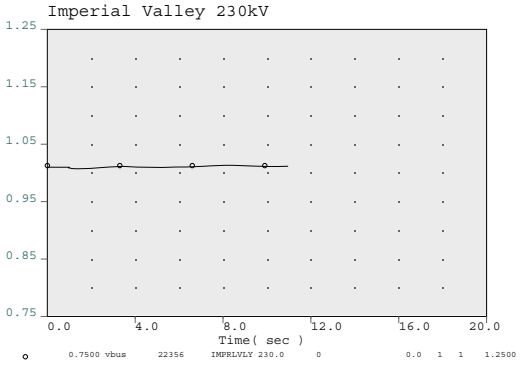
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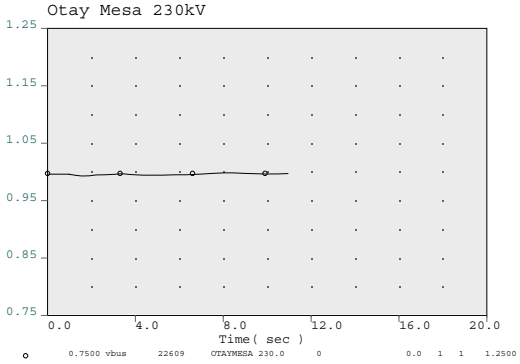
El Centro



Imperial Valley 230kV



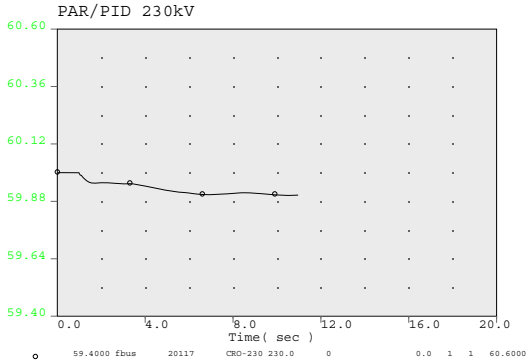
Otay Mesa 230kV



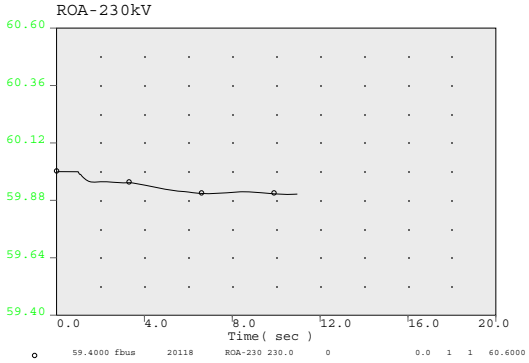
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

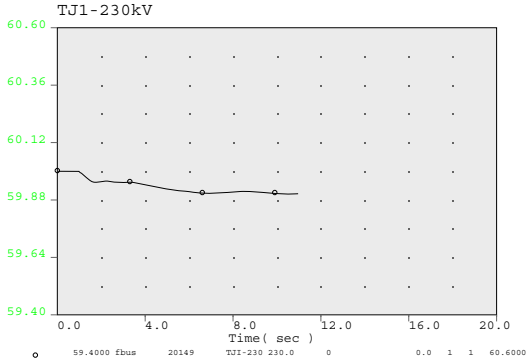
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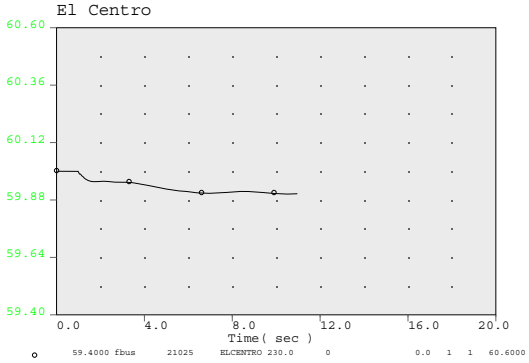
ROA-230kV



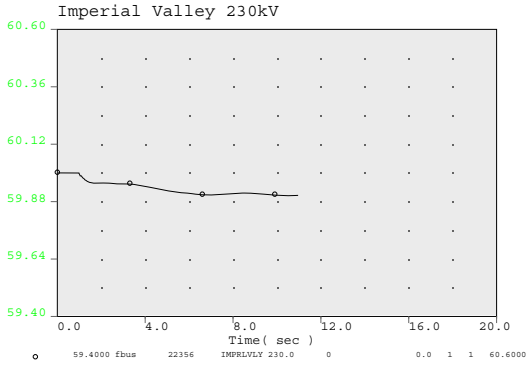
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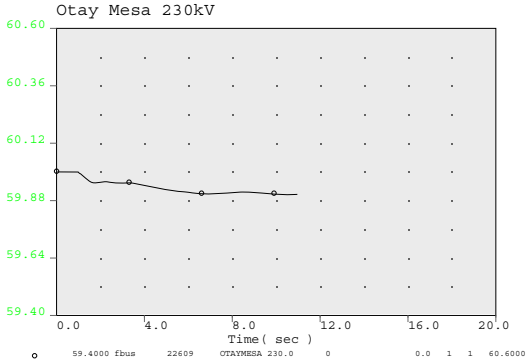
El Centro



Imperial Valley 230kV



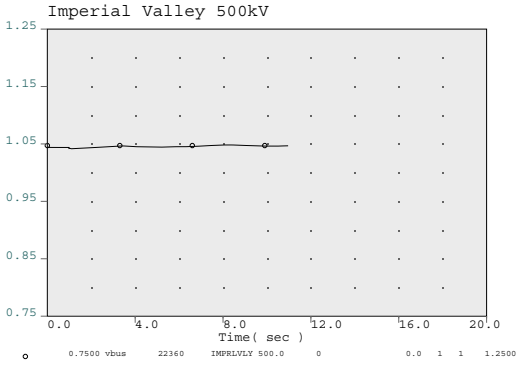
Otay Mesa 230kV



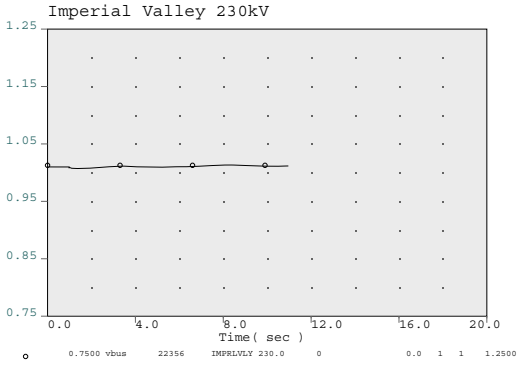
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

Imperial Valley Area - VOLTAGE

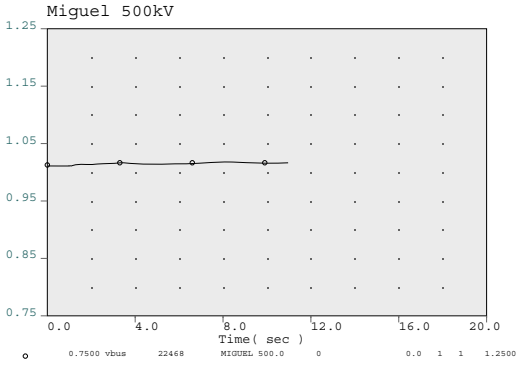
Imperial Valley 500kV



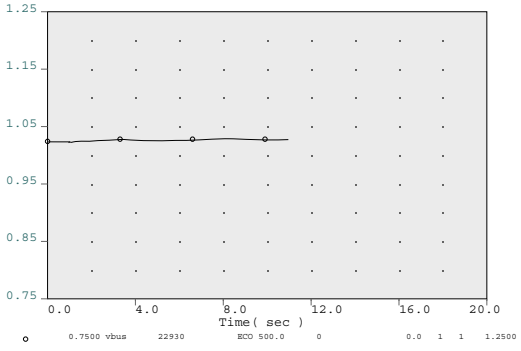
Imperial Valley 230kV



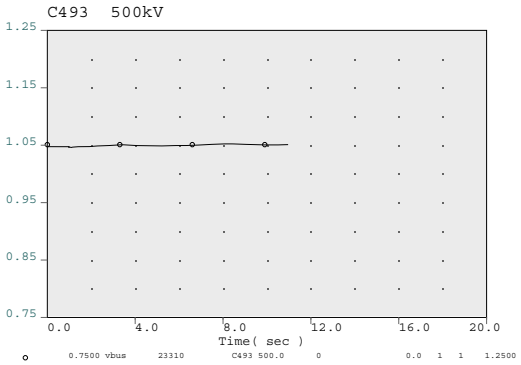
Miguel 500kV



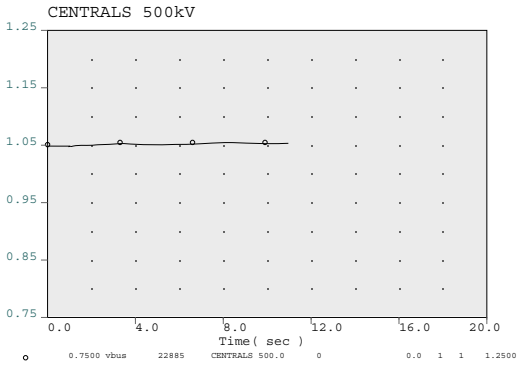
Windfarms 500



C493 500kV

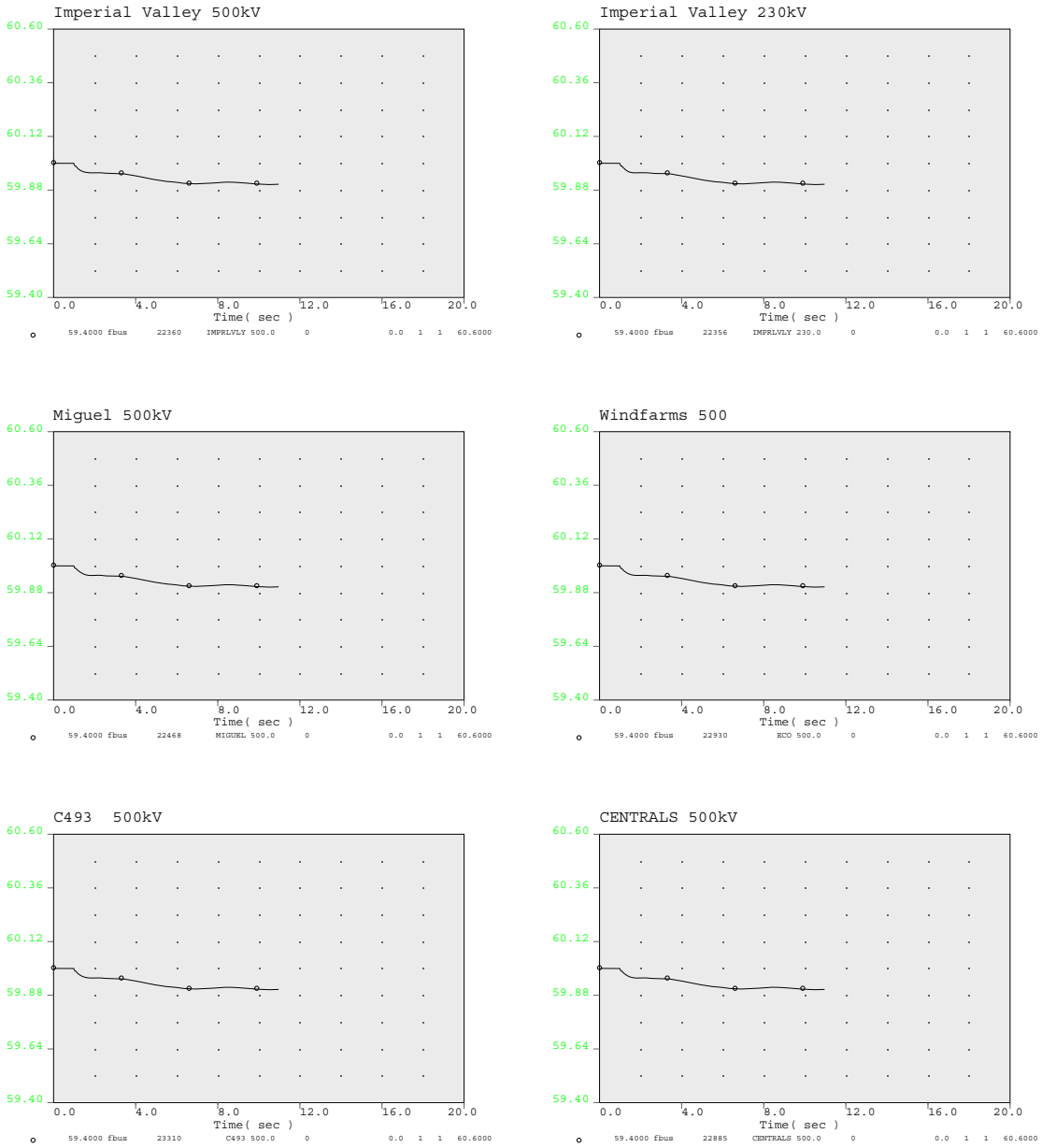


CENTRALS 500kV



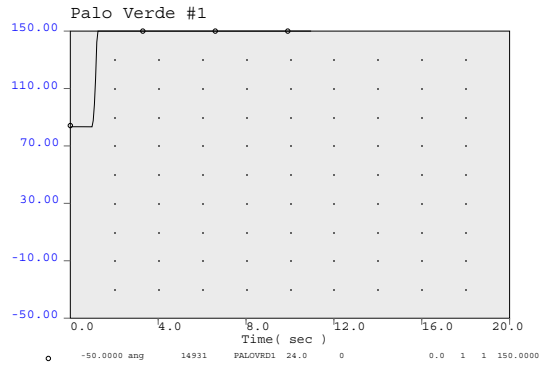
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

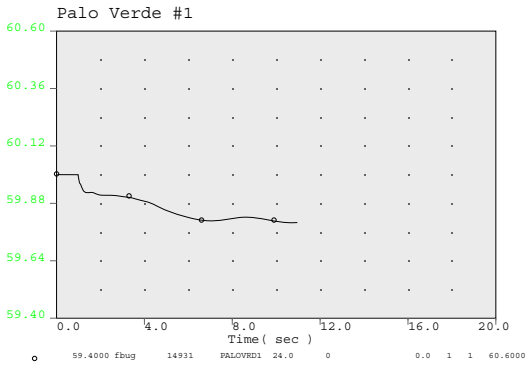
Imperial Valley Area - Frequency

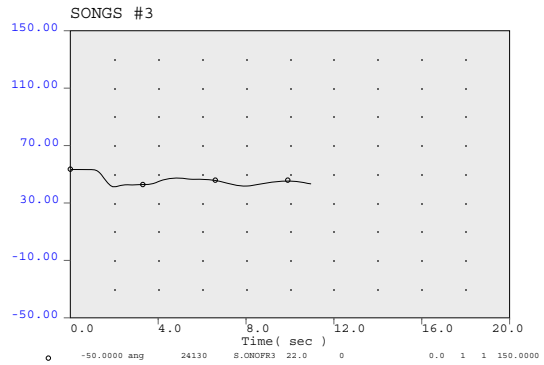


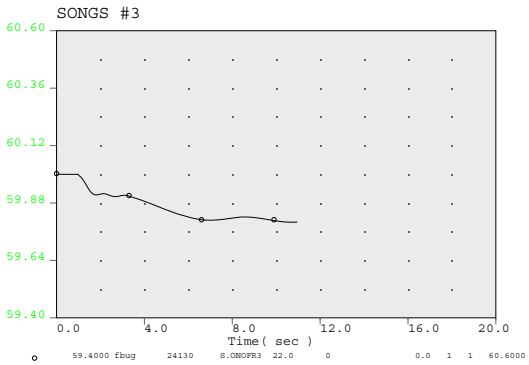
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generator #2

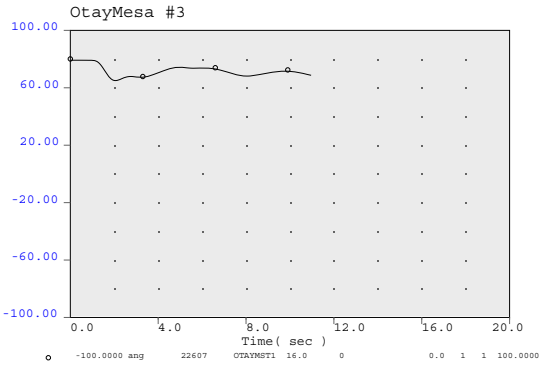
RELATIVE ROTOR ANGLE & FREQUENCY

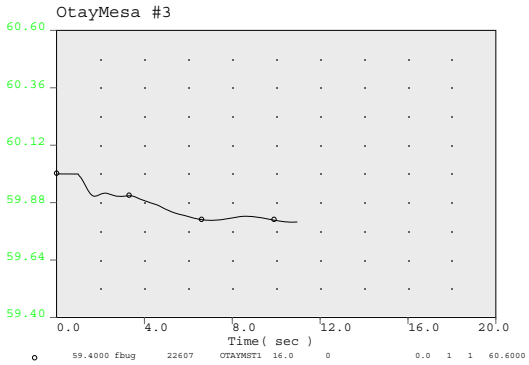












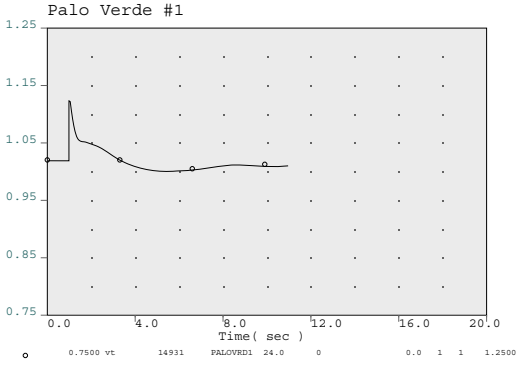
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Page 1

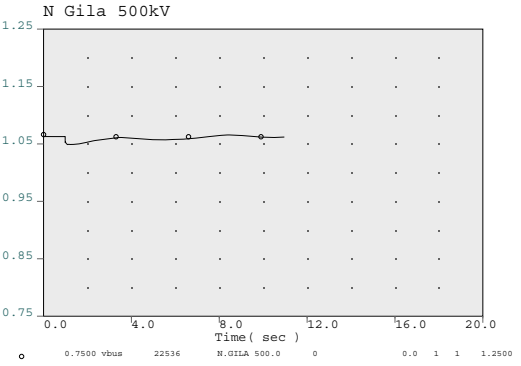
SDGE	PaloVerde-g2_pre_int9_hs.chf	i\hs\pre_int9\ws_pre_int9 Mon Oct 11 08:24:02 2010

RELATIVE VOLTAGE

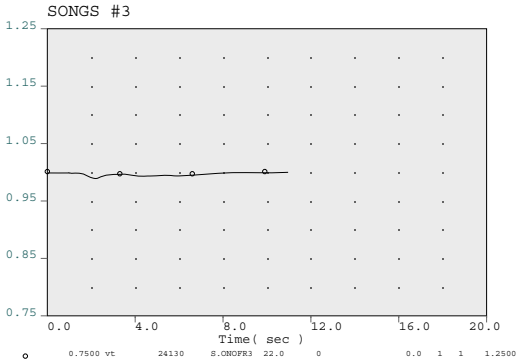
Palo Verde #1



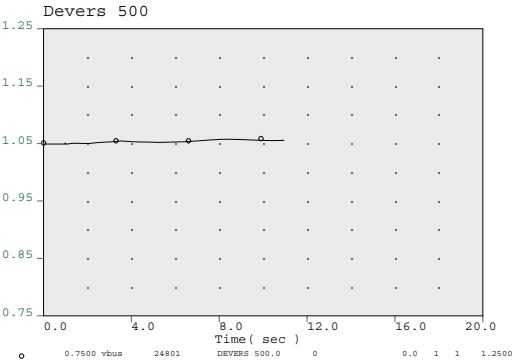
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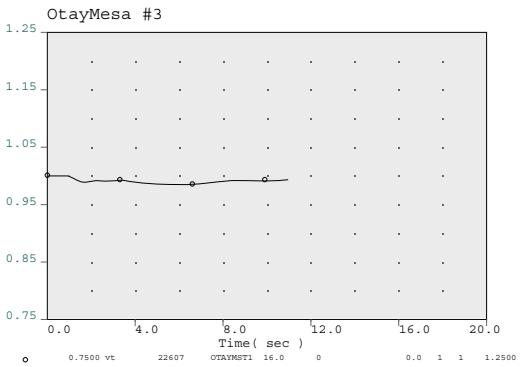
SONGS #3



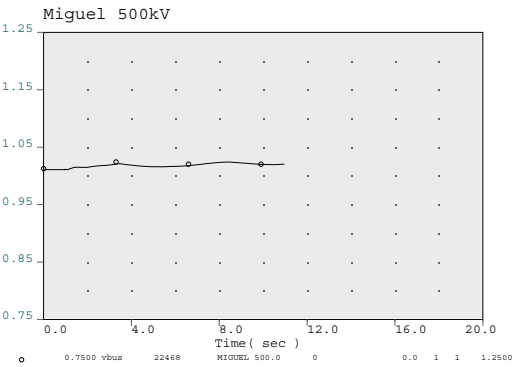
Devers 500



OtayMesa #3



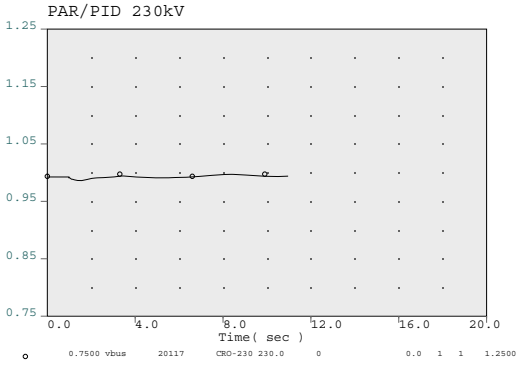
Miguel 500kV



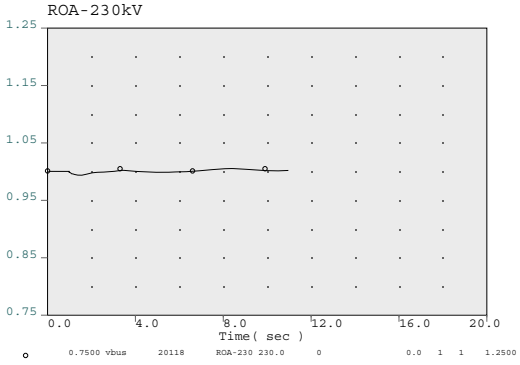
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

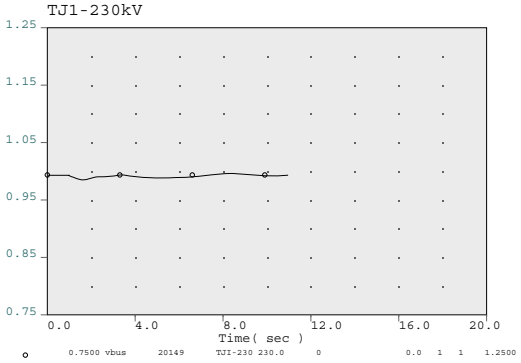
PAR/PID 230kV



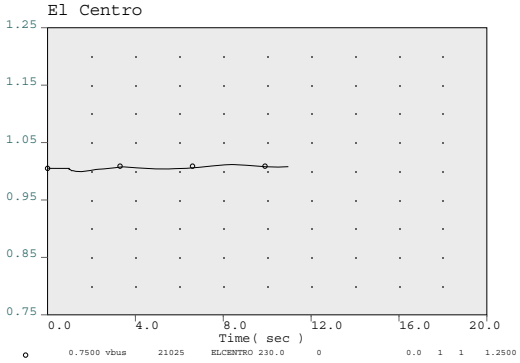
ROA-230kV



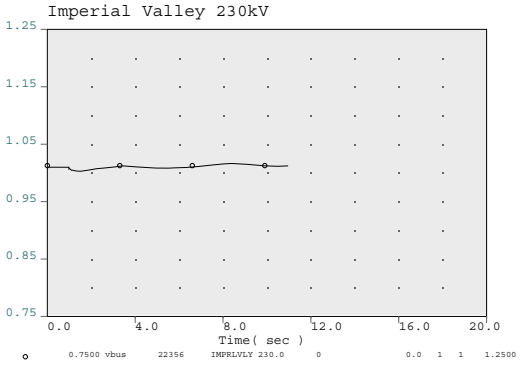
TJ1-230kV



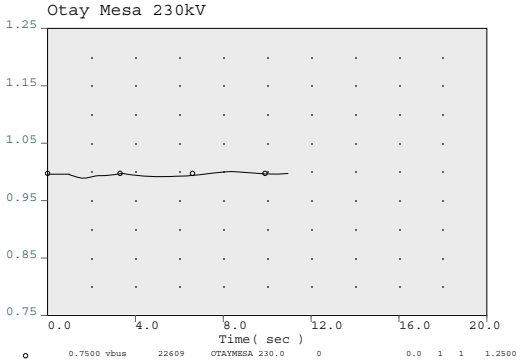
El Centro



Imperial Valley 230kV



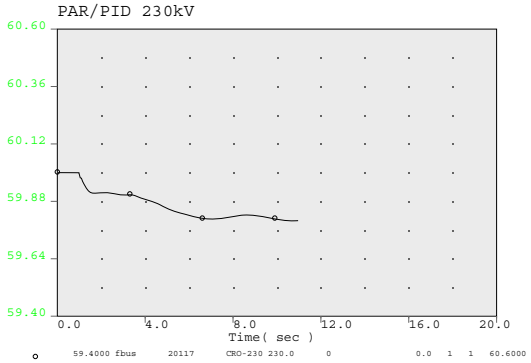
Otay Mesa 230kV



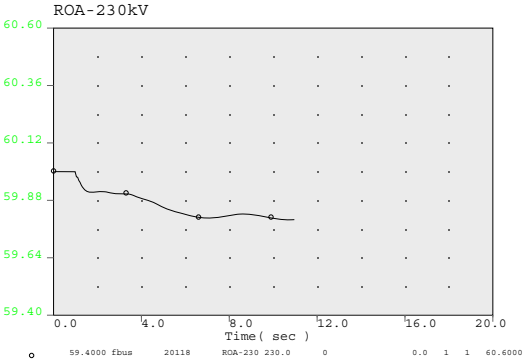
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

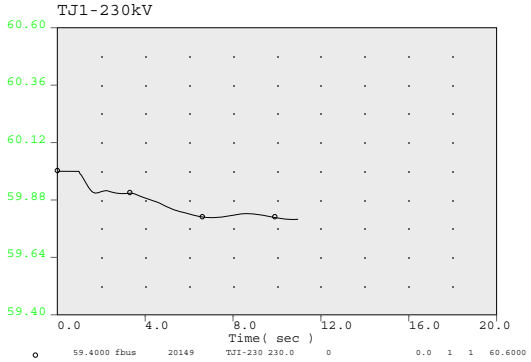
PAR/PID 230kV



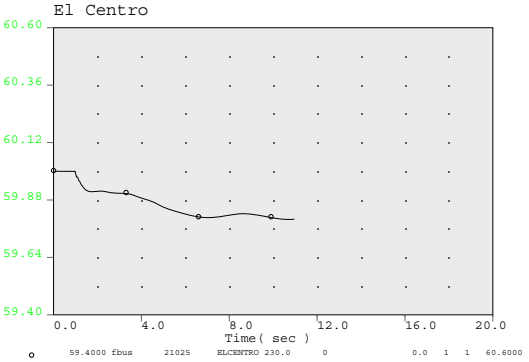
ROA-230kV



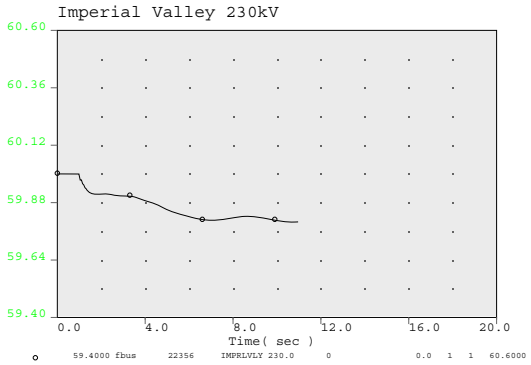
TJ1-230kV



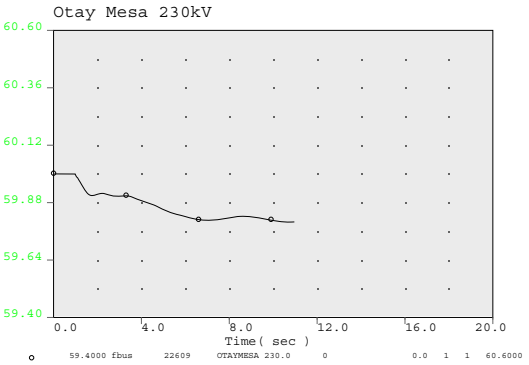
El Centro



Imperial Valley 230kV



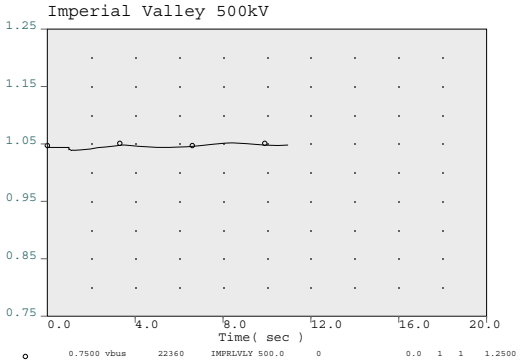
Otay Mesa 230kV



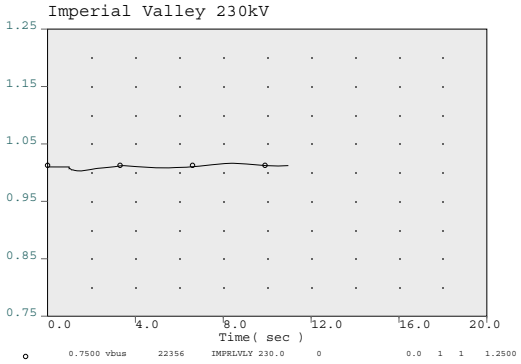
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - VOLTAGE

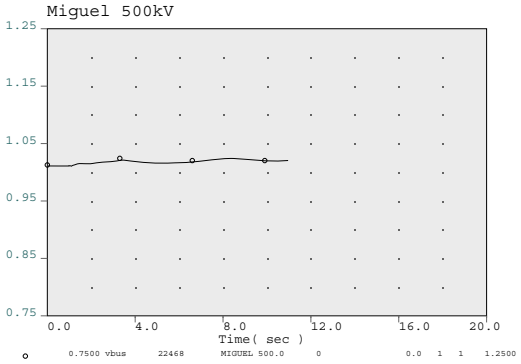
Imperial Valley 500kV



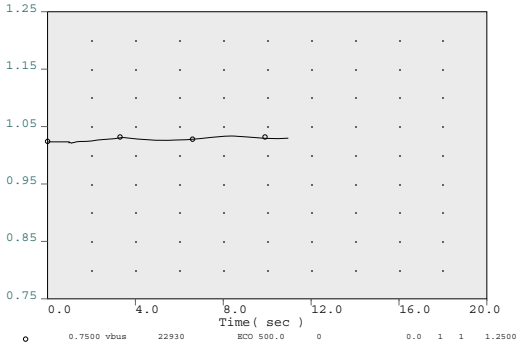
Imperial Valley 230kV



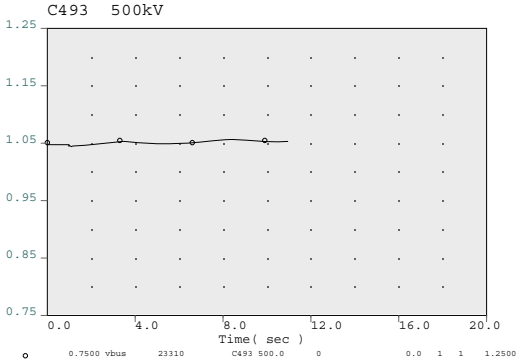
Miguel 500kV



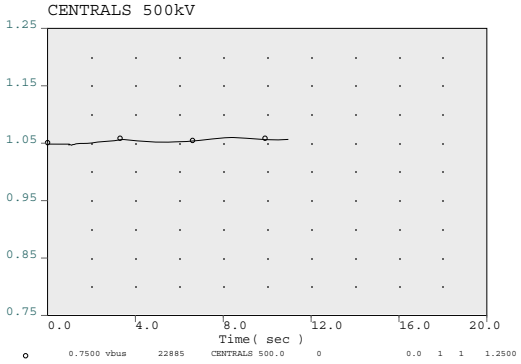
Windfarms 500



C493 500kV



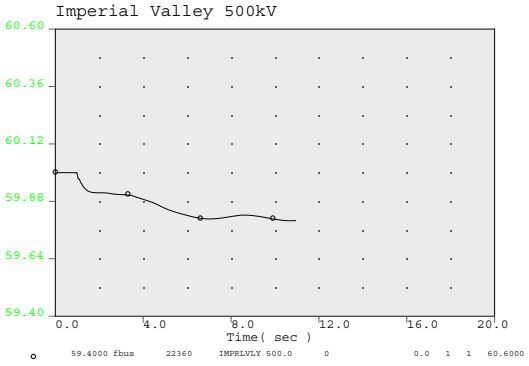
CENTRALS 500kV



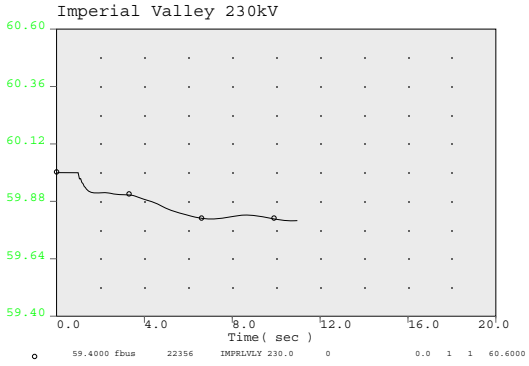
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - Frequency

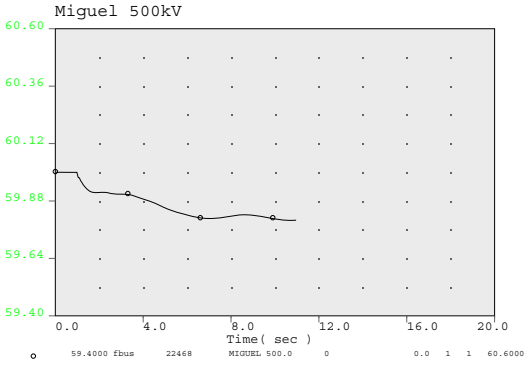
Imperial Valley 500kV



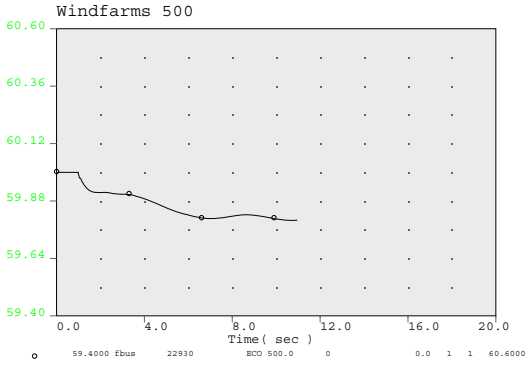
Imperial Valley 230kV



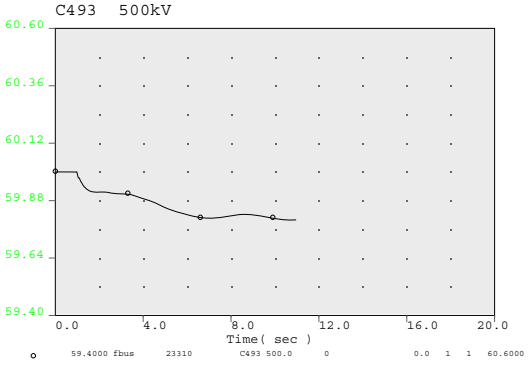
Miguel 500kV



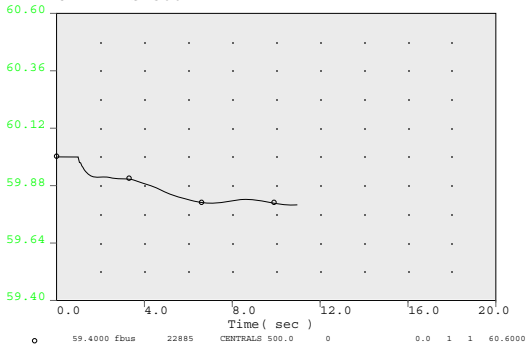
Windfarms 500



C493 500kV

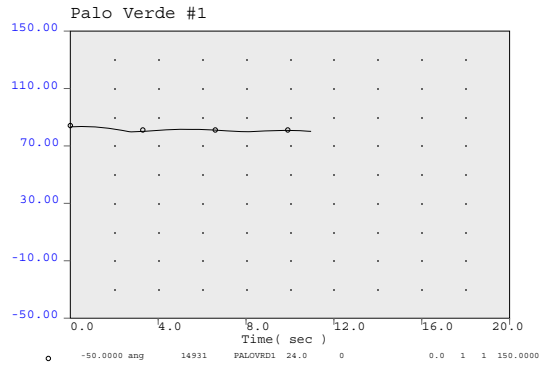


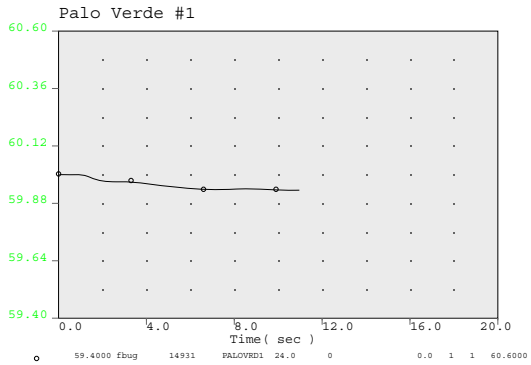
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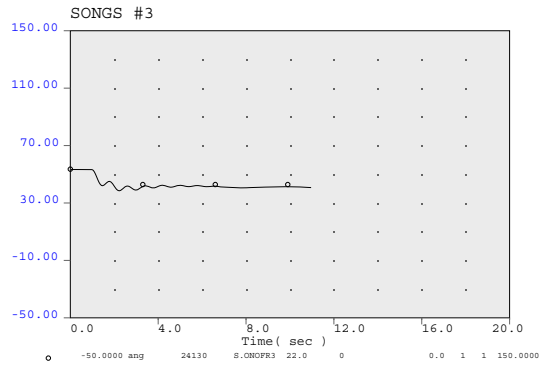


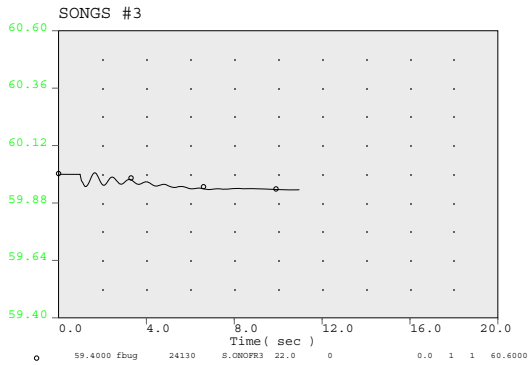
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

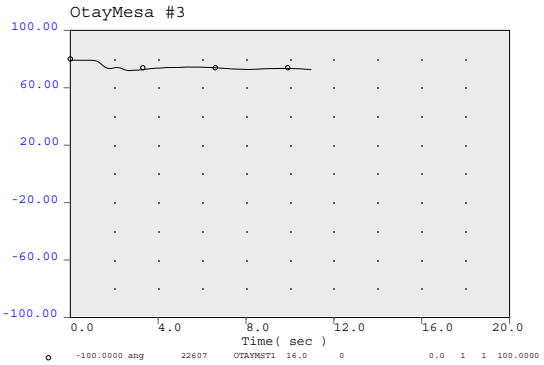
RELATIVE ROTOR ANGLE & FREQUENCY

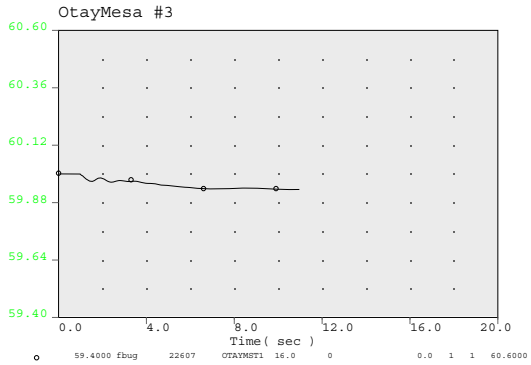










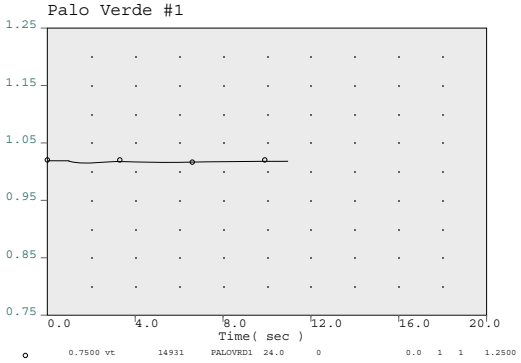


SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

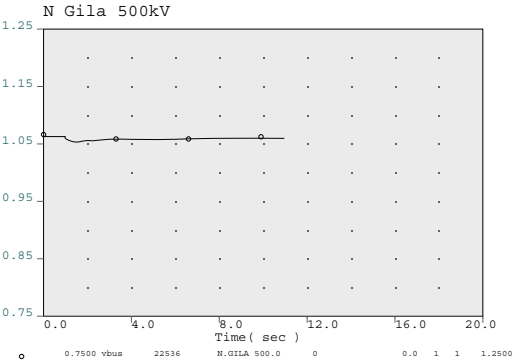
SDGE	SONGS-g1_pre_int9_hs.chf	i\hs\pre_int9\ws_pre_int9 Mon Oct 11 08:24:05 2010

RELATIVE VOLTAGE

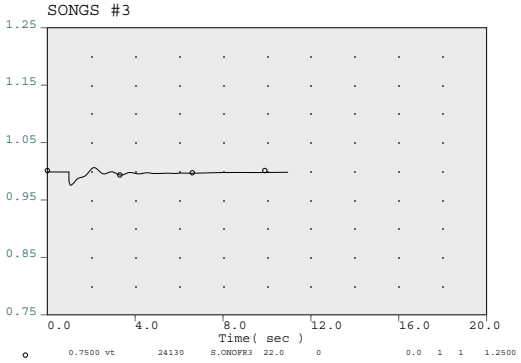
Palo Verde #1



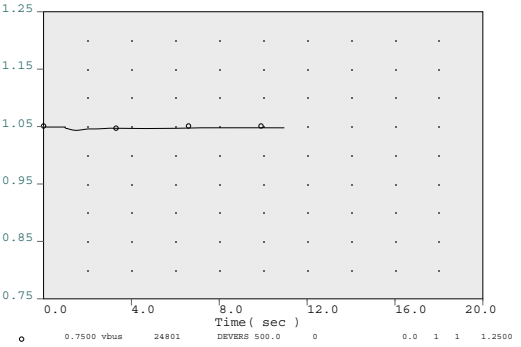
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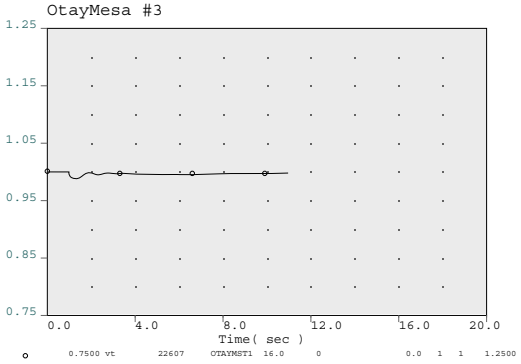
SONGS #3



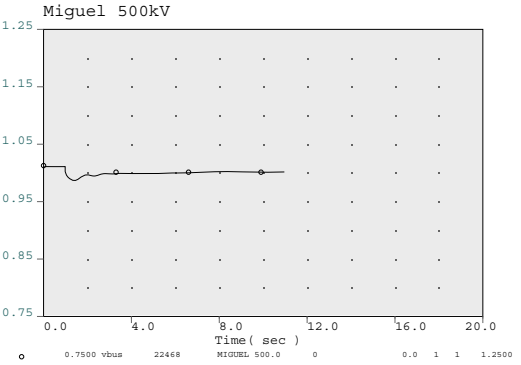
Devers 500



OtayMesa #3



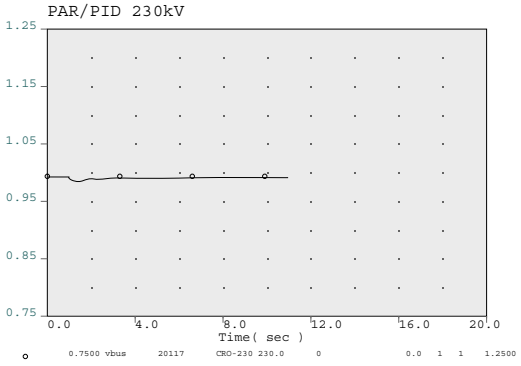
Miguel 500kV



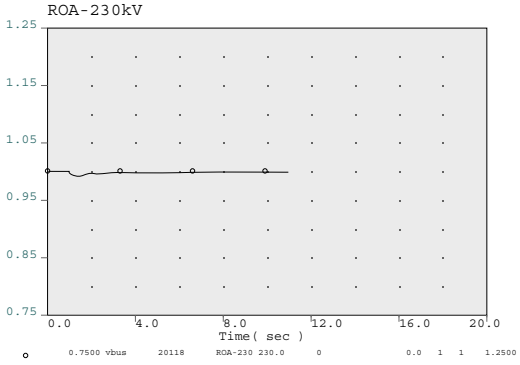
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

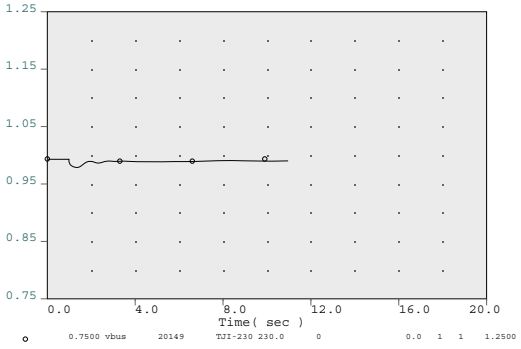
PAR/PID 230kV



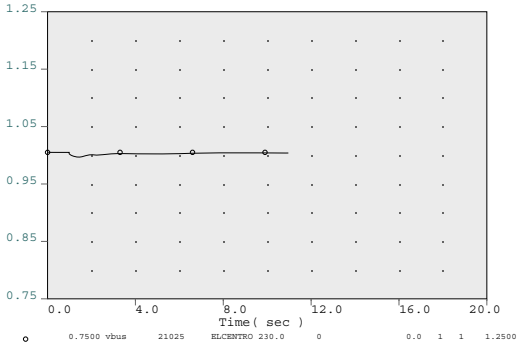
ROA-230kV



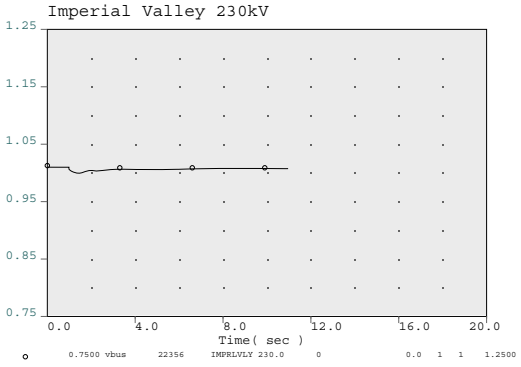
TJ1-230kV



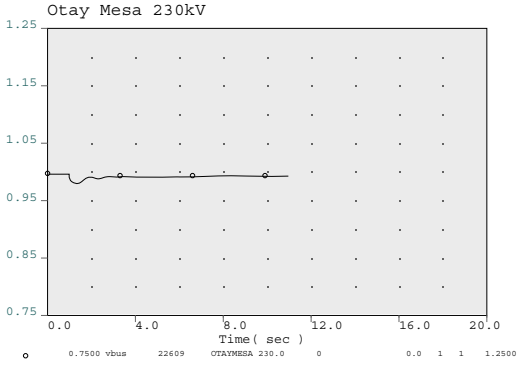
El Centro



Imperial Valley 230kV



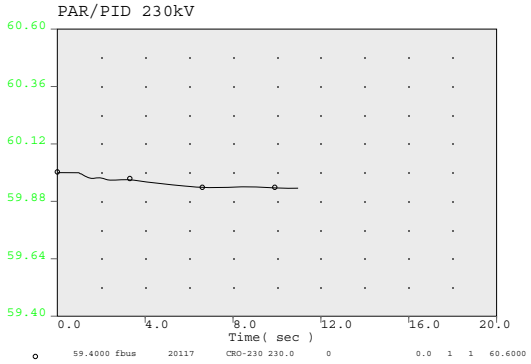
Otay Mesa 230kV



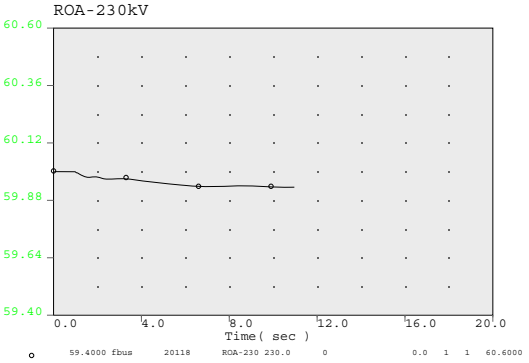
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison

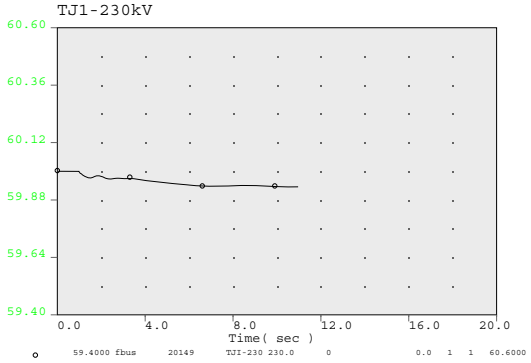
PAR/PID 230kV



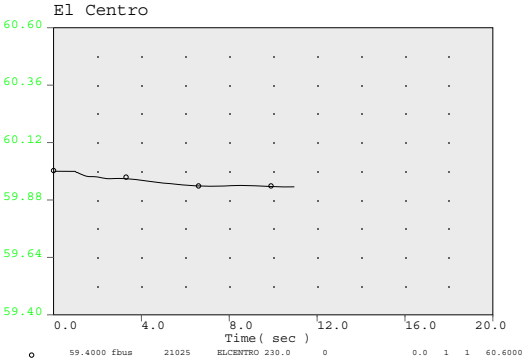
ROA-230kV



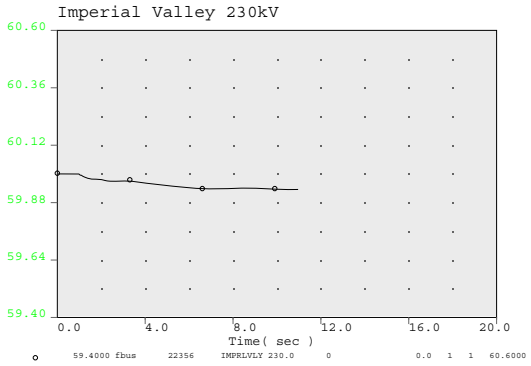
TJ1-230kV



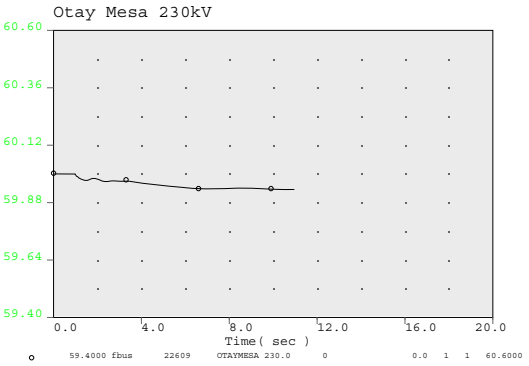
El Centro



Imperial Valley 230kV



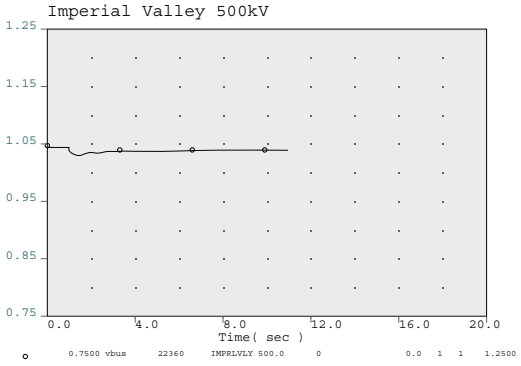
Otay Mesa 230kV



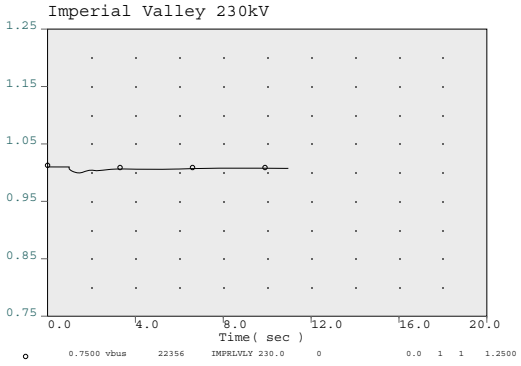
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

Imperial Valley Area - VOLTAGE

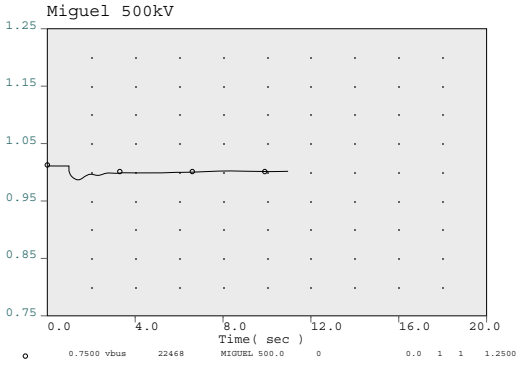
Imperial Valley 500kV



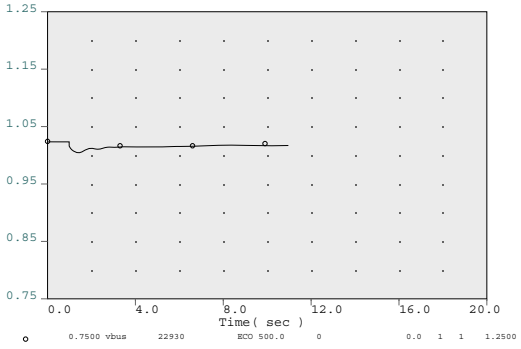
Imperial Valley 230kV



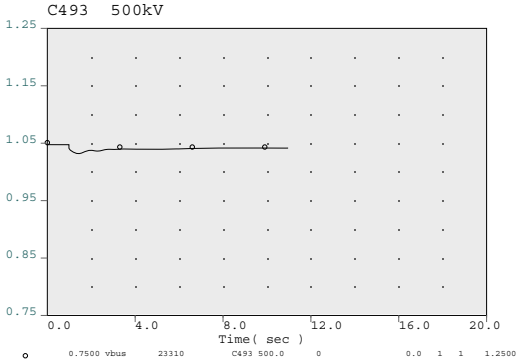
Miguel 500kV



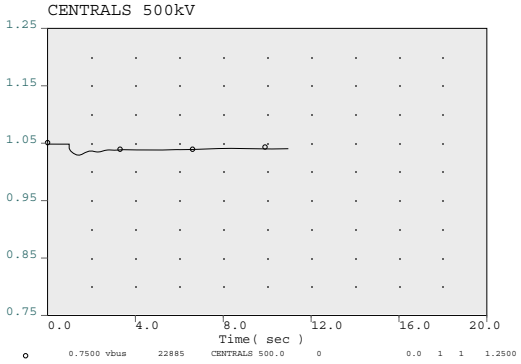
Windfarms 500



C493 500kV

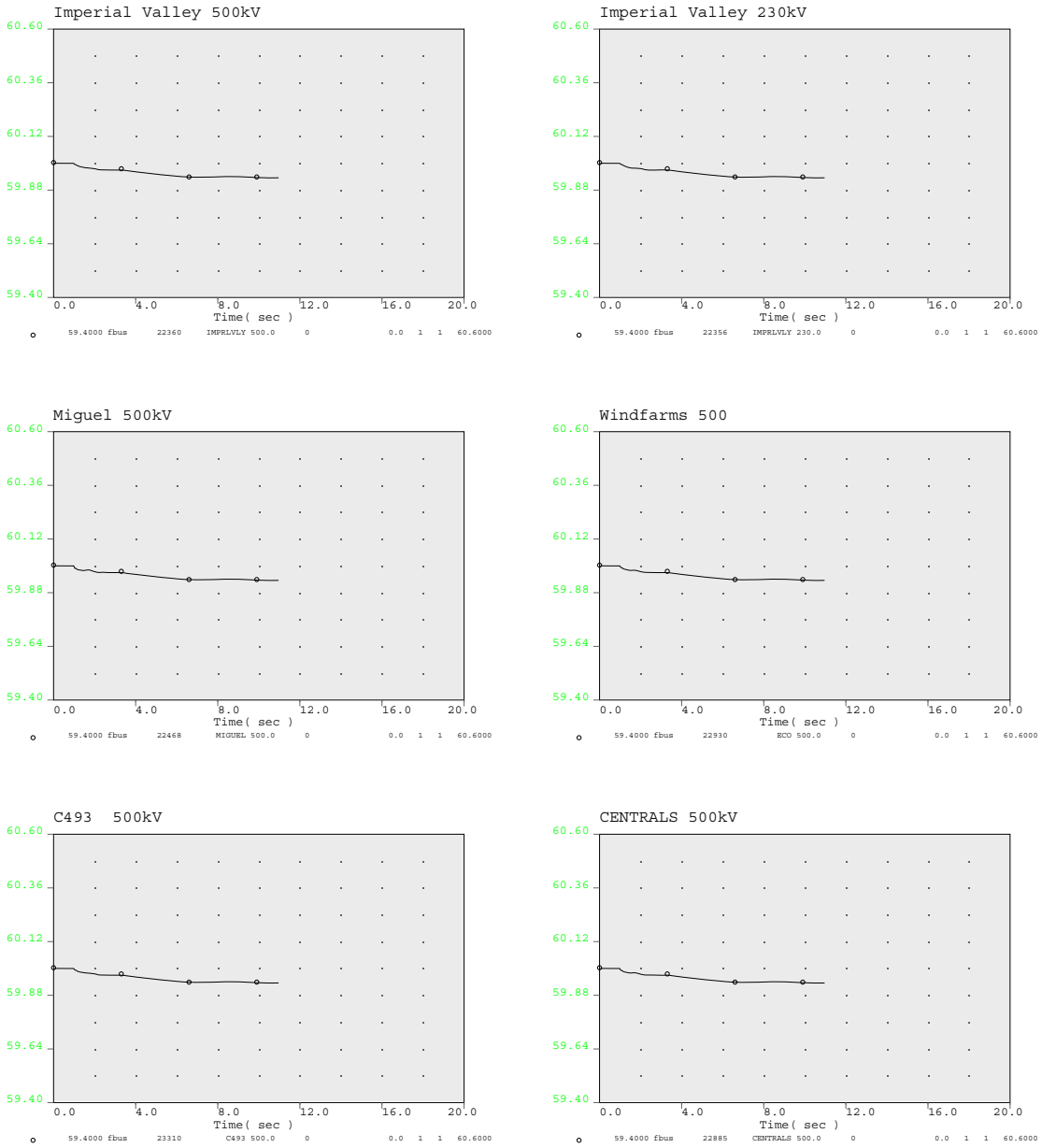


CENTRALS 500kV



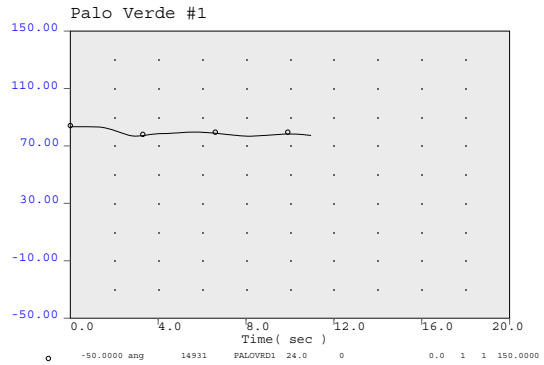
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

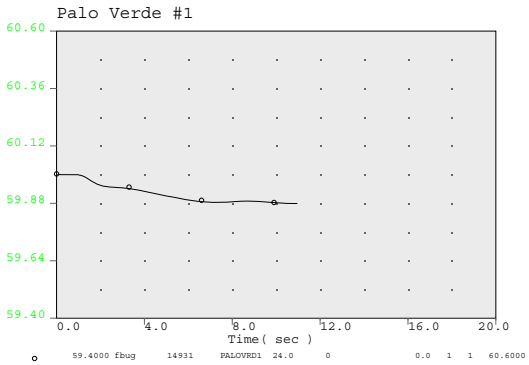
Imperial Valley Area - Frequency

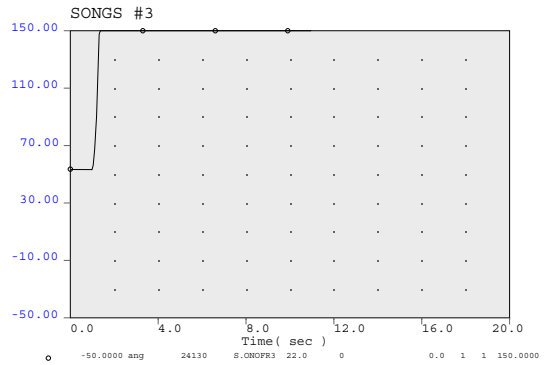


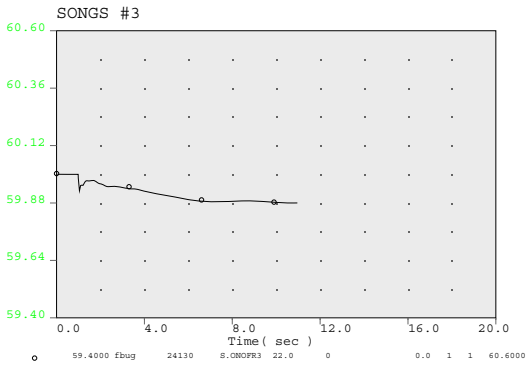
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generator #2

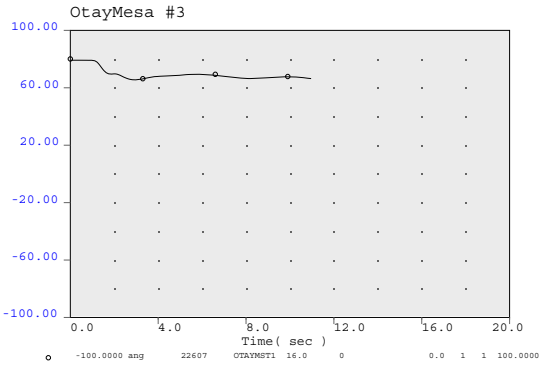
RELATIVE ROTOR ANGLE & FREQUENCY

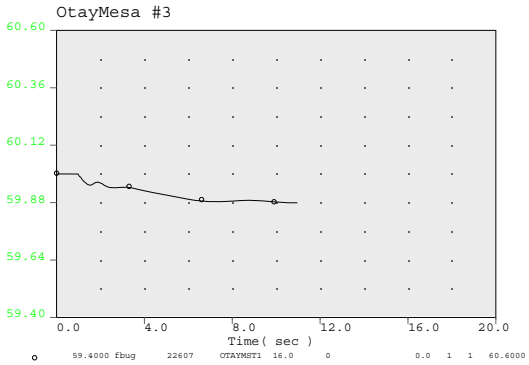












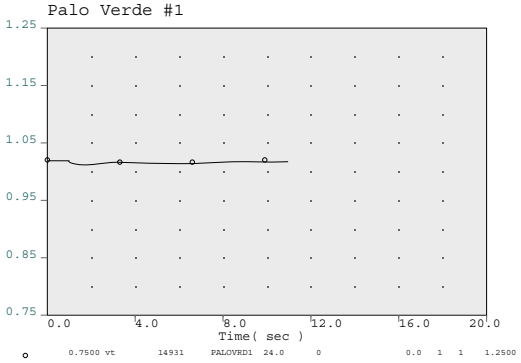
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 1

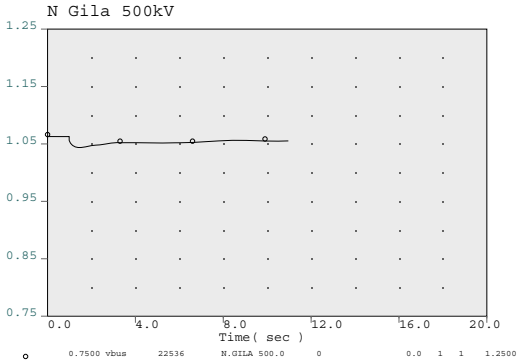
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RELATIVE VOLTAGE

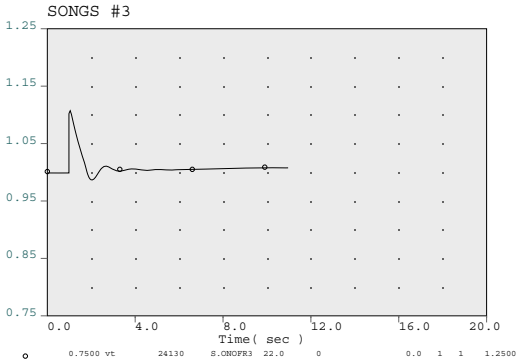
Palo Verde #1



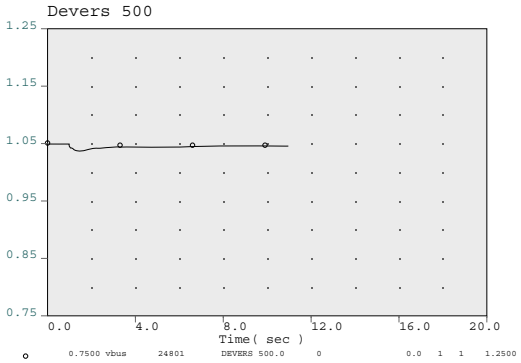
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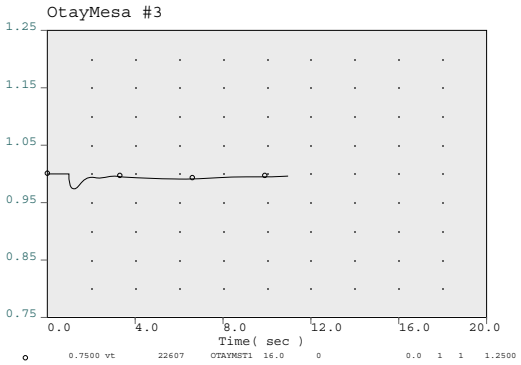
SONGS #3



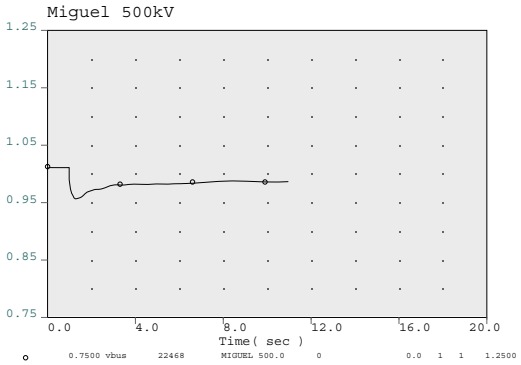
Devers 500



OtayMesa #3



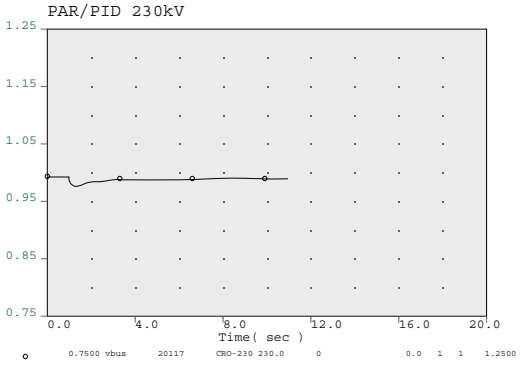
Miguel 500kV



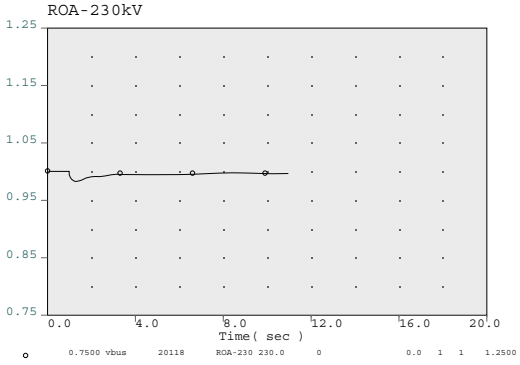
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

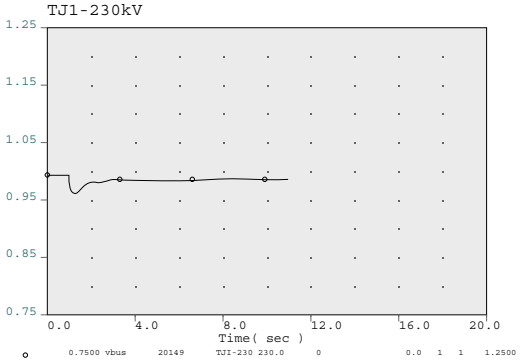
PAR/PID 230kV



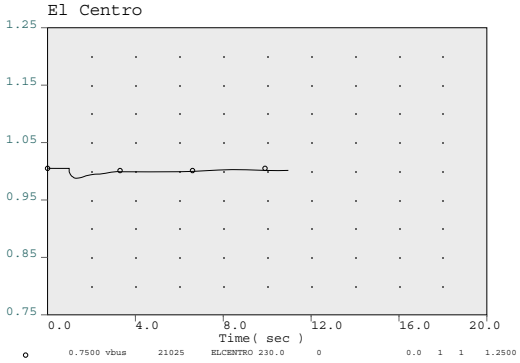
ROA-230kV



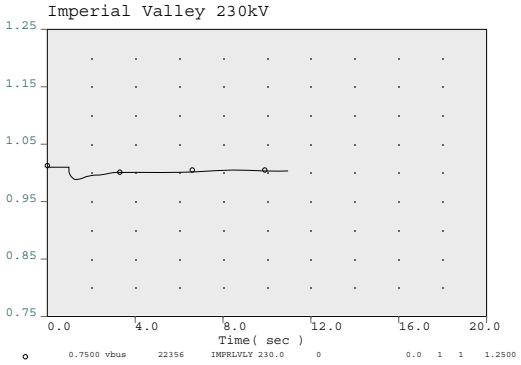
TJ1-230kV



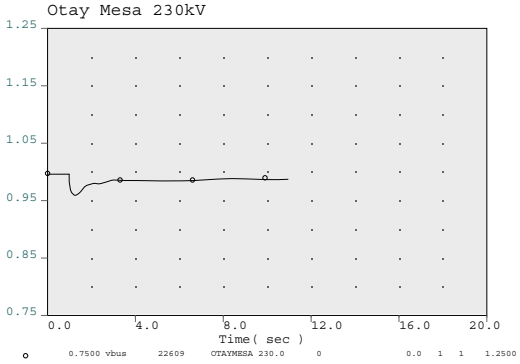
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



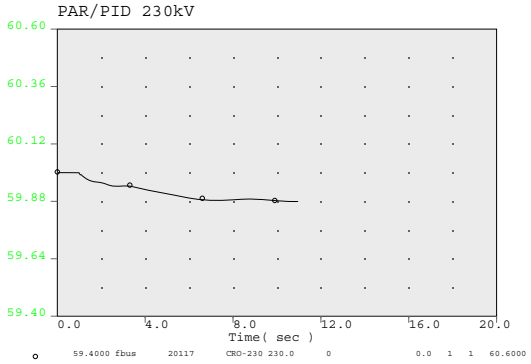
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 3

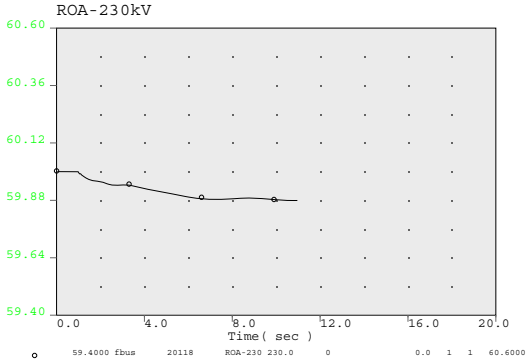
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Affected System Frequency Check and Comparison

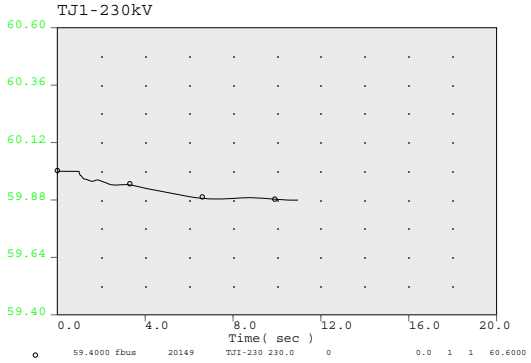
PAR/PID 230kV



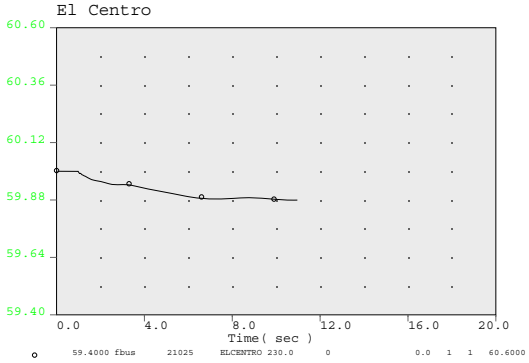
ROA-230kV



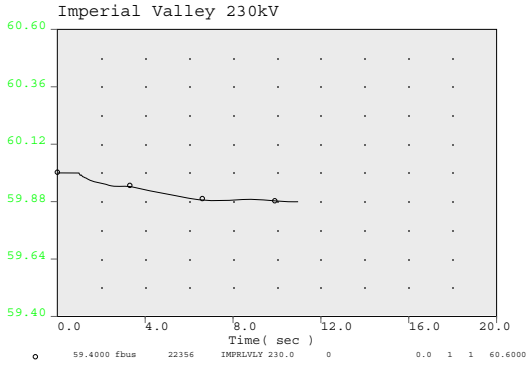
TJ1-230kV



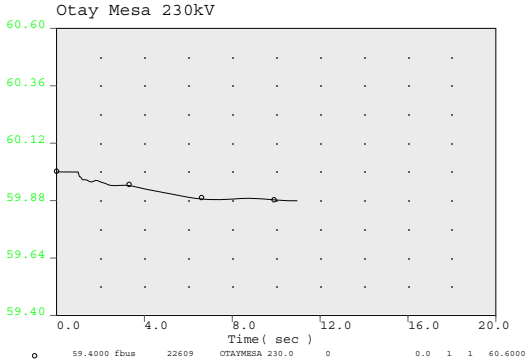
El Centro



Imperial Valley 230kV



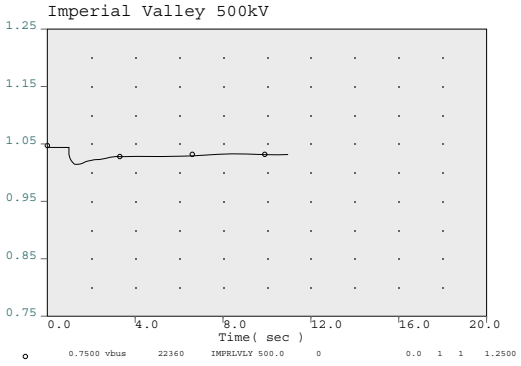
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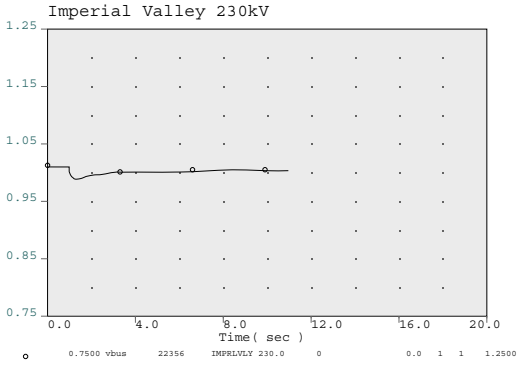
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

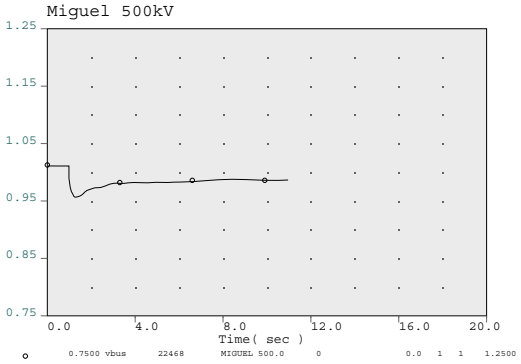
Imperial Valley 500kV



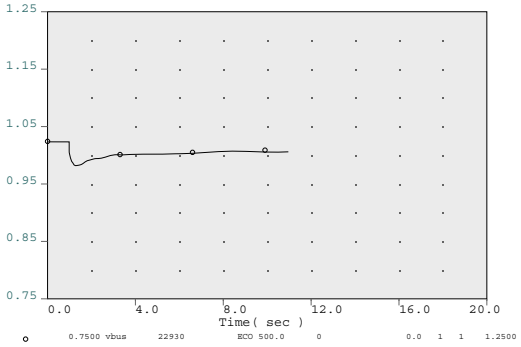
Imperial Valley 230kV



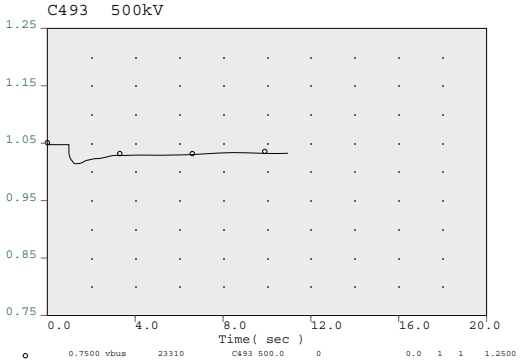
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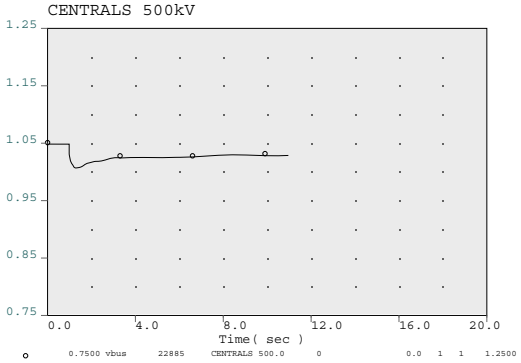
Windfarms 500



C493 500kV



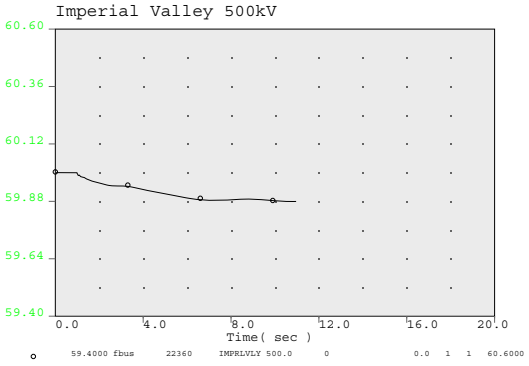
CENTRALS 500kV



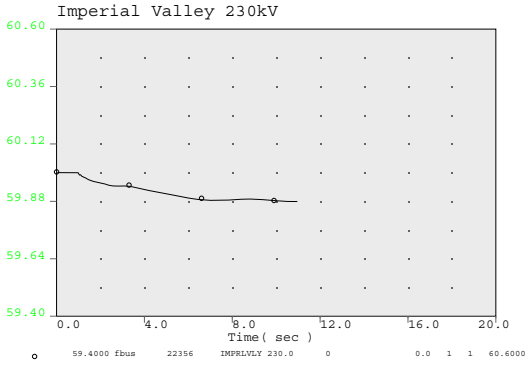
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - Frequency

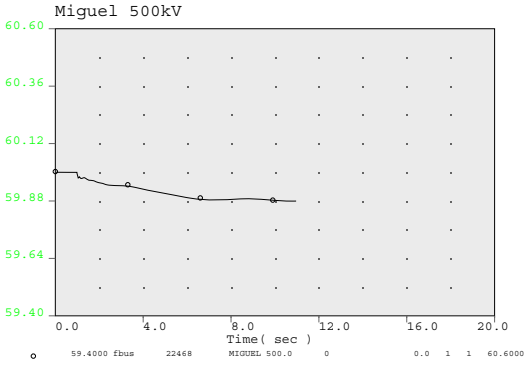
Imperial Valley 500kV



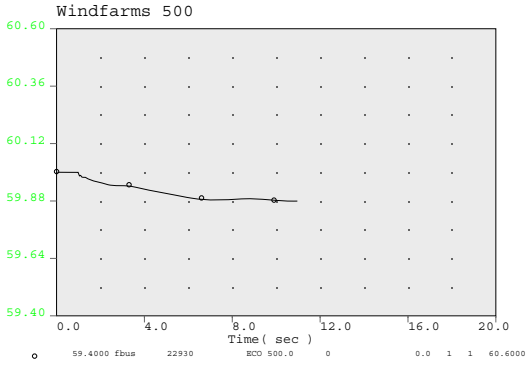
Imperial Valley 230kV



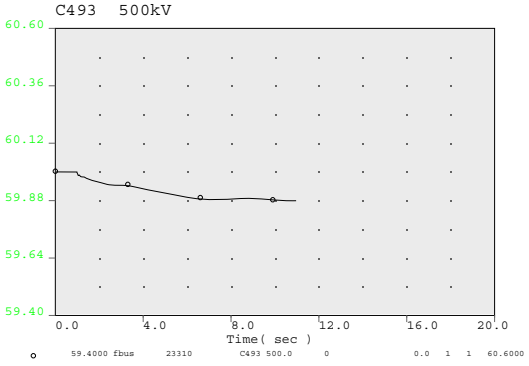
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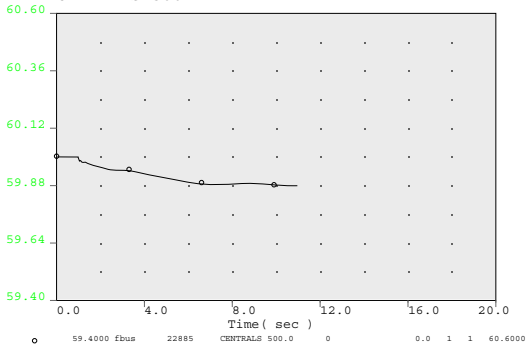
Windfarms 500



C493 500kV

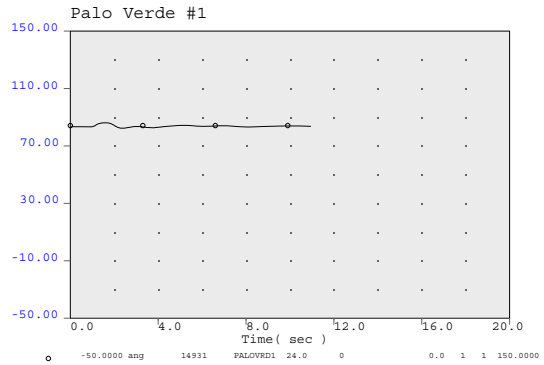


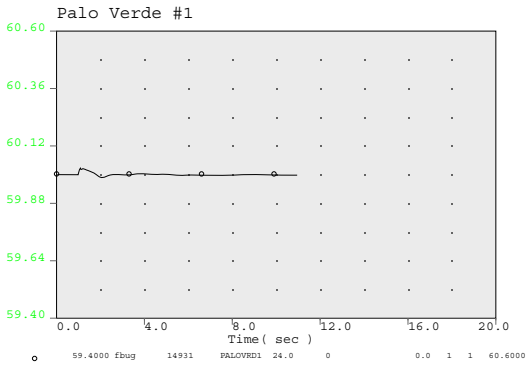
CENTRALS 500kV

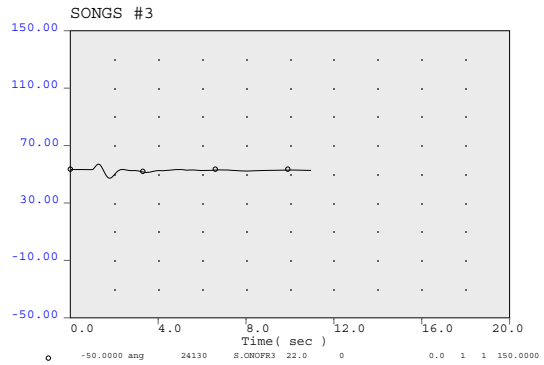


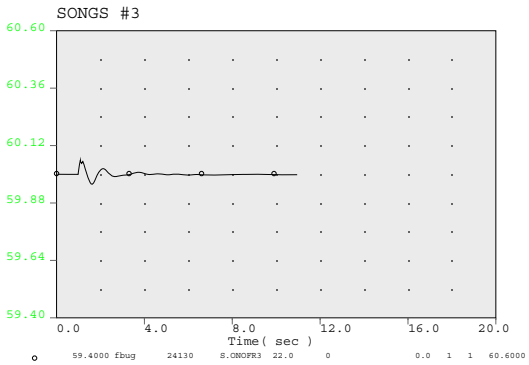
SDG&E Cluster 2 - pre
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

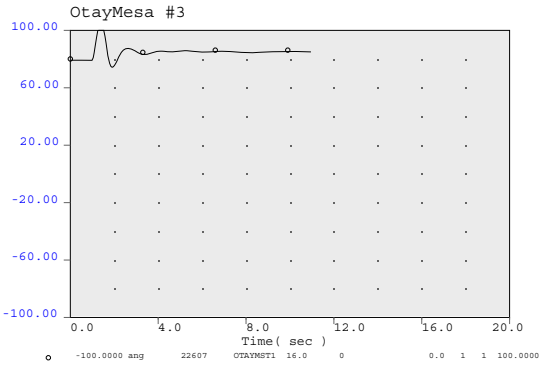
RELATIVE ROTOR ANGLE & FREQUENCY

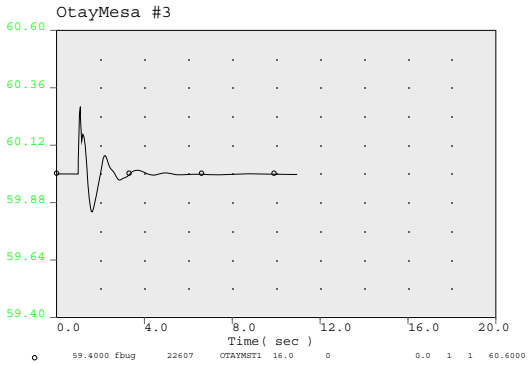












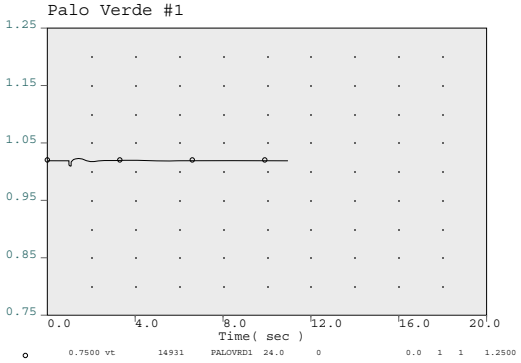
SDG&E Cluster 2 - pre int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Page 1

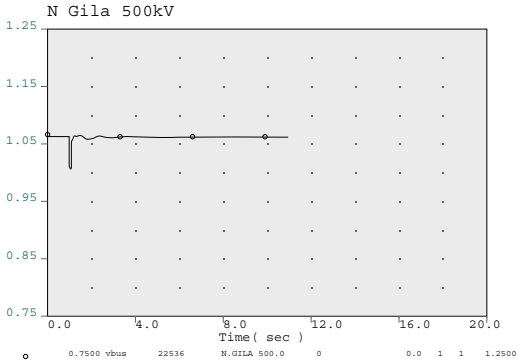
SDGE	SY230-SG_pre_int9_hs.chf	i\hs\pre_int9\ws_pre_int9 Mon Oct 11 08:23:38 2010

RELATIVE VOLTAGE

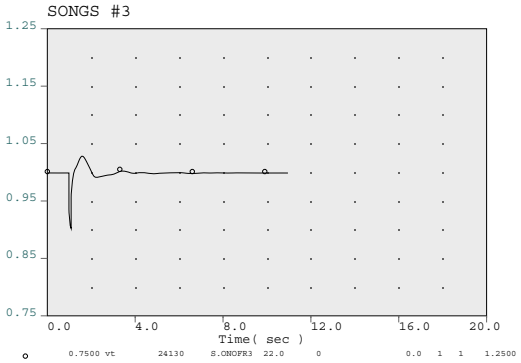
Palo Verde #1



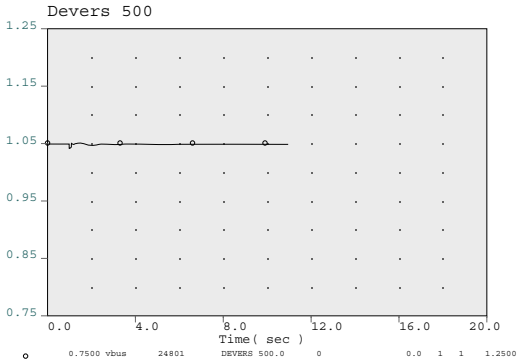
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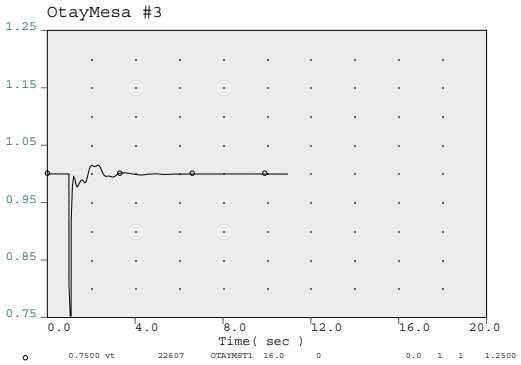
SONGS #3



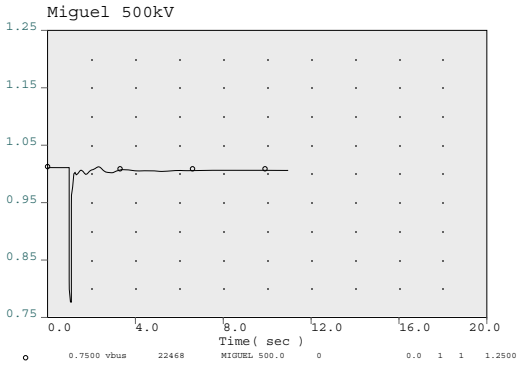
Devers 500



OtayMesa #3



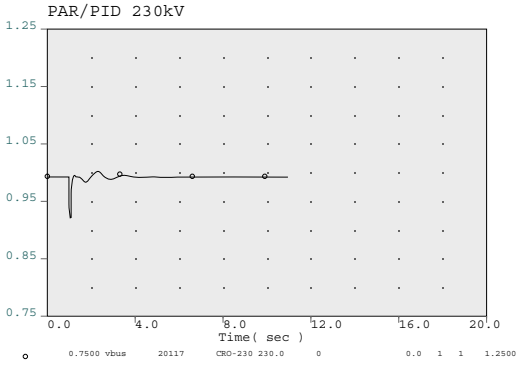
Miguel 500kV



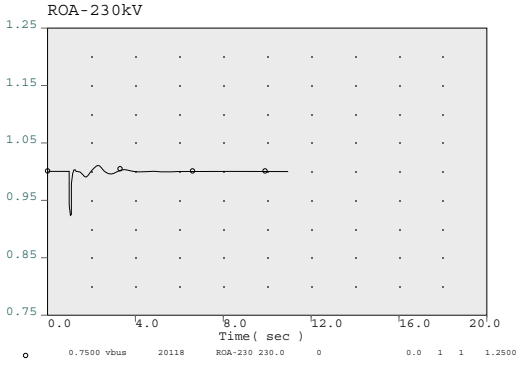
SDG&E Cluster 2 - pre int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Affected System Voltage Check and Comparison

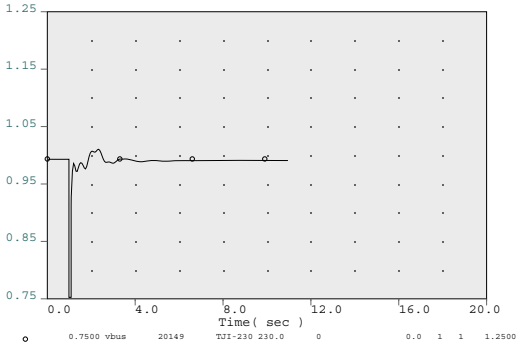
PAR/PID 230kV



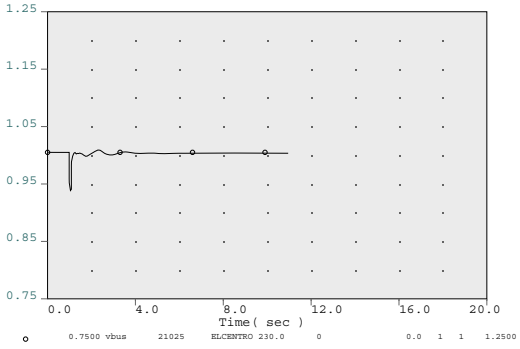
ROA-230kV



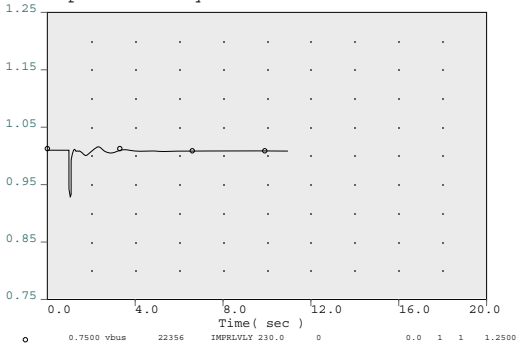
TJ1-230kV



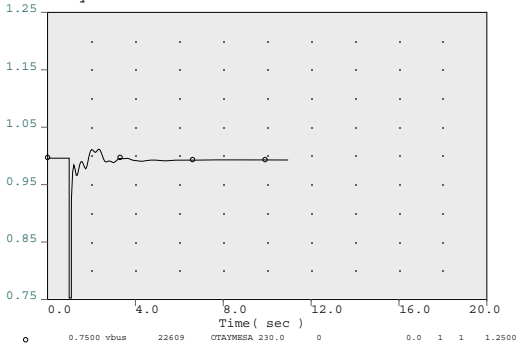
El Centro



Imperial Valley 230kV



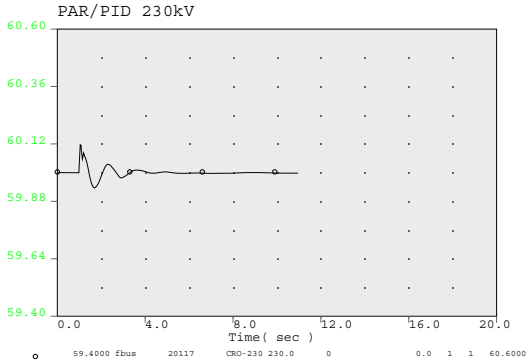
Otay Mesa 230kV



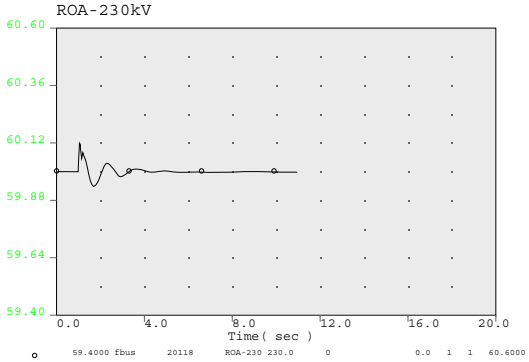
SDG&E Cluster 2 - pre int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Affected System Frequency Check and Comparison

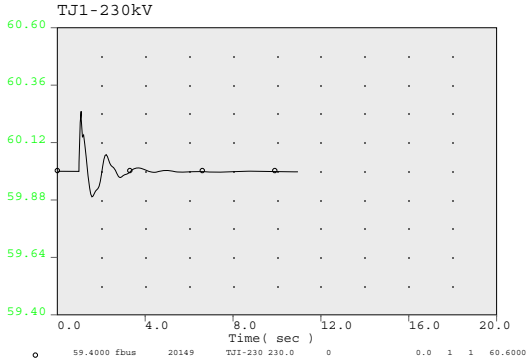
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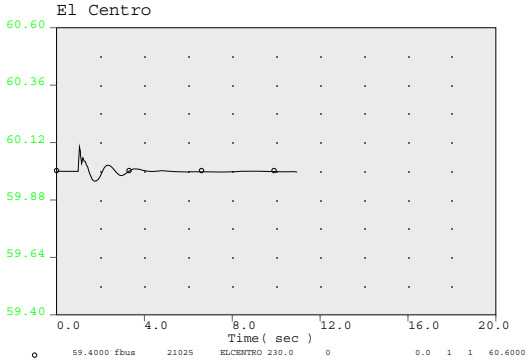
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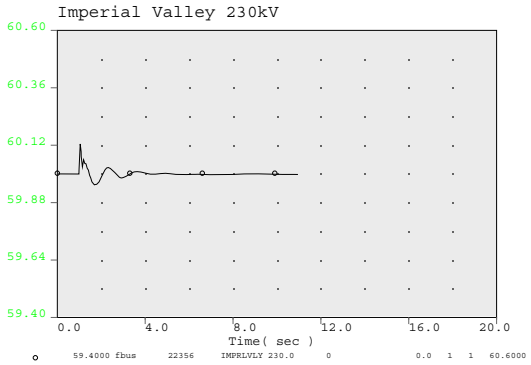
TJ1-230kV



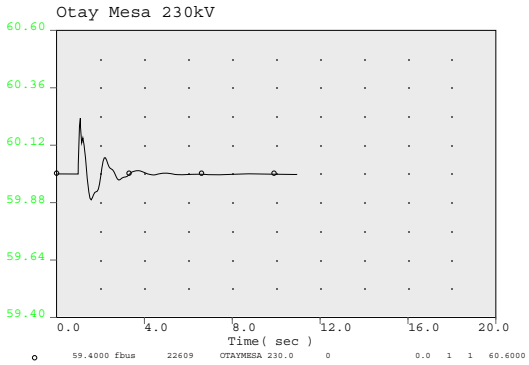
El Centro



Imperial Valley 230kV



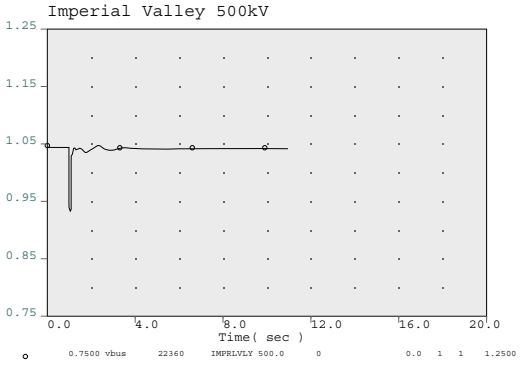
Otay Mesa 230kV



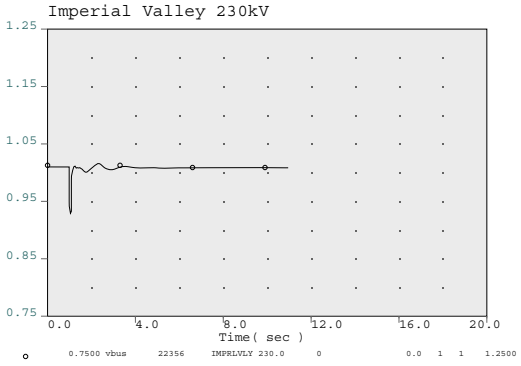
SDG&E Cluster 2 - pre int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Imperial Valley Area - VOLTAGE

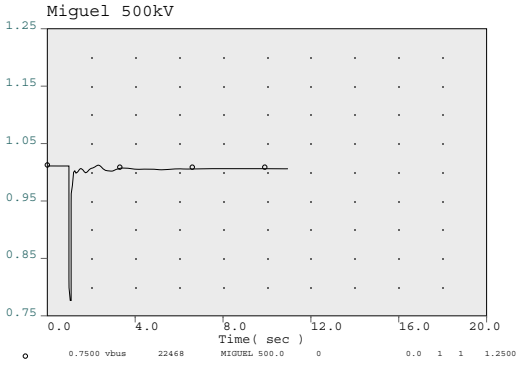
Imperial Valley 500kV



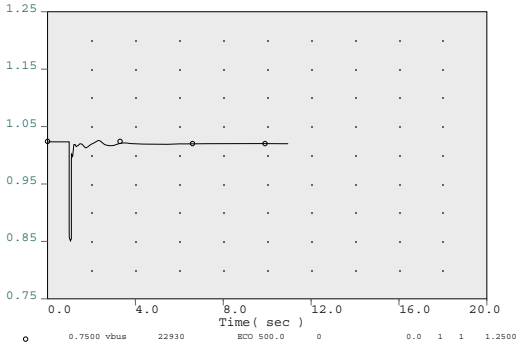
Imperial Valley 230kV



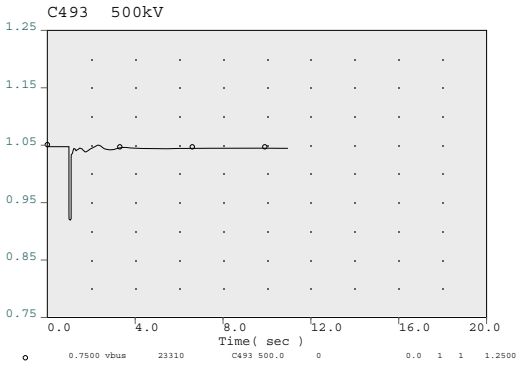
Miguel 500kV



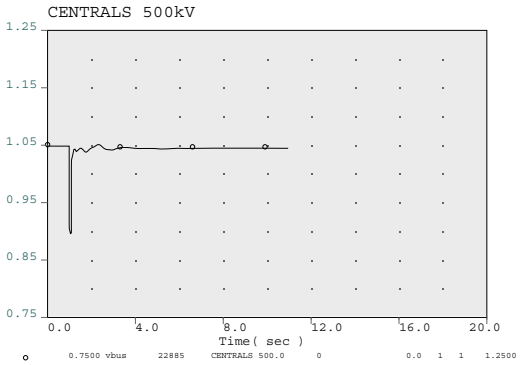
Windfarms 500



C493 500kV



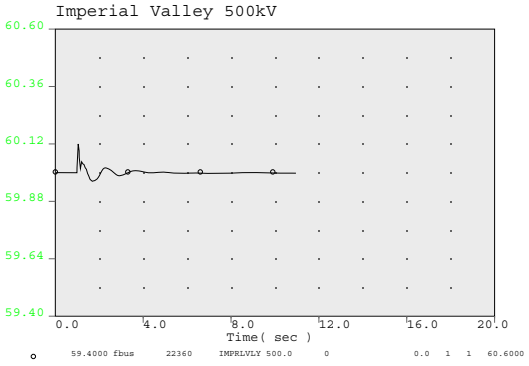
CENTRALS 500kV



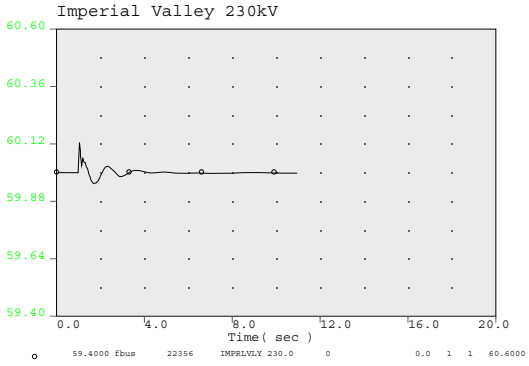
SDG&E Cluster 2 - pre int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Imperial Valley Area - Frequency

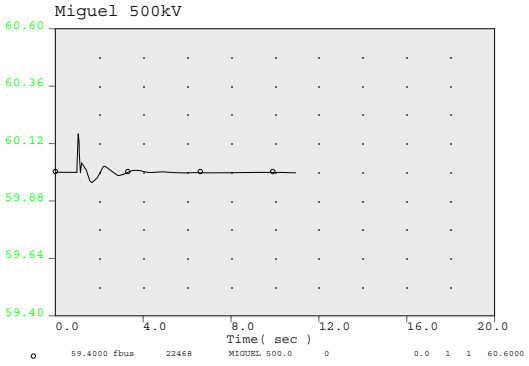
Imperial Valley 500kV



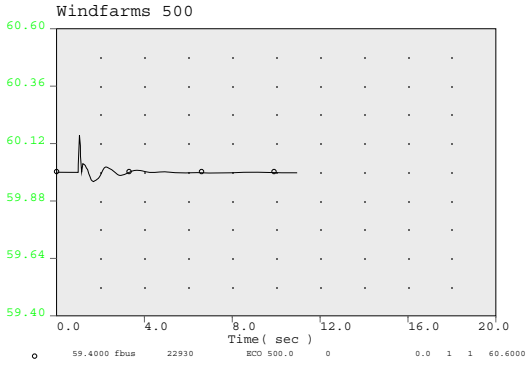
Imperial Valley 230kV



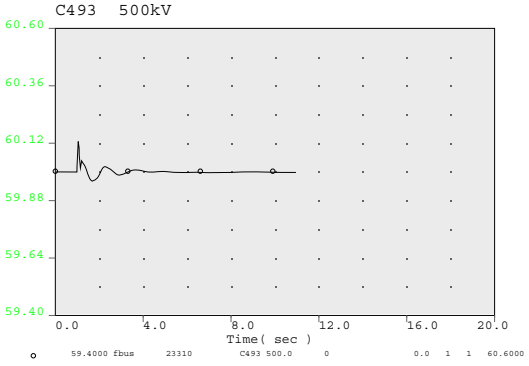
Miguel 500kV



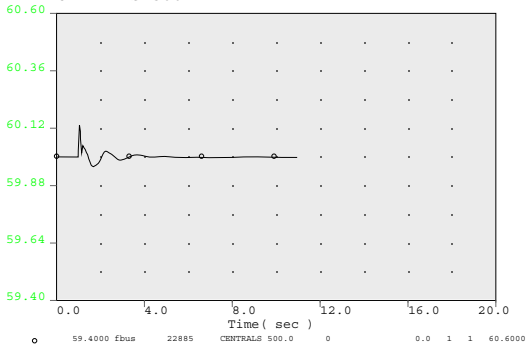
Windfarms 500



C493 500kV

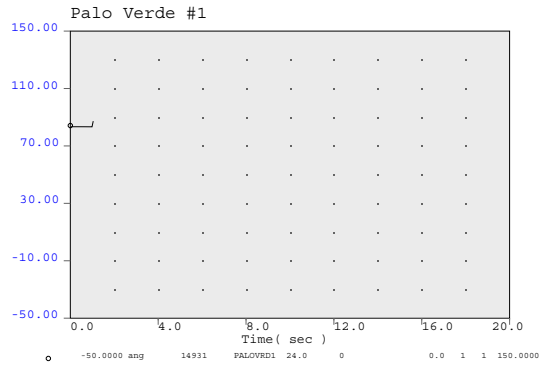


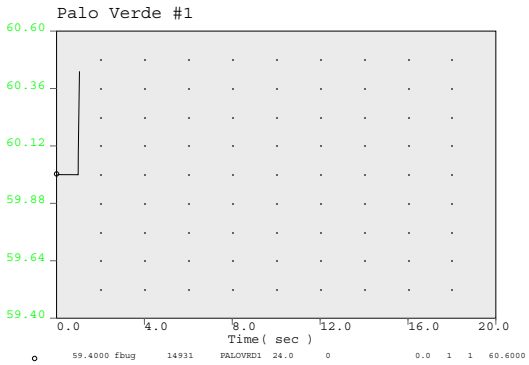
CENTRALS 500kV

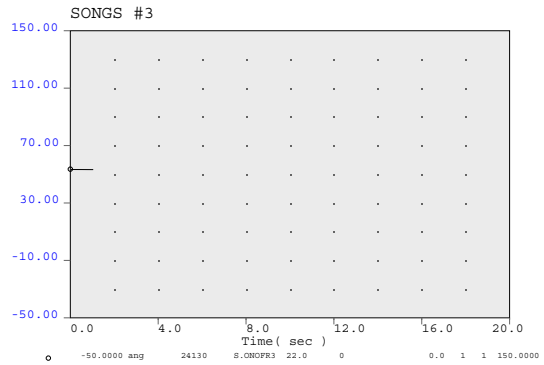


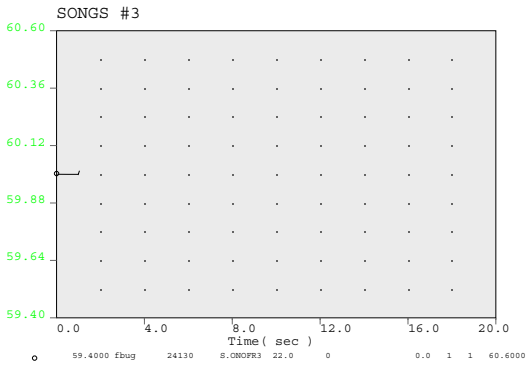
SDG&E Cluster 2 - pre int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

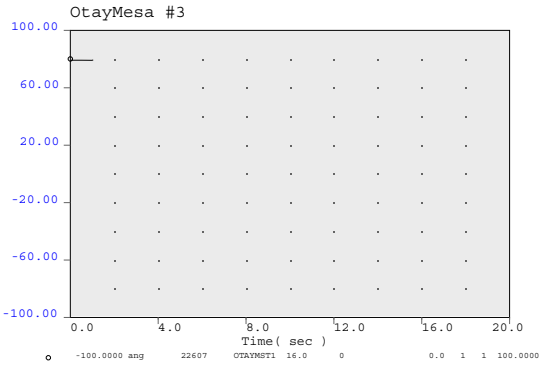
RELATIVE ROTOR ANGLE & FREQUENCY

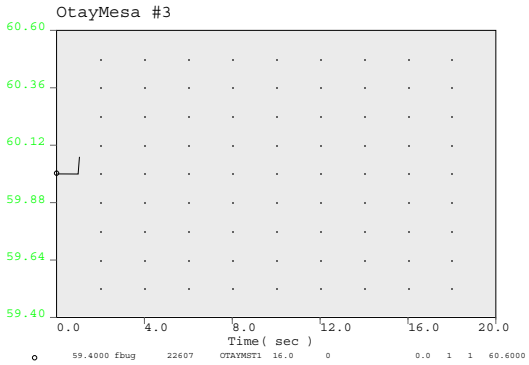












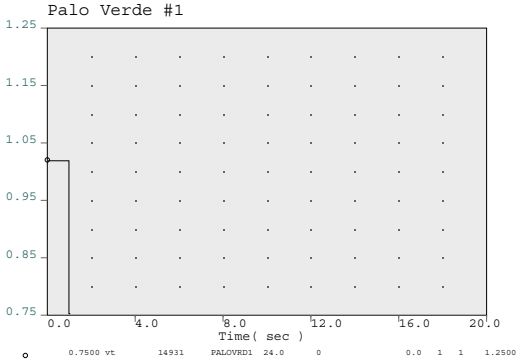
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Page 1

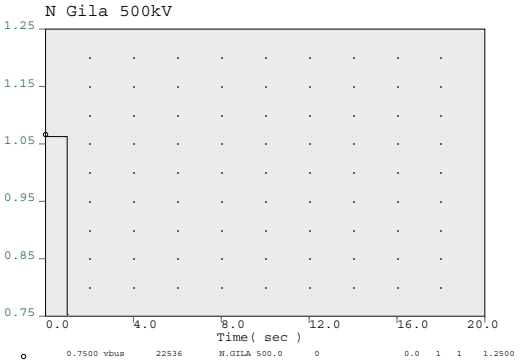
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RELATIVE VOLTAGE

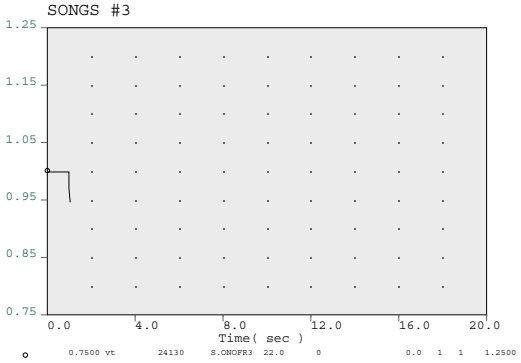
Palo Verde #1



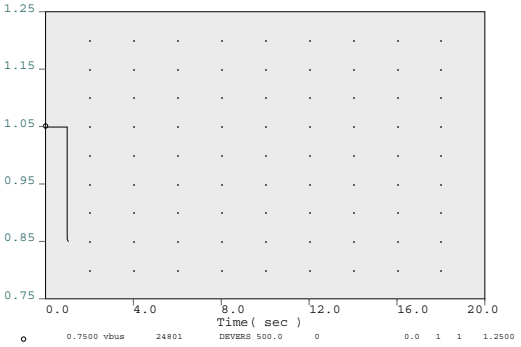
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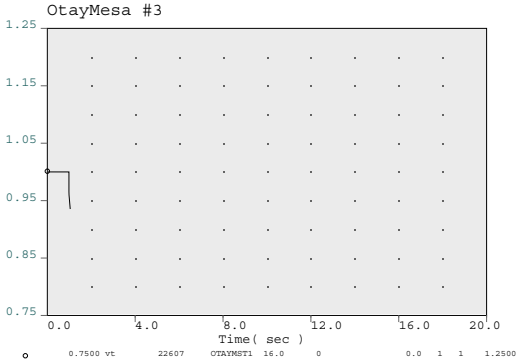
SONGS #3



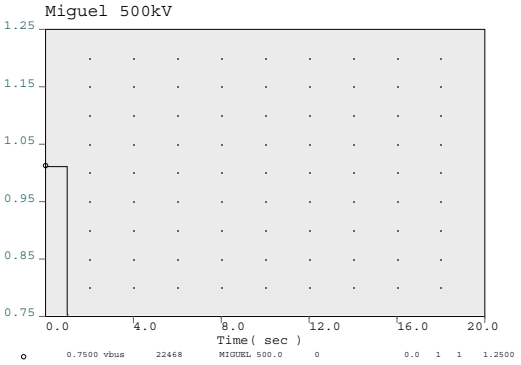
Devers 500



OtayMesa #3



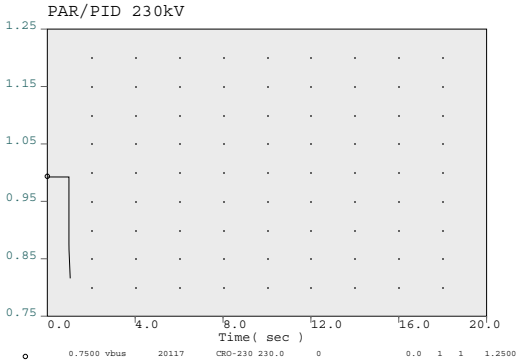
Miguel 500kV



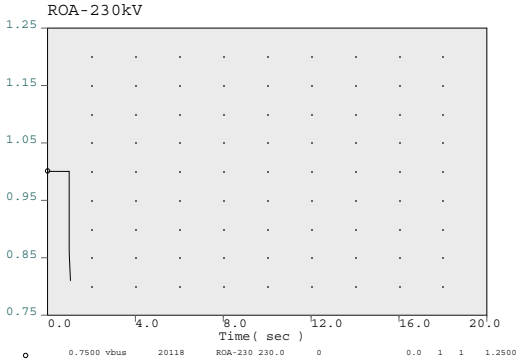
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

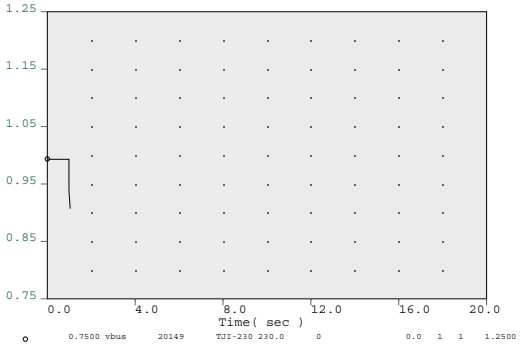
PAR/PID 230kV



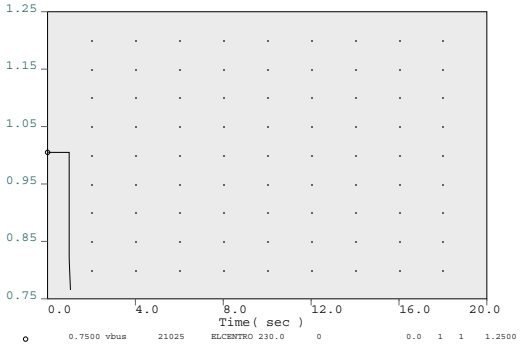
ROA-230kV



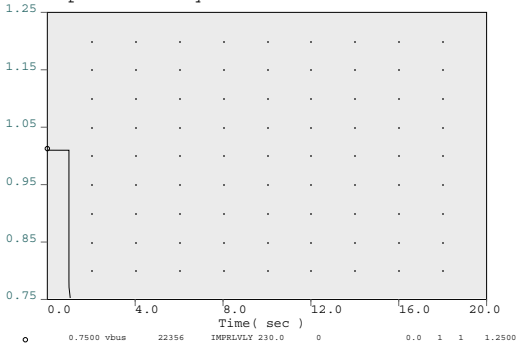
TJ1-230kV



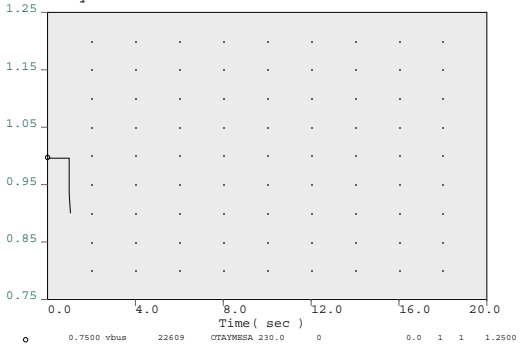
El Centro



Imperial Valley 230kV



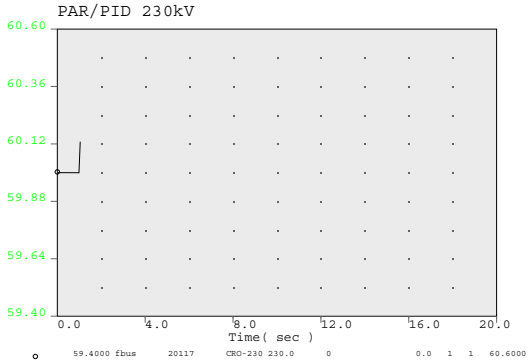
Otay Mesa 230kV



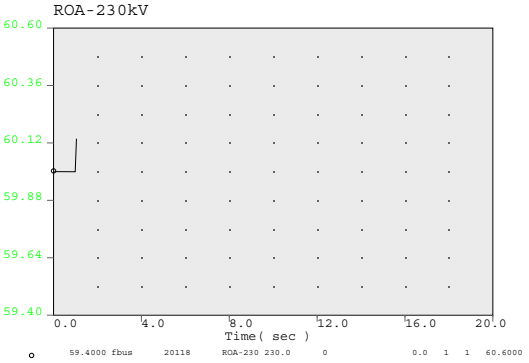
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

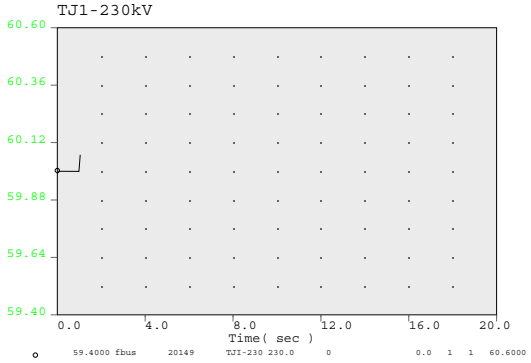
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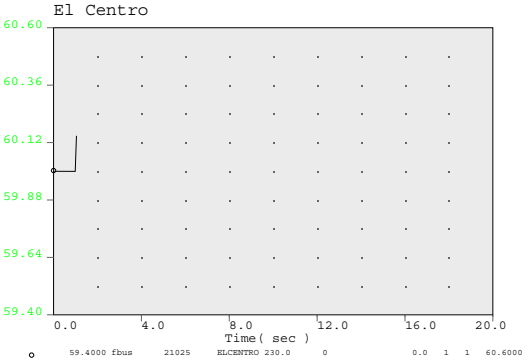
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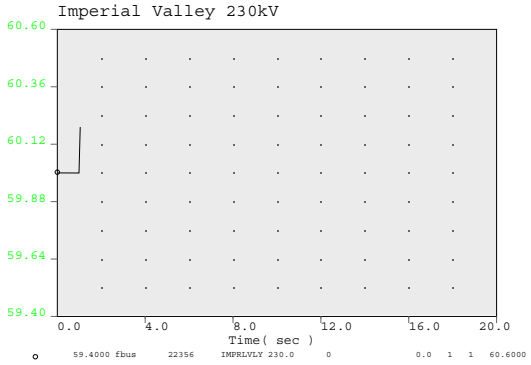
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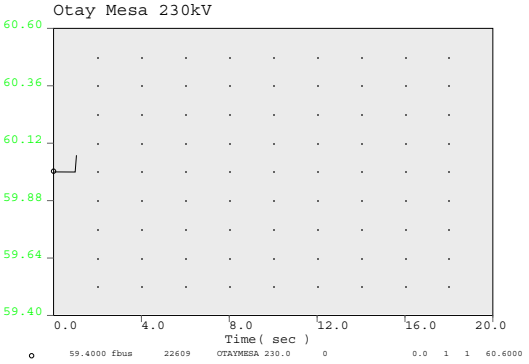
El Centro



Imperial Valley 230kV



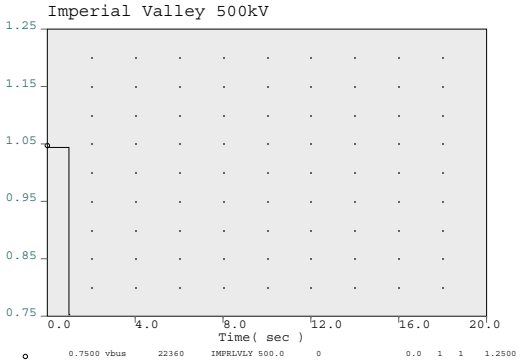
Otay Mesa 230kV



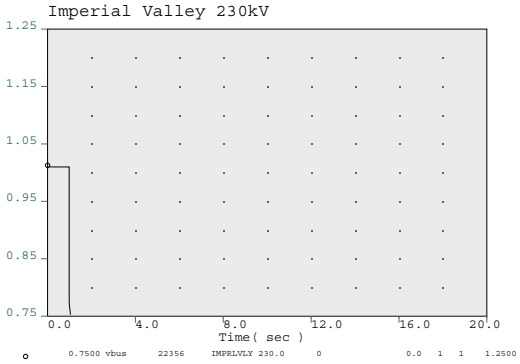
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

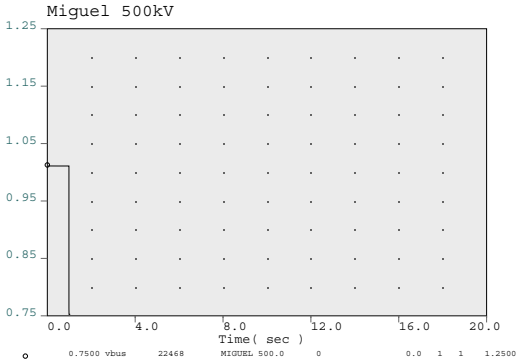
Imperial Valley 500kV



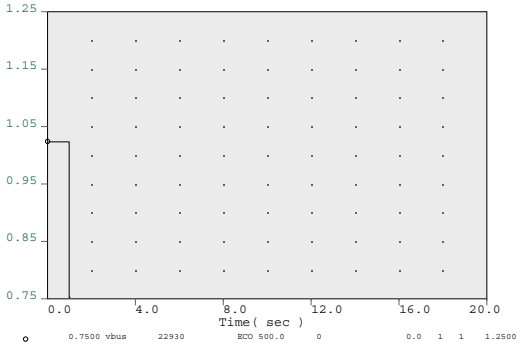
Imperial Valley 230kV



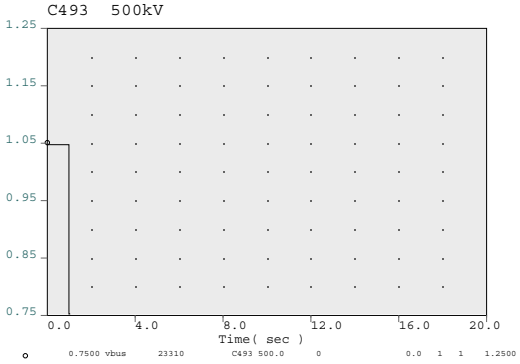
Miguel 500kV



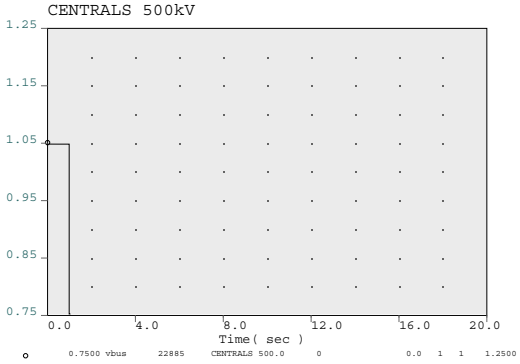
Windfarms 500



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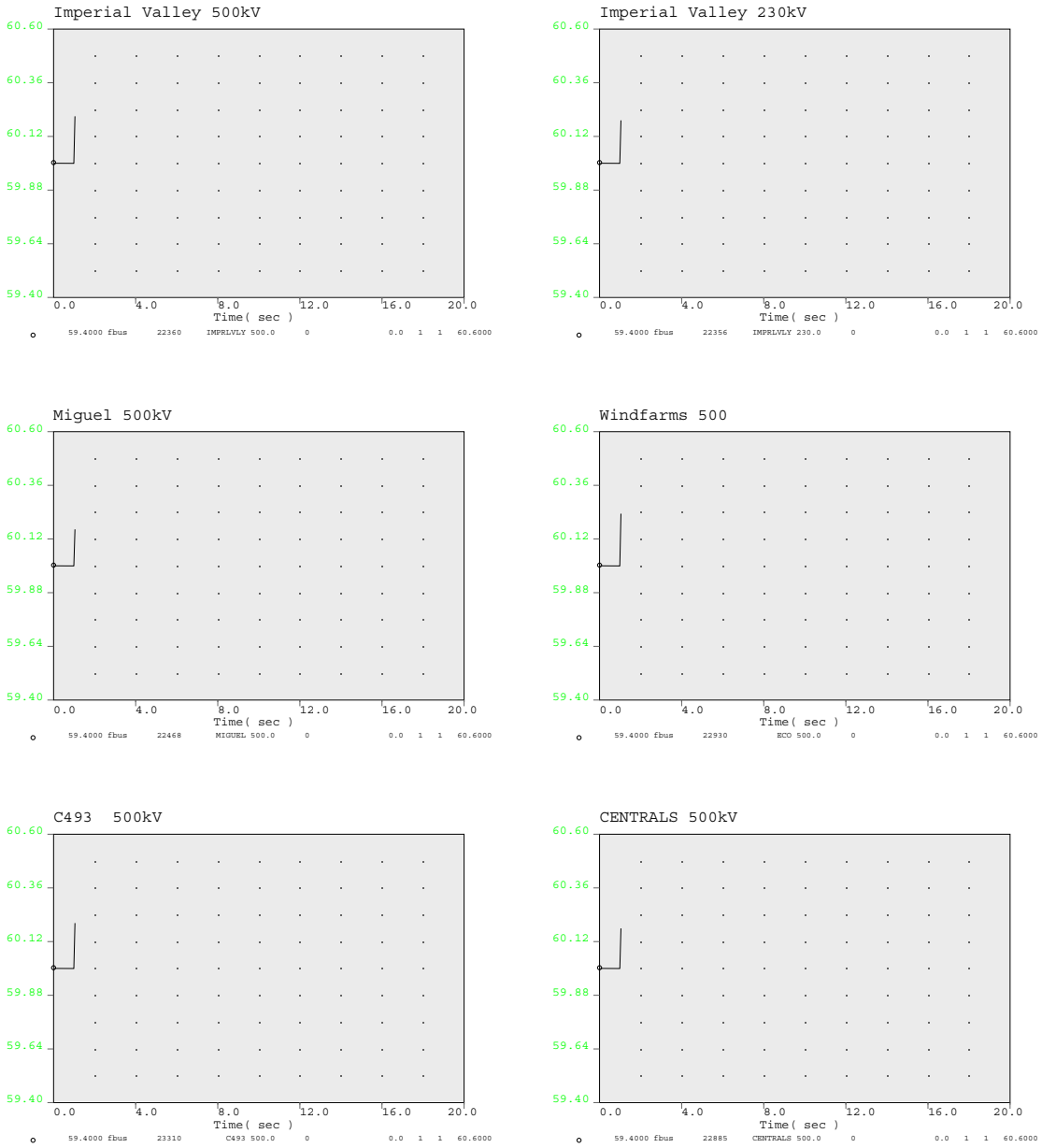


CENTRALS 500kV



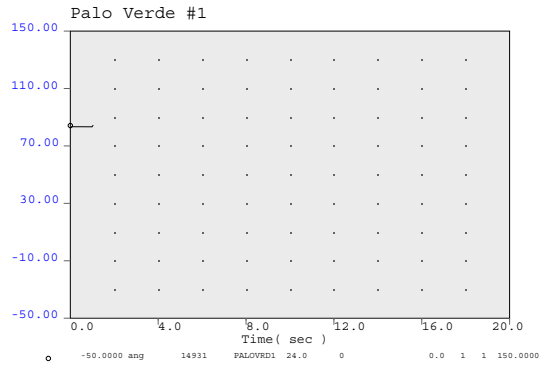
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

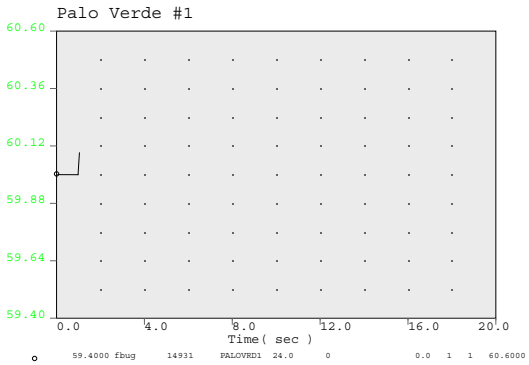
Imperial Valley Area - Frequency

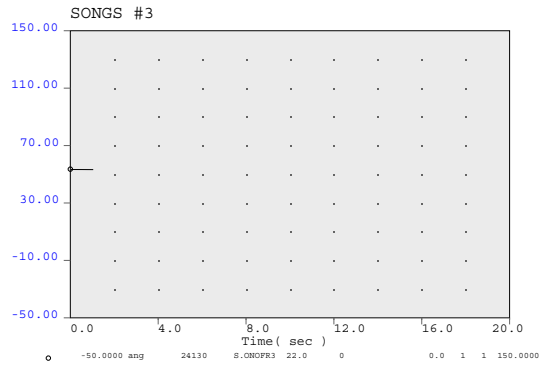


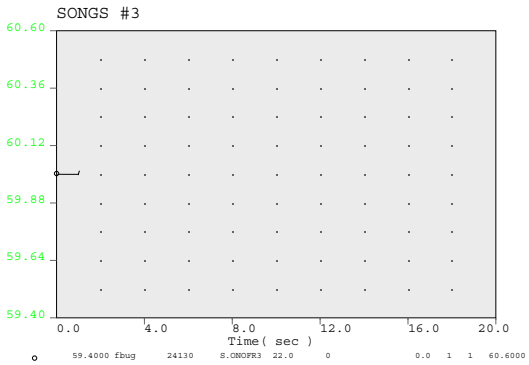
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

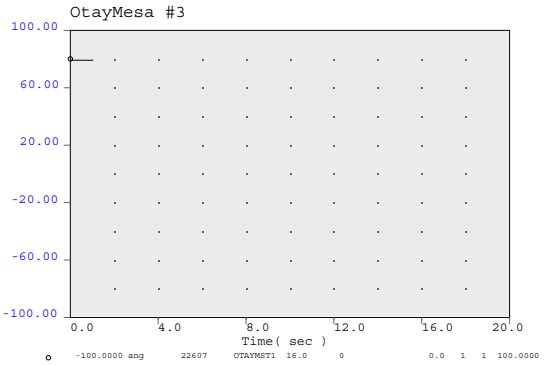
RELATIVE ROTOR ANGLE & FREQUENCY

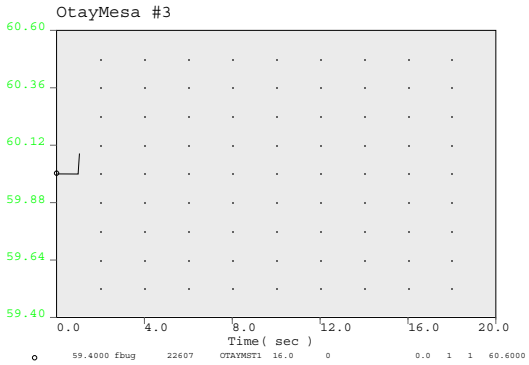












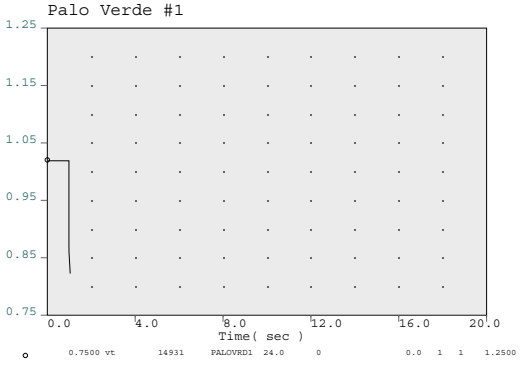
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Page 1

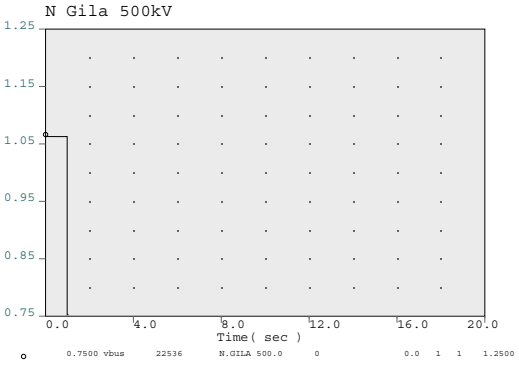
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RELATIVE VOLTAGE

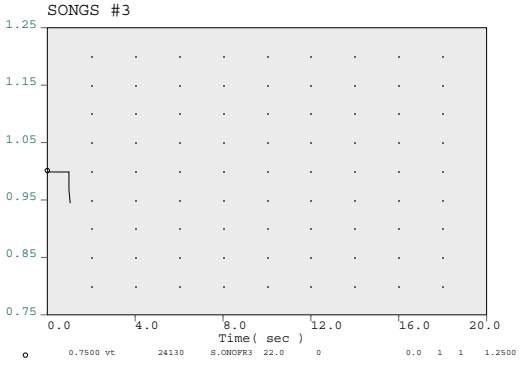
Palo Verde #1



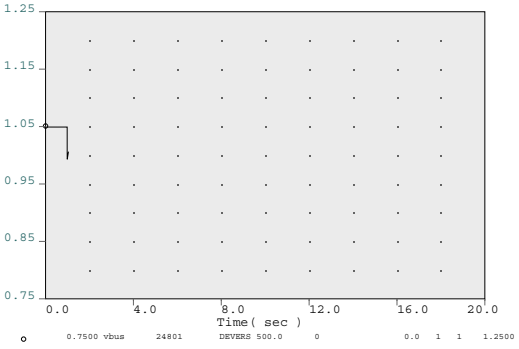
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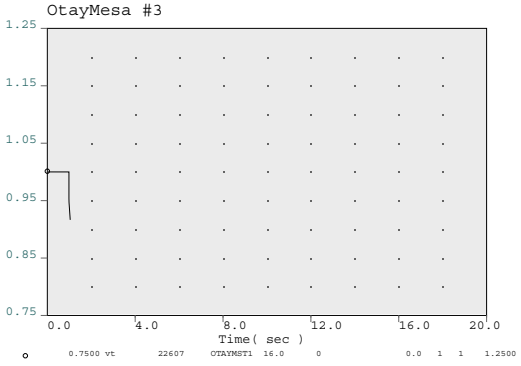
SONGS #3



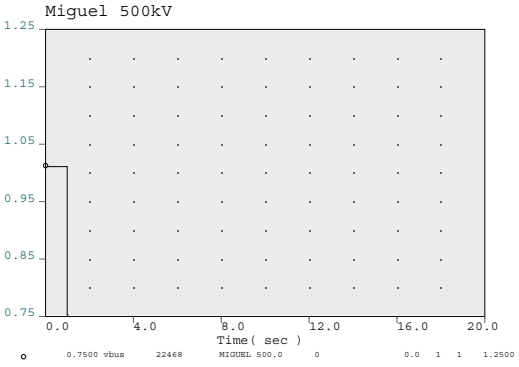
Devers 500



OtayMesa #3



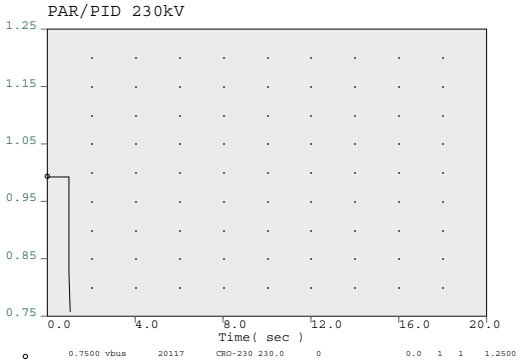
Miguel 500kV



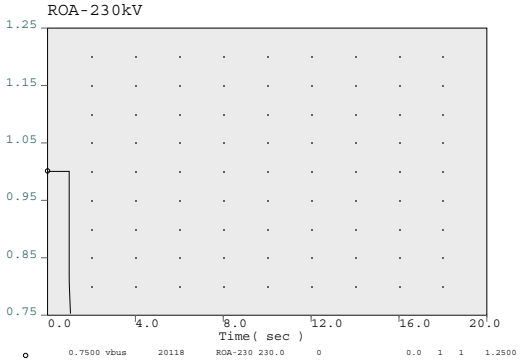
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

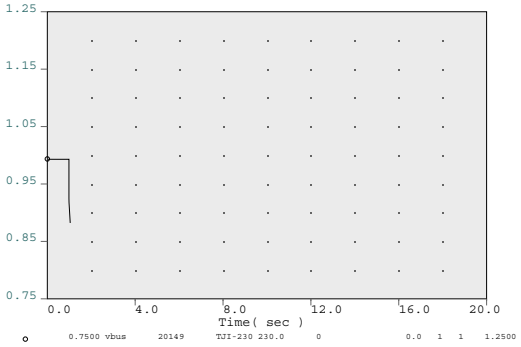
PAR/PID 230kV



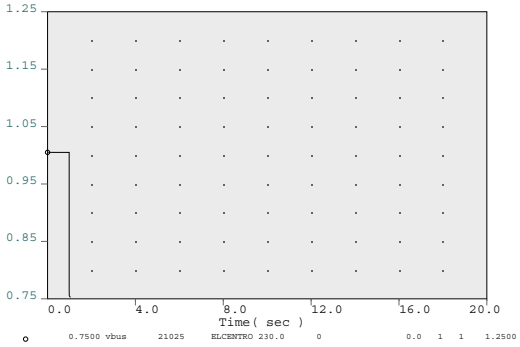
ROA-230kV



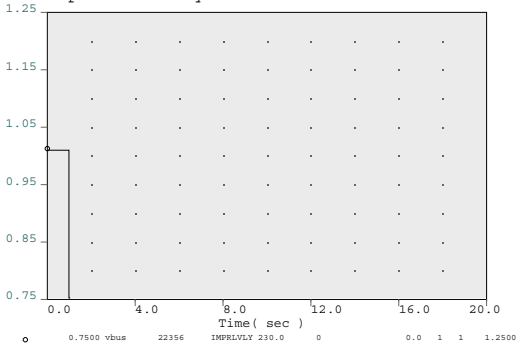
TJ1-230kV



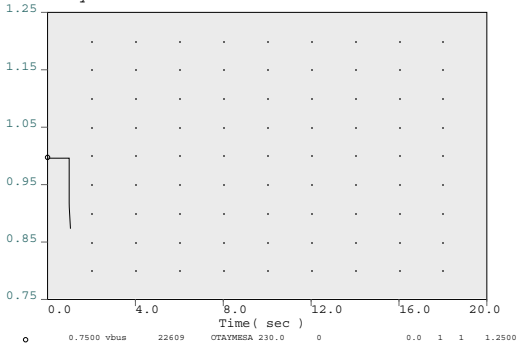
El Centro



Imperial Valley 230kV



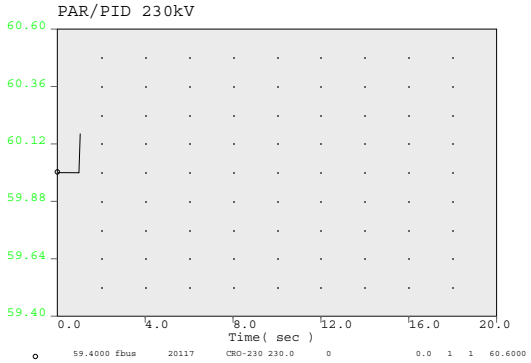
Otay Mesa 230kV



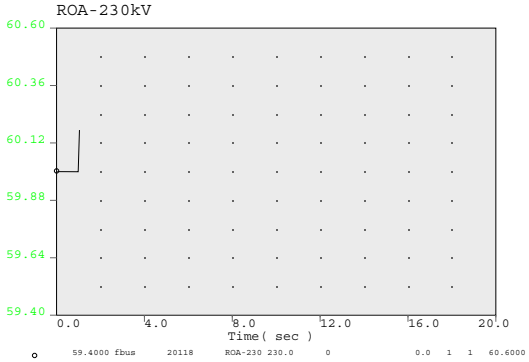
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

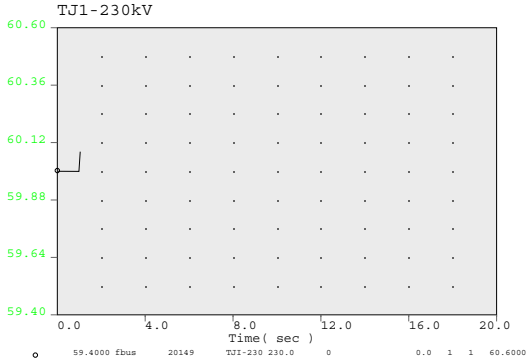
PAR/PID 230kV



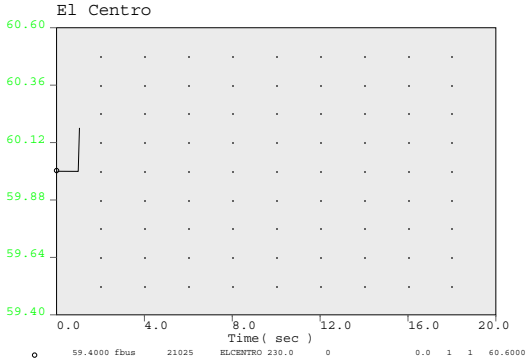
ROA-230kV



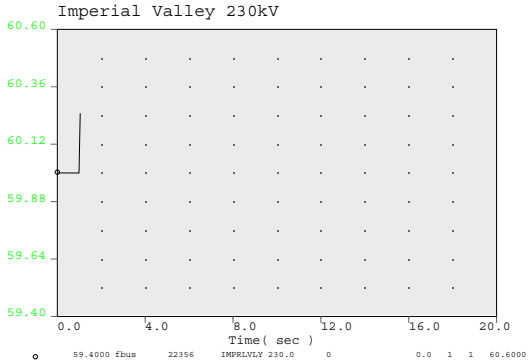
TJ1-230kV



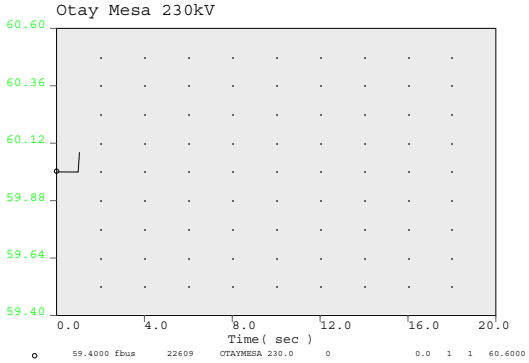
El Centro



Imperial Valley 230kV



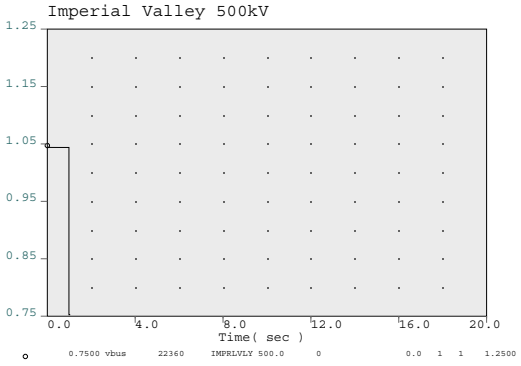
Otay Mesa 230kV



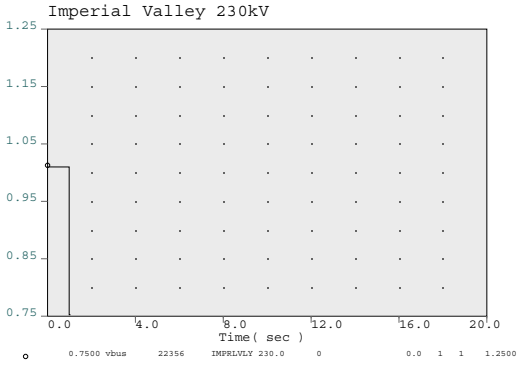
SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

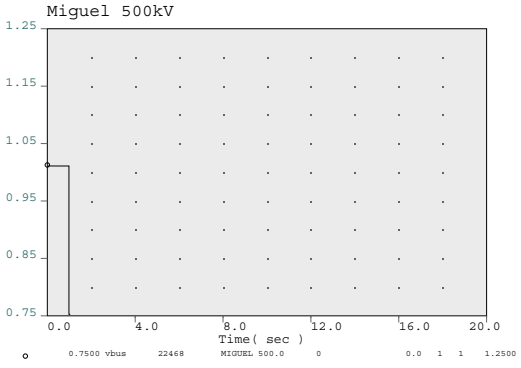
Imperial Valley 500kV



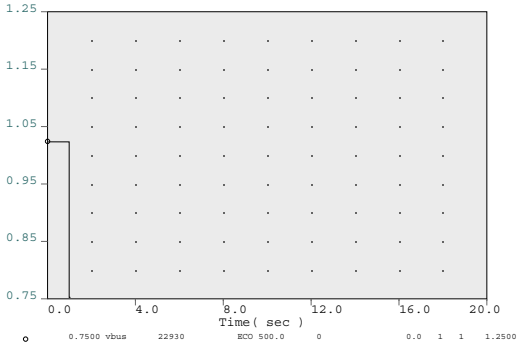
Imperial Valley 230kV



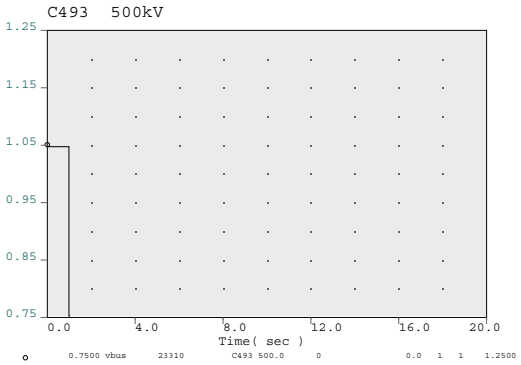
Miguel 500kV



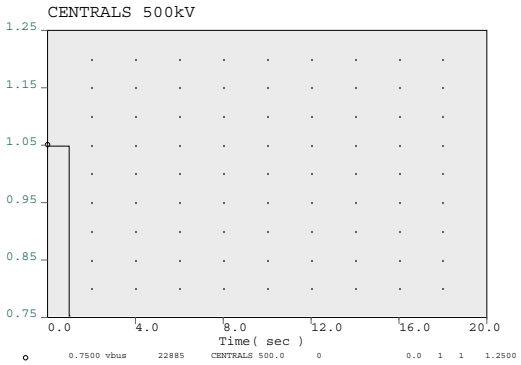
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Heavy Summer
T468-N.Gila 500 kV line

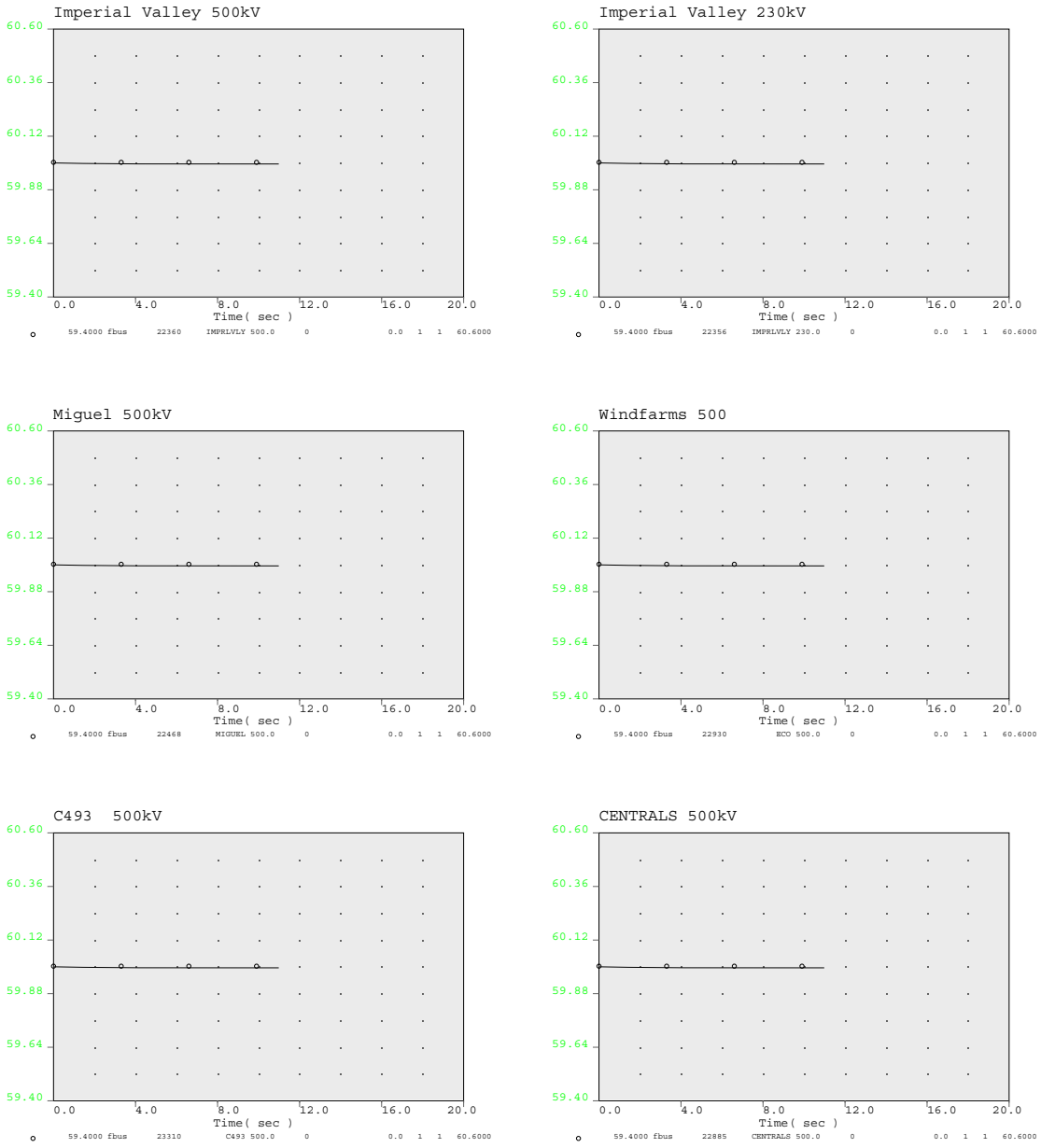
Appendix J-8

Transient Stability Analysis Plots

Internal Cluster

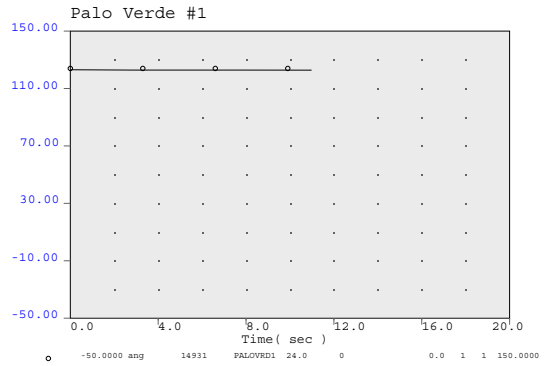
Light Load (Spring or Light Autumn) Pre

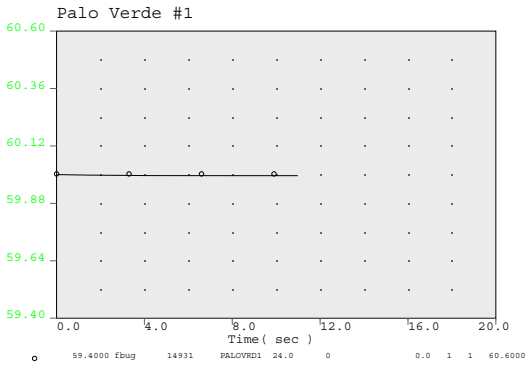
Imperial Valley Area - Frequency

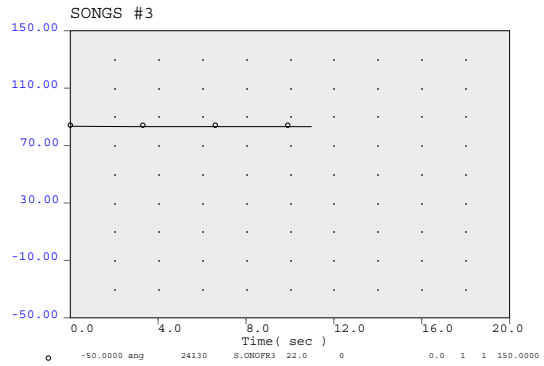


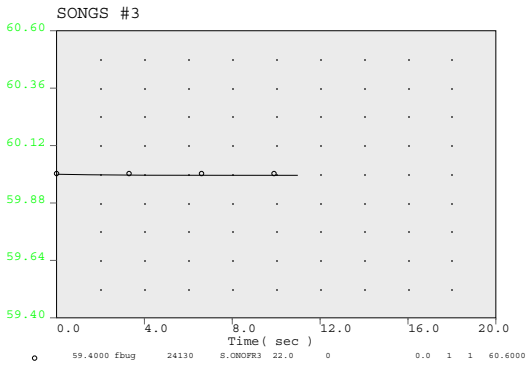
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

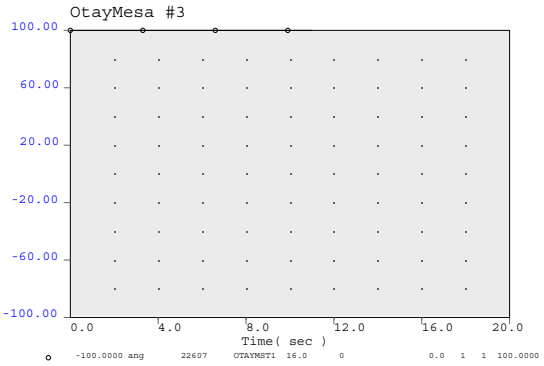
RELATIVE ROTOR ANGLE & FREQUENCY

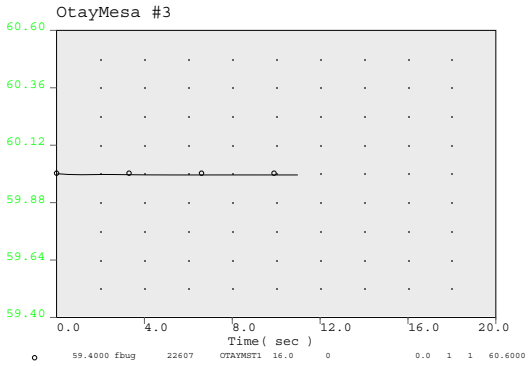












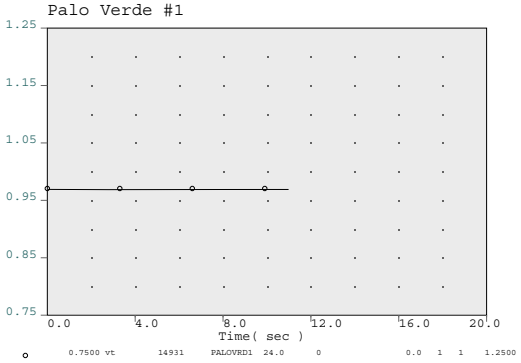
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

Page 1

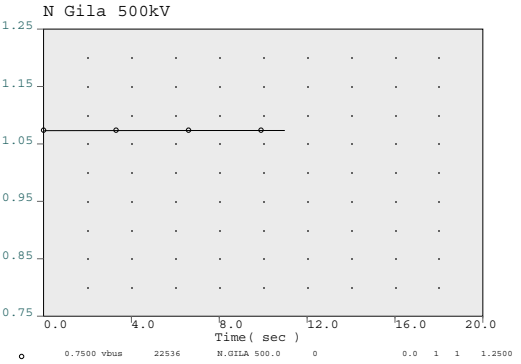
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RELATIVE VOLTAGE

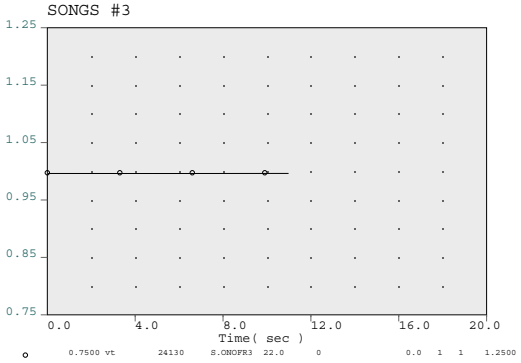
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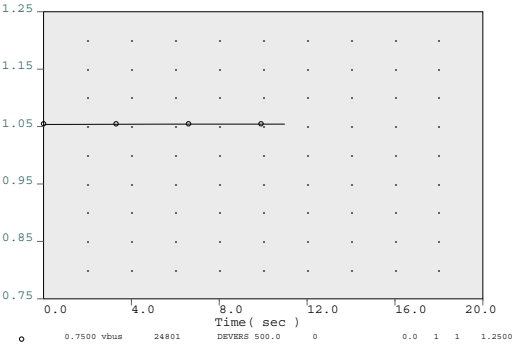
N Gila 500kV



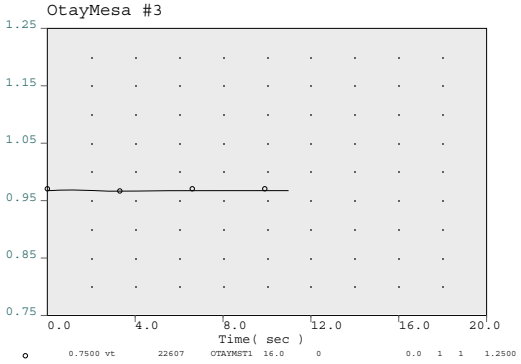
SONGS #3



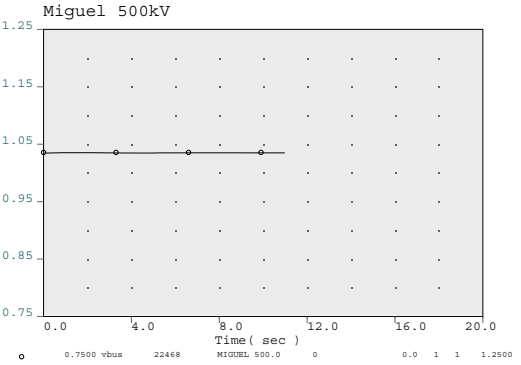
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OtayMesa #3



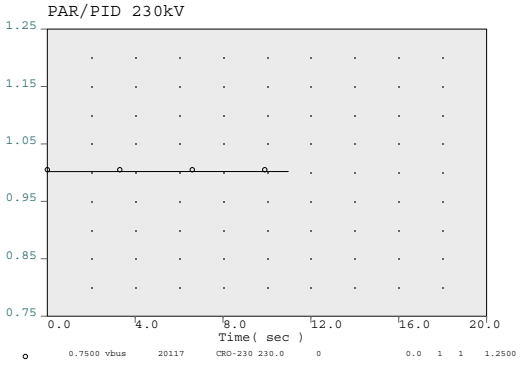
Miguel 500kV



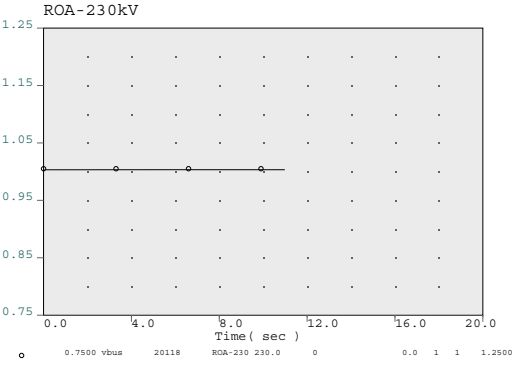
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

Affected System Voltage Check and Comparison

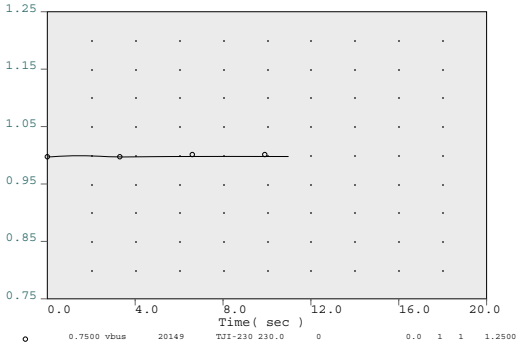
PAR/PID 230kV



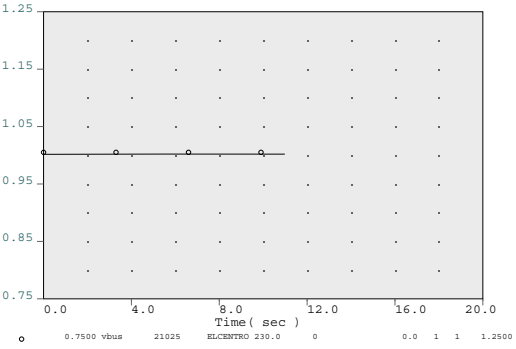
ROA-230kV



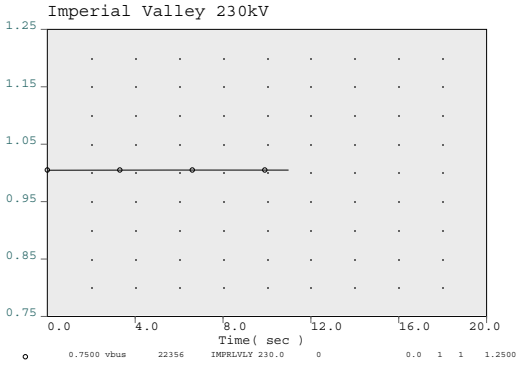
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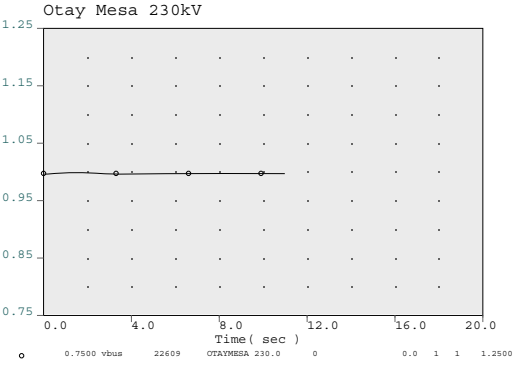
El Centro



Imperial Valley 230kV

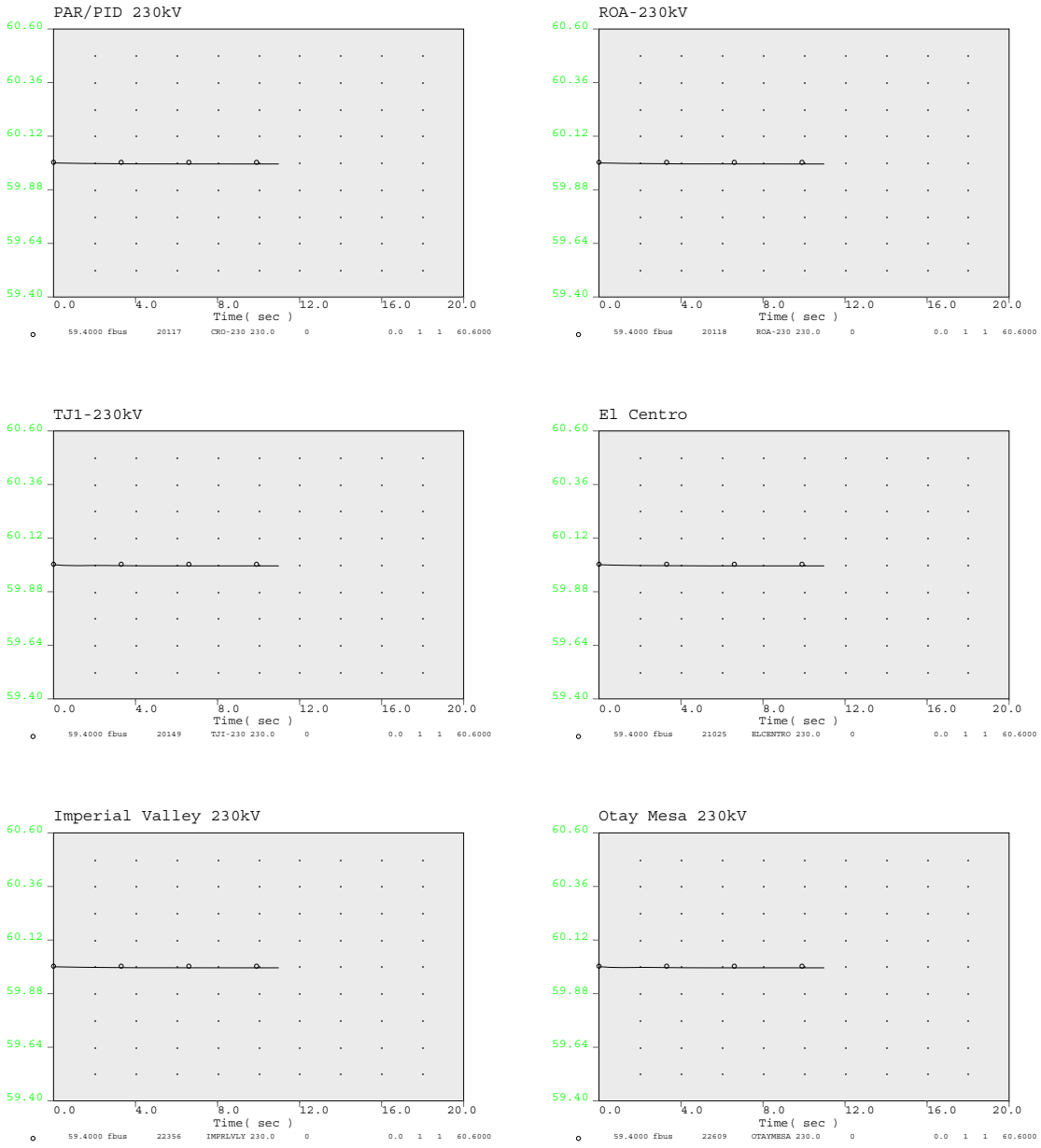


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

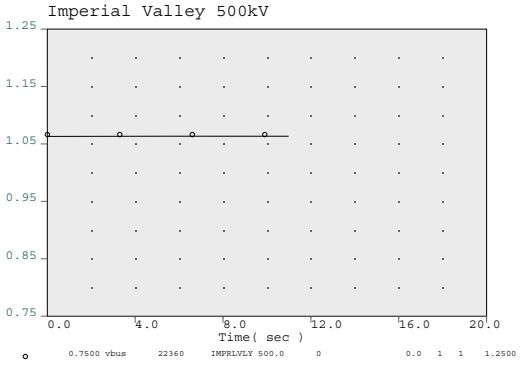
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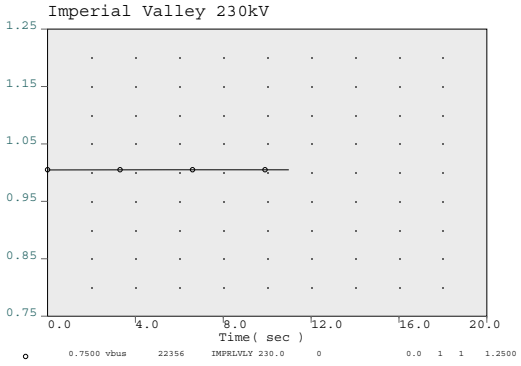
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

Imperial Valley Area - VOLTAGE

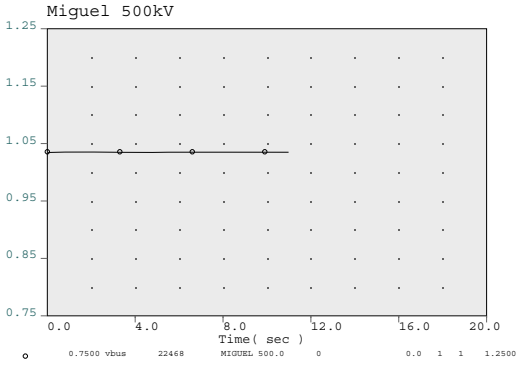
Imperial Valley 500kV



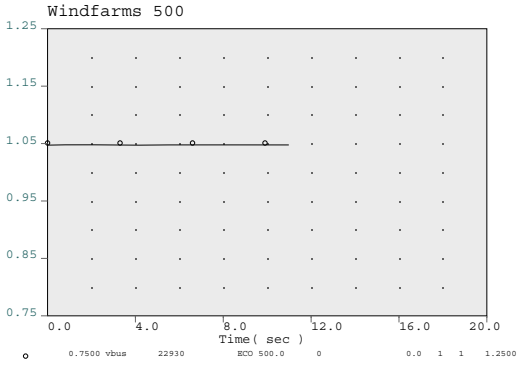
Imperial Valley 230kV



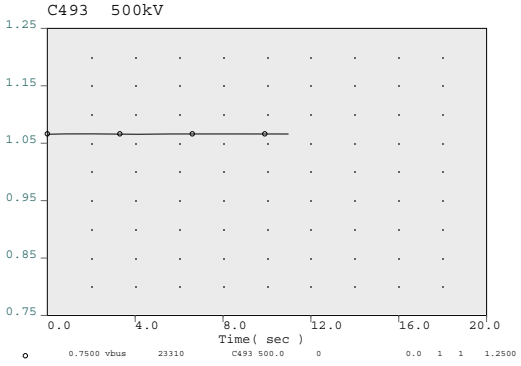
Miguel 500kV



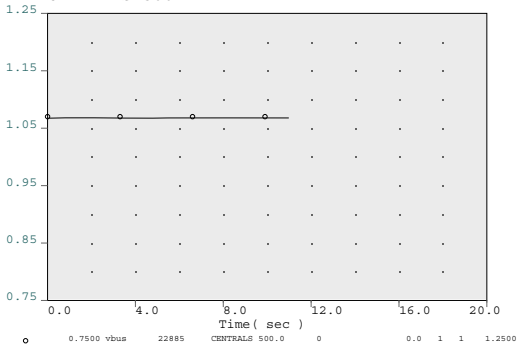
Windfarms 500



C493 500kV

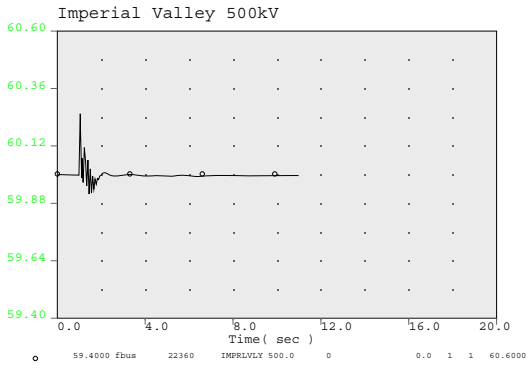


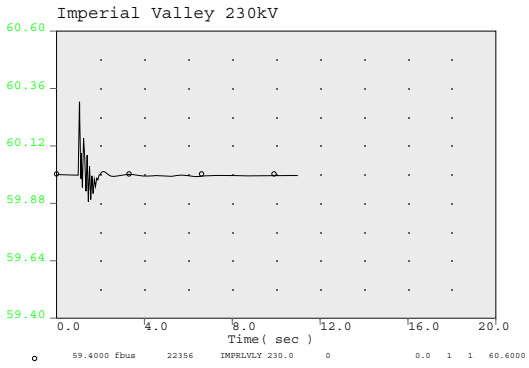
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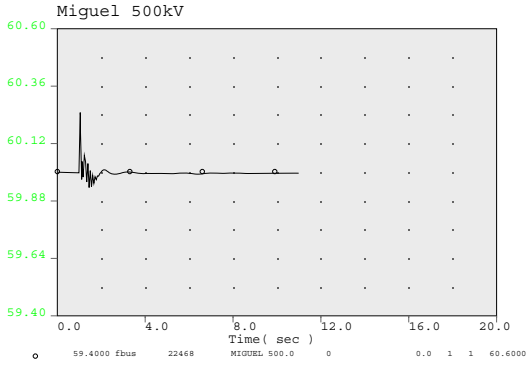


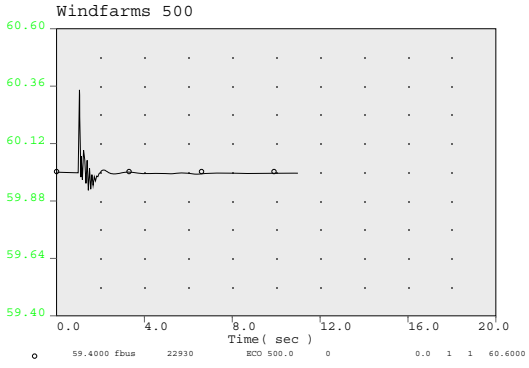
SDG&E Cluster 2 - pre
2014 Light Autumn
Flat

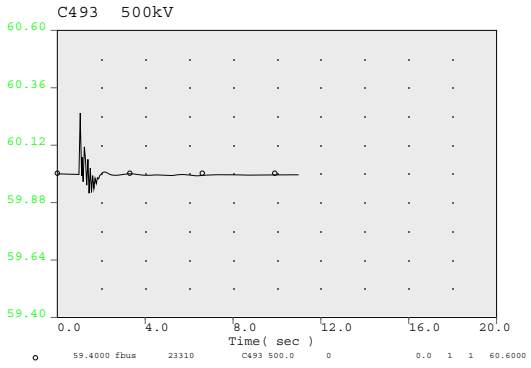
Imperial Valley Area - Frequency

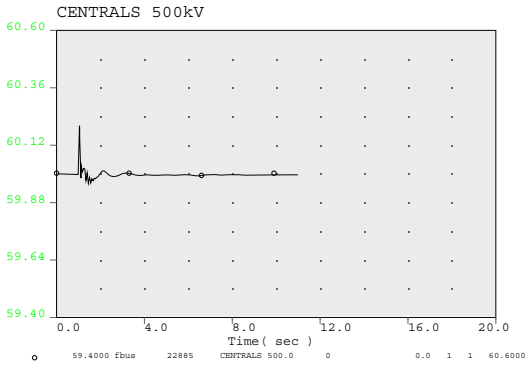






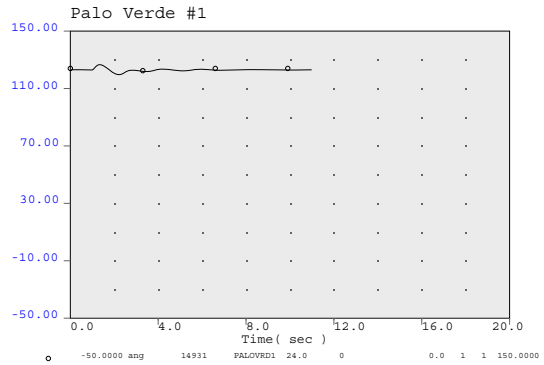


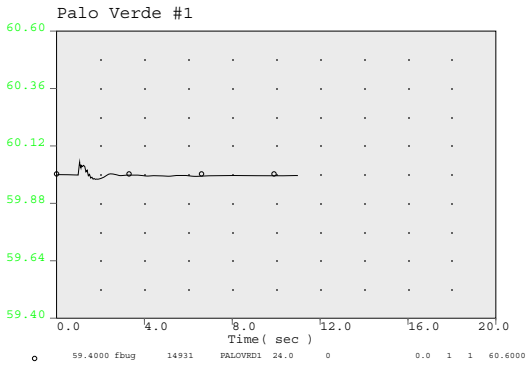


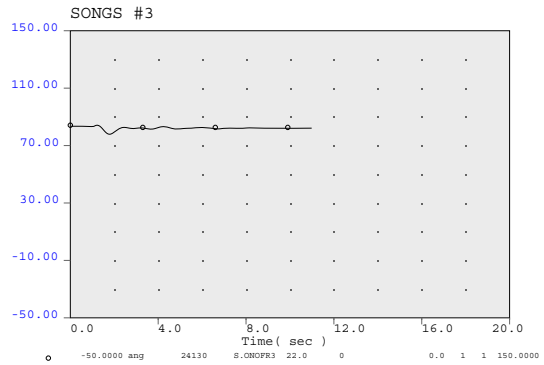


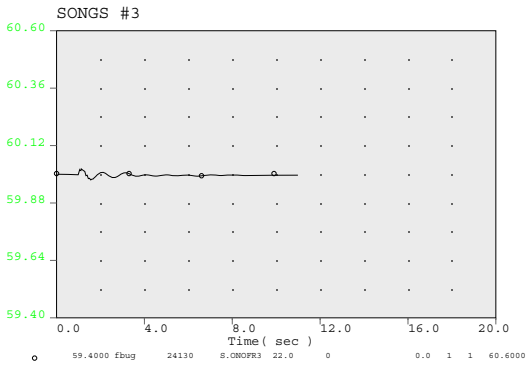
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

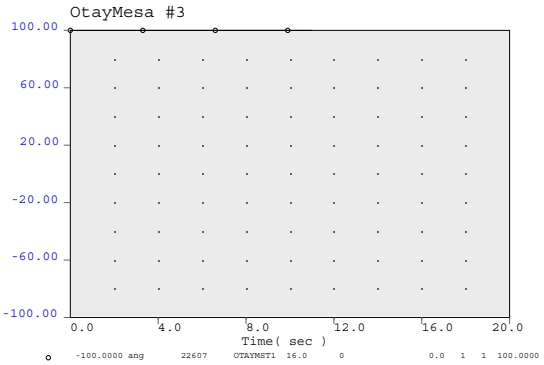
RELATIVE ROTOR ANGLE & FREQUENCY

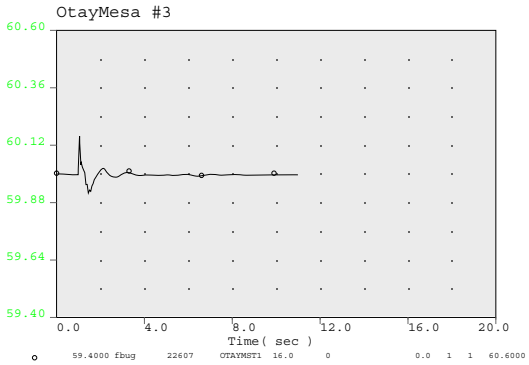






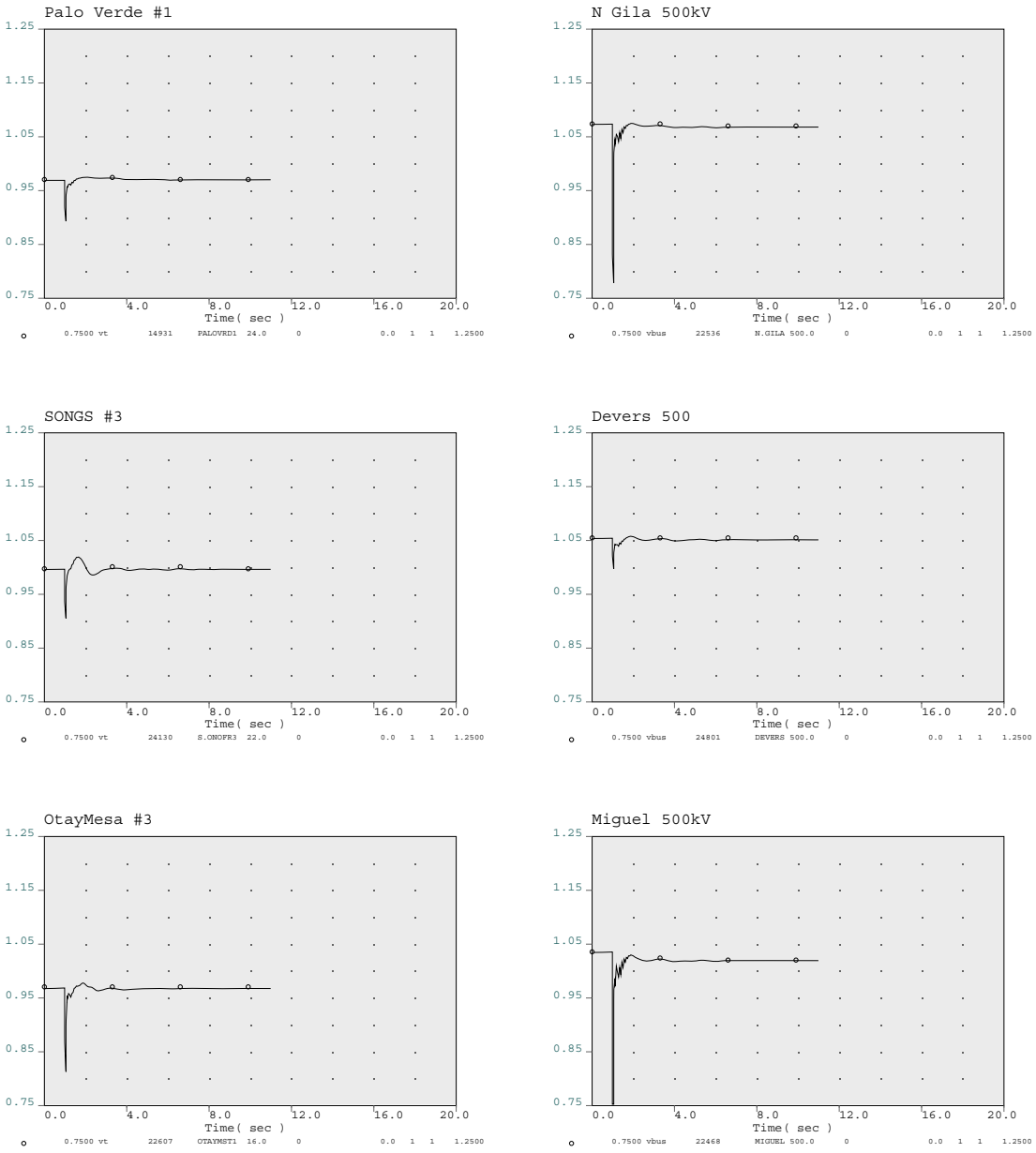






SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

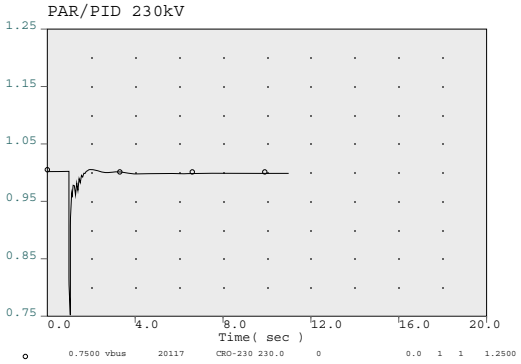
RELATIVE VOLTAGE



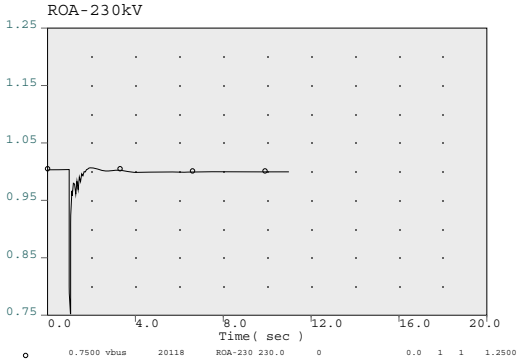
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

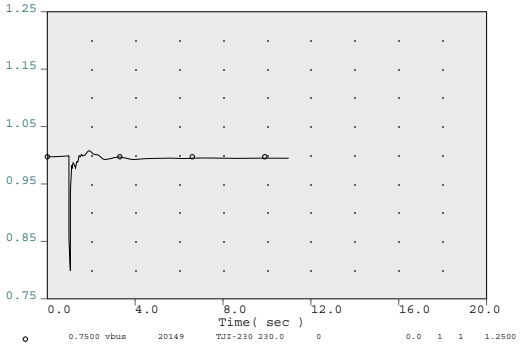
PAR/PID 230kV



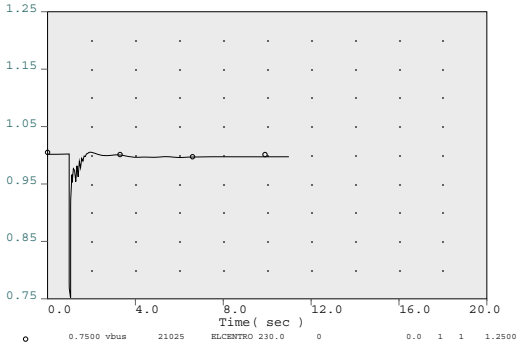
ROA-230kV



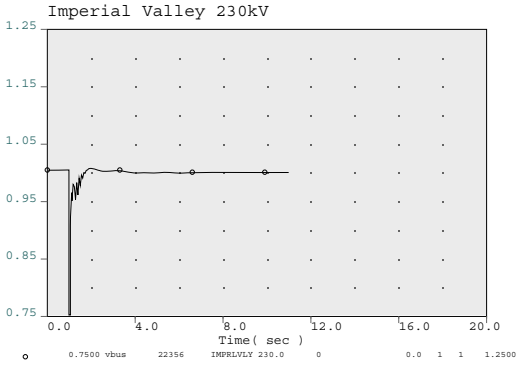
TJ1-230kV



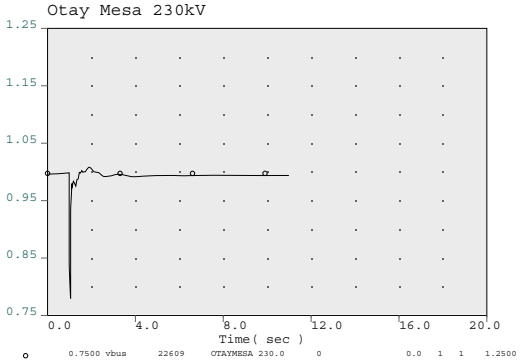
El Centro



Imperial Valley 230kV

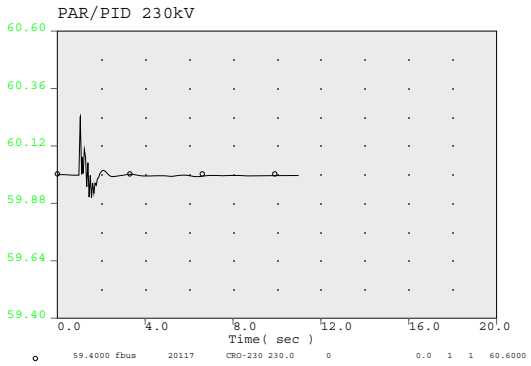


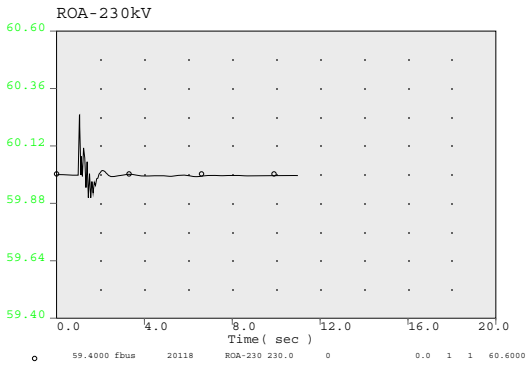
Otay Mesa 230kV

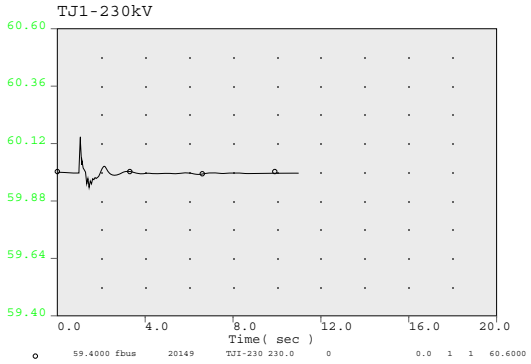


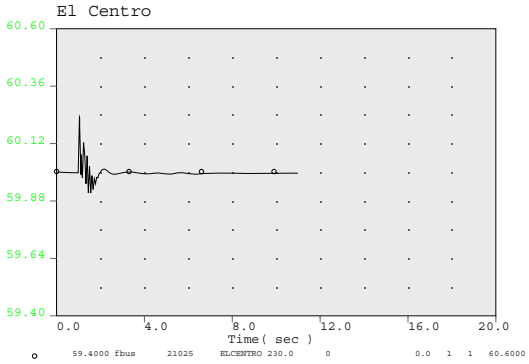
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

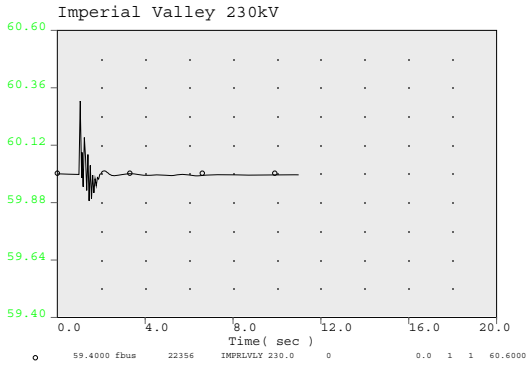
Affected System Frequency Check and Comparison

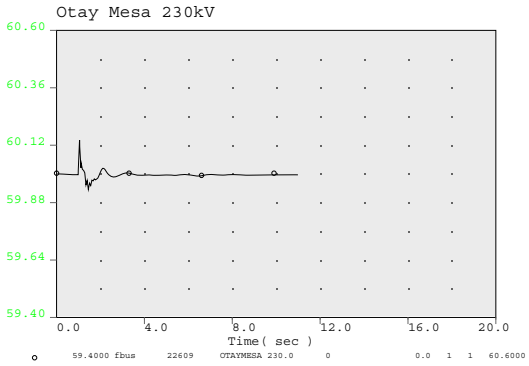








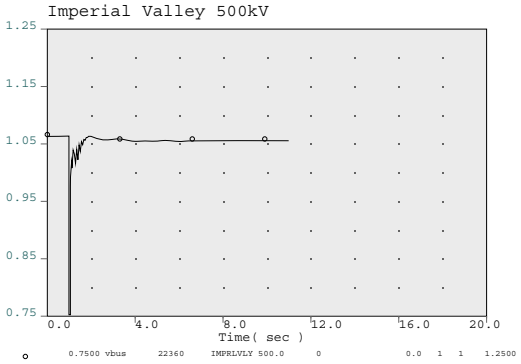




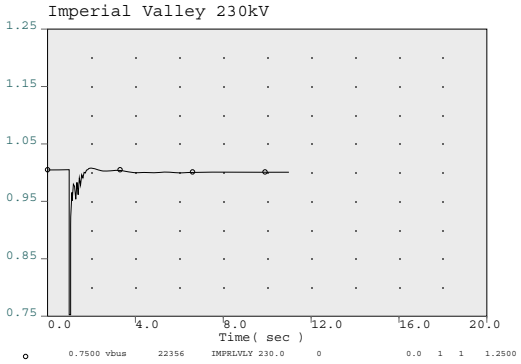
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

Imperial Valley Area - VOLTAGE

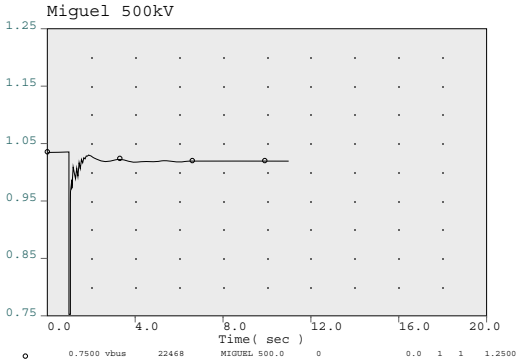
Imperial Valley 500kV



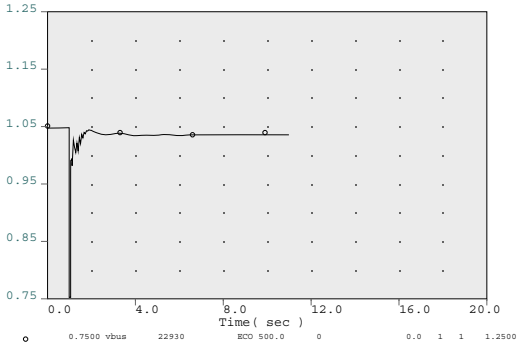
Imperial Valley 230kV



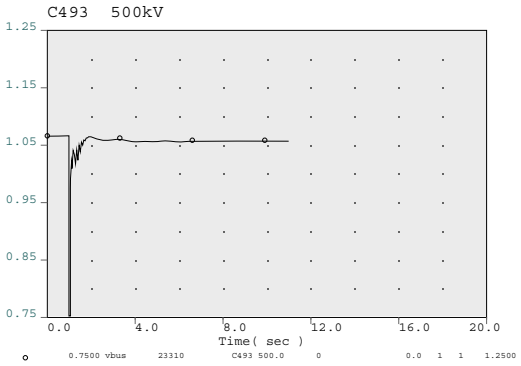
Miguel 500kV



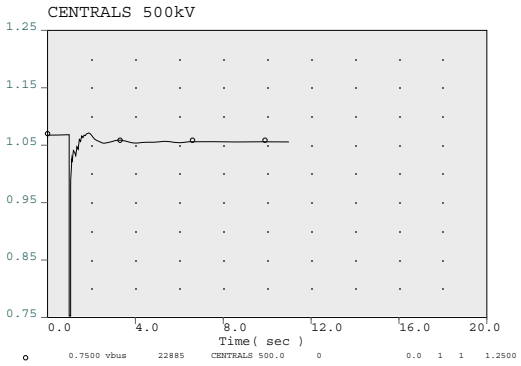
Windfarms 500



C493 500kV

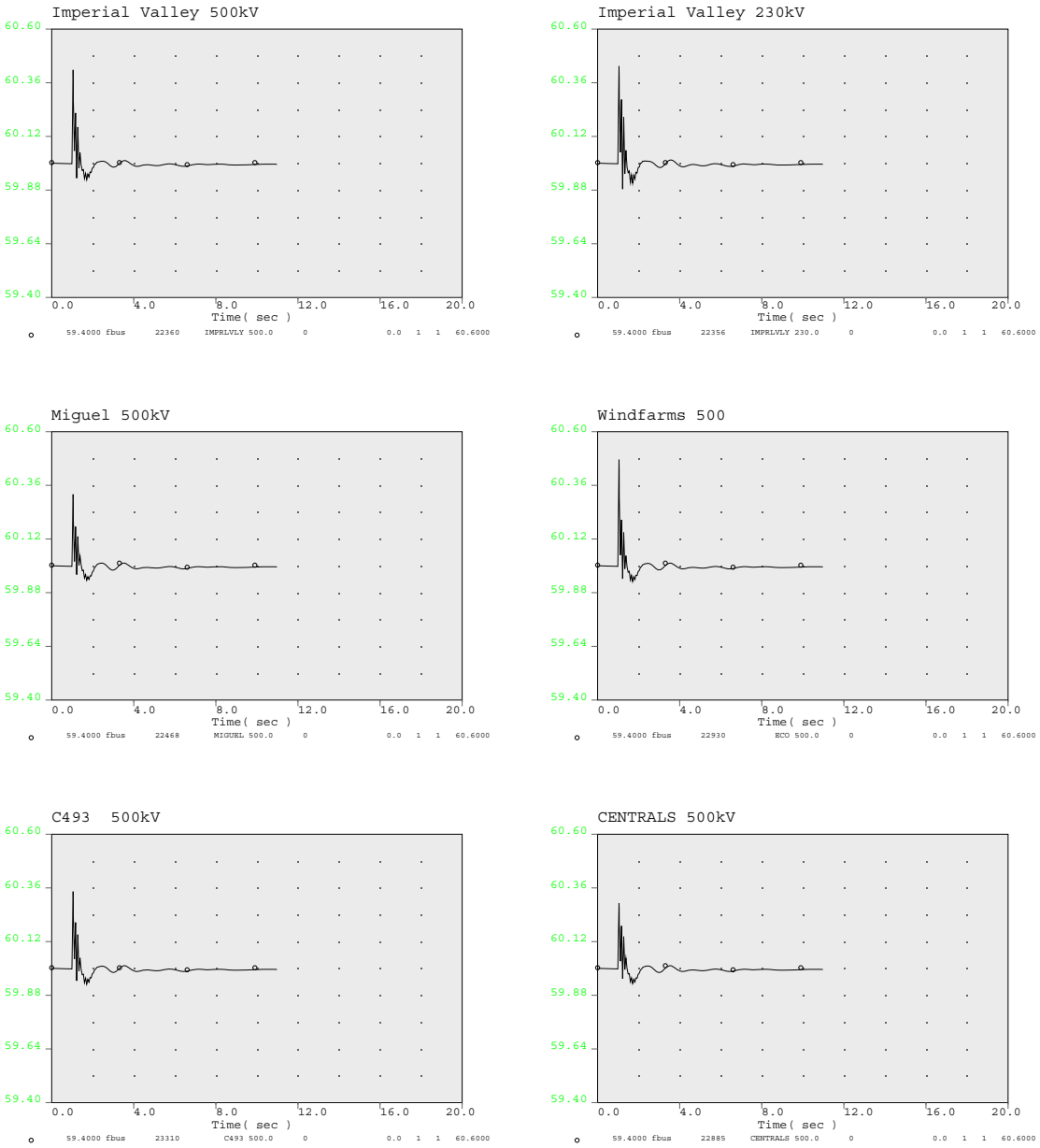


CENTRALS 500kV



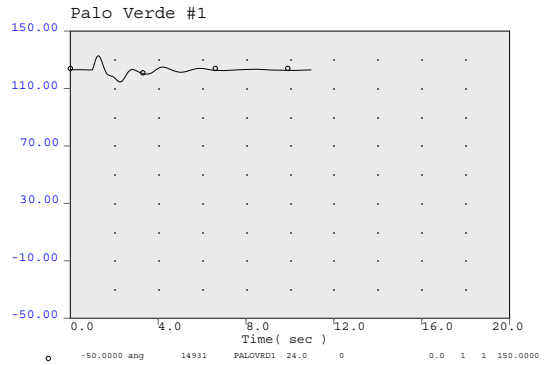
SDG&E Cluster 2 - pre
2014 Light Autumn
C493 - CENTRALS 500kV line

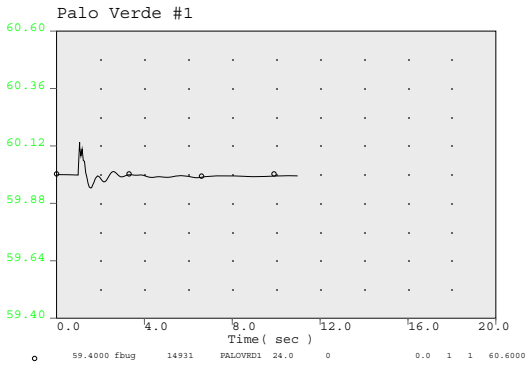
Imperial Valley Area - Frequency

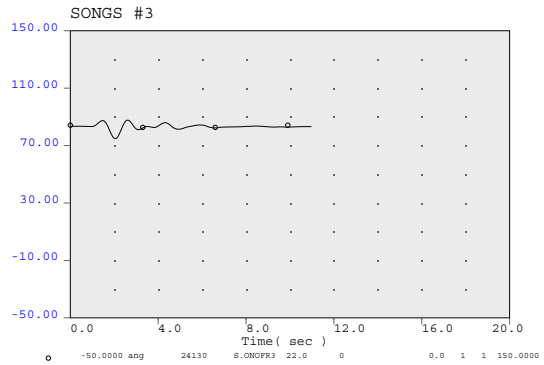


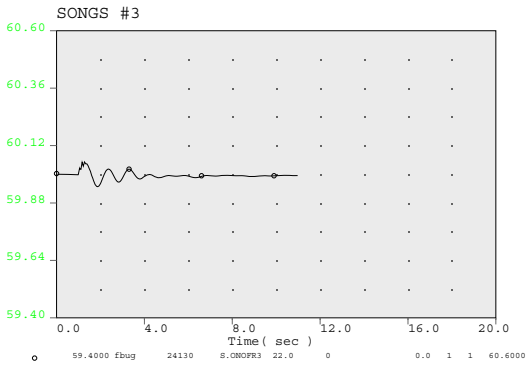
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

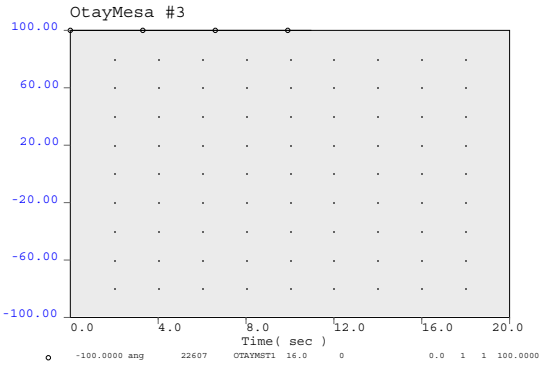
RELATIVE ROTOR ANGLE & FREQUENCY

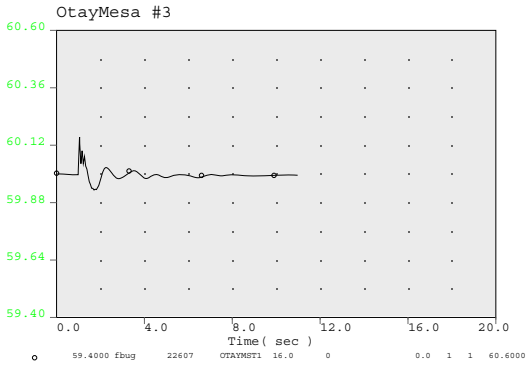










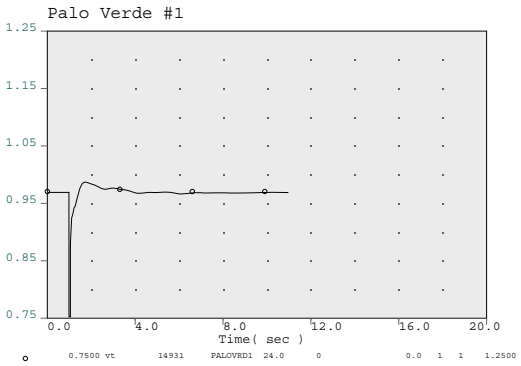


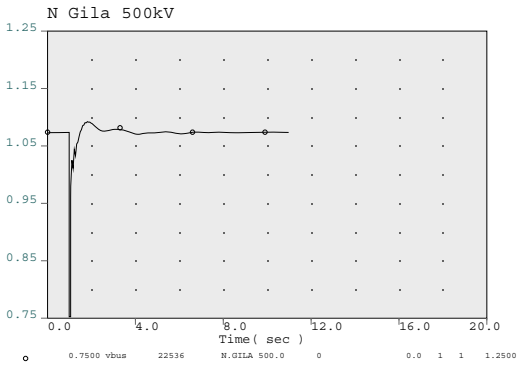
SDG&E Cluster 2 - pre
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

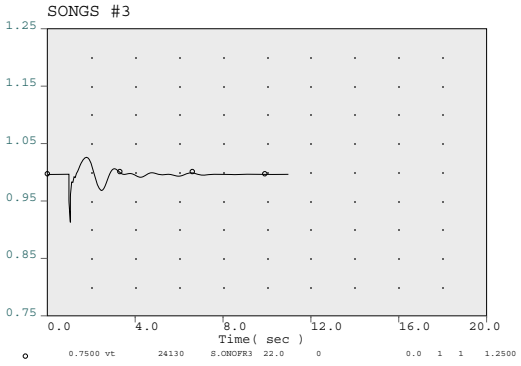
Page 1

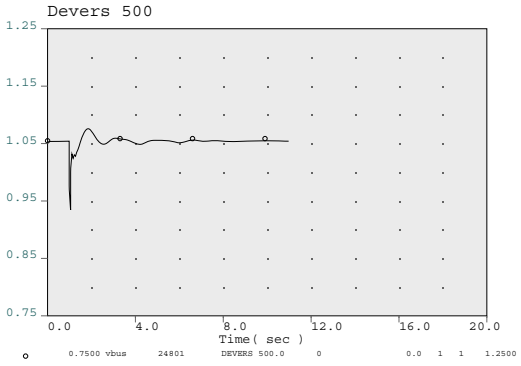
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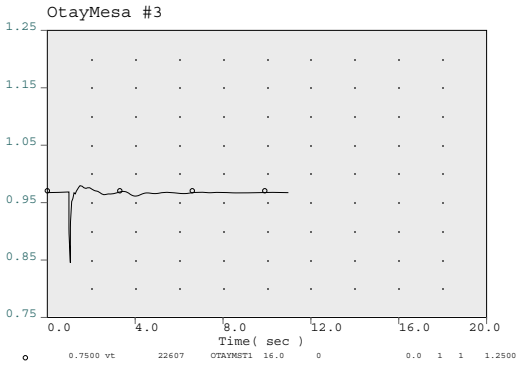
RELATIVE VOLTAGE

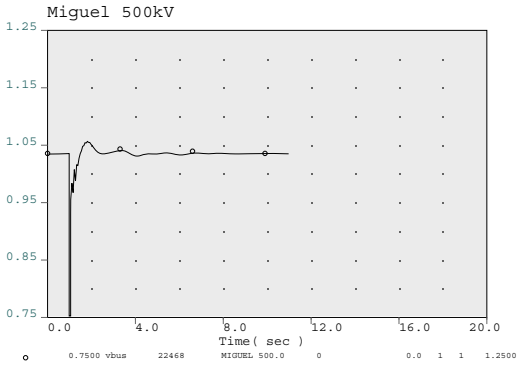








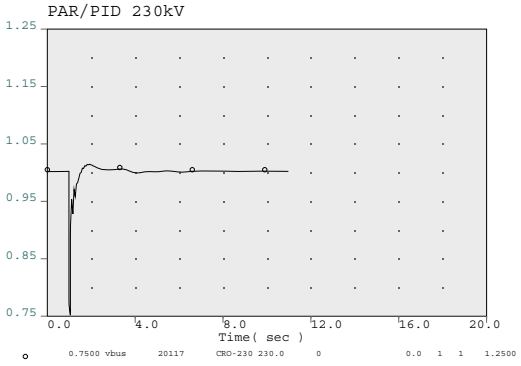




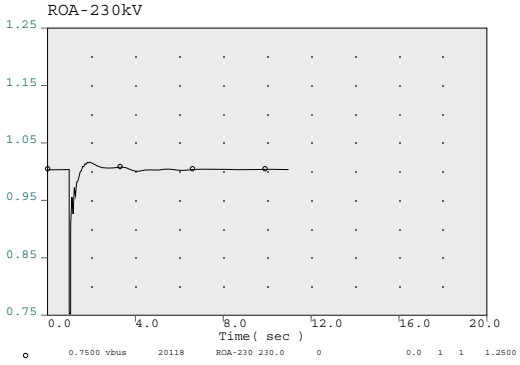
SDG&E Cluster 2 - pre
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Affected System Voltage Check and Comparison

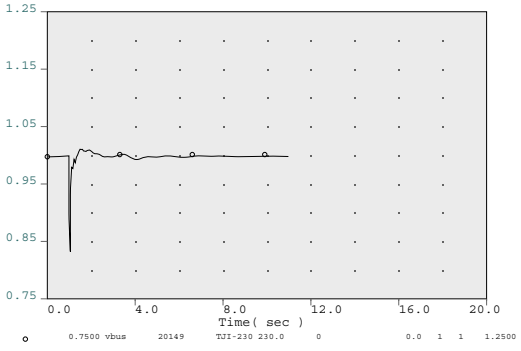
PAR/PID 230kV



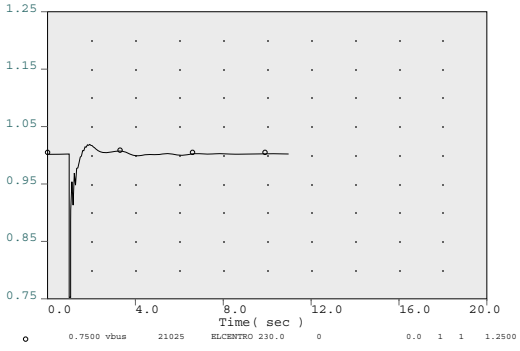
ROA-230kV



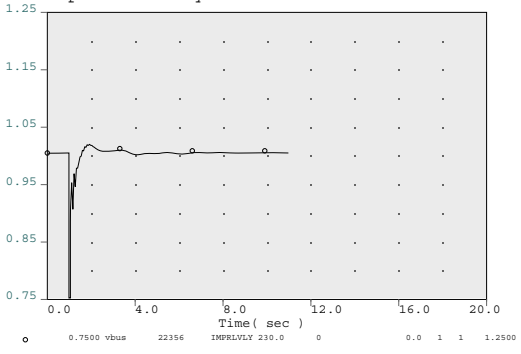
TJ1-230kV



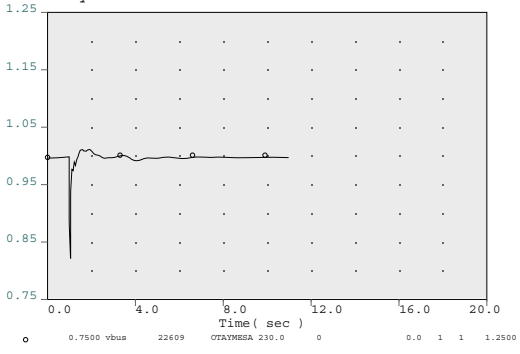
El Centro



Imperial Valley 230kV

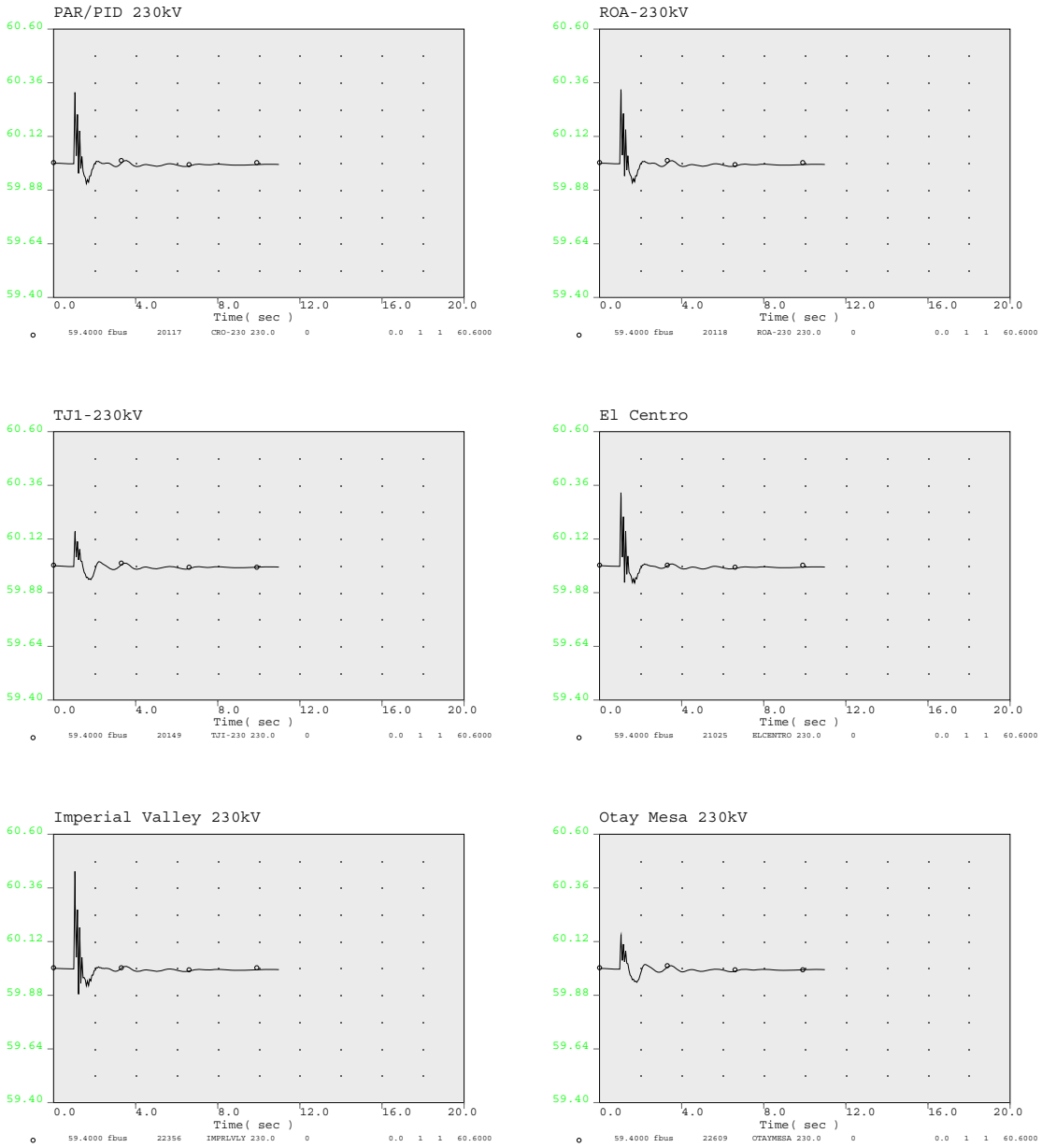


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

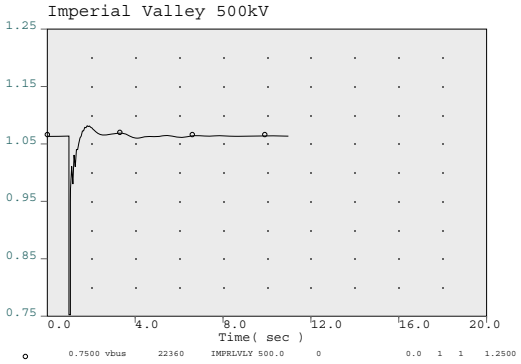
Affected System Frequency Check and Comparison



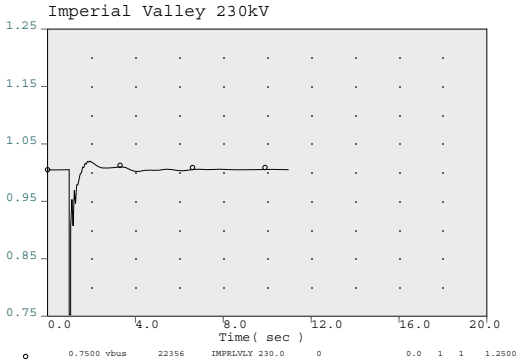
SDG&E Cluster 2 - pre
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

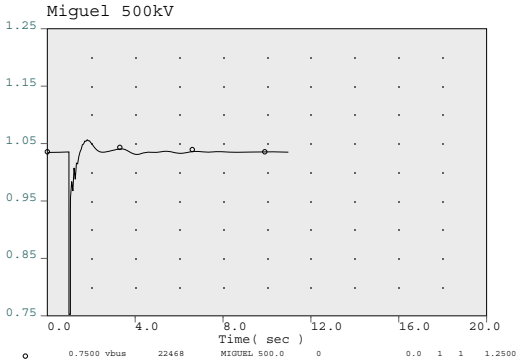
Imperial Valley 500kV



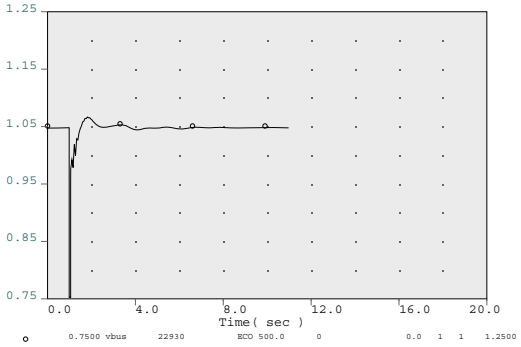
Imperial Valley 230kV



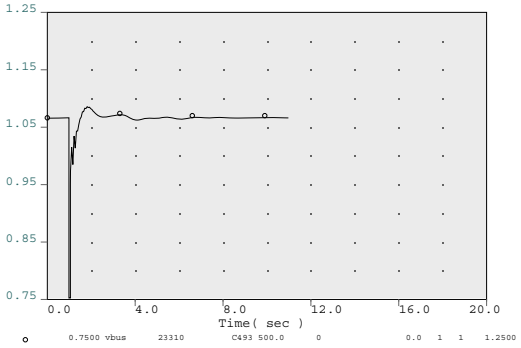
Miguel 500kV



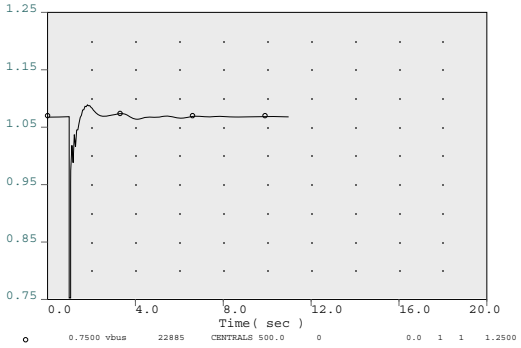
Windfarms 500



C493 500kV

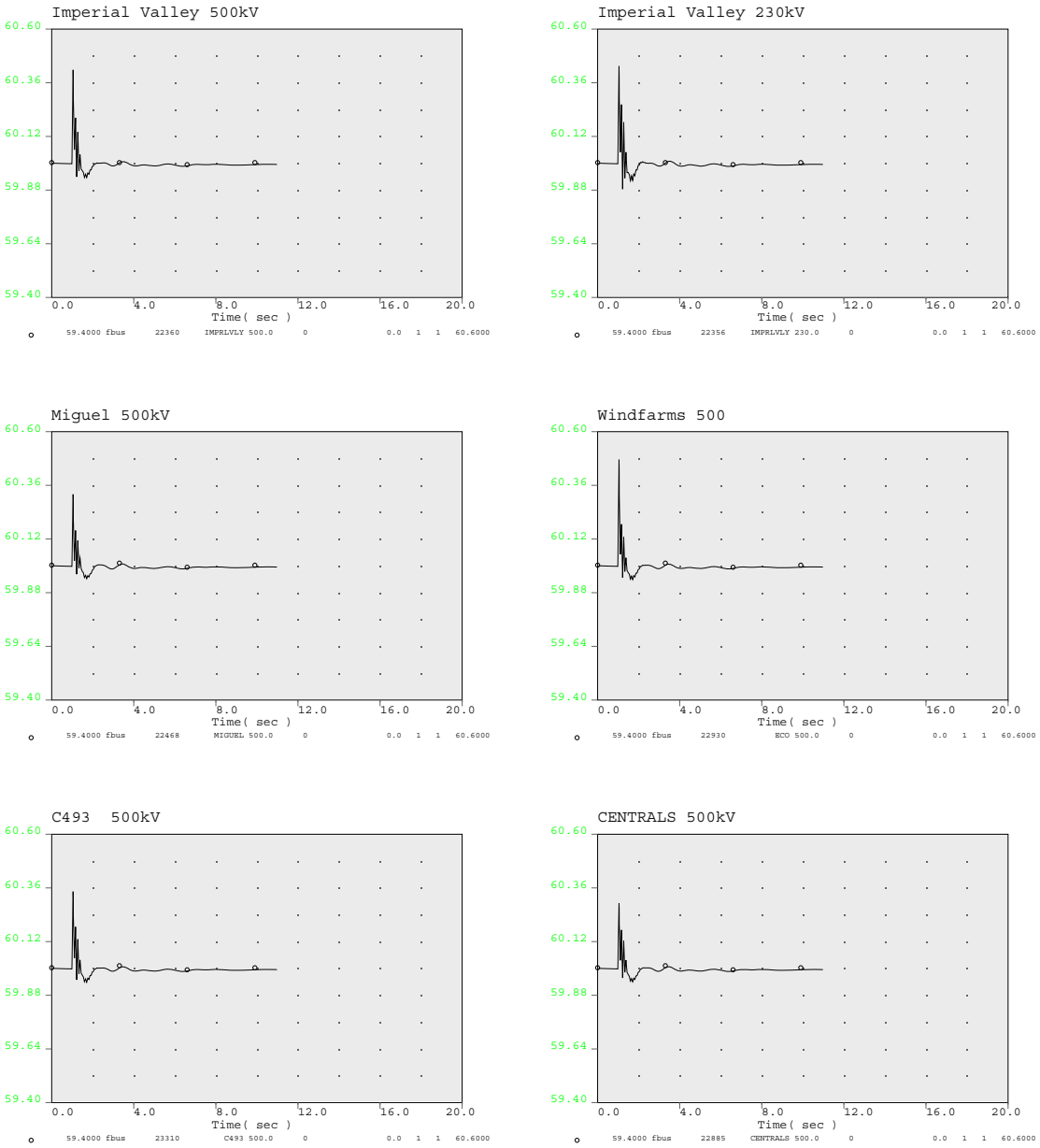


CENTRALS 500kV



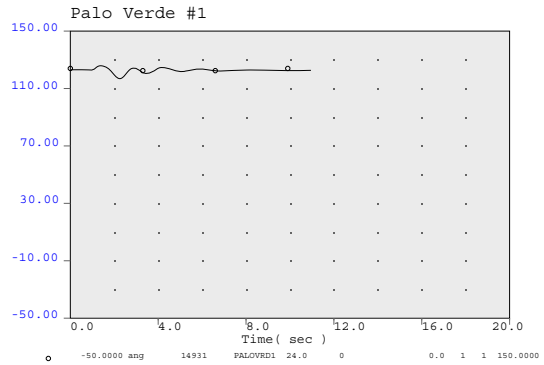
SDG&E Cluster 2 - pre
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

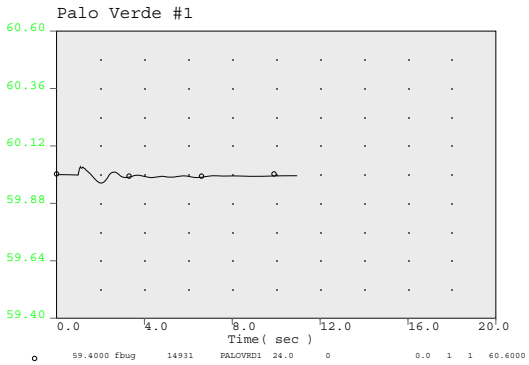
Imperial Valley Area - Frequency

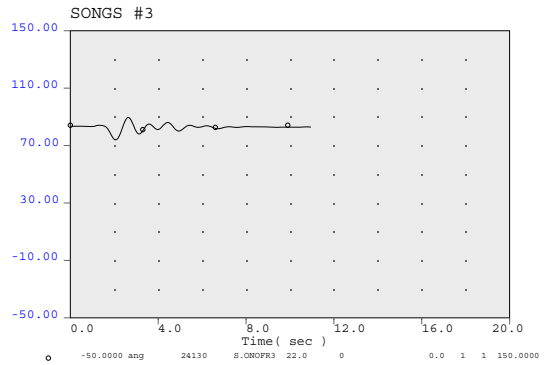


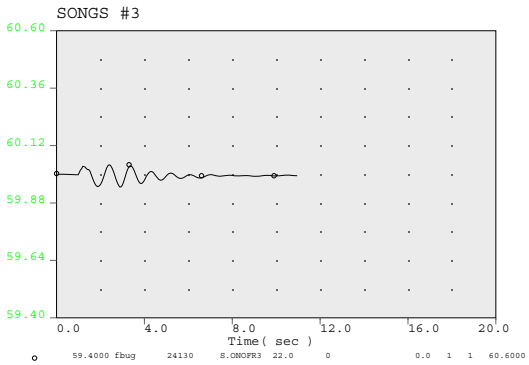
SDG&E Cluster 2 - pre
2014 Light Autumn
Haasyampa-N.Gila 500 kV line

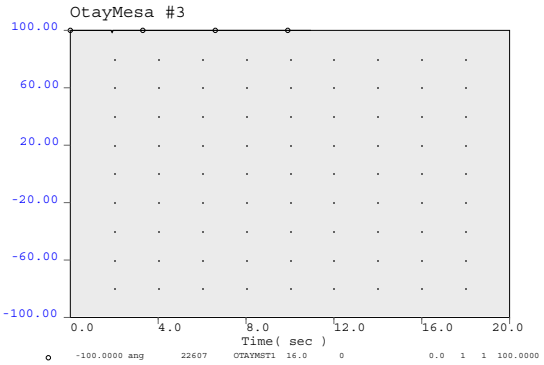
RELATIVE ROTOR ANGLE & FREQUENCY

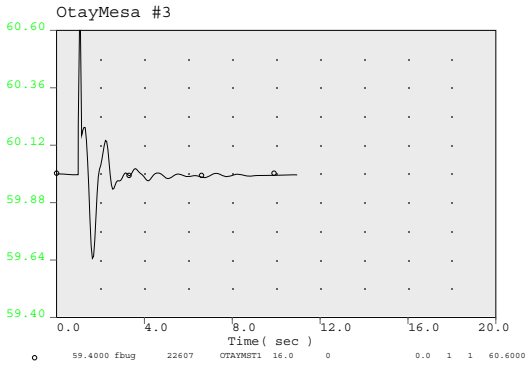












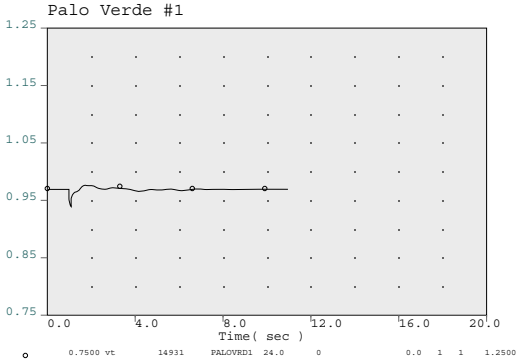
SDG&E Cluster 2 - pre int
2014 Light Autumn
OM - SX 230 kV N-1

Page 1

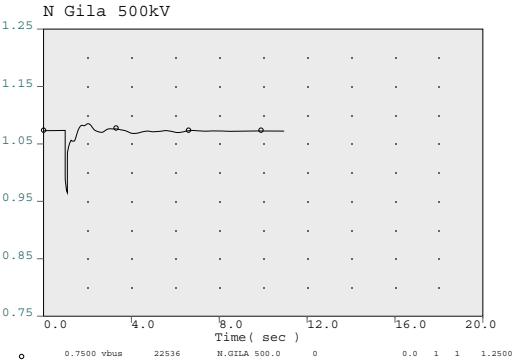
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RELATIVE VOLTAGE

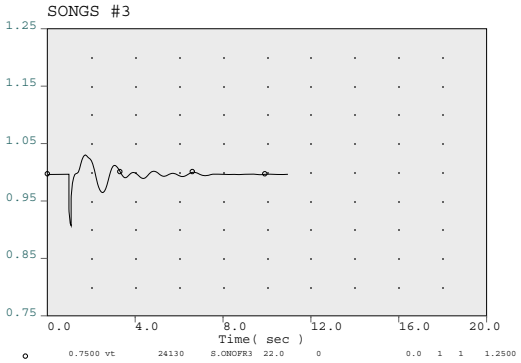
Palo Verde #1



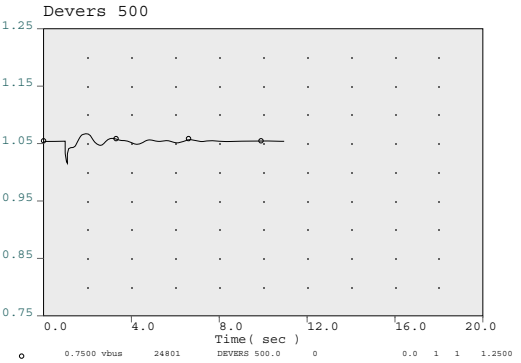
N Gila 500kV



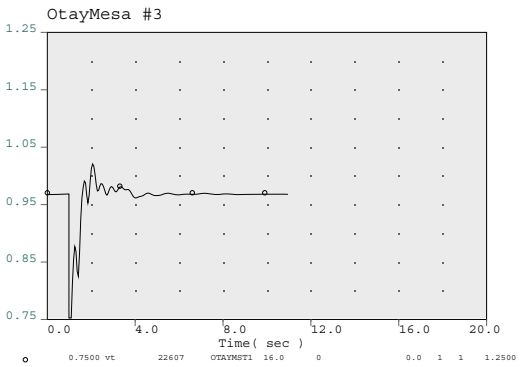
SONGS #3



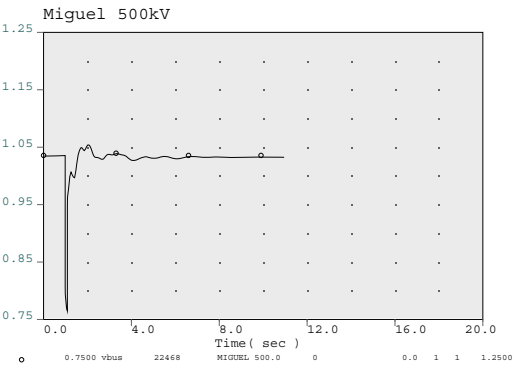
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OtayMesa #3



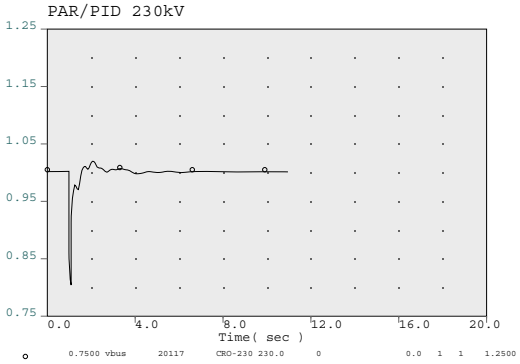
Miguel 500kV



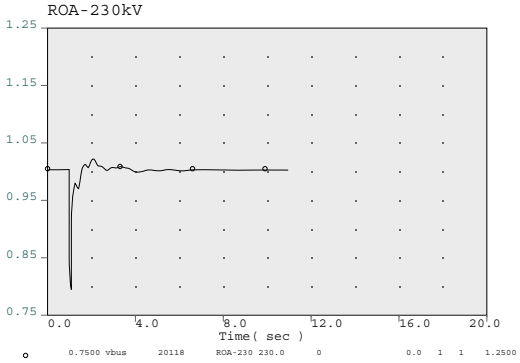
SDG&E Cluster 2 - pre int
2014 Light Autumn
OM - SX 230 kV N-1

Affected System Voltage Check and Comparison

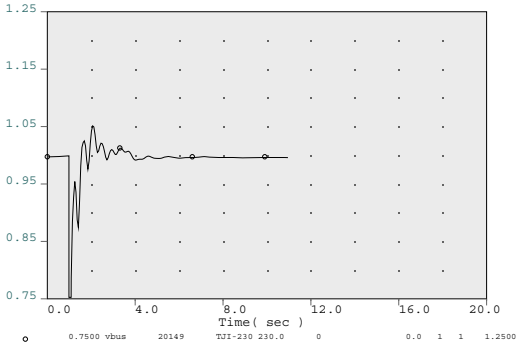
PAR/PID 230kV



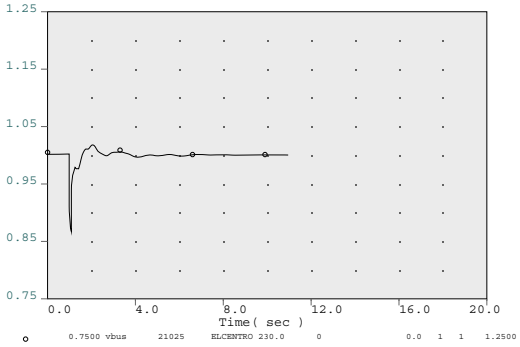
ROA-230kV



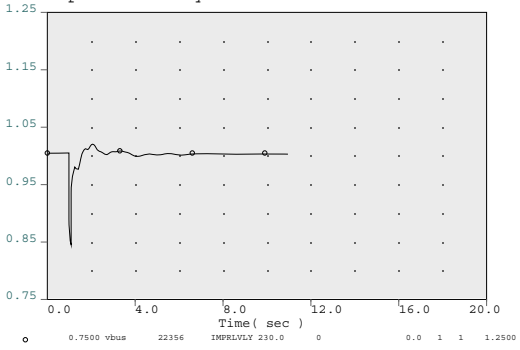
TJ1-230kV



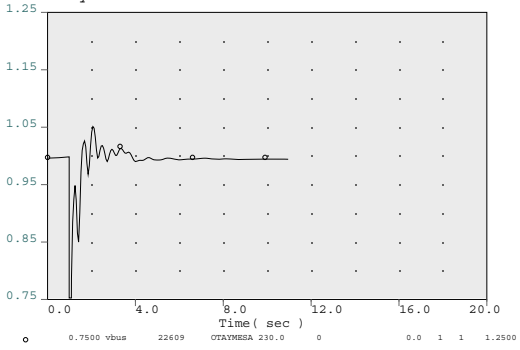
El Centro



Imperial Valley 230kV

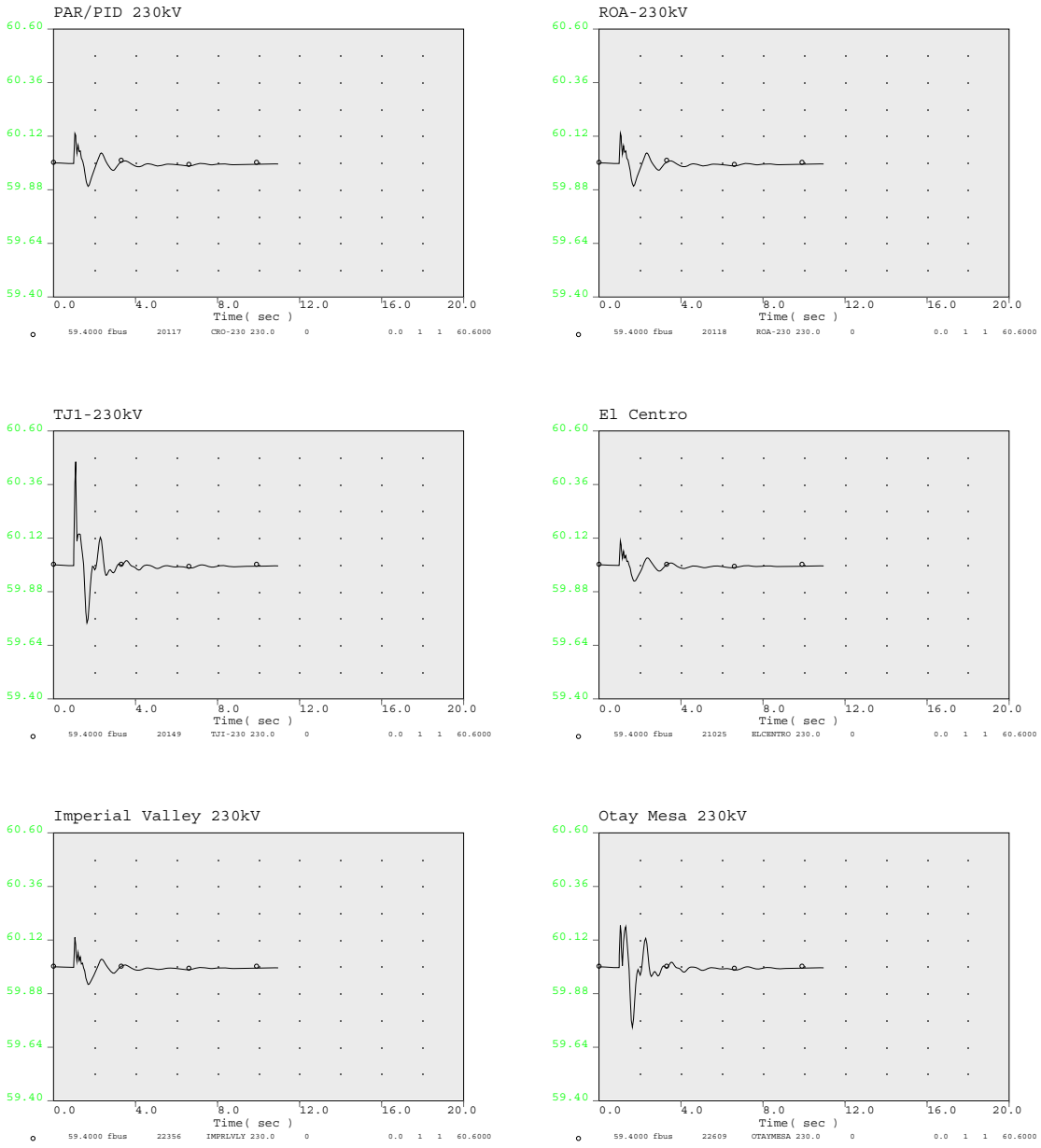


Otay Mesa 230kV



SDG&E Cluster 2 - pre int
2014 Light Autumn
OM - SX 230 kV N-1

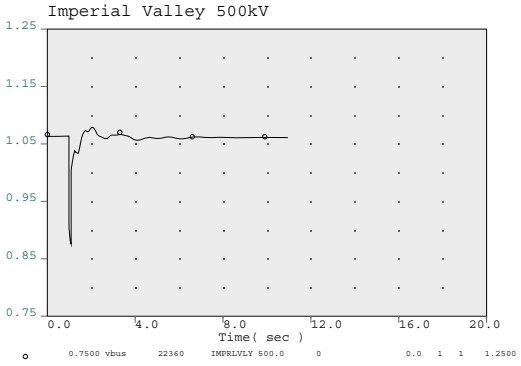
Affected System Frequency Check and Comparison



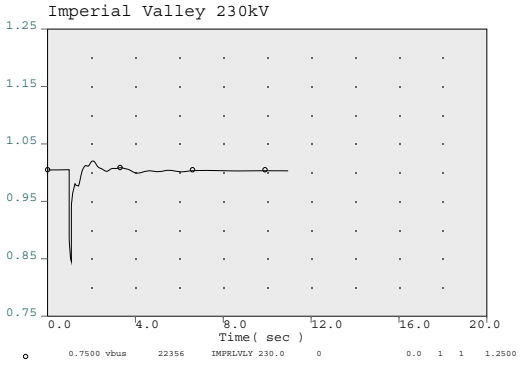
SDG&E Cluster 2 - pre int
2014 Light Autumn
OM - SX 230 kV N-1

Imperial Valley Area - VOLTAGE

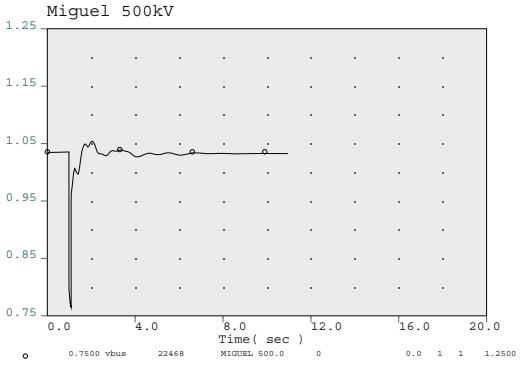
Imperial Valley 500kV



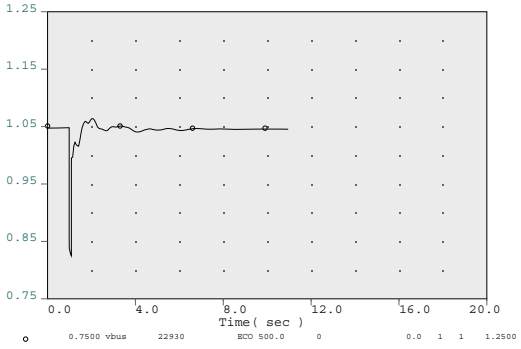
Imperial Valley 230kV



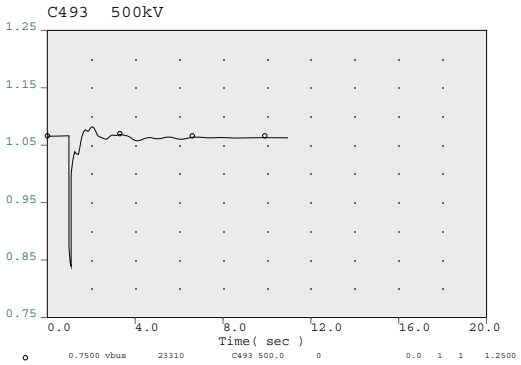
Miguel 500kV



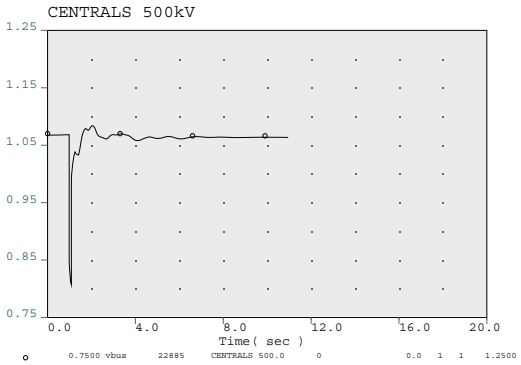
Windfarms 500



C493 500kV



CENTRALS 500kV



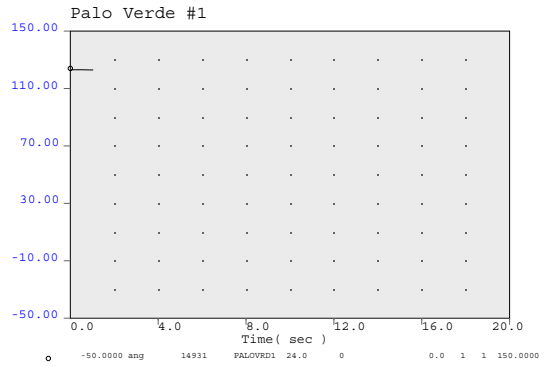
SDG&E Cluster 2 - pre int
2014 Light Autumn
OM - SX 230 kV N-1

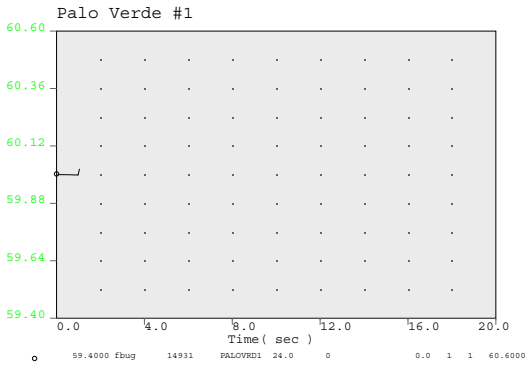
Imperial Valley Area - Frequency

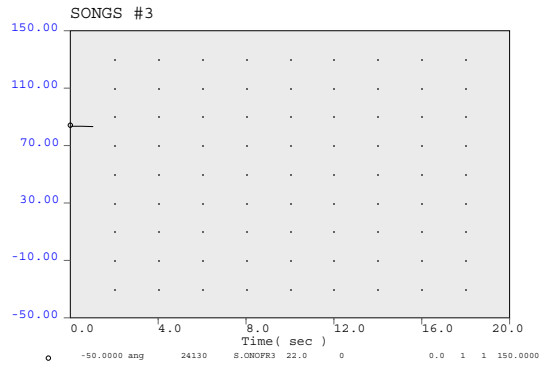


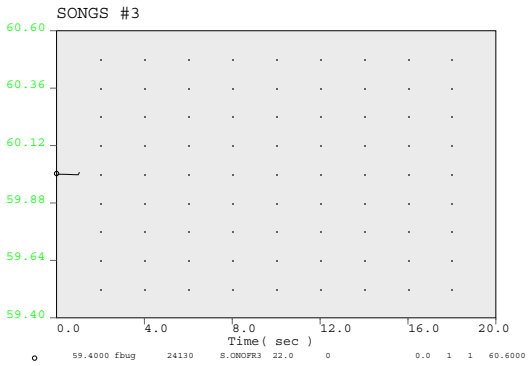
SDG&E Cluster 2 - pre int
2014 Light Autumn
OM - SX 230 kV N-1

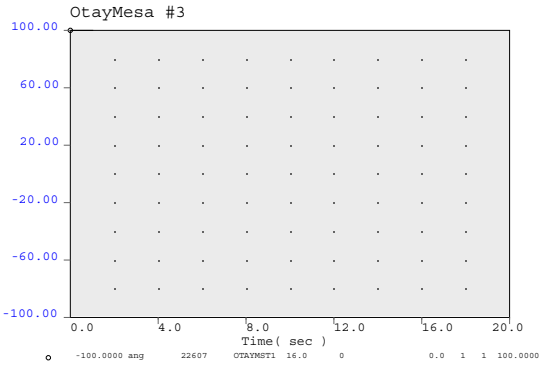
RELATIVE ROTOR ANGLE & FREQUENCY

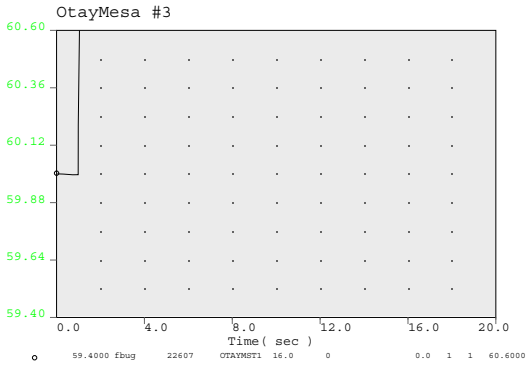












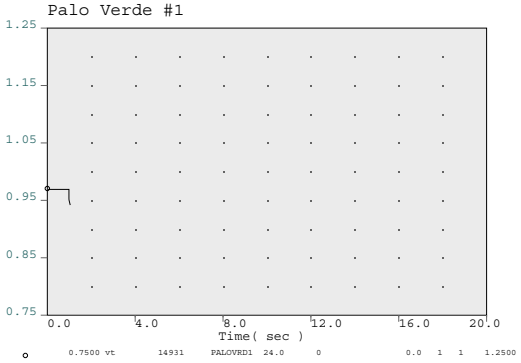
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

Page 1

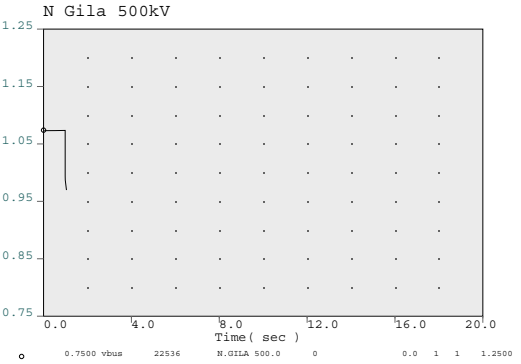
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RELATIVE VOLTAGE

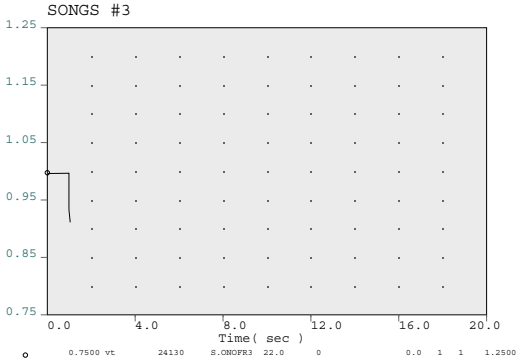
Palo Verde #1



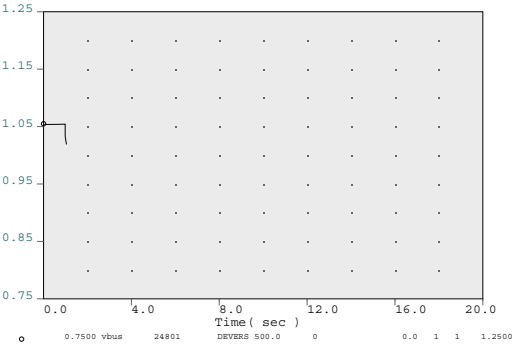
N Gila 500kV



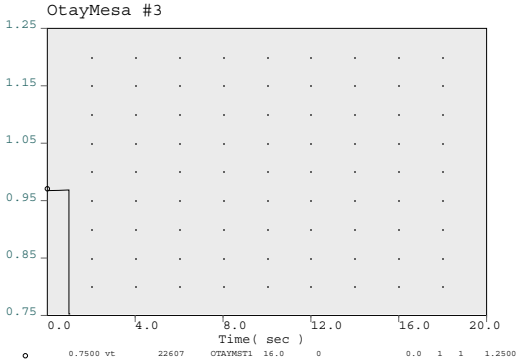
SONGS #3



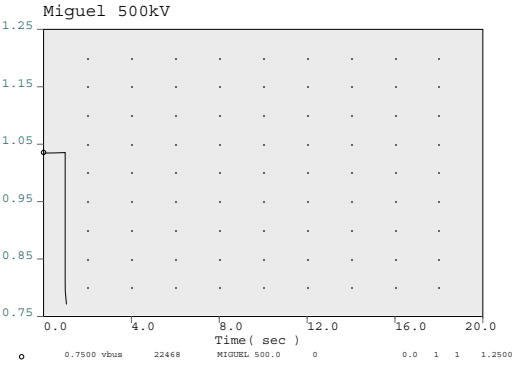
Devers 500



OtayMesa #3



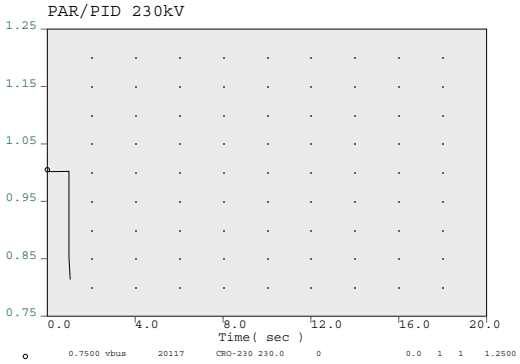
Miguel 500kV



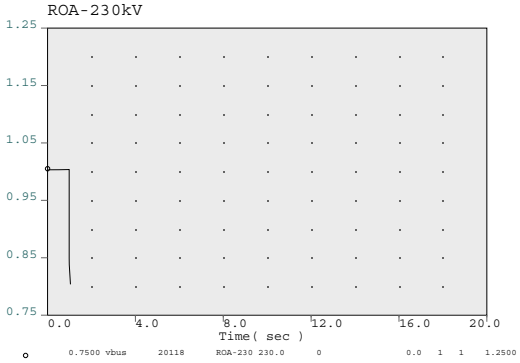
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

Affected System Voltage Check and Comparison

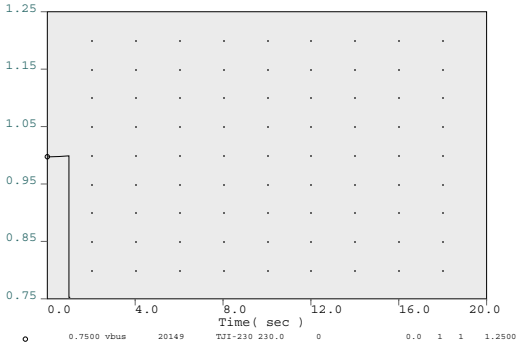
PAR/PID 230kV



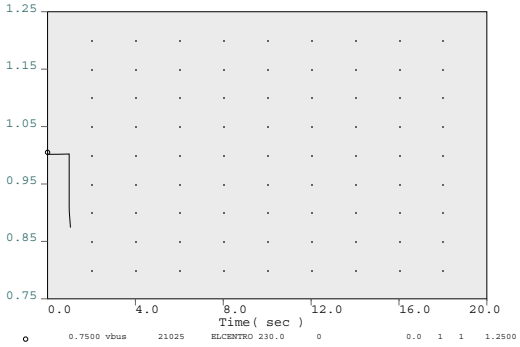
ROA-230kV



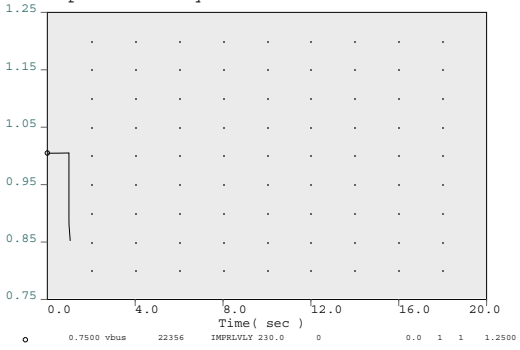
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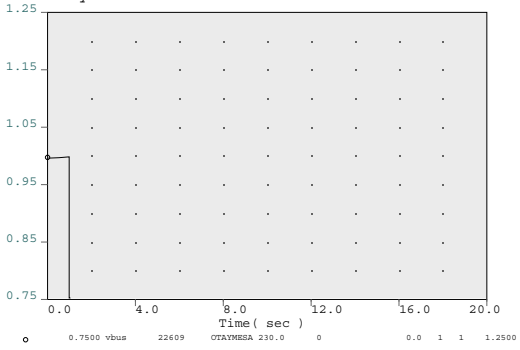
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Imperial Valley 230kV

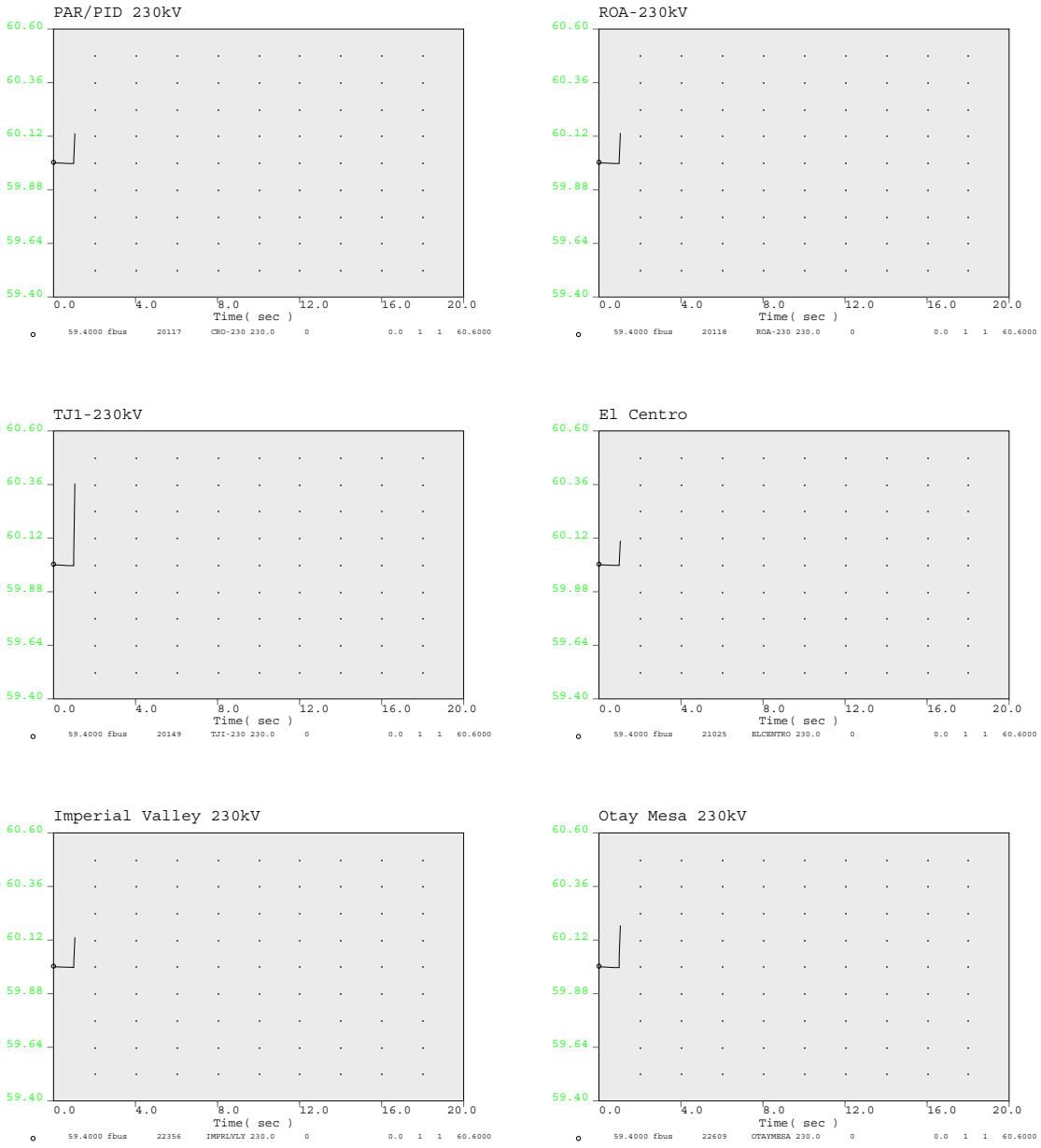


Otay Mesa 230kV



SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

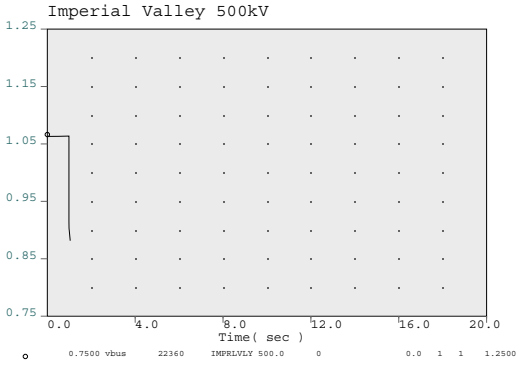
Affected System Frequency Check and Comparison



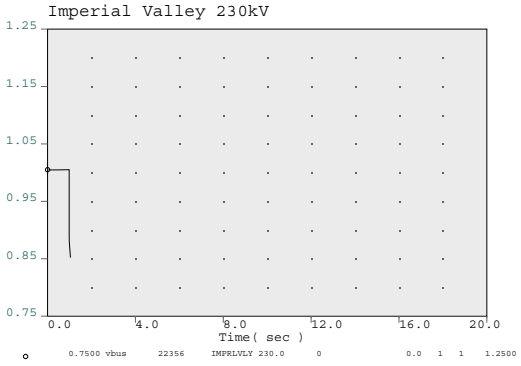
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

Imperial Valley Area - VOLTAGE

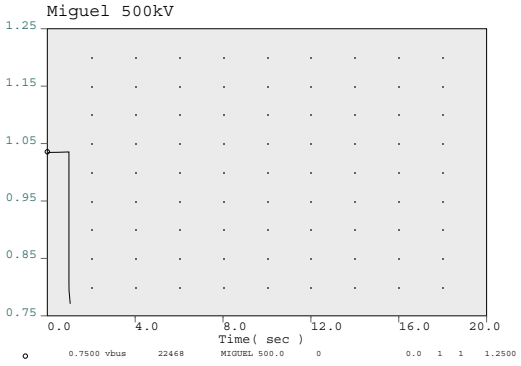
Imperial Valley 500kV



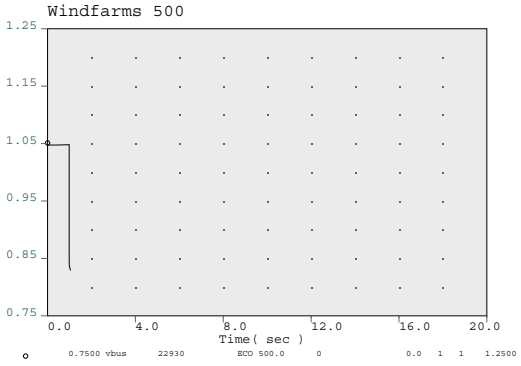
Imperial Valley 230kV



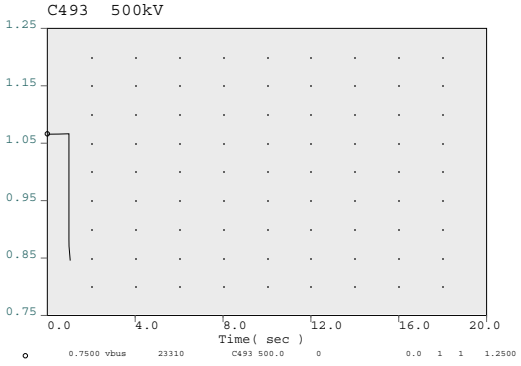
Miguel 500kV



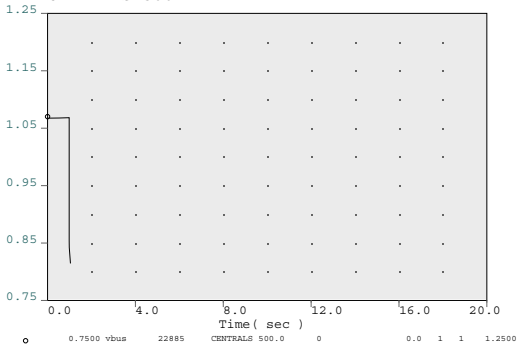
Windfarms 500



C493 500kV

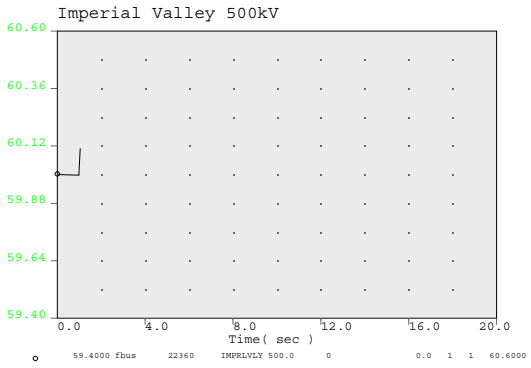


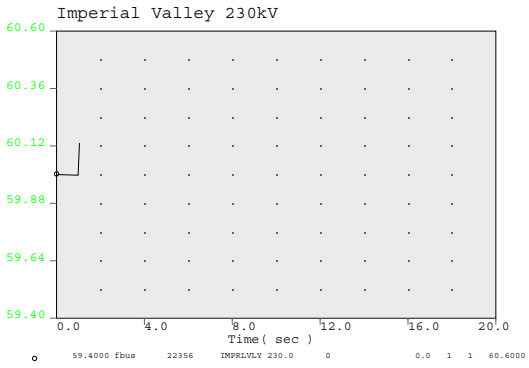
CENTRALS 500kV

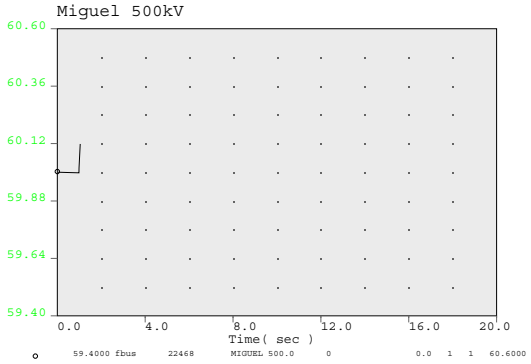


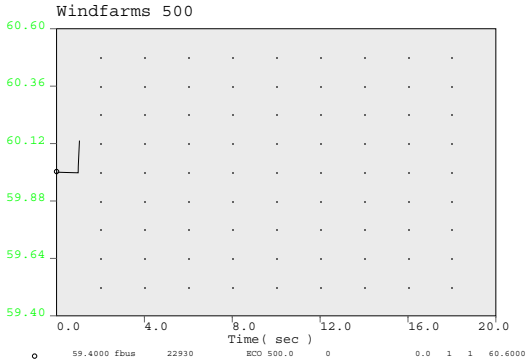
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

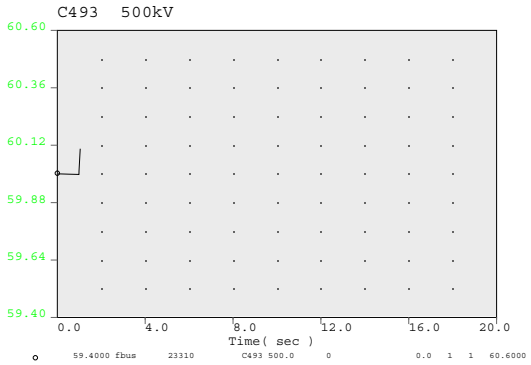
Imperial Valley Area - Frequency

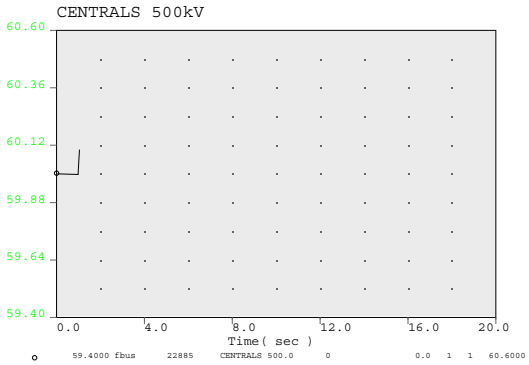






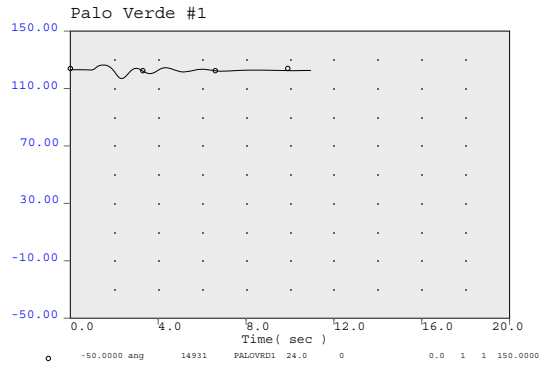


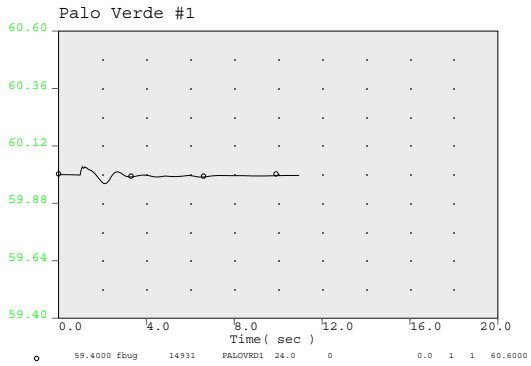


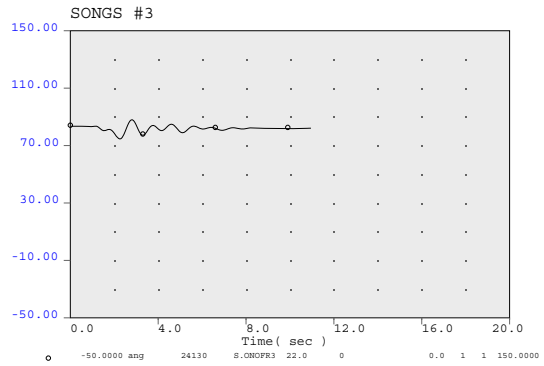


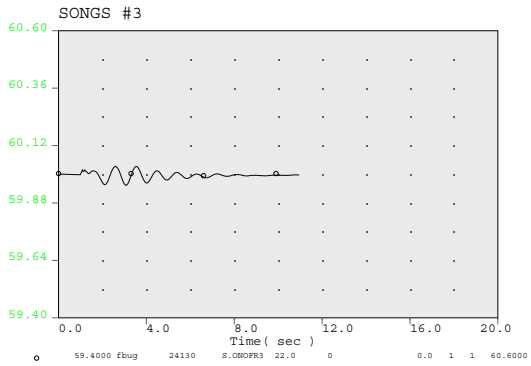
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

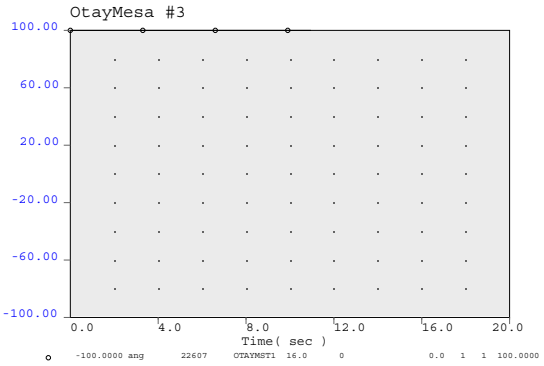
RELATIVE ROTOR ANGLE & FREQUENCY

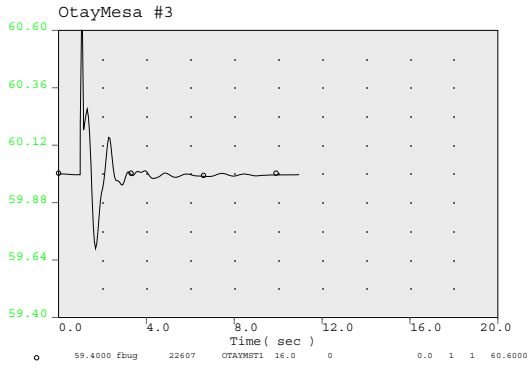












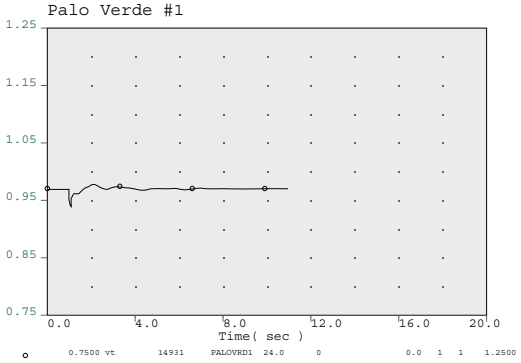
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

Page 1

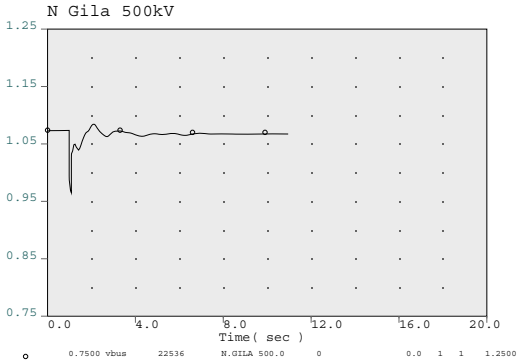
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RELATIVE VOLTAGE

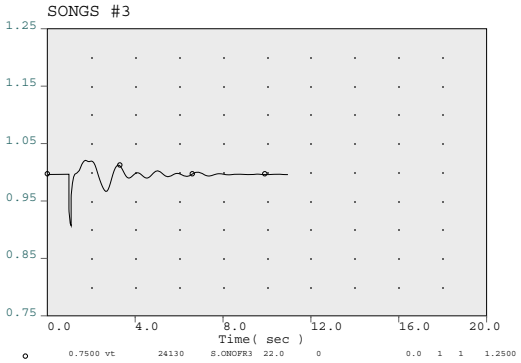
Palo Verde #1



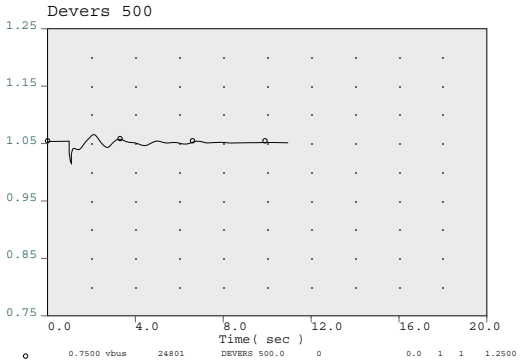
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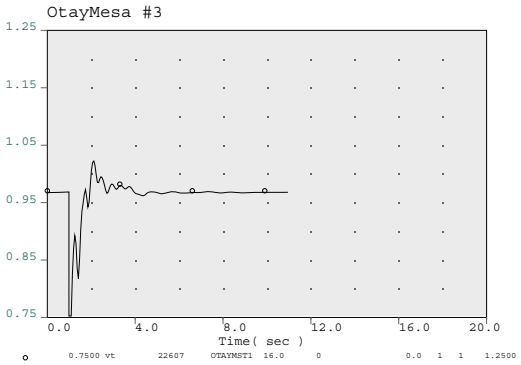
SONGS #3



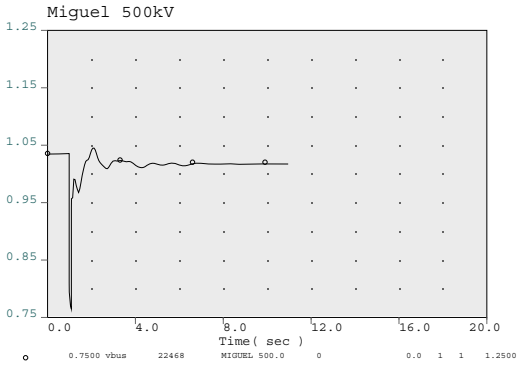
Devers 500



OtayMesa #3



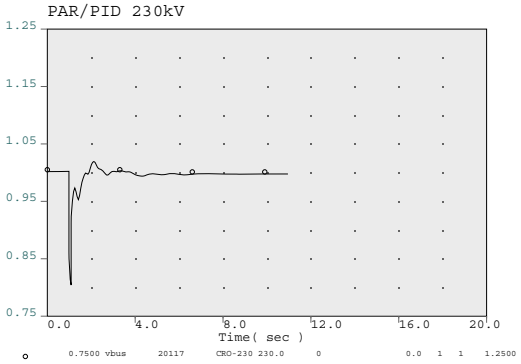
Miguel 500kV



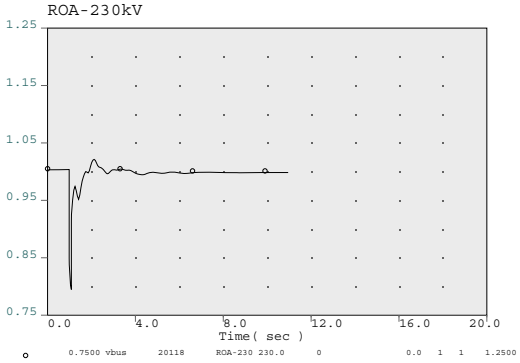
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

Affected System Voltage Check and Comparison

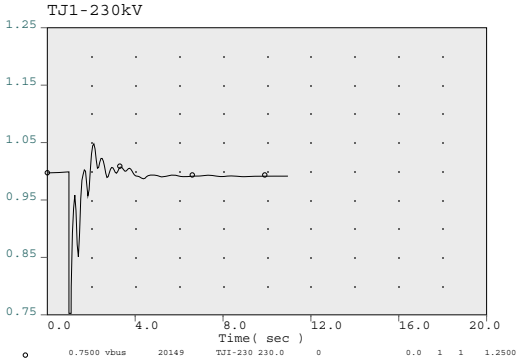
PAR/PID 230kV



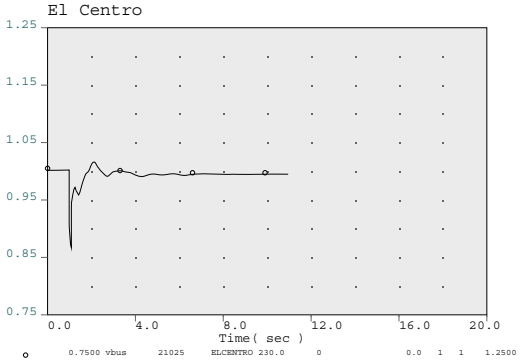
ROA-230kV



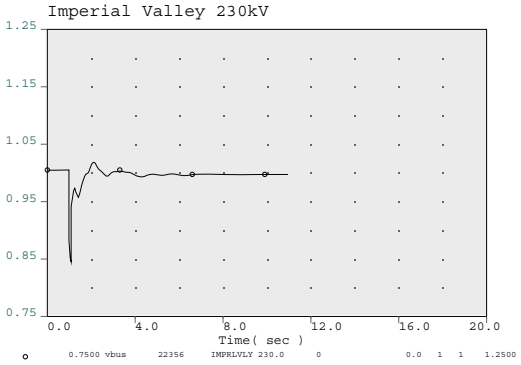
TJ1-230kV



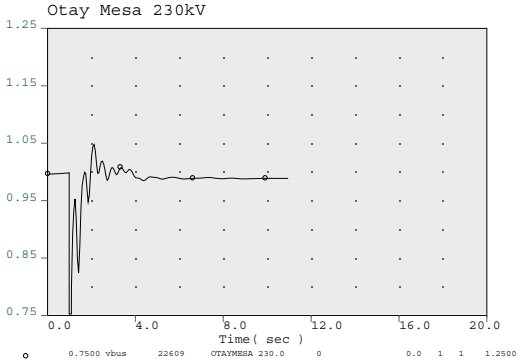
El Centro



Imperial Valley 230kV

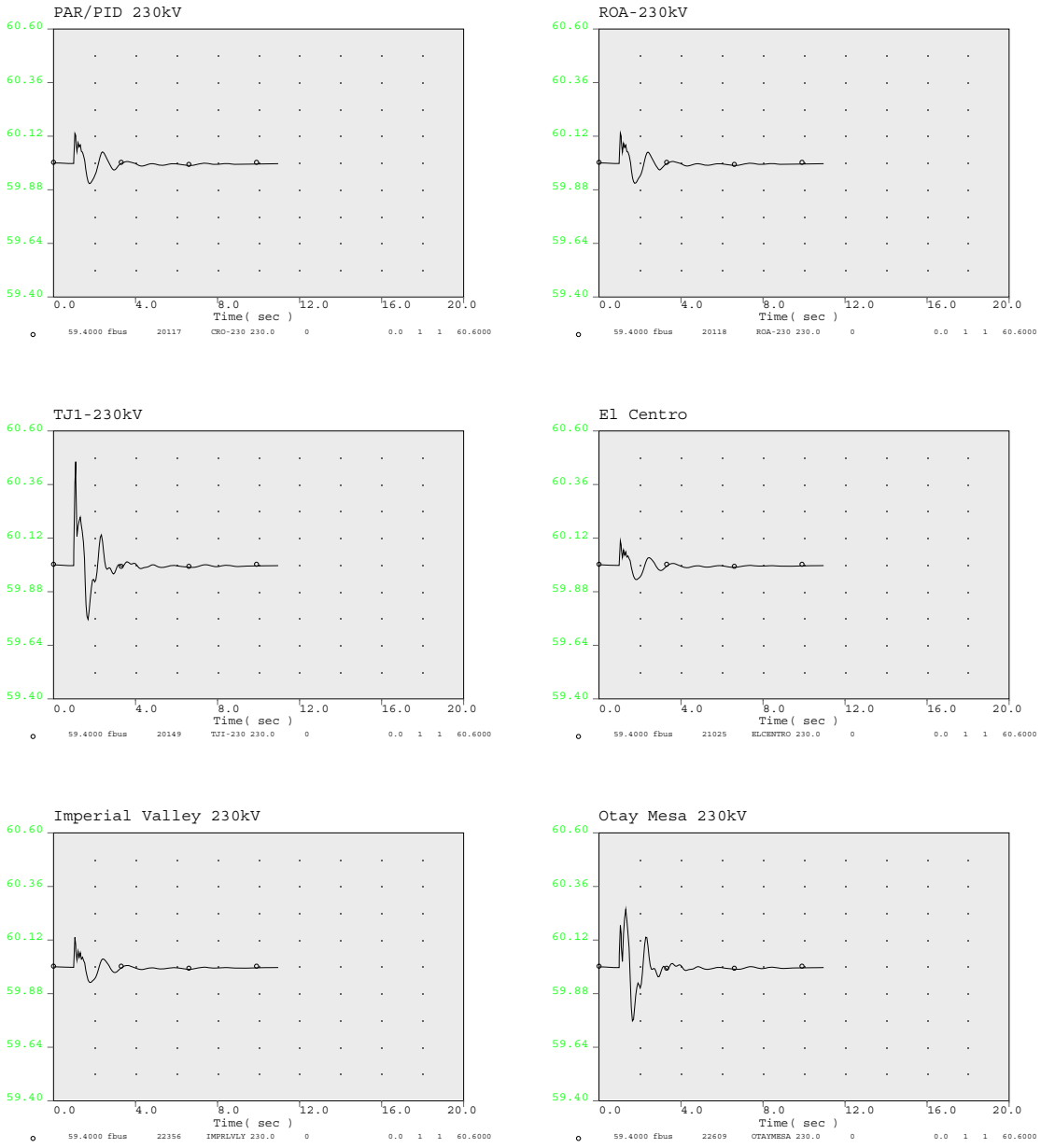


Otay Mesa 230kV



SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

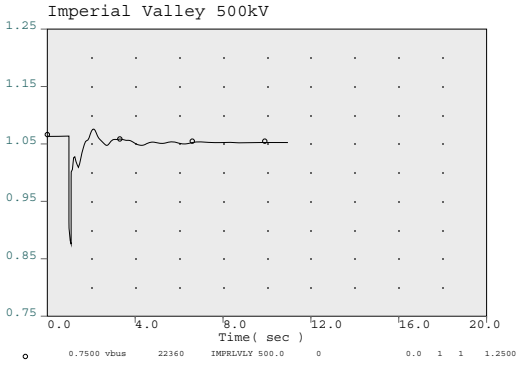
Affected System Frequency Check and Comparison



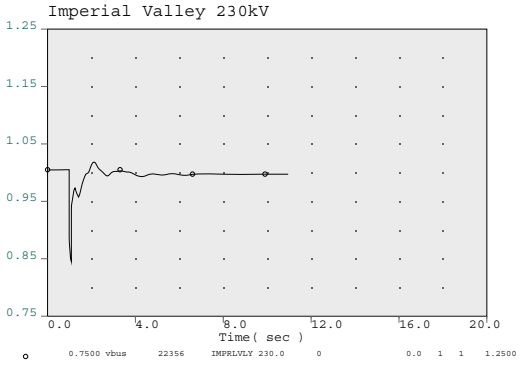
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

Imperial Valley Area - VOLTAGE

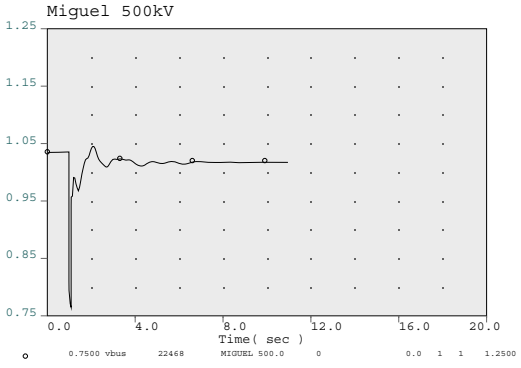
Imperial Valley 500kV



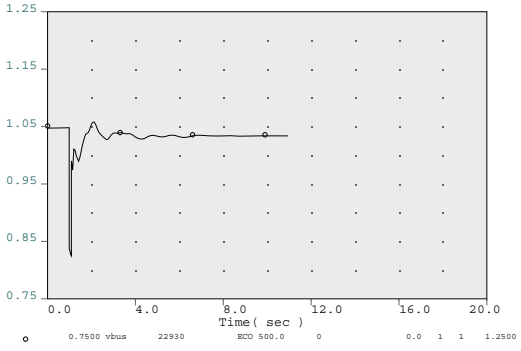
Imperial Valley 230kV



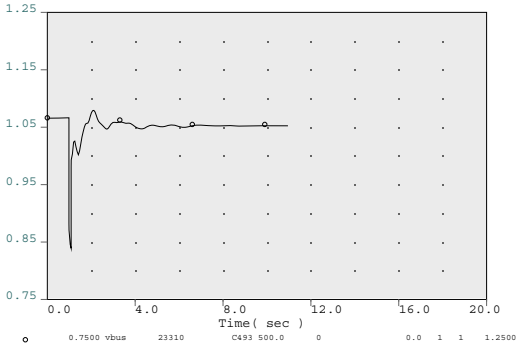
Miguel 500kV



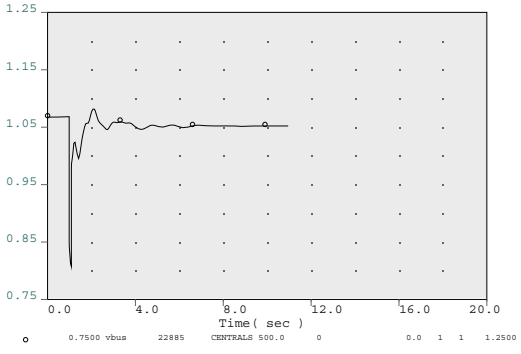
Windfarms 500



C493 500kV



CENTRALS 500kV



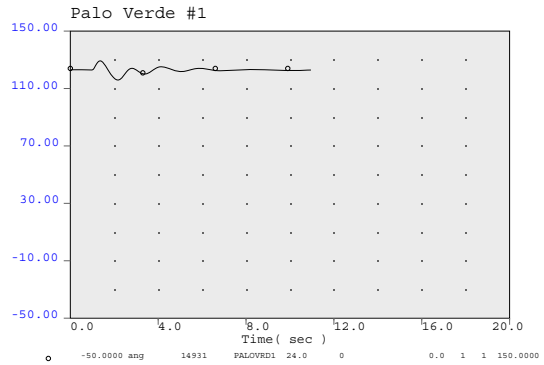
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

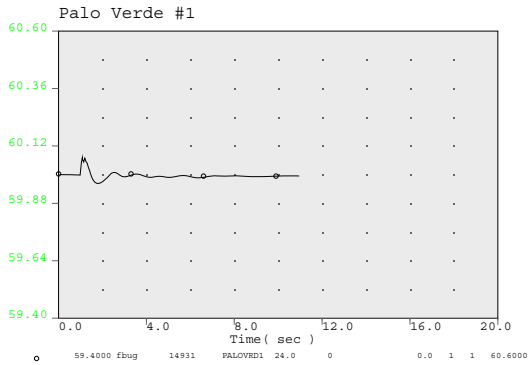
Imperial Valley Area - Frequency

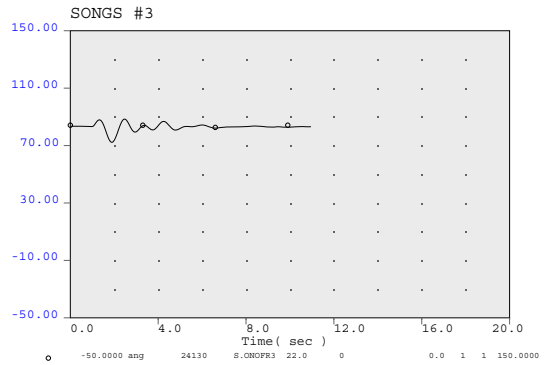


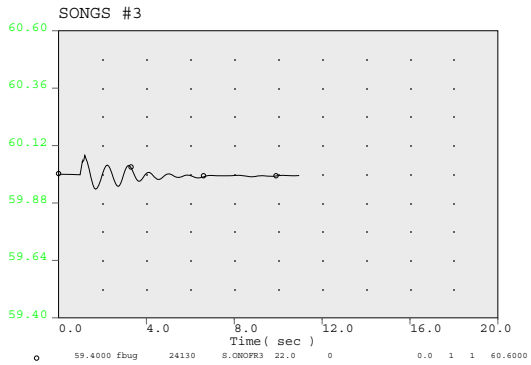
SDG&E Cluster 2 - pre int
2014 Light Autumn
Otay Mesa - Southbay 230 kV N-1

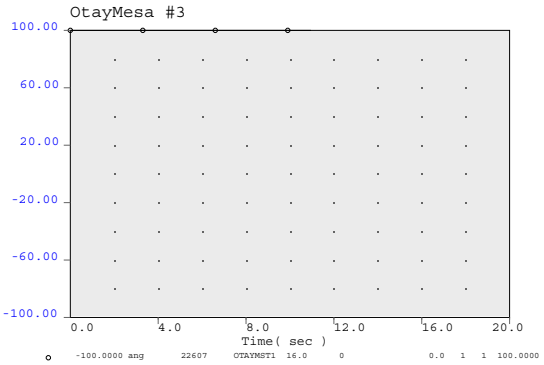
RELATIVE ROTOR ANGLE & FREQUENCY

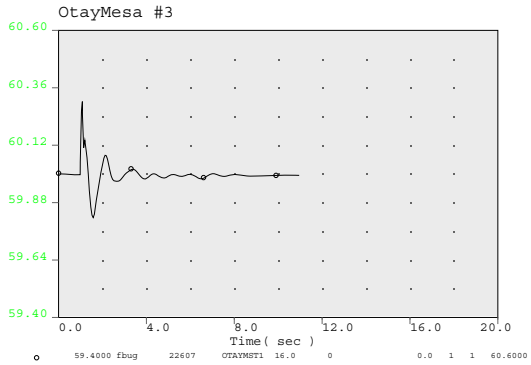












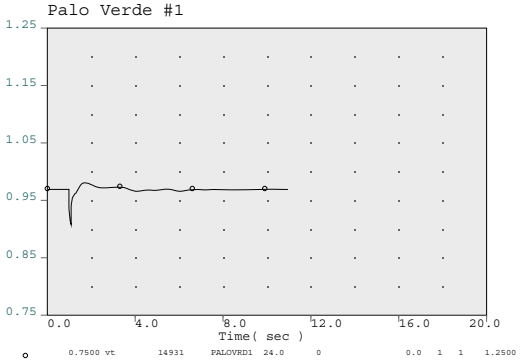
SDG&E Cluster 2 - pre int
2014 Light Autumn
Sycamore - Miguel 230 kV N-1

Page 1

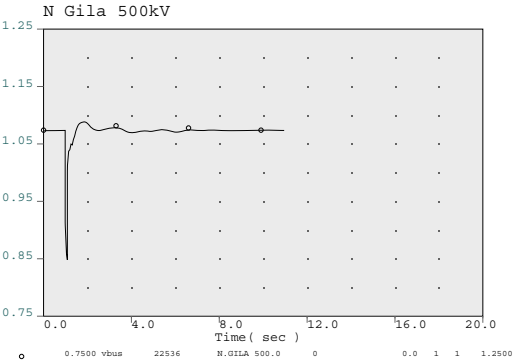
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RELATIVE VOLTAGE

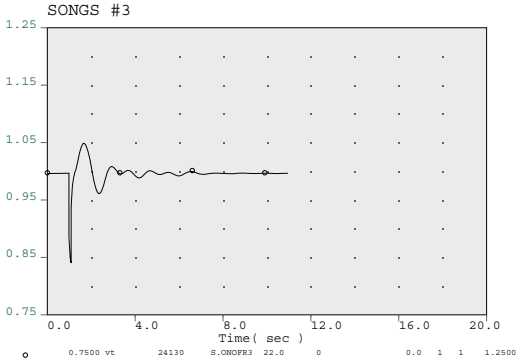
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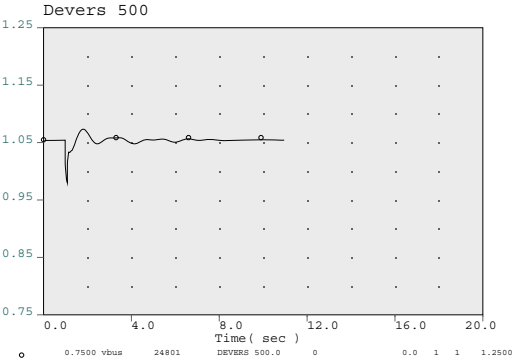
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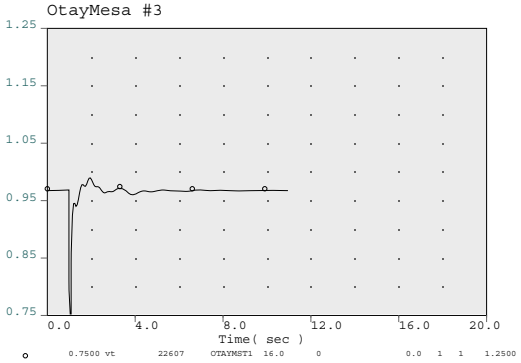
SONGS #3



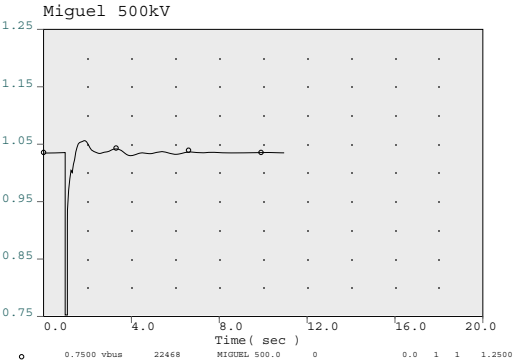
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OtayMesa #3



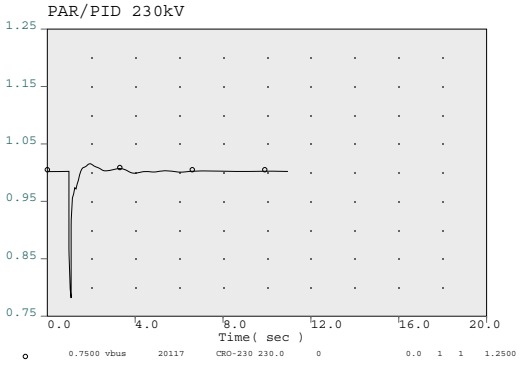
Miguel 500kV



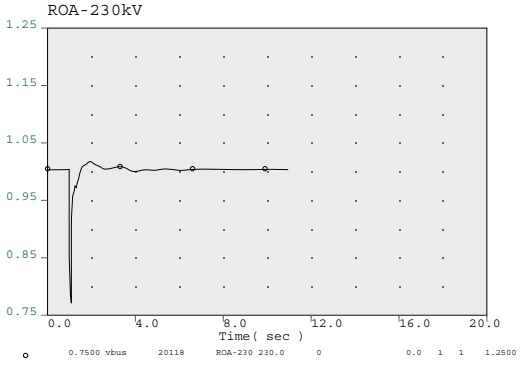
SDG&E Cluster 2 - pre int
2014 Light Autumn
Sycamore - Miguel 230 kV N-1

Affected System Voltage Check and Comparison

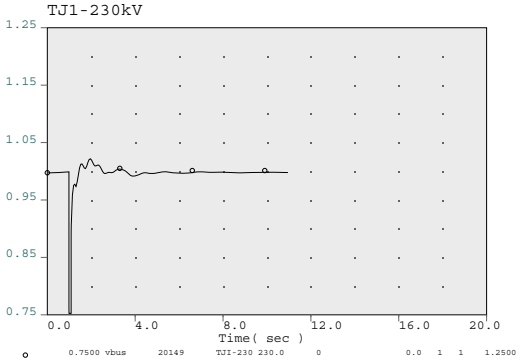
PAR/PID 230kV



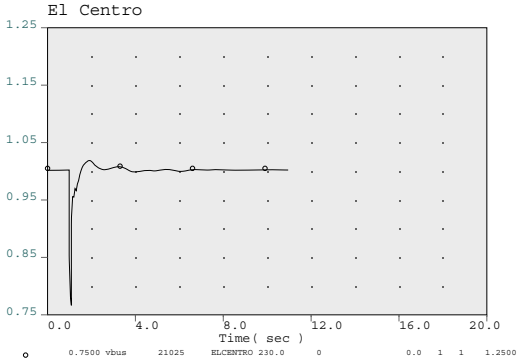
ROA-230kV



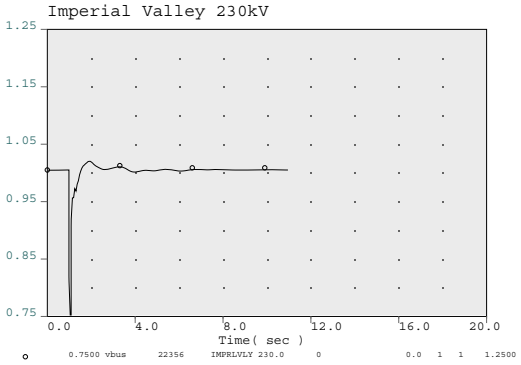
TJ1-230kV



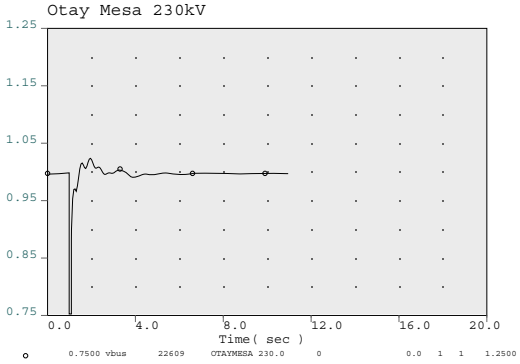
El Centro



Imperial Valley 230kV



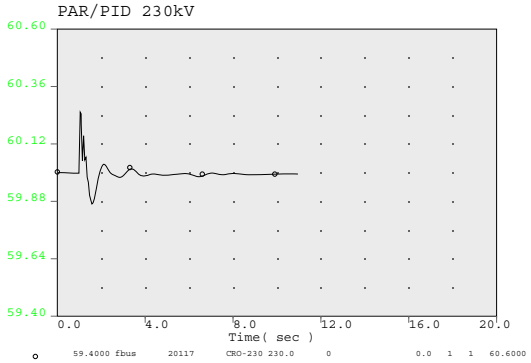
Otay Mesa 230kV



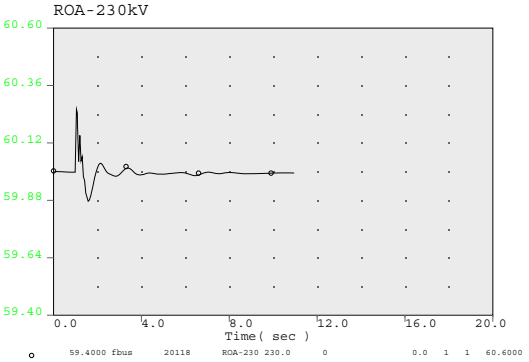
SDG&E Cluster 2 - pre int
2014 Light Autumn
Sycamore - Miguel 230 kV N-1

Affected System Frequency Check and Comparison

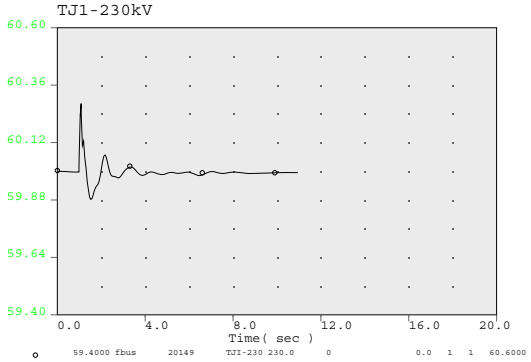
PAR/PID 230kV



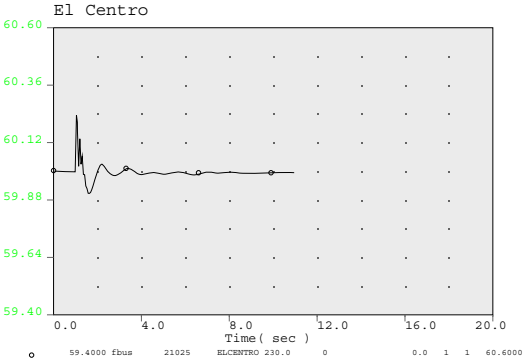
ROA-230kV



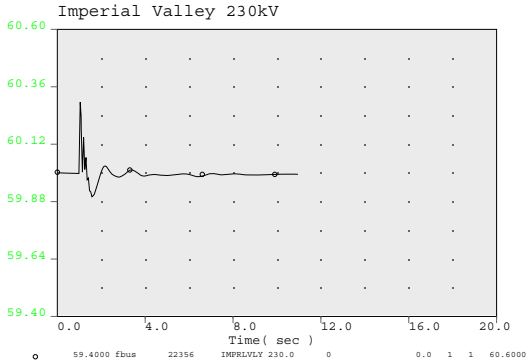
TJ1-230kV



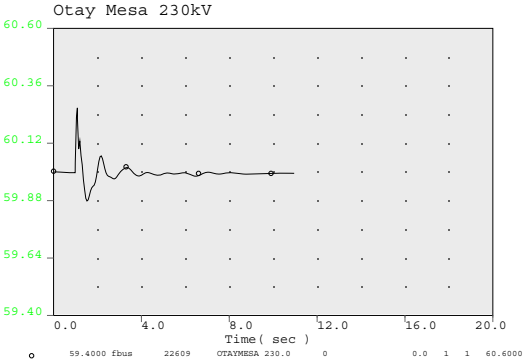
El Centro



Imperial Valley 230kV



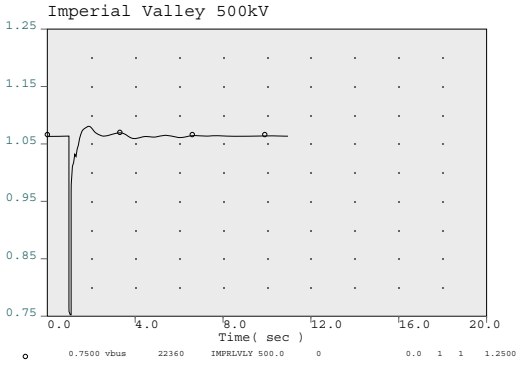
Otay Mesa 230kV



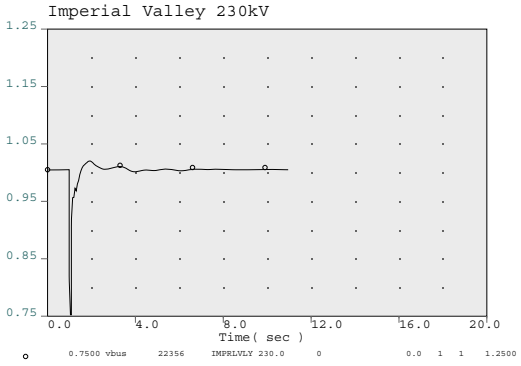
SDG&E Cluster 2 - pre int
2014 Light Autumn
Sycamore - Miguel 230 kV N-1

Imperial Valley Area - VOLTAGE

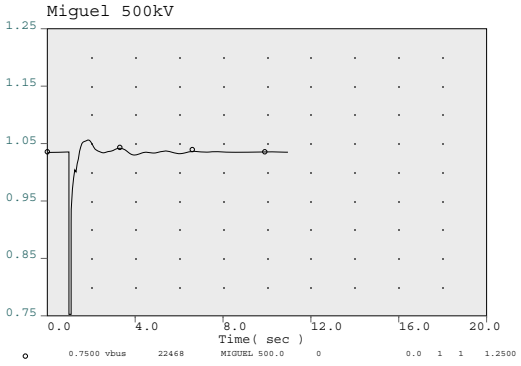
Imperial Valley 500kV



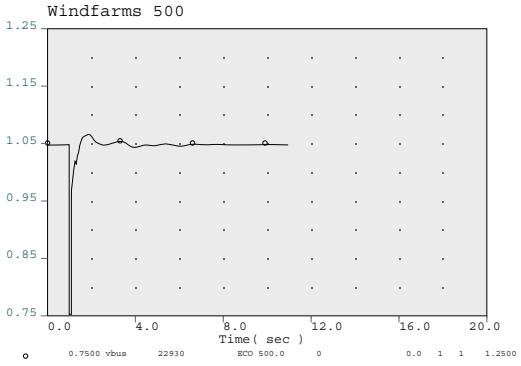
Imperial Valley 230kV



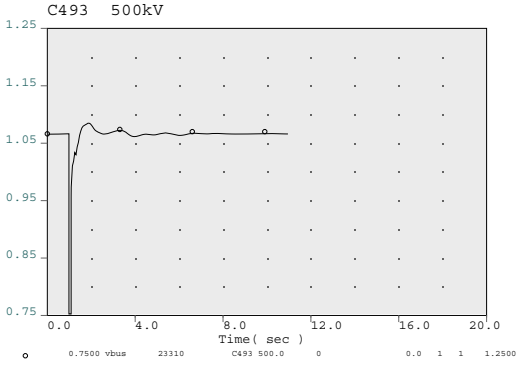
Miguel 500kV



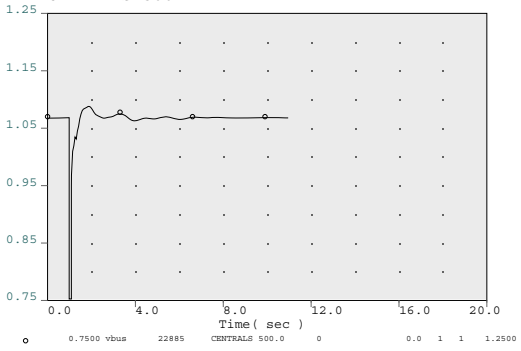
Windfarms 500



C493 500kV

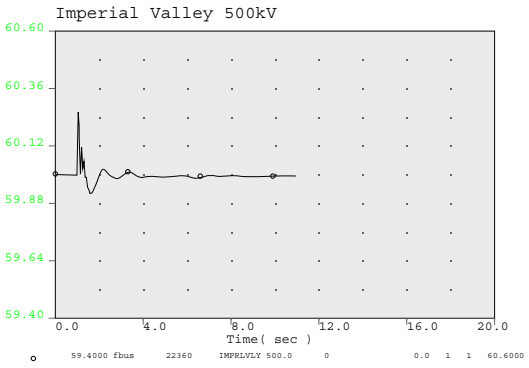


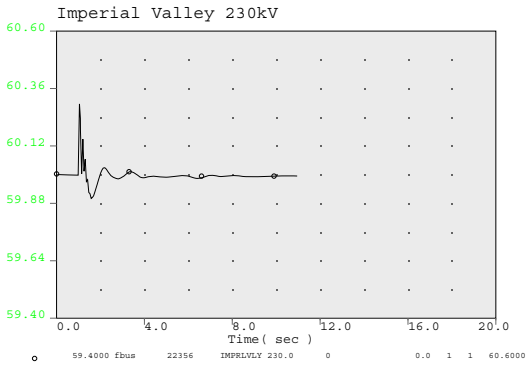
CENTRALS 500kV

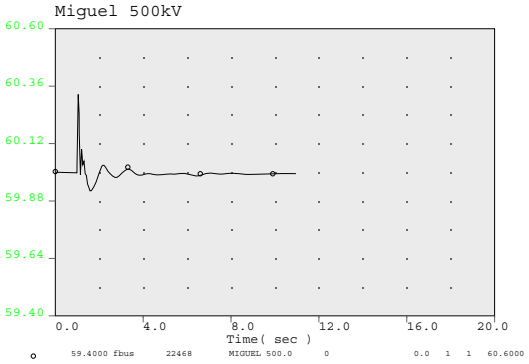


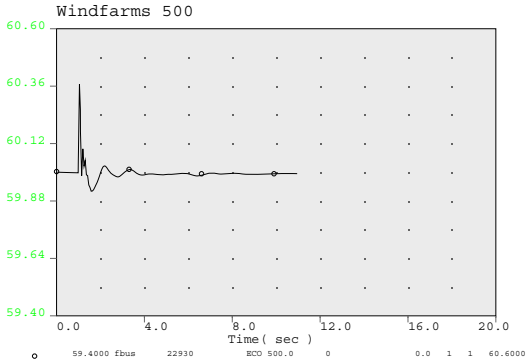
SDG&E Cluster 2 - pre int
2014 Light Autumn
Sycamore - Miguel 230 kV N-1

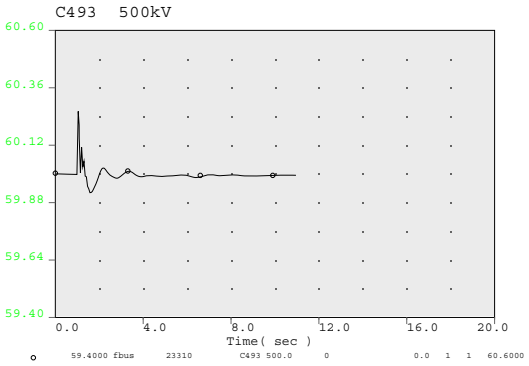
Imperial Valley Area - Frequency

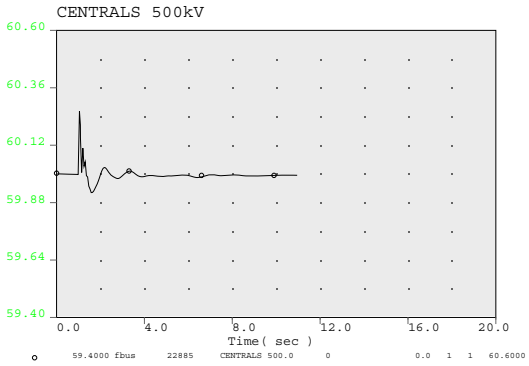






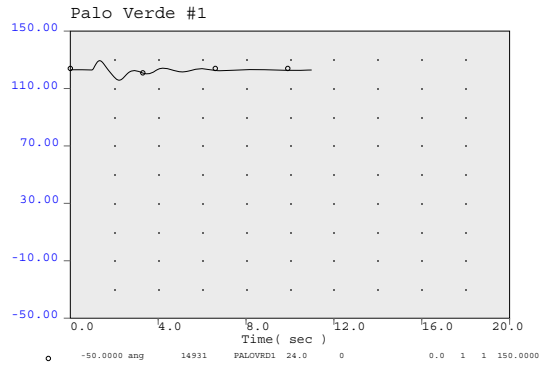


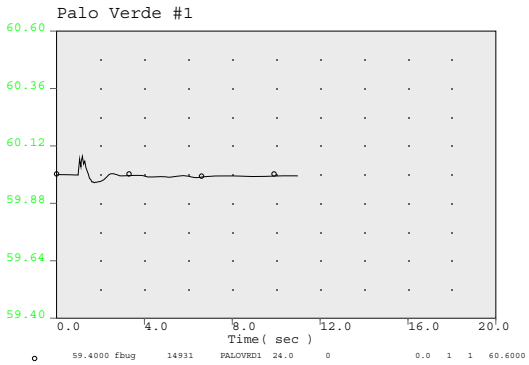


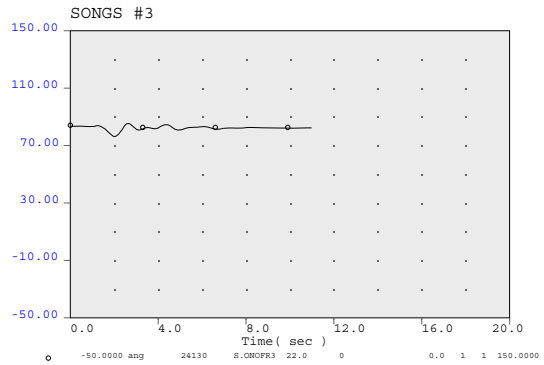


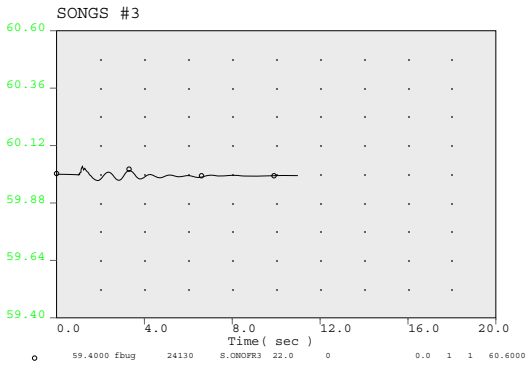
SDG&E Cluster 2 - pre int
2014 Light Autumn
Sycamore - Miguel 230 kV N-1

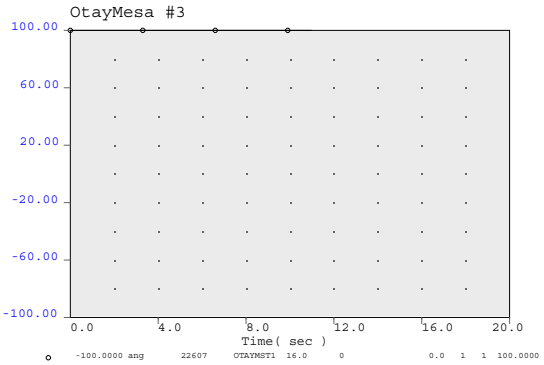
RELATIVE ROTOR ANGLE & FREQUENCY

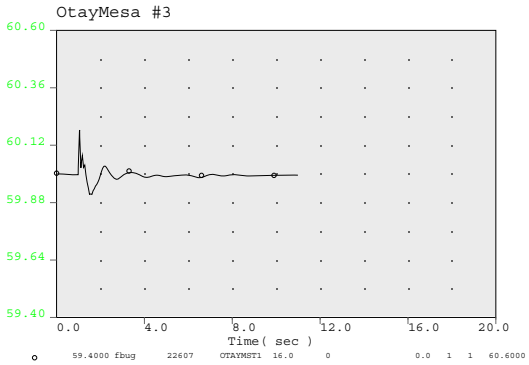








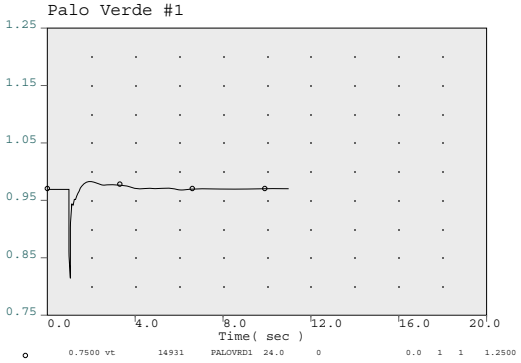




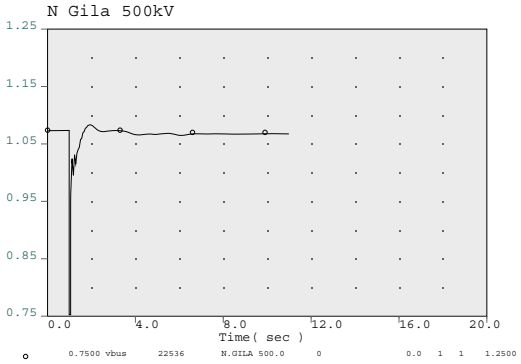
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

RELATIVE VOLTAGE

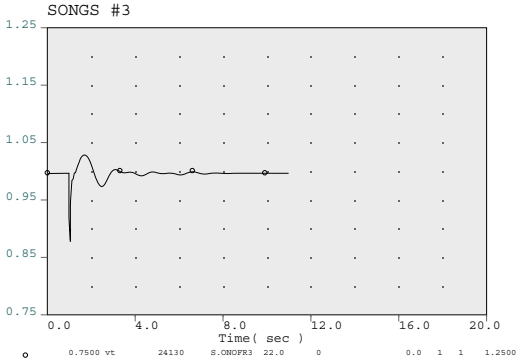
Palo Verde #1



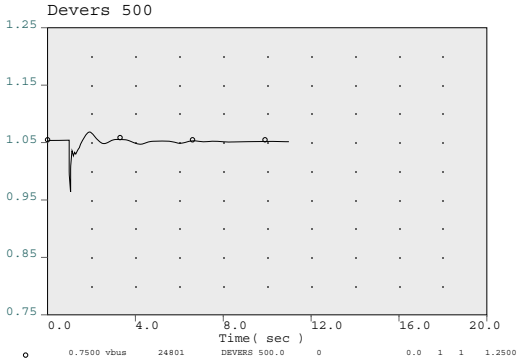
N Gila 500kV



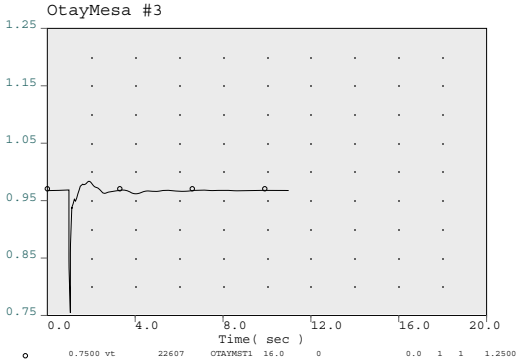
SONGS #3



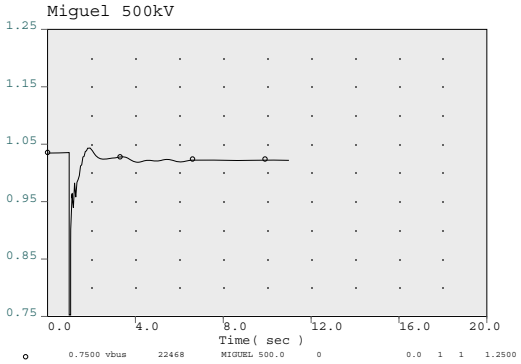
Devers 500



OtayMesa #3



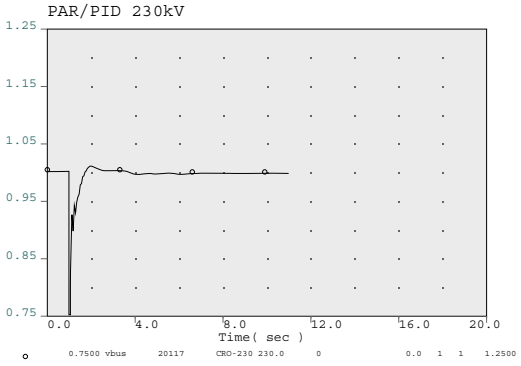
Miguel 500kV



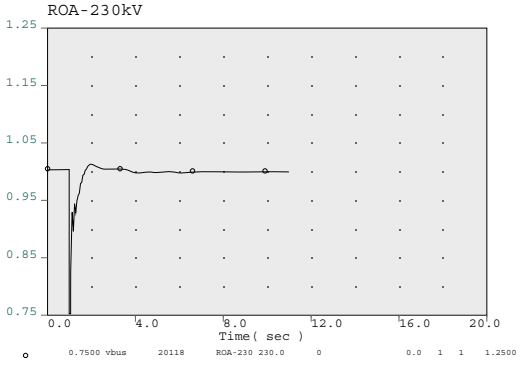
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

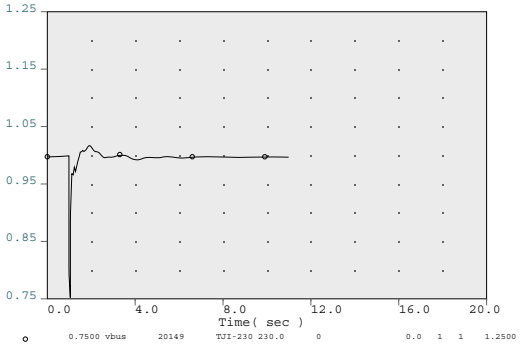
PAR/PID 230kV



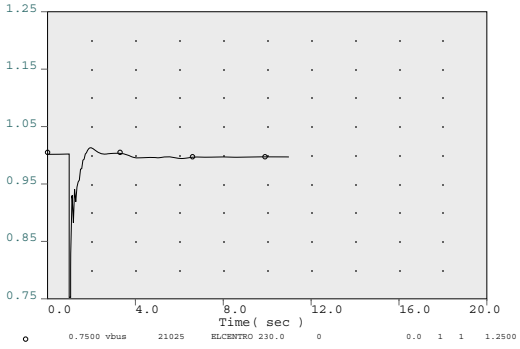
ROA-230kV



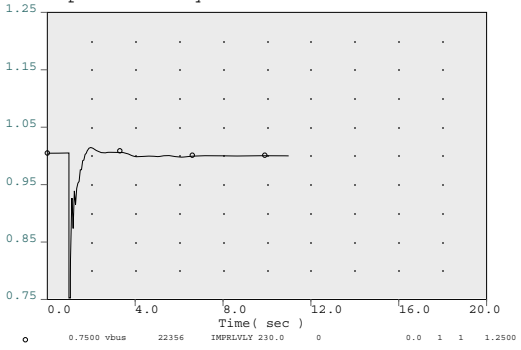
TJ1-230kV



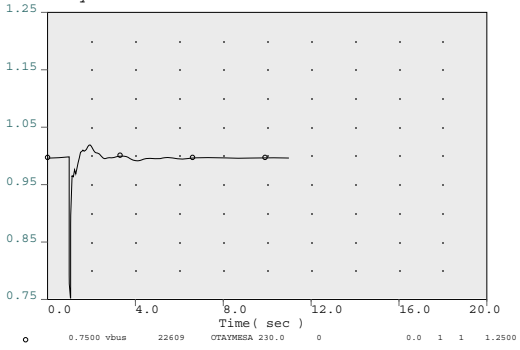
El Centro



Imperial Valley 230kV



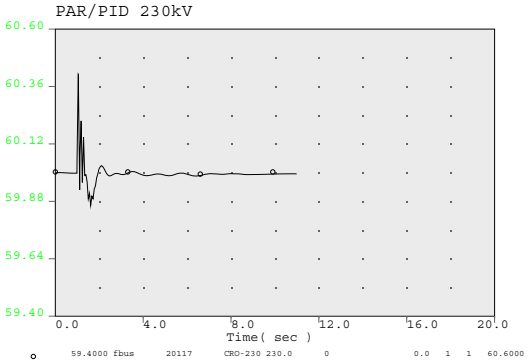
Otay Mesa 230kV



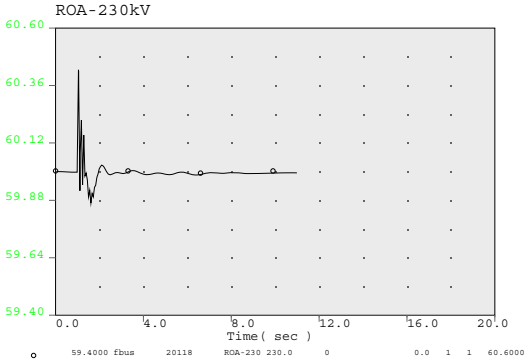
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

Affected System Frequency Check and Comparison

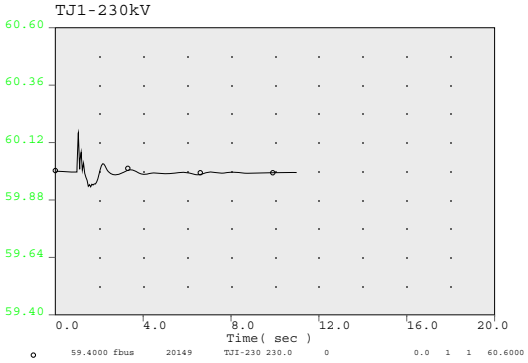
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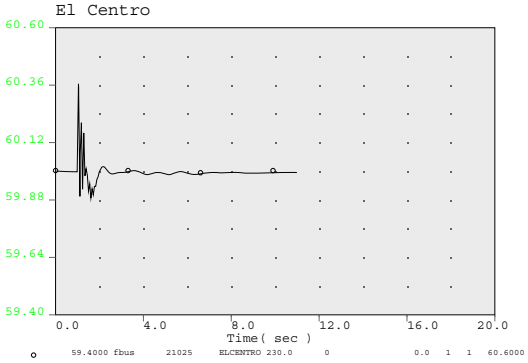
ROA-230kV



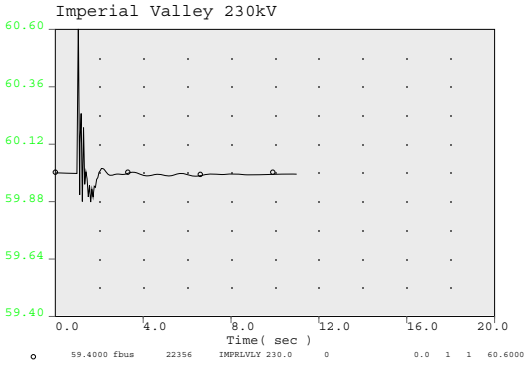
TJ1-230kV



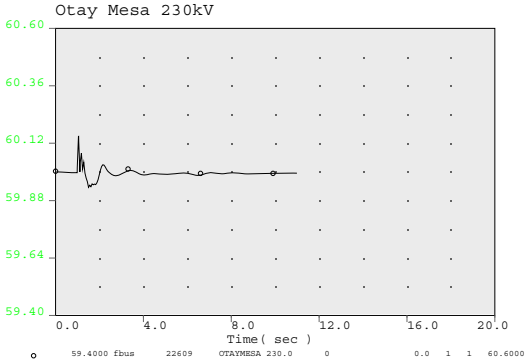
El Centro



Imperial Valley 230kV



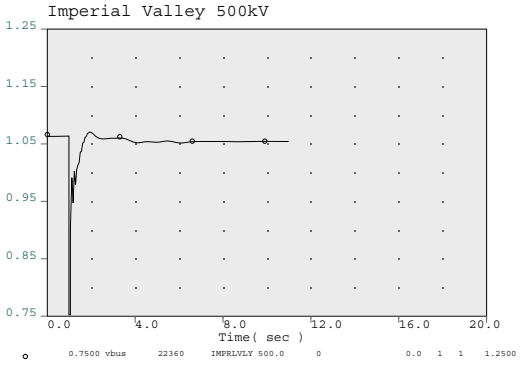
Otay Mesa 230kV



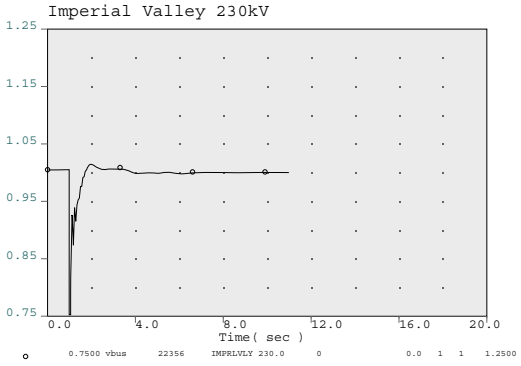
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

Imperial Valley Area - VOLTAGE

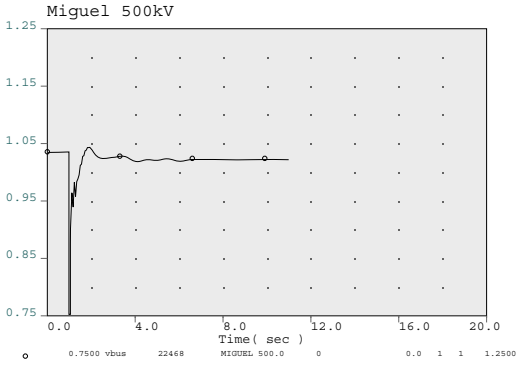
Imperial Valley 500kV



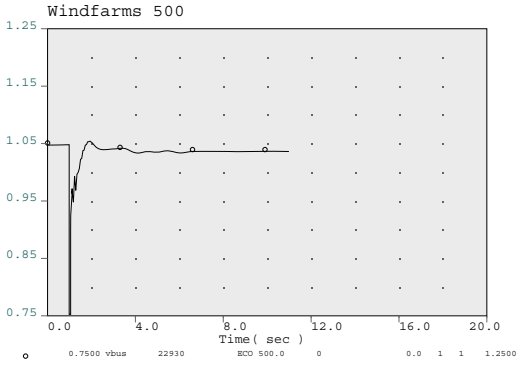
Imperial Valley 230kV



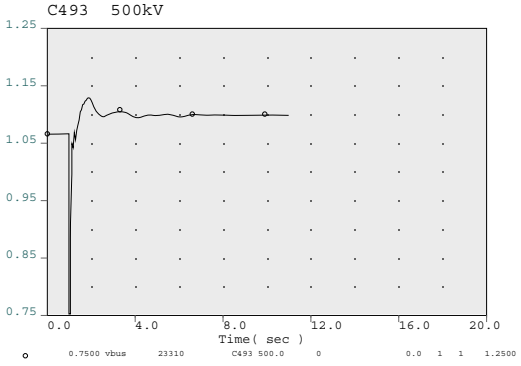
Miguel 500kV



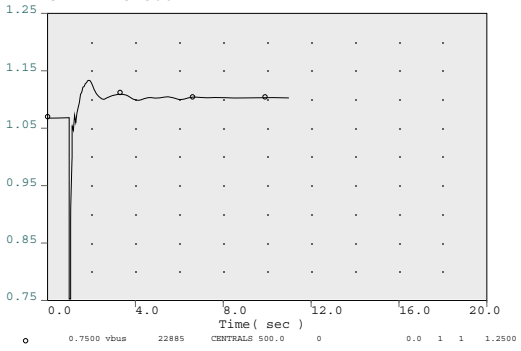
Windfarms 500



C493 500kV

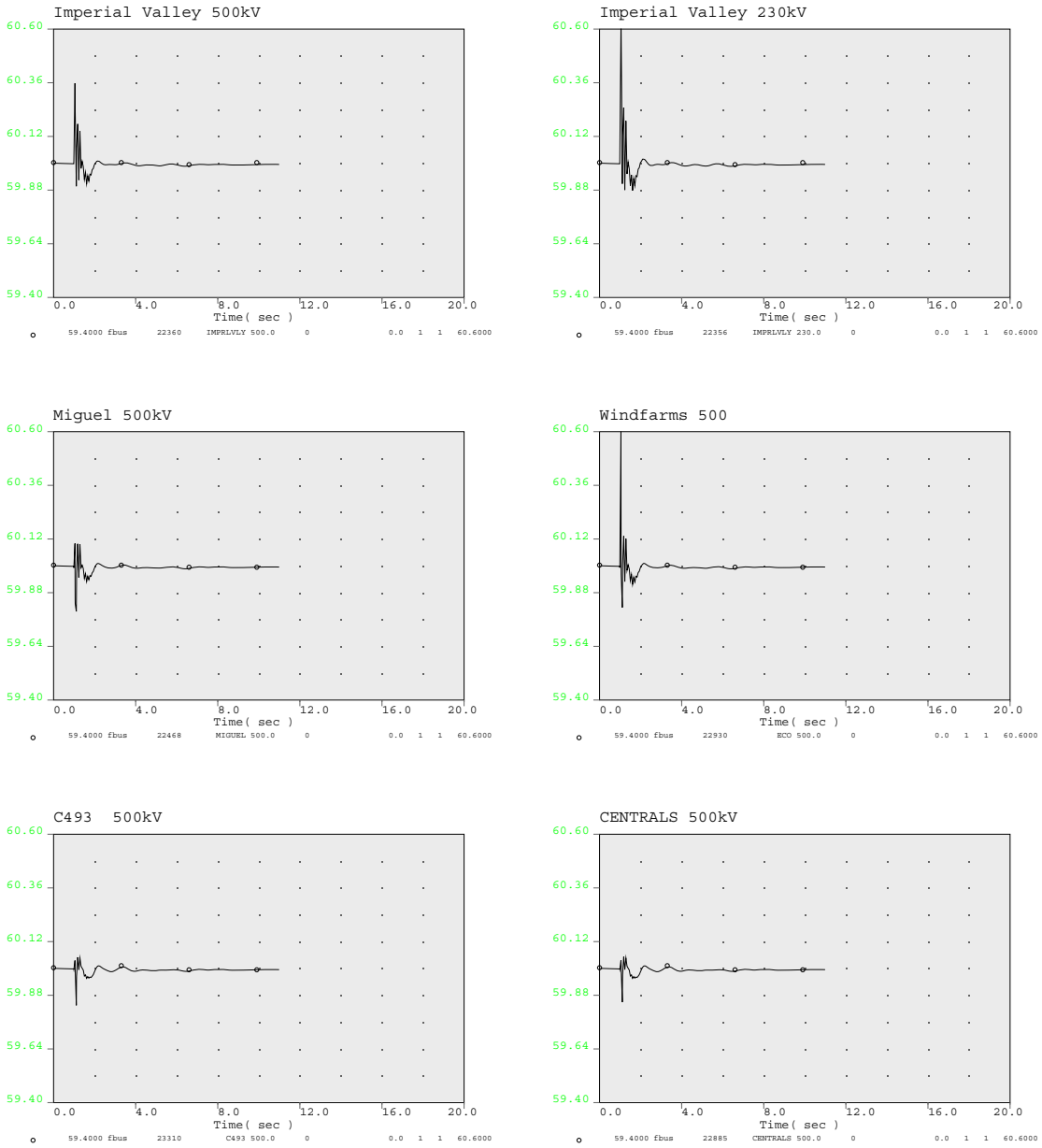


CENTRALS 500kV



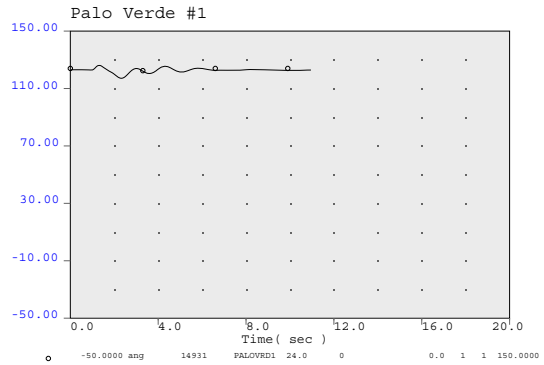
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

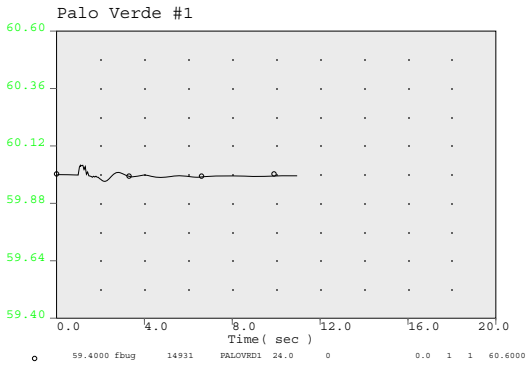
Imperial Valley Area - Frequency

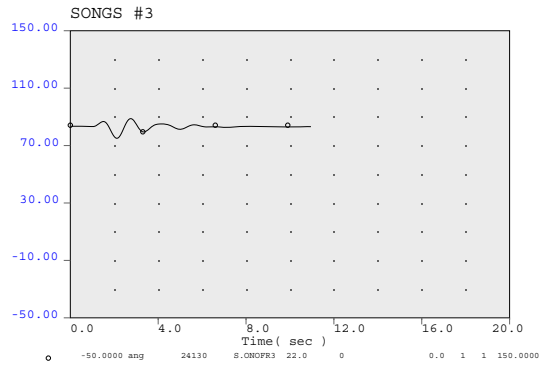


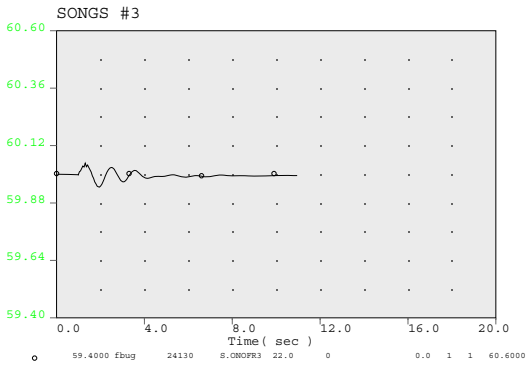
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley- C493 500kV line1

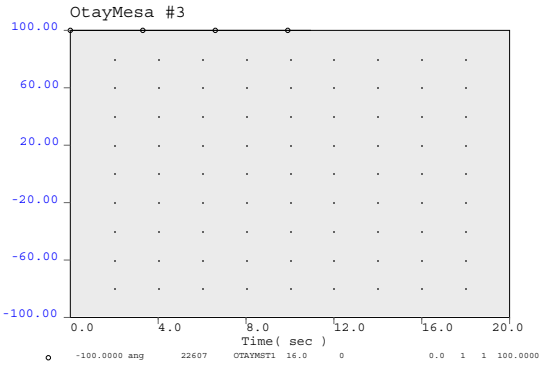
RELATIVE ROTOR ANGLE & FREQUENCY

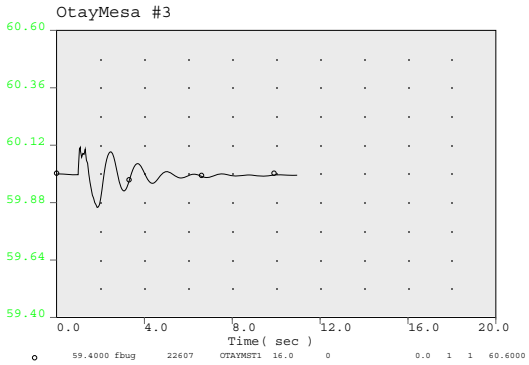












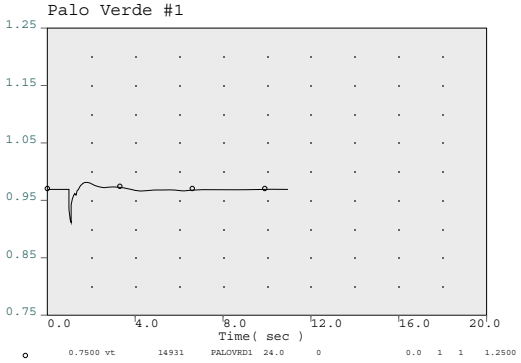
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Page 1

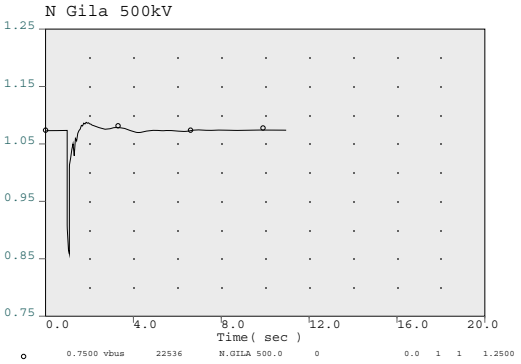
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RELATIVE VOLTAGE

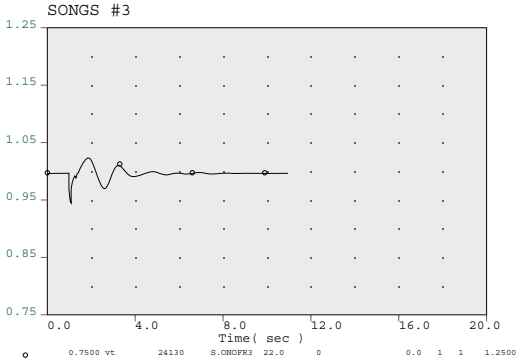
Palo Verde #1



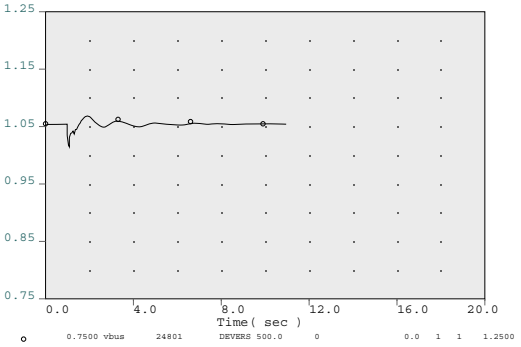
N Gila 500kV



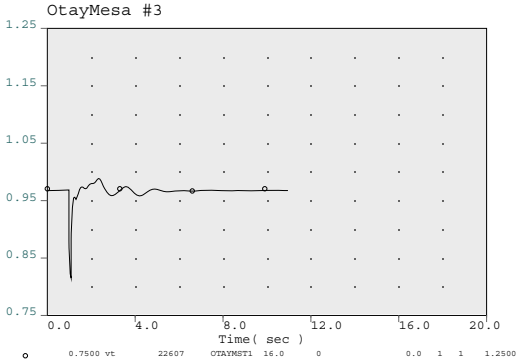
SONGS #3



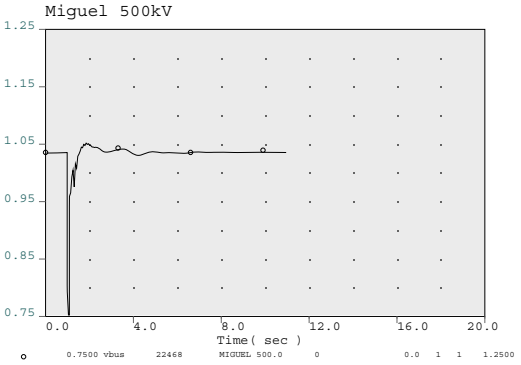
Devers 500



OtayMesa #3



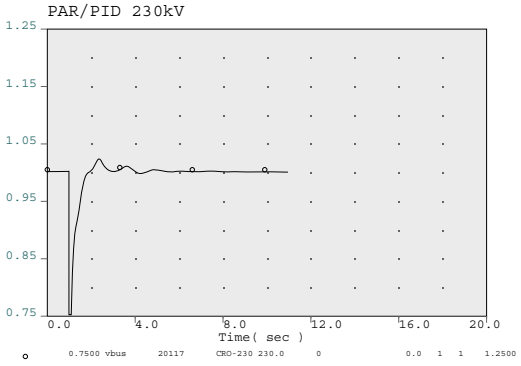
Miguel 500kV



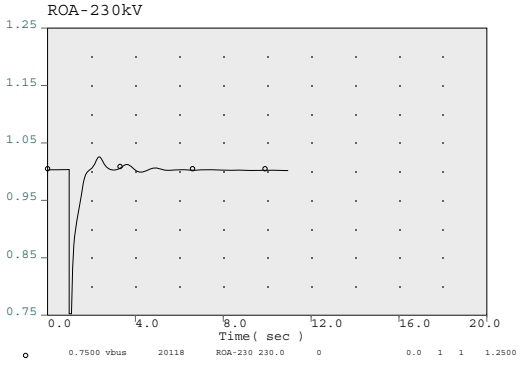
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

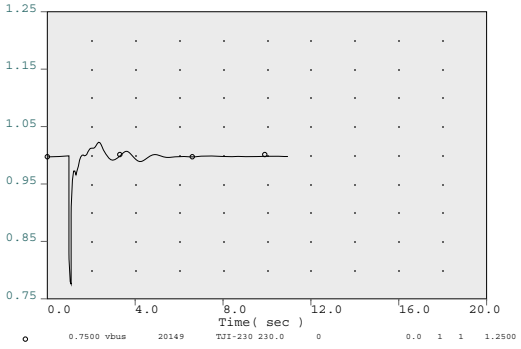
PAR/PID 230kV



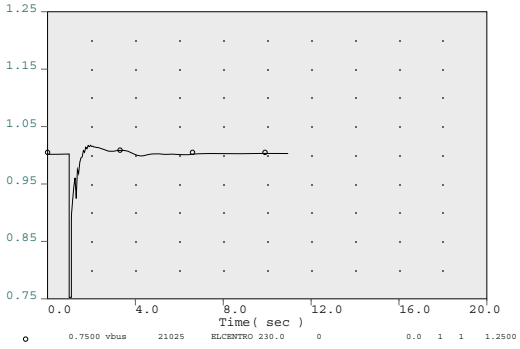
ROA-230kV



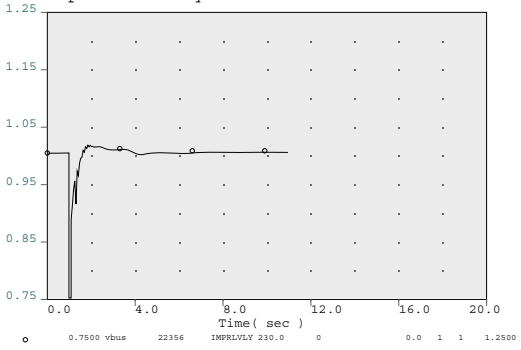
TJ1-230kV



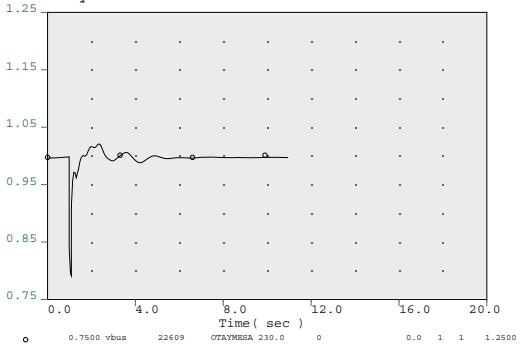
El Centro



Imperial Valley 230kV

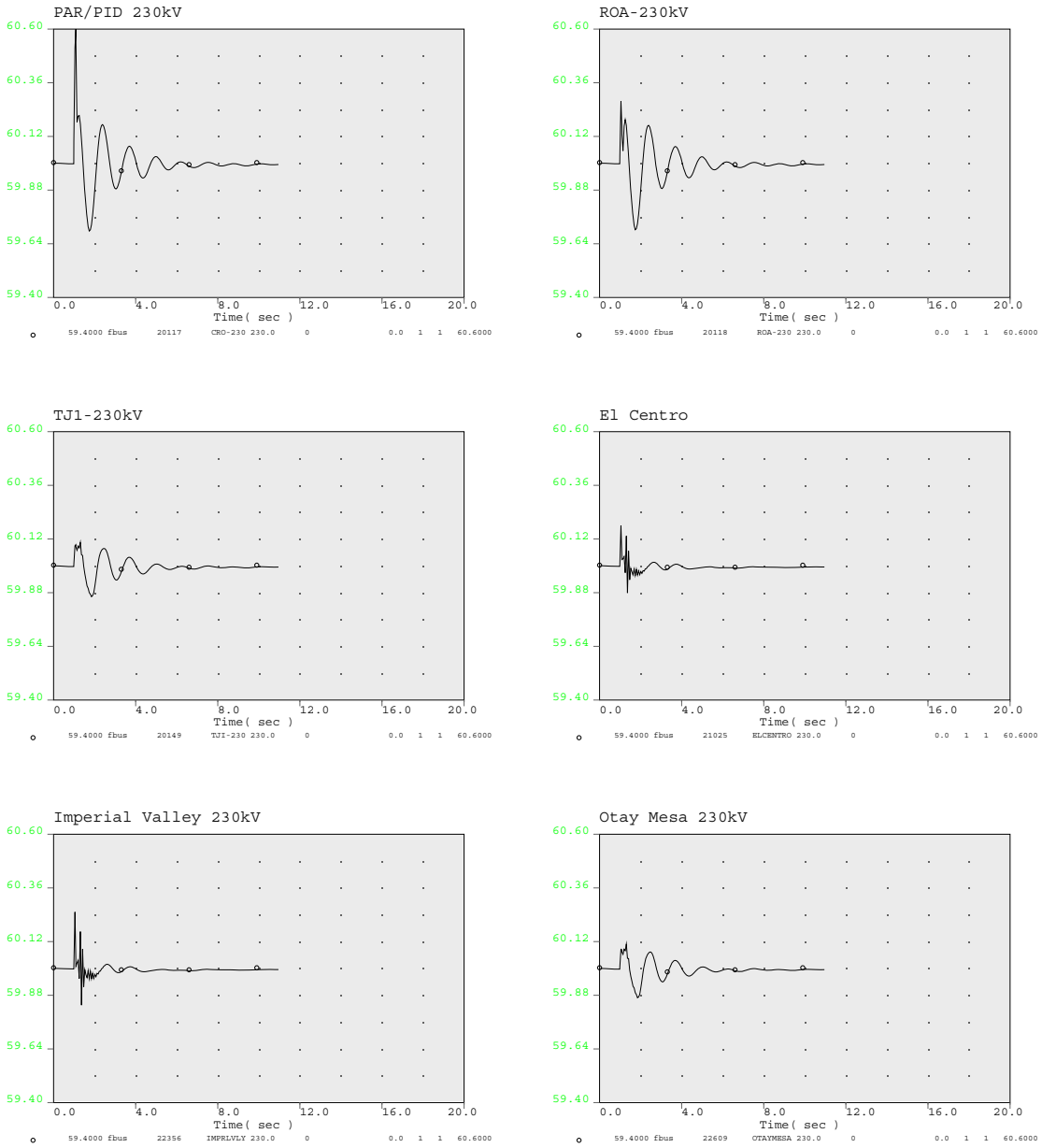


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

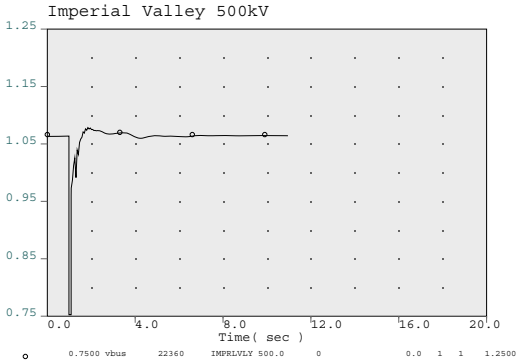
Affected System Frequency Check and Comparison



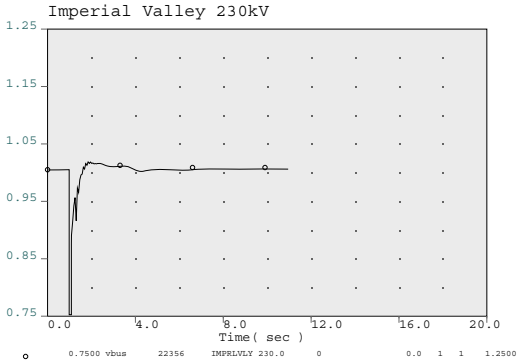
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - VOLTAGE

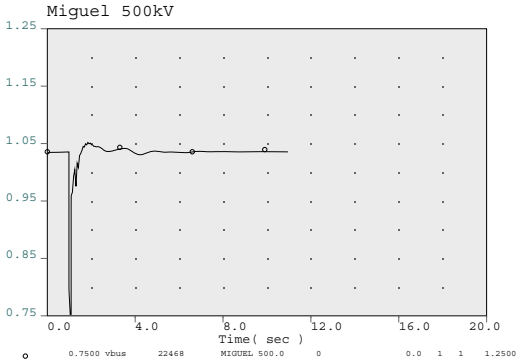
Imperial Valley 500kV



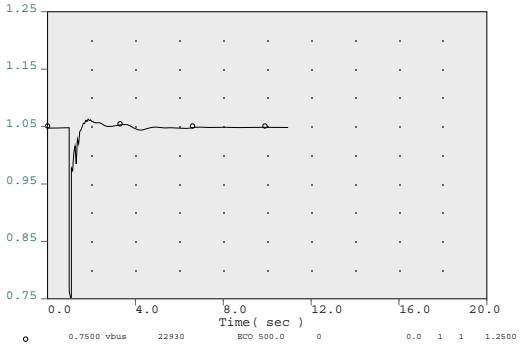
Imperial Valley 230kV



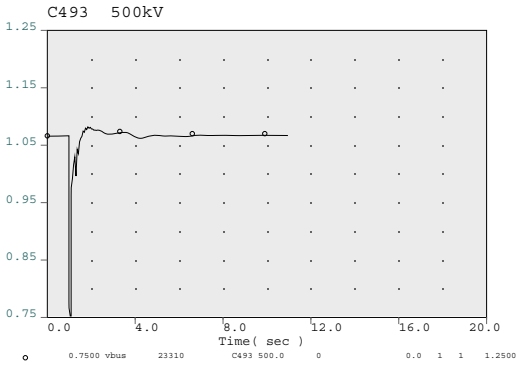
Miguel 500kV



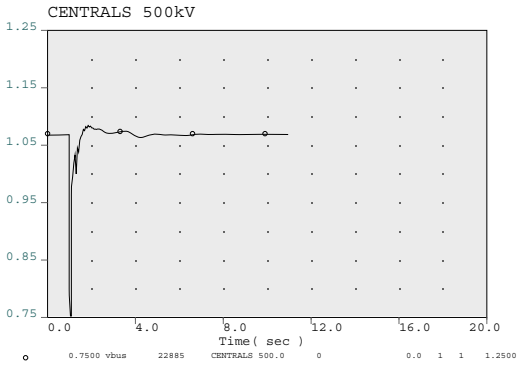
Windfarms 500



C493 500kV

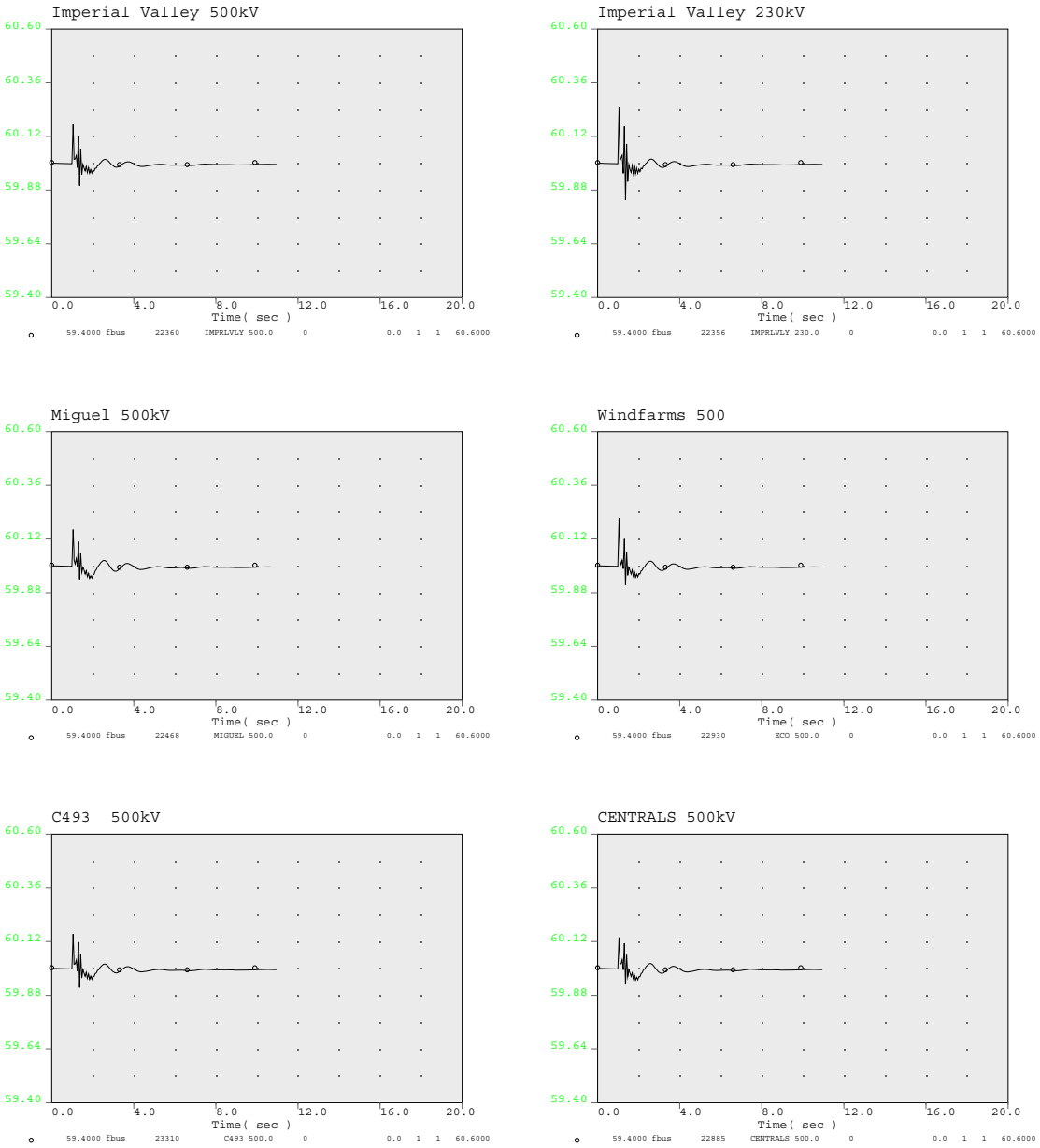


CENTRALS 500kV



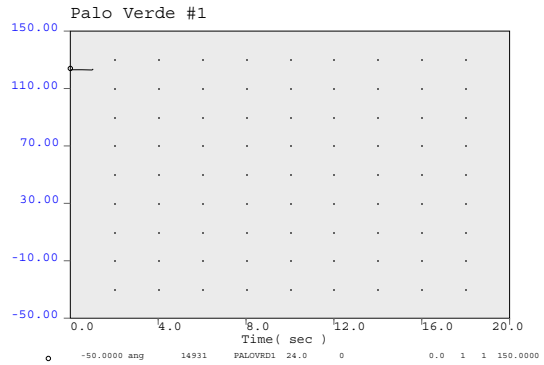
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

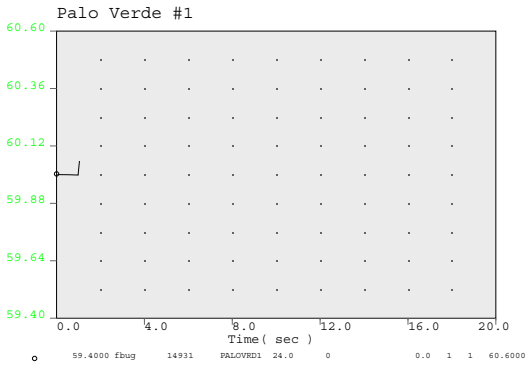
Imperial Valley Area - Frequency

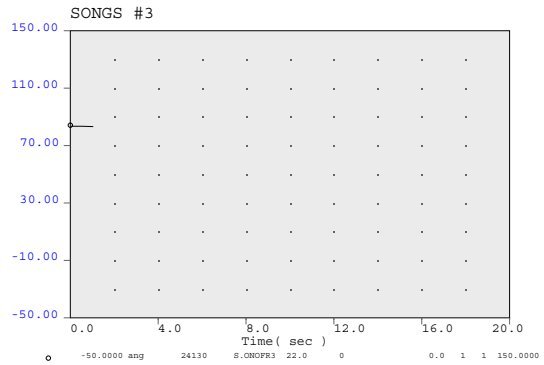


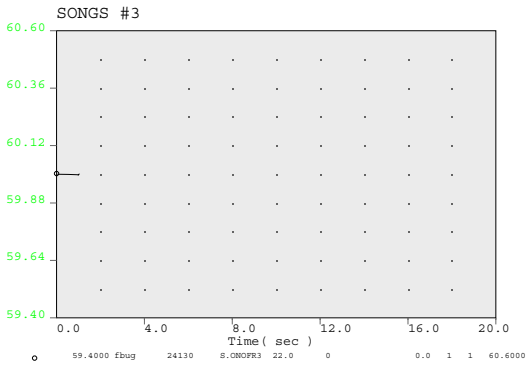
SDG&E Cluster 2 - pre
2014 Light Autumn
Loss of IV-ROA 230 kV SLO

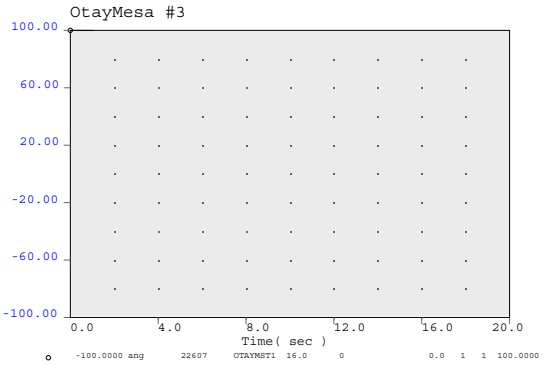
RELATIVE ROTOR ANGLE & FREQUENCY

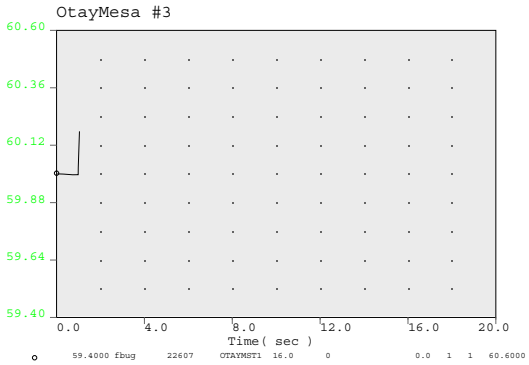












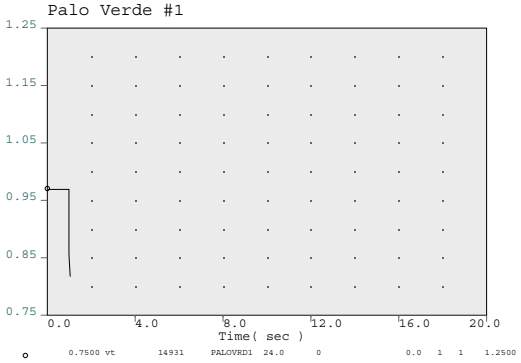
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-Windfarms 500 kV line1

Page 1

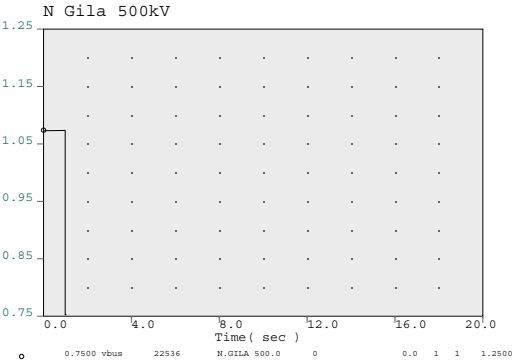
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RELATIVE VOLTAGE

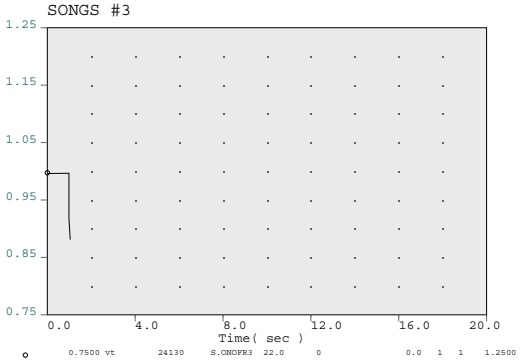
Palo Verde #1



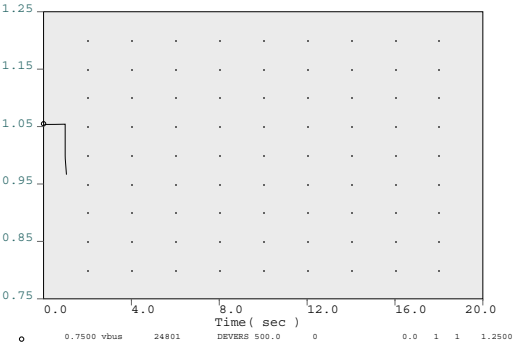
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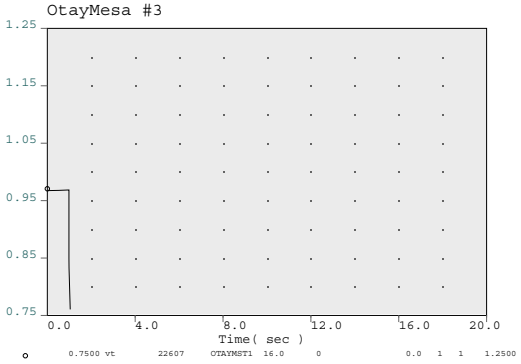
SONGS #3



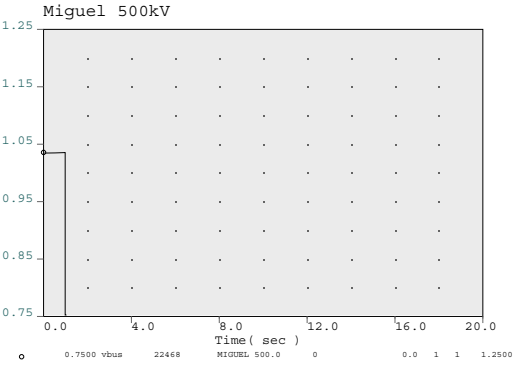
Devers 500



OtayMesa #3



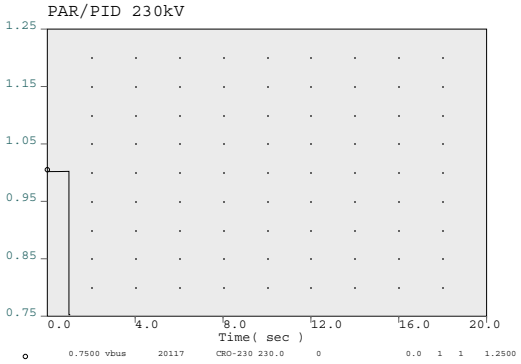
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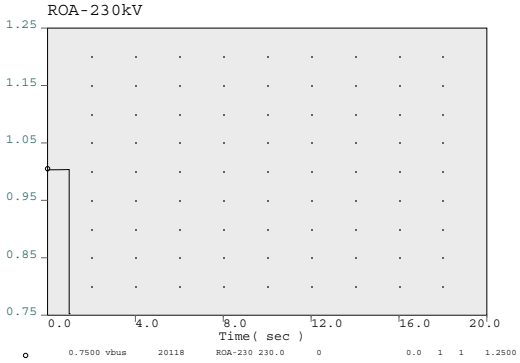
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-Windfarms 500 kV line1

Affected System Voltage Check and Comparison

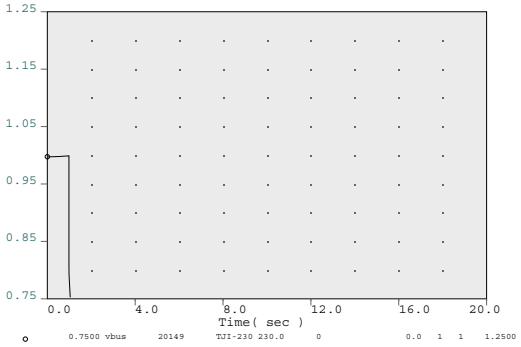
PAR/PID 230kV



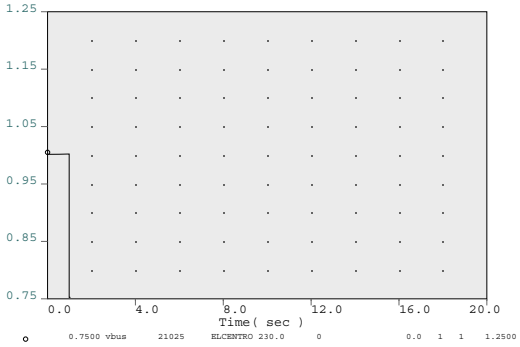
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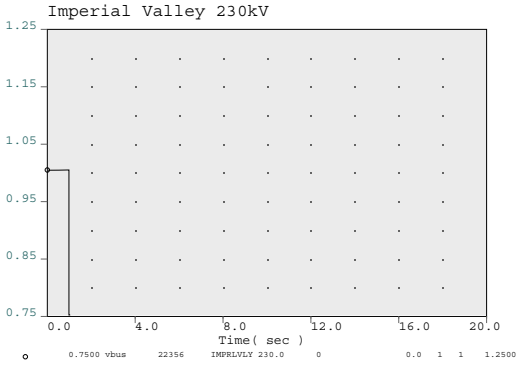
TJ1-230kV



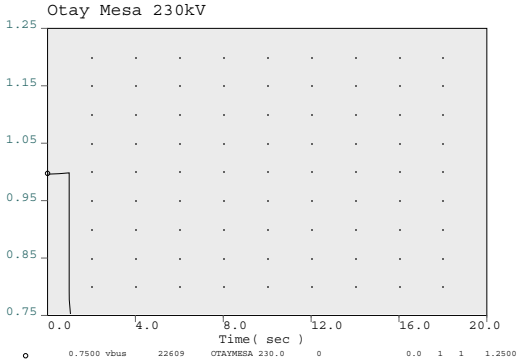
El Centro



Imperial Valley 230kV

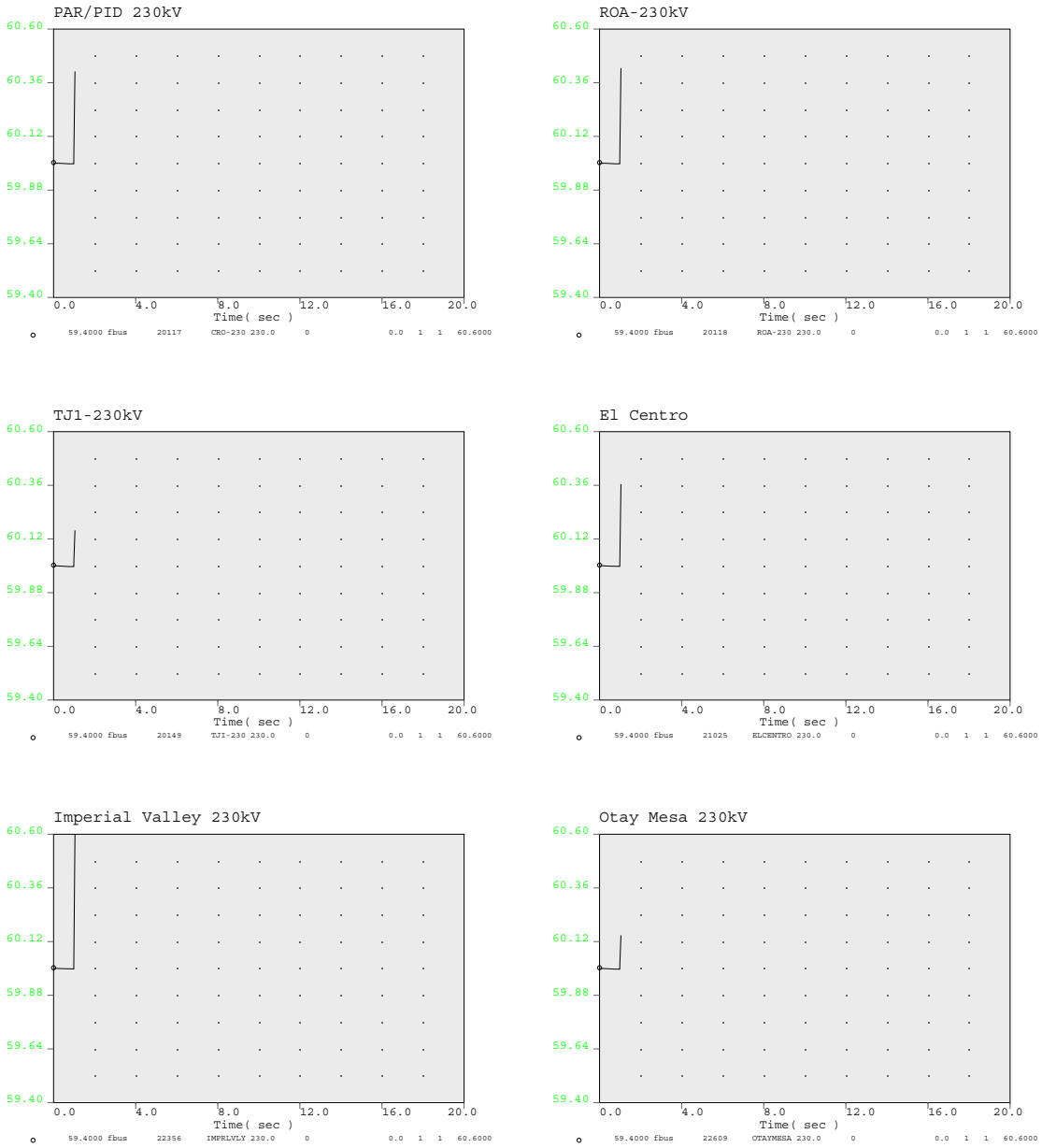


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-Windfarms 500 kV line1

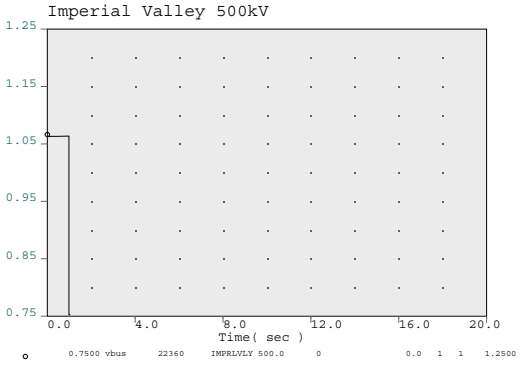
Affected System Frequency Check and Comparison



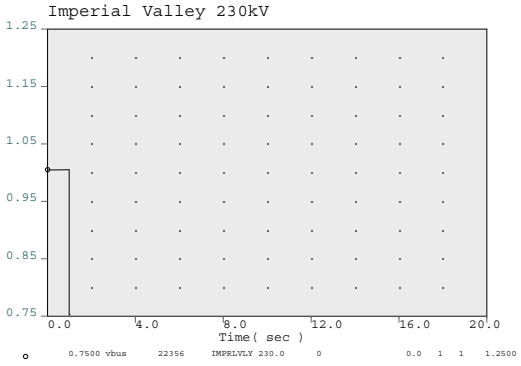
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-Windfarms 500 kV line1

Imperial Valley Area - VOLTAGE

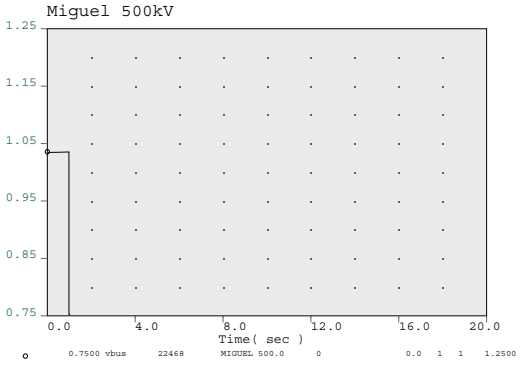
Imperial Valley 500kV



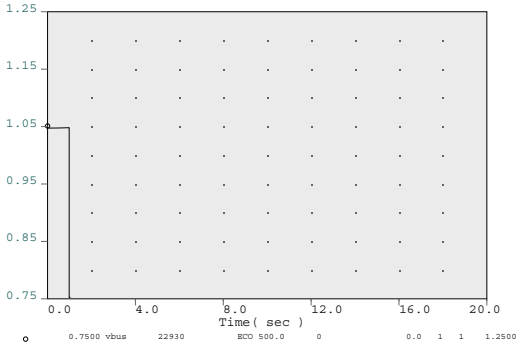
Imperial Valley 230kV



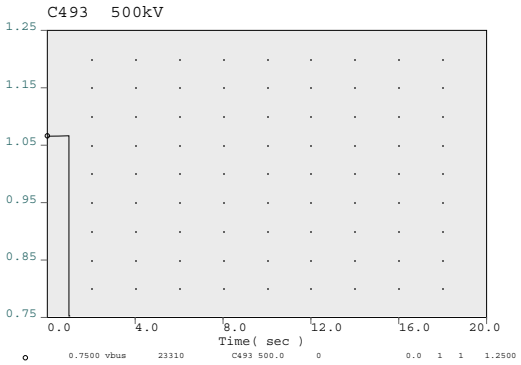
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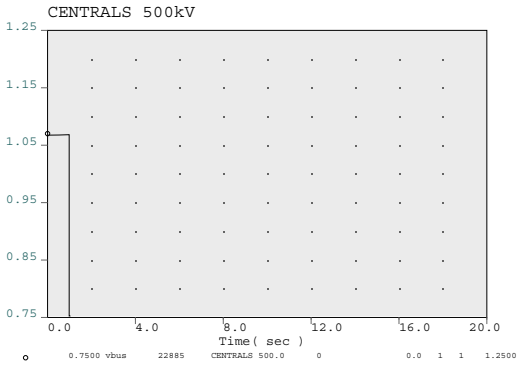
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C493 500kV

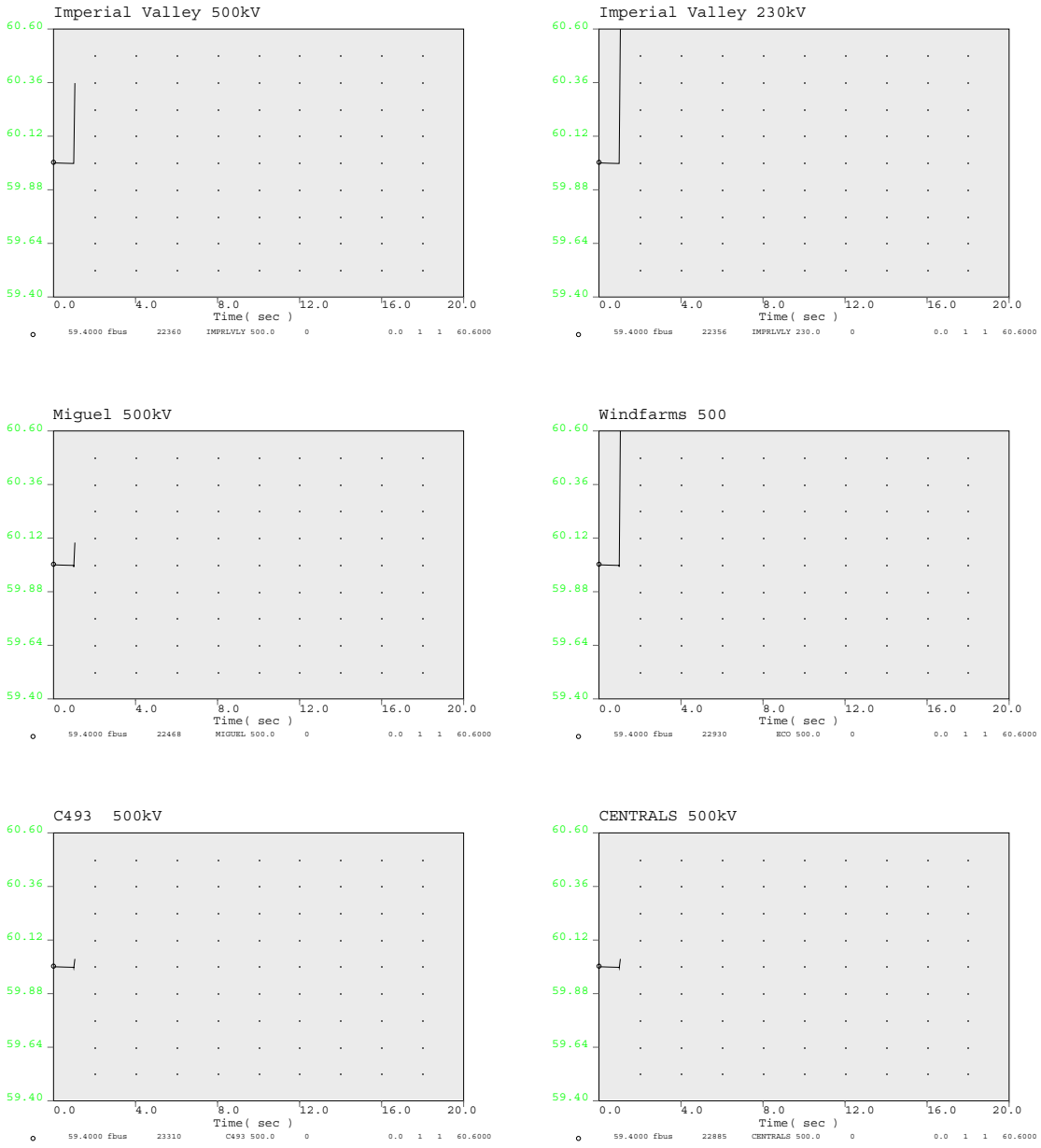


CENTRALS 500kV



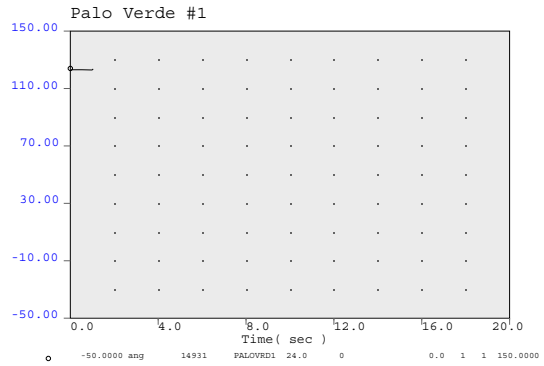
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-Windfarms 500 kV line1

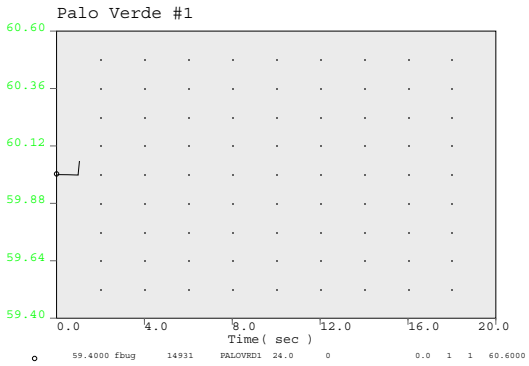
Imperial Valley Area - Frequency

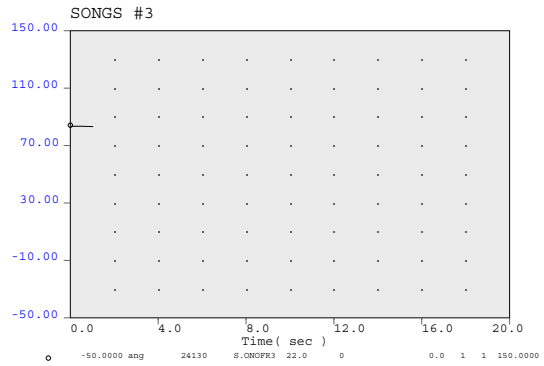


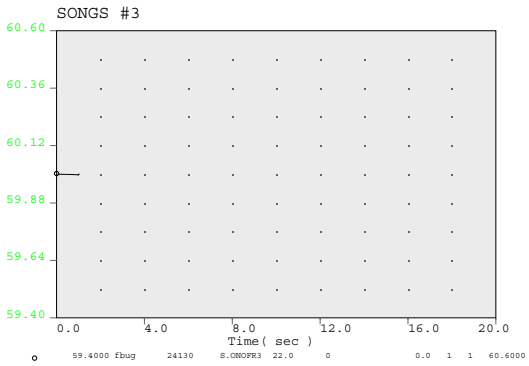
SDG&E Cluster 2 - pre
2014 Light Autumn
Imperial Valley-Windfarms 500 kV line1

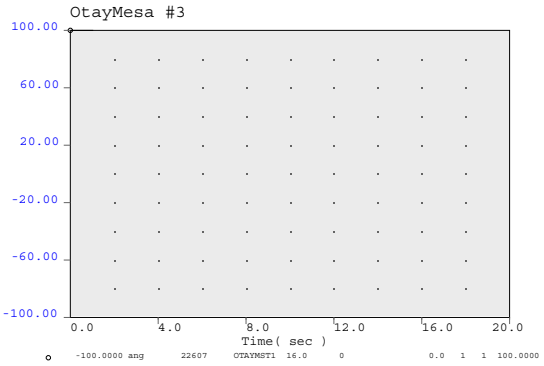
RELATIVE ROTOR ANGLE & FREQUENCY

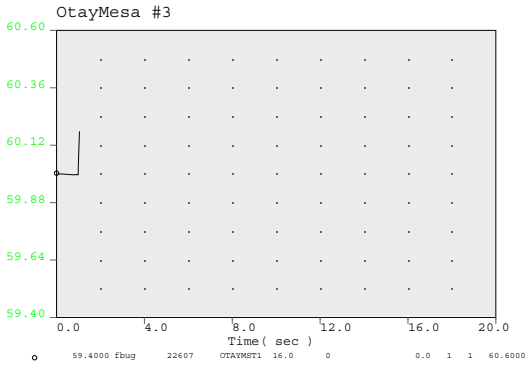












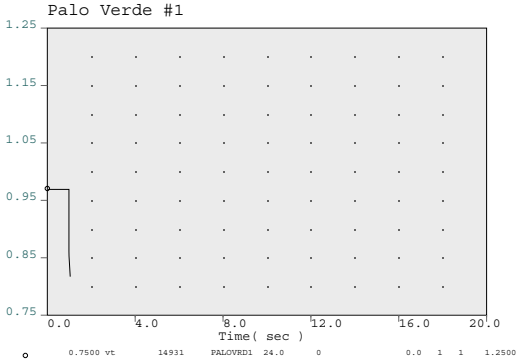
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-Windfarms & IV-C493 500 kV Double line outage

Page 1

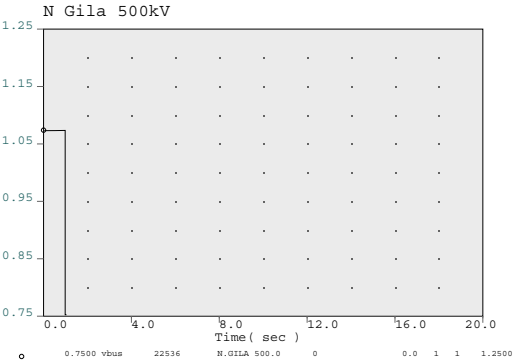
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RELATIVE VOLTAGE

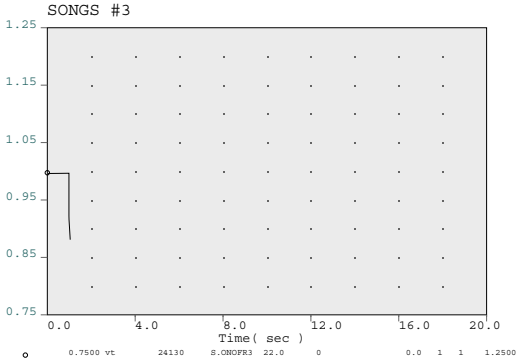
Palo Verde #1



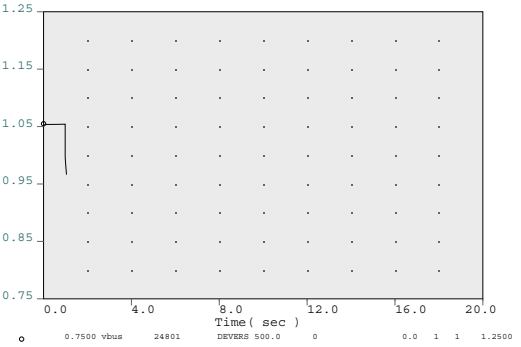
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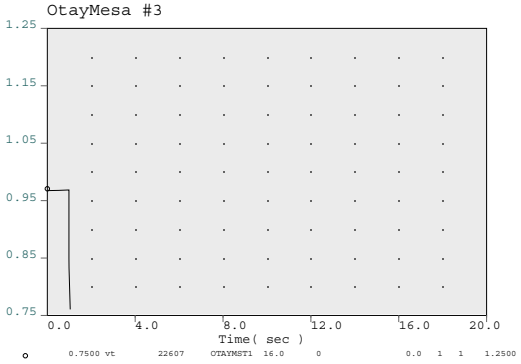
SONGS #3



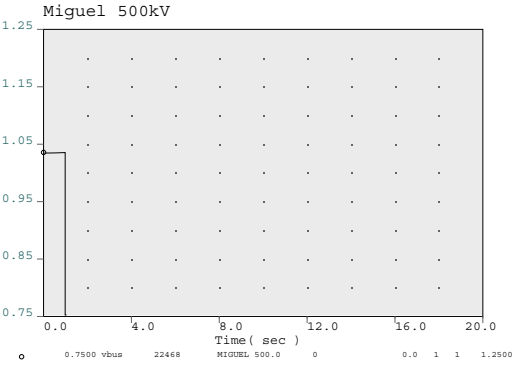
Devers 500



OtayMesa #3



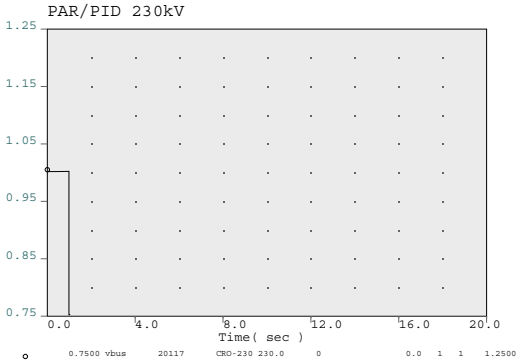
Miguel 500kV



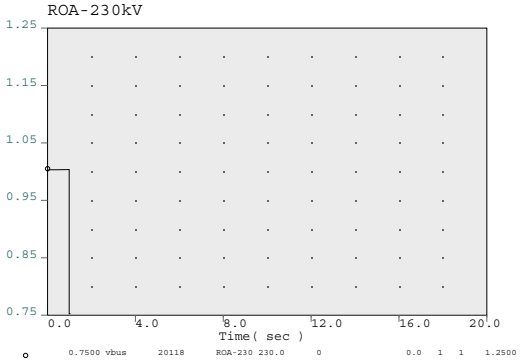
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-Windfarms & IV-C493 500 kV Double line outage

Affected System Voltage Check and Comparison

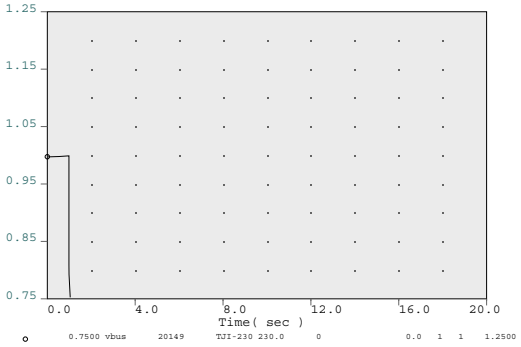
PAR/PID 230kV



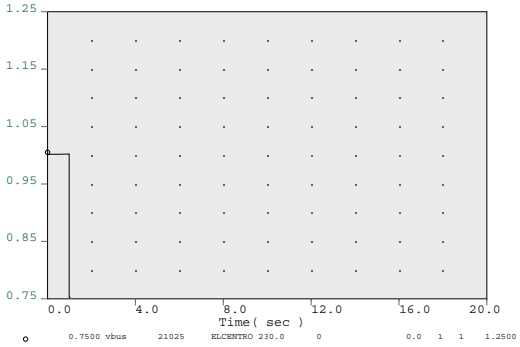
ROA-230kV



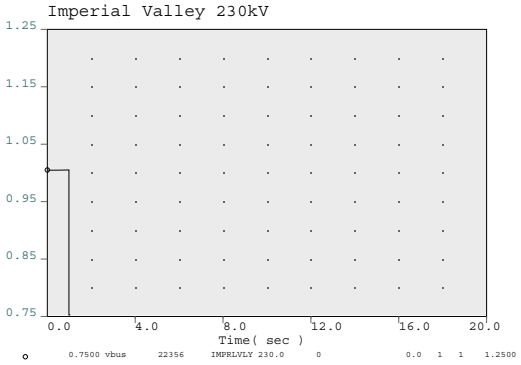
TJ1-230kV



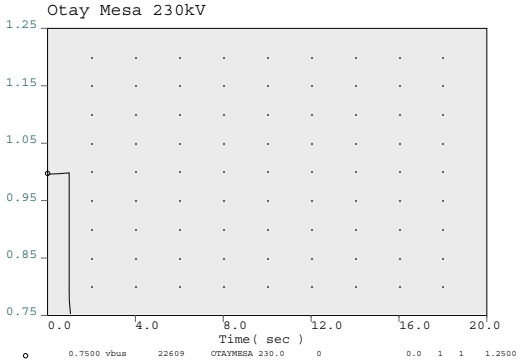
El Centro



Imperial Valley 230kV

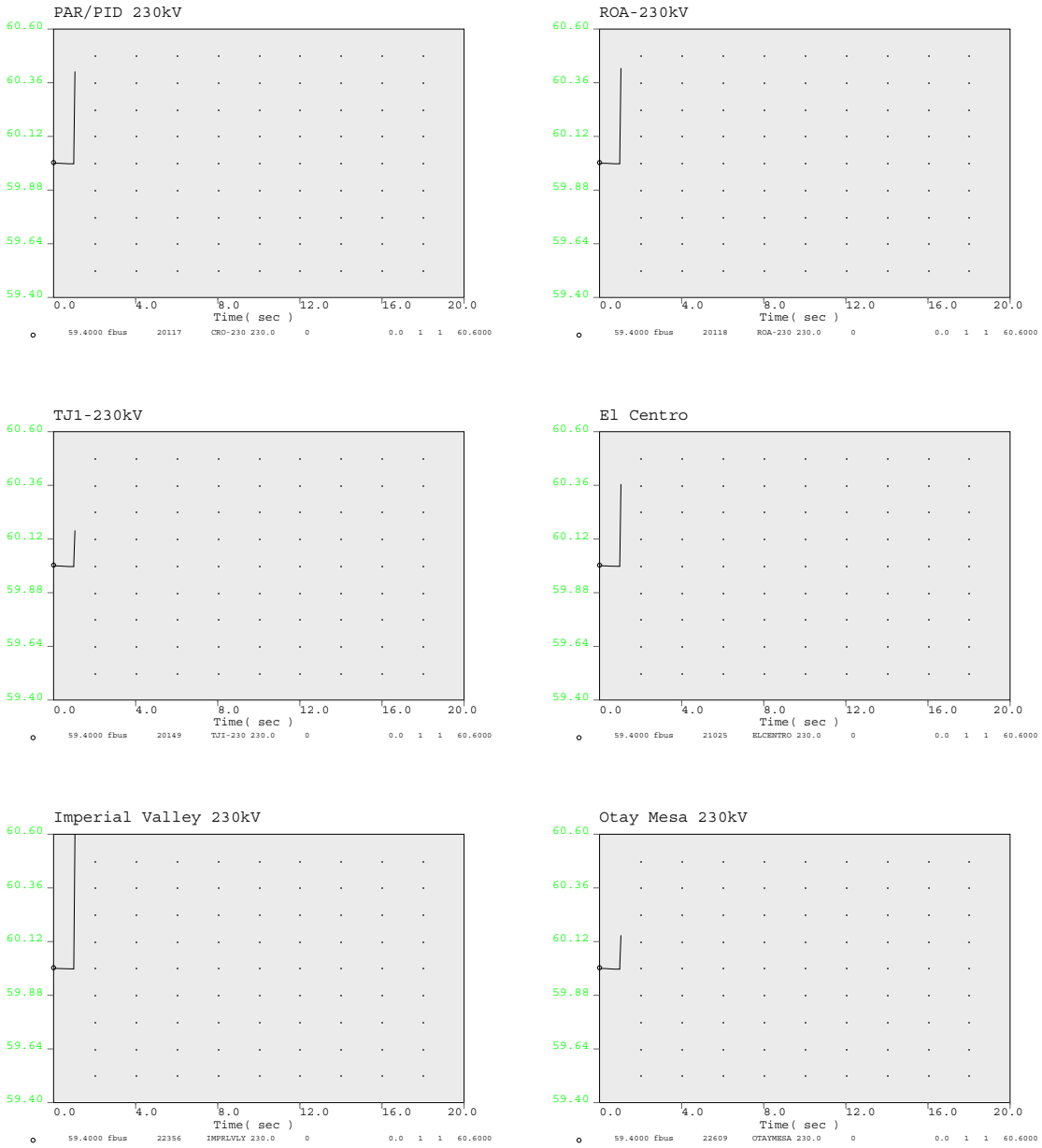


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
IV-Windfarms & IV-C493 500 kV Double line outage

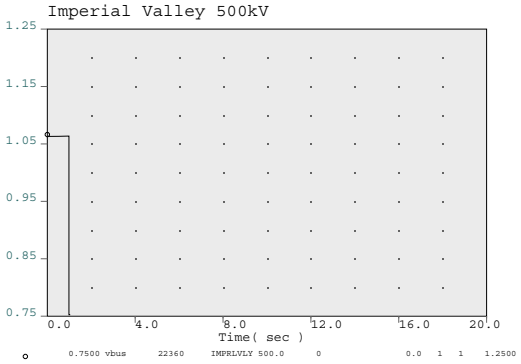
Affected System Frequency Check and Comparison



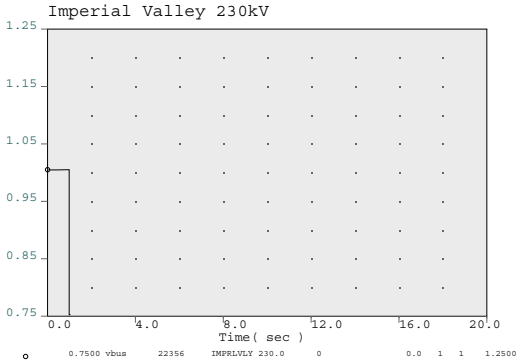
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-Windfarms & IV-C493 500 kV Double line outage

Imperial Valley Area - VOLTAGE

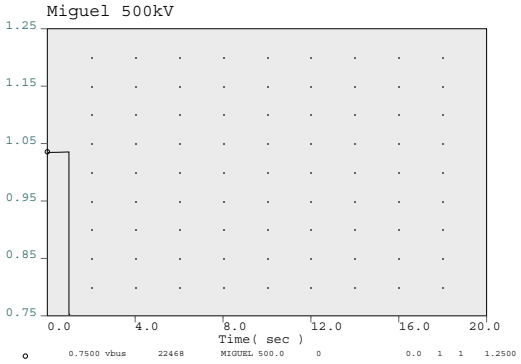
Imperial Valley 500kV



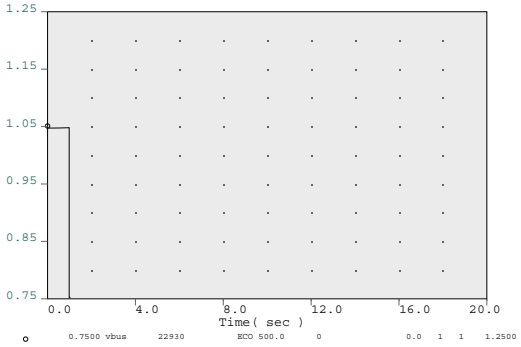
Imperial Valley 230kV



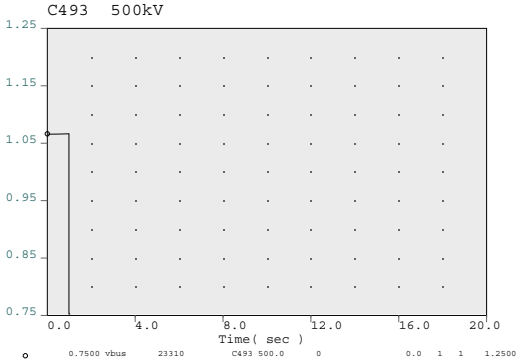
Miguel 500kV



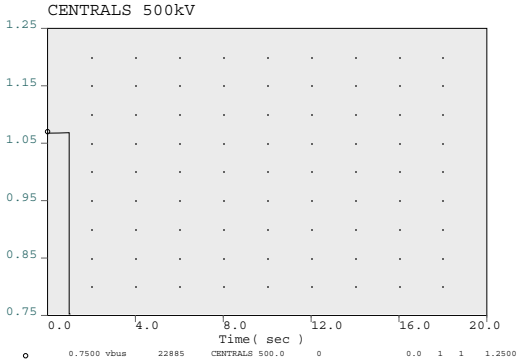
Windfarms 500



C493 500kV

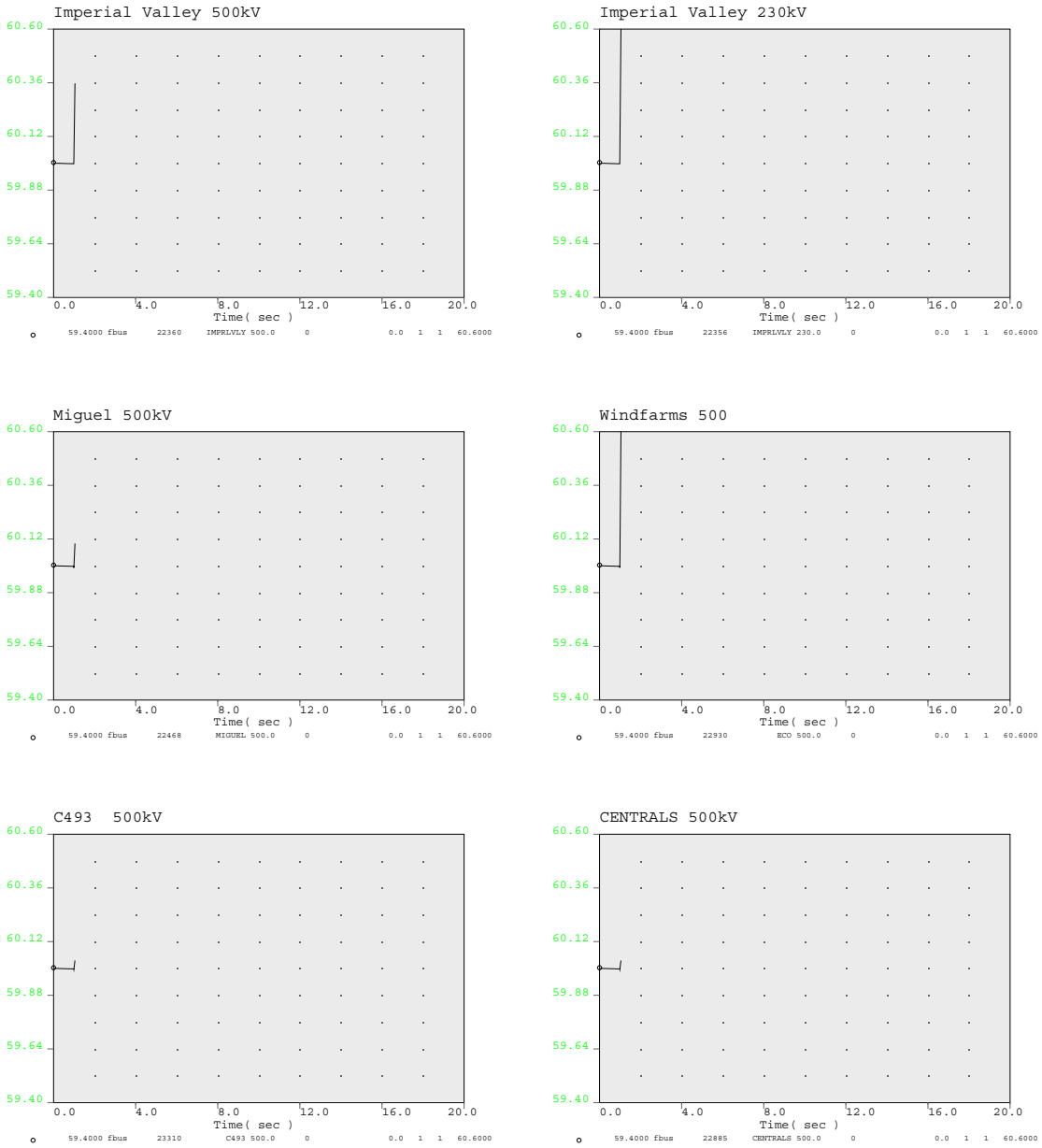


CENTRALS 500kV



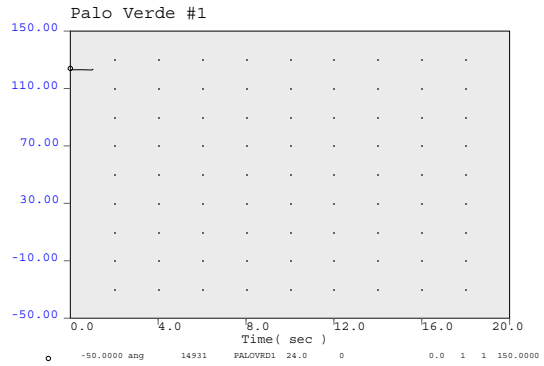
SDG&E Cluster 2 - pre
2014 Light Autumn
IV-Windfarms & IV-C493 500 kV Double line outage

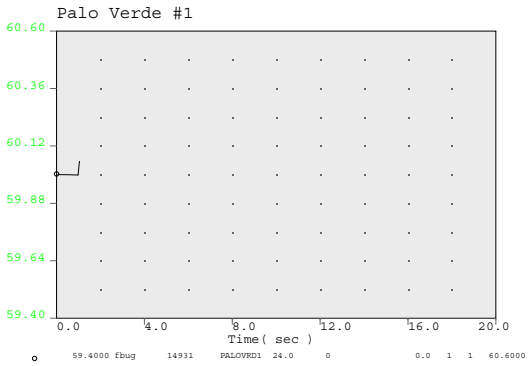
Imperial Valley Area - Frequency

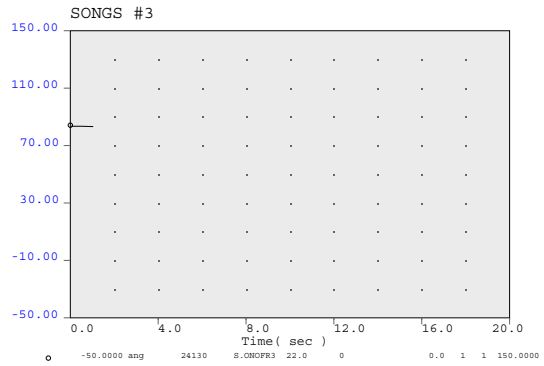


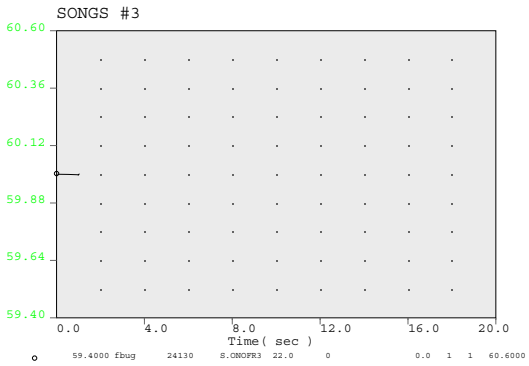
SDG&E Cluster 2 - pre
2014 Light Autumn
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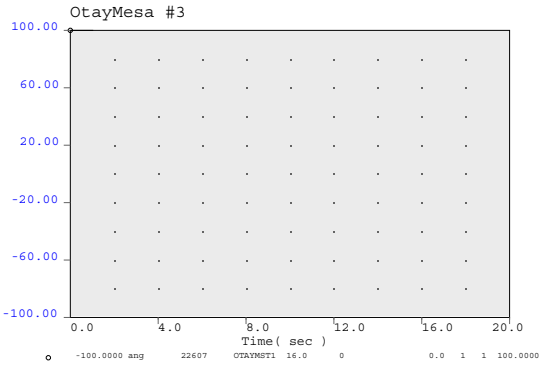
RELATIVE ROTOR ANGLE & FREQUENCY

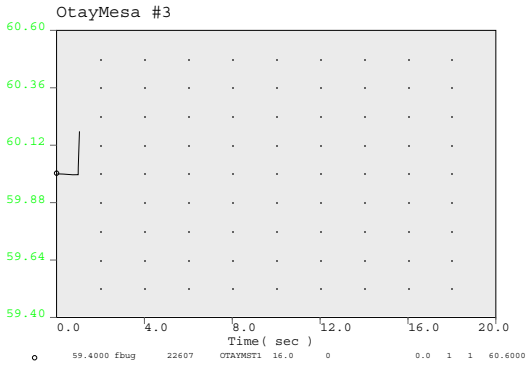










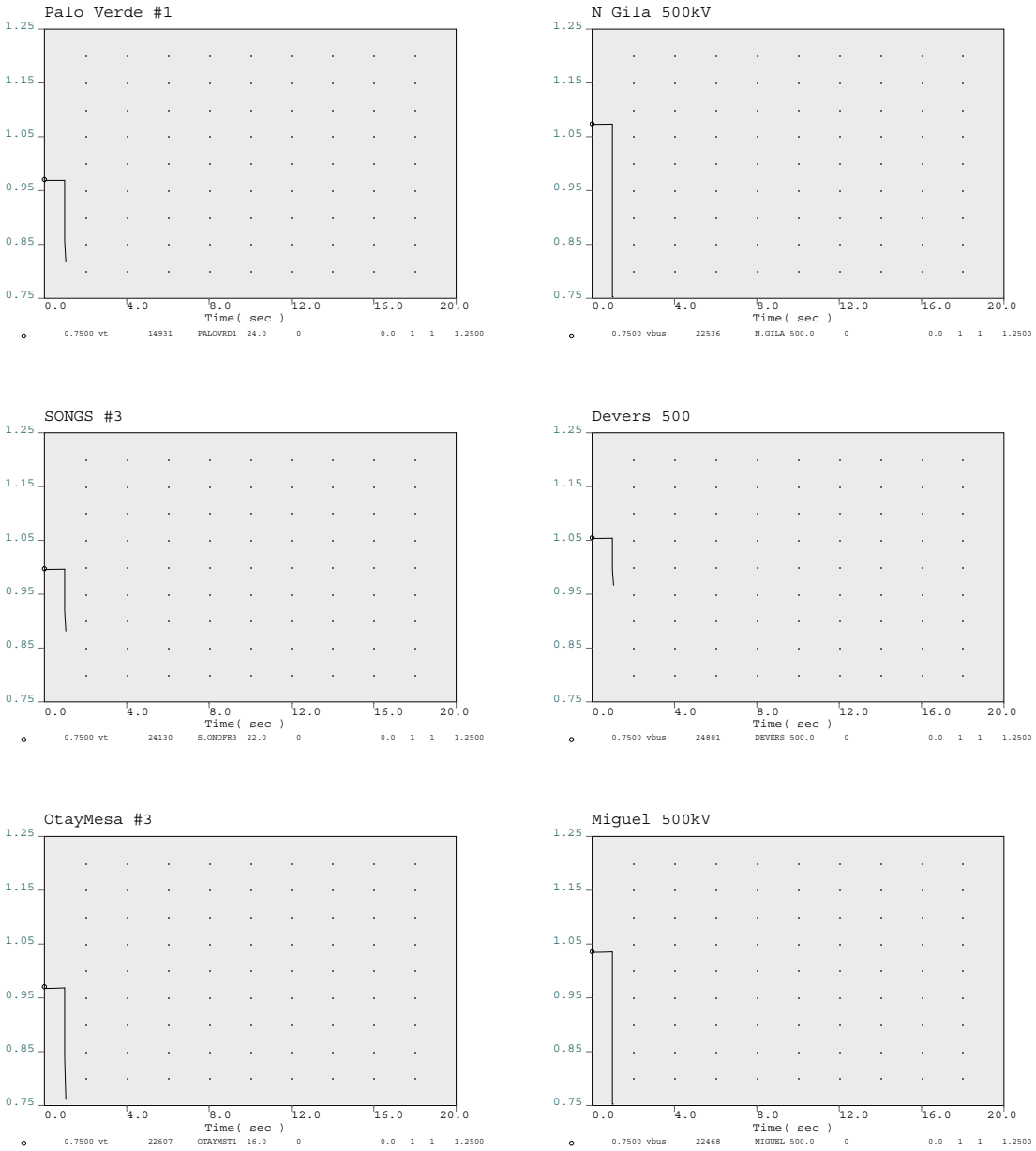


SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-Windfarms 500 kV line

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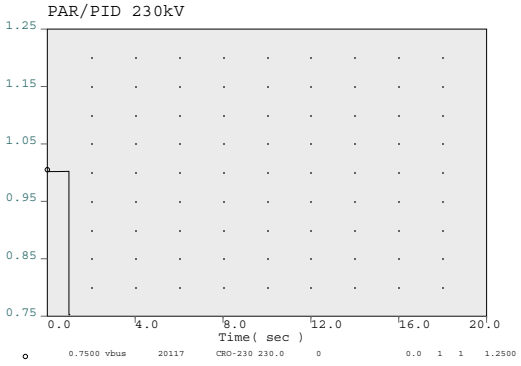
RELATIVE VOLTAGE



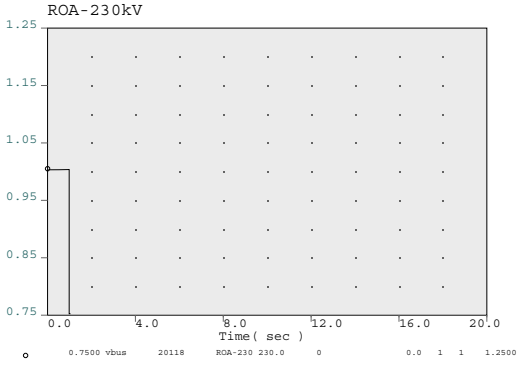
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-Windfarms 500 kV line

Affected System Voltage Check and Comparison

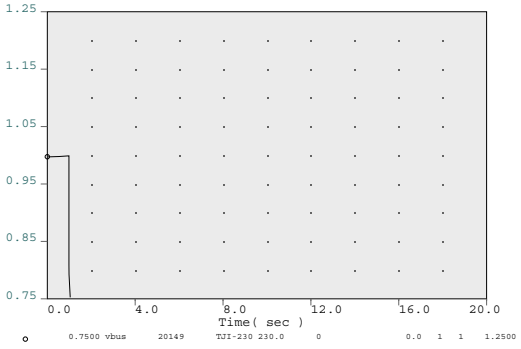
PAR/PID 230kV



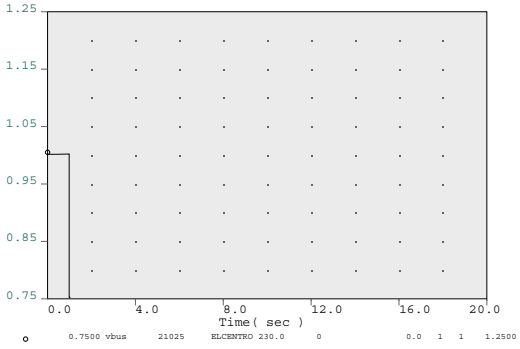
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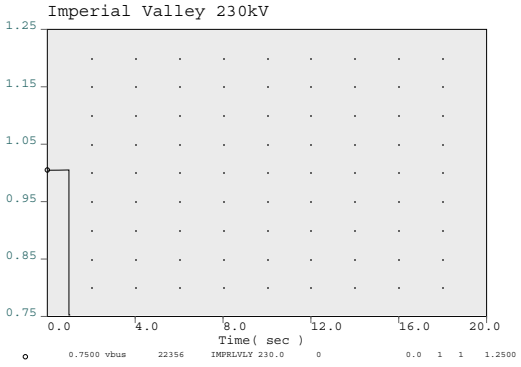
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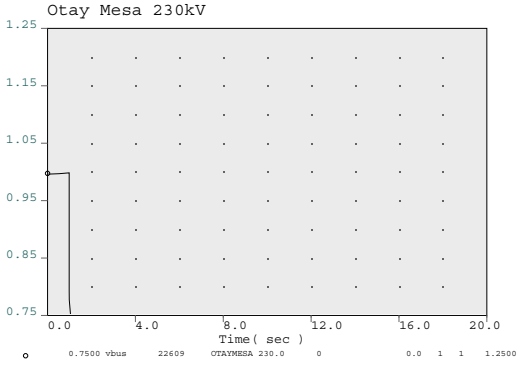
El Centro



Imperial Valley 230kV

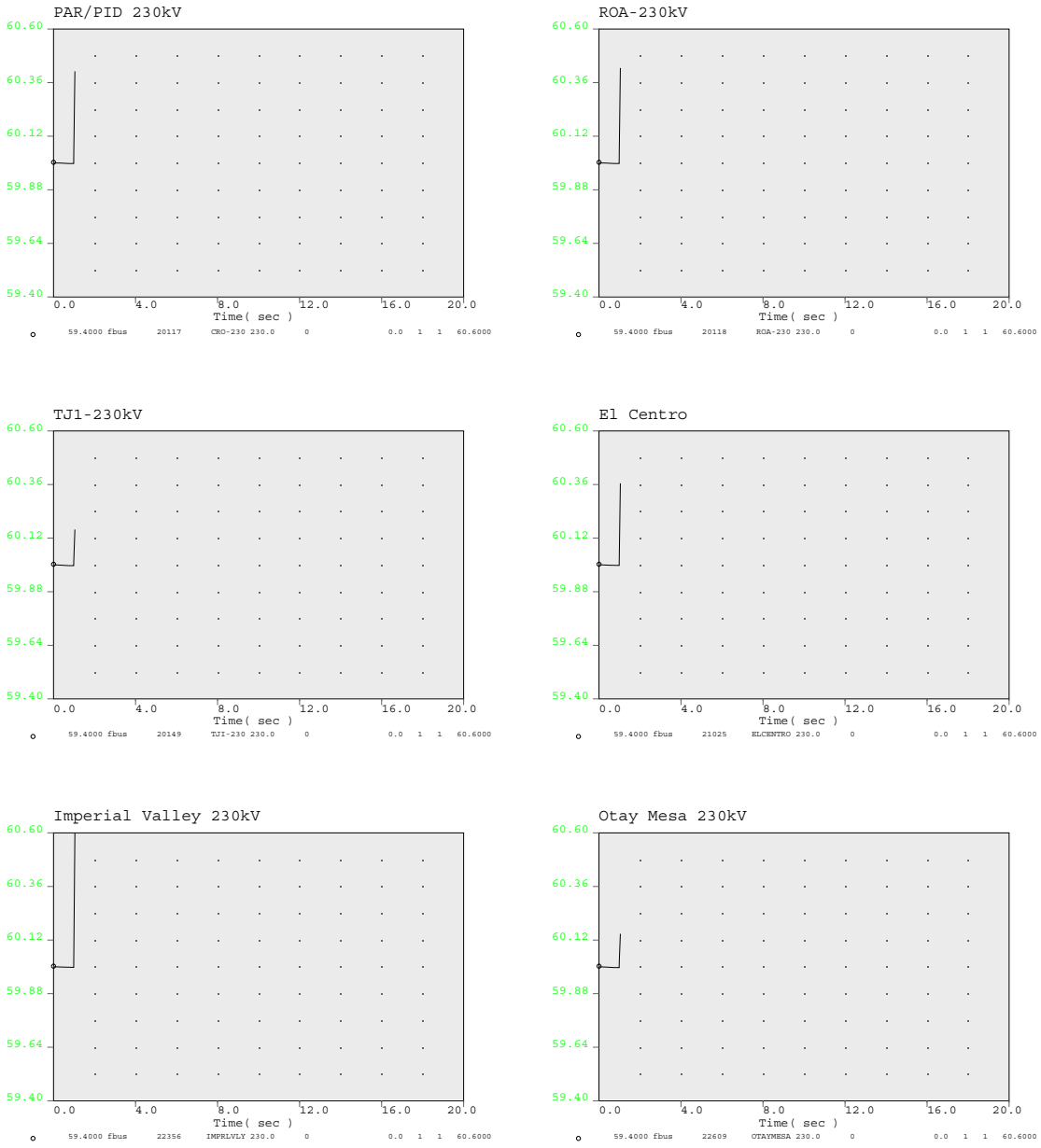


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-Windfarms 500 kV line

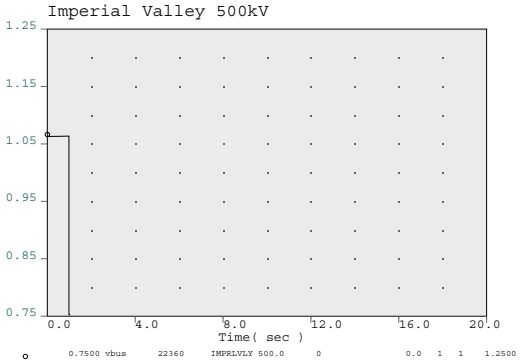
Affected System Frequency Check and Comparison



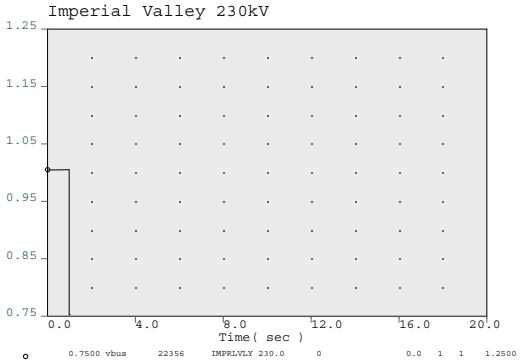
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-Windfarms 500 kV line

Imperial Valley Area - VOLTAGE

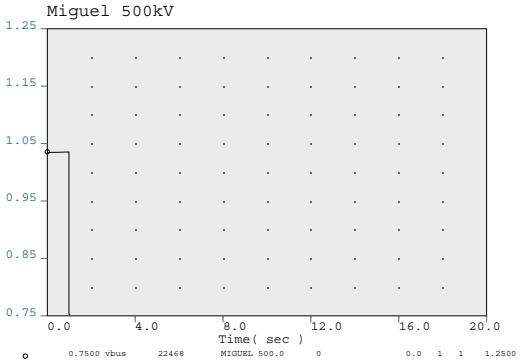
Imperial Valley 500kV



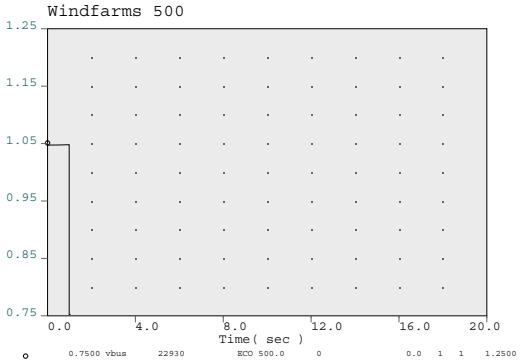
Imperial Valley 230kV



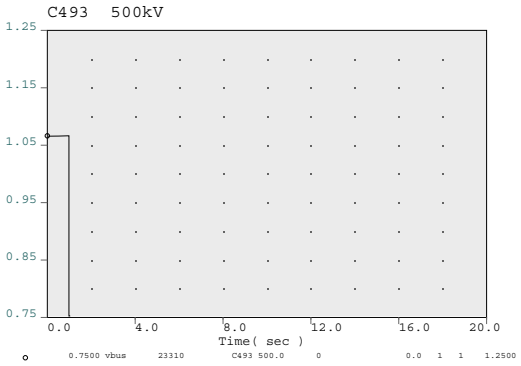
Miguel 500kV



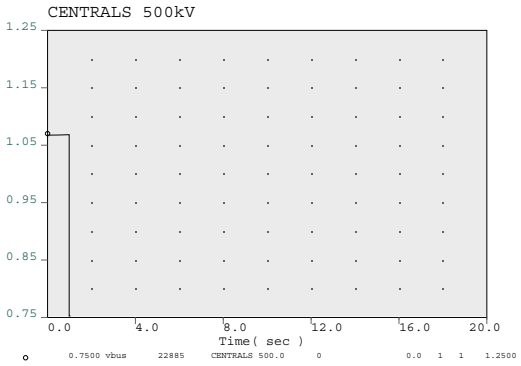
Windfarms 500



C493 500kV

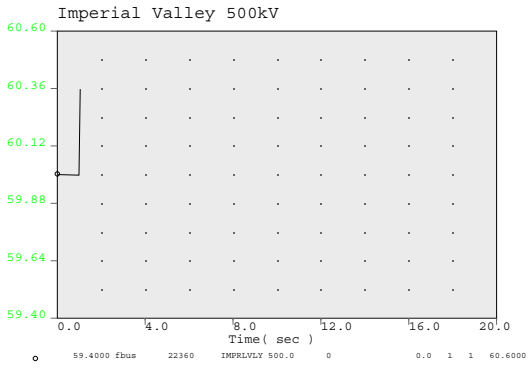


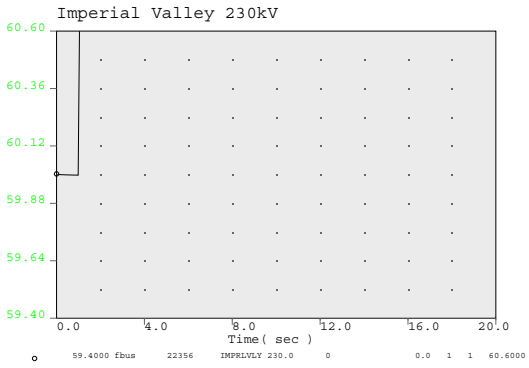
CENTRALS 500kV

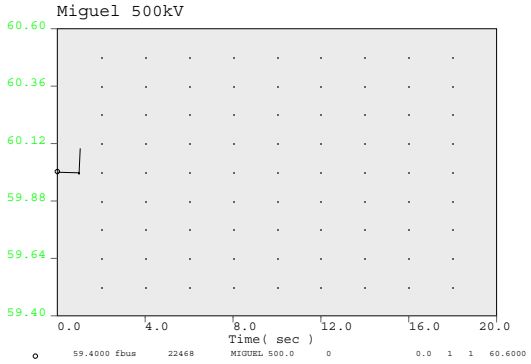


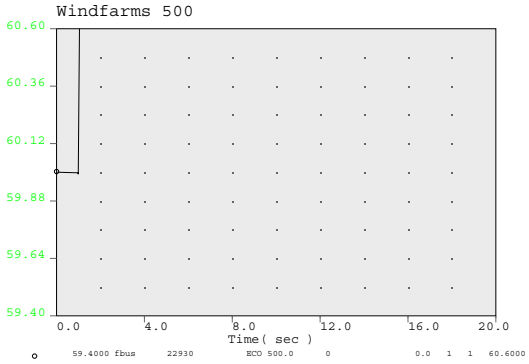
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-Windfarms 500 kV line

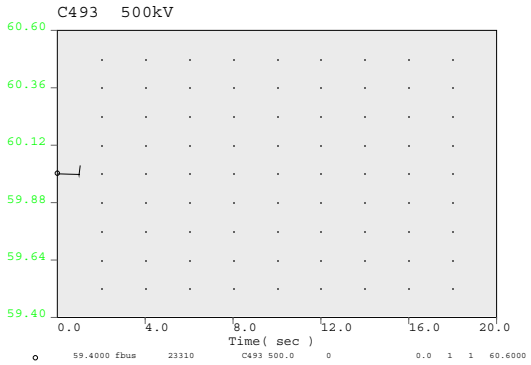
Imperial Valley Area - Frequency

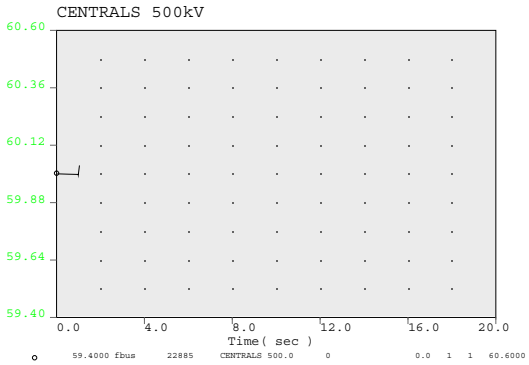






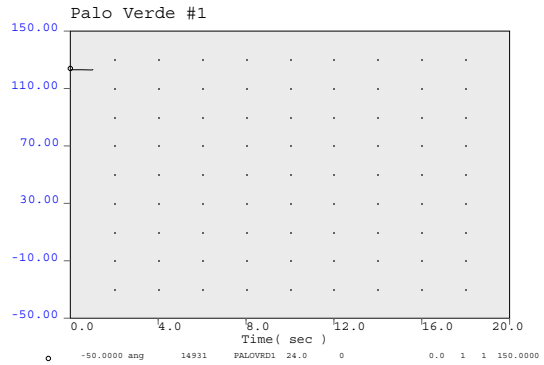


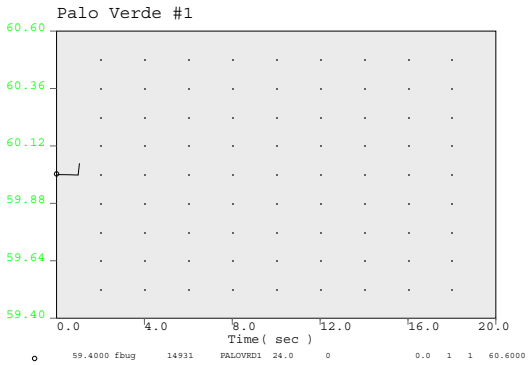


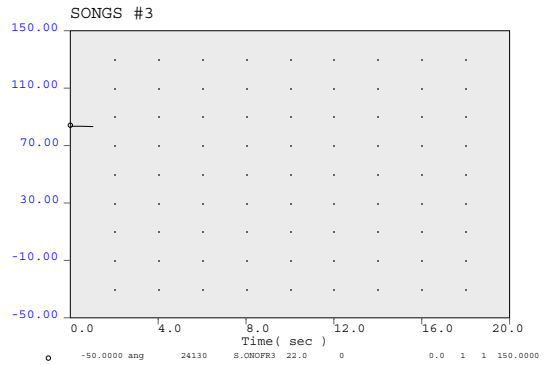


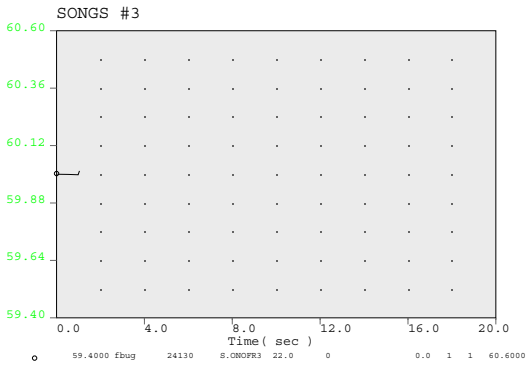
SDG&E Cluster 2 - pre
2014 Light Autumn
Miguel-Windfarms 500 kV line

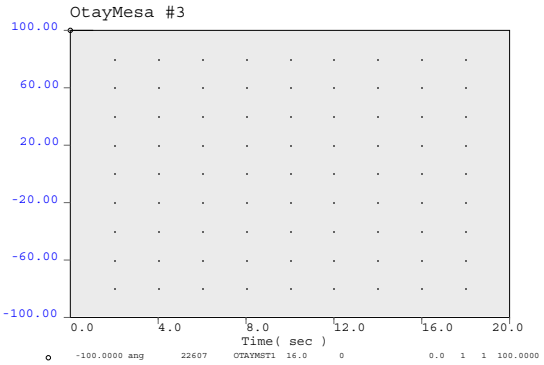
RELATIVE ROTOR ANGLE & FREQUENCY

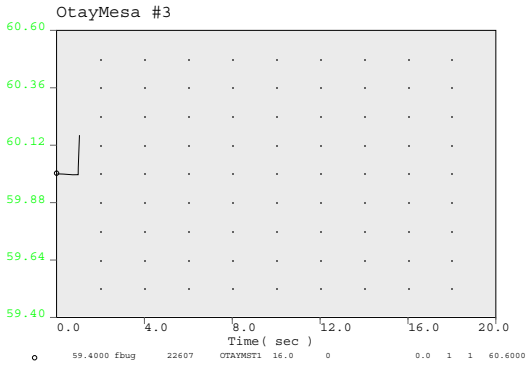












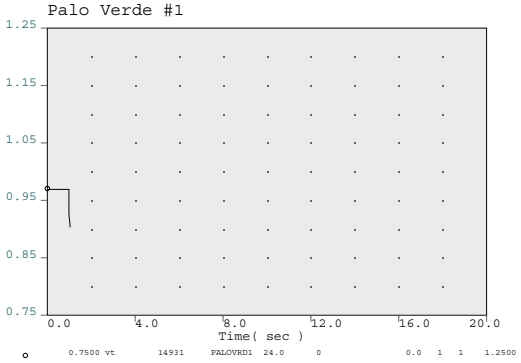
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

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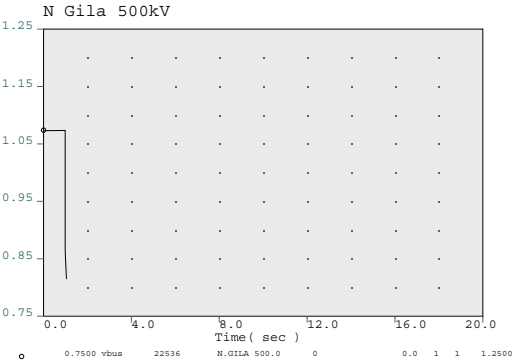
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RELATIVE VOLTAGE

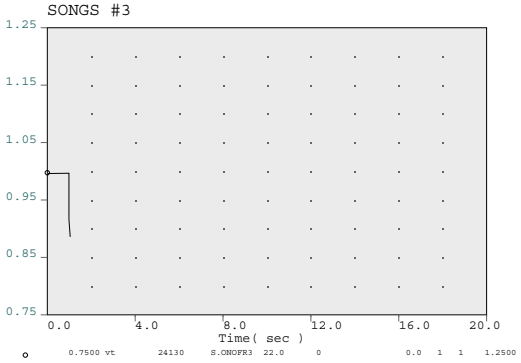
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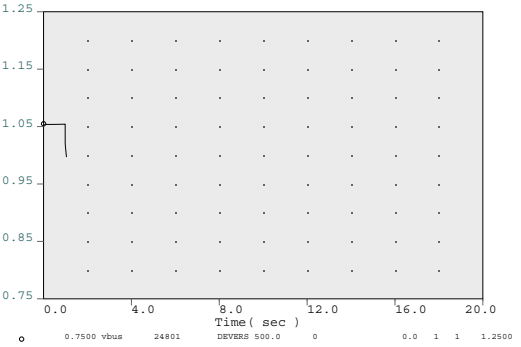
N Gila 500kV



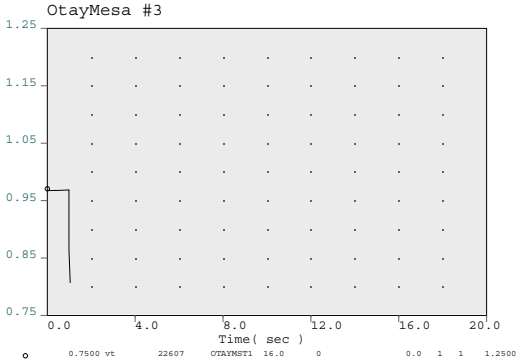
SONGS #3



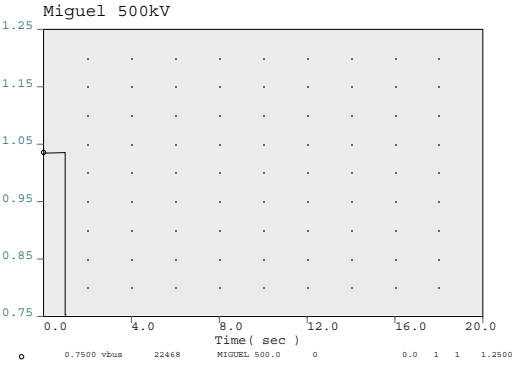
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OtayMesa #3



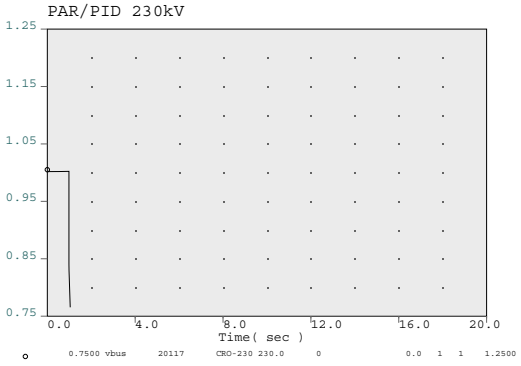
Miguel 500kV



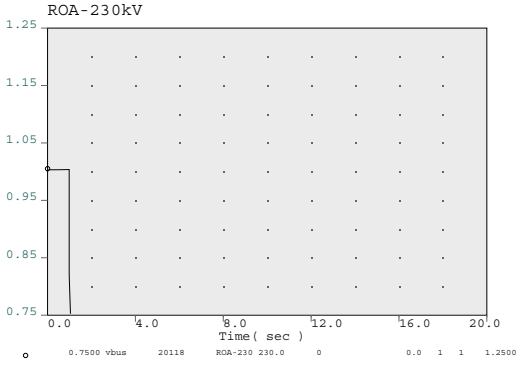
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

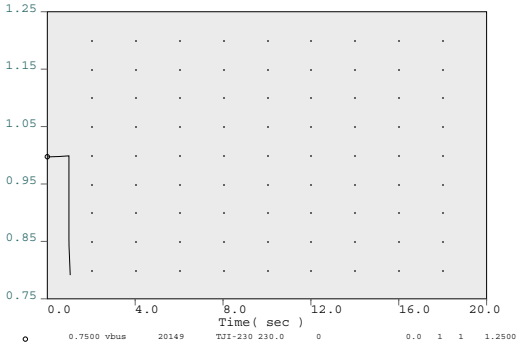
PAR/PID 230kV



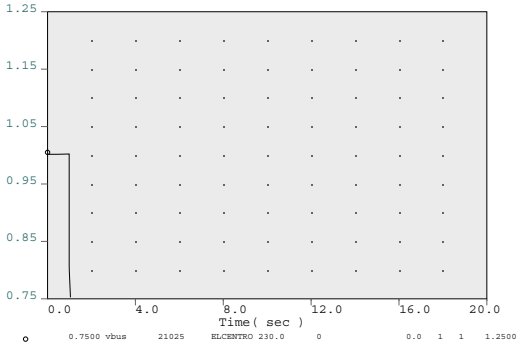
ROA-230kV



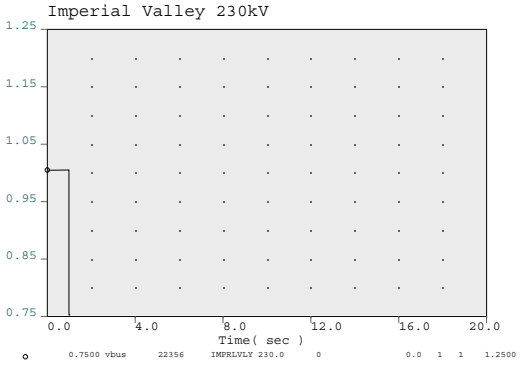
TJ1-230kV



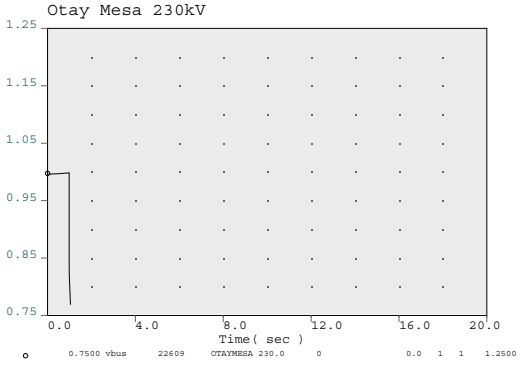
El Centro



Imperial Valley 230kV



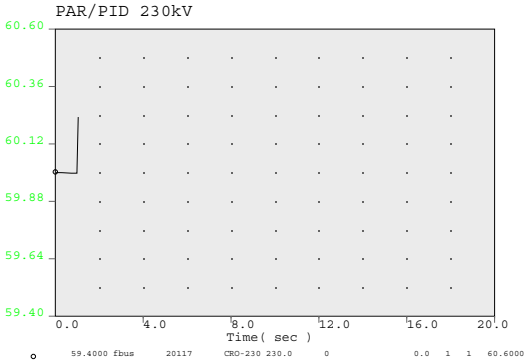
Otay Mesa 230kV



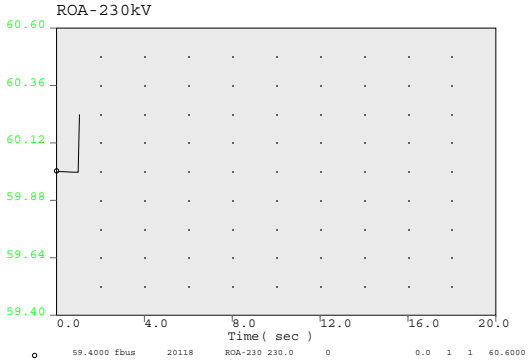
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

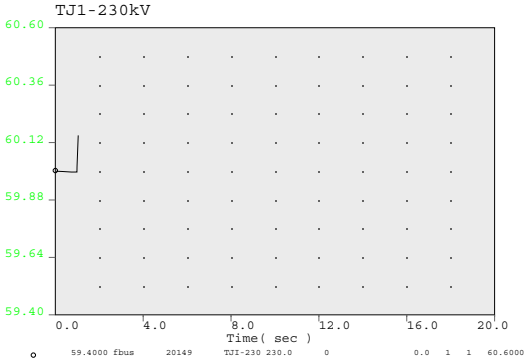
PAR/PID 230kV



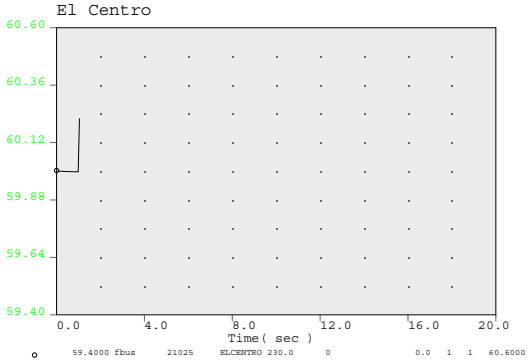
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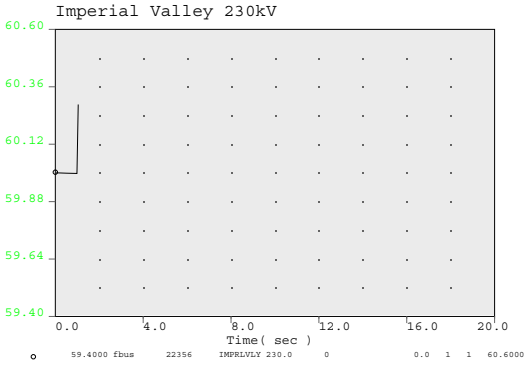
TJ1-230kV



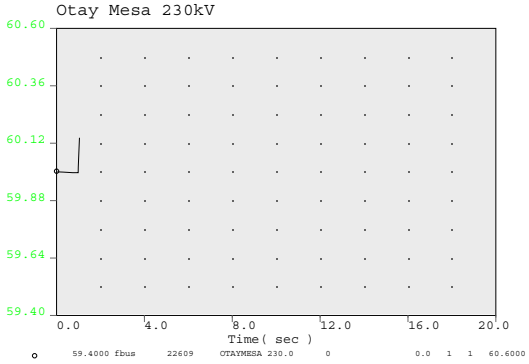
El Centro



Imperial Valley 230kV



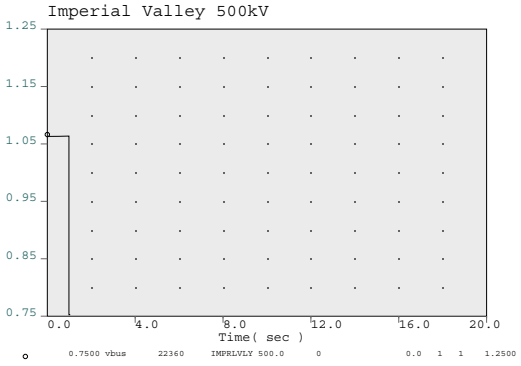
Otay Mesa 230kV



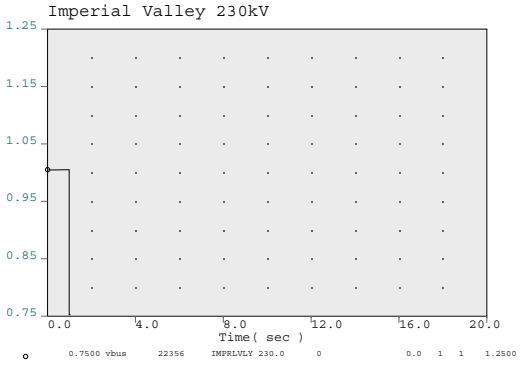
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

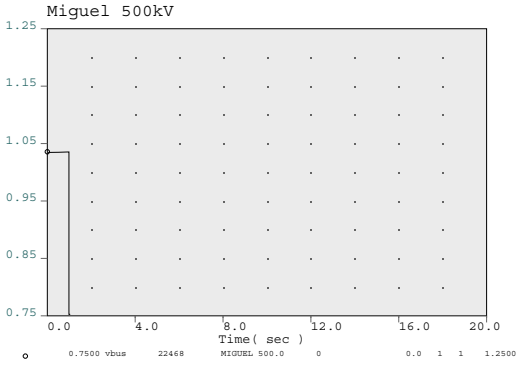
Imperial Valley 500kV



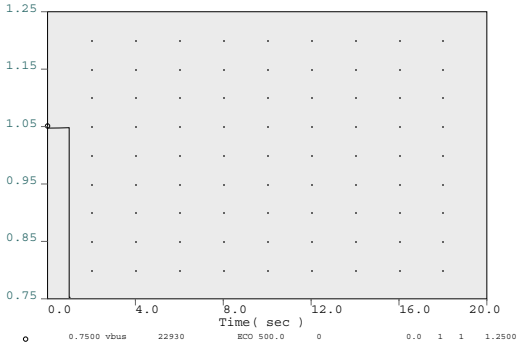
Imperial Valley 230kV



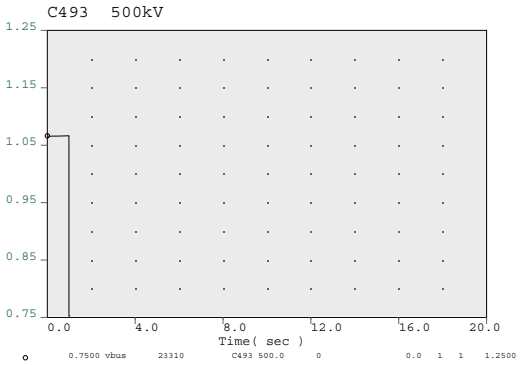
Miguel 500kV



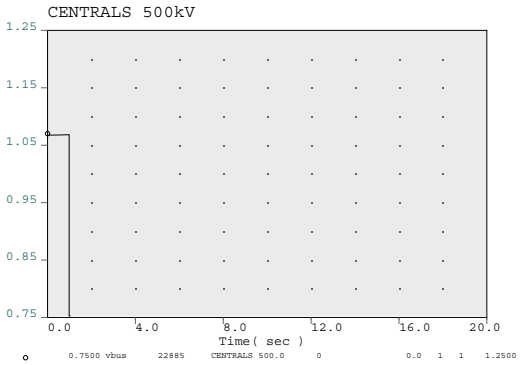
Windfarms 500



C493 500kV

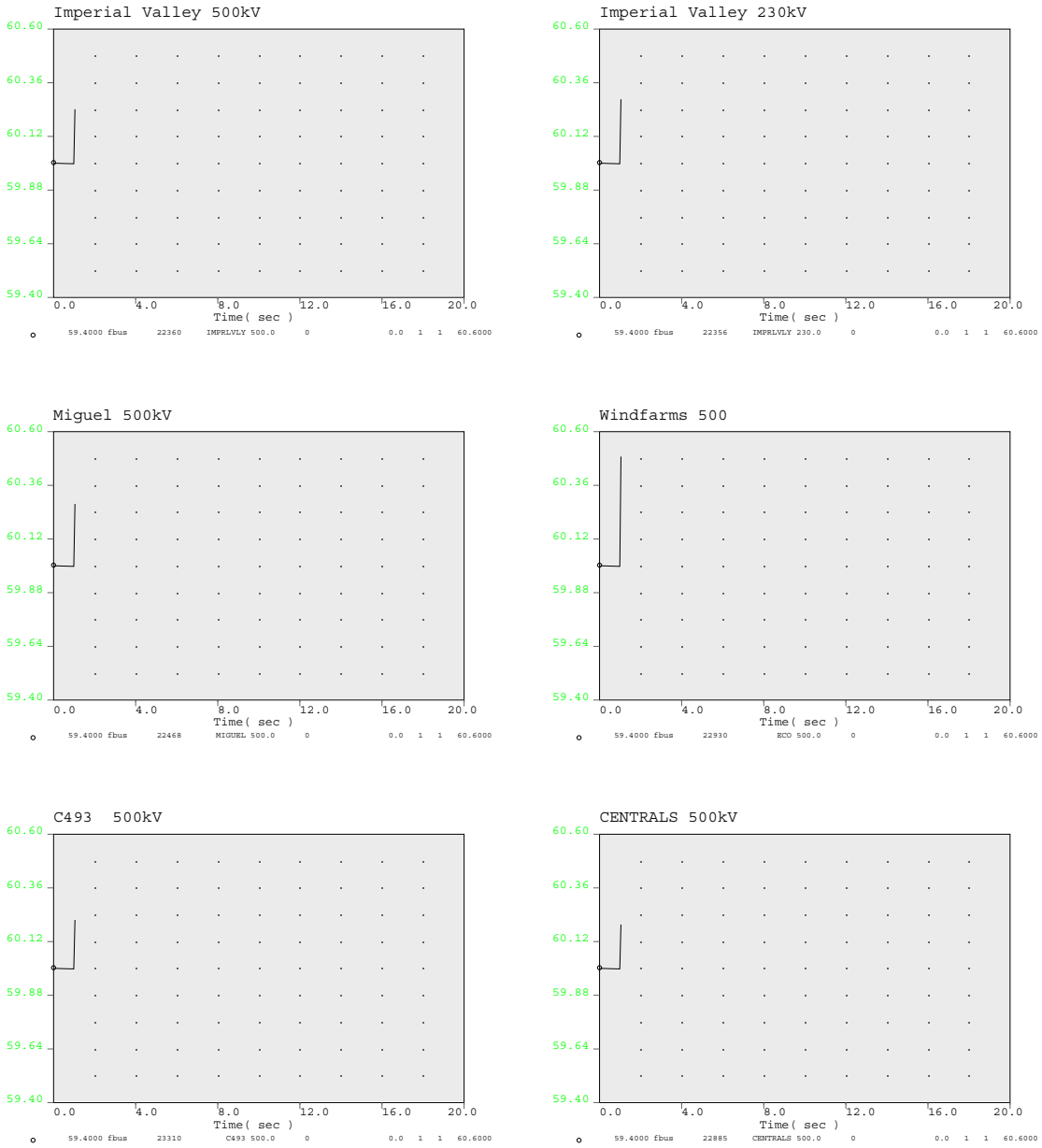


CENTRALS 500kV



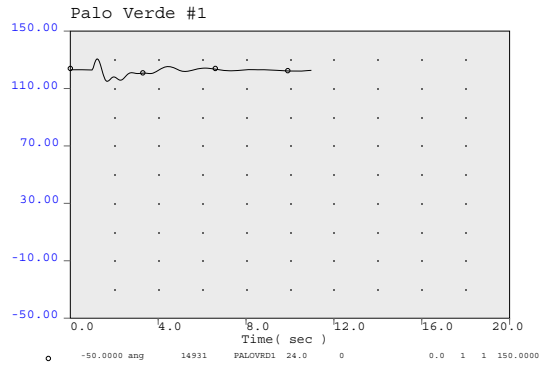
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

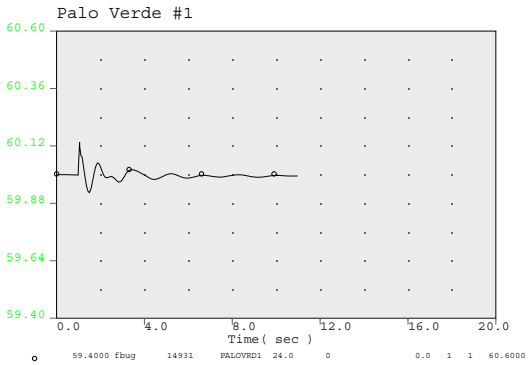
Imperial Valley Area - Frequency

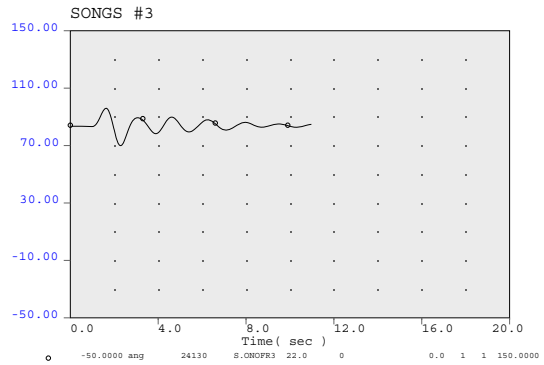


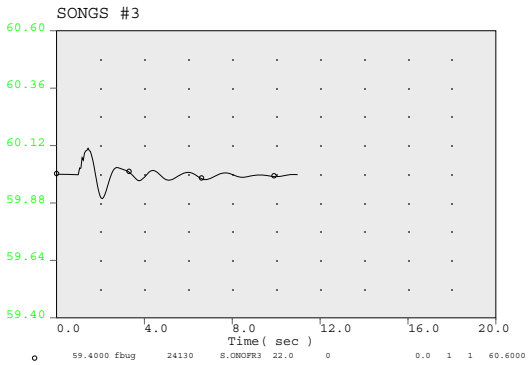
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

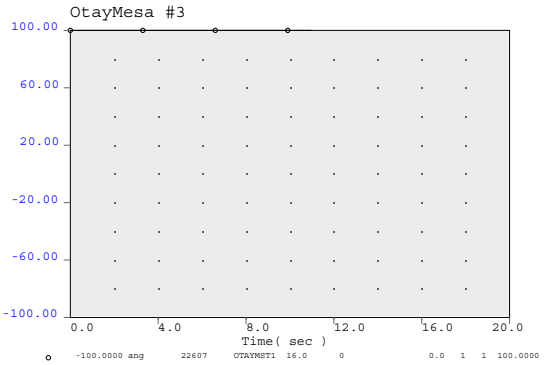
RELATIVE ROTOR ANGLE & FREQUENCY

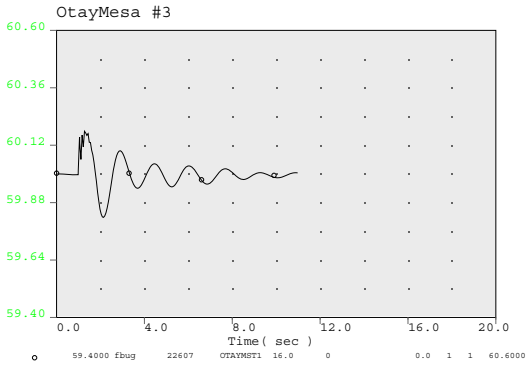










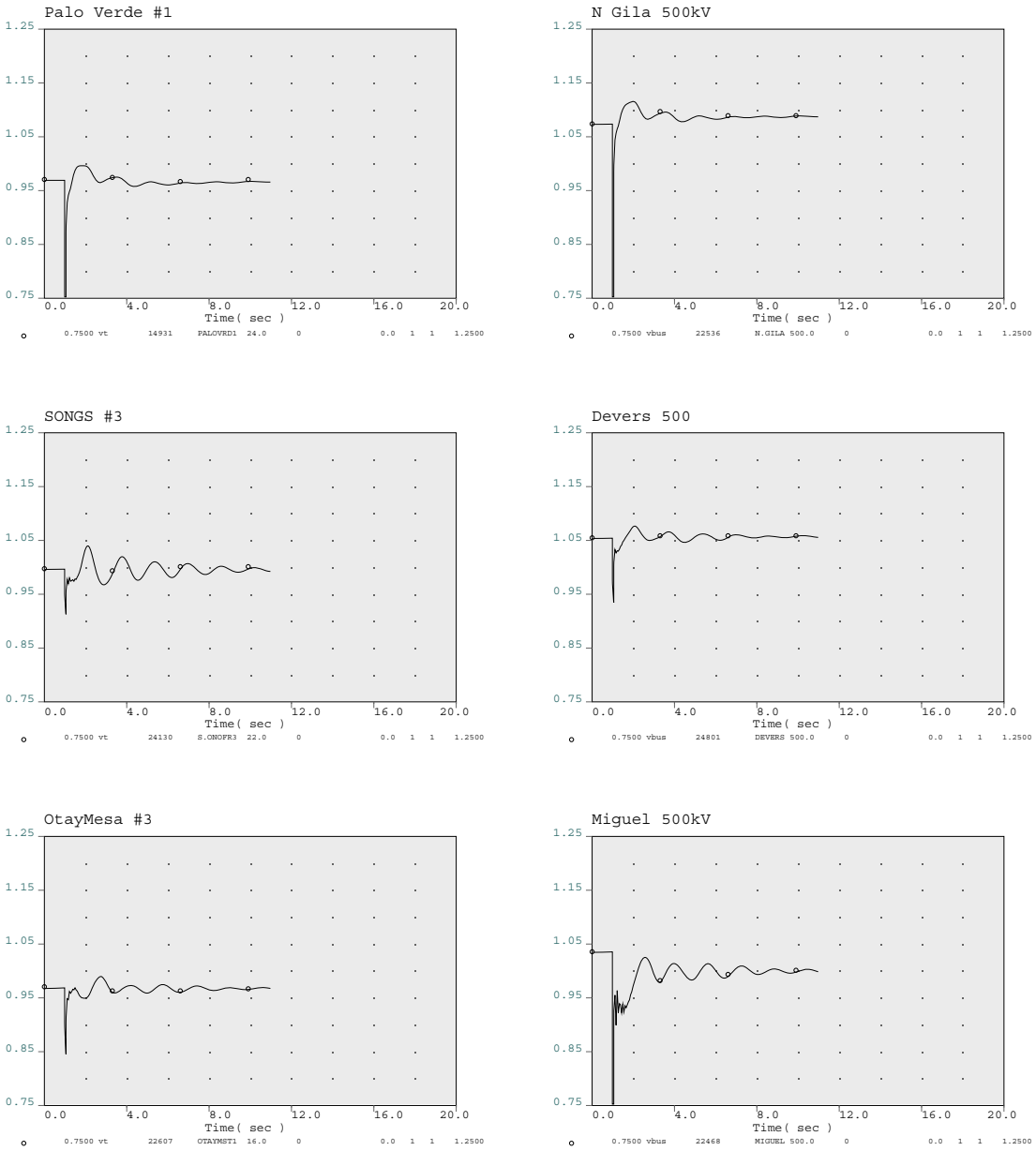


SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Page 1

SDGE	NGila_IV_slo_pre_int_ll.chf	p_i\ll\pre_int\ws_pre_int Tue Nov 02 07:24:40 2010

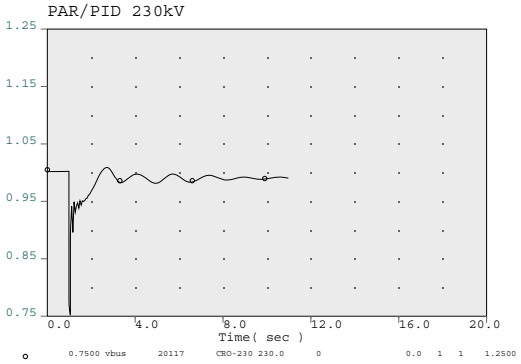
RELATIVE VOLTAGE



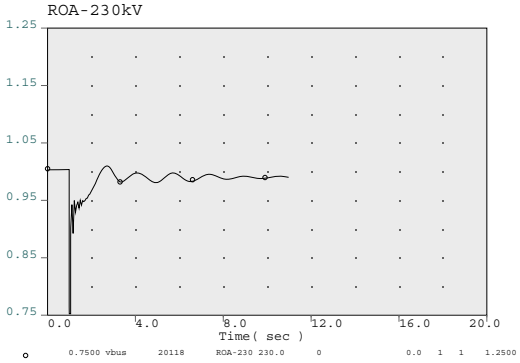
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

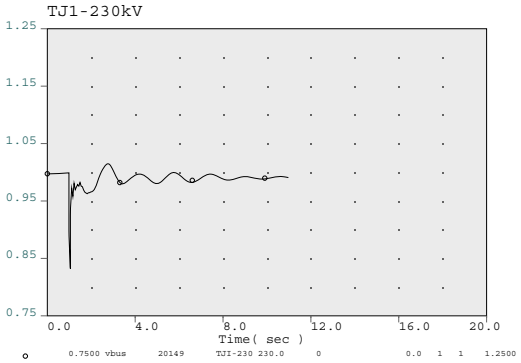
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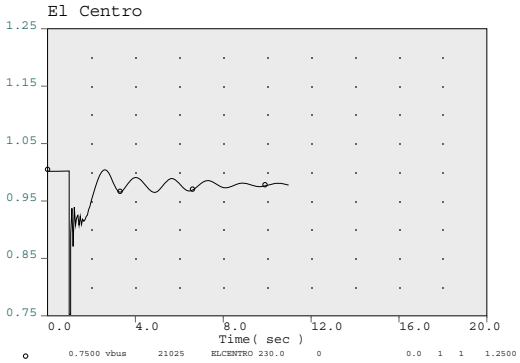
ROA-230kV



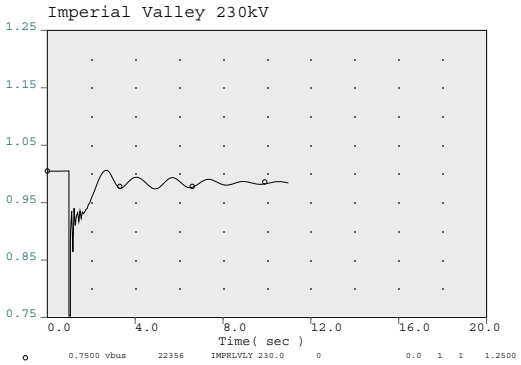
TJ1-230kV



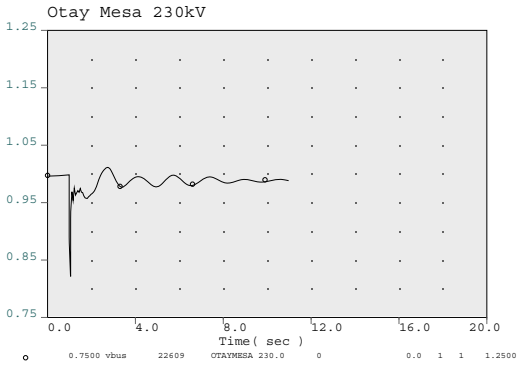
El Centro



Imperial Valley 230kV

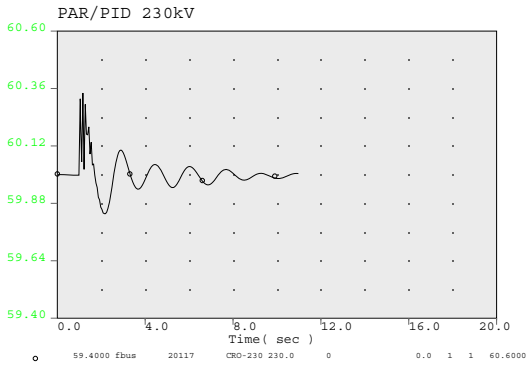


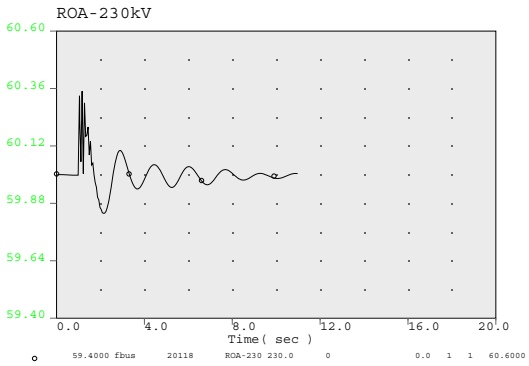
Otay Mesa 230kV

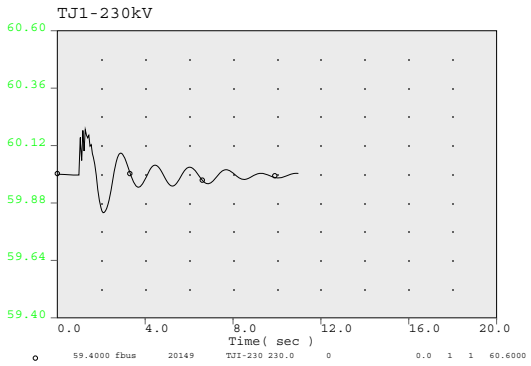


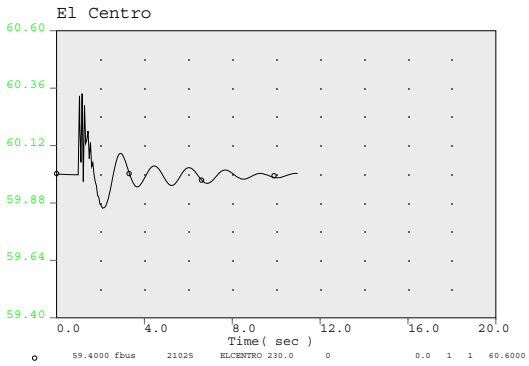
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

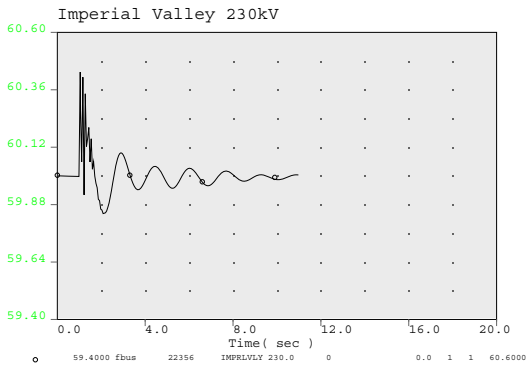
Affected System Frequency Check and Comparison

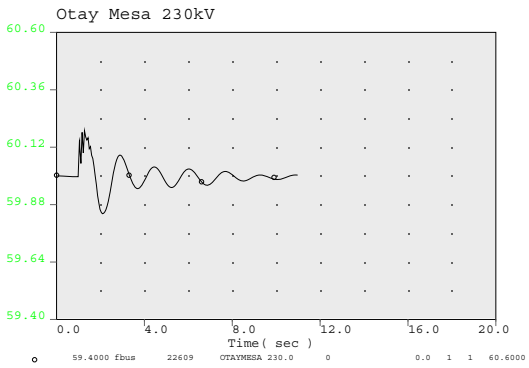








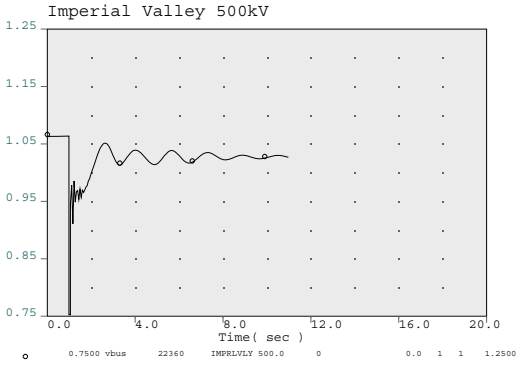




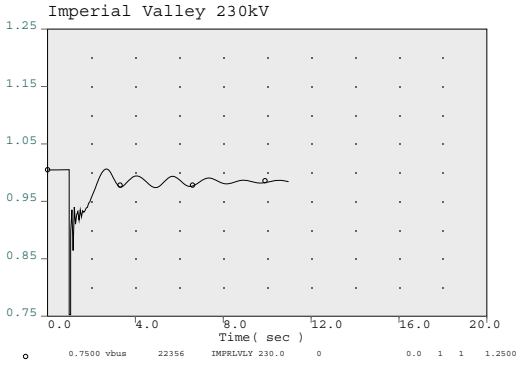
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

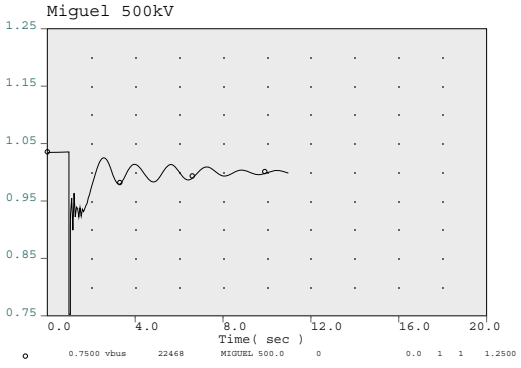
Imperial Valley 500kV



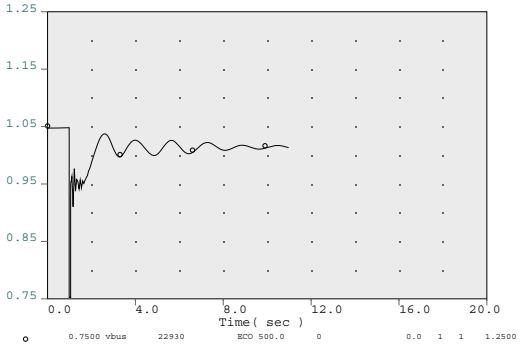
Imperial Valley 230kV



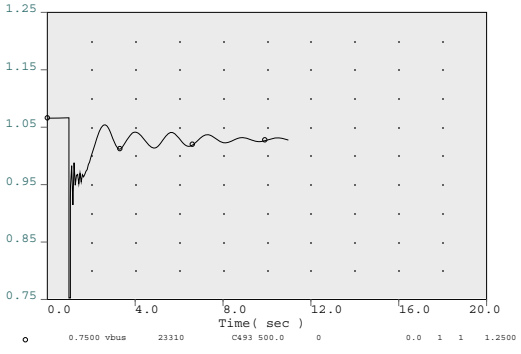
Miguel 500kV



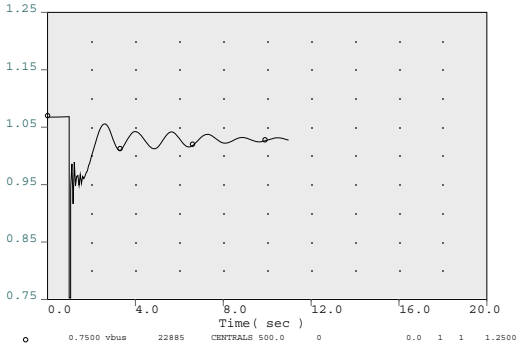
Windfarms 500



C493 500kV

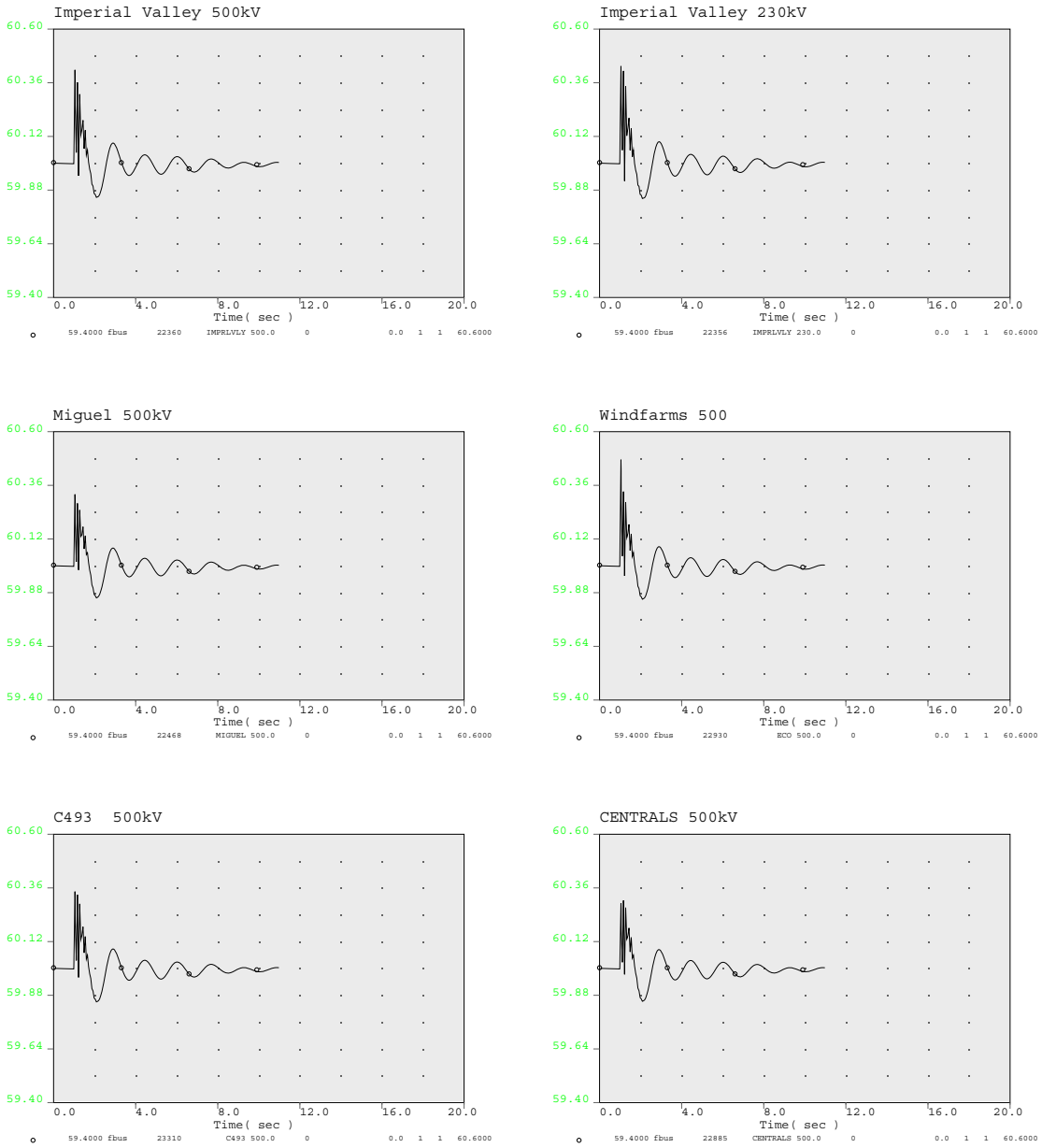


CENTRALS 500kV



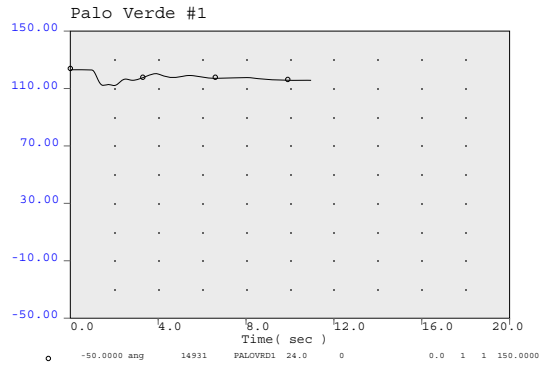
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

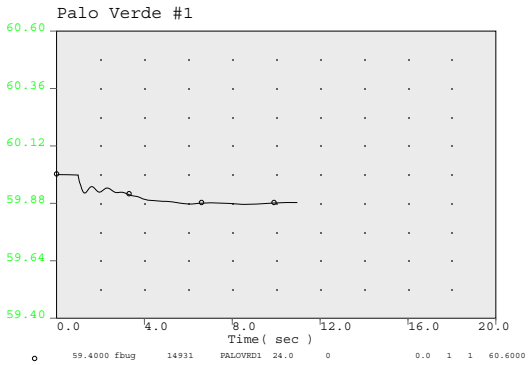
Imperial Valley Area - Frequency

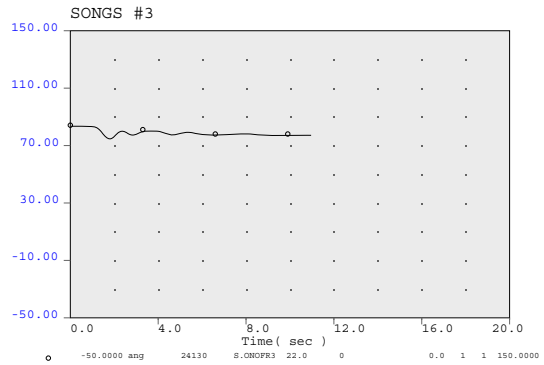


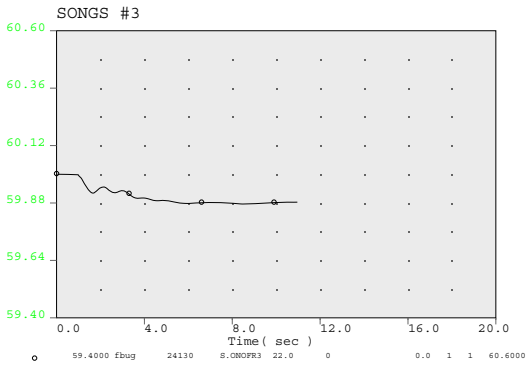
SDG&E Cluster 2 - pre
2014 Light Autumn
North Gila - Imperial Valley 500 kV line

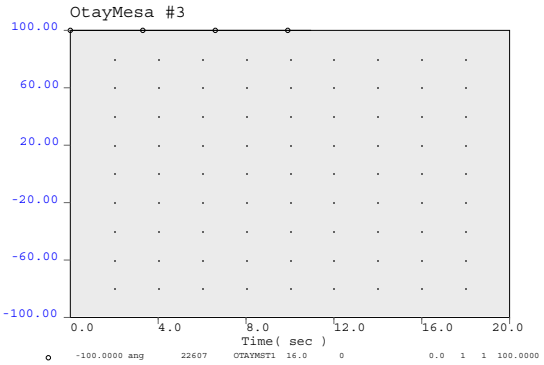
RELATIVE ROTOR ANGLE & FREQUENCY

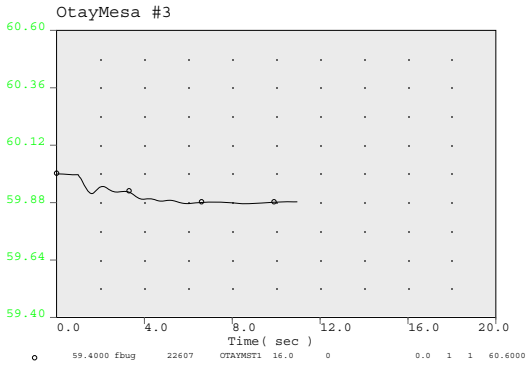








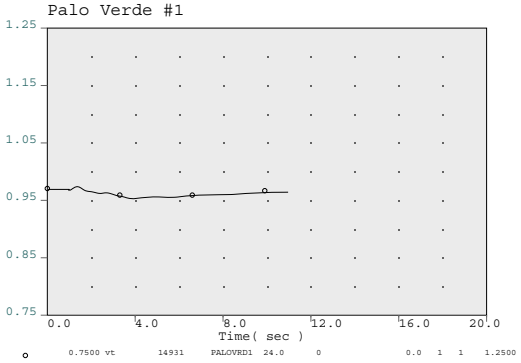




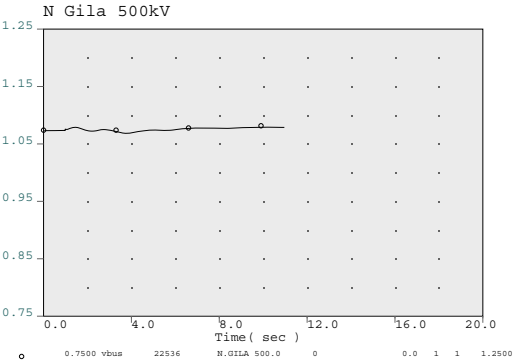
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

RELATIVE VOLTAGE

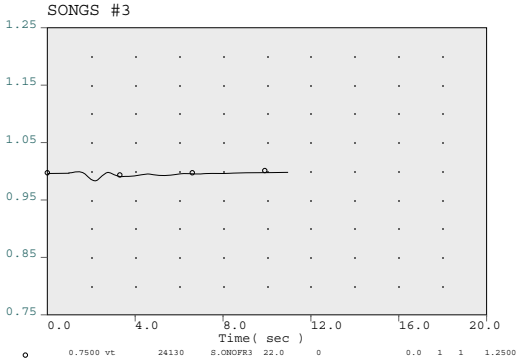
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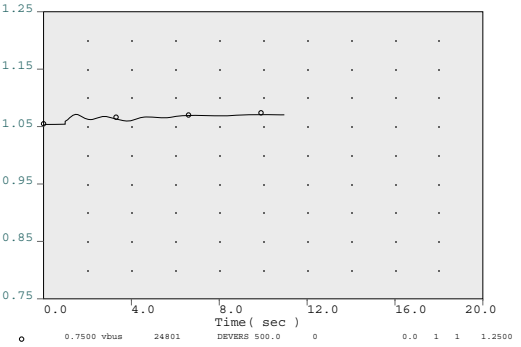
N Gila 500kV



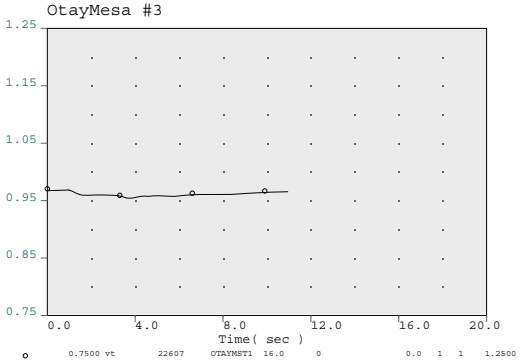
SONGS #3



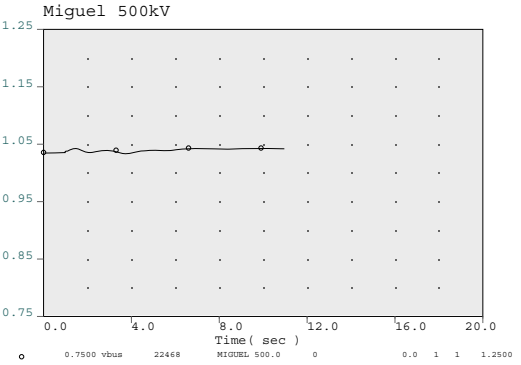
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OtayMesa #3



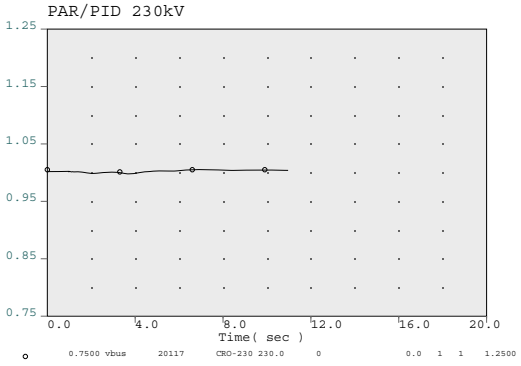
Miguel 500kV



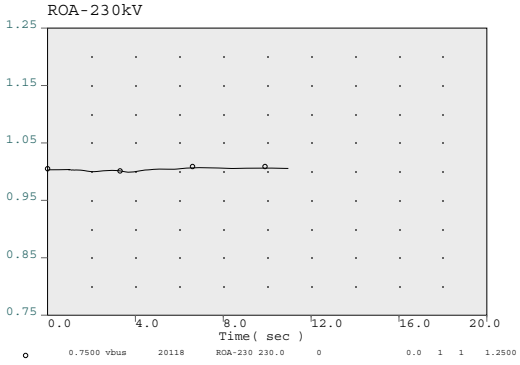
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

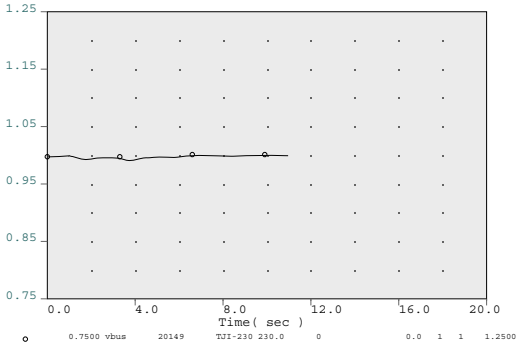
PAR/PID 230kV



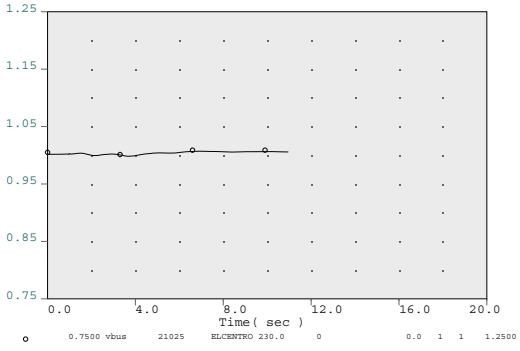
ROA-230kV



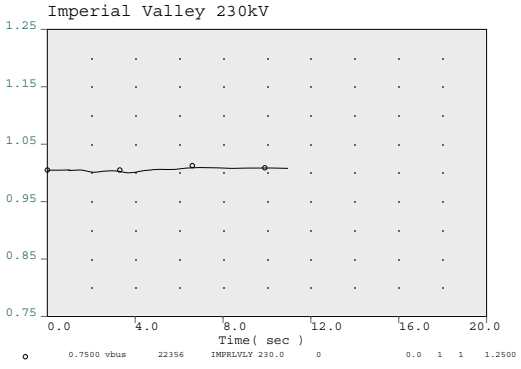
TJ1-230kV



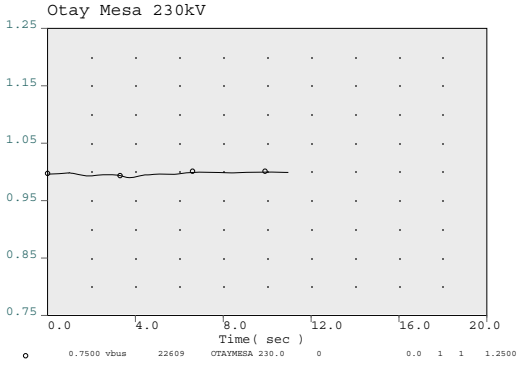
El Centro



Imperial Valley 230kV

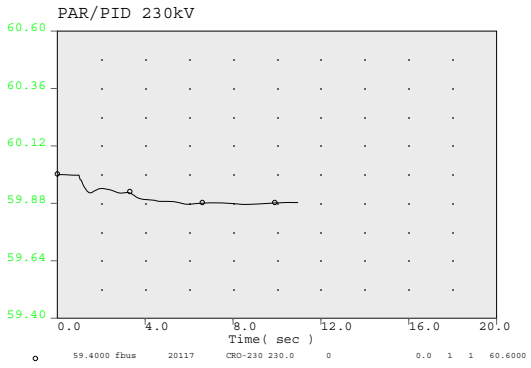


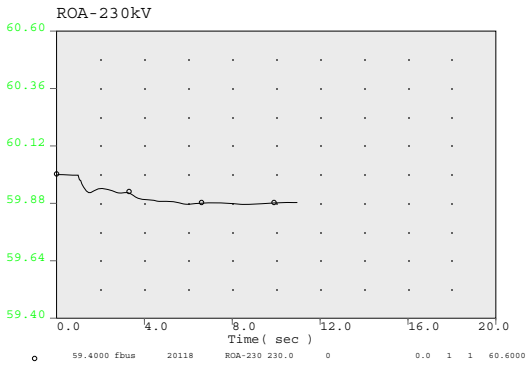
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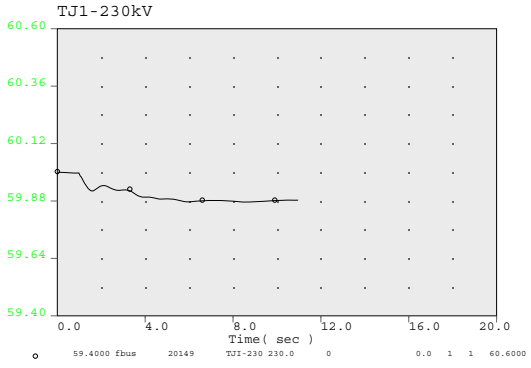


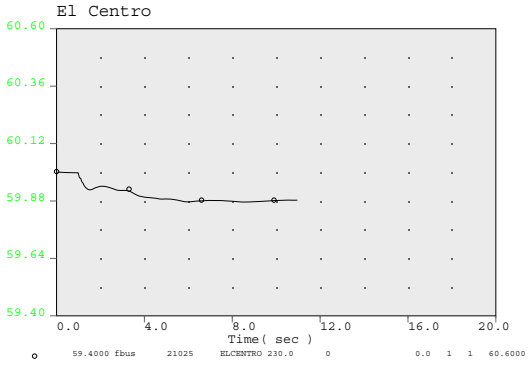
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

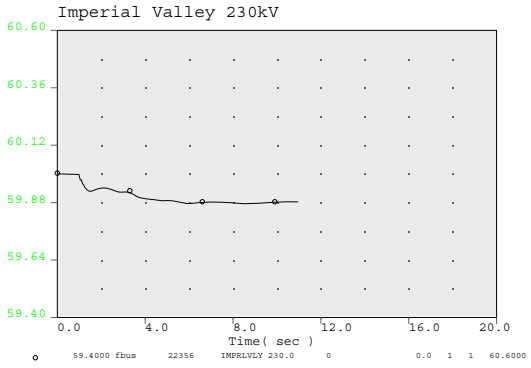
Affected System Frequency Check and Comparison

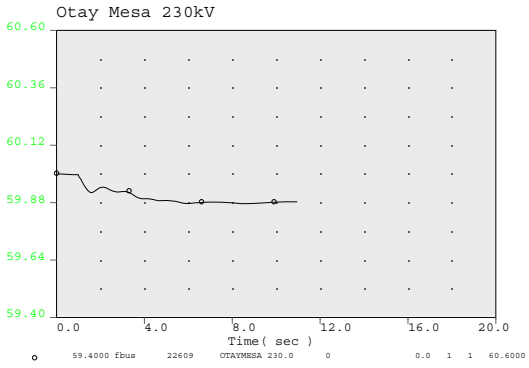








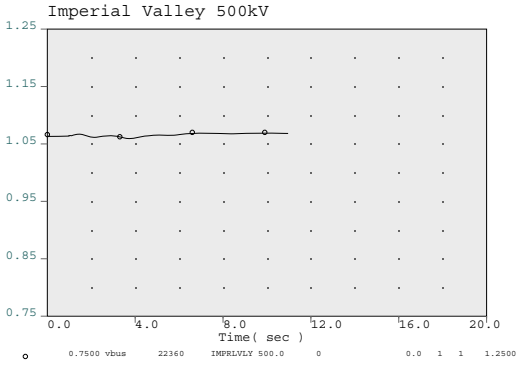




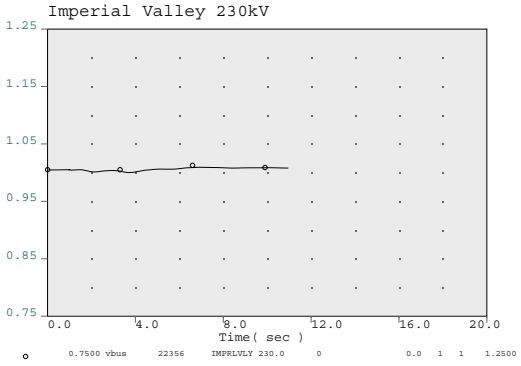
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

Imperial Valley Area - VOLTAGE

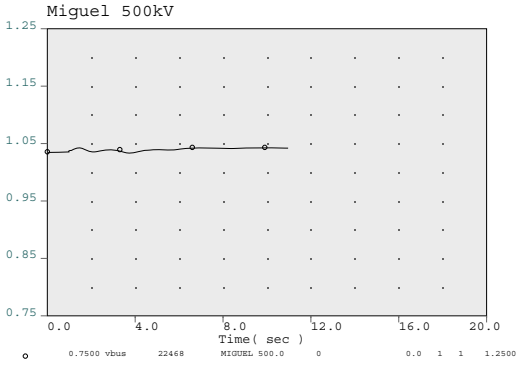
Imperial Valley 500kV



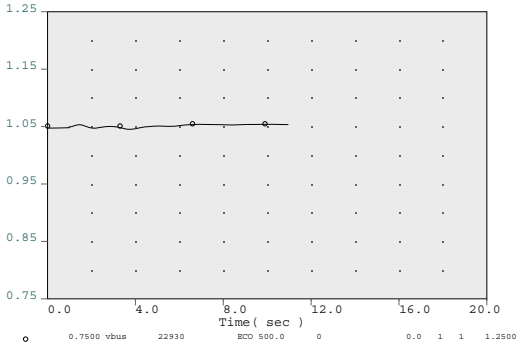
Imperial Valley 230kV



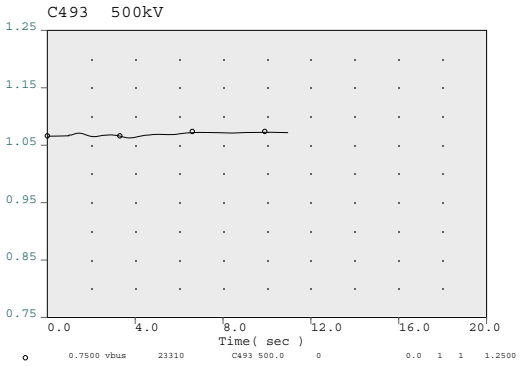
Miguel 500kV



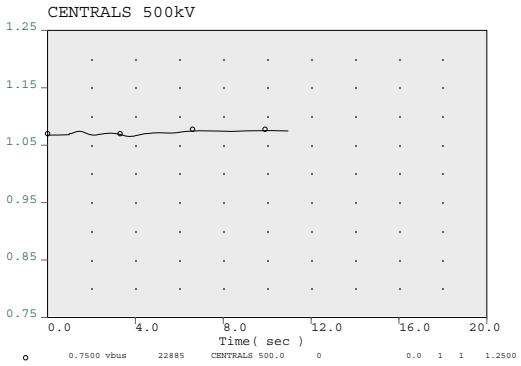
Windfarms 500



C493 500kV

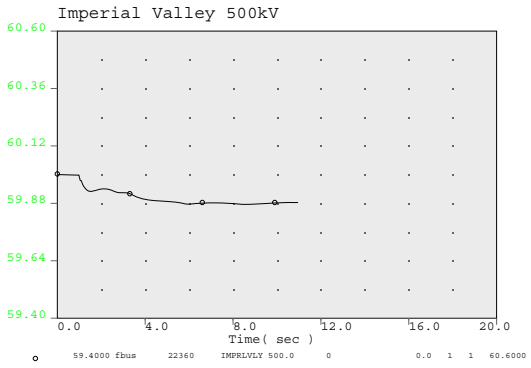


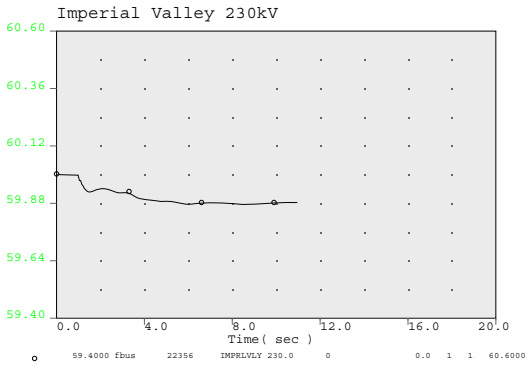
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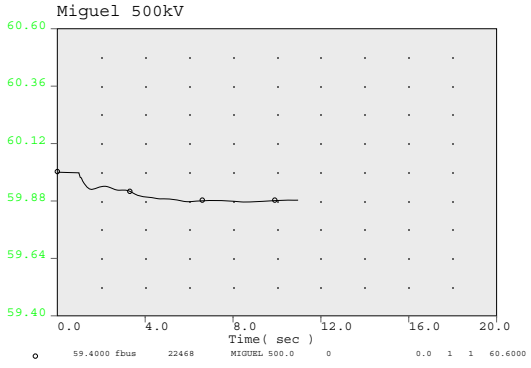


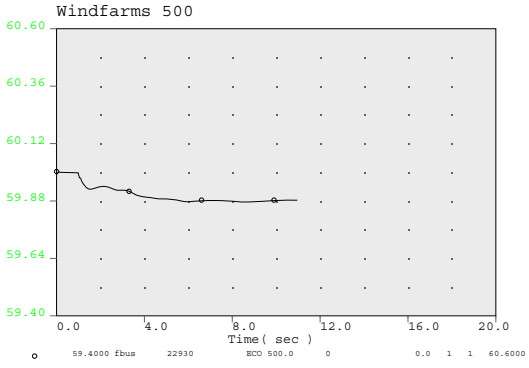
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

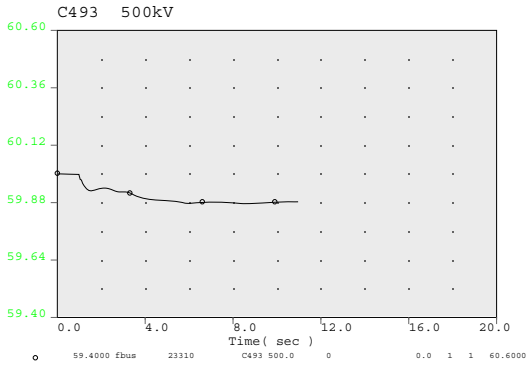
Imperial Valley Area - Frequency

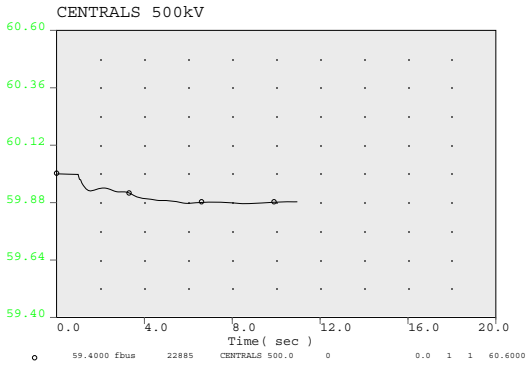






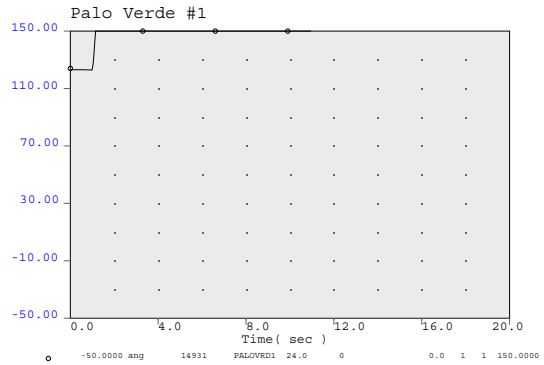


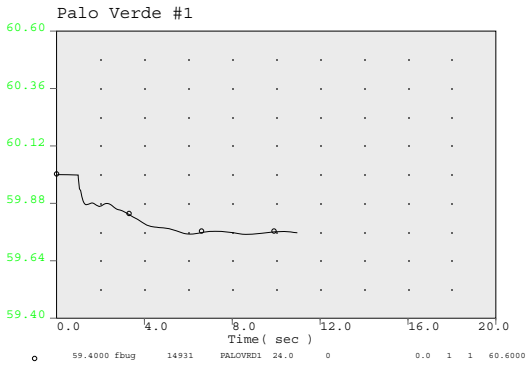


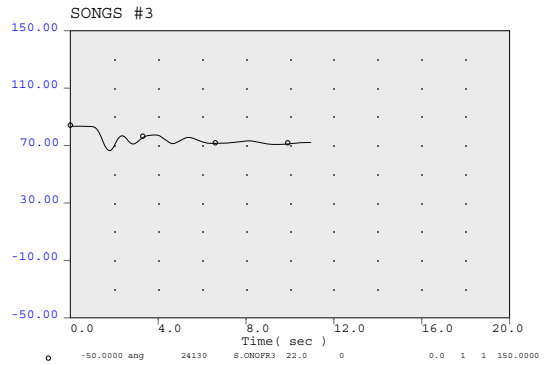


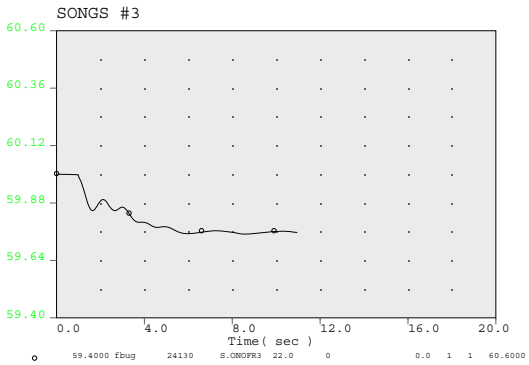
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generator #2

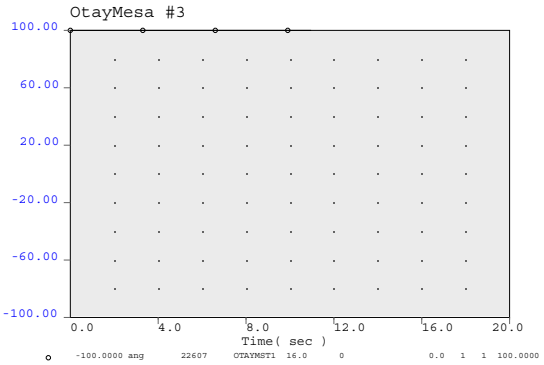
RELATIVE ROTOR ANGLE & FREQUENCY

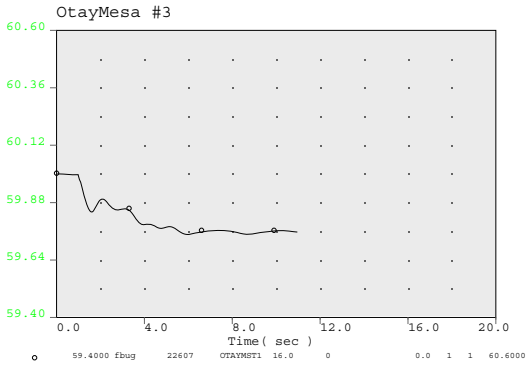








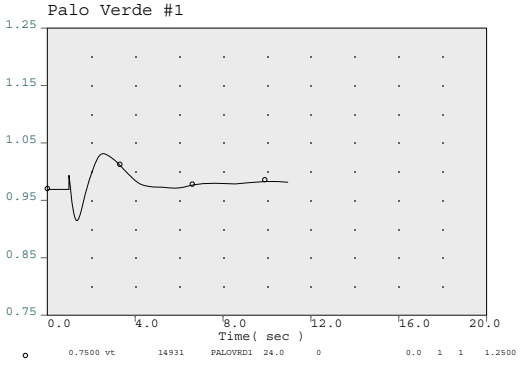




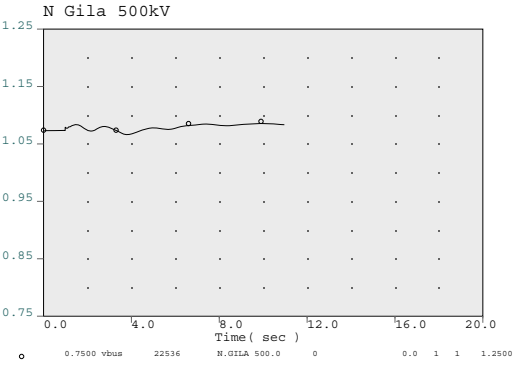
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

RELATIVE VOLTAGE

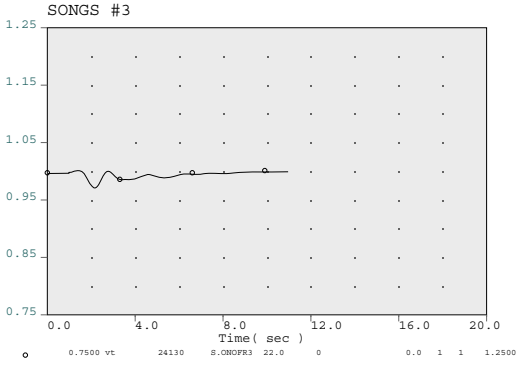
Palo Verde #1



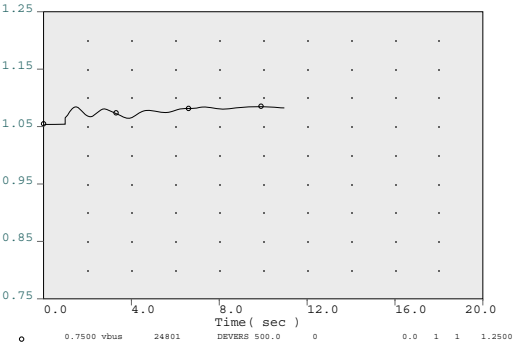
N Gila 500kV



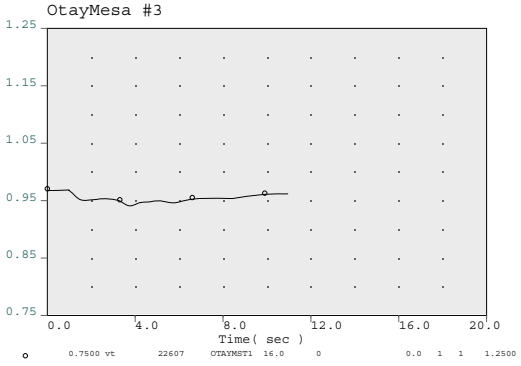
SONGS #3



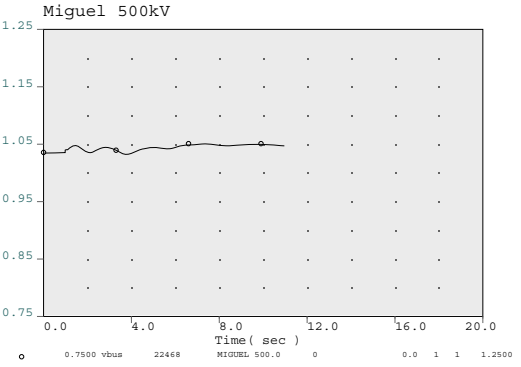
Devers 500



OtayMesa #3



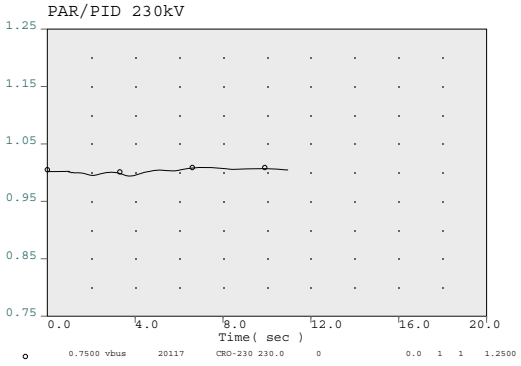
Miguel 500kV



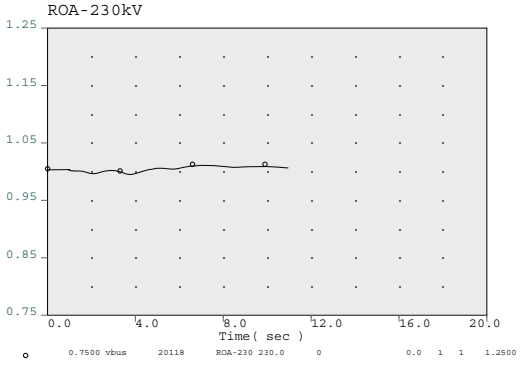
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

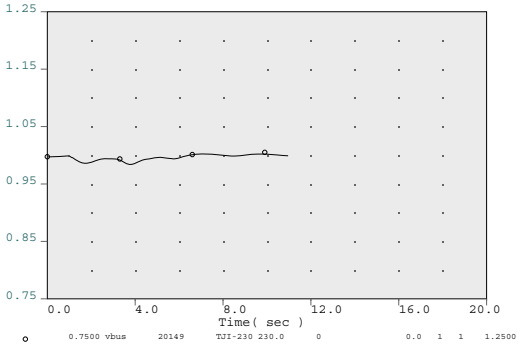
PAR/PID 230kV



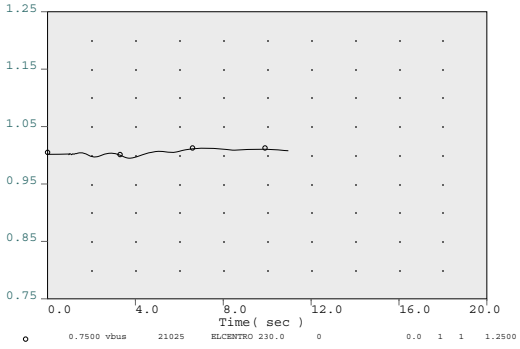
ROA-230kV



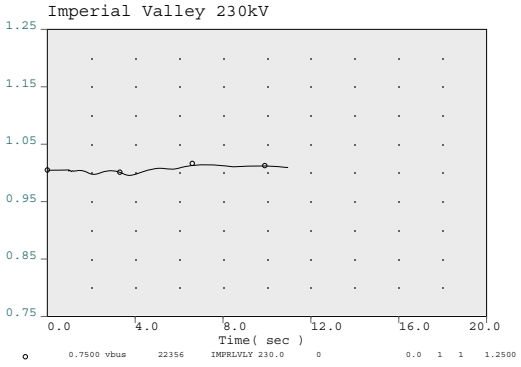
TJ1-230kV



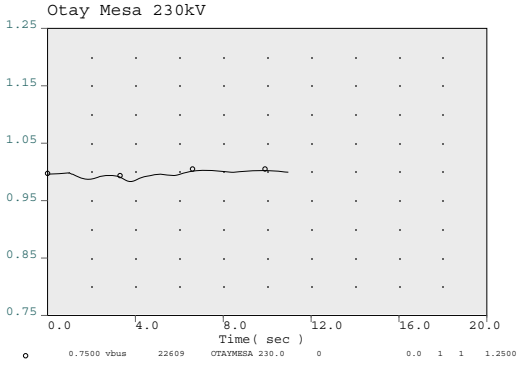
El Centro



Imperial Valley 230kV

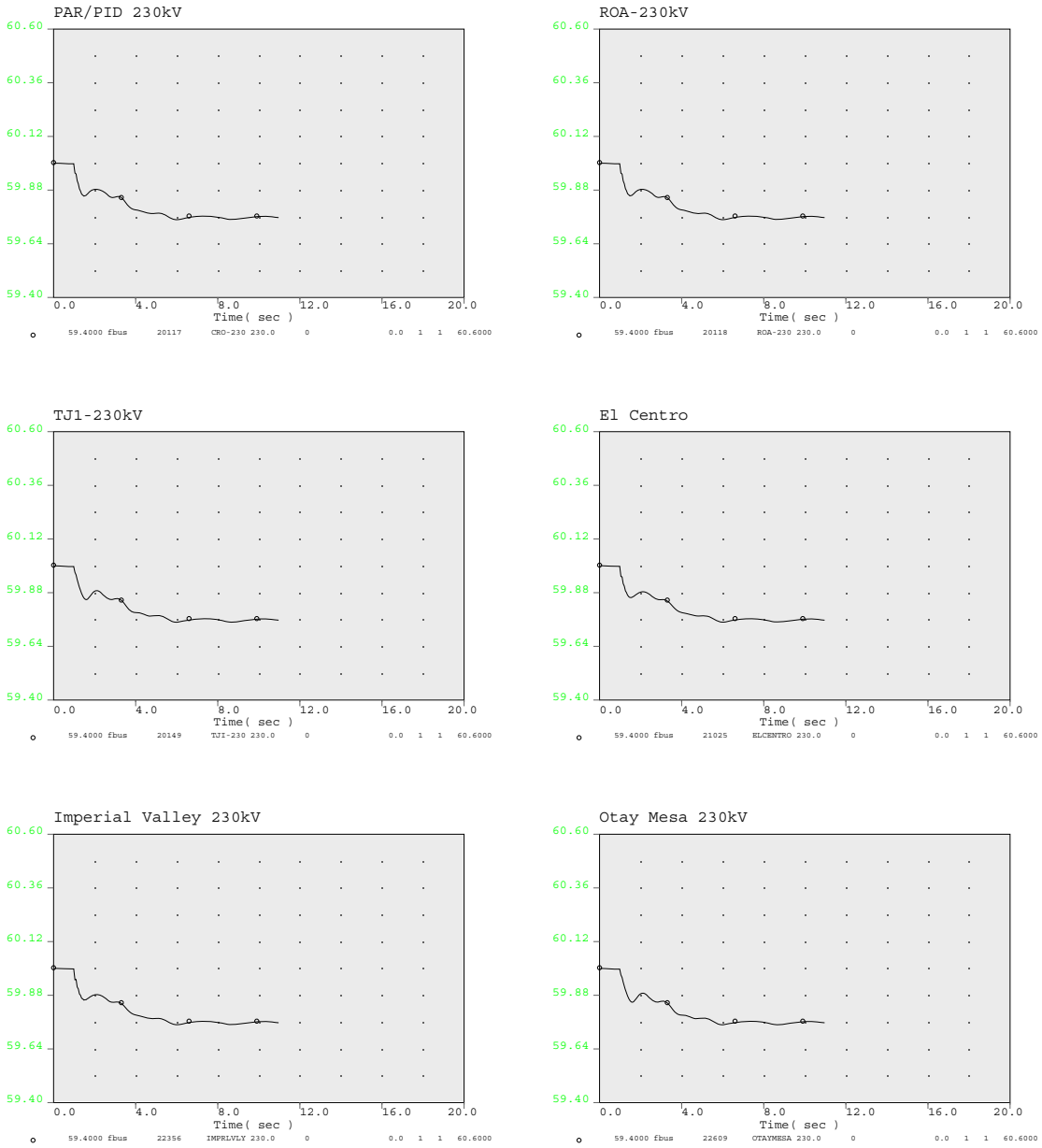


Otay Mesa 230kV



SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

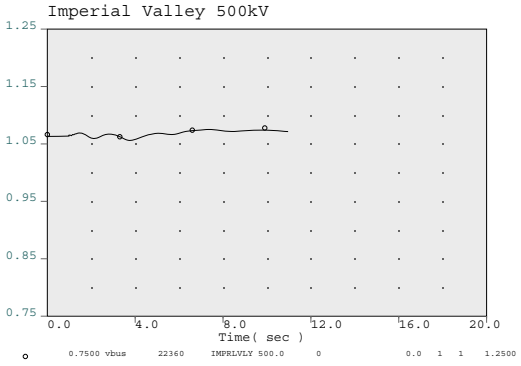
Affected System Frequency Check and Comparison



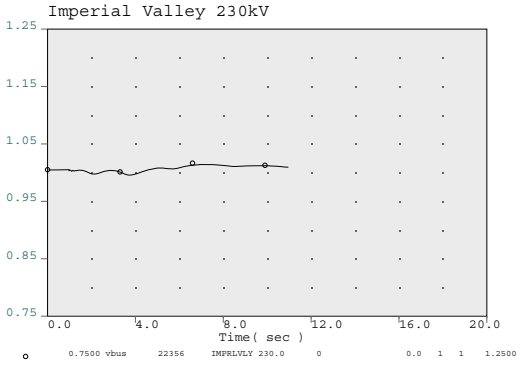
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

Imperial Valley Area - VOLTAGE

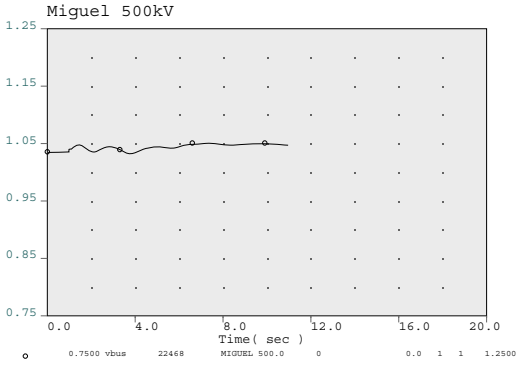
Imperial Valley 500kV



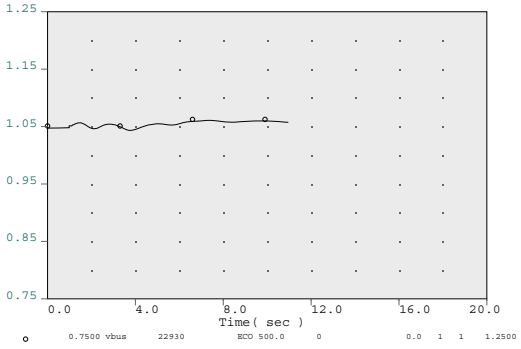
Imperial Valley 230kV



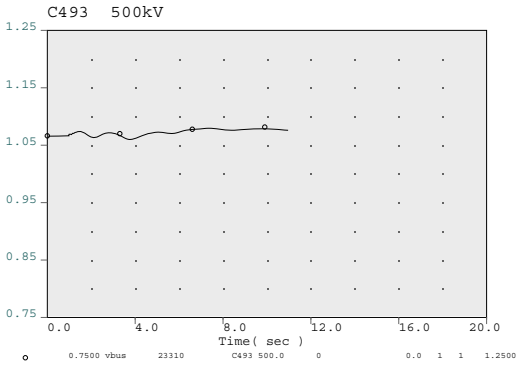
Miguel 500kV



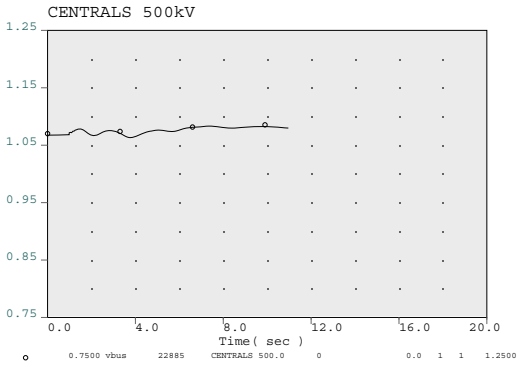
Windfarms 500



C493 500kV

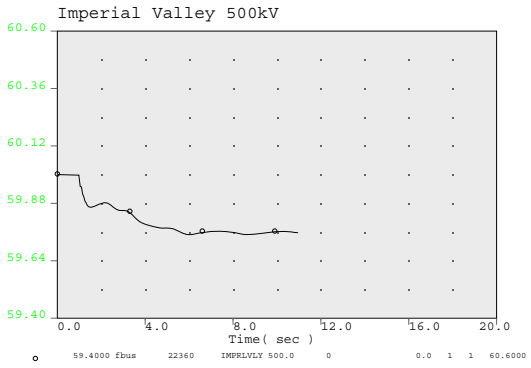


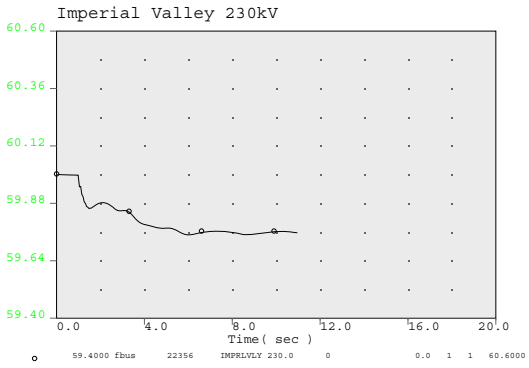
CENTRALS 500kV

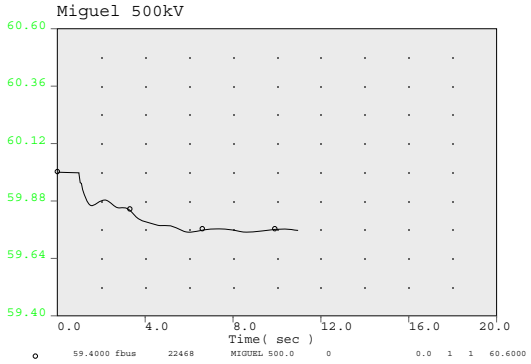


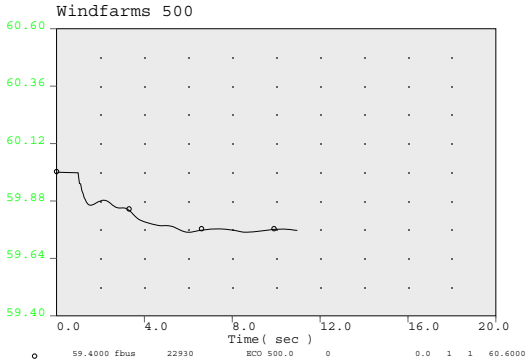
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

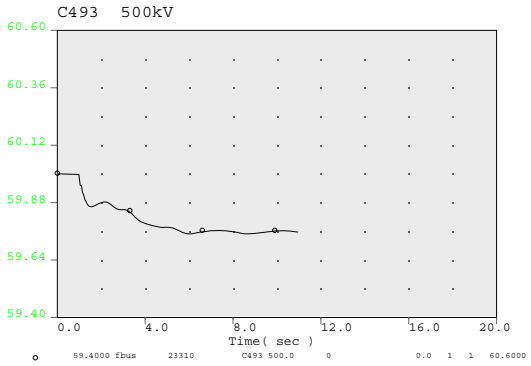
Imperial Valley Area - Frequency

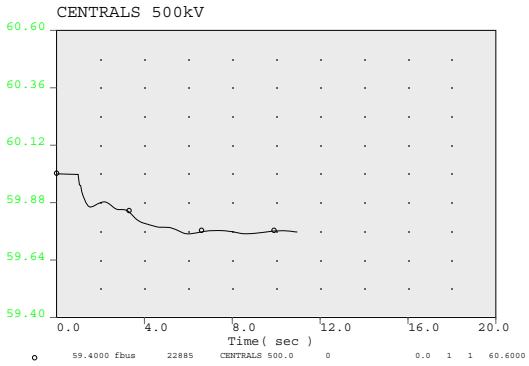






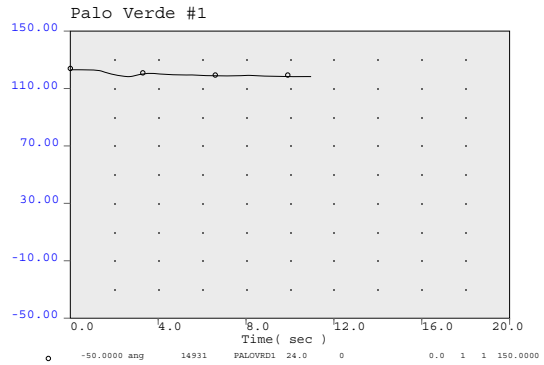


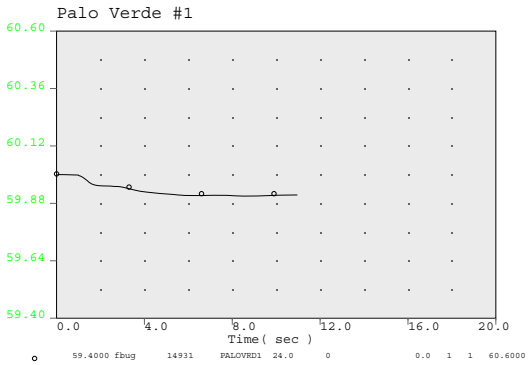


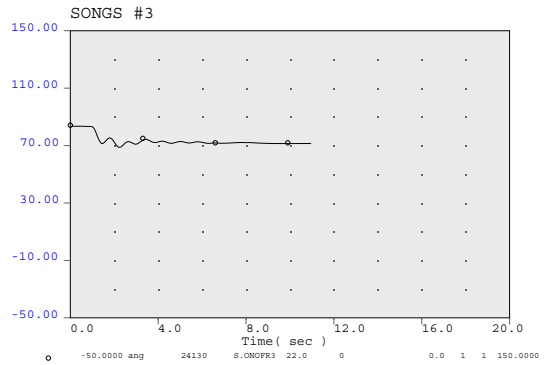


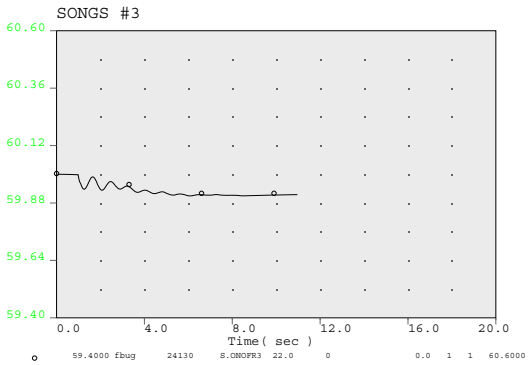
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip PaloVerde Generators 1 & 2

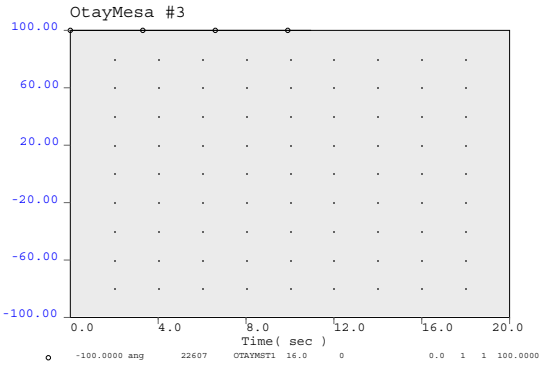
RELATIVE ROTOR ANGLE & FREQUENCY

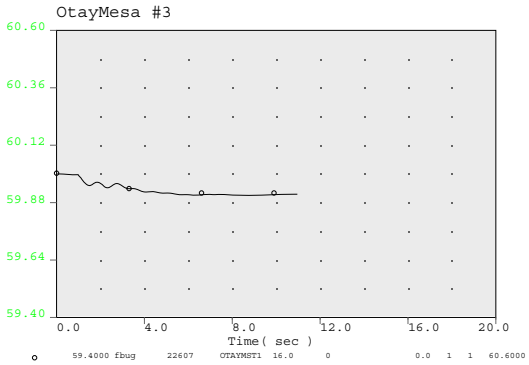












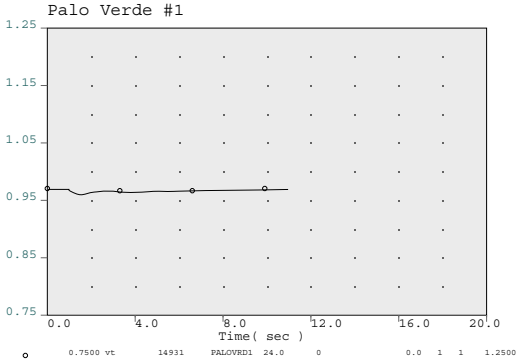
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Page 1

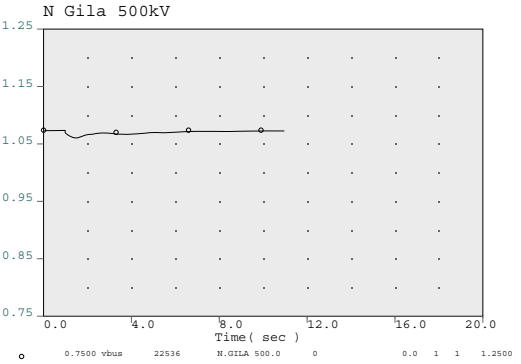
SDGE	SONGS-g1_pre_int_ll.chf	p_i\ll\pre_int\ws_pre_int Tue Nov 02 07:25:37 2010

RELATIVE VOLTAGE

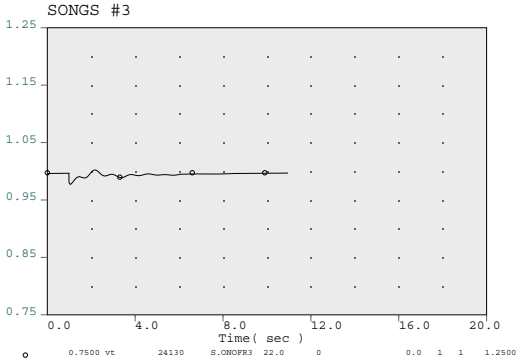
Palo Verde #1



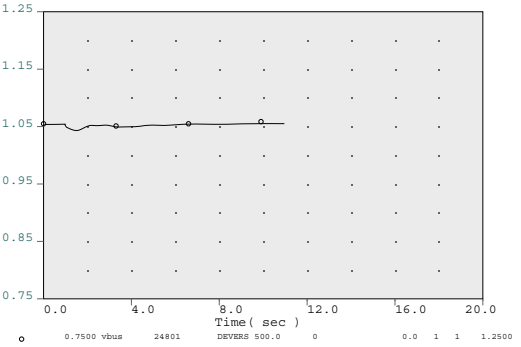
N Gila 500kV



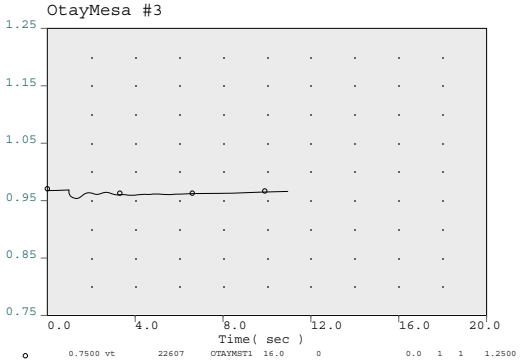
SONGS #3



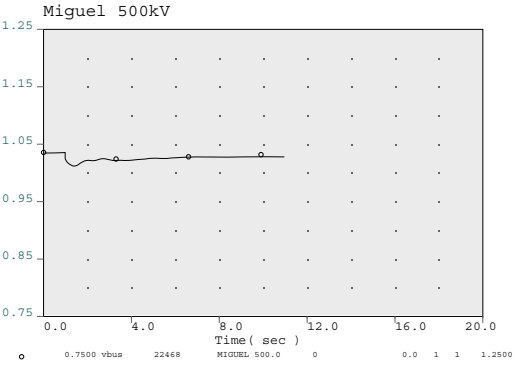
Devers 500



OtayMesa #3



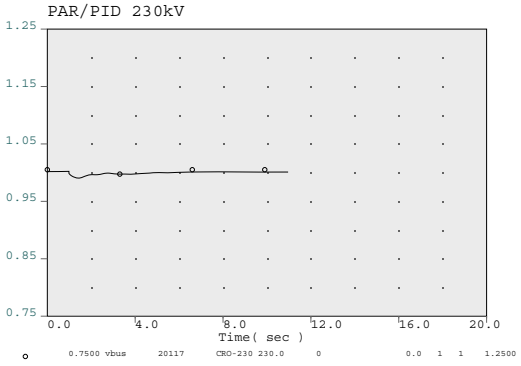
Miguel 500kV



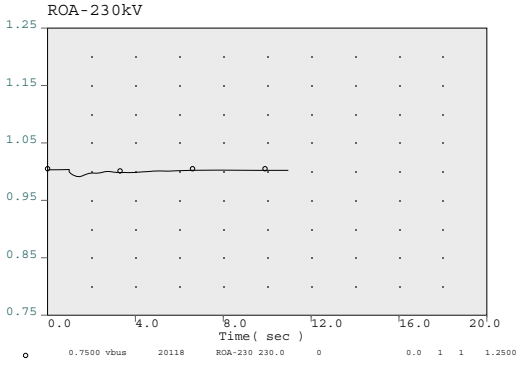
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

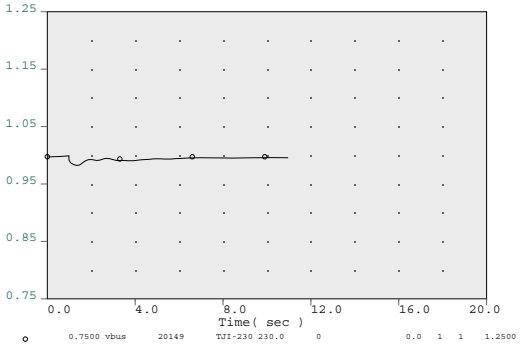
PAR/PID 230kV



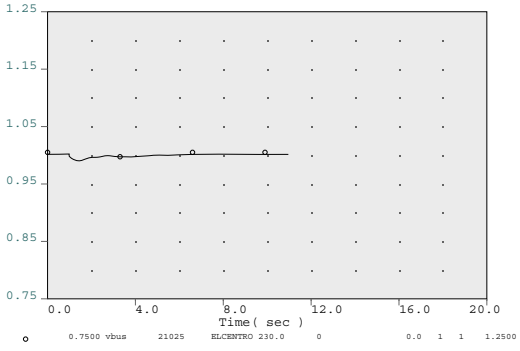
ROA-230kV



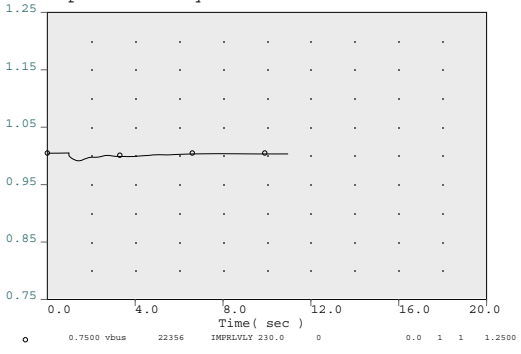
TJ1-230kV



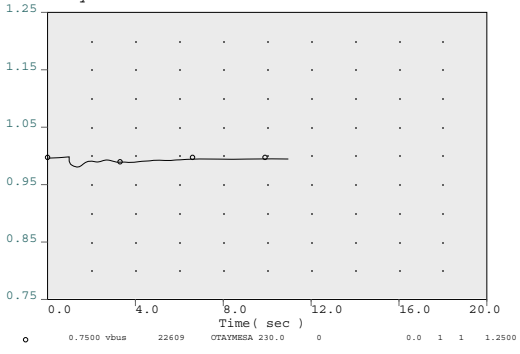
El Centro



Imperial Valley 230kV



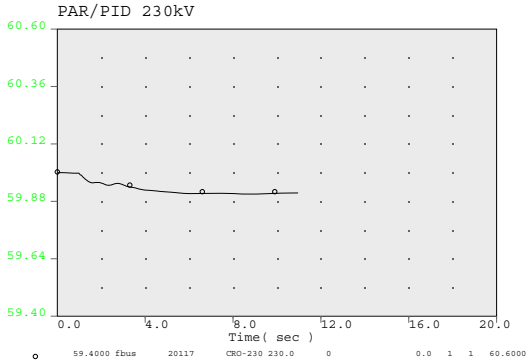
Otay Mesa 230kV



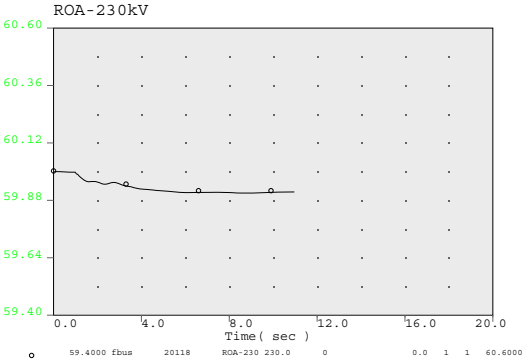
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Affected System Frequency Check and Comparison

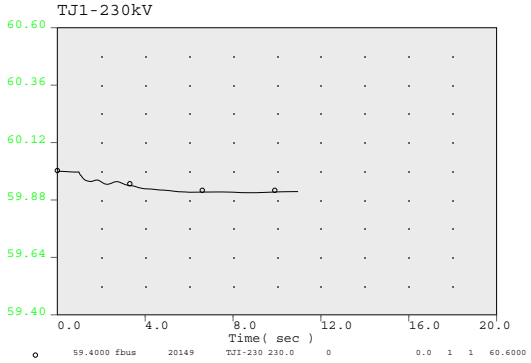
PAR/PID 230kV



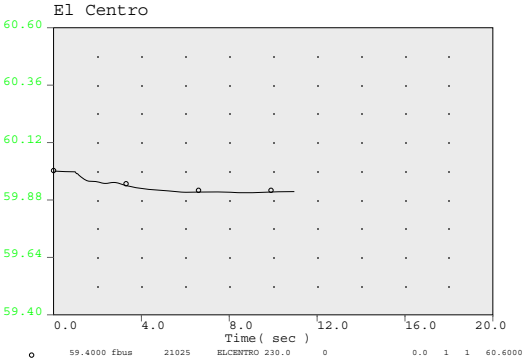
ROA-230kV



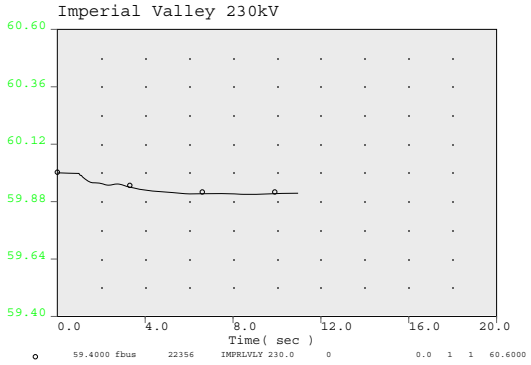
TJ1-230kV



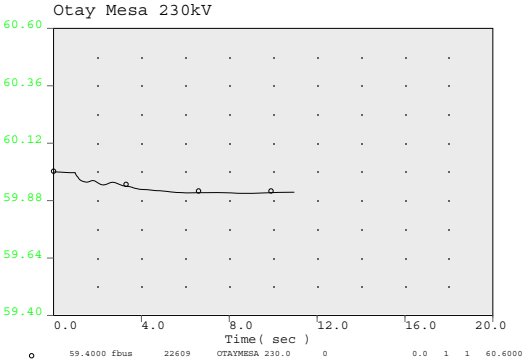
El Centro



Imperial Valley 230kV



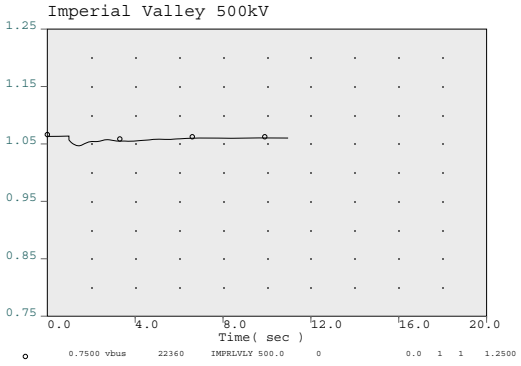
Otay Mesa 230kV



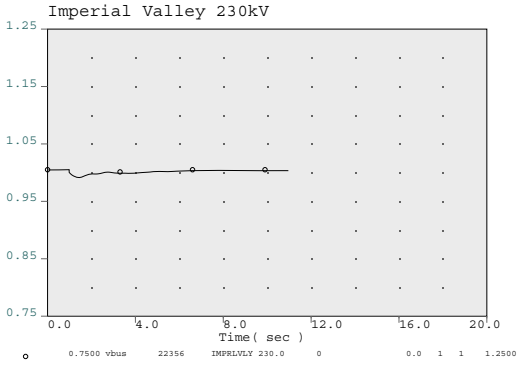
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

Imperial Valley Area - VOLTAGE

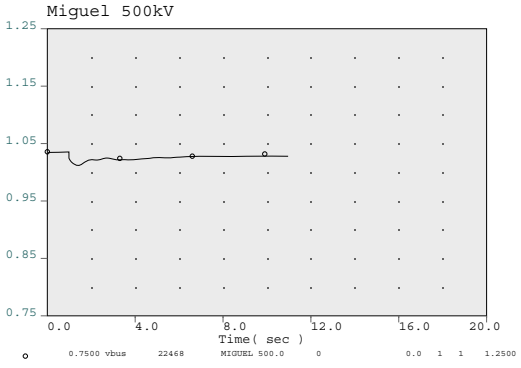
Imperial Valley 500kV



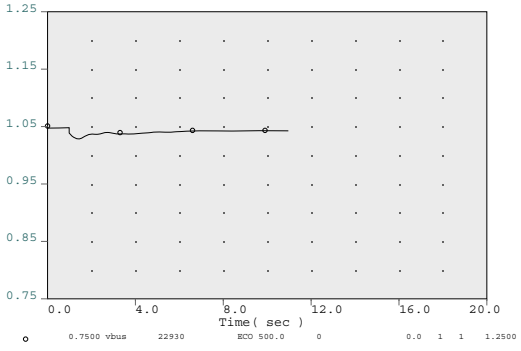
Imperial Valley 230kV



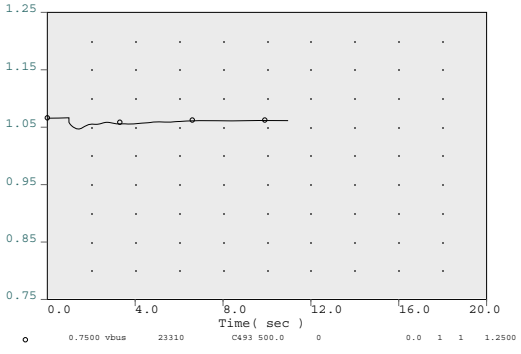
Miguel 500kV



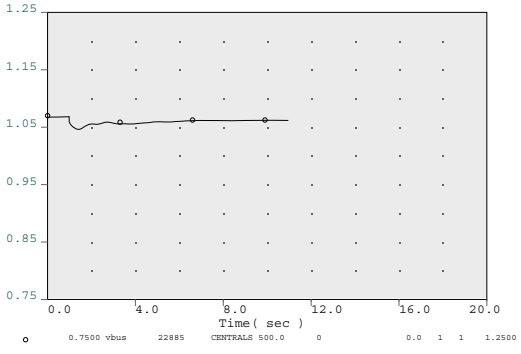
Windfarms 500



C493 500kV

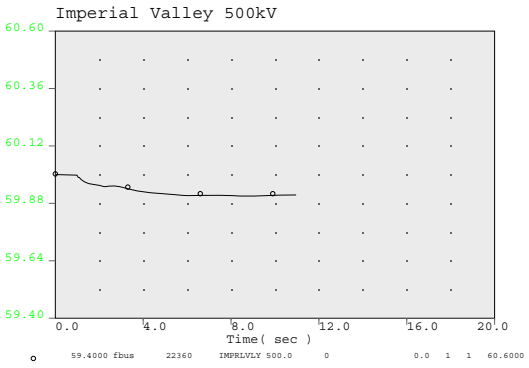


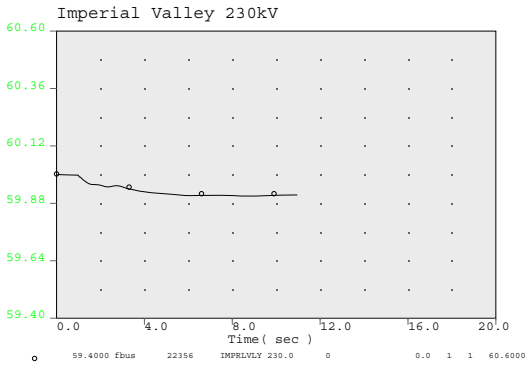
CENTRALS 500kV

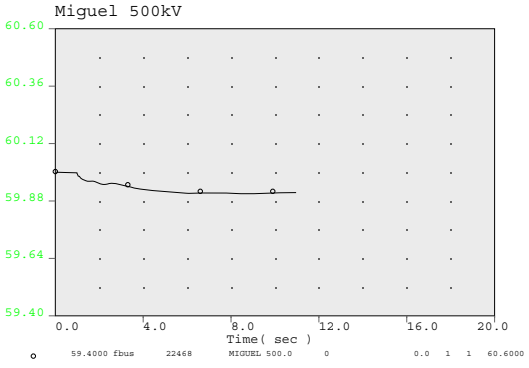


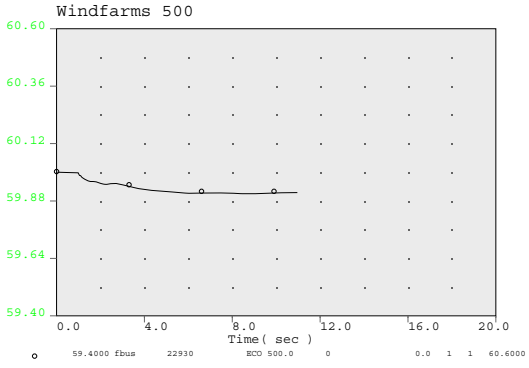
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

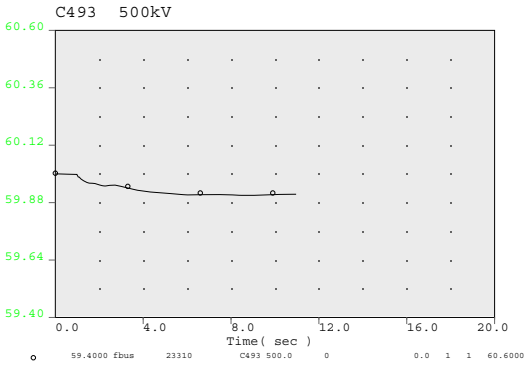
Imperial Valley Area - Frequency

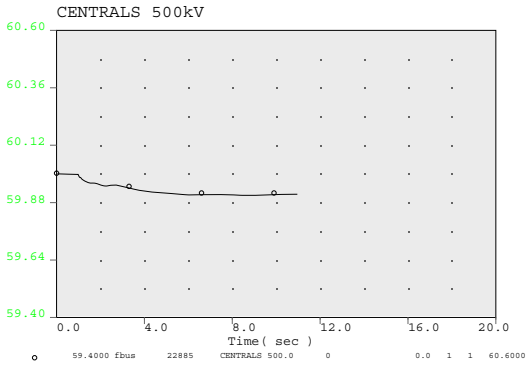






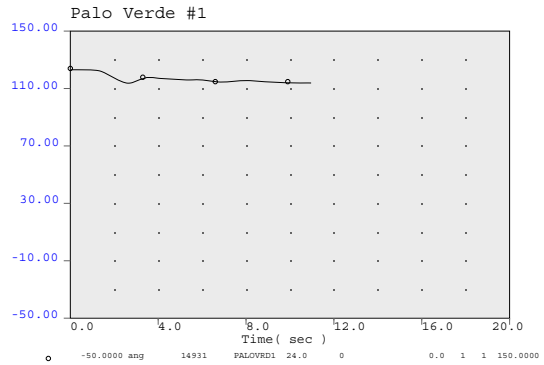


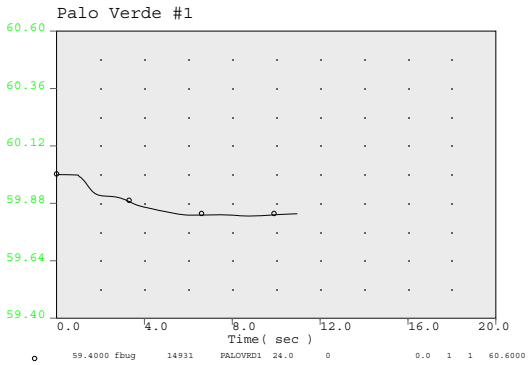


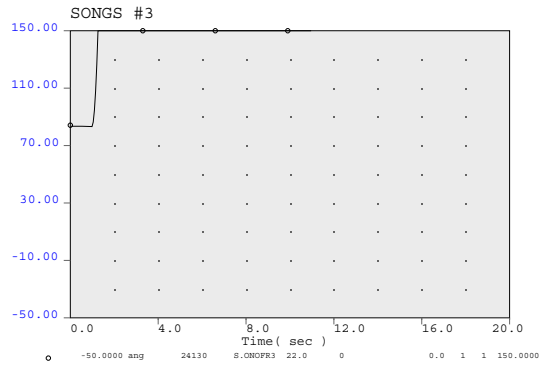


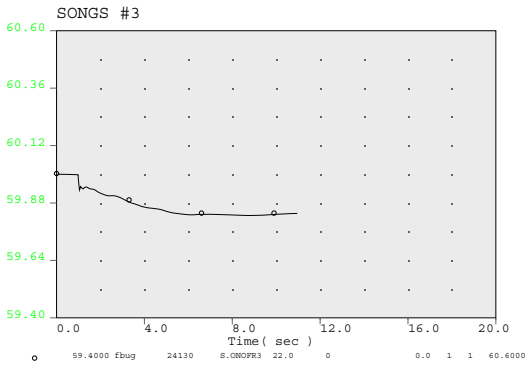
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generator #2

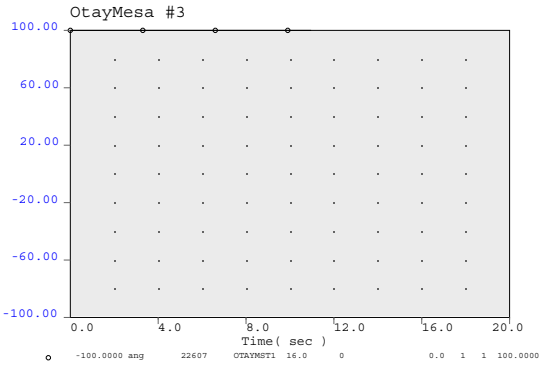
RELATIVE ROTOR ANGLE & FREQUENCY

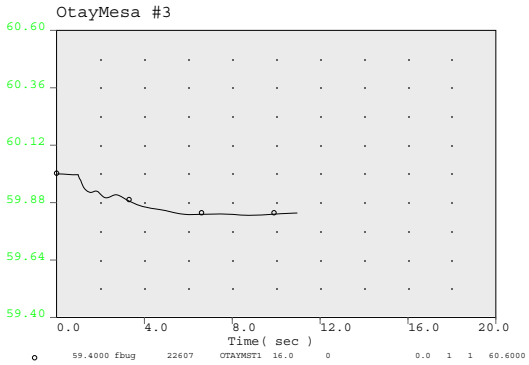












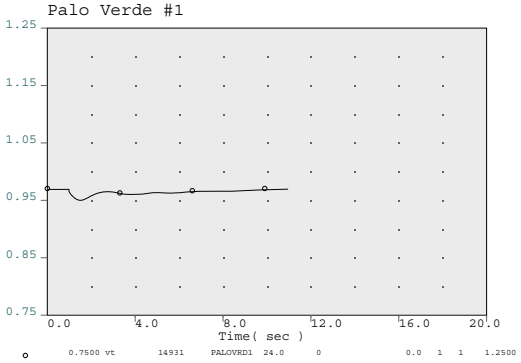
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Page 1

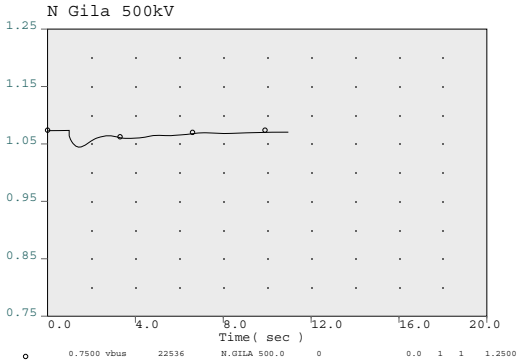
SDGE	SONGS-g2_pre_int_ll.chf	p_i\ll\pre_int\ws_pre_int Tue Nov 02 07:25:55 2010

RELATIVE VOLTAGE

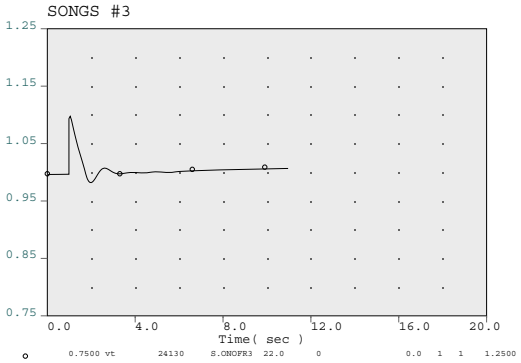
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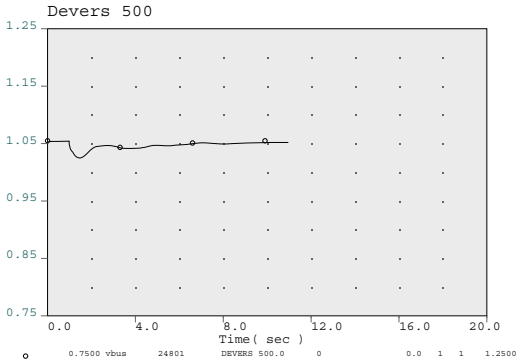
N Gila 500kV



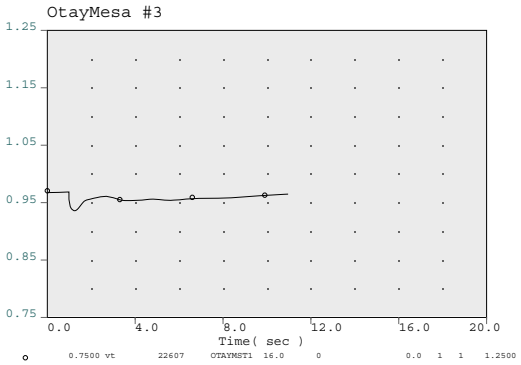
SONGS #3



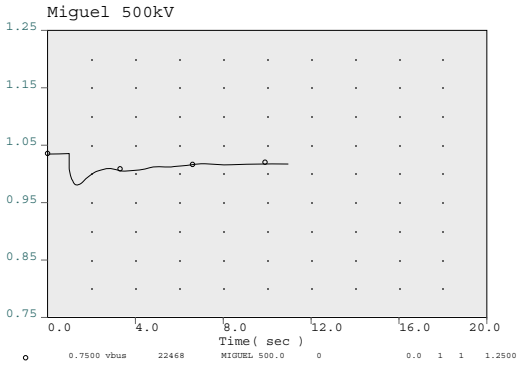
Devers 500



OtayMesa #3



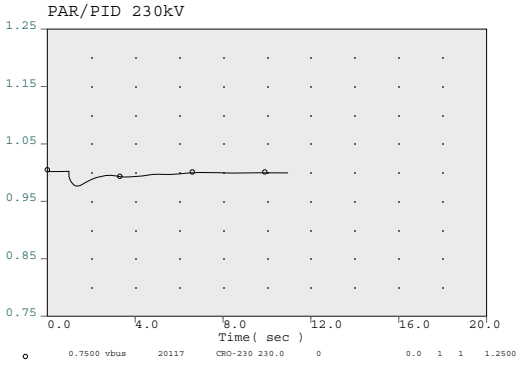
Miguel 500kV



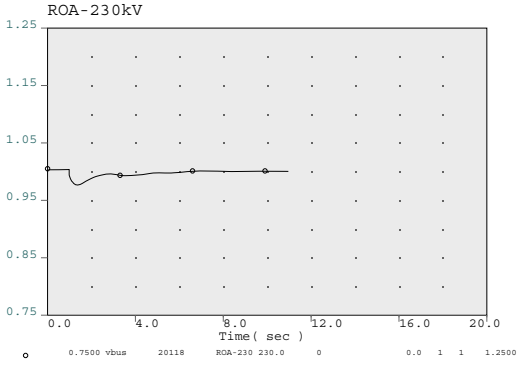
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

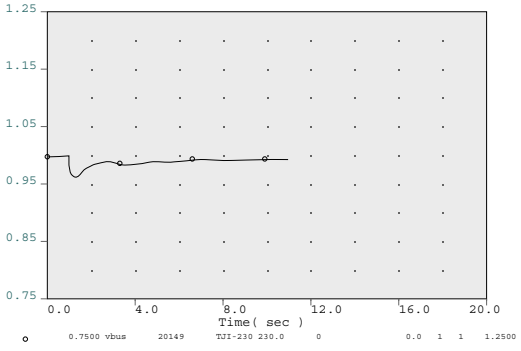
PAR/PID 230kV



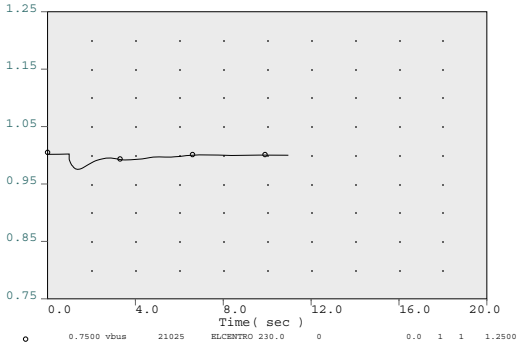
ROA-230kV



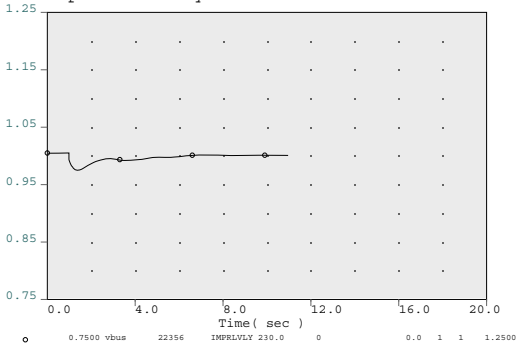
TJ1-230kV



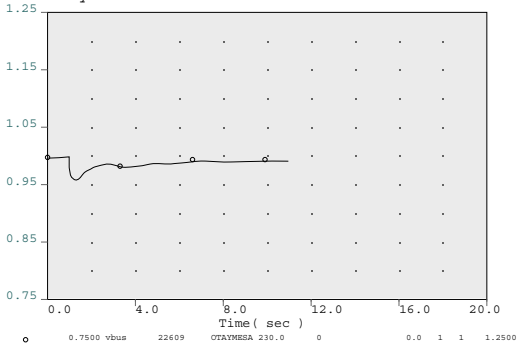
El Centro



Imperial Valley 230kV



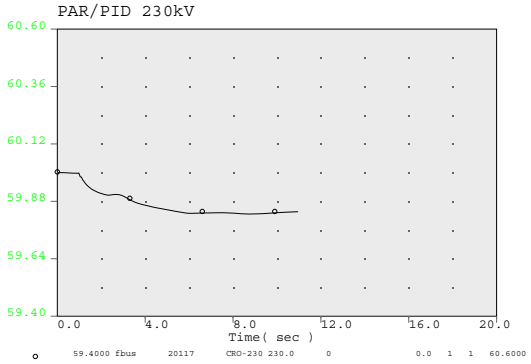
Otay Mesa 230kV



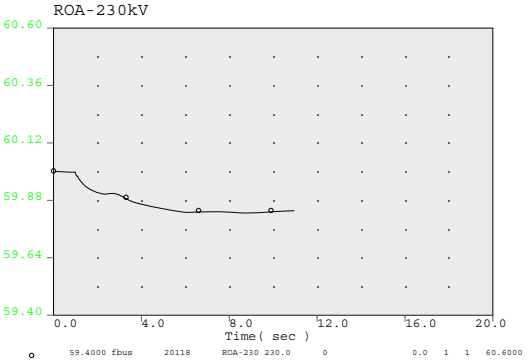
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Affected System Frequency Check and Comparison

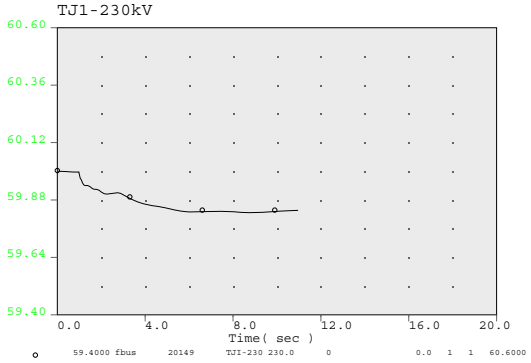
PAR/PID 230kV



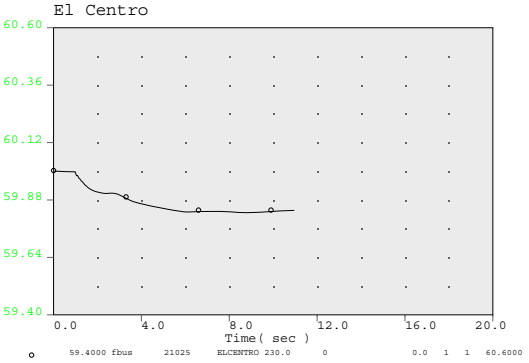
ROA-230kV



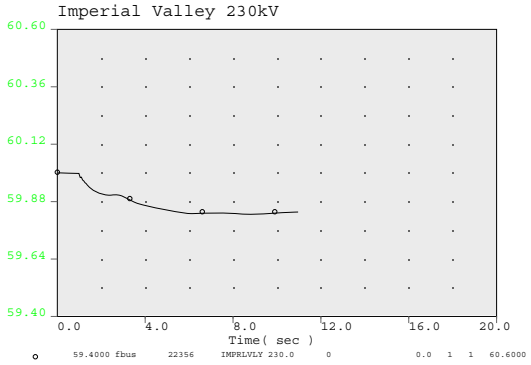
TJ1-230kV



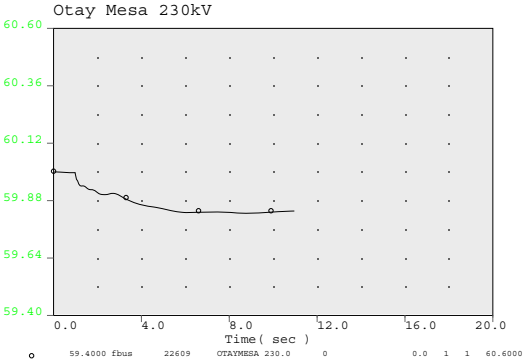
El Centro



Imperial Valley 230kV



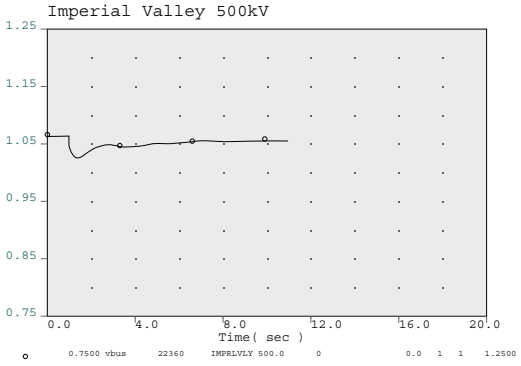
Otay Mesa 230kV



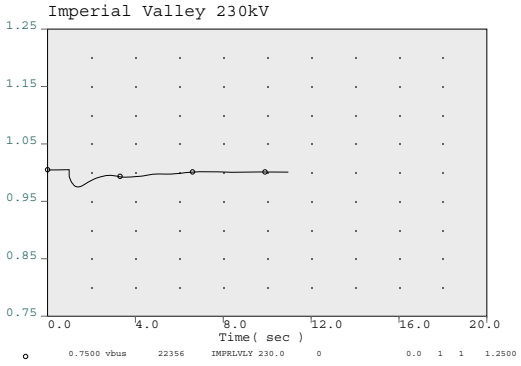
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

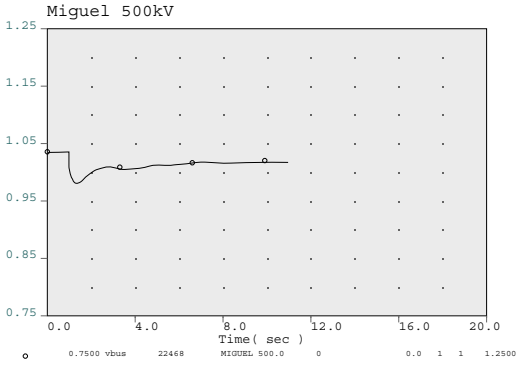
Imperial Valley 500kV



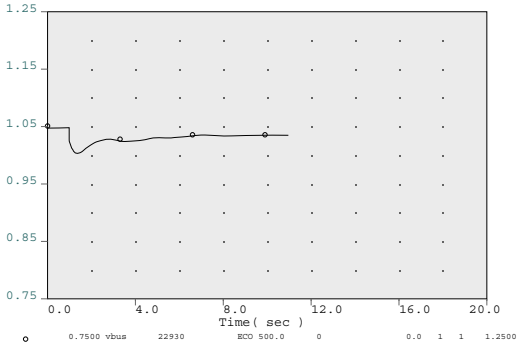
Imperial Valley 230kV



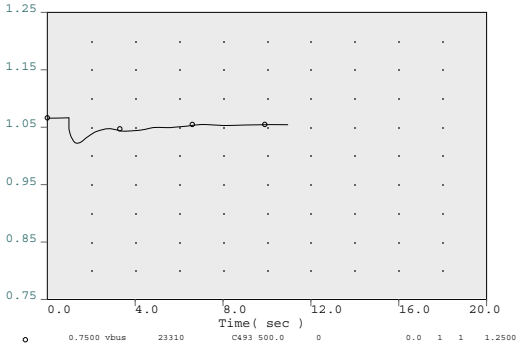
Miguel 500kV



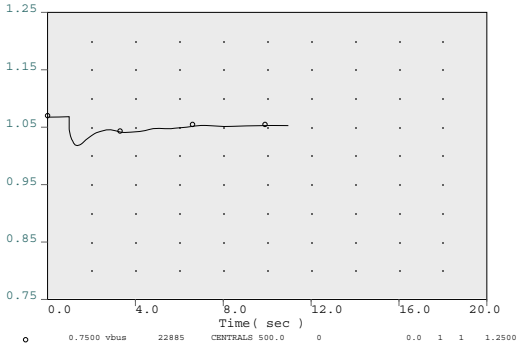
Windfarms 500



C493 500kV

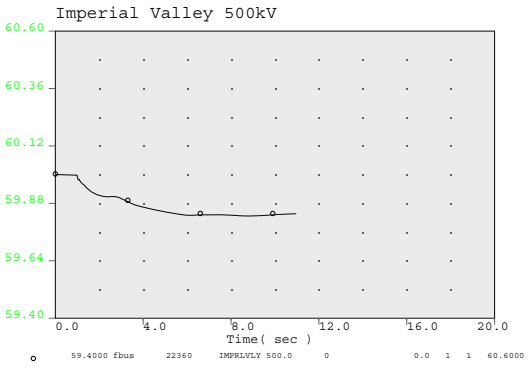


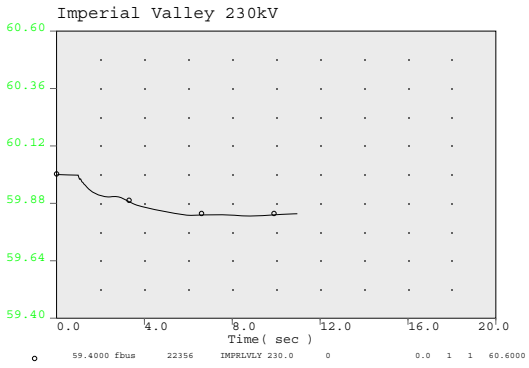
CENTRALS 500kV

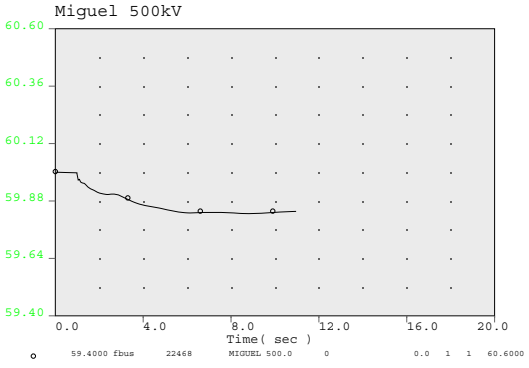


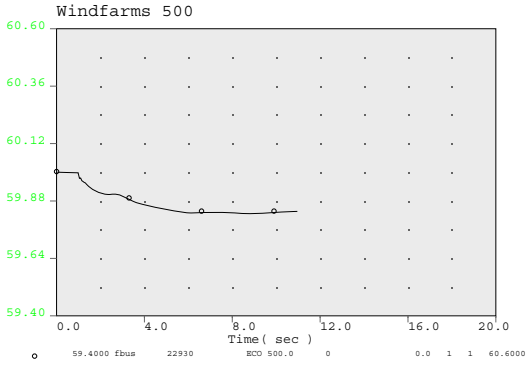
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

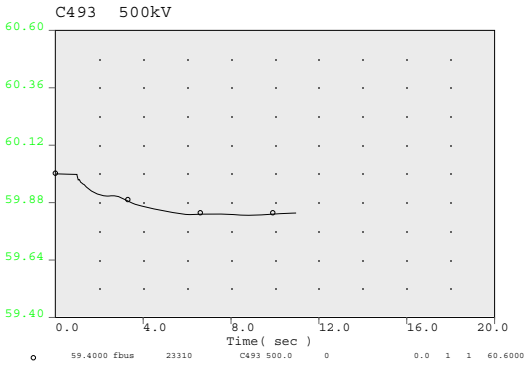
Imperial Valley Area - Frequency

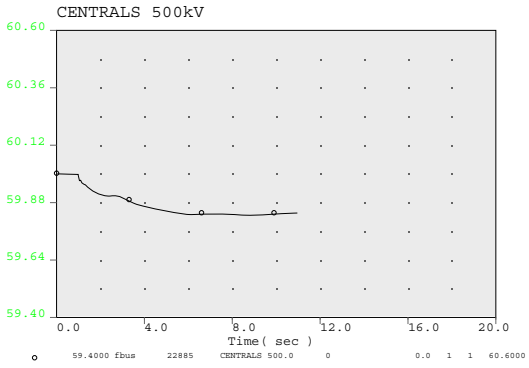






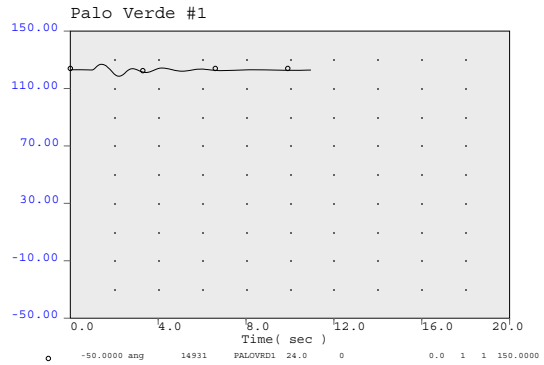


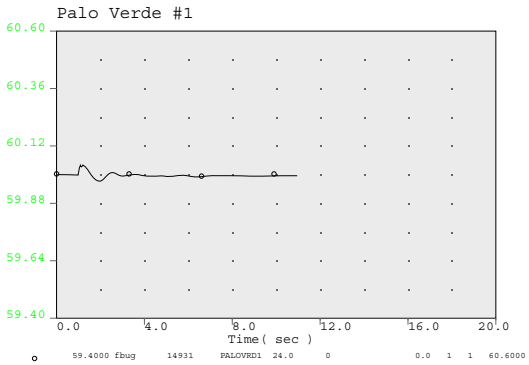


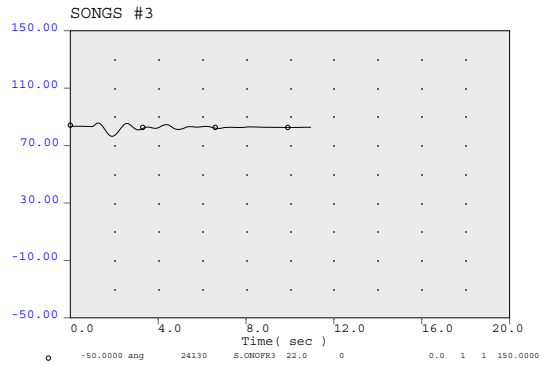


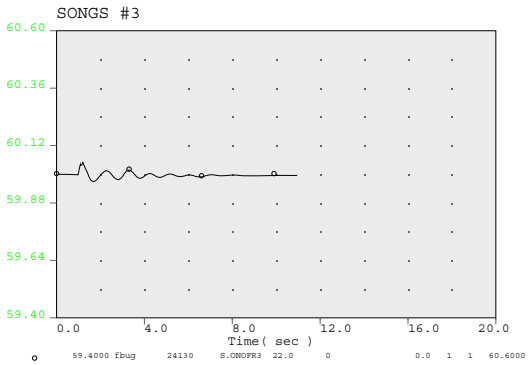
SDG&E Cluster 2 - pre
2014 Light Autumn
Trip San Onofre Generators 2 & 3

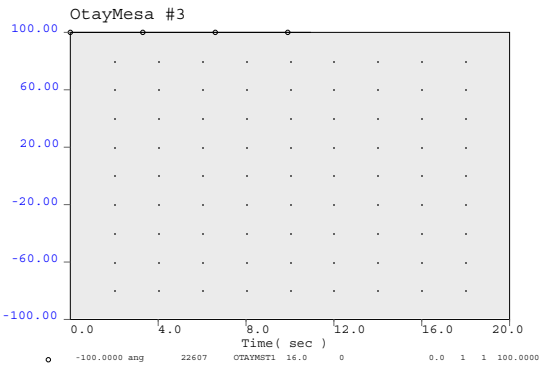
RELATIVE ROTOR ANGLE & FREQUENCY

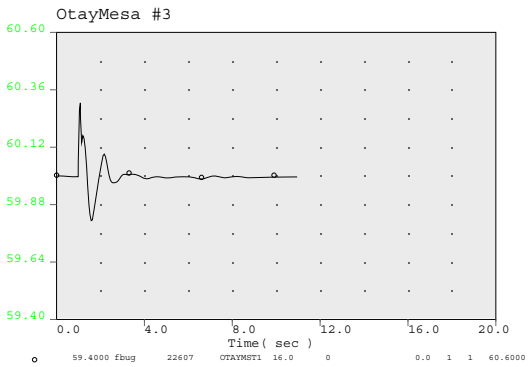












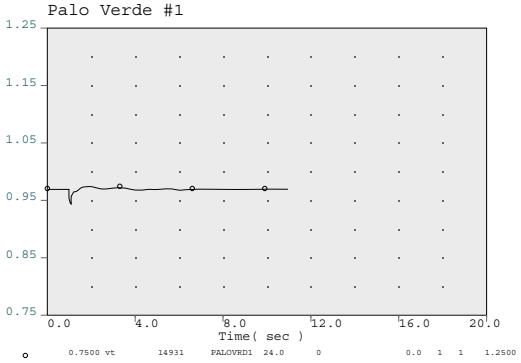
SDG&E Cluster 2 - pre int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Page 1

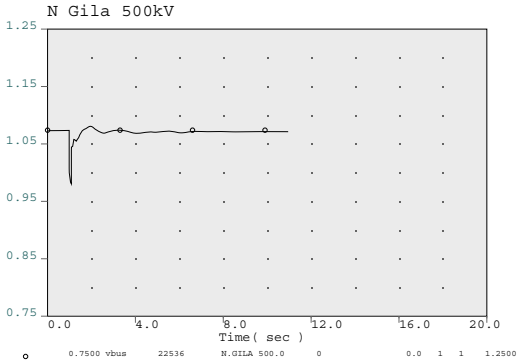
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RELATIVE VOLTAGE

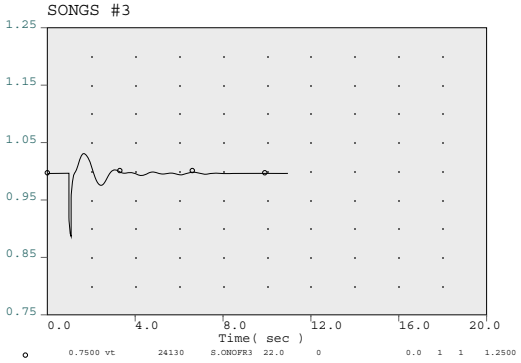
Palo Verde #1



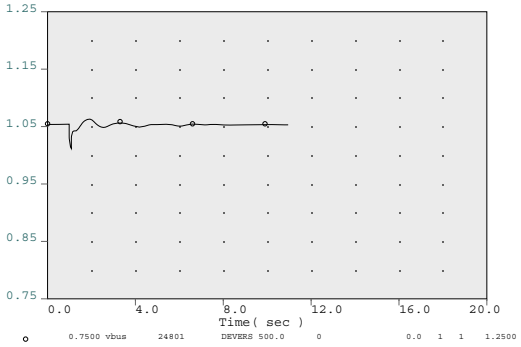
N Gila 500kV



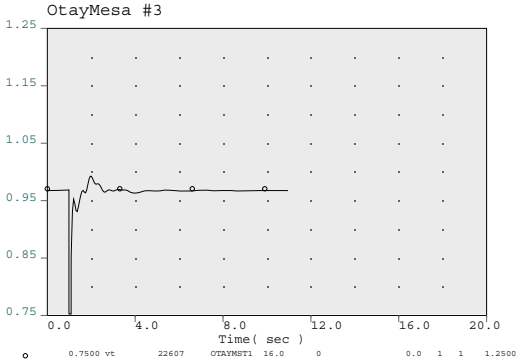
SONGS #3



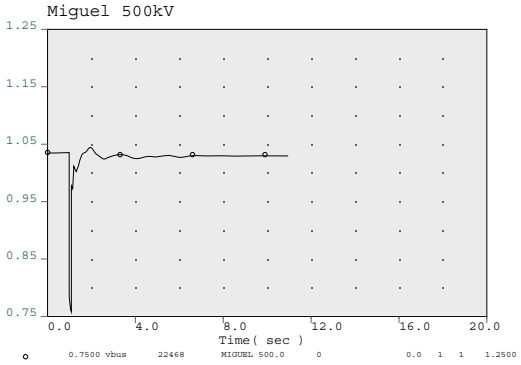
Devers 500



OtayMesa #3



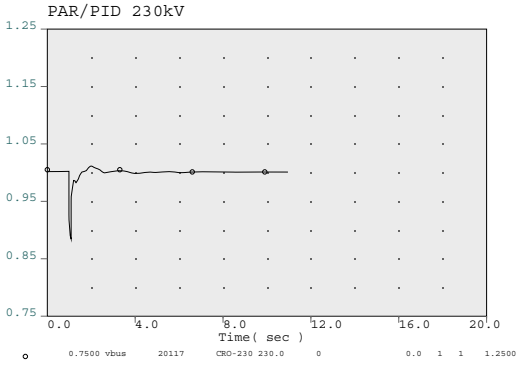
Miguel 500kV



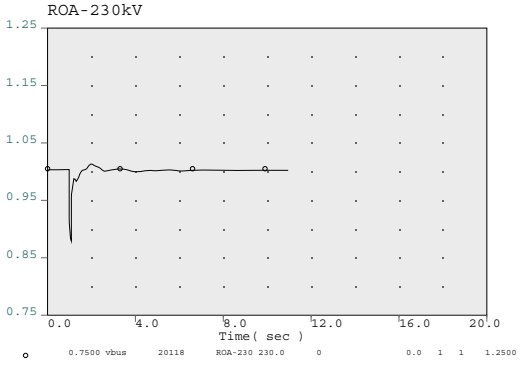
SDG&E Cluster 2 - pre int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Affected System Voltage Check and Comparison

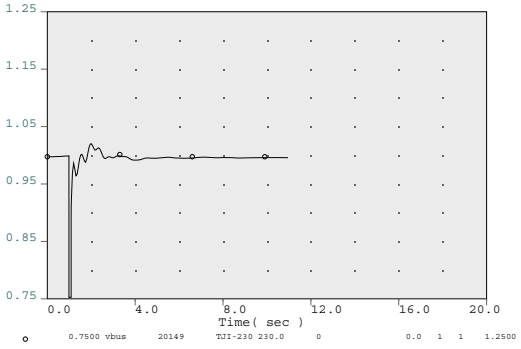
PAR/PID 230kV



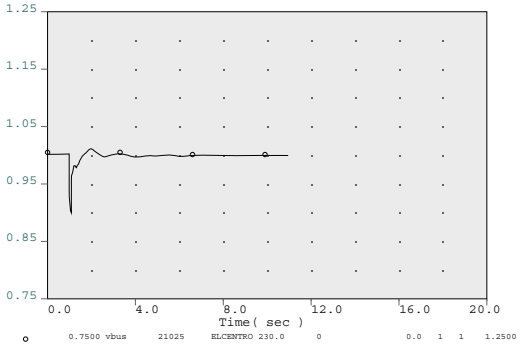
ROA-230kV



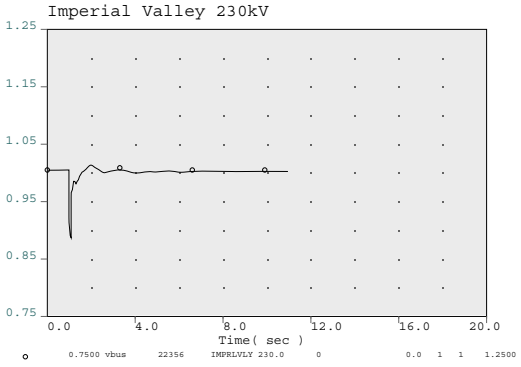
TJ1-230kV



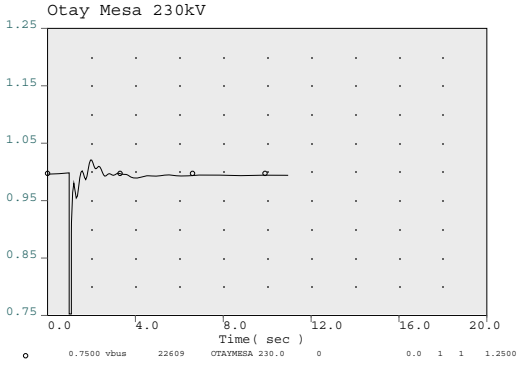
El Centro



Imperial Valley 230kV



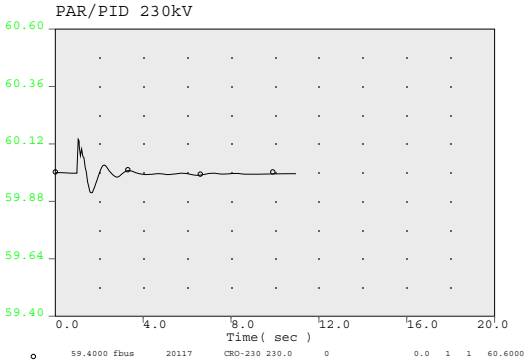
Otay Mesa 230kV



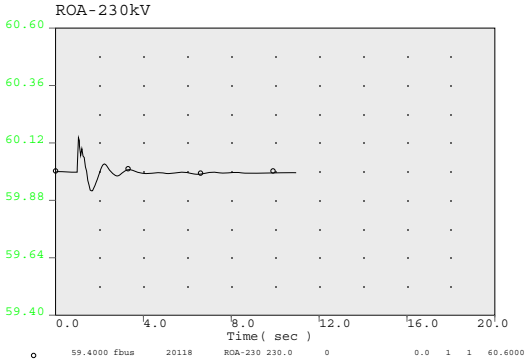
SDG&E Cluster 2 - pre int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Affected System Frequency Check and Comparison

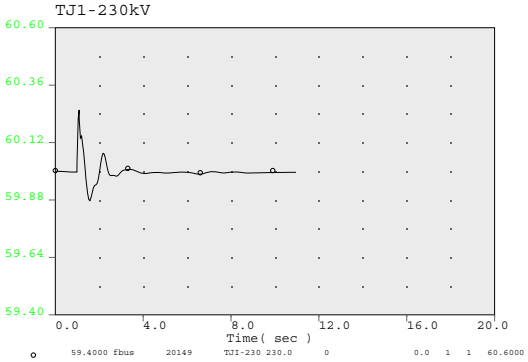
PAR/PID 230kV



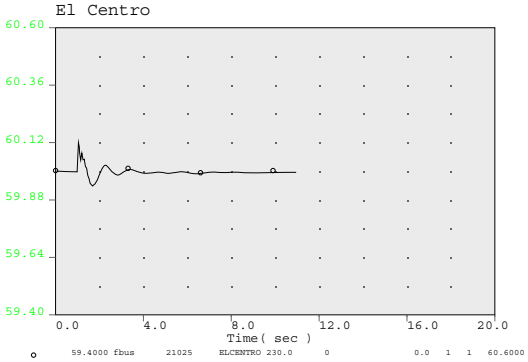
ROA-230kV



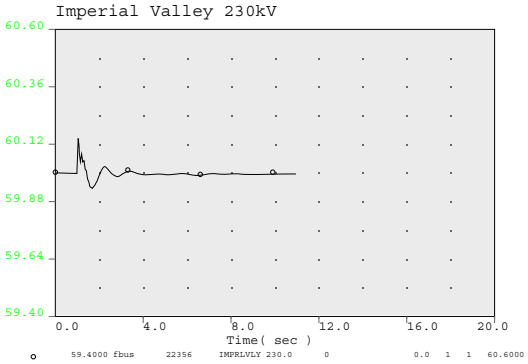
TJ1-230kV



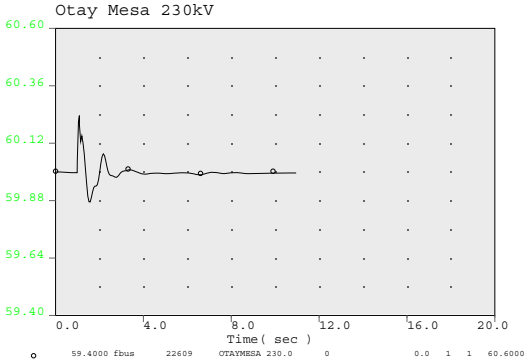
El Centro



Imperial Valley 230kV



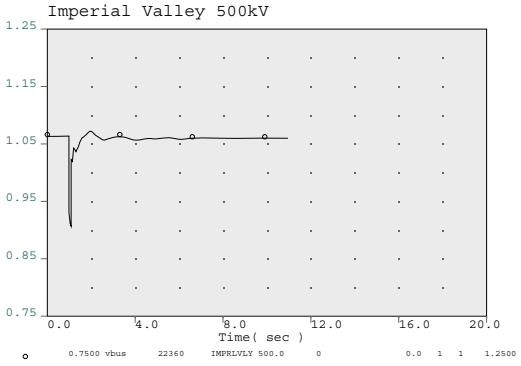
Otay Mesa 230kV



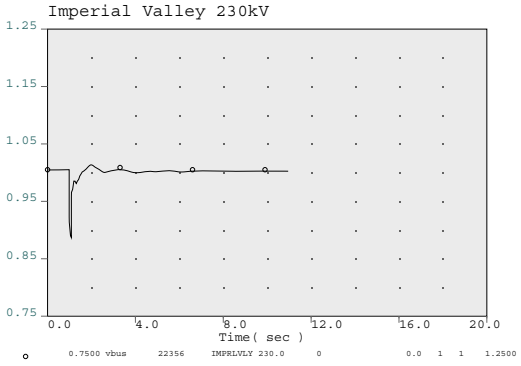
SDG&E Cluster 2 - pre int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

Imperial Valley Area - VOLTAGE

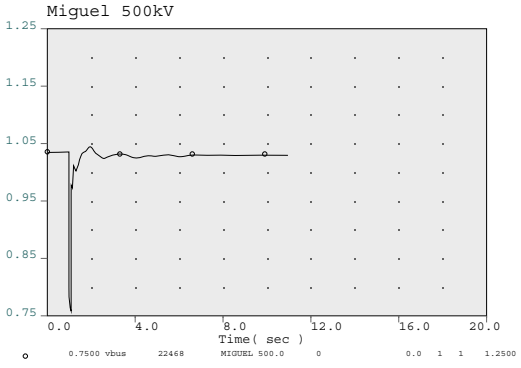
Imperial Valley 500kV



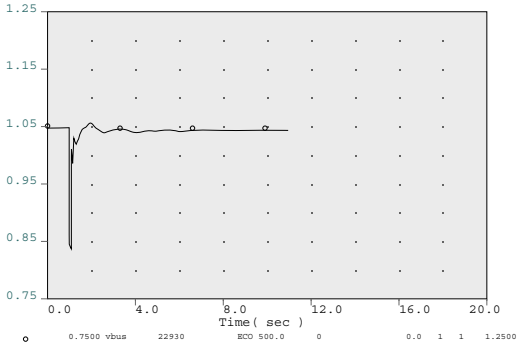
Imperial Valley 230kV



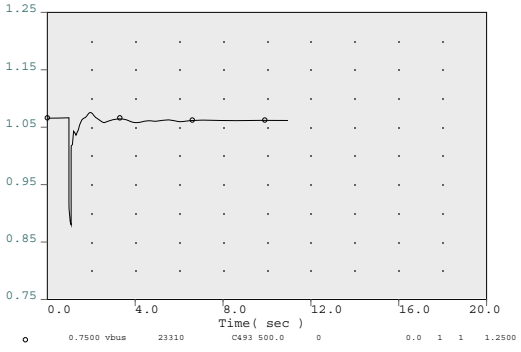
Miguel 500kV



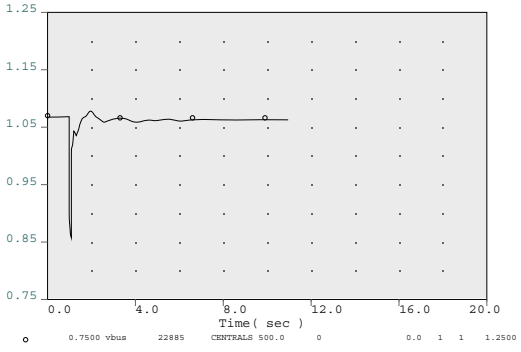
Windfarms 500



C493 500kV



CENTRALS 500kV



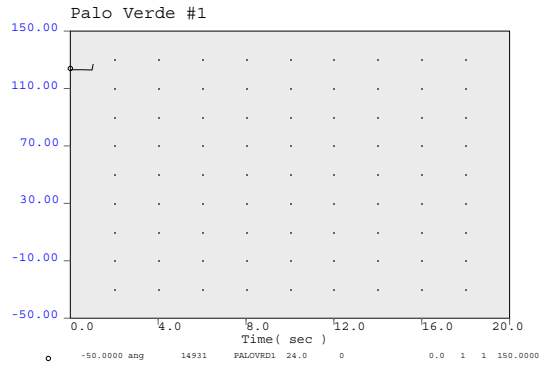
SDG&E Cluster 2 - pre int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

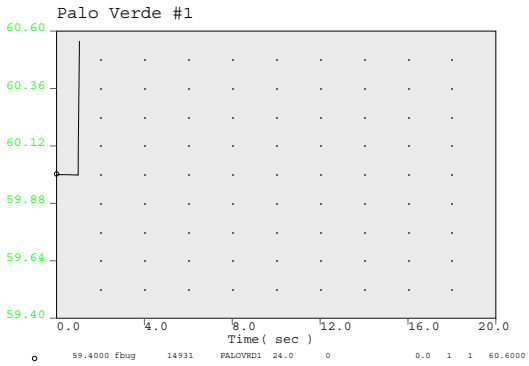
Imperial Valley Area - Frequency

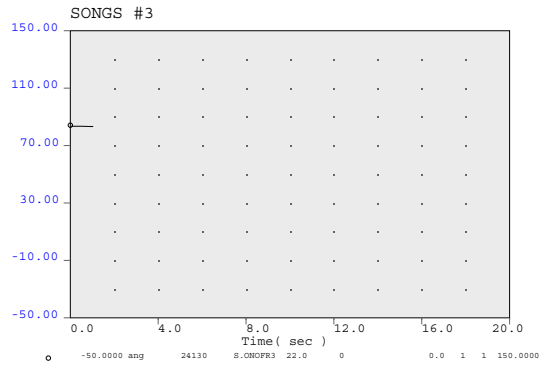


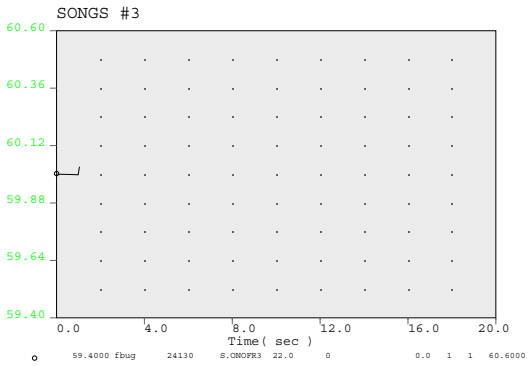
SDG&E Cluster 2 - pre int
2014 Light Autumn
South Bay - Silvergate 230 kV N-1

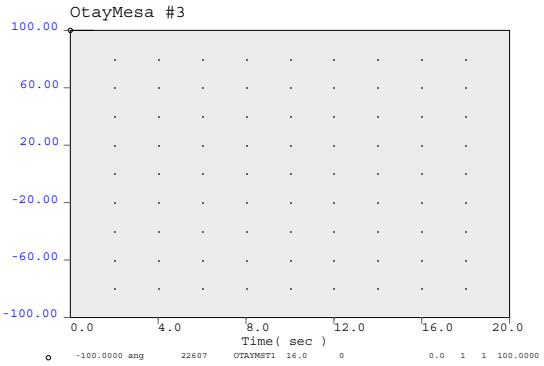
RELATIVE ROTOR ANGLE & FREQUENCY

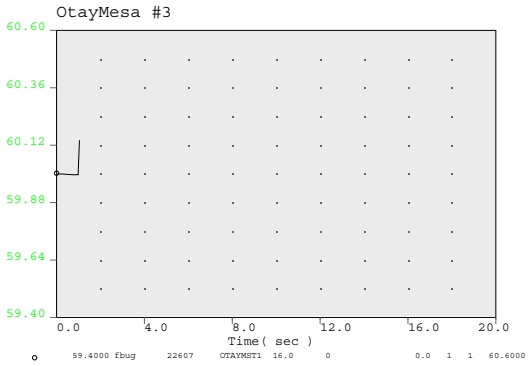












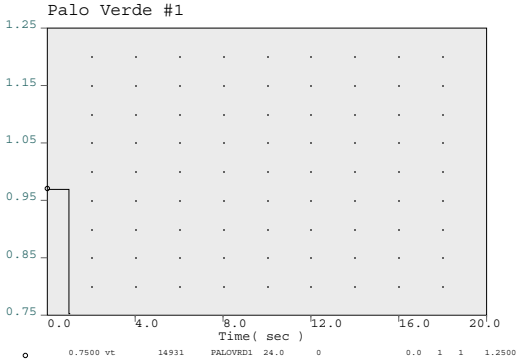
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Page 1

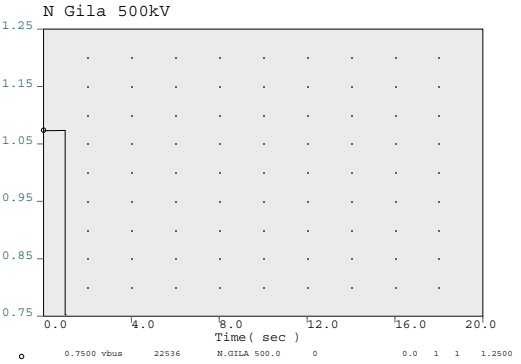
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RELATIVE VOLTAGE

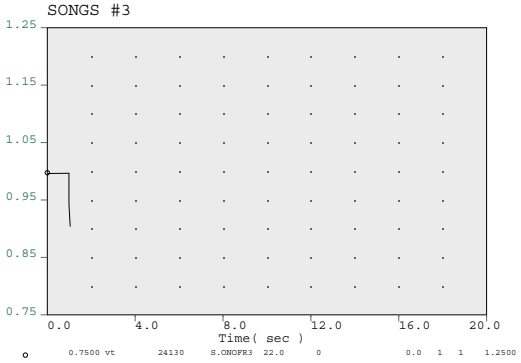
Palo Verde #1



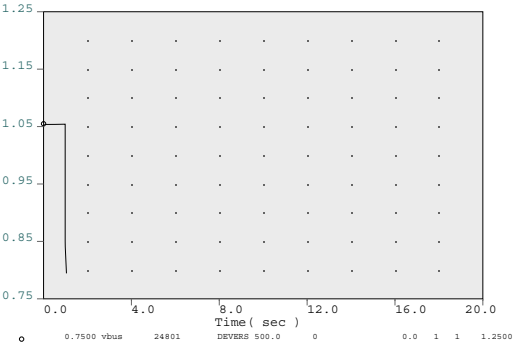
N Gila 500kV



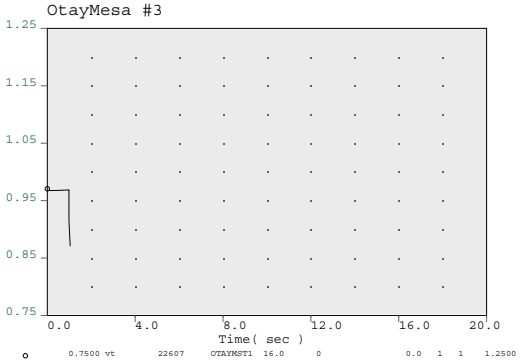
SONGS #3



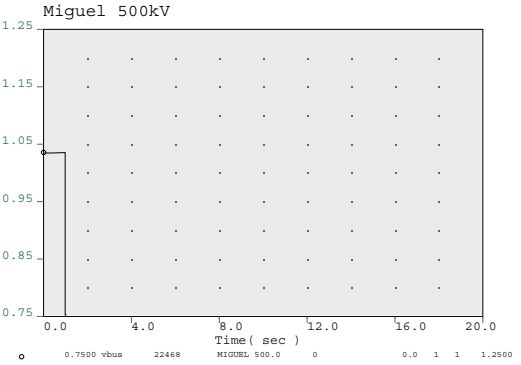
Devers 500



OtayMesa #3



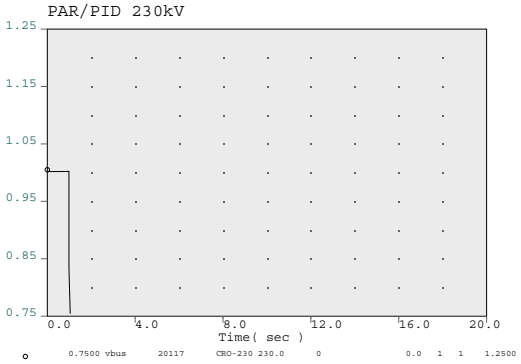
Miguel 500kV



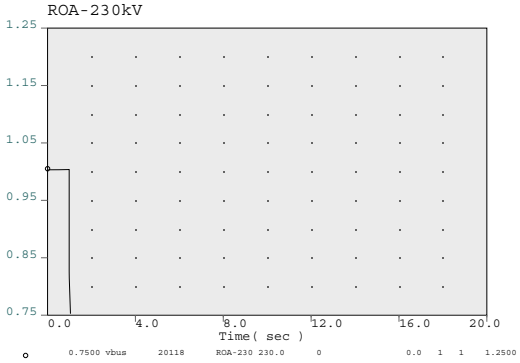
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

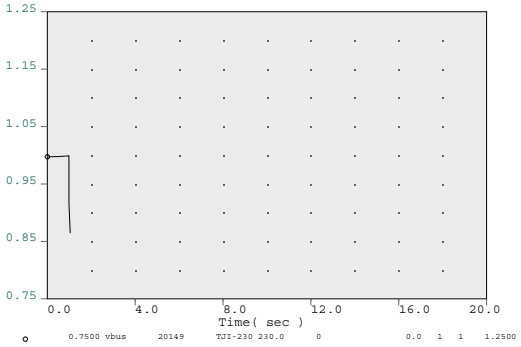
PAR/PID 230kV



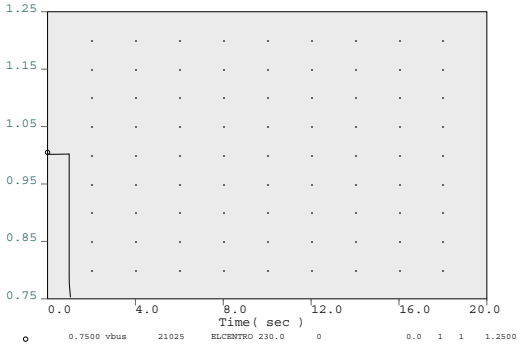
ROA-230kV



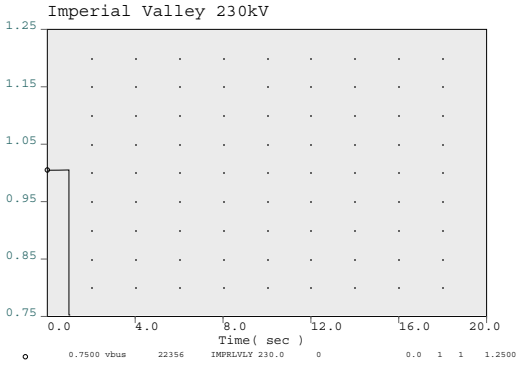
TJ1-230kV



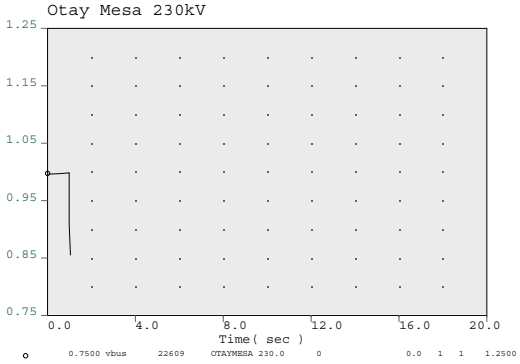
El Centro



Imperial Valley 230kV



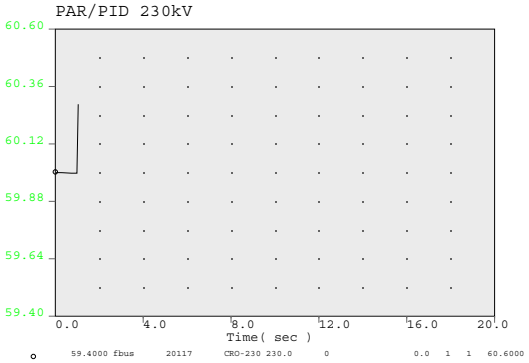
Otay Mesa 230kV



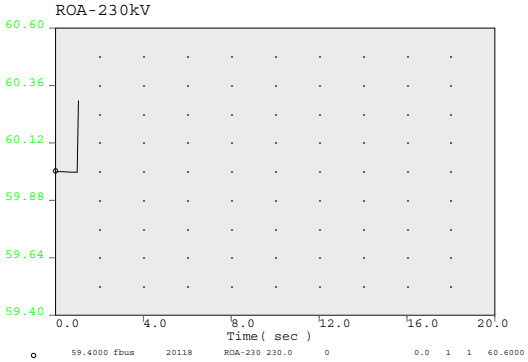
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

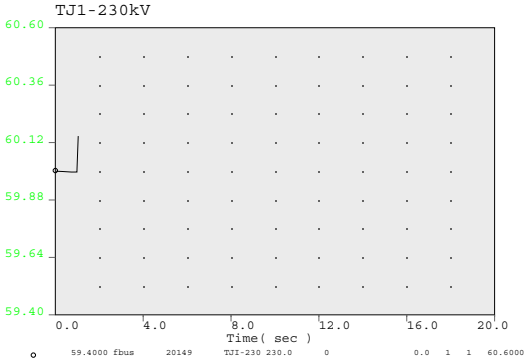
PAR/PID 230kV



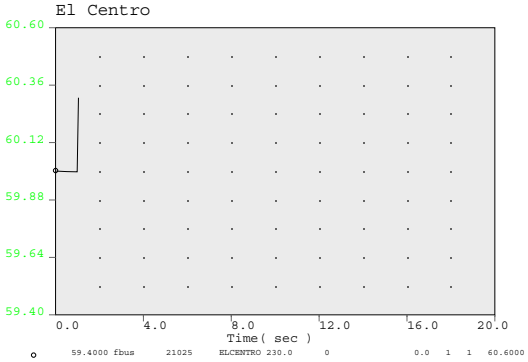
ROA-230kV



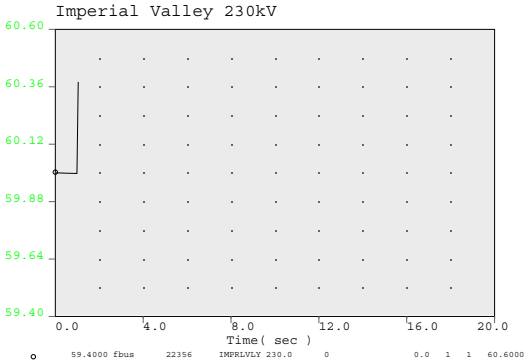
TJ1-230kV



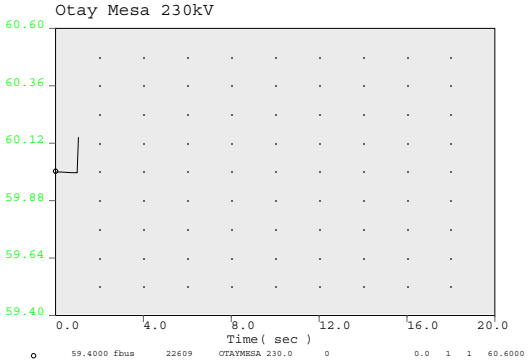
El Centro



Imperial Valley 230kV



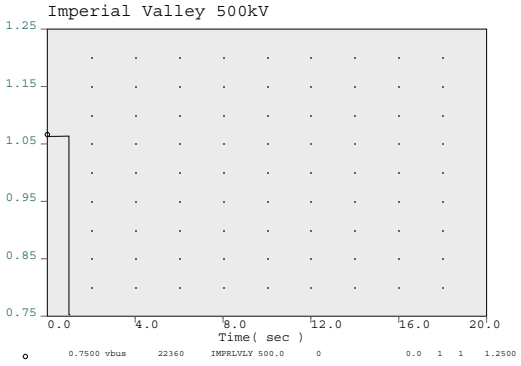
Otay Mesa 230kV



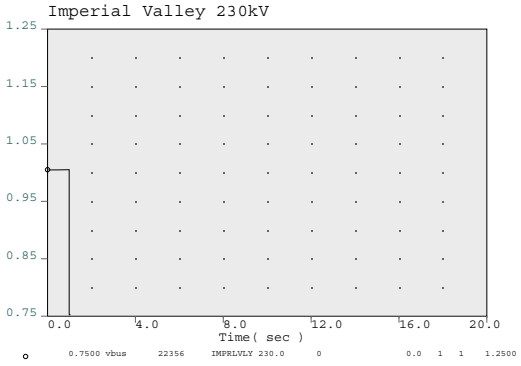
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

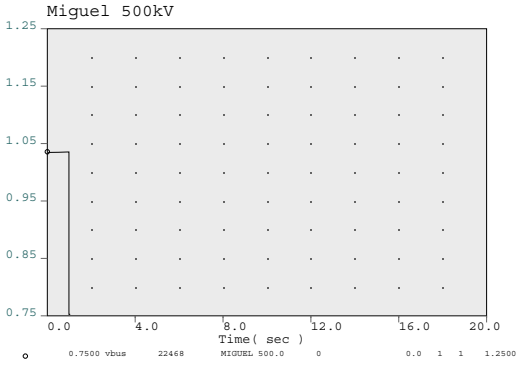
Imperial Valley 500kV



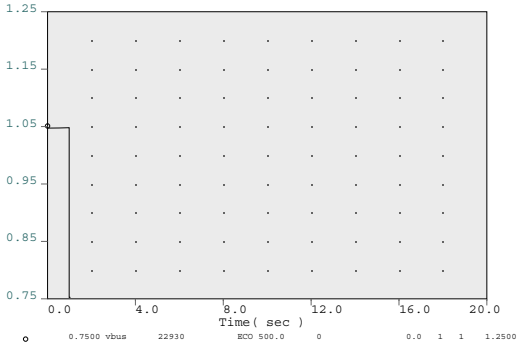
Imperial Valley 230kV



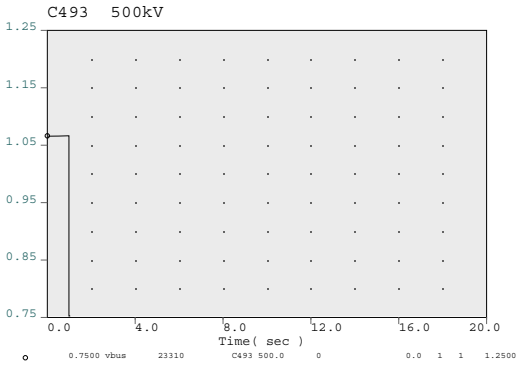
Miguel 500kV



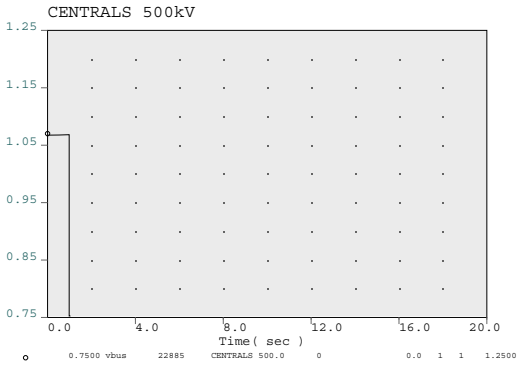
Windfarms 500



C493 500kV

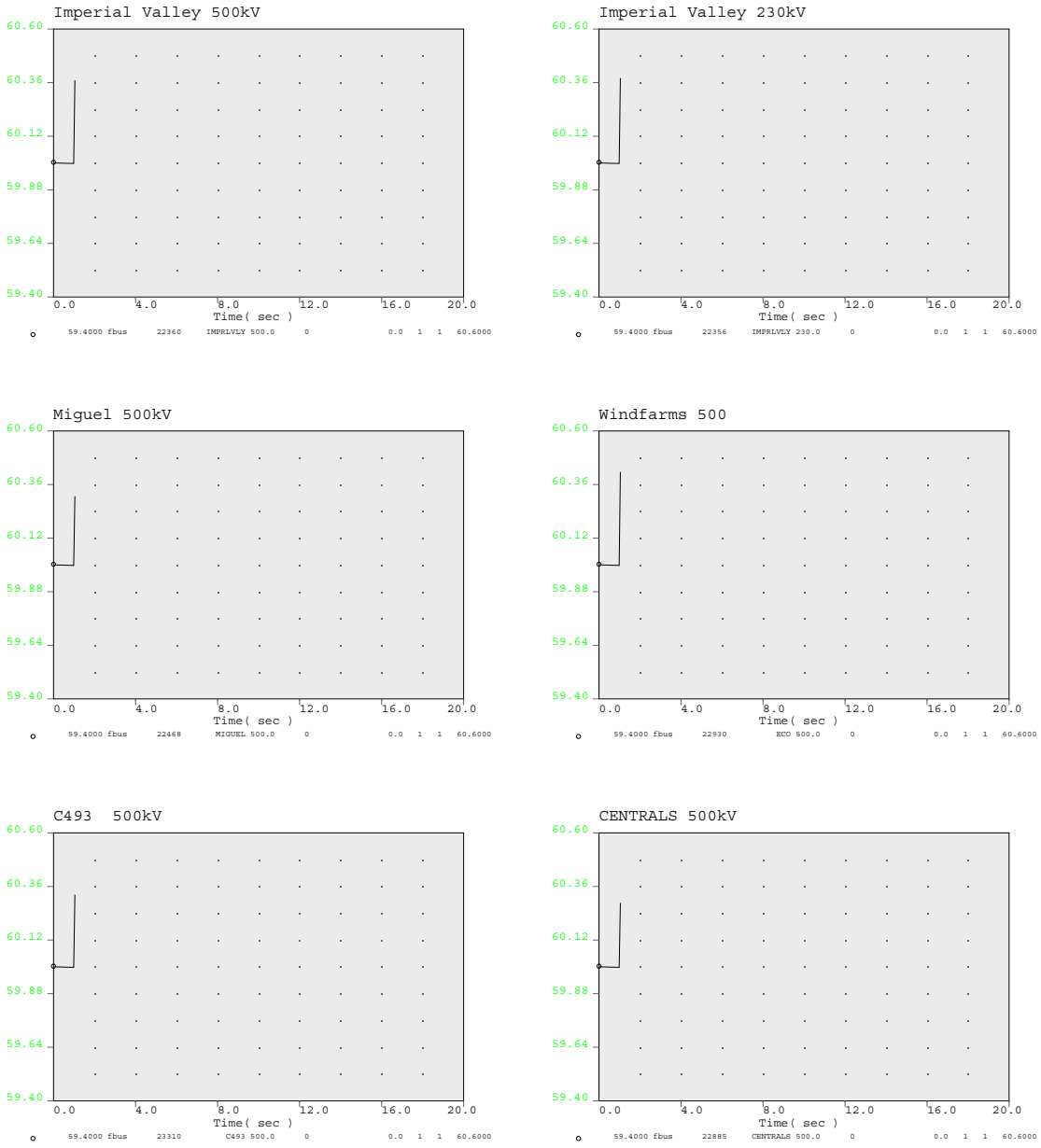


CENTRALS 500kV



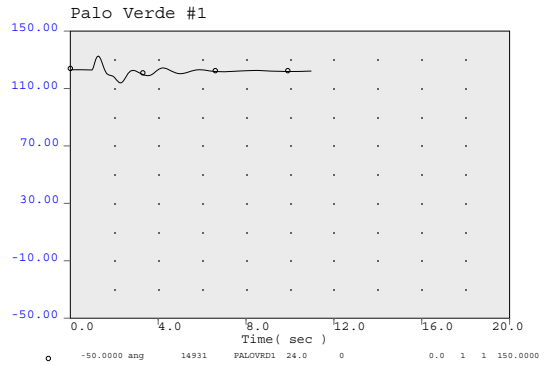
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

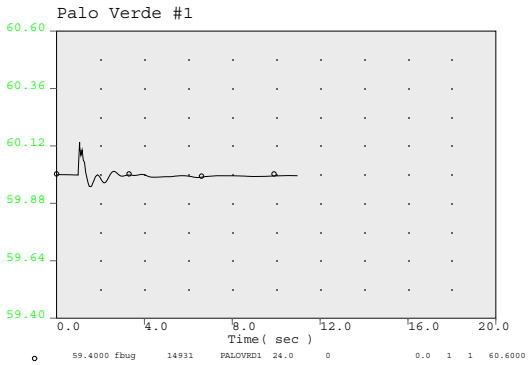
Imperial Valley Area - Frequency

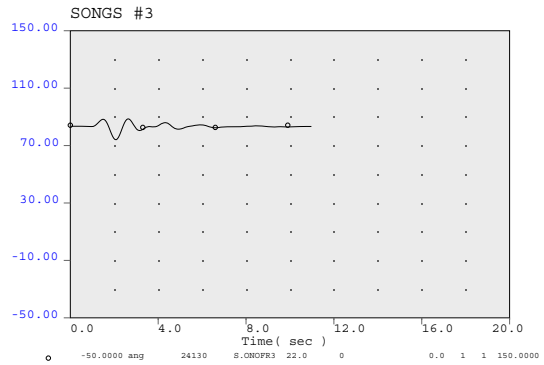


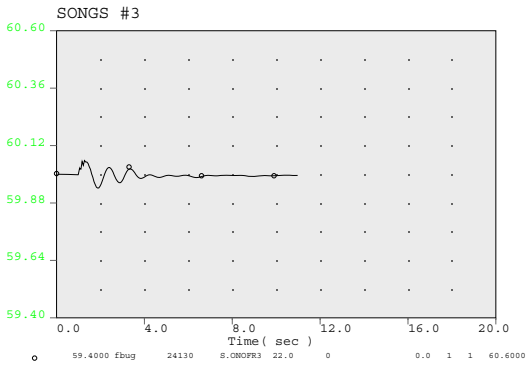
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

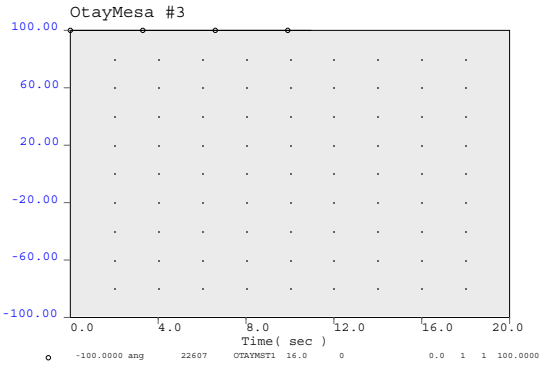
RELATIVE ROTOR ANGLE & FREQUENCY

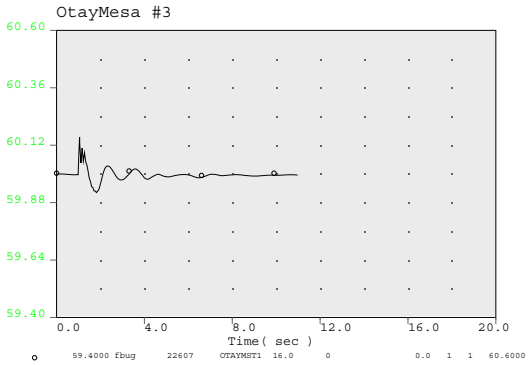












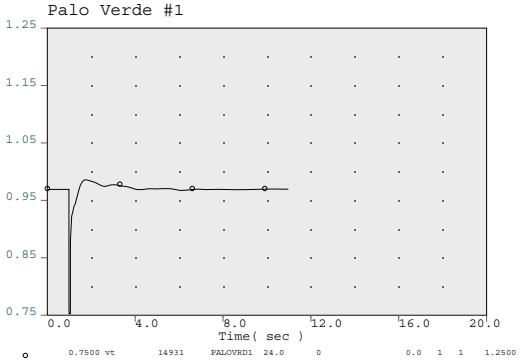
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Page 1

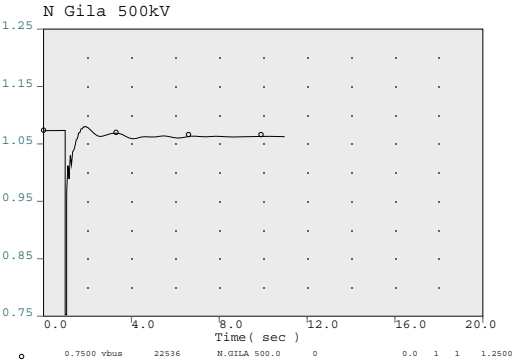
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RELATIVE VOLTAGE

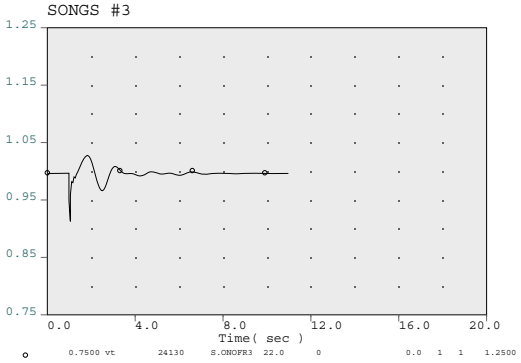
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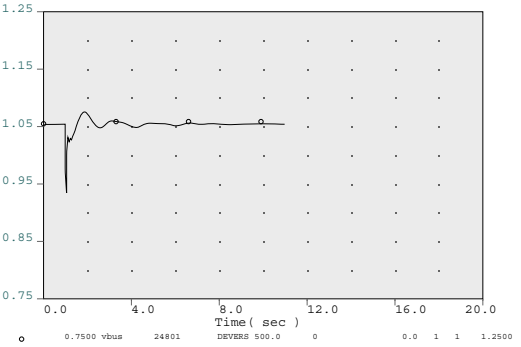
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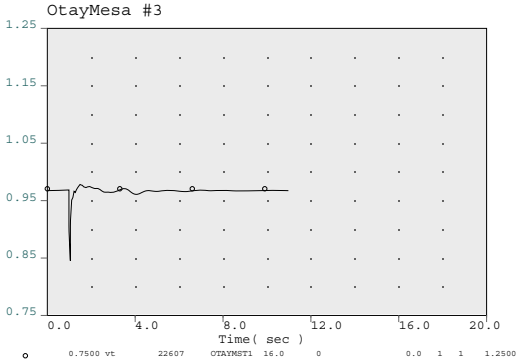
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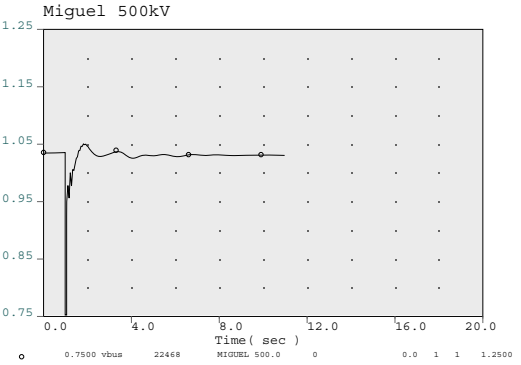
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OtayMesa #3



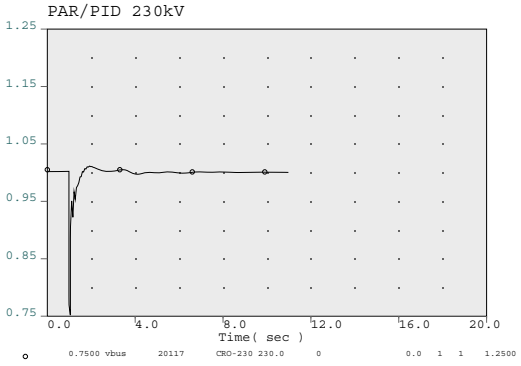
Miguel 500kV



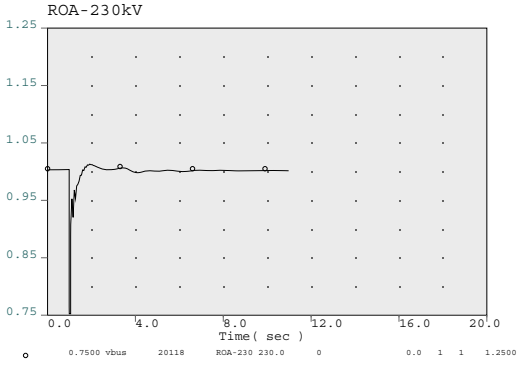
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Voltage Check and Comparison

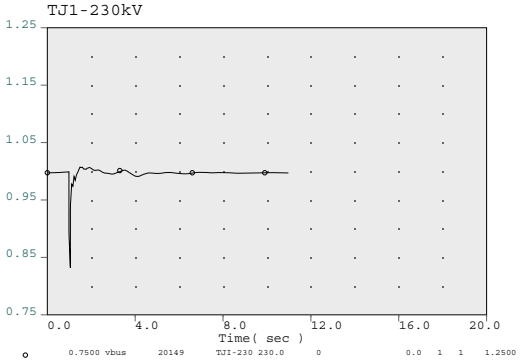
PAR/PID 230kV



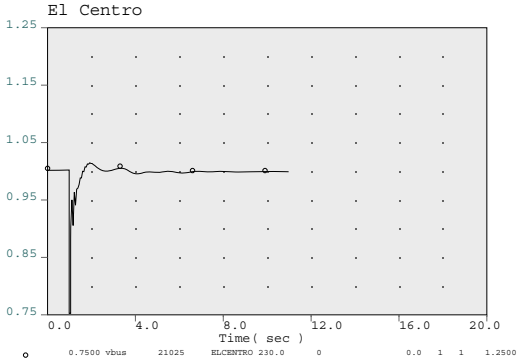
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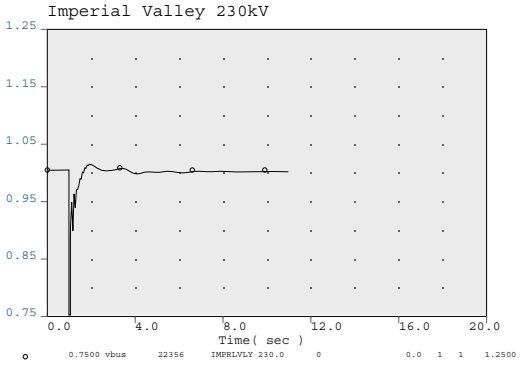
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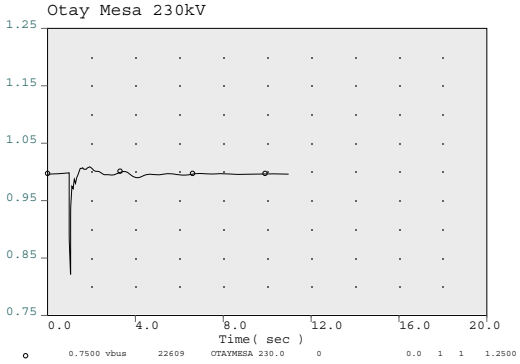
El Centro



Imperial Valley 230kV



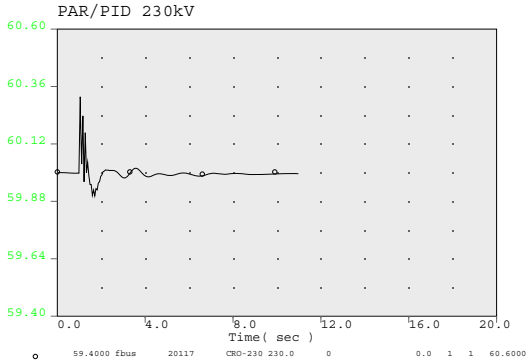
Otay Mesa 230kV



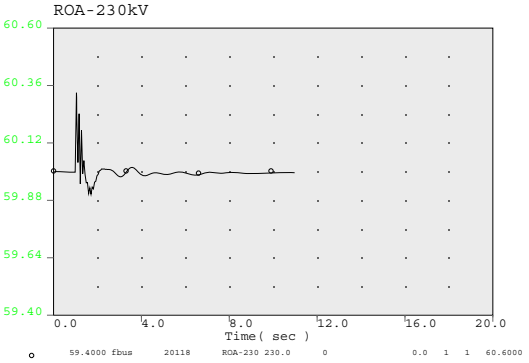
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Affected System Frequency Check and Comparison

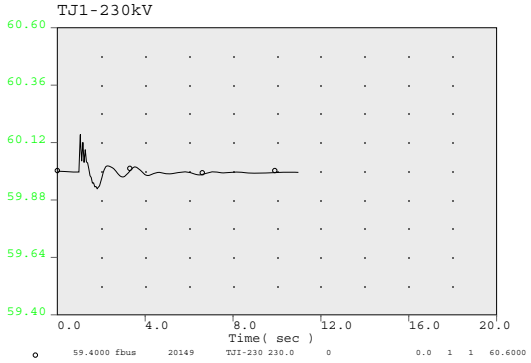
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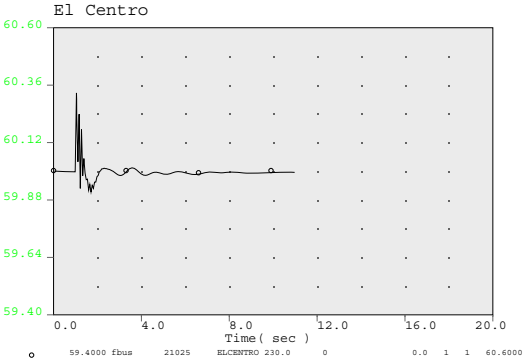
ROA-230kV



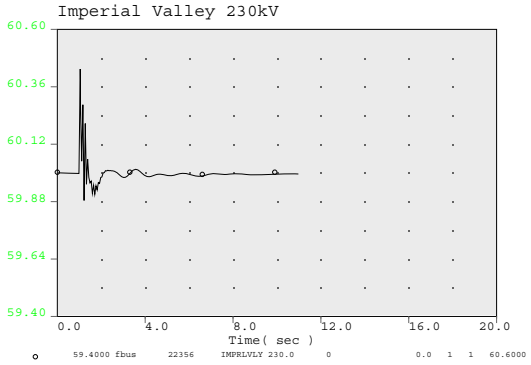
TJ1-230kV



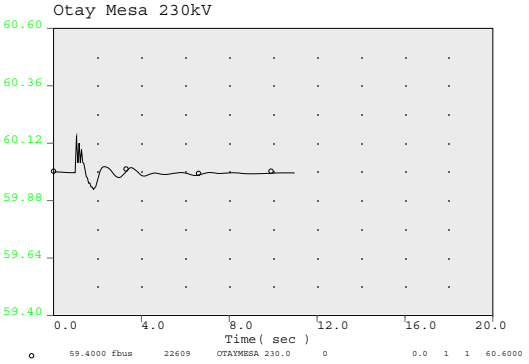
El Centro



Imperial Valley 230kV



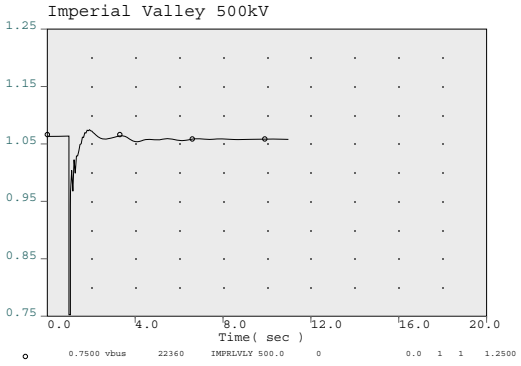
Otay Mesa 230kV



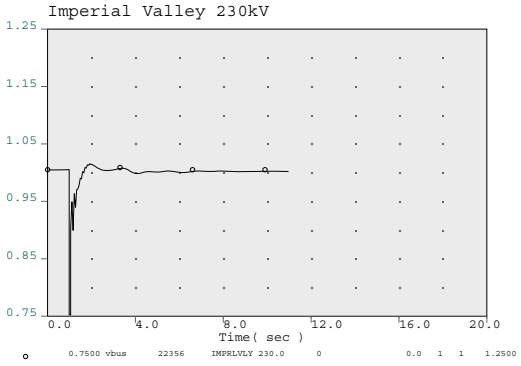
SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Imperial Valley Area - VOLTAGE

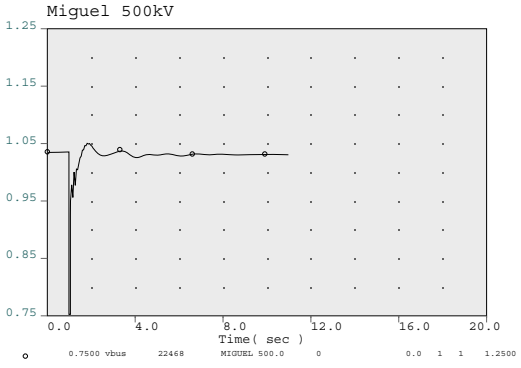
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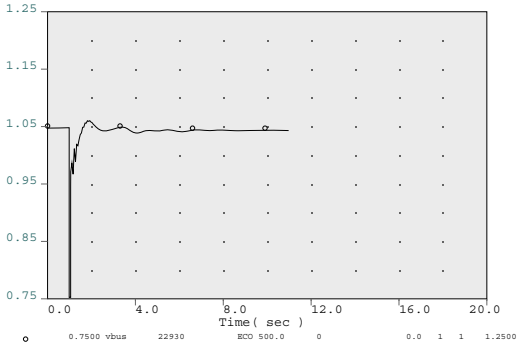
Imperial Valley 230kV



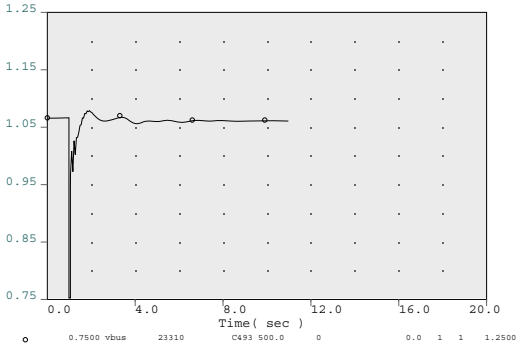
Miguel 500kV



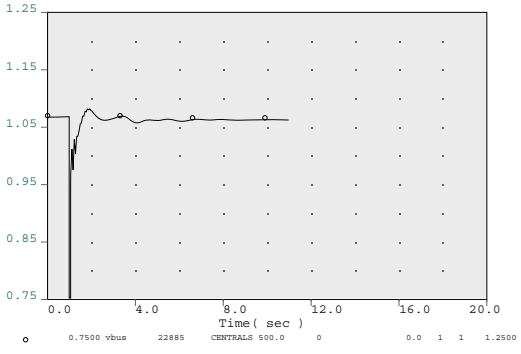
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - pre
2014 Light Autumn
T468-N.Gila 500 kV line

Appendix J-9

Transient Stability Analysis Plots

Internal Cluster

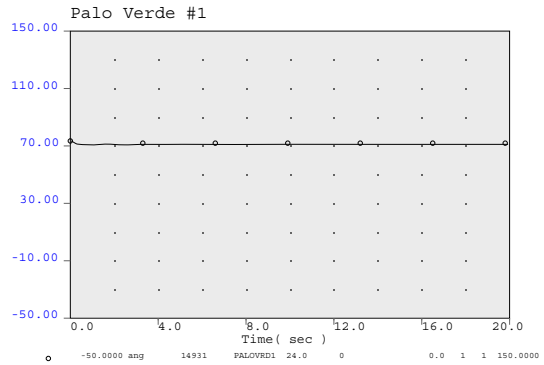
Heavy Summer Post

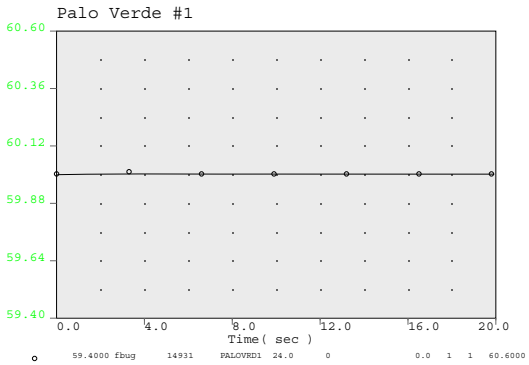
Imperial Valley Area - Frequency

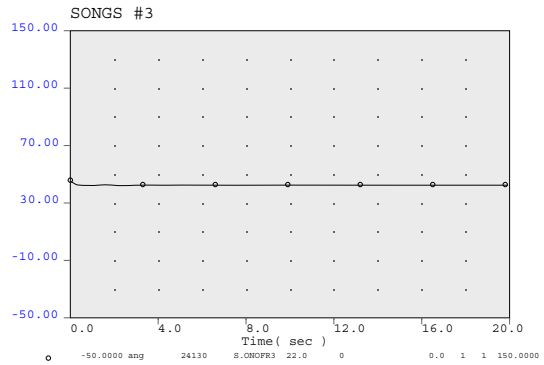


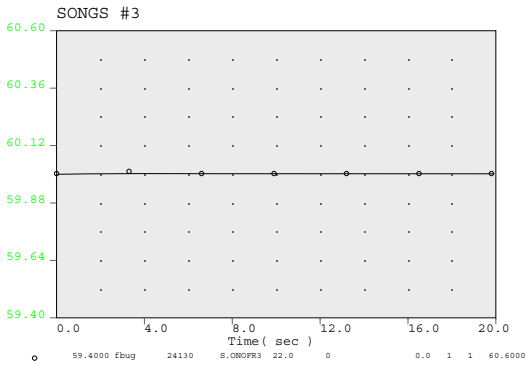
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

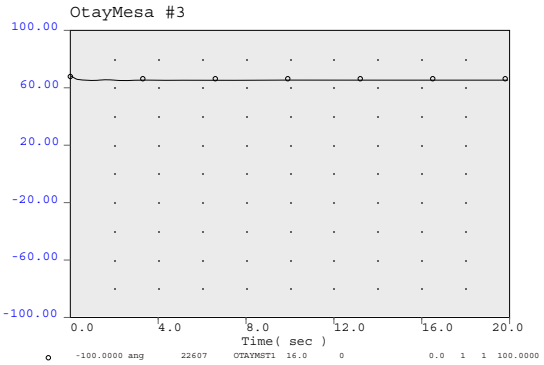
RELATIVE ROTOR ANGLE & FREQUENCY

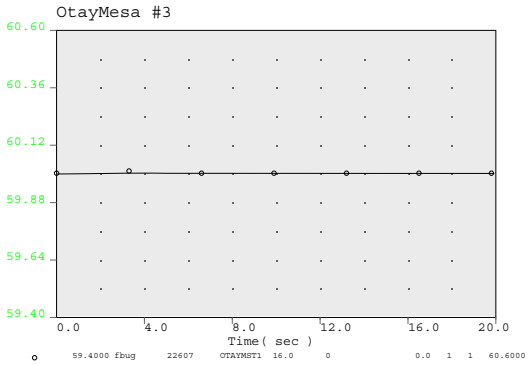










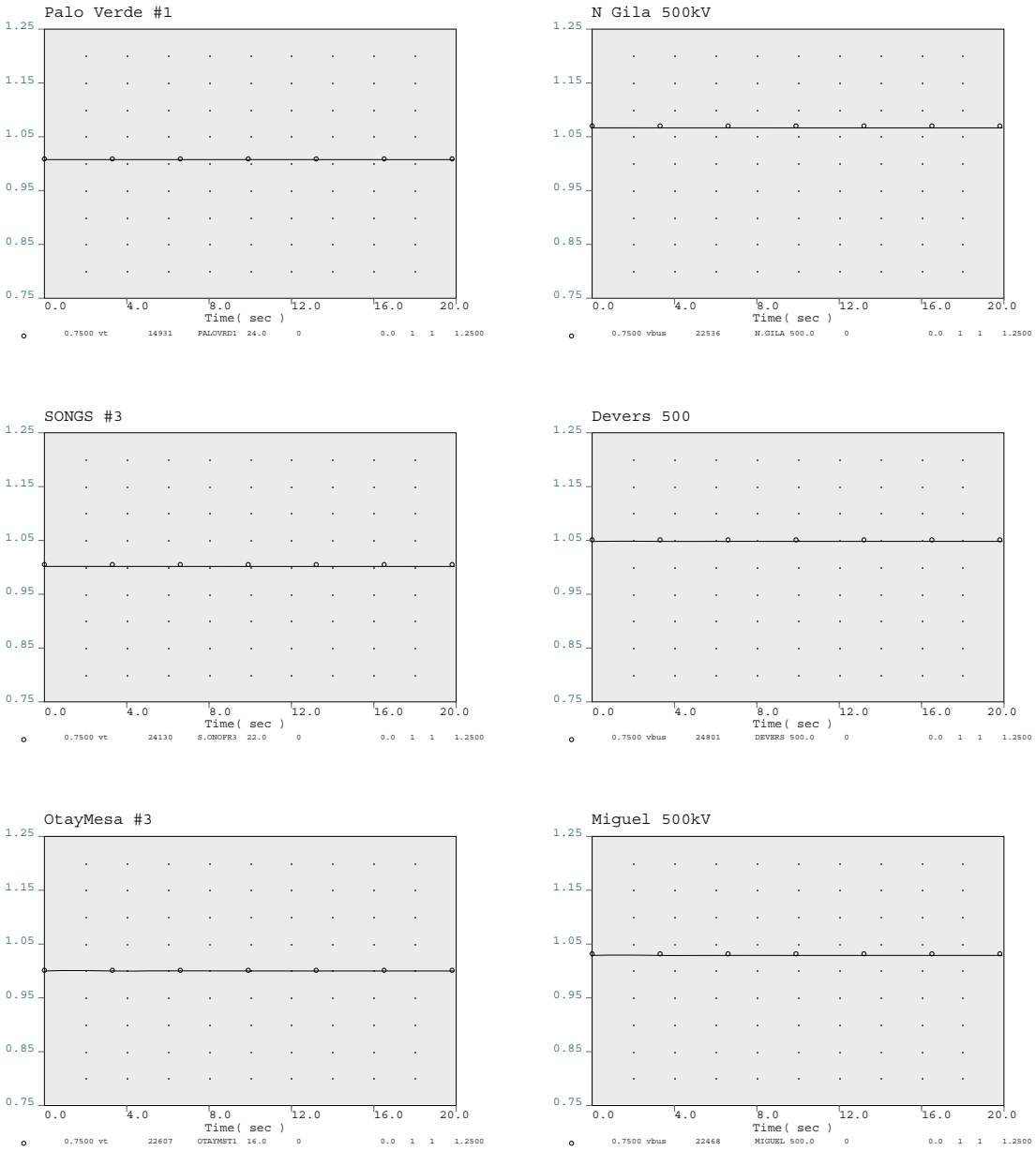


SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Page 1

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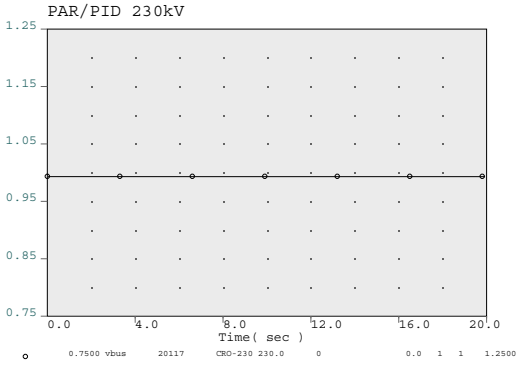
RELATIVE VOLTAGE



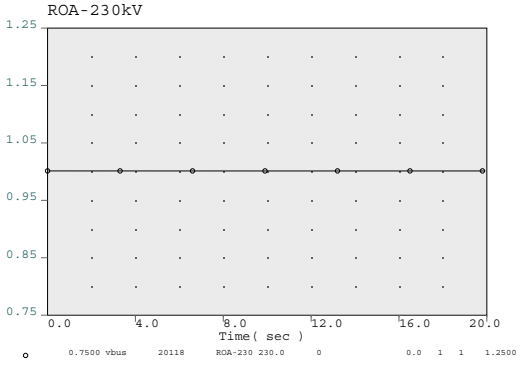
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Affected System Voltage Check and Comparison

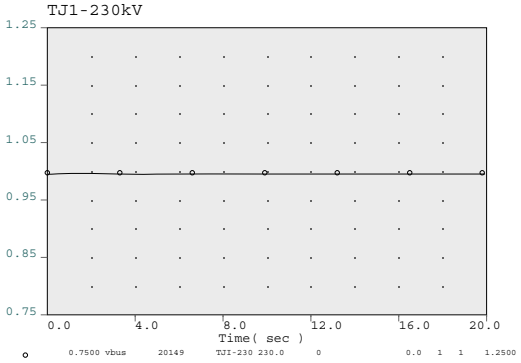
PAR/PID 230kV



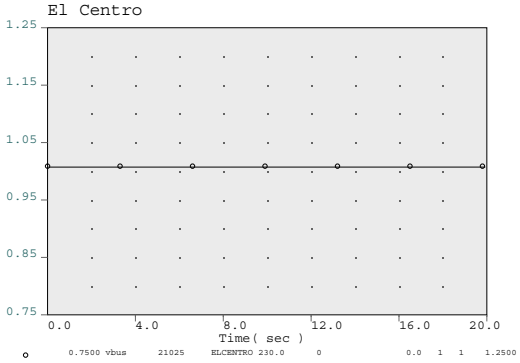
ROA-230kV



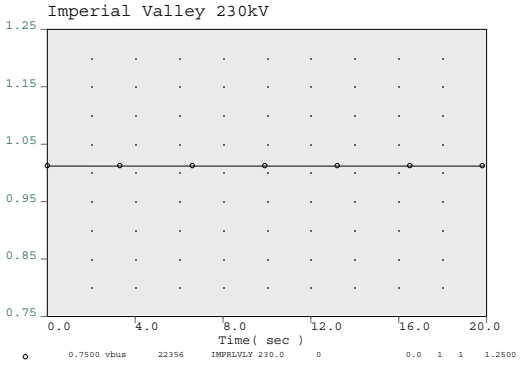
TJ1-230kV



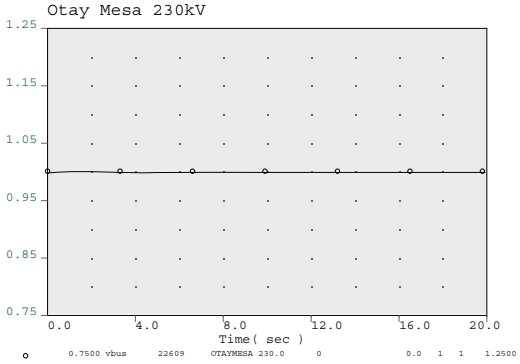
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



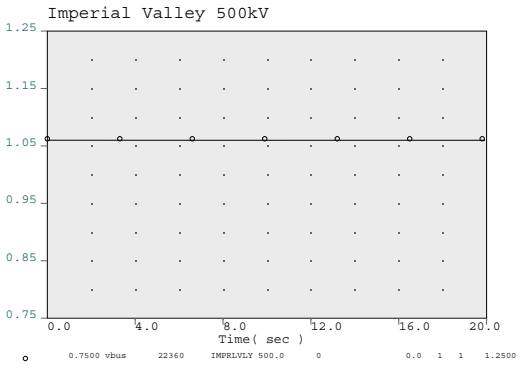
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

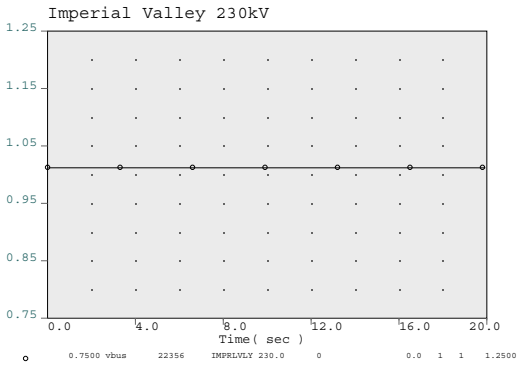
Affected System Frequency Check and Comparison

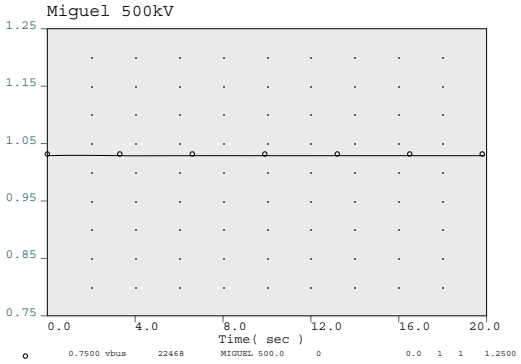


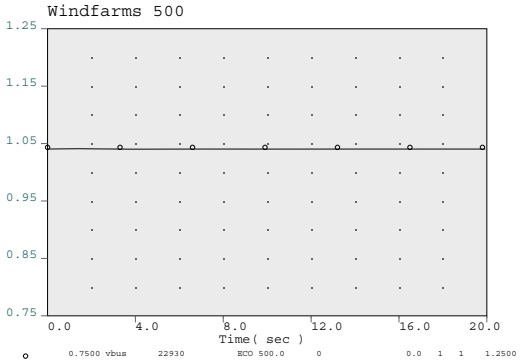
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

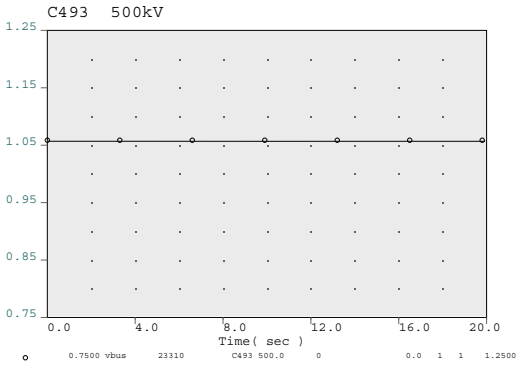
Imperial Valley Area - VOLTAGE

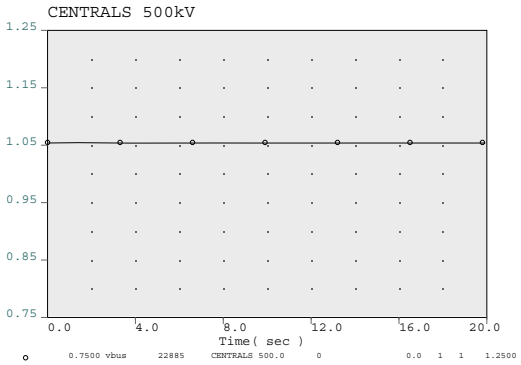








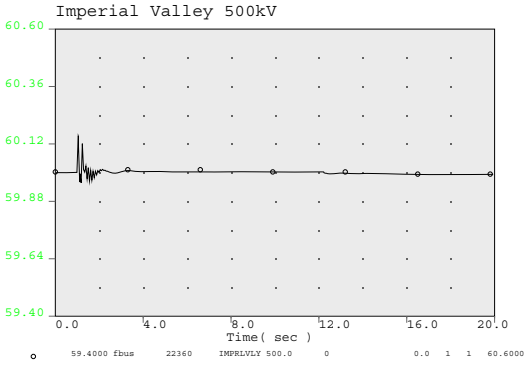




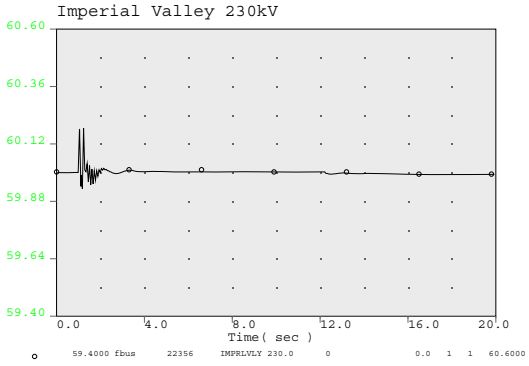
SDG&E Cluster 2 - post
2014 Heavy Summer
Flat

Imperial Valley Area - Frequency

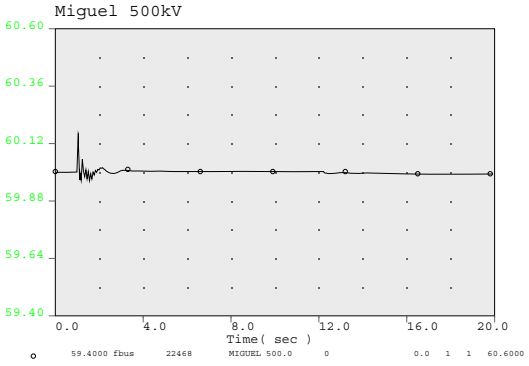
Imperial Valley 500kV



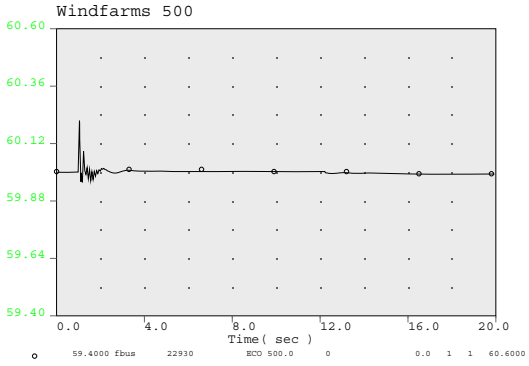
Imperial Valley 230kV



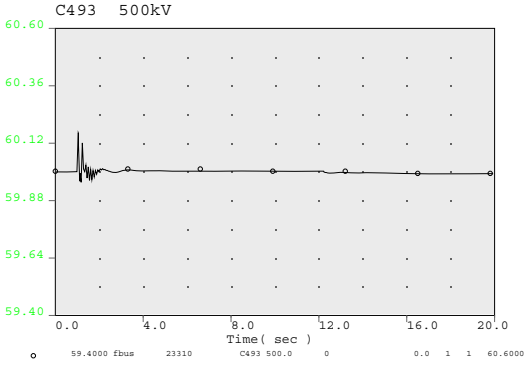
Miguel 500kV



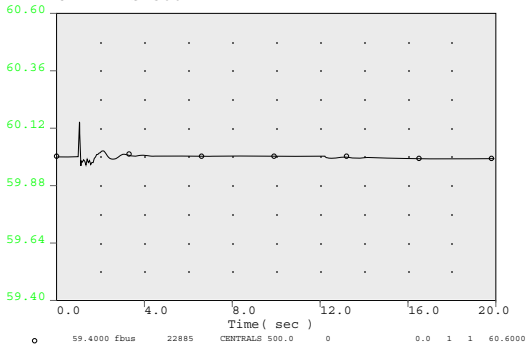
Windfarms 500



C493 500kV

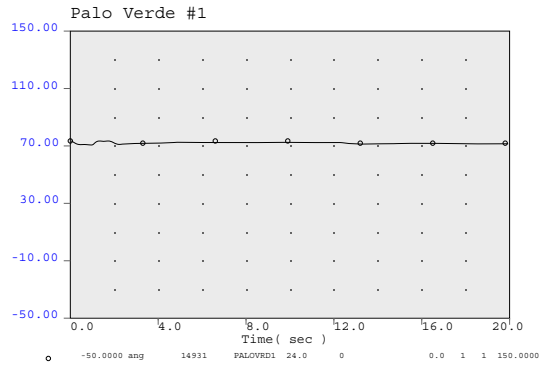


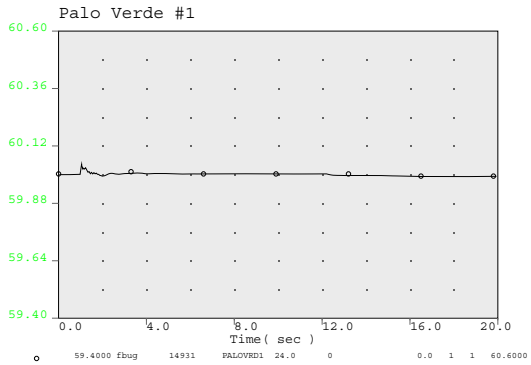
CENTRALS 500kV

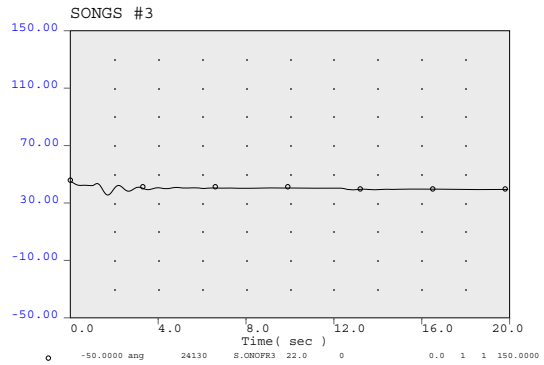


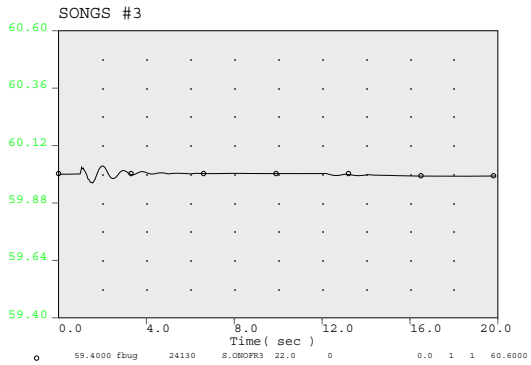
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

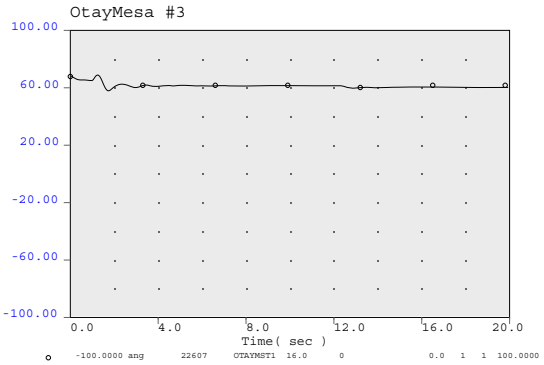
RELATIVE ROTOR ANGLE & FREQUENCY

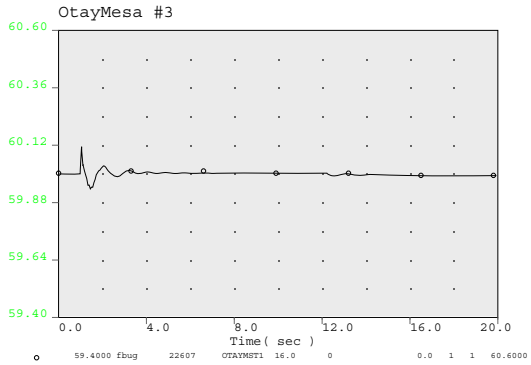








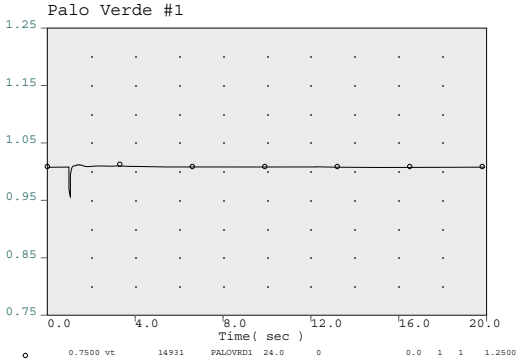




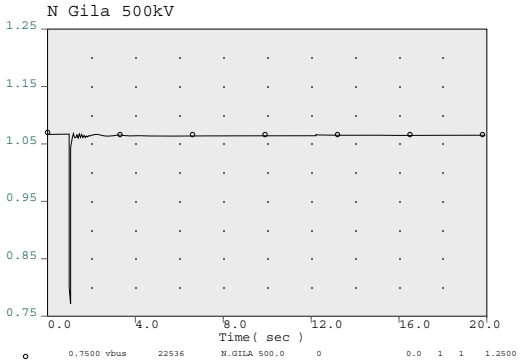
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

RELATIVE VOLTAGE

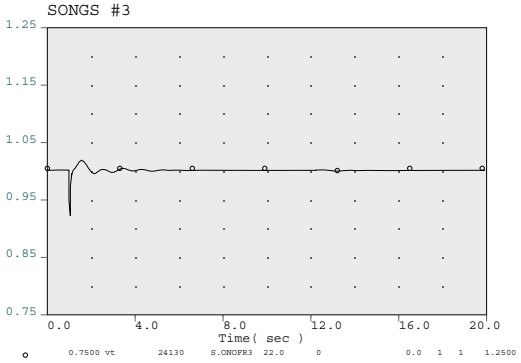
Palo Verde #1



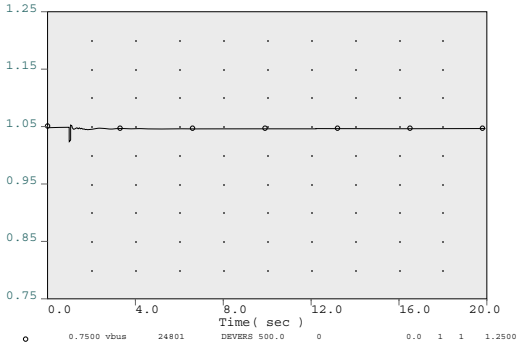
N Gila 500kV



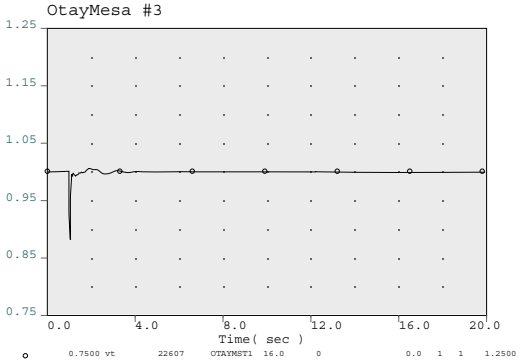
SONGS #3



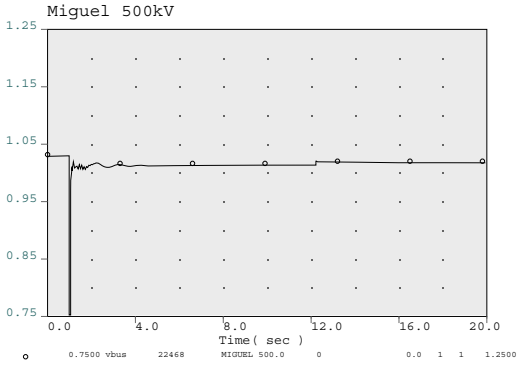
Devers 500



OtayMesa #3



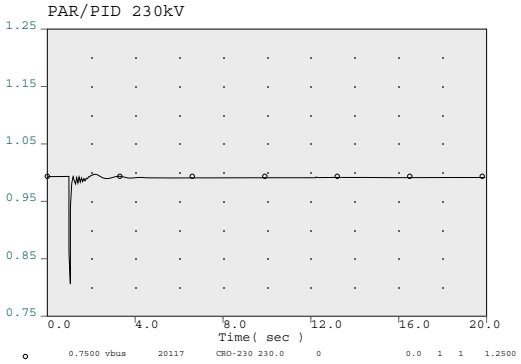
Miguel 500kV



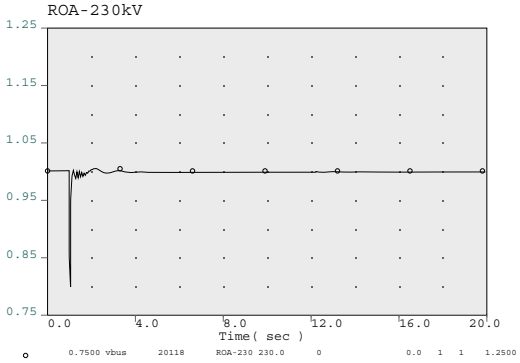
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

Affected System Voltage Check and Comparison

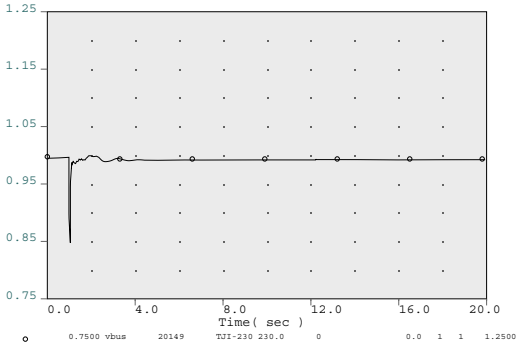
PAR/PID 230kV



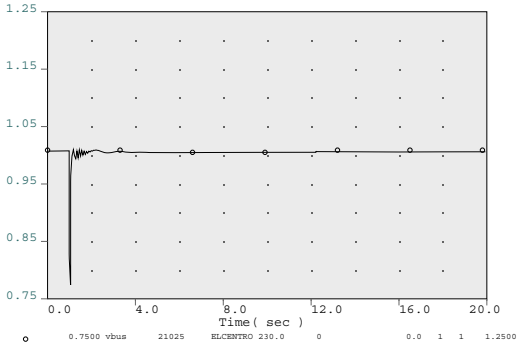
ROA-230kV



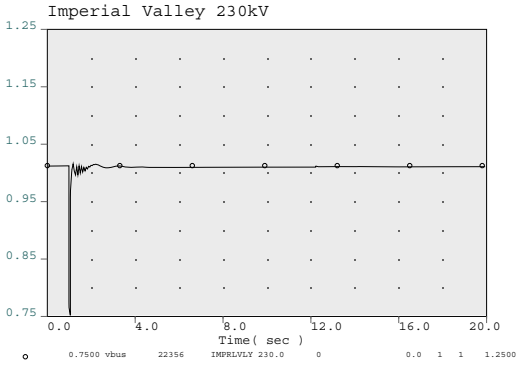
TJ1-230kV



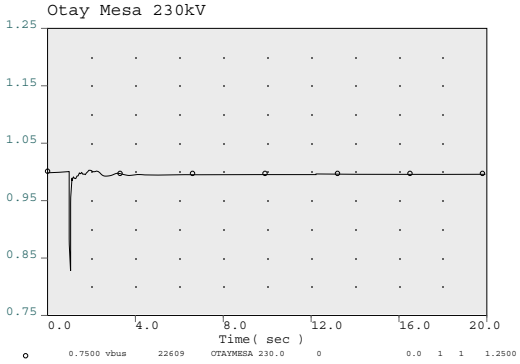
El Centro



Imperial Valley 230kV

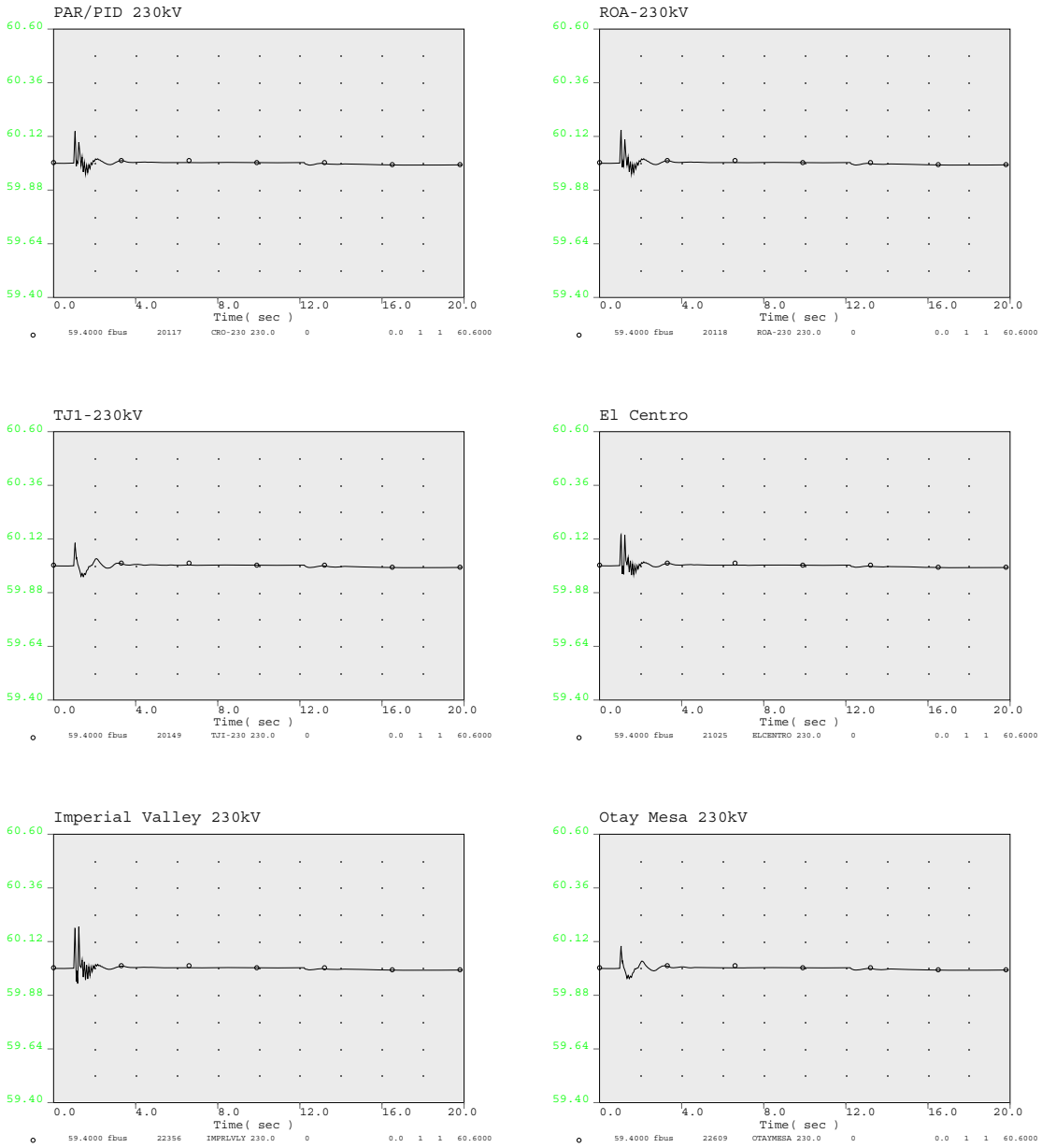


Otay Mesa 230kV



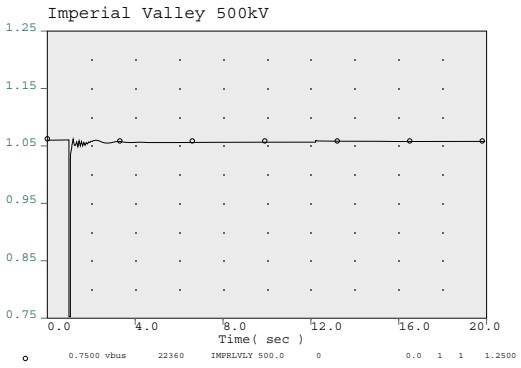
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

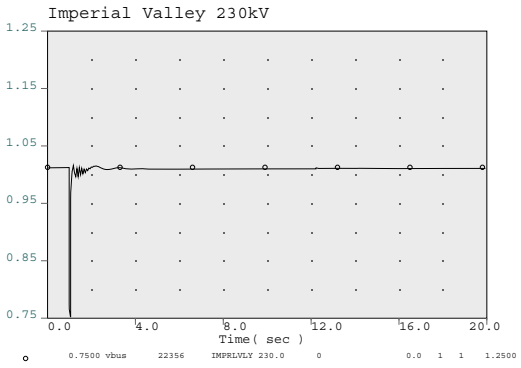
Affected System Frequency Check and Comparison

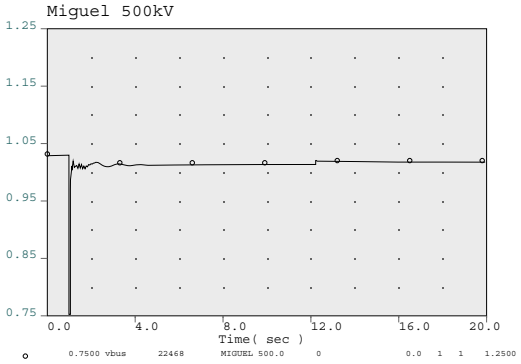


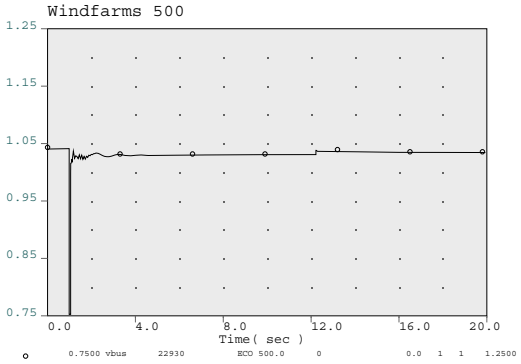
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

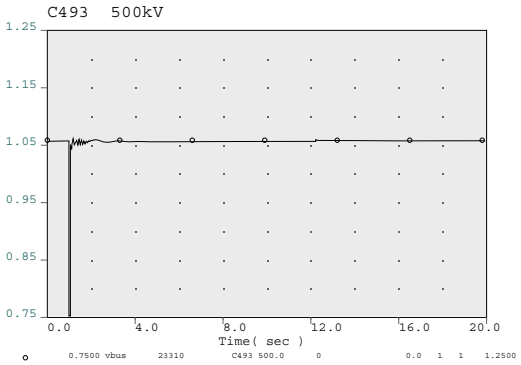
Imperial Valley Area - VOLTAGE

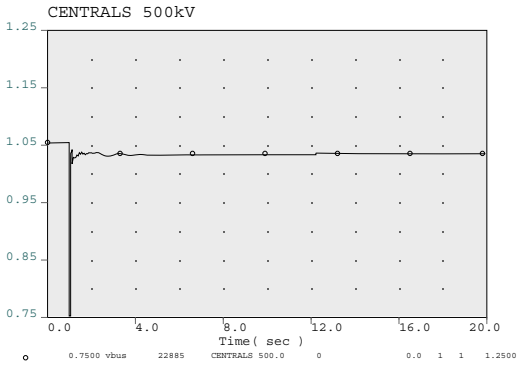






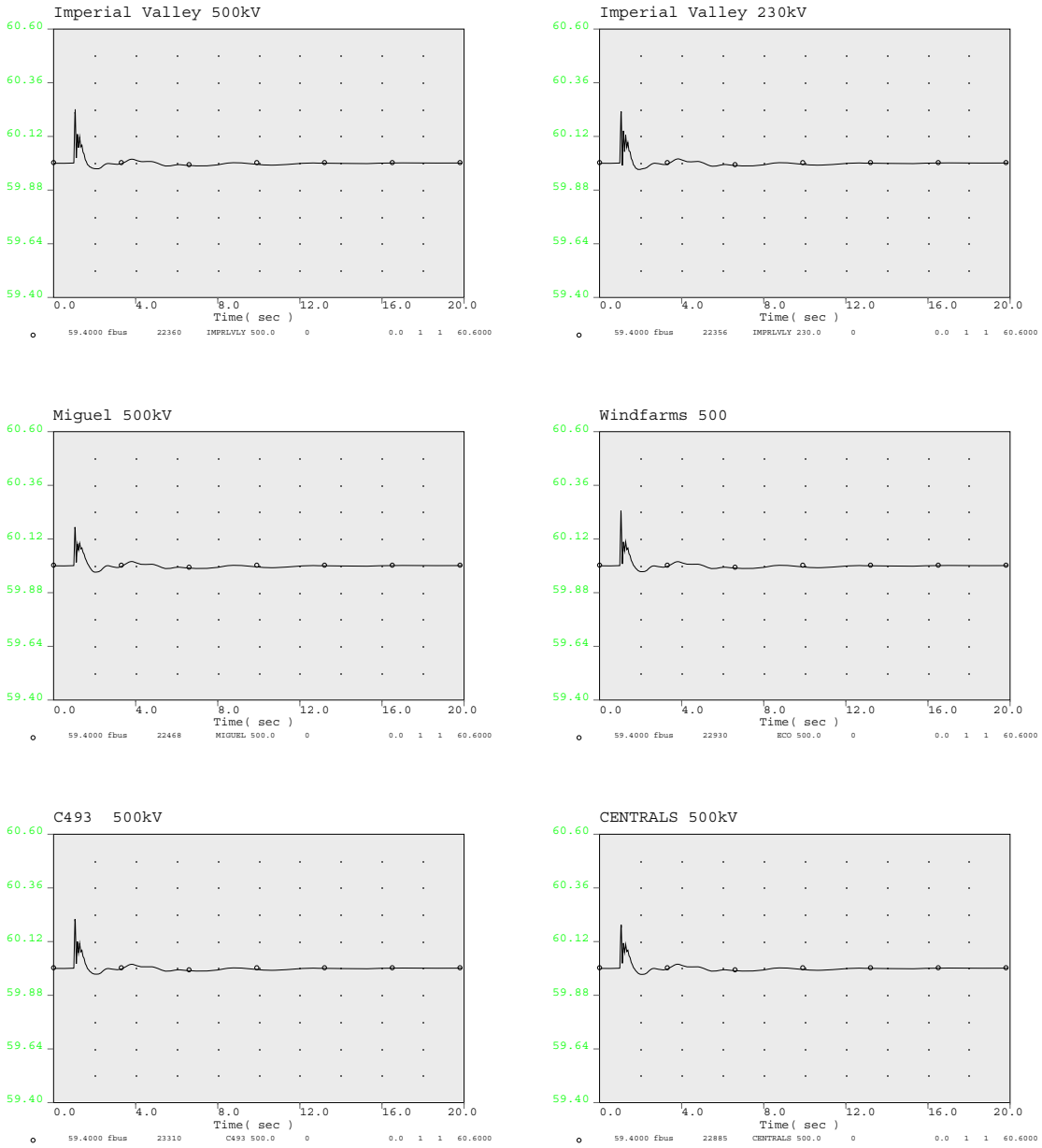






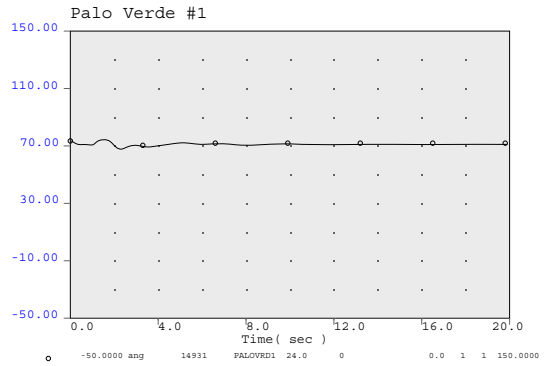
SDG&E Cluster 2 - post
2014 Heavy Summer
C493 - CENTRALS 500kV line

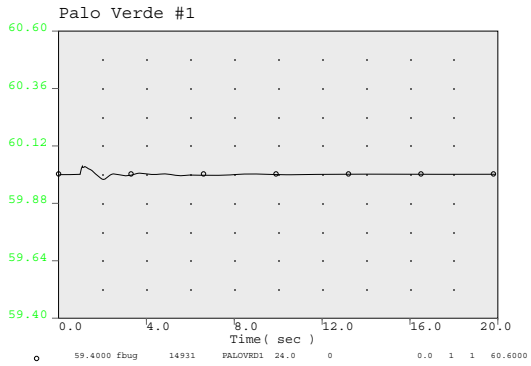
Imperial Valley Area - Frequency

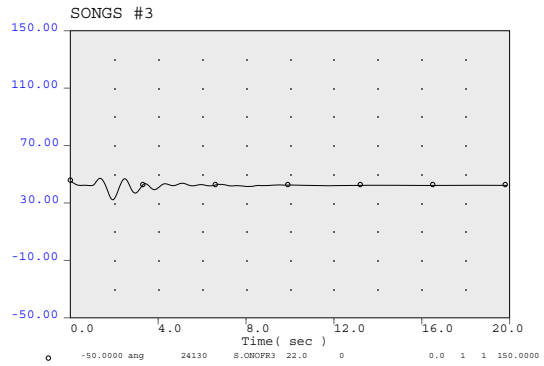


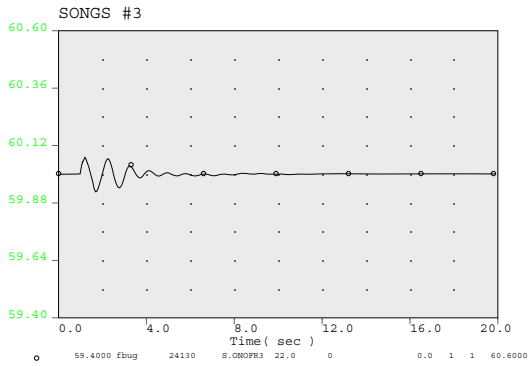
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

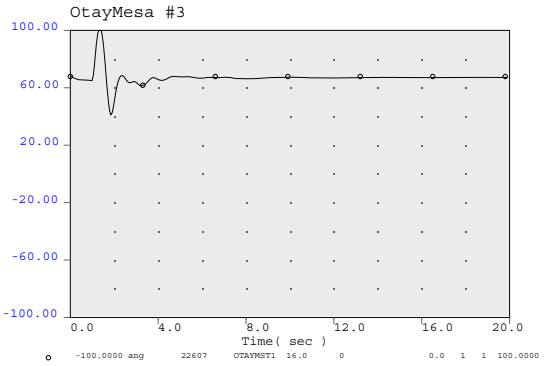
RELATIVE ROTOR ANGLE & FREQUENCY

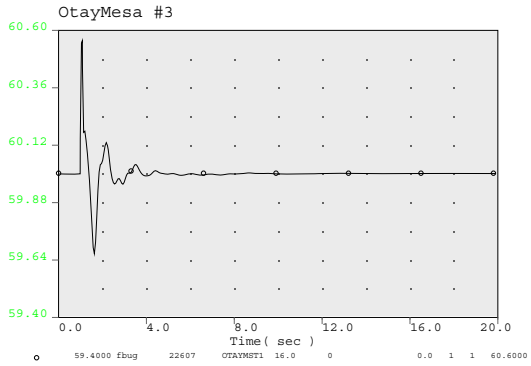












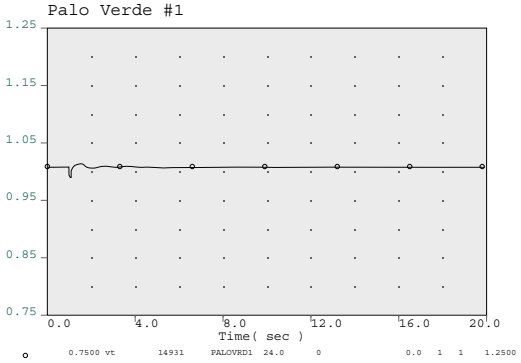
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SX 230 kV N-1

Page 1

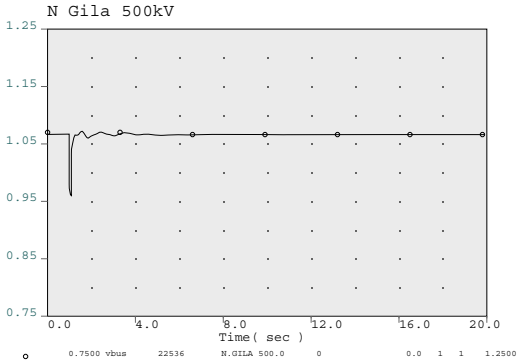
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RELATIVE VOLTAGE

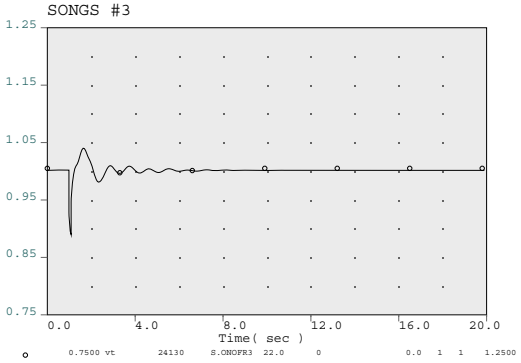
Palo Verde #1



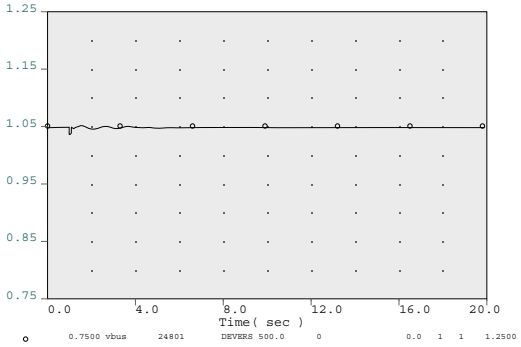
N Gila 500kV



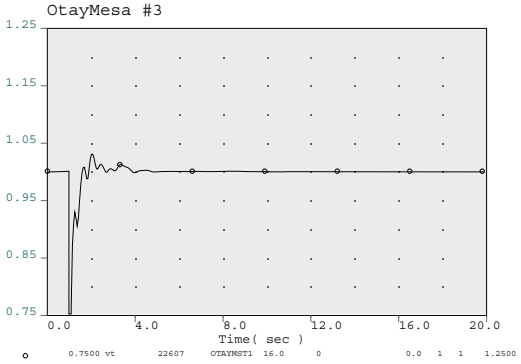
SONGS #3



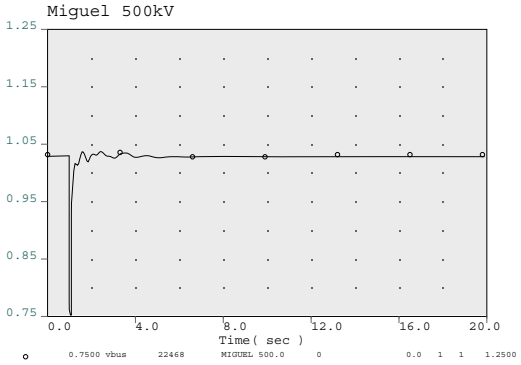
Devers 500



OtayMesa #3



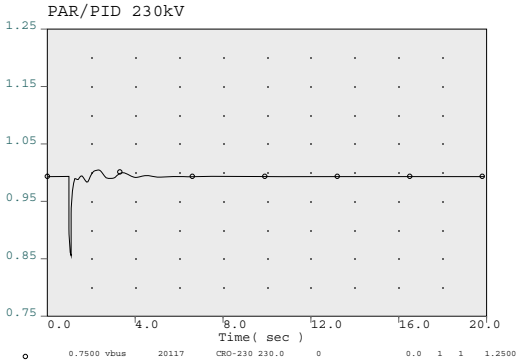
Miguel 500kV



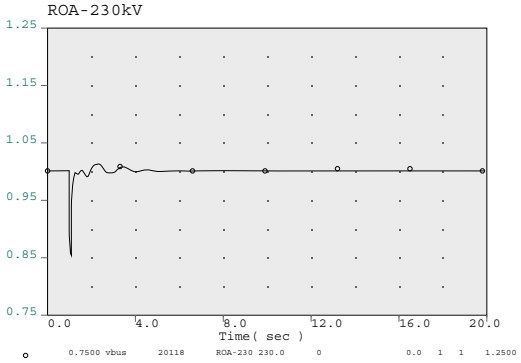
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SX 230 kV N-1

Affected System Voltage Check and Comparison

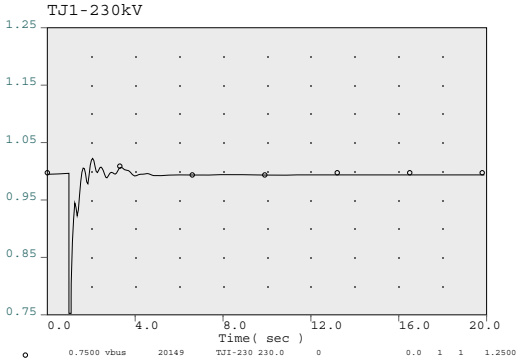
PAR/PID 230kV



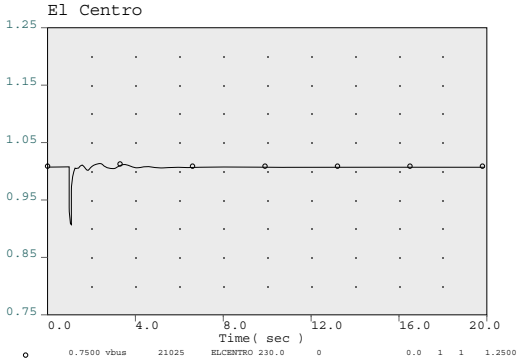
ROA-230kV



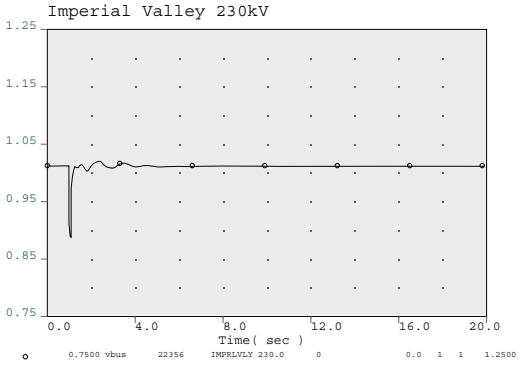
TJ1-230kV



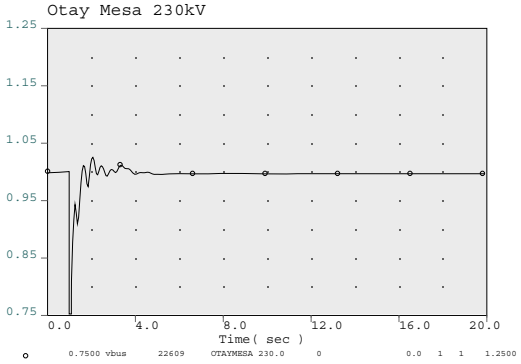
El Centro



Imperial Valley 230kV



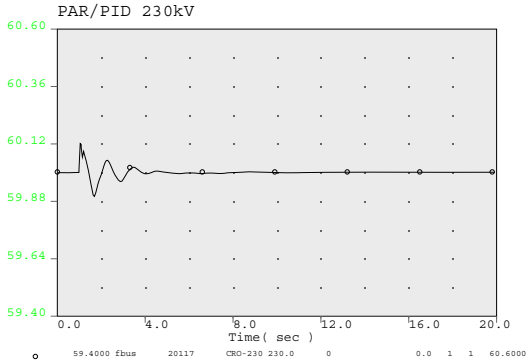
Otay Mesa 230kV



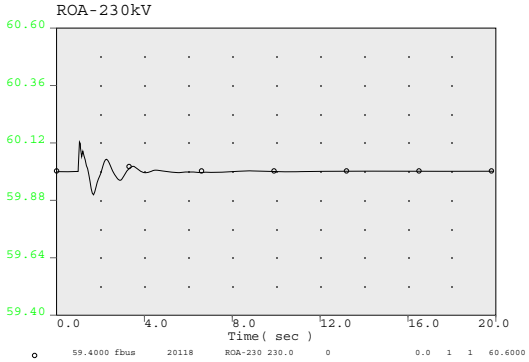
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SX 230 kV N-1

Affected System Frequency Check and Comparison

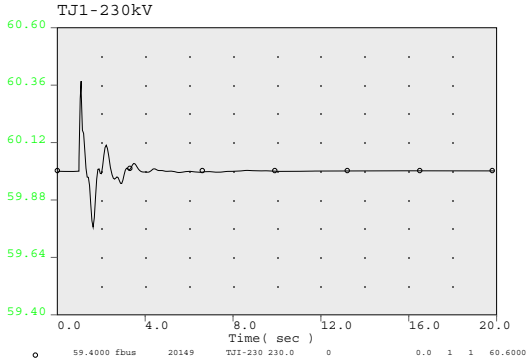
PAR/PID 230kV



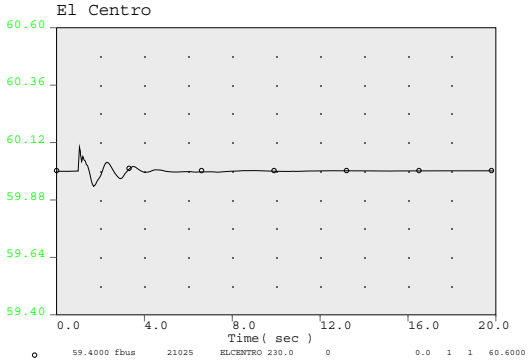
ROA-230kV



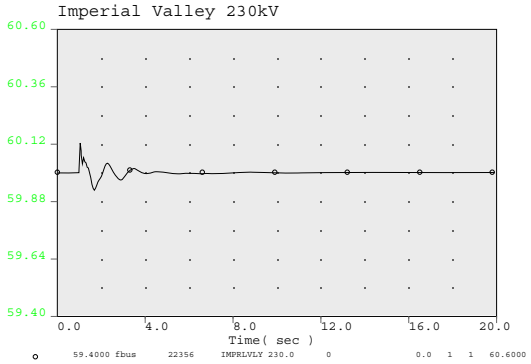
TJ1-230kV



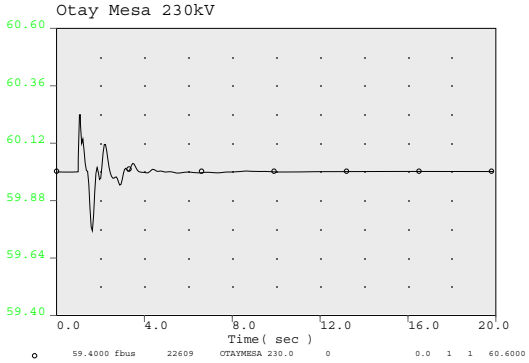
El Centro



Imperial Valley 230kV

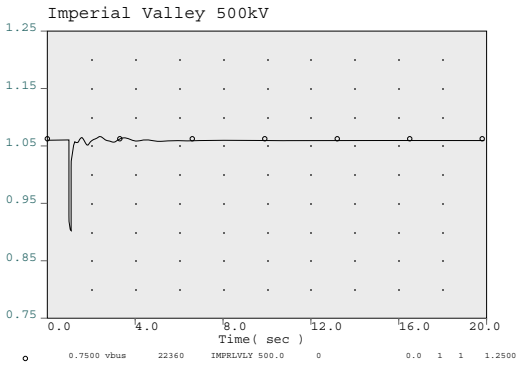


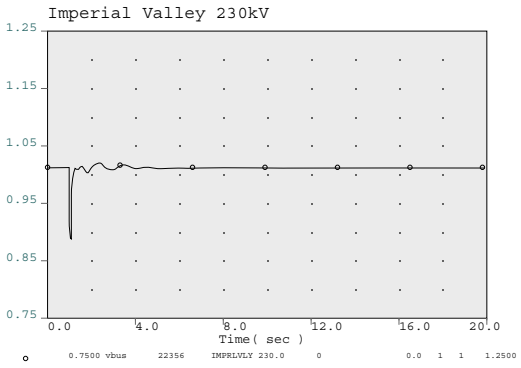
Otay Mesa 230kV

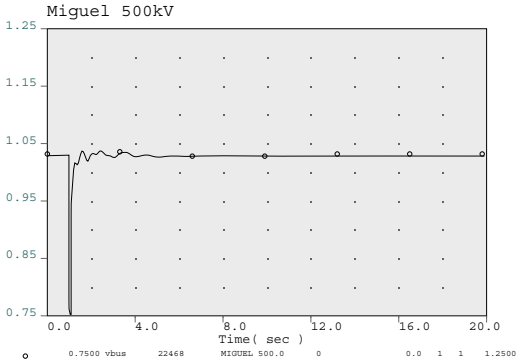


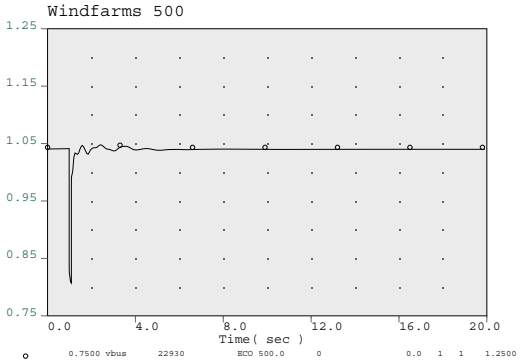
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SX 230 kV N-1

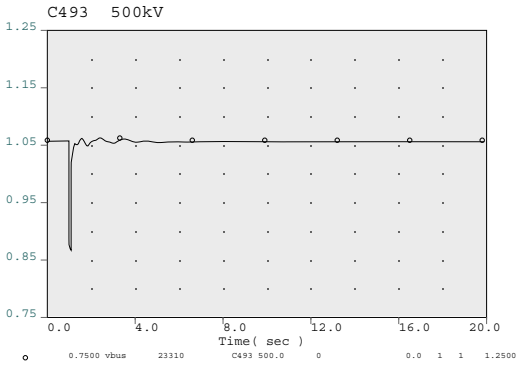
Imperial Valley Area - VOLTAGE

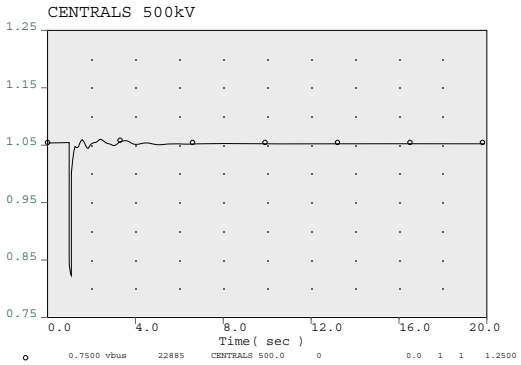












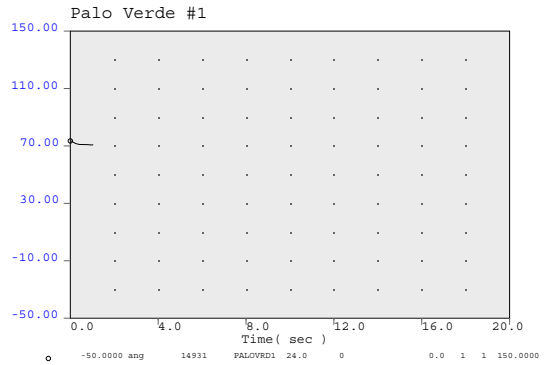
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SX 230 kV N-1

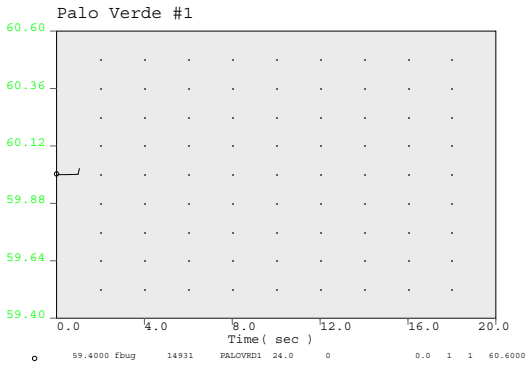
Imperial Valley Area - Frequency

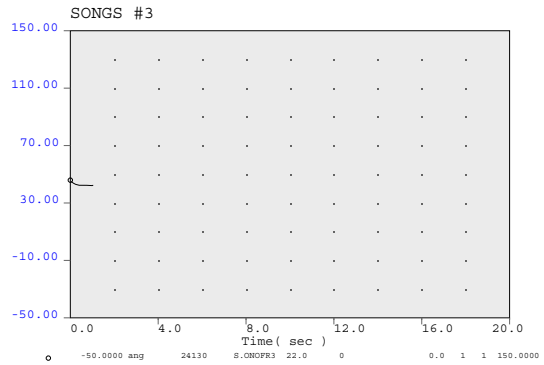


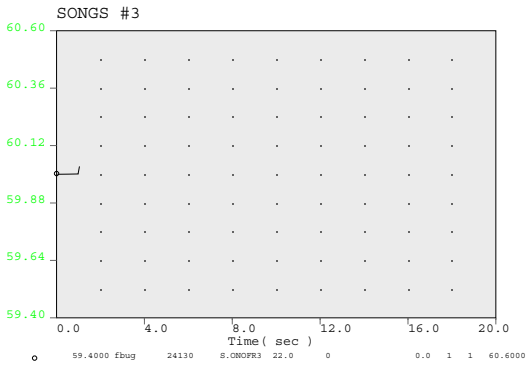
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SX 230 kV N-1

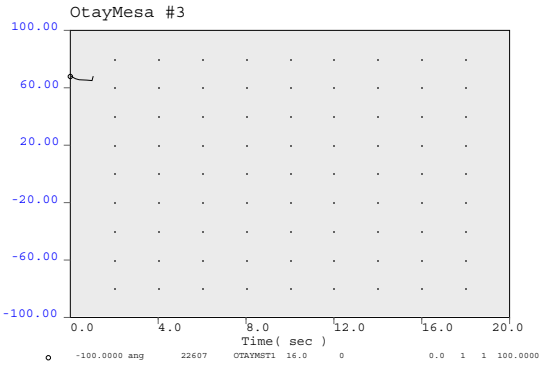
RELATIVE ROTOR ANGLE & FREQUENCY

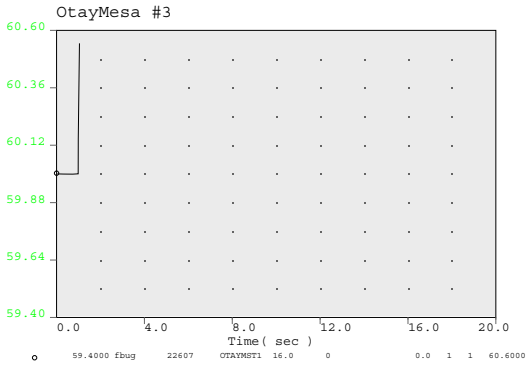












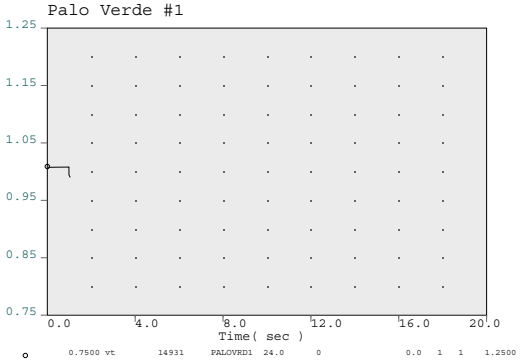
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SY 230 kV N-1

Page 1

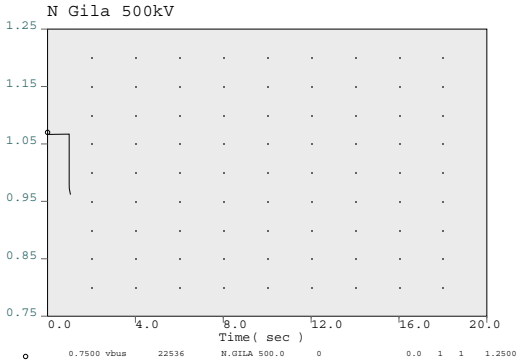
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RELATIVE VOLTAGE

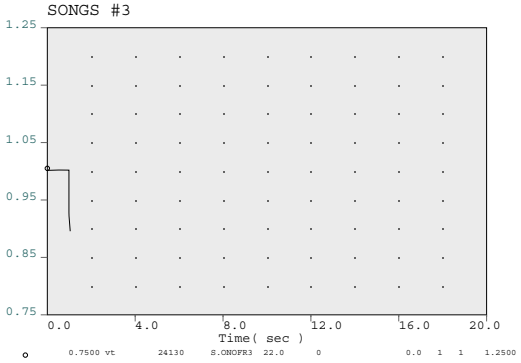
Palo Verde #1



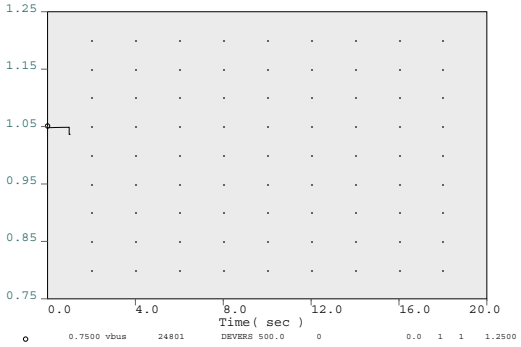
N Gila 500kV



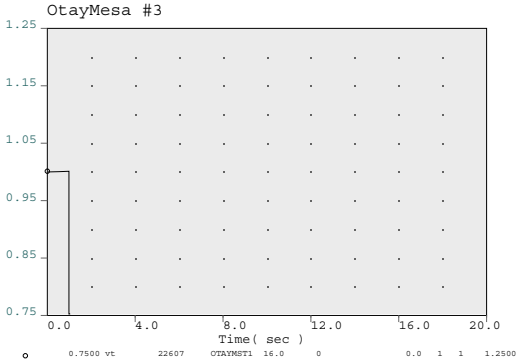
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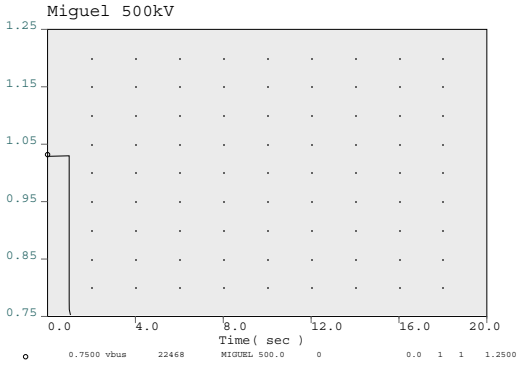
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OtayMesa #3



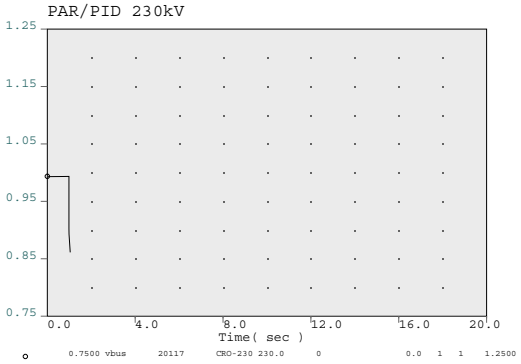
Miguel 500kV



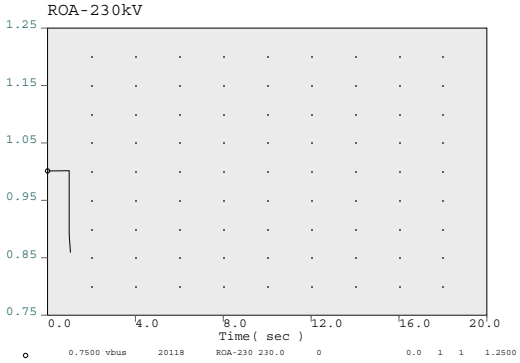
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SY 230 kV N-1

Affected System Voltage Check and Comparison

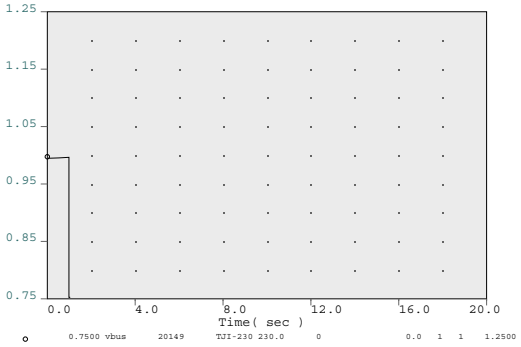
PAR/PID 230kV



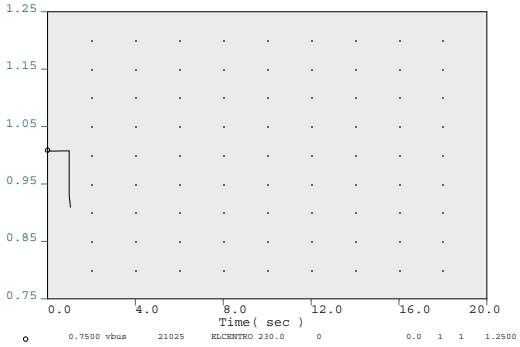
ROA-230kV



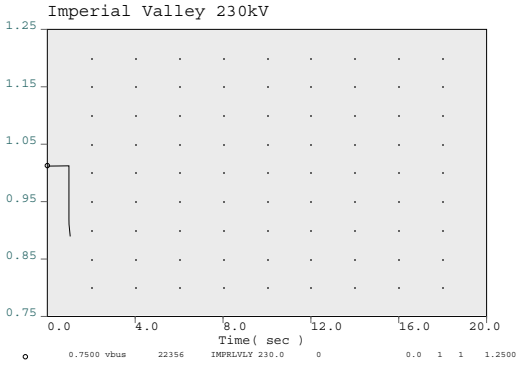
TJ1-230kV



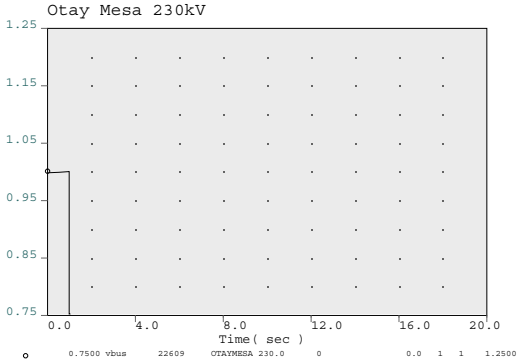
El Centro



Imperial Valley 230kV



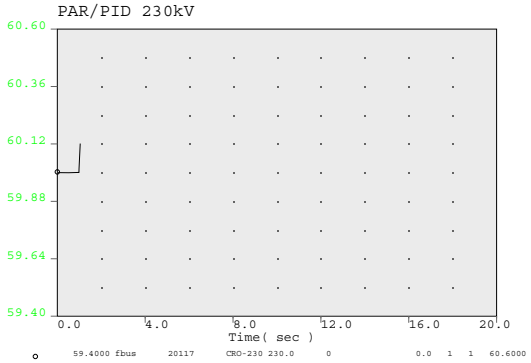
Otay Mesa 230kV



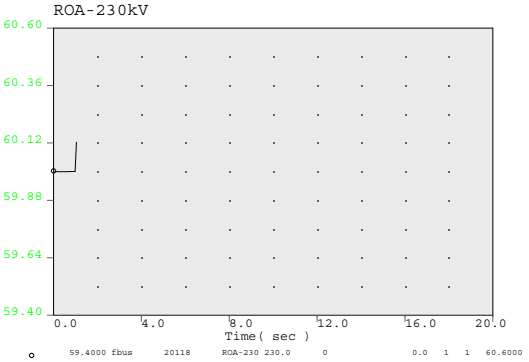
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SY 230 kV N-1

Affected System Frequency Check and Comparison

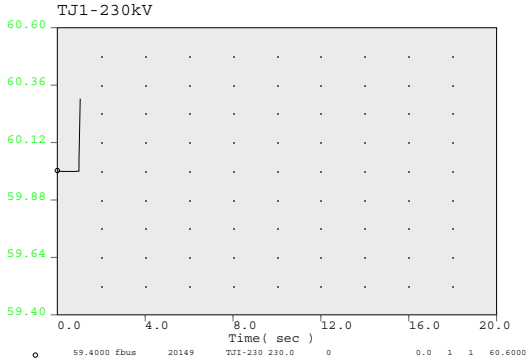
PAR/PID 230kV



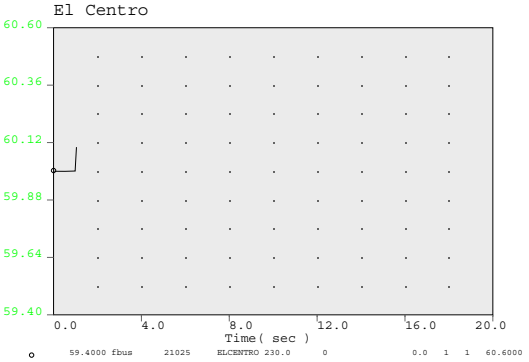
ROA-230kV



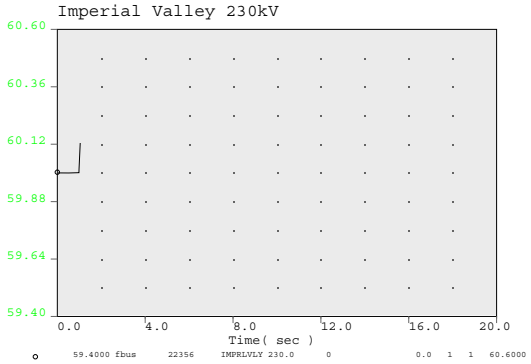
TJ1-230kV



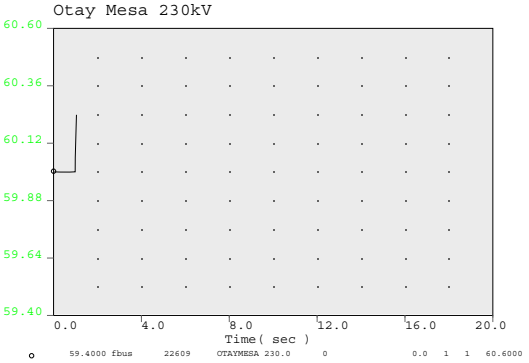
El Centro



Imperial Valley 230kV



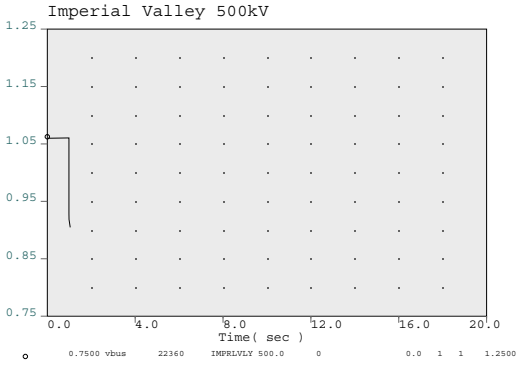
Otay Mesa 230kV



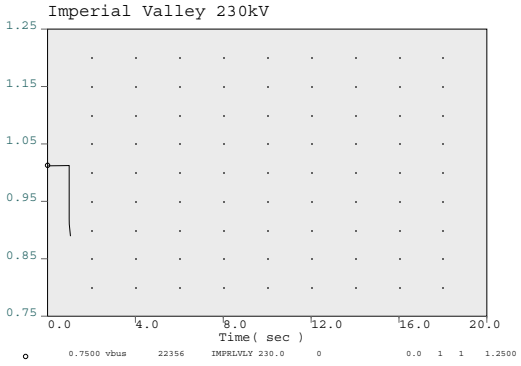
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SY 230 kV N-1

Imperial Valley Area - VOLTAGE

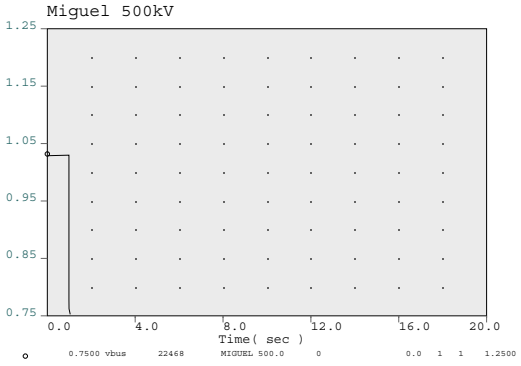
Imperial Valley 500kV



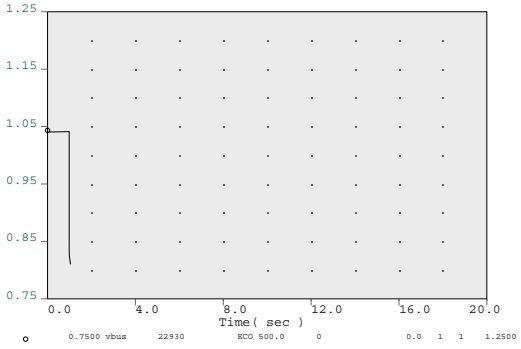
Imperial Valley 230kV



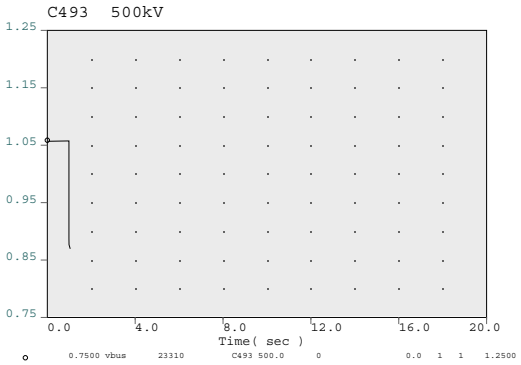
Miguel 500kV



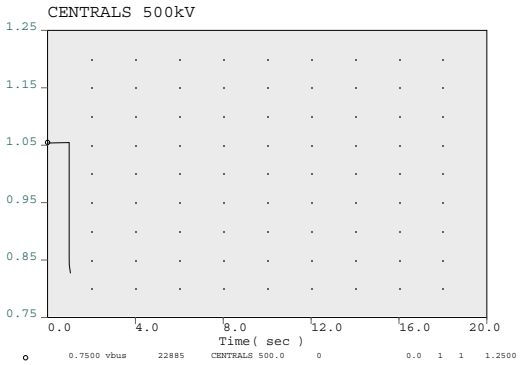
Windfarms 500



C493 500kV



CENTRALS 500kV

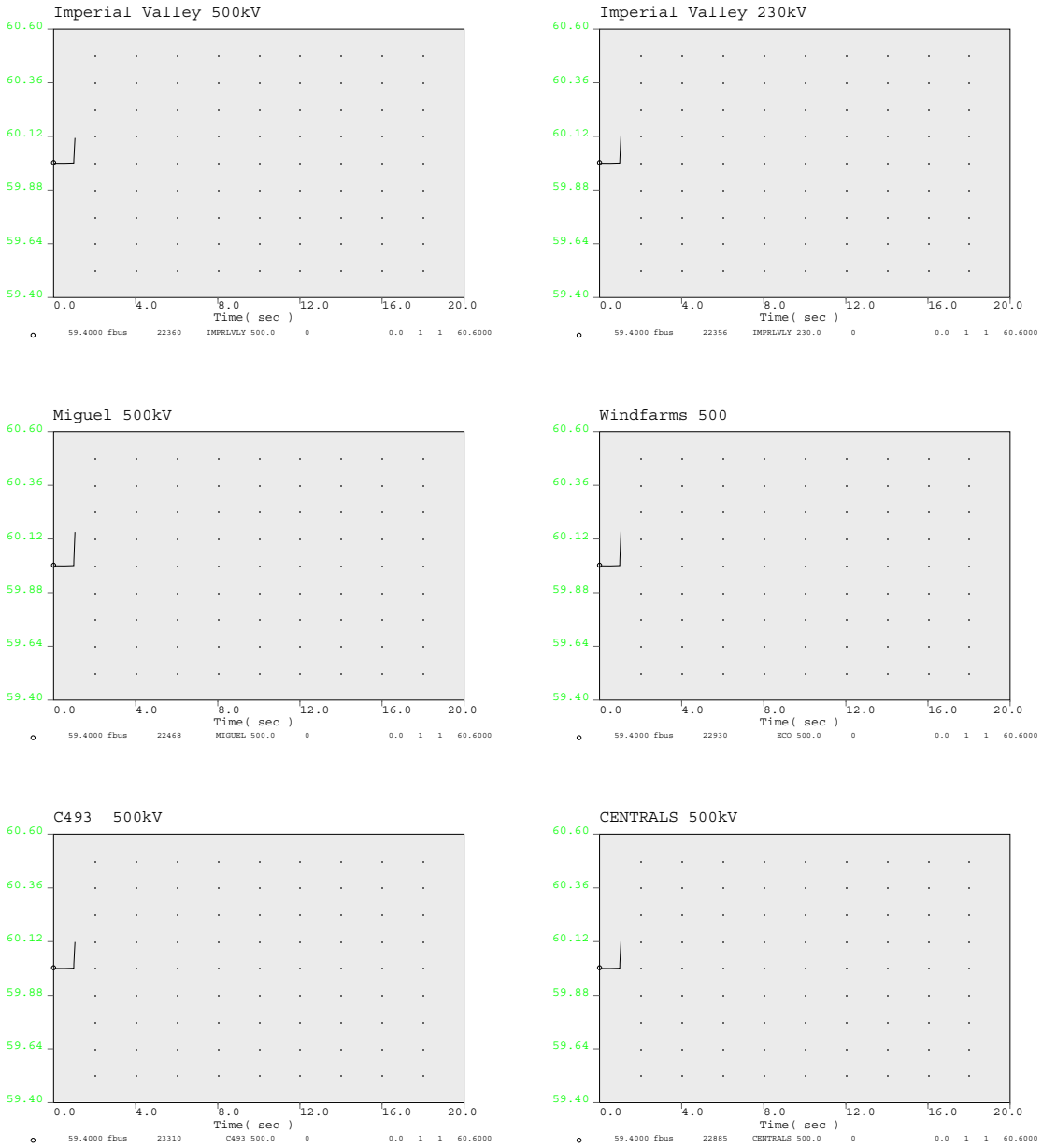


SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SY 230 kV N-1

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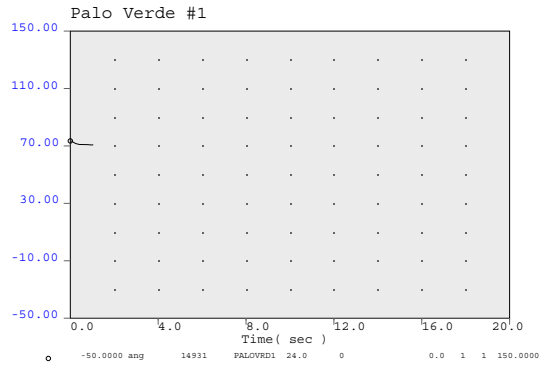
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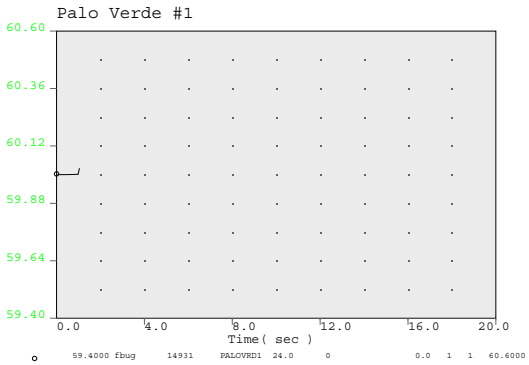
Imperial Valley Area - Frequency

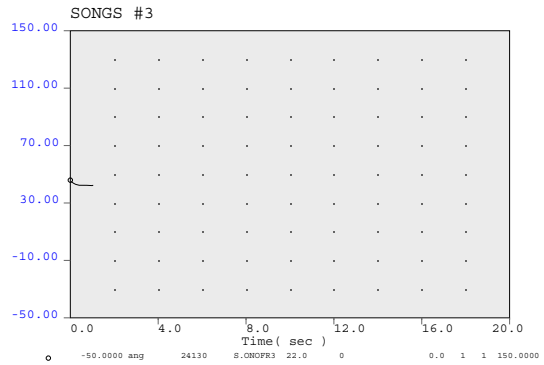


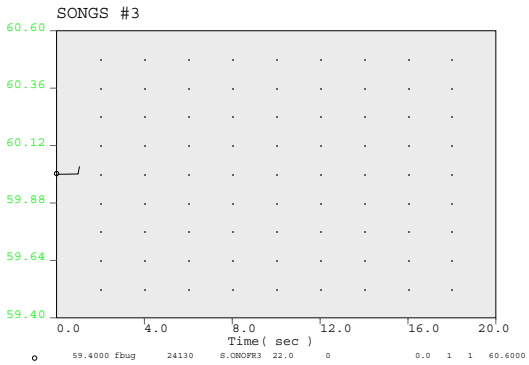
SDG&E Cluster 2 - pst int
2014 Heavy Summer
C574 - SY 230 kV N-1

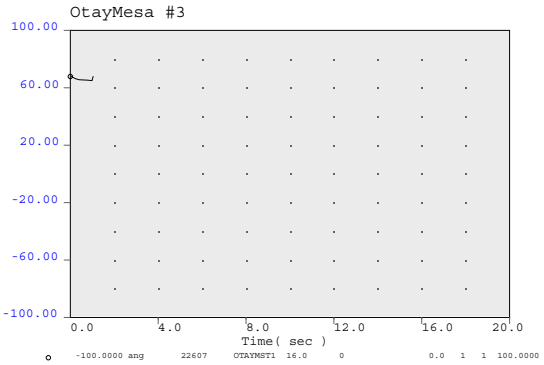
RELATIVE ROTOR ANGLE & FREQUENCY

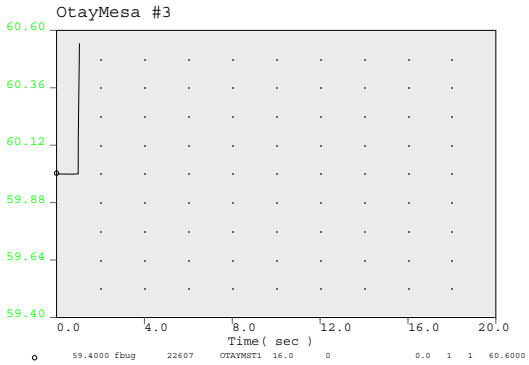












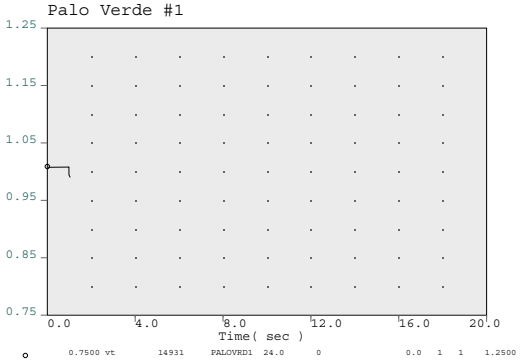
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

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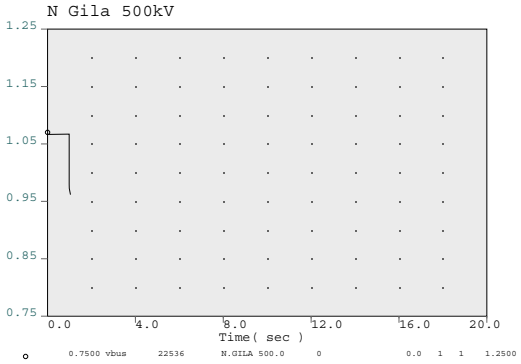
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RELATIVE VOLTAGE

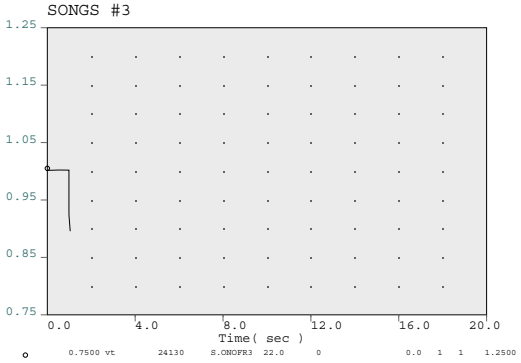
Palo Verde #1



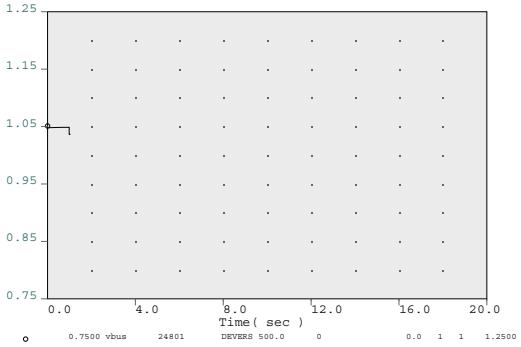
N Gila 500kV



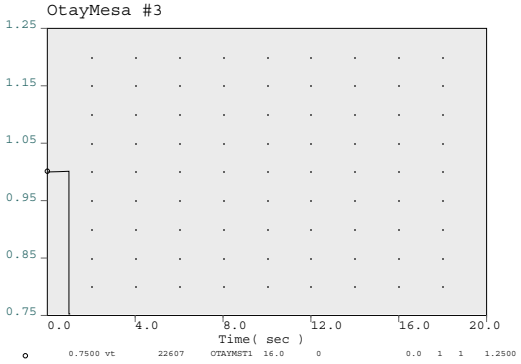
SONGS #3



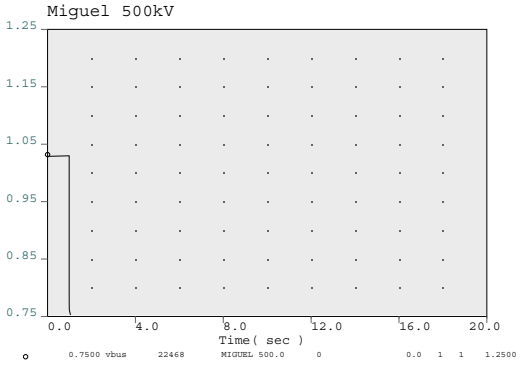
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OtayMesa #3



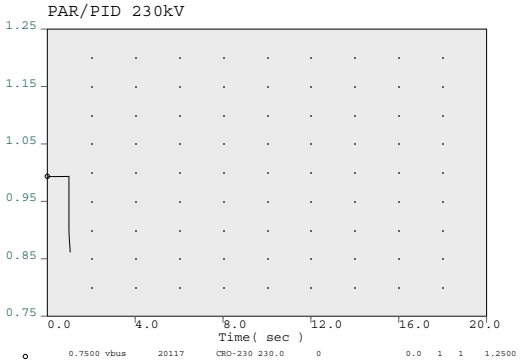
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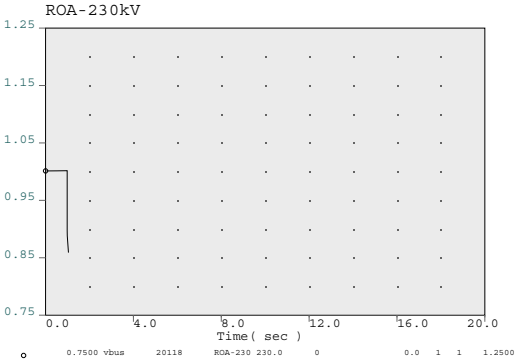
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

Affected System Voltage Check and Comparison

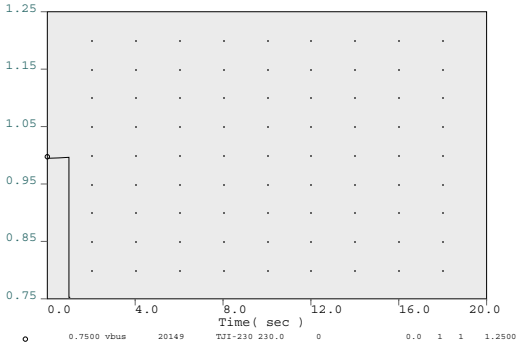
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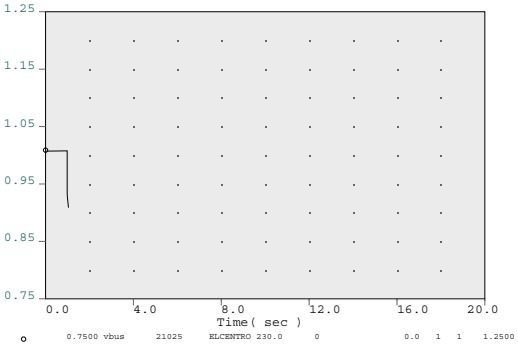
ROA-230kV



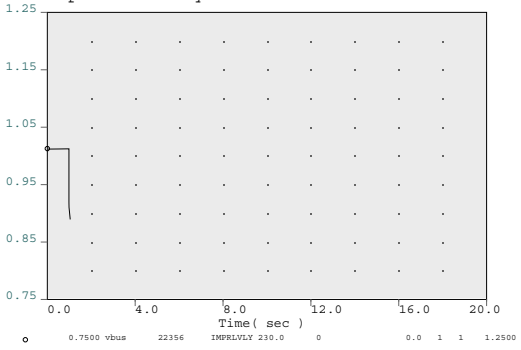
TJ1-230kV



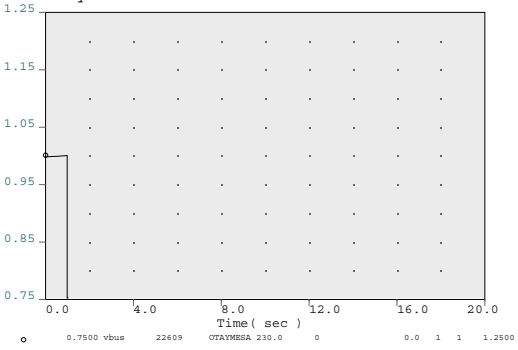
El Centro



Imperial Valley 230kV



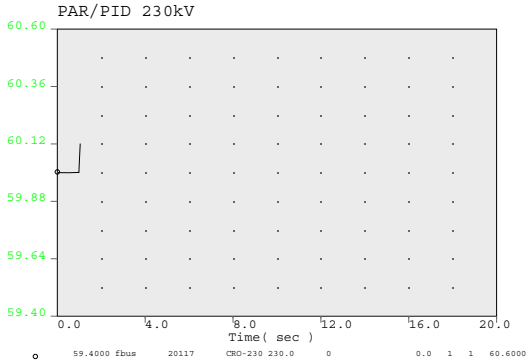
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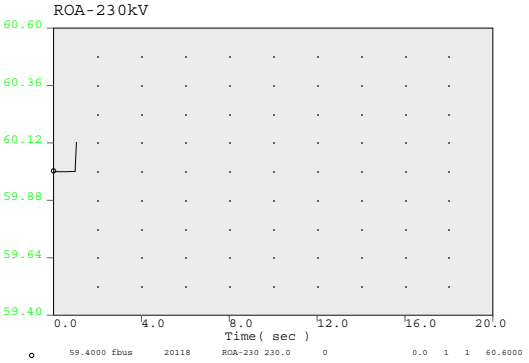
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

Affected System Frequency Check and Comparison

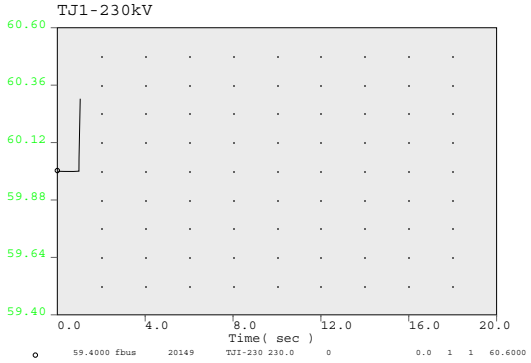
PAR/PID 230kV



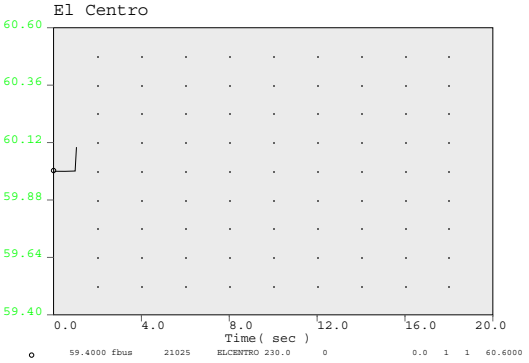
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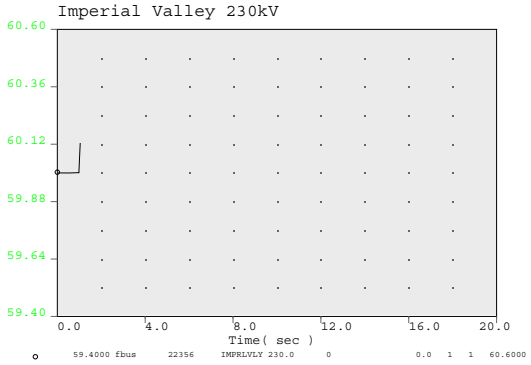
TJ1-230kV



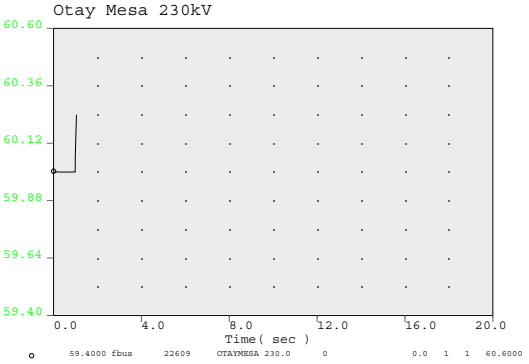
El Centro



Imperial Valley 230kV



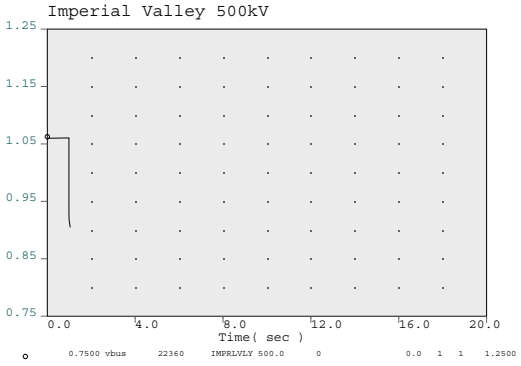
Otay Mesa 230kV



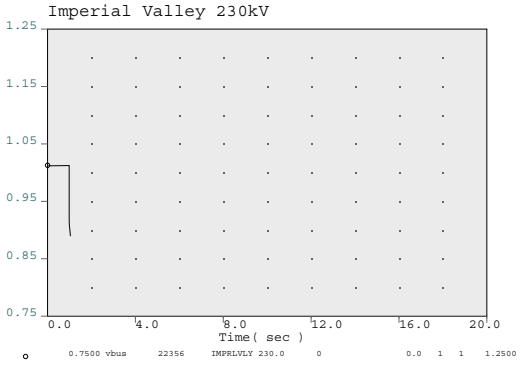
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

Imperial Valley Area - VOLTAGE

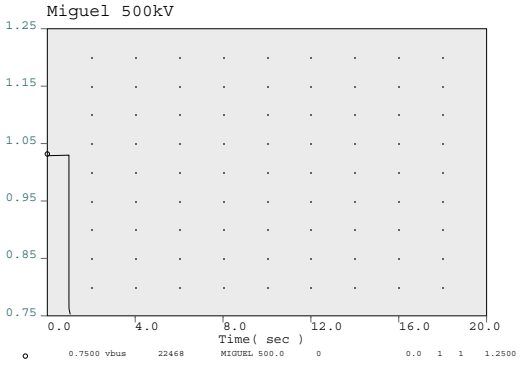
Imperial Valley 500kV



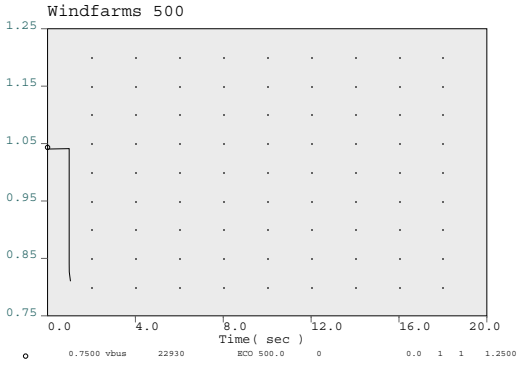
Imperial Valley 230kV



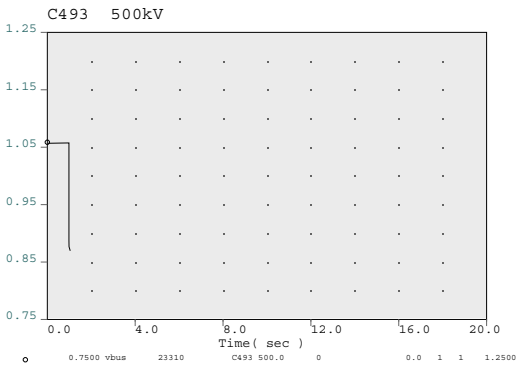
Miguel 500kV



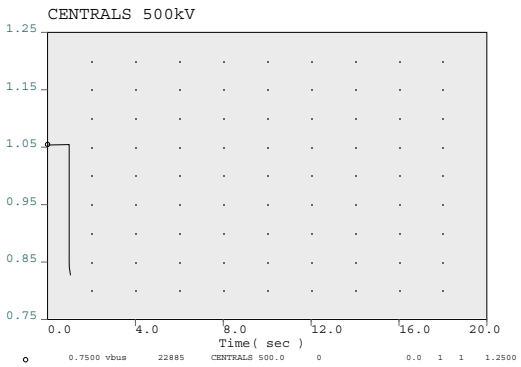
Windfarms 500



C493 500kV

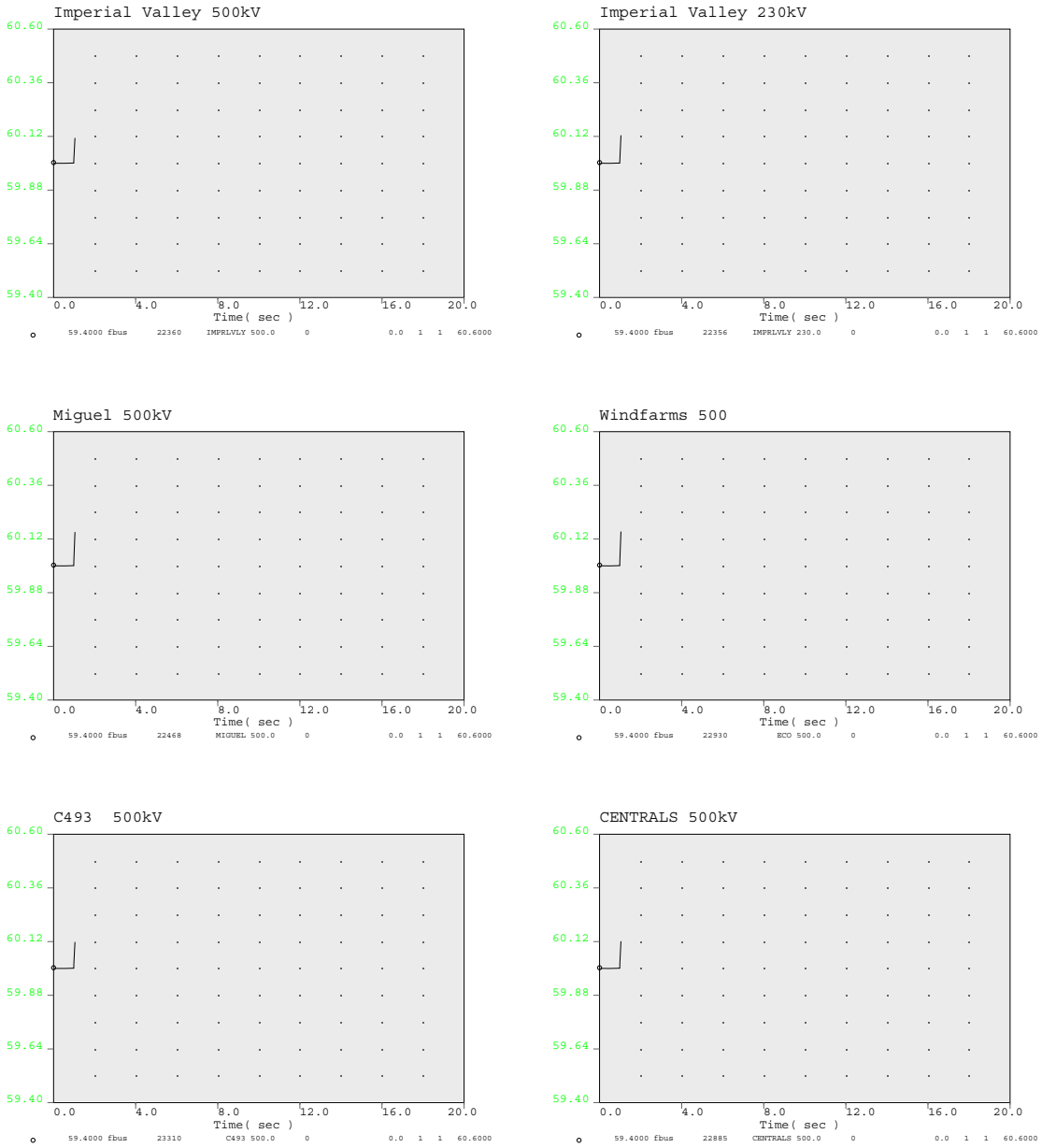


CENTRALS 500kV



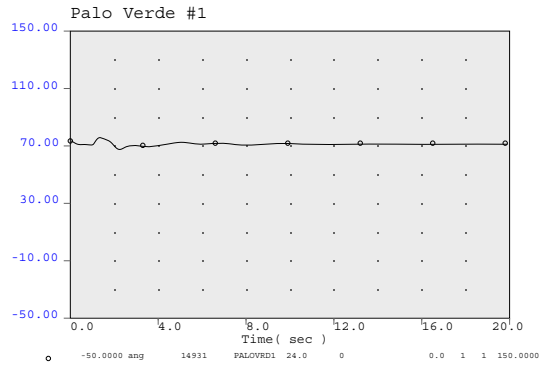
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

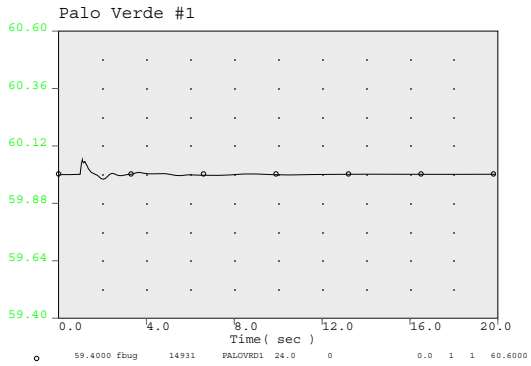
Imperial Valley Area - Frequency

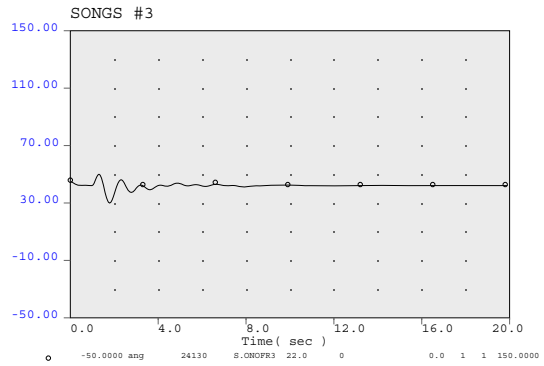


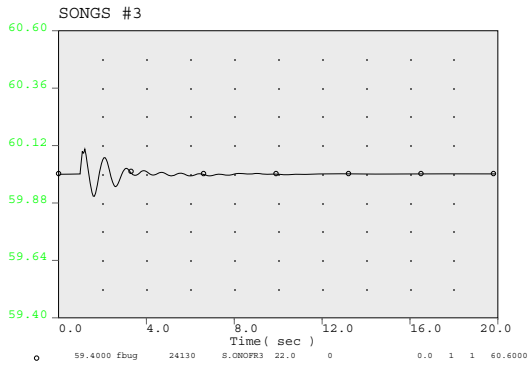
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

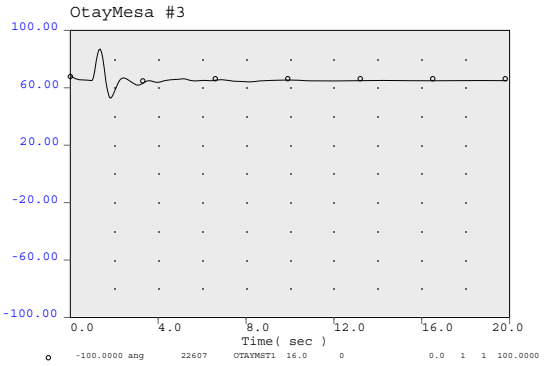
RELATIVE ROTOR ANGLE & FREQUENCY

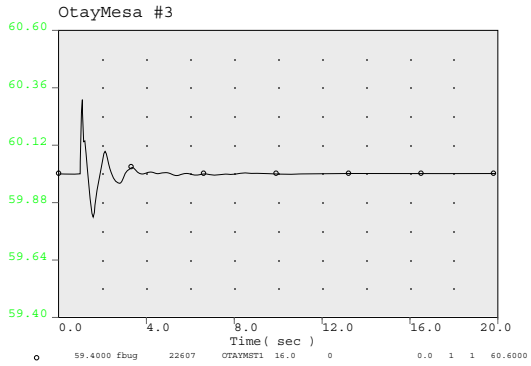










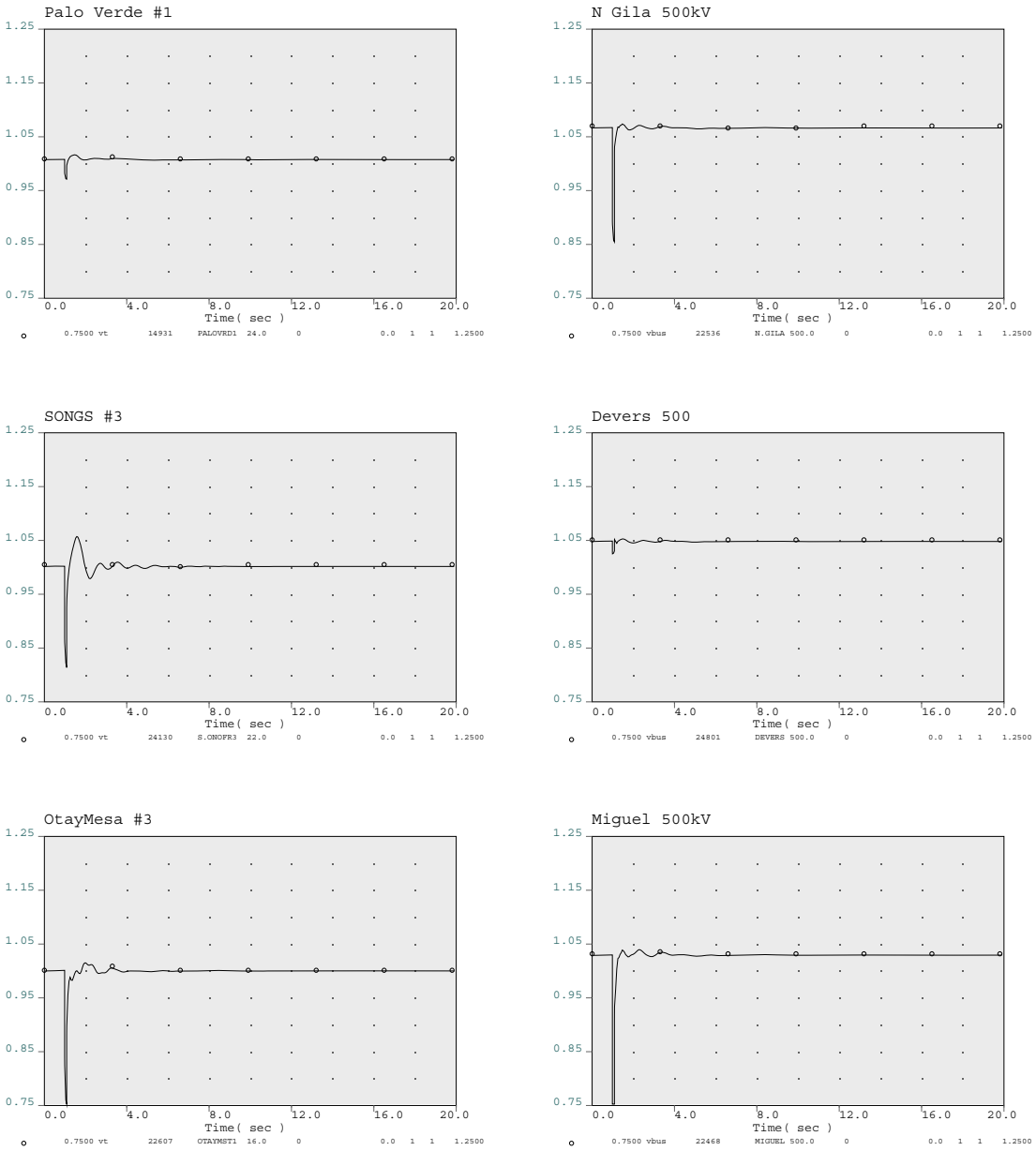


SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

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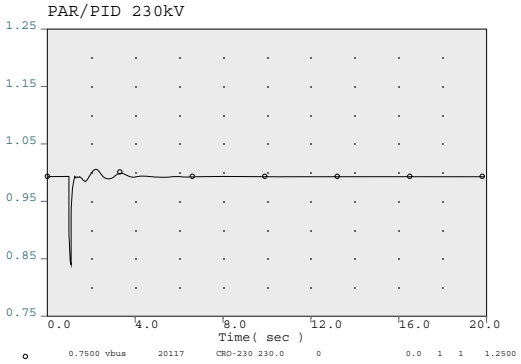
RELATIVE VOLTAGE



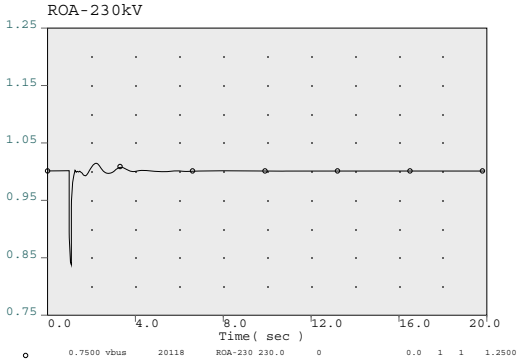
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

Affected System Voltage Check and Comparison

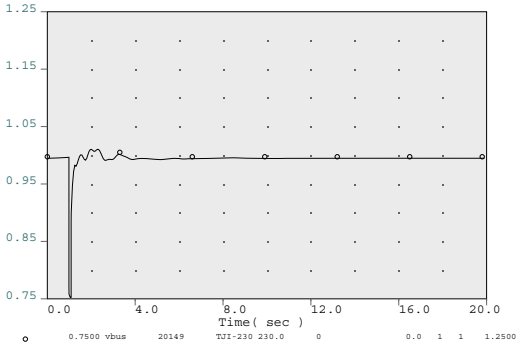
PAR/PID 230kV



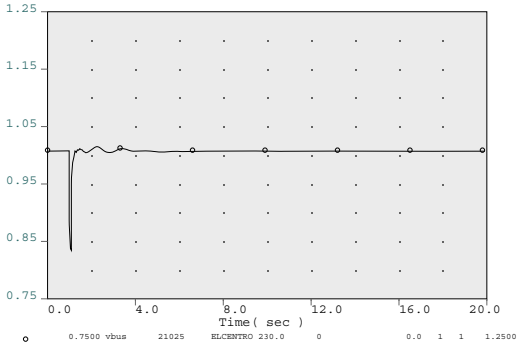
ROA-230kV



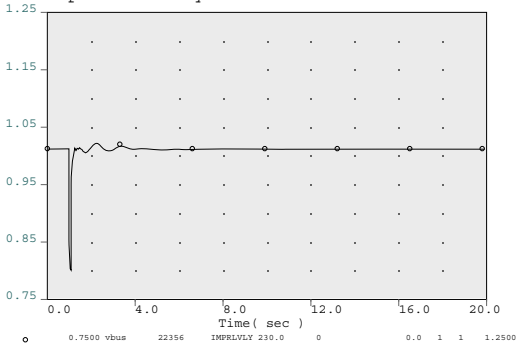
TJ1-230kV



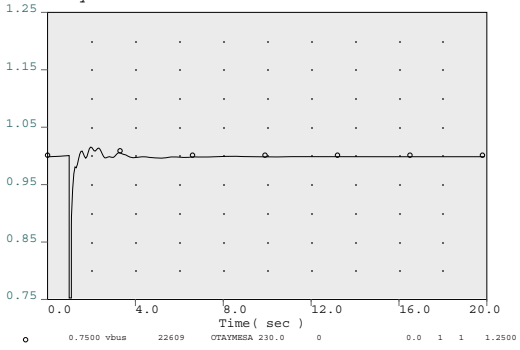
El Centro



Imperial Valley 230kV



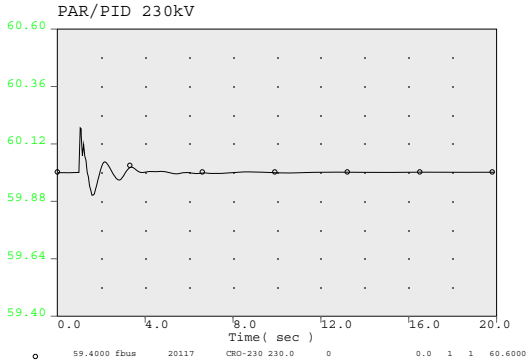
Otay Mesa 230kV



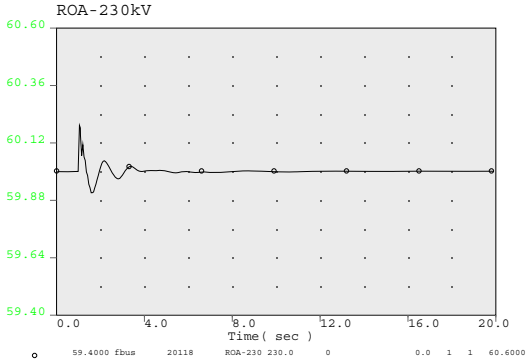
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

Affected System Frequency Check and Comparison

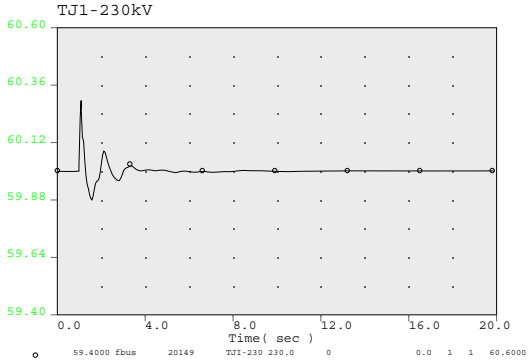
PAR/PID 230kV



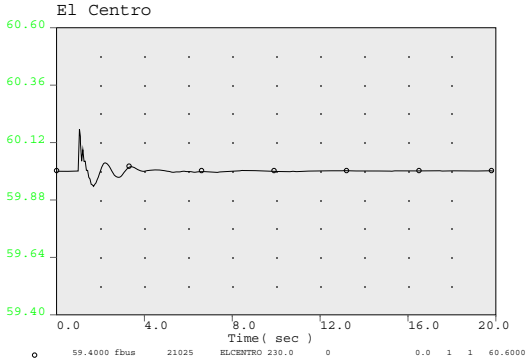
ROA-230kV



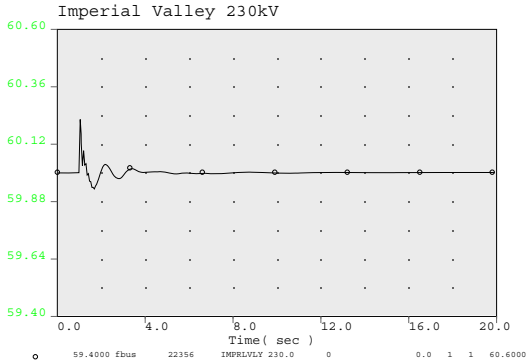
TJ1-230kV



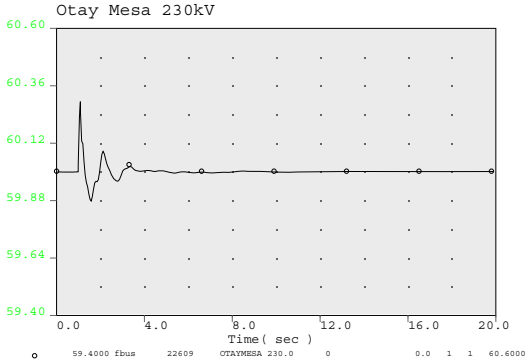
El Centro



Imperial Valley 230kV



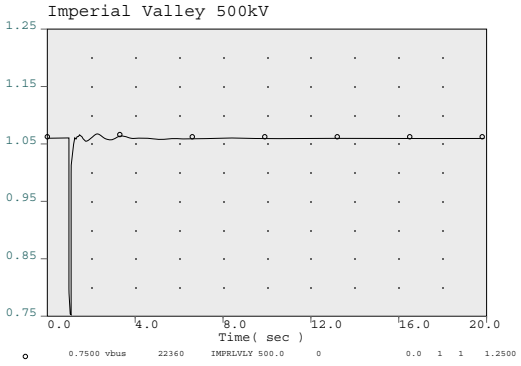
Otay Mesa 230kV



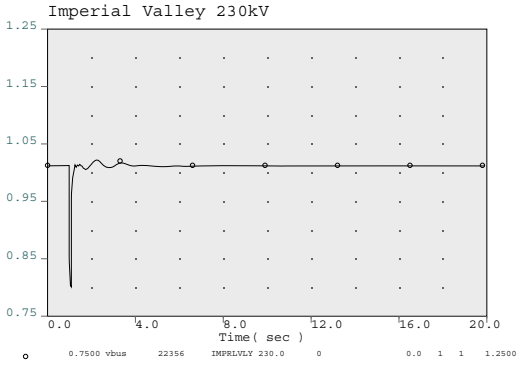
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

Imperial Valley Area - VOLTAGE

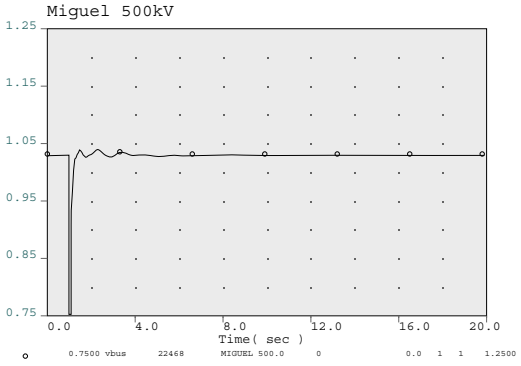
Imperial Valley 500kV



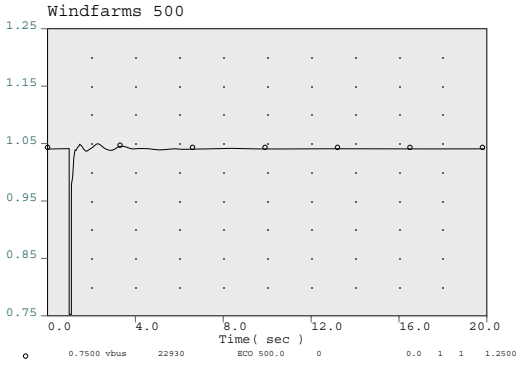
Imperial Valley 230kV



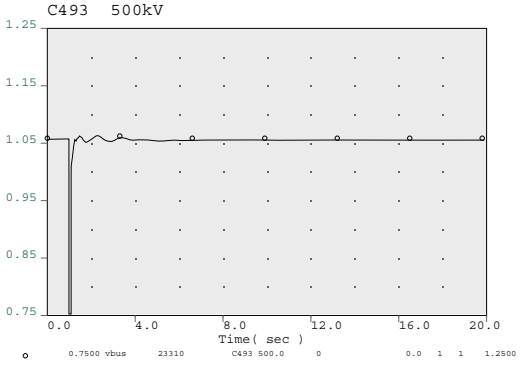
Miguel 500kV



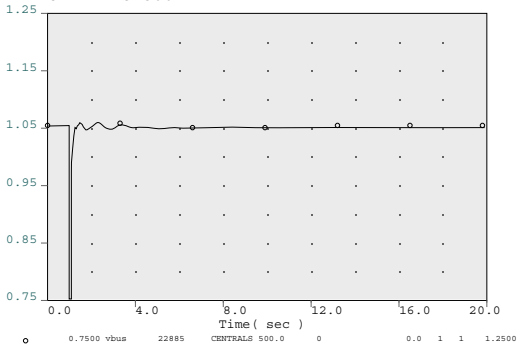
Windfarms 500



C493 500kV



CENTRALS 500kV



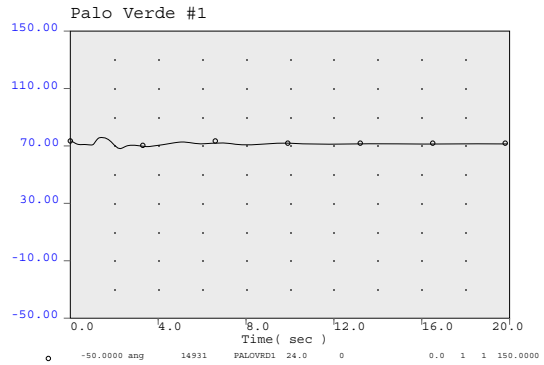
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

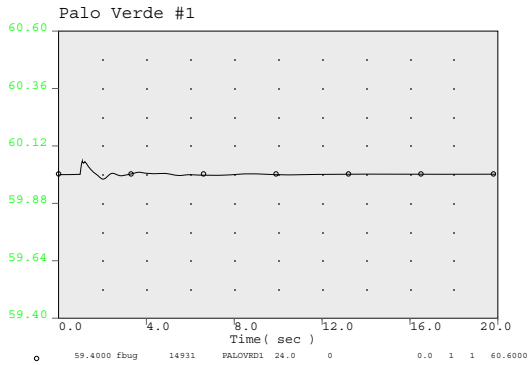
Imperial Valley Area - Frequency

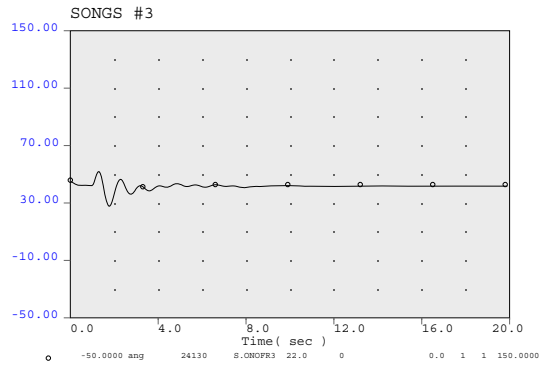


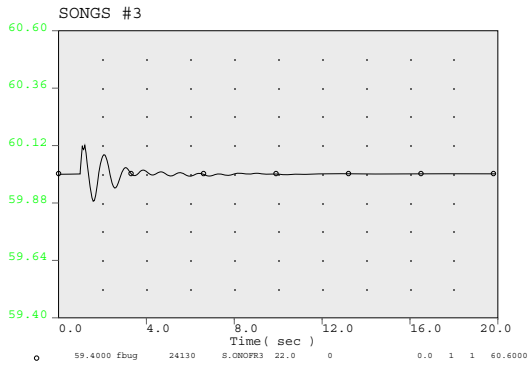
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - C565 230 kV N-1

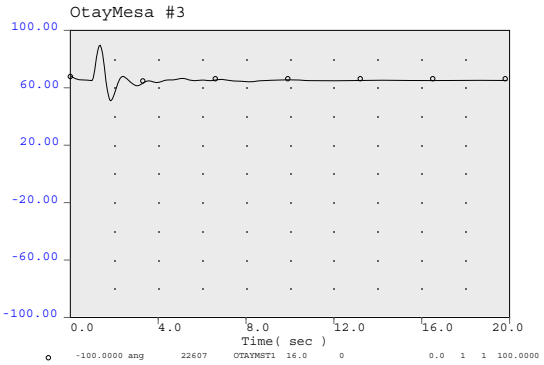
RELATIVE ROTOR ANGLE & FREQUENCY

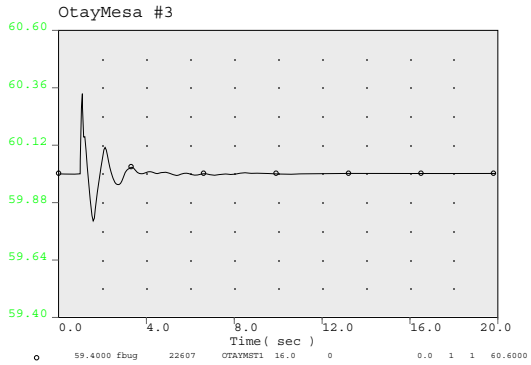










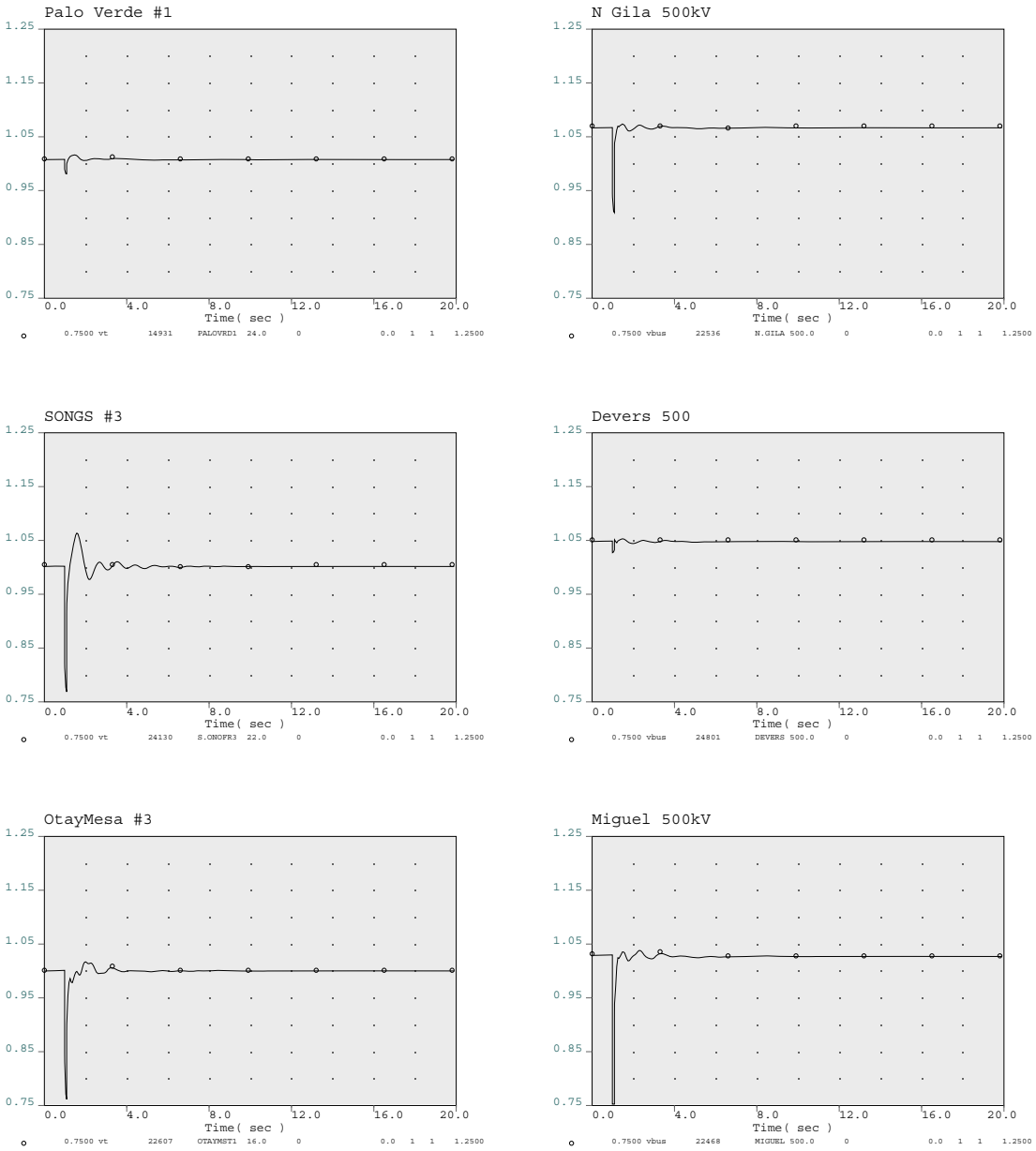


SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - Penasquitos 230 kV N-1

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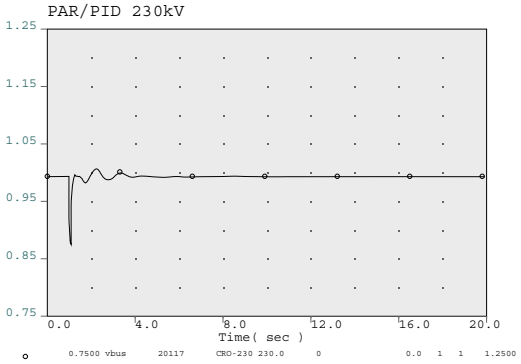
RELATIVE VOLTAGE



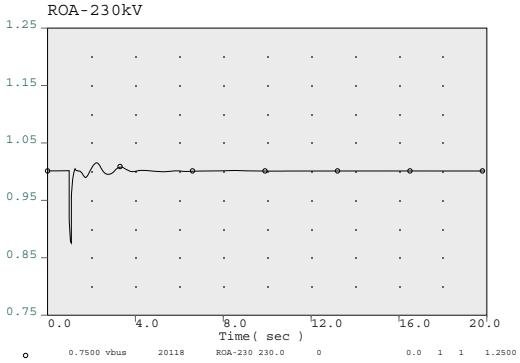
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - Penasquitos 230 kV N-1

Affected System Voltage Check and Comparison

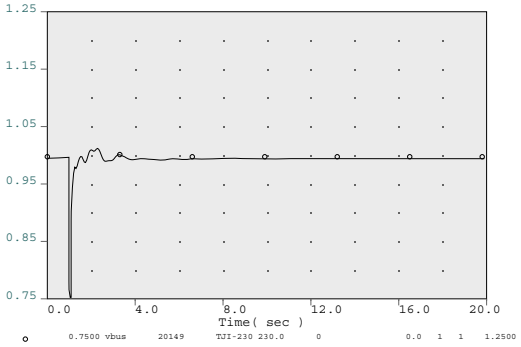
PAR/PID 230kV



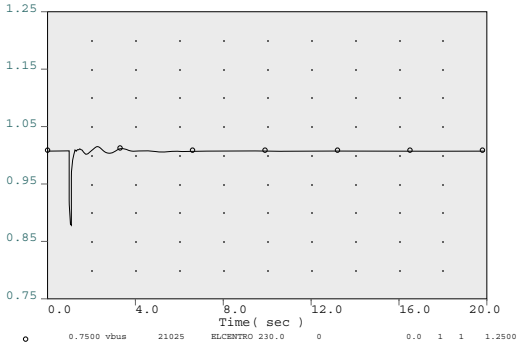
ROA-230kV



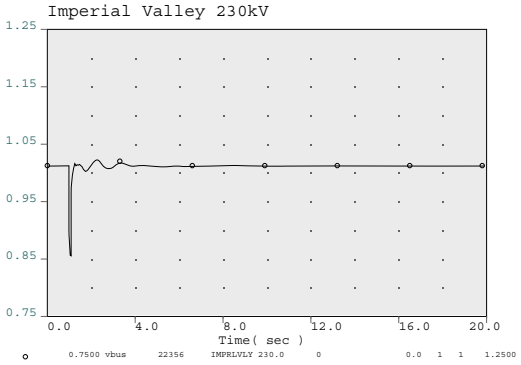
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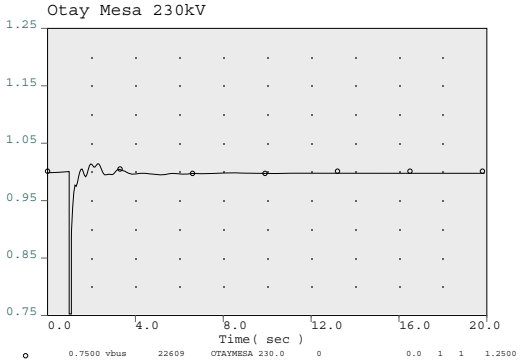
El Centro



Imperial Valley 230kV



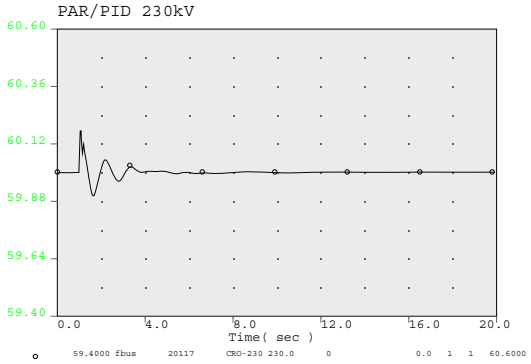
Otay Mesa 230kV



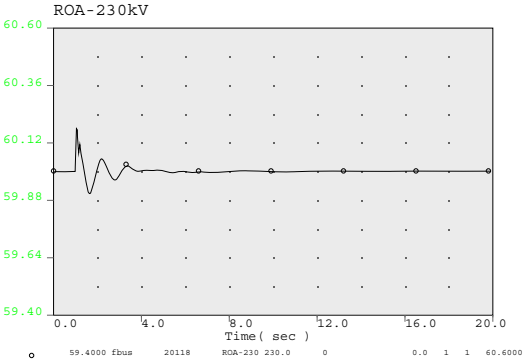
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - Penasquitos 230 kV N-1

Affected System Frequency Check and Comparison

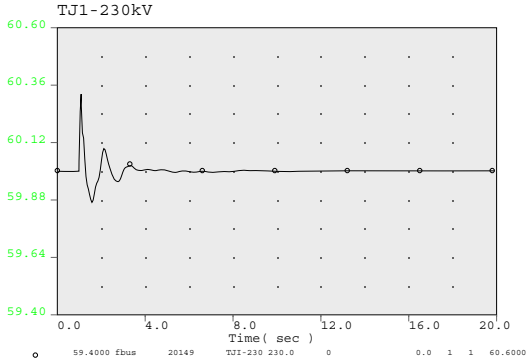
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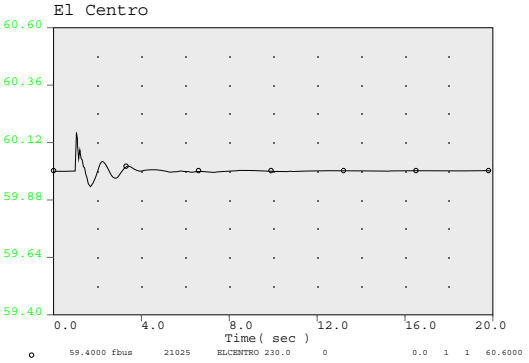
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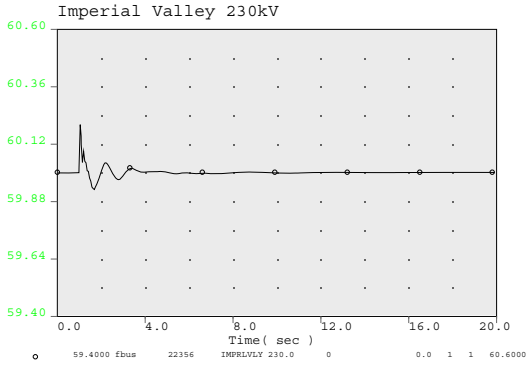
TJ1-230kV



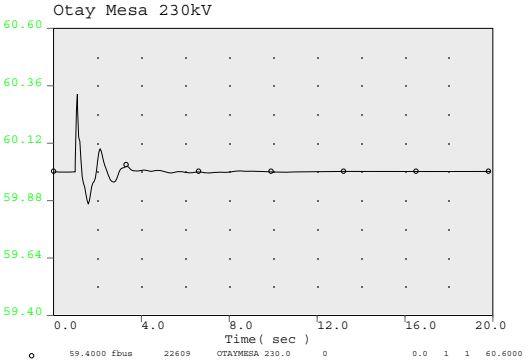
El Centro



Imperial Valley 230kV



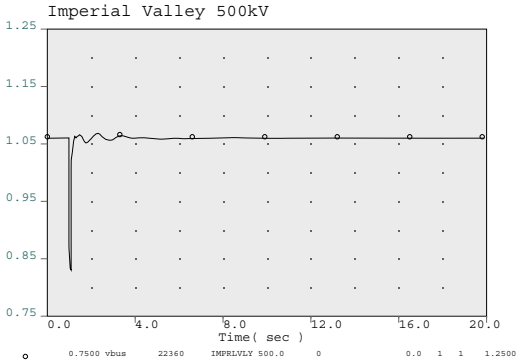
Otay Mesa 230kV



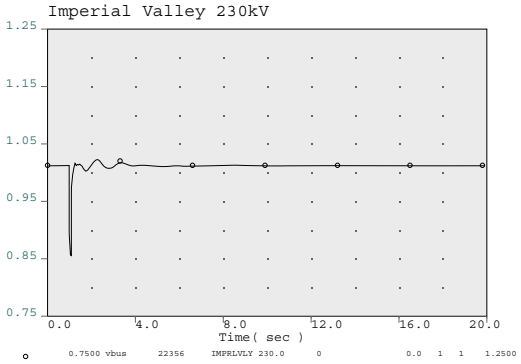
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - Penasquitos 230 kV N-1

Imperial Valley Area - VOLTAGE

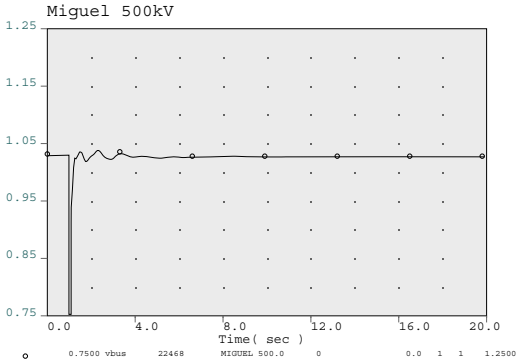
Imperial Valley 500kV



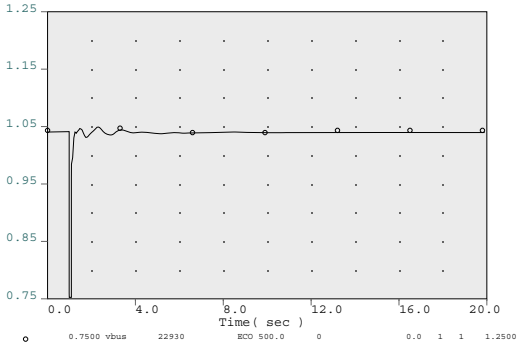
Imperial Valley 230kV



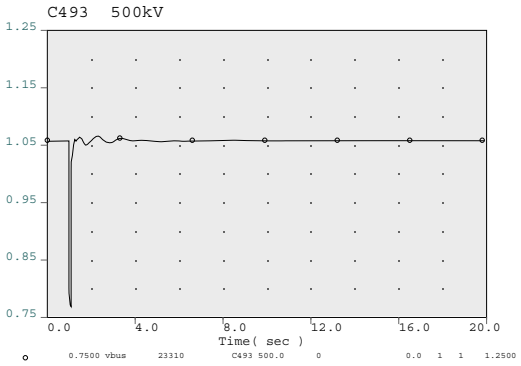
Miguel 500kV



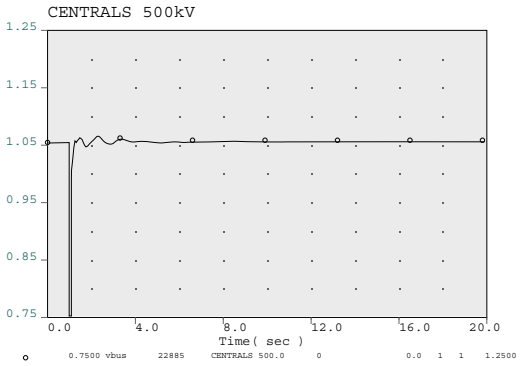
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - Penasquitos 230 kV N-1

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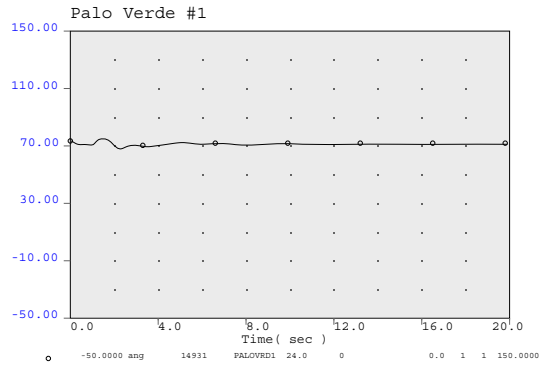
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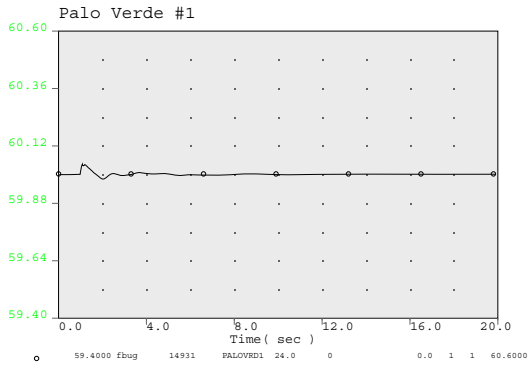
Imperial Valley Area - Frequency

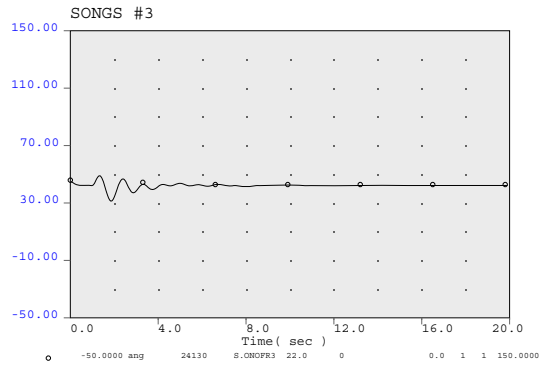


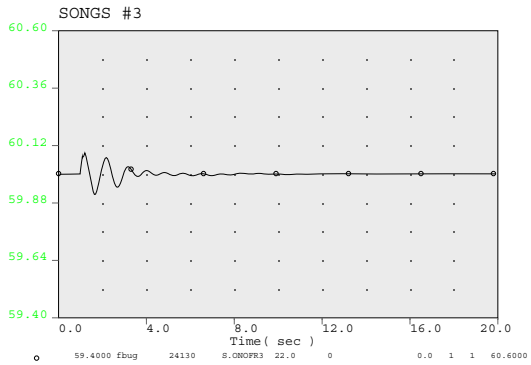
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Sycamore - Penasquitos 230 kV N-1

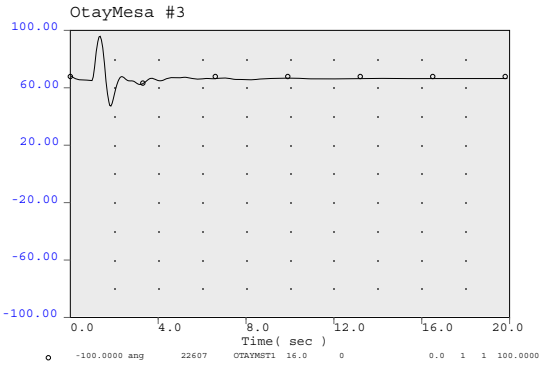
RELATIVE ROTOR ANGLE & FREQUENCY

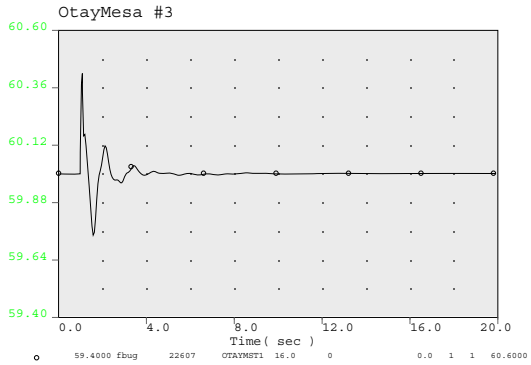












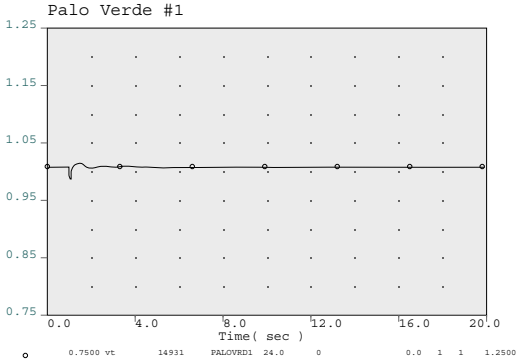
SDG&E Cluster 2 - pst int
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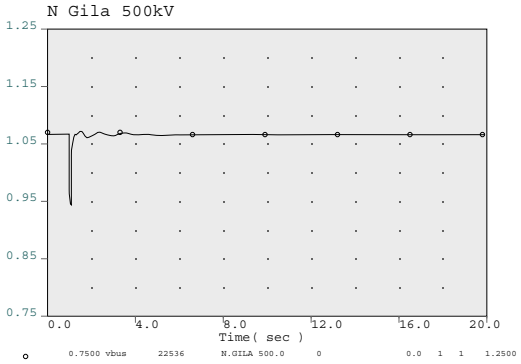
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RELATIVE VOLTAGE

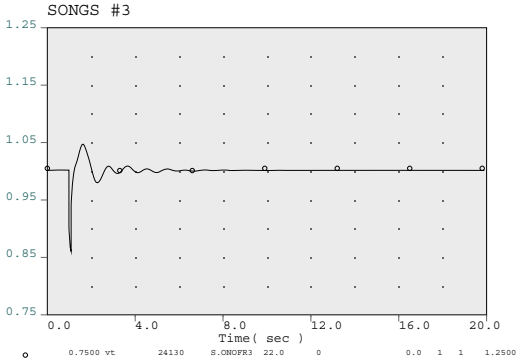
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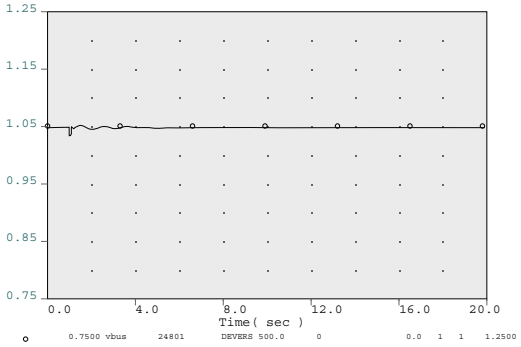
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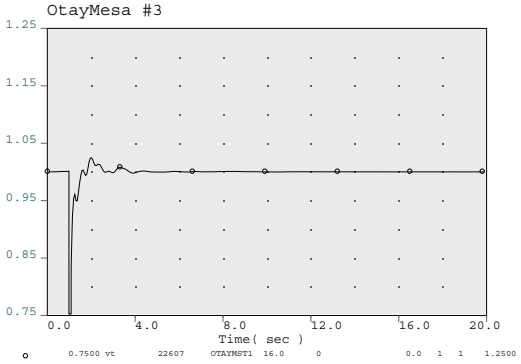
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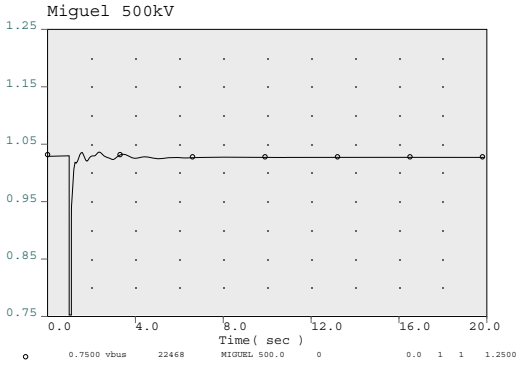
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OtayMesa #3



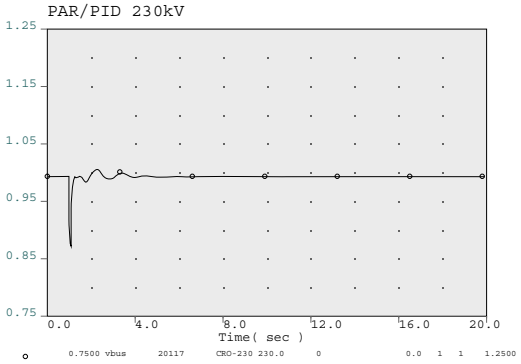
Miguel 500kV



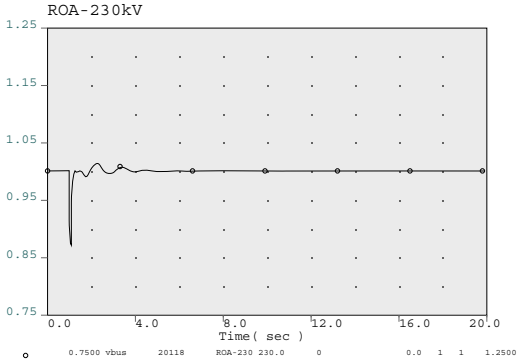
SDG&E Cluster 2 - pst int
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South Bay - Silvergate 230 kV N-1

Affected System Voltage Check and Comparison

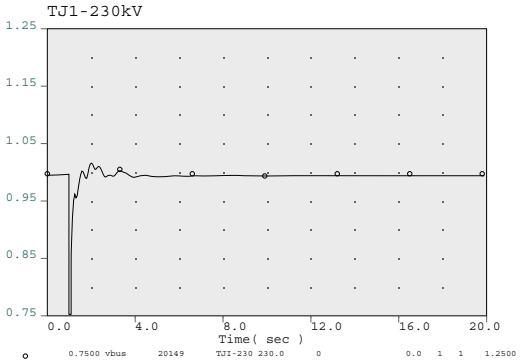
PAR/PID 230kV



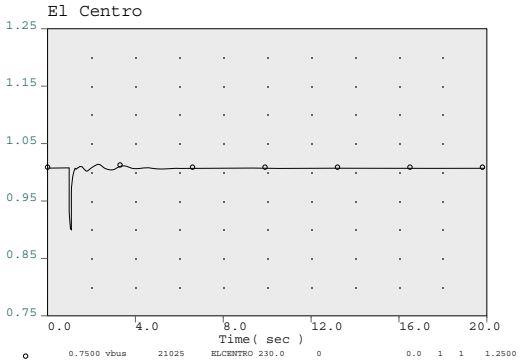
ROA-230kV



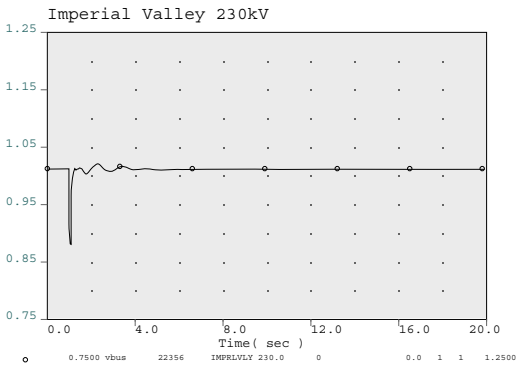
TJ1-230kV



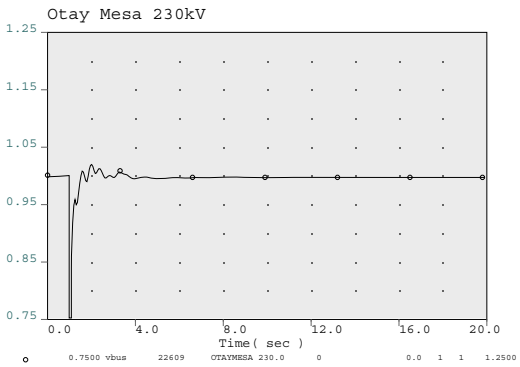
El Centro



Imperial Valley 230kV



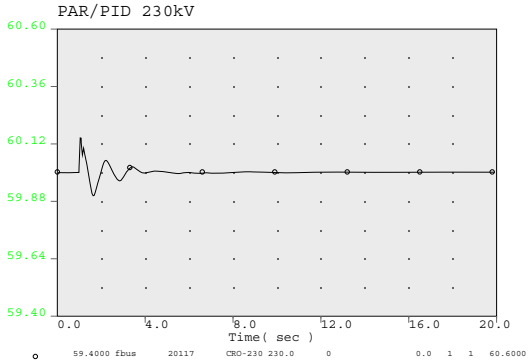
Otay Mesa 230kV



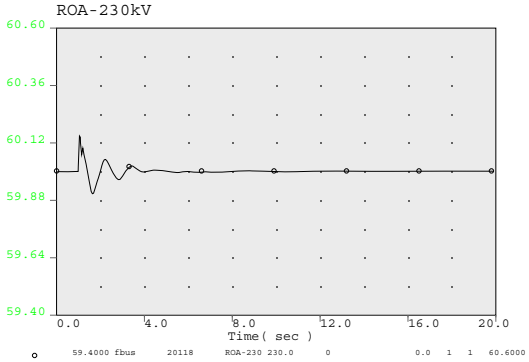
SDG&E Cluster 2 - pst int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Affected System Frequency Check and Comparison

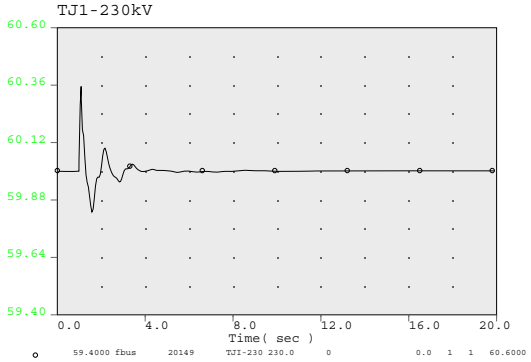
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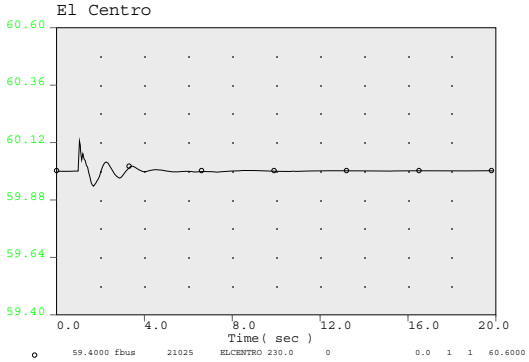
ROA-230kV



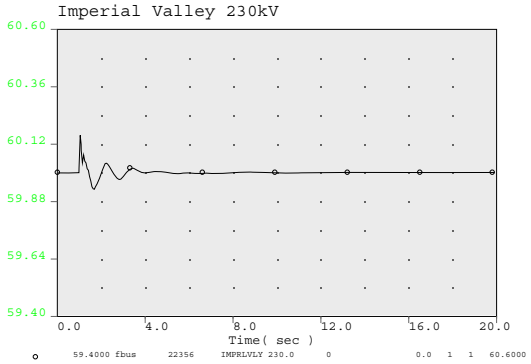
TJ1-230kV



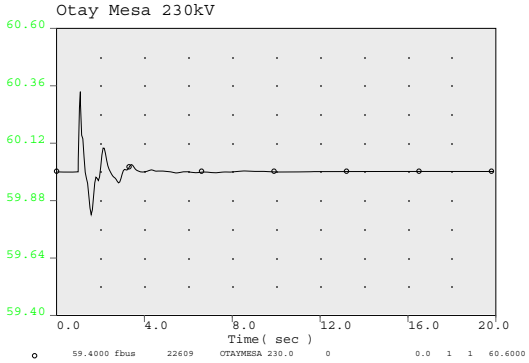
El Centro



Imperial Valley 230kV



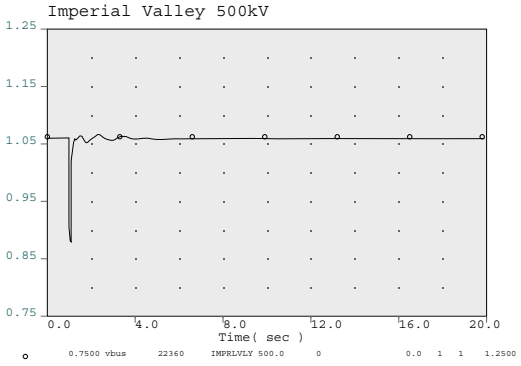
Otay Mesa 230kV



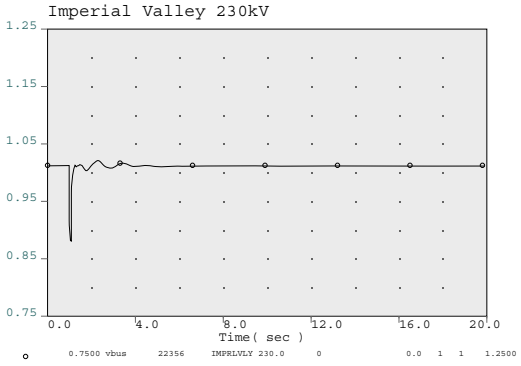
SDG&E Cluster 2 - pst int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

Imperial Valley Area - VOLTAGE

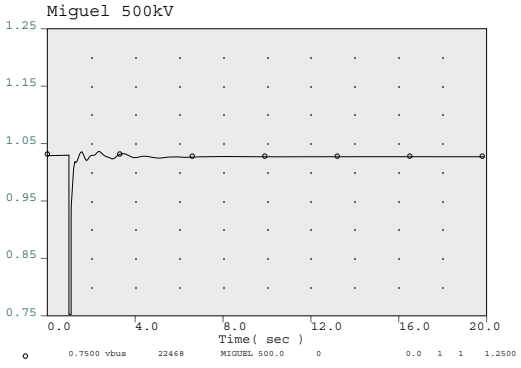
Imperial Valley 500kV



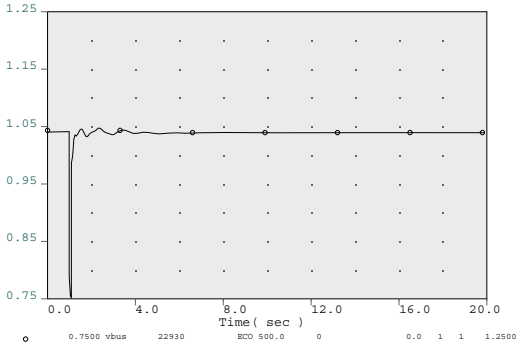
Imperial Valley 230kV



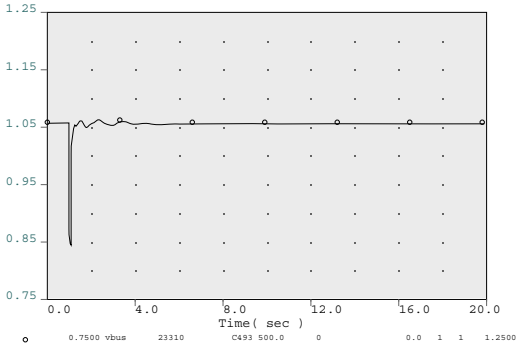
Miguel 500kV



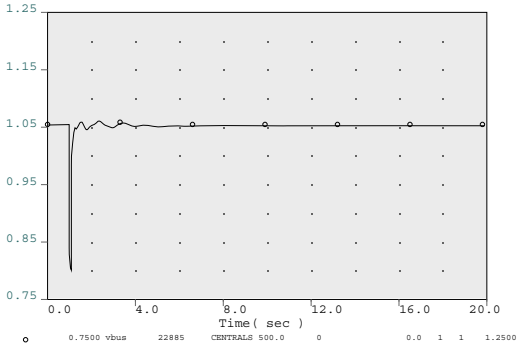
Windfarms 500



C493 500kV



CENTRALS 500kV



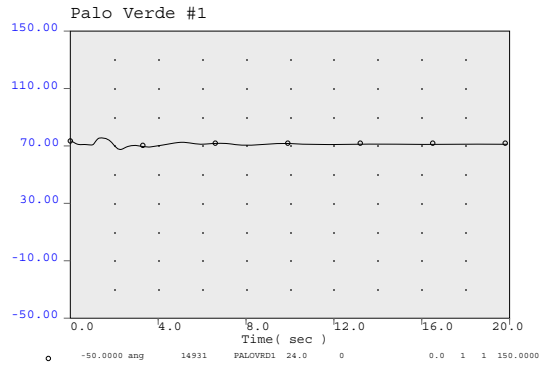
SDG&E Cluster 2 - pst int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

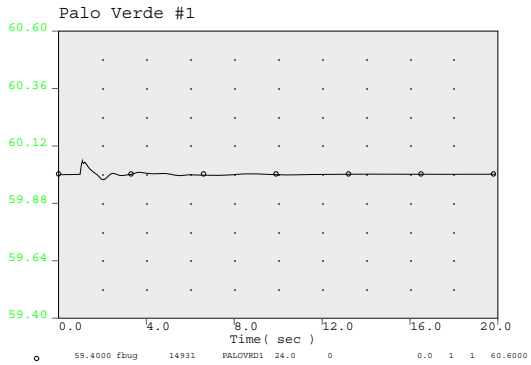
Imperial Valley Area - Frequency

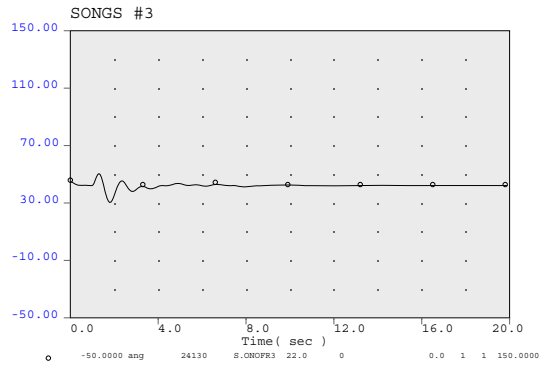


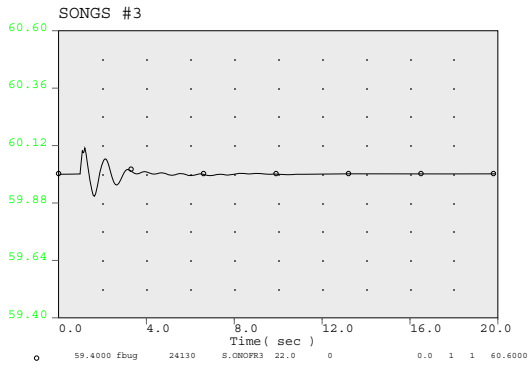
SDG&E Cluster 2 - pst int
2014 Heavy Summer
South Bay - Silvergate 230 kV N-1

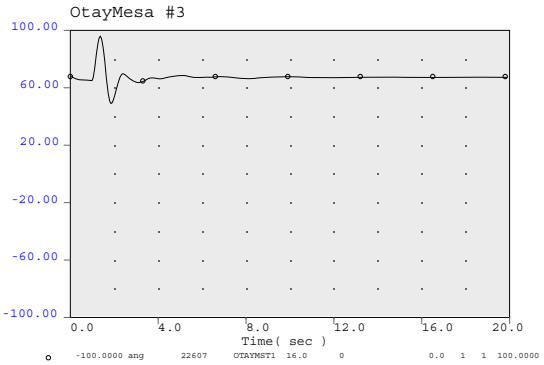
RELATIVE ROTOR ANGLE & FREQUENCY

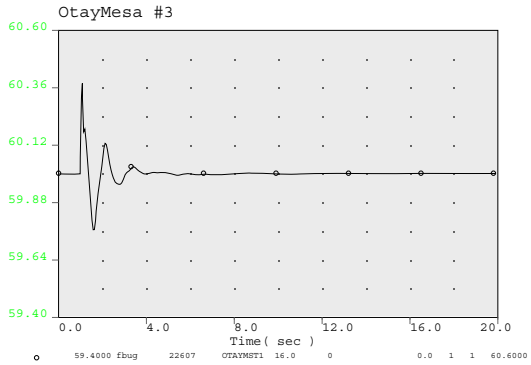












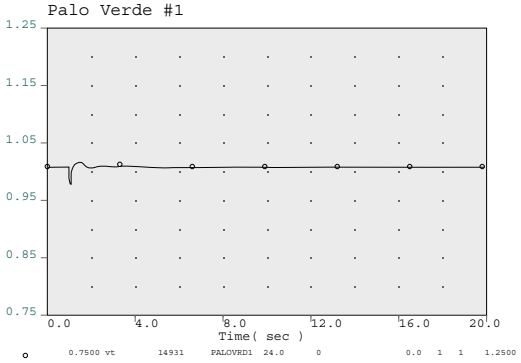
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Southbay - Mission 230 kV N-1

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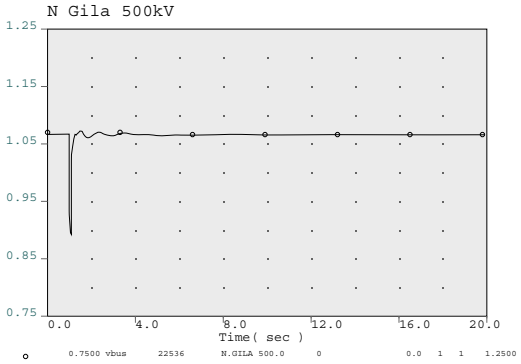
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RELATIVE VOLTAGE

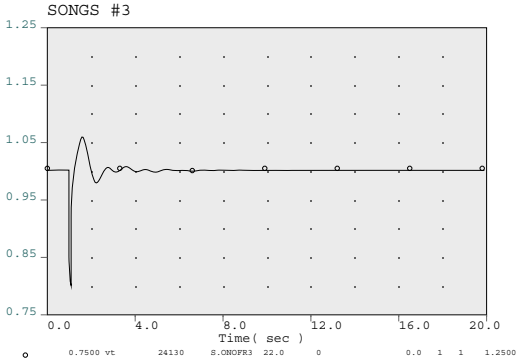
Palo Verde #1



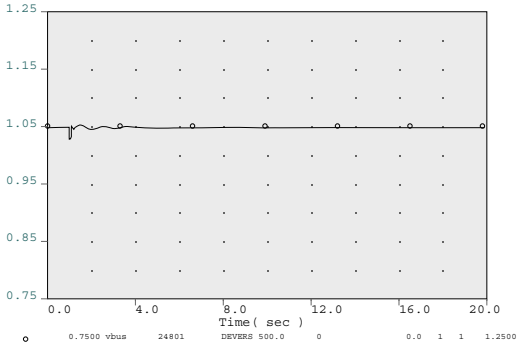
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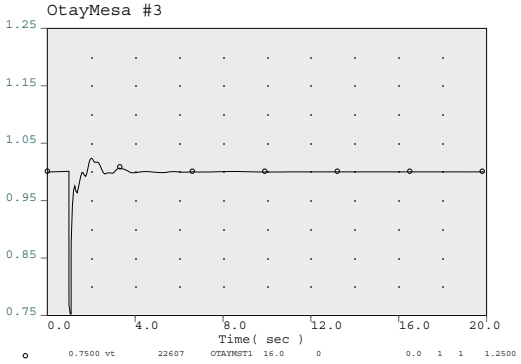
SONGS #3



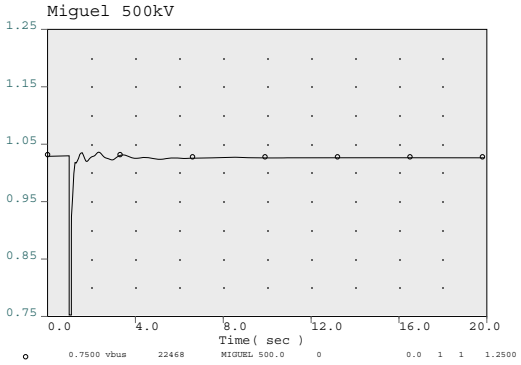
Devers 500



OtayMesa #3



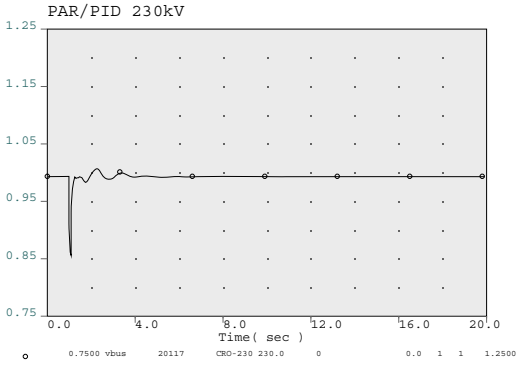
Miguel 500kV



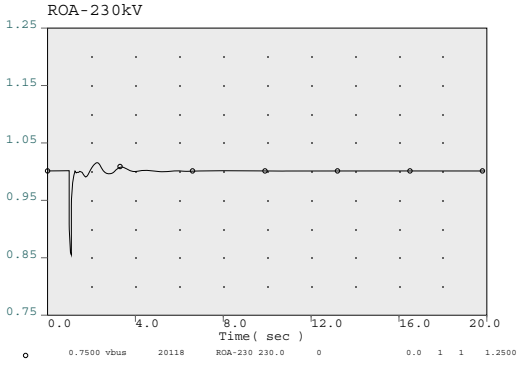
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Southbay - Mission 230 kV N-1

Affected System Voltage Check and Comparison

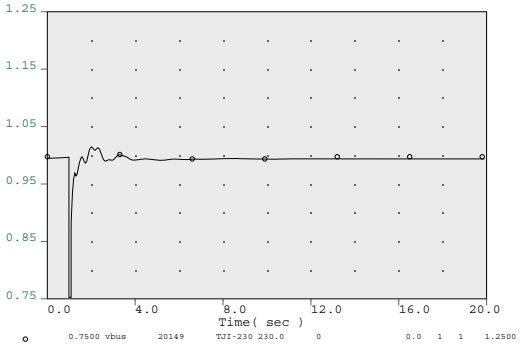
PAR/PID 230kV



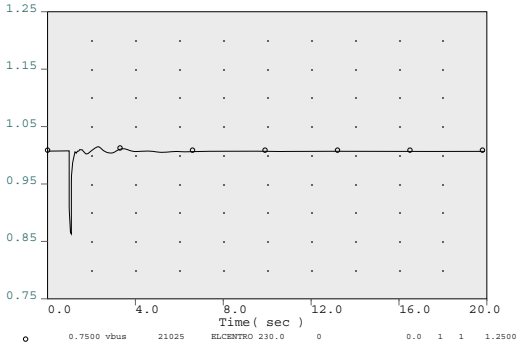
ROA-230kV



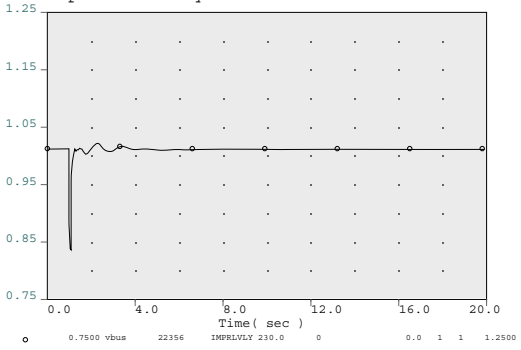
TJ1-230kV



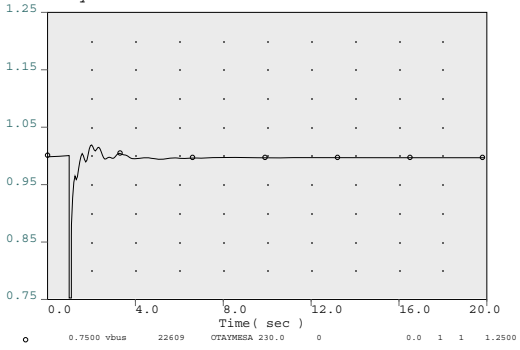
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



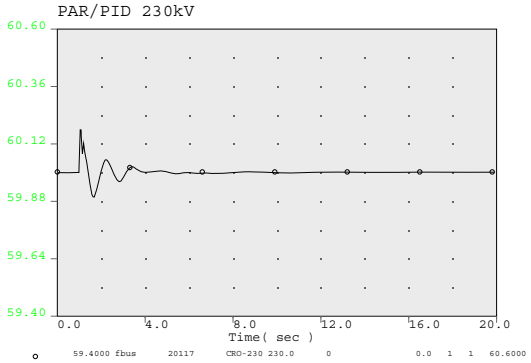
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Southbay - Mission 230 kV N-1

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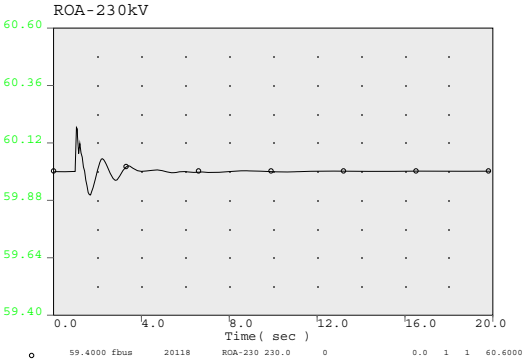
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Affected System Frequency Check and Comparison

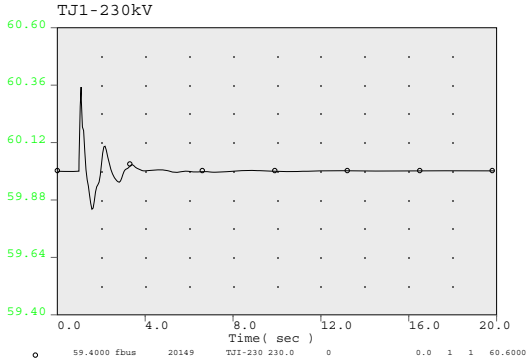
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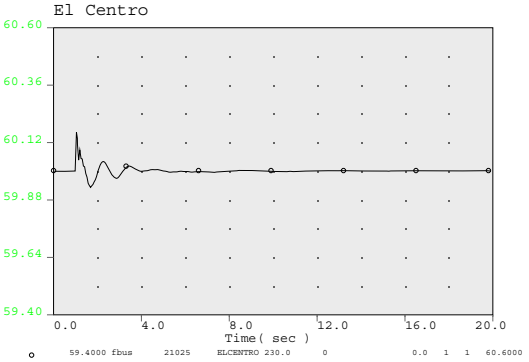
ROA-230kV



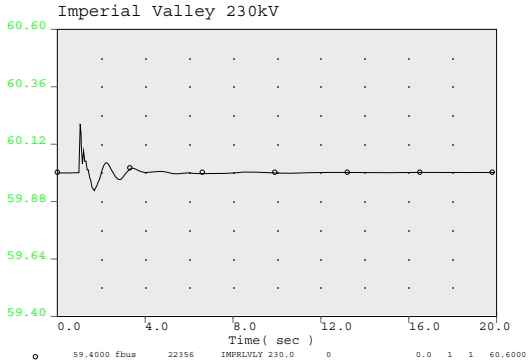
TJ1-230kV



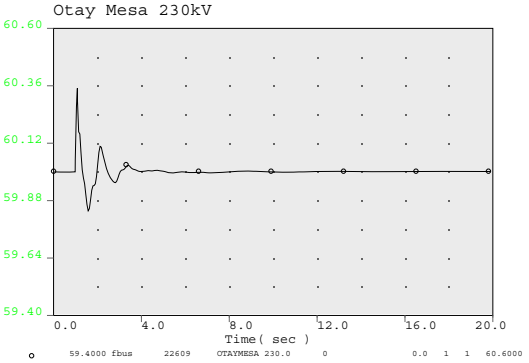
El Centro



Imperial Valley 230kV



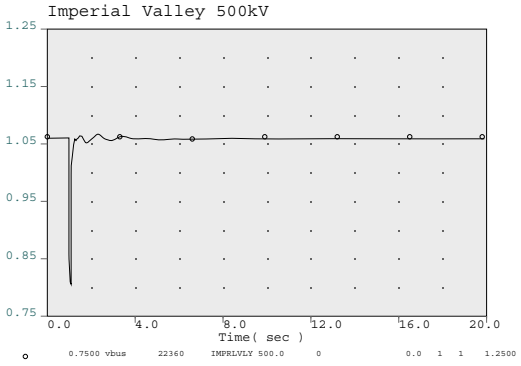
Otay Mesa 230kV



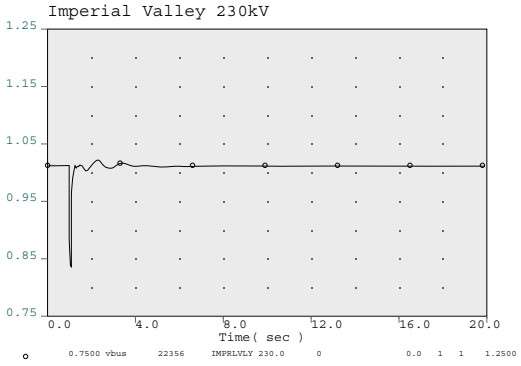
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Southbay - Mission 230 kV N-1

Imperial Valley Area - VOLTAGE

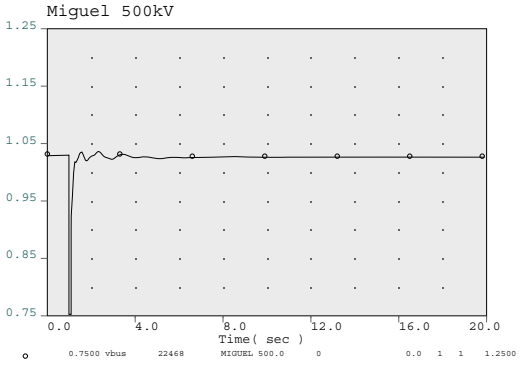
Imperial Valley 500kV



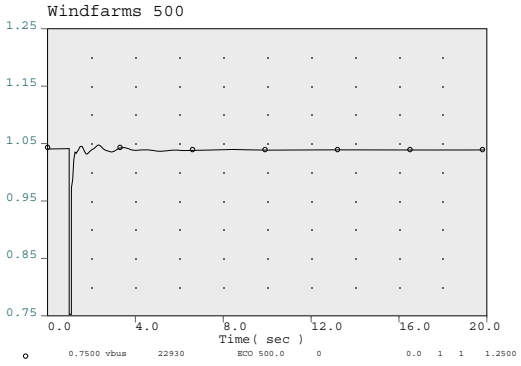
Imperial Valley 230kV



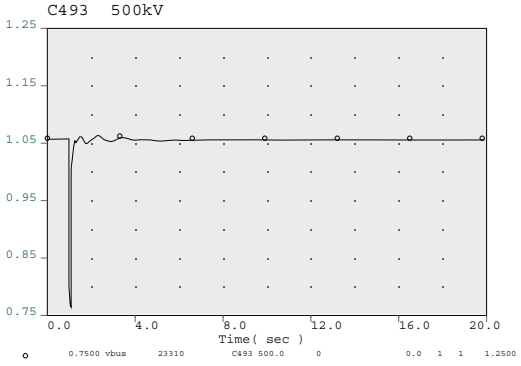
Miguel 500kV



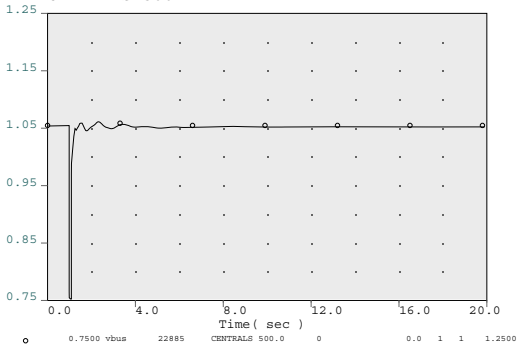
Windfarms 500



C493 500kV



CENTRALS 500kV



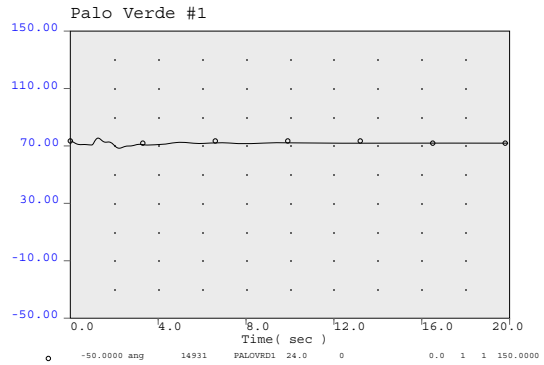
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Southbay - Mission 230 kV N-1

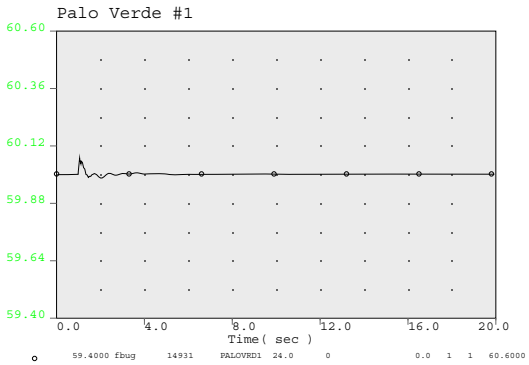
Imperial Valley Area - Frequency

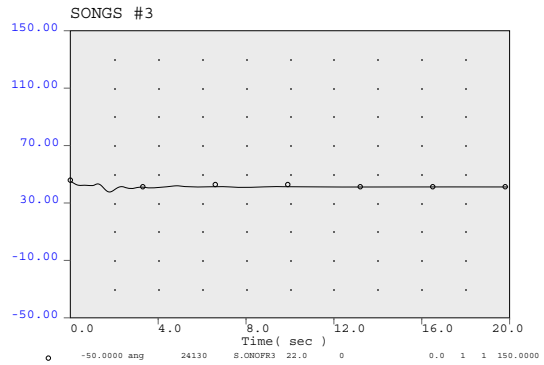


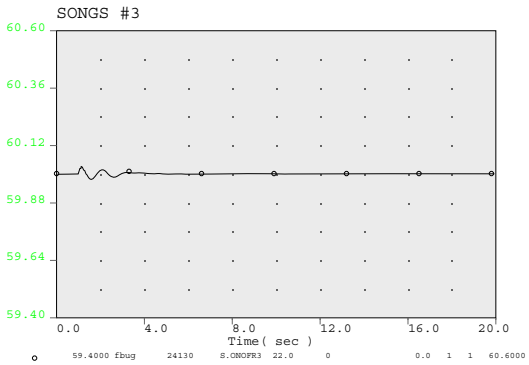
SDG&E Cluster 2 - pst int
2014 Heavy Summer
Southbay - Mission 230 kV N-1

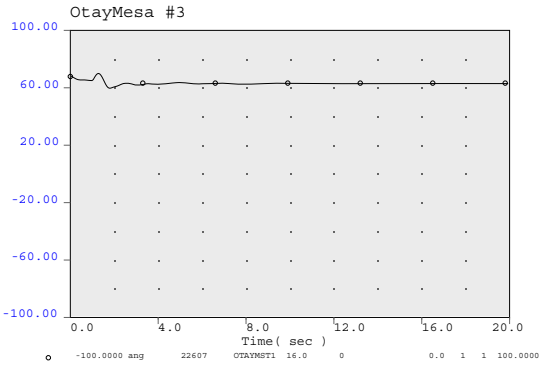
RELATIVE ROTOR ANGLE & FREQUENCY

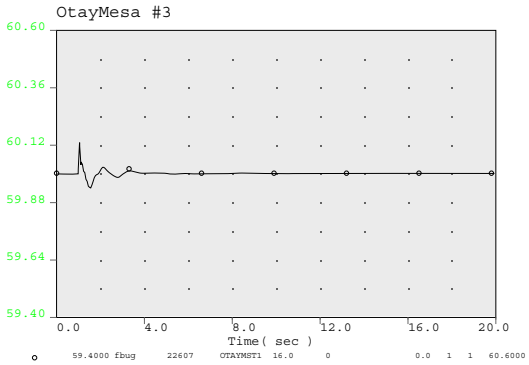












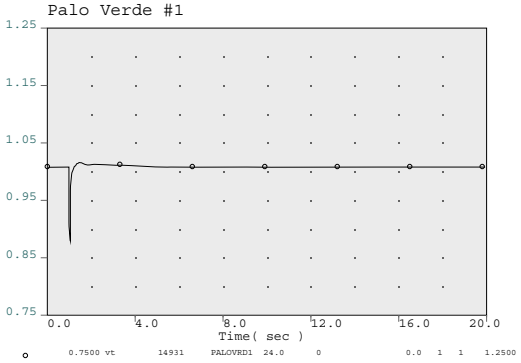
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

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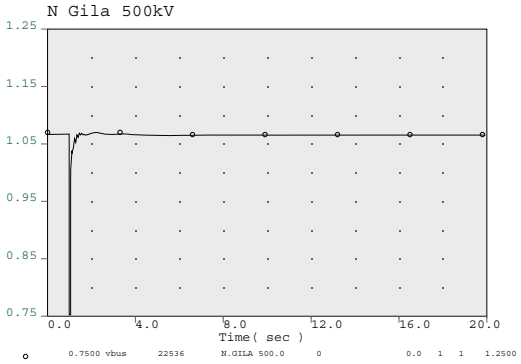
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RELATIVE VOLTAGE

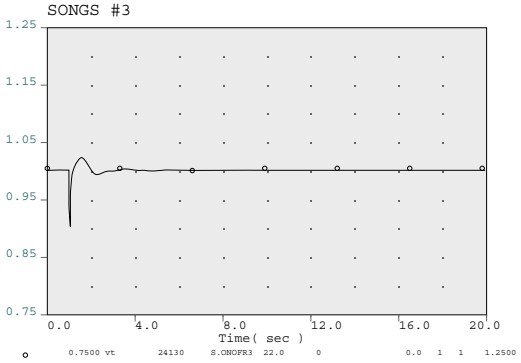
Palo Verde #1



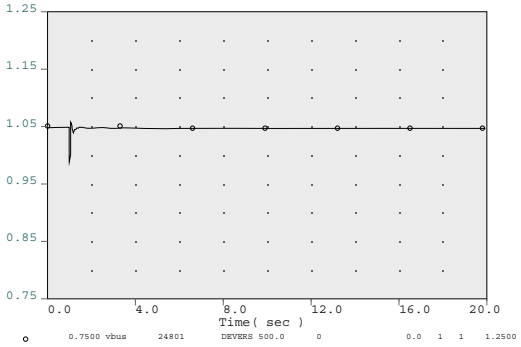
N Gila 500kV



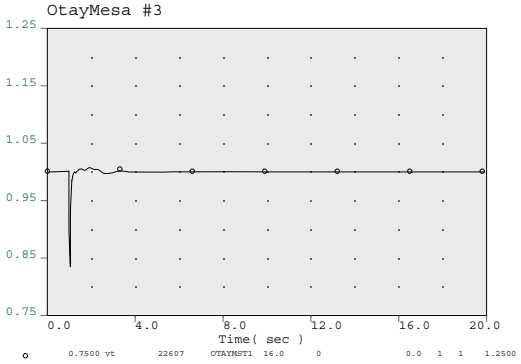
SONGS #3



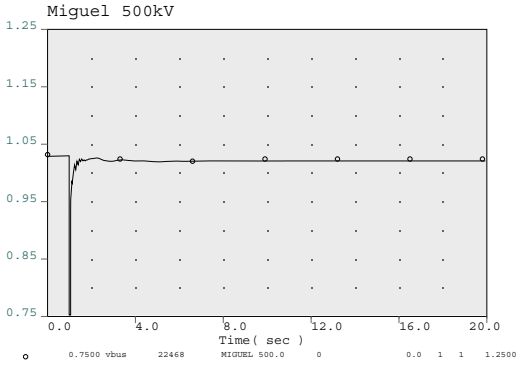
Devers 500



OtayMesa #3



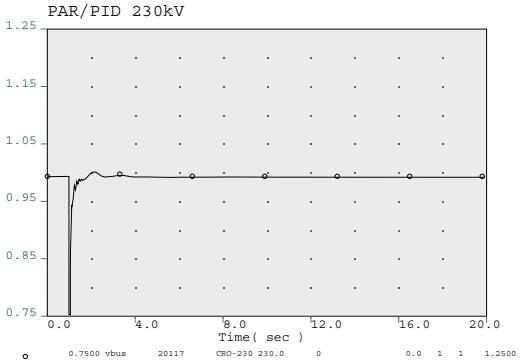
Miguel 500kV



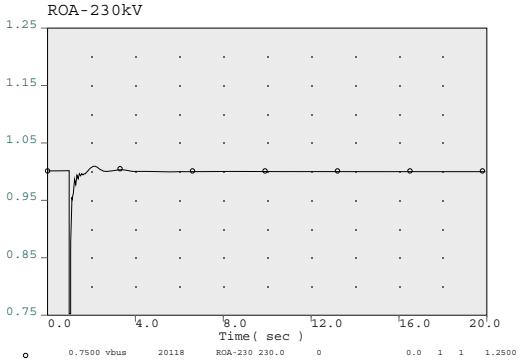
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

Affected System Voltage Check and Comparison

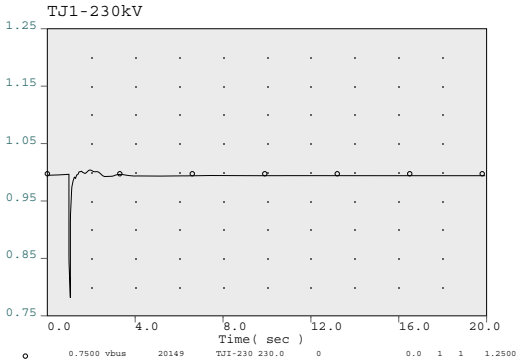
PAR/PID 230kV



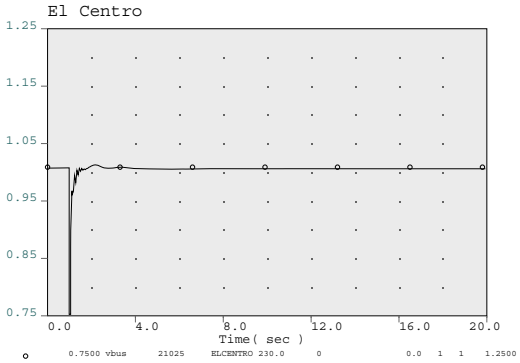
ROA-230kV



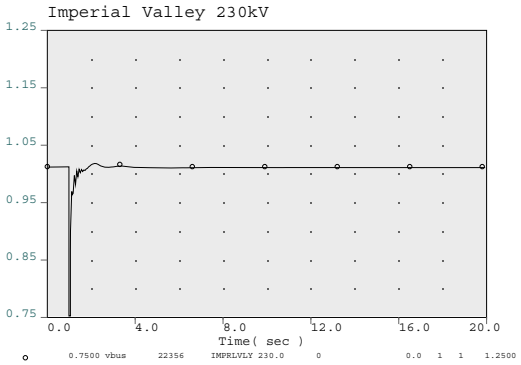
TJ1-230kV



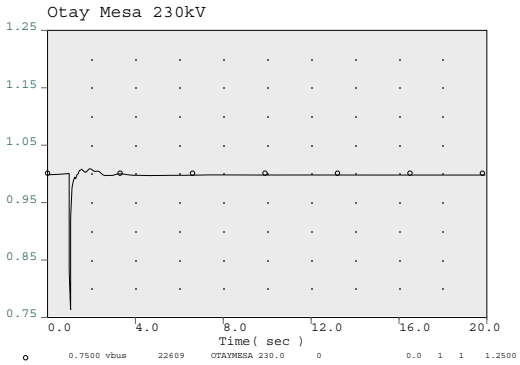
El Centro



Imperial Valley 230kV



Otay Mesa 230kV



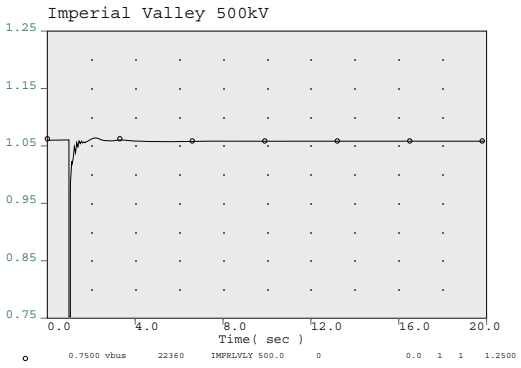
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

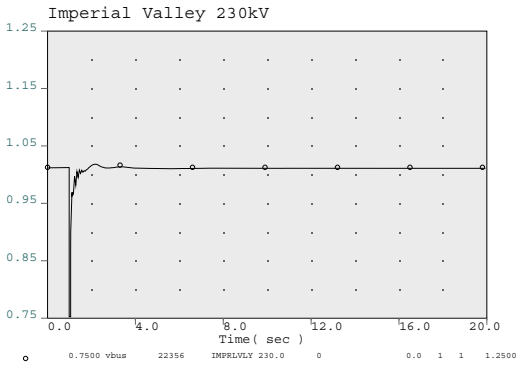
Affected System Frequency Check and Comparison

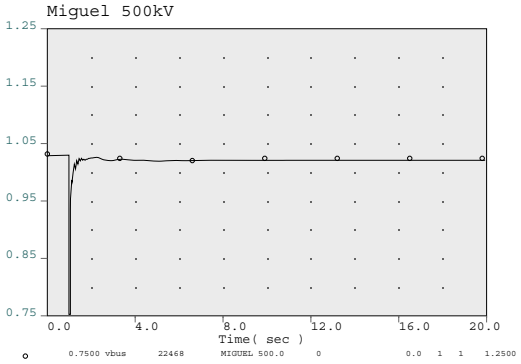


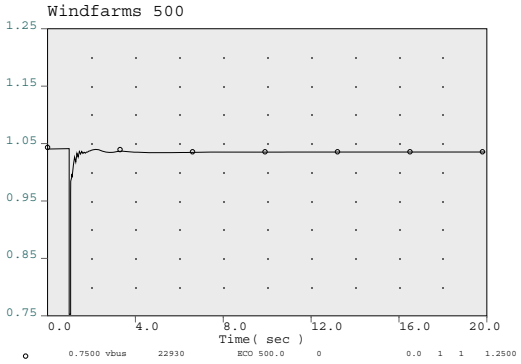
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

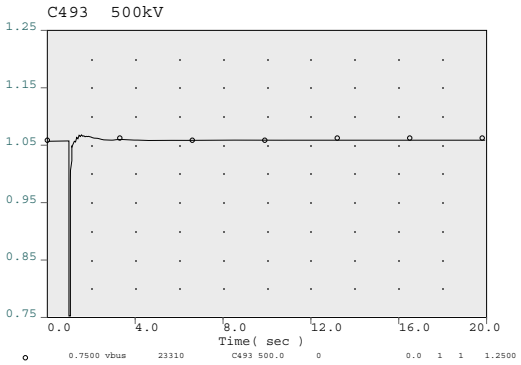
Imperial Valley Area - VOLTAGE

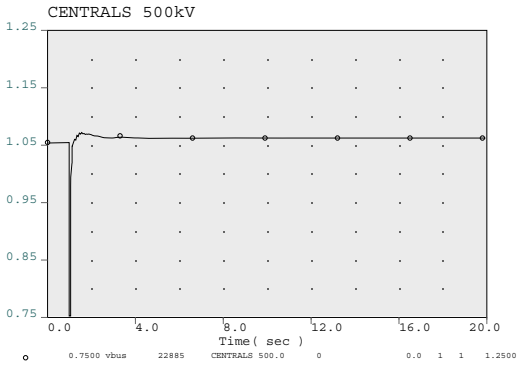












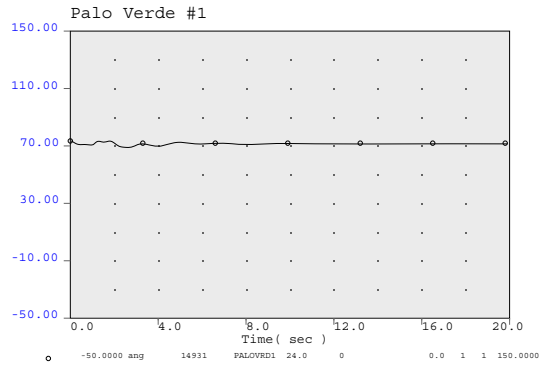
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

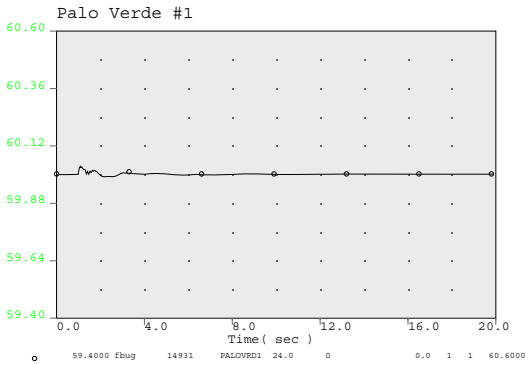
Imperial Valley Area - Frequency

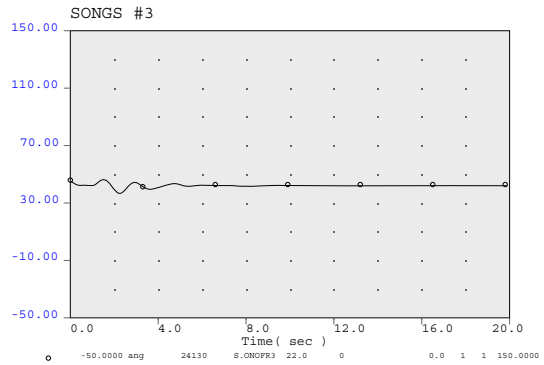


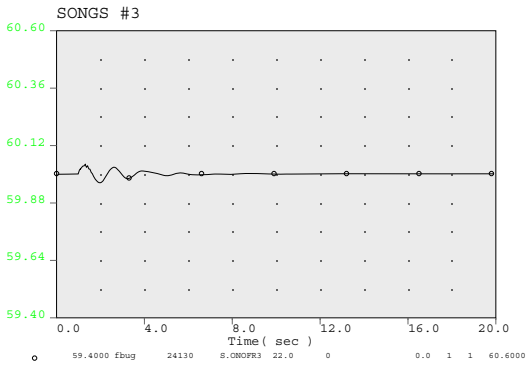
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley- C493 500kV line1

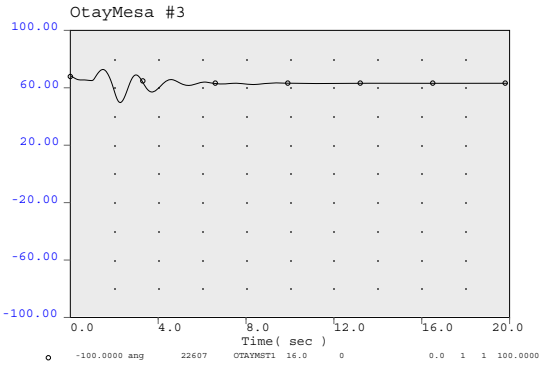
RELATIVE ROTOR ANGLE & FREQUENCY

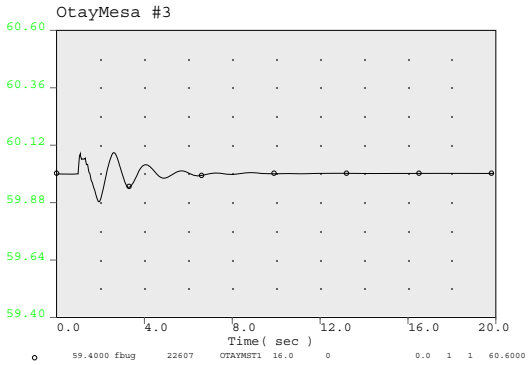










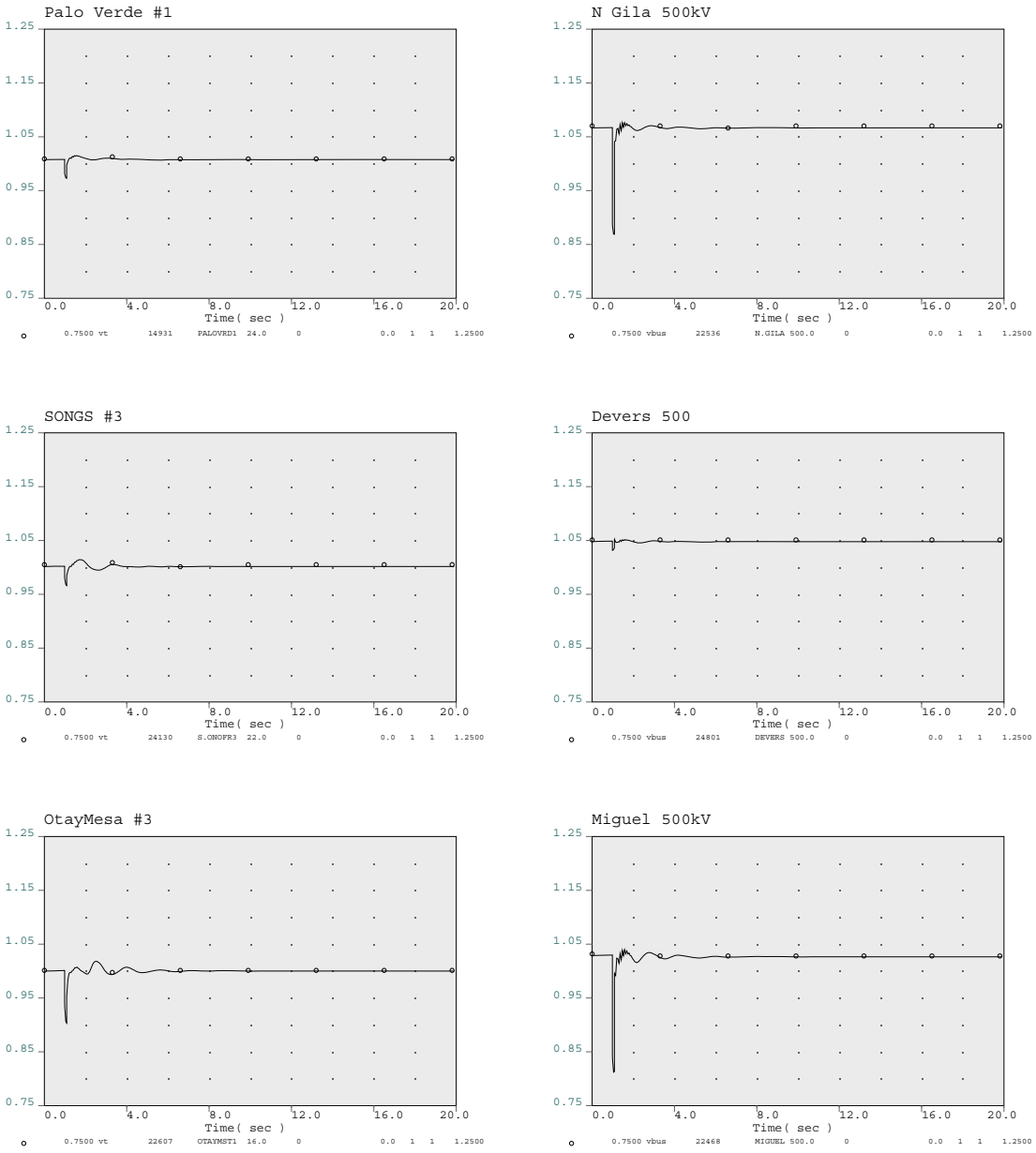


SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Page 1

SDGE	IV_ROA_6_slo_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:41:55 2010

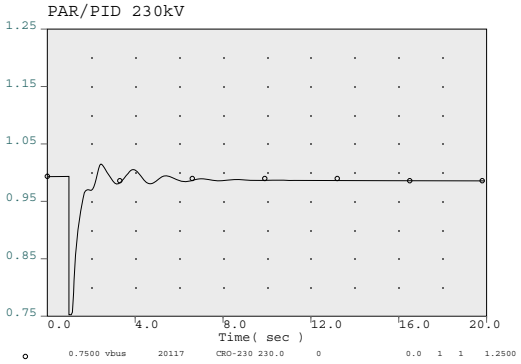
RELATIVE VOLTAGE



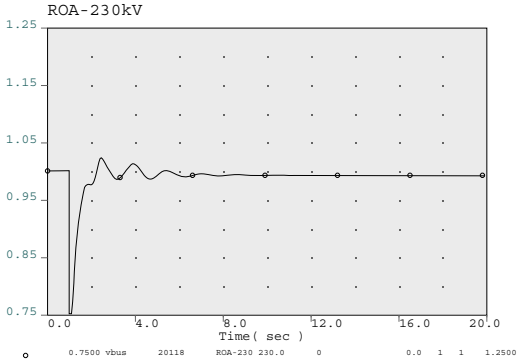
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Voltage Check and Comparison

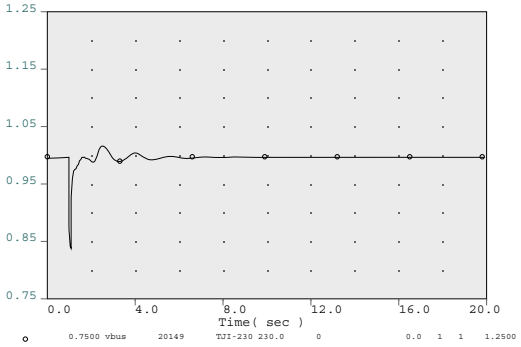
PAR/PID 230kV



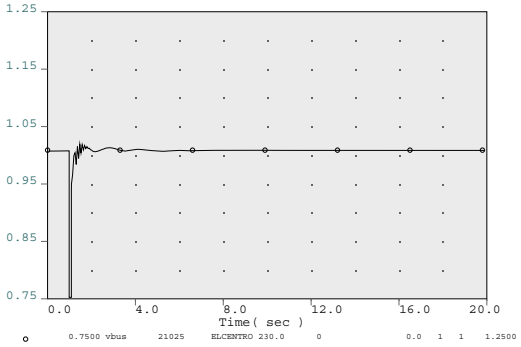
ROA-230kV



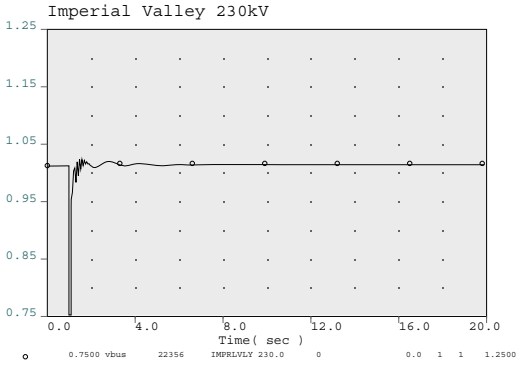
TJ1-230kV



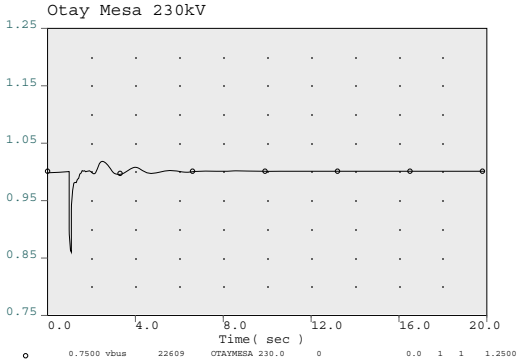
El Centro



Imperial Valley 230kV



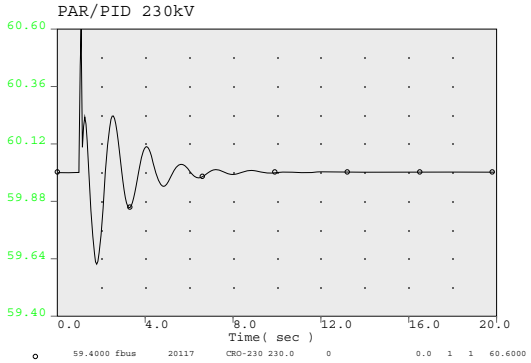
Otay Mesa 230kV



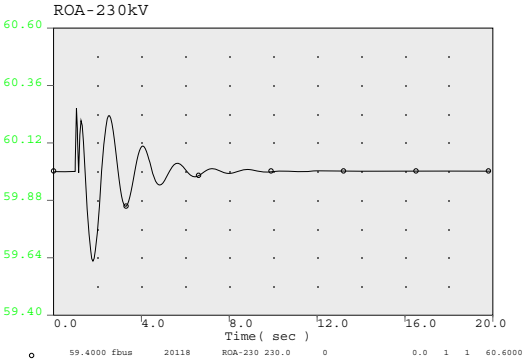
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Affected System Frequency Check and Comparison

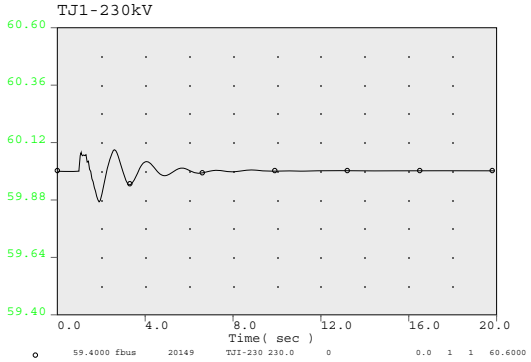
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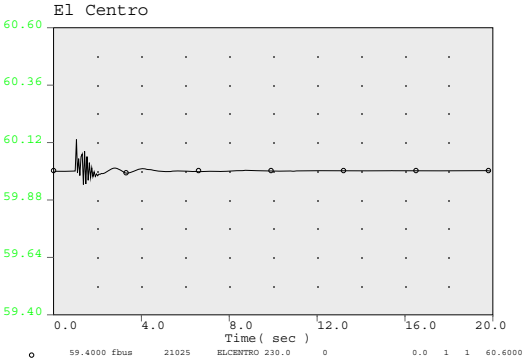
ROA-230kV



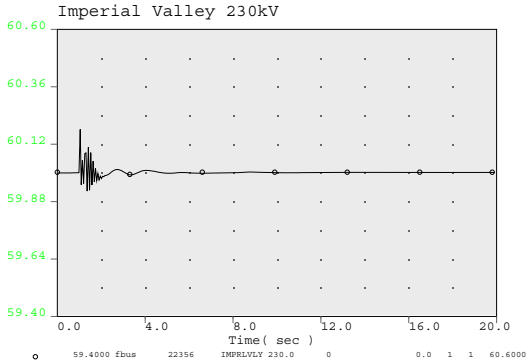
TJ1-230kV



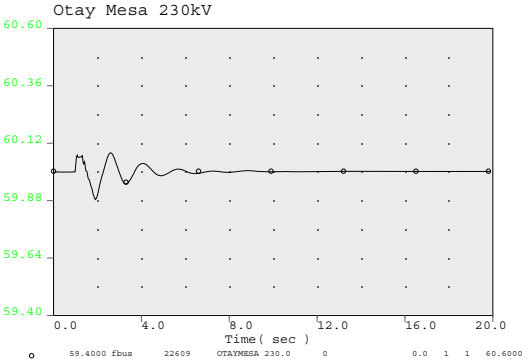
El Centro



Imperial Valley 230kV

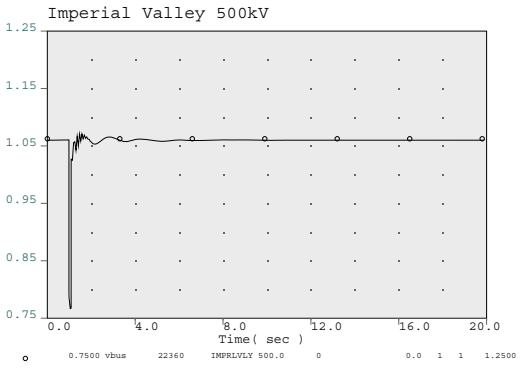


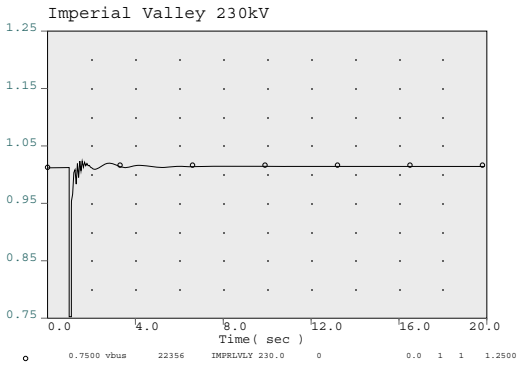
Otay Mesa 230kV

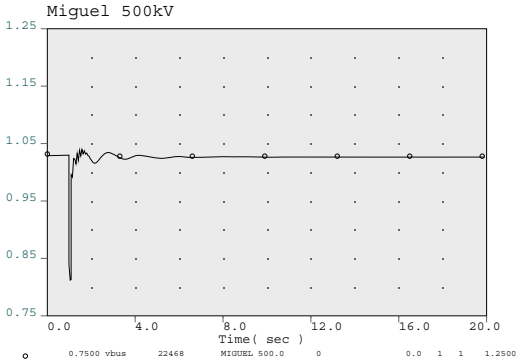


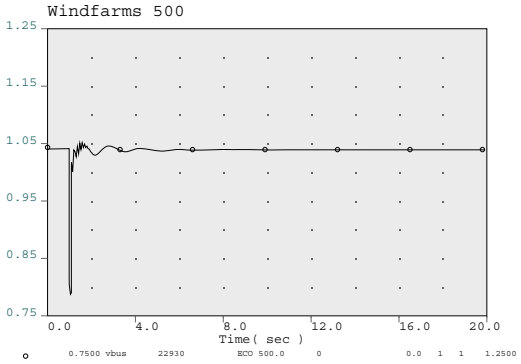
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

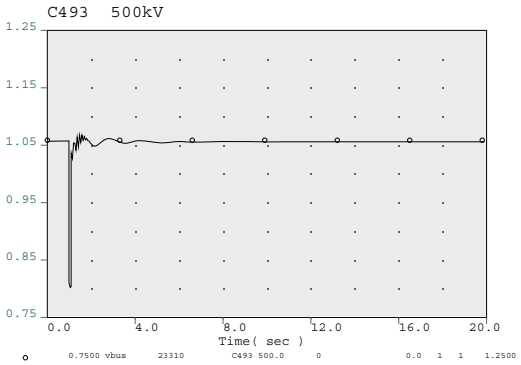
Imperial Valley Area - VOLTAGE

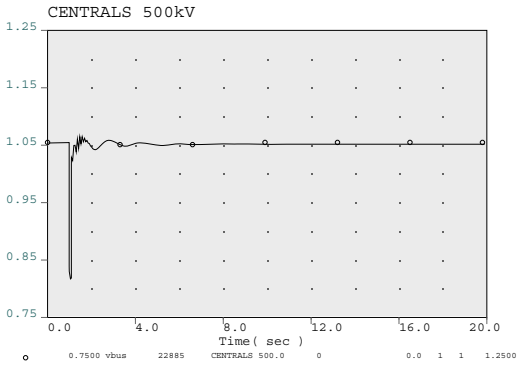








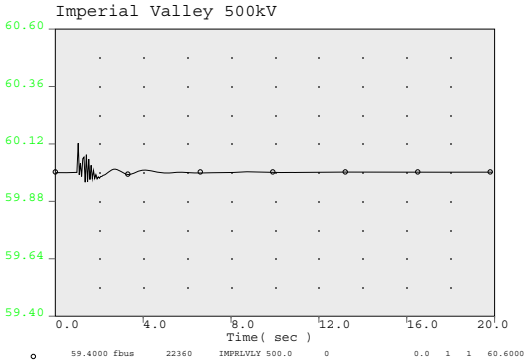




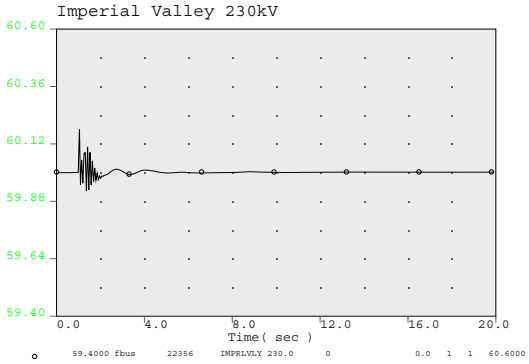
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

Imperial Valley Area - Frequency

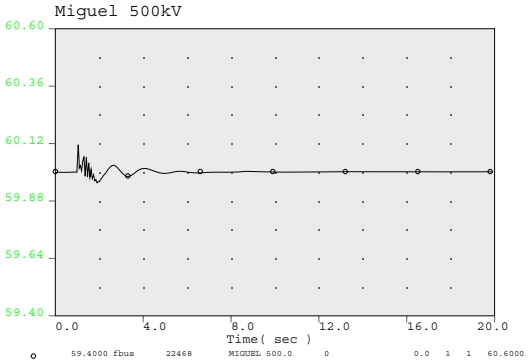
Imperial Valley 500kV



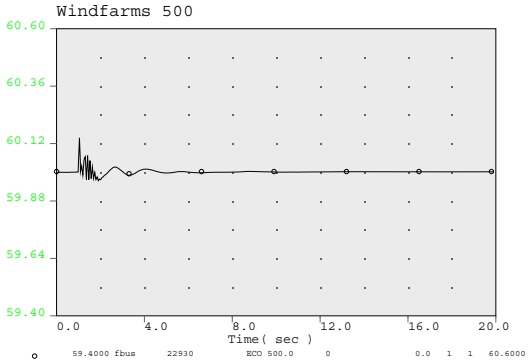
Imperial Valley 230kV



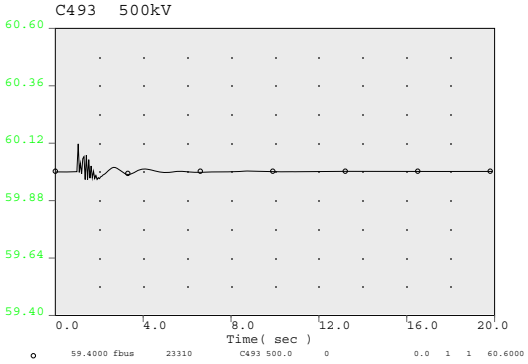
Miguel 500kV



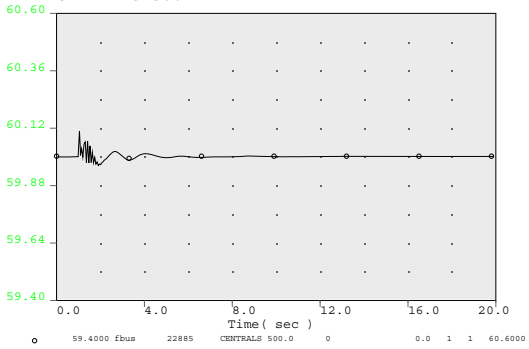
Windfarms 500



C493 500kV

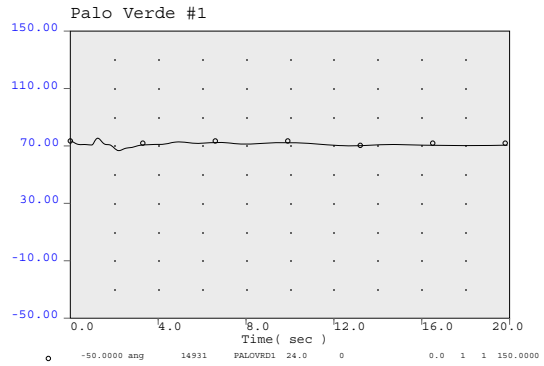


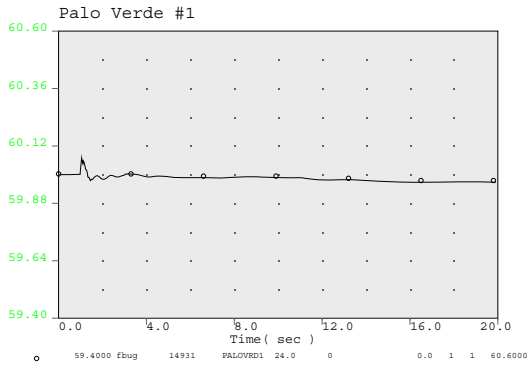
CENTRALS 500kV

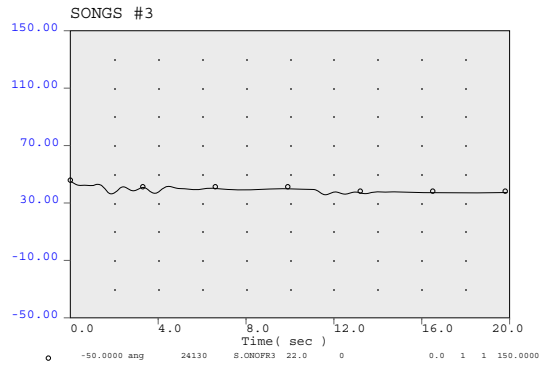


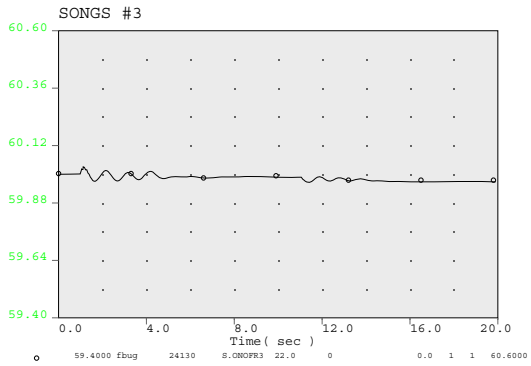
SDG&E Cluster 2 - post
2014 Heavy Summer
Fault Imperial Valley 230 kV
Loss of IV-ROA 230 kV SLO

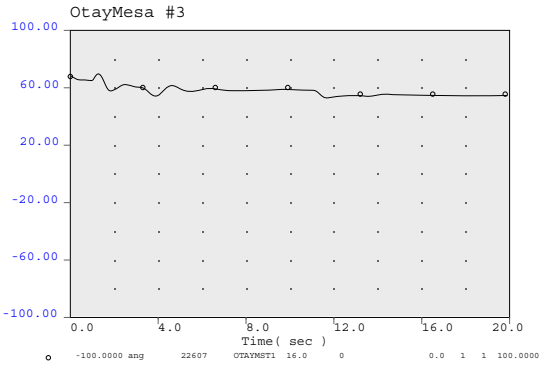
RELATIVE ROTOR ANGLE & FREQUENCY

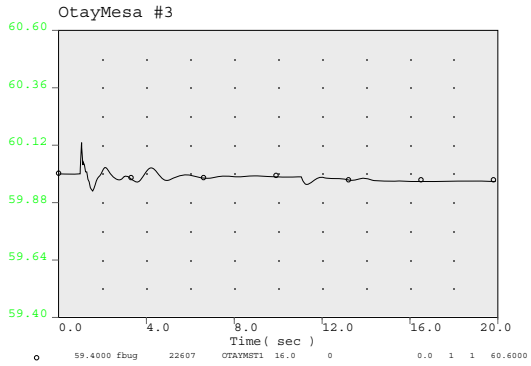












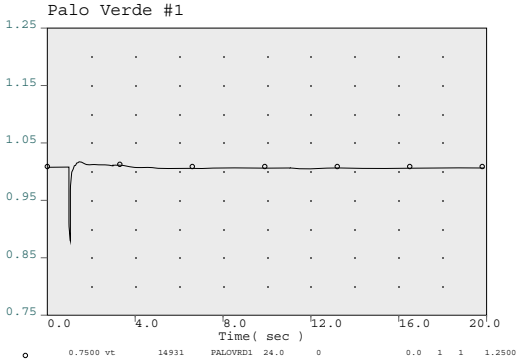
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Page 1

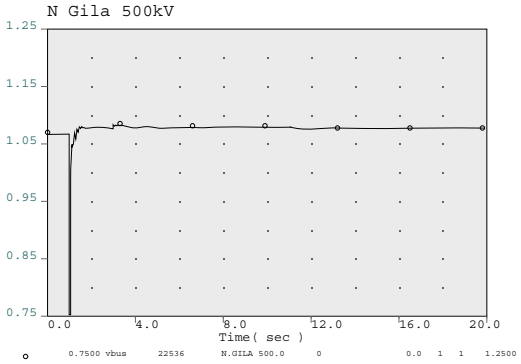
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RELATIVE VOLTAGE

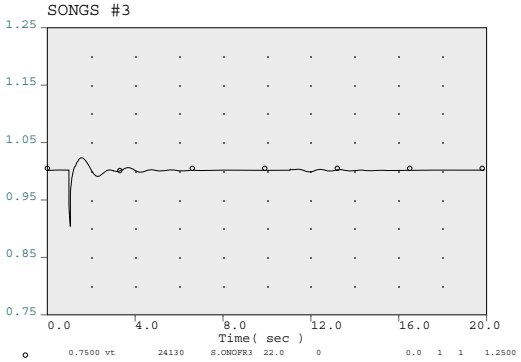
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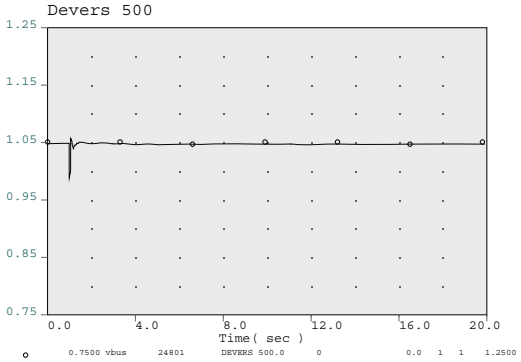
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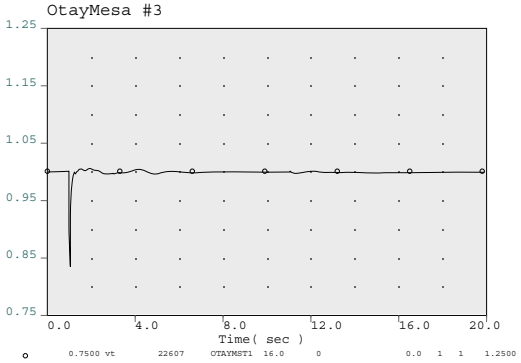
SONGS #3



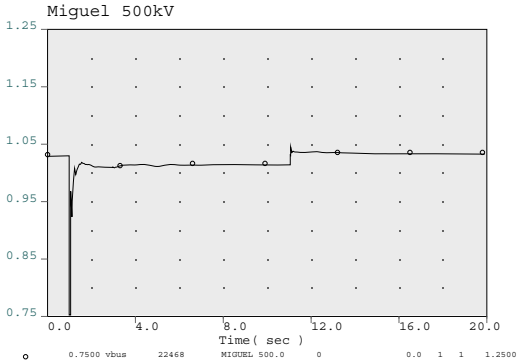
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OtayMesa #3



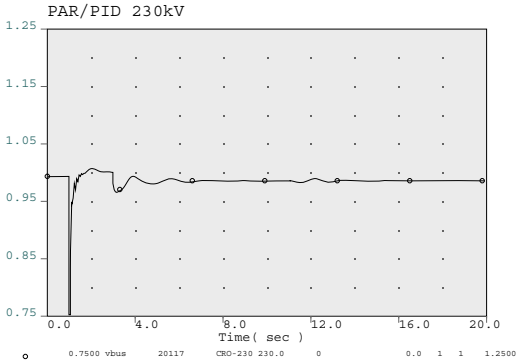
Miguel 500kV



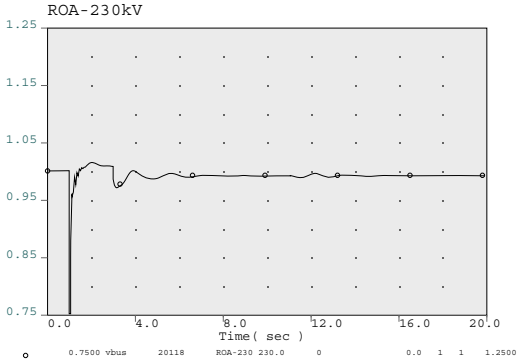
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Voltage Check and Comparison

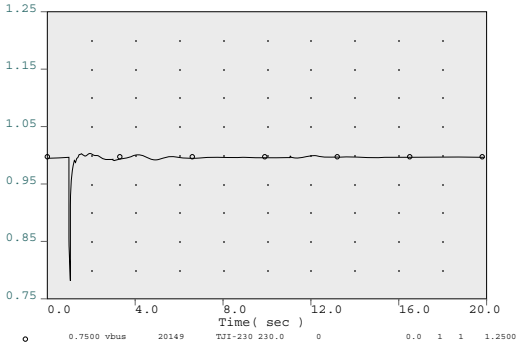
PAR/PID 230kV



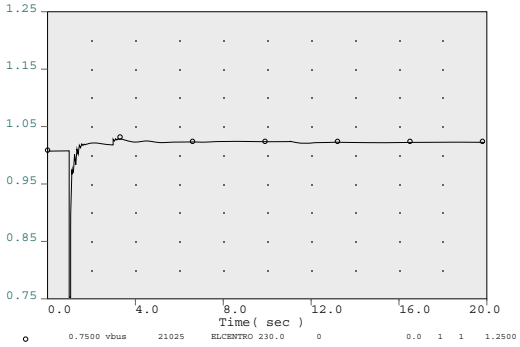
ROA-230kV



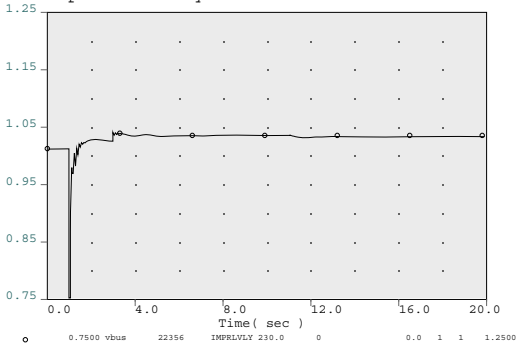
TJ1-230kV



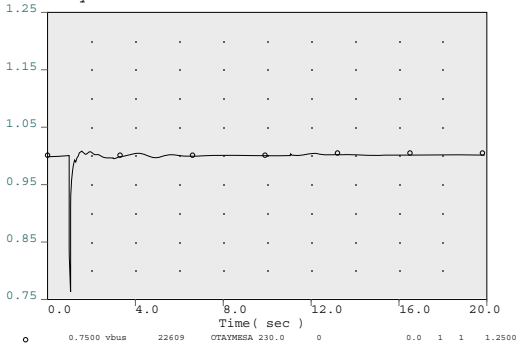
El Centro



Imperial Valley 230kV



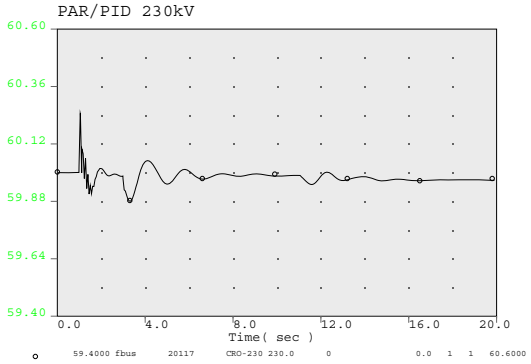
Otay Mesa 230kV



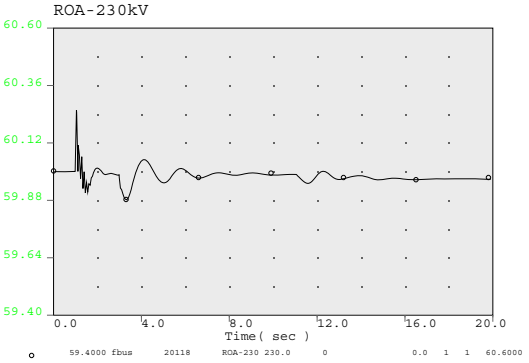
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Affected System Frequency Check and Comparison

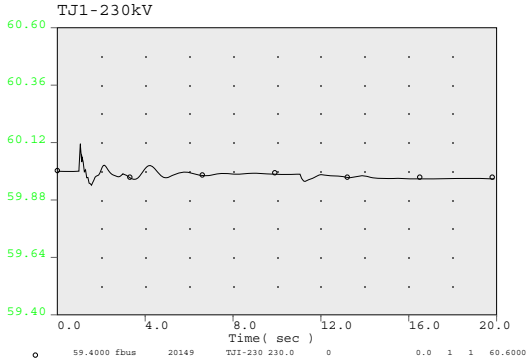
PAR/PID 230kV



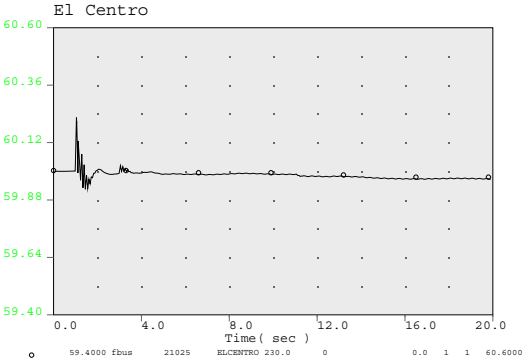
ROA-230kV



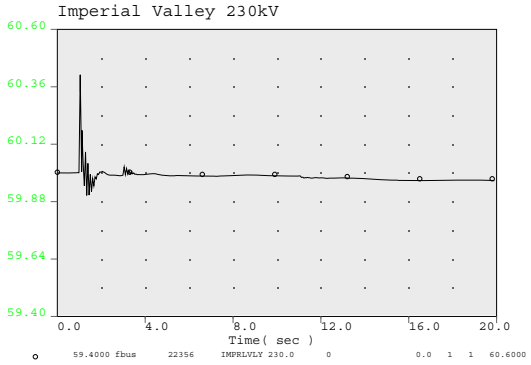
TJ1-230kV



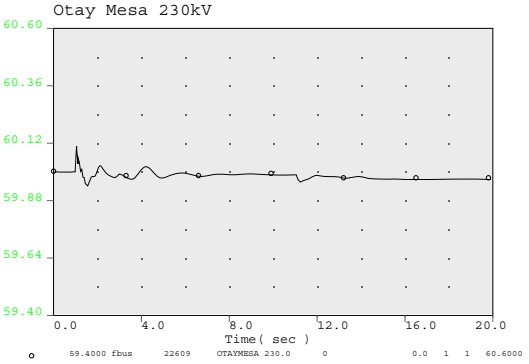
El Centro



Imperial Valley 230kV



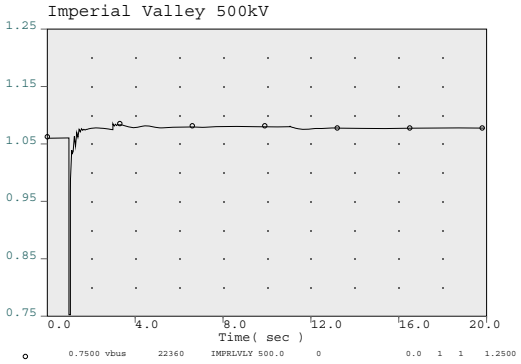
Otay Mesa 230kV



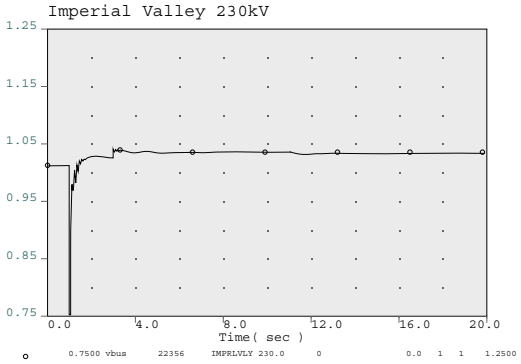
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - VOLTAGE

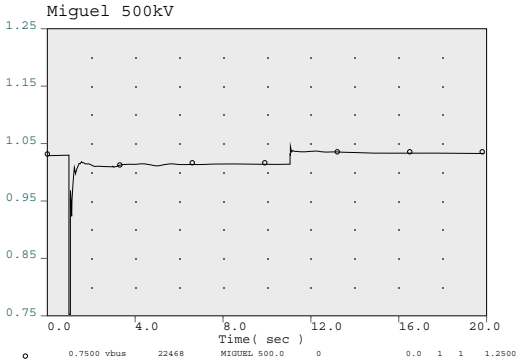
Imperial Valley 500kV



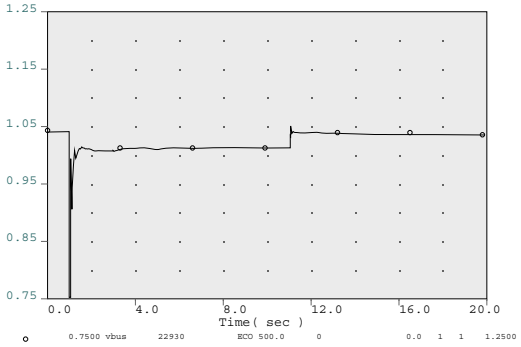
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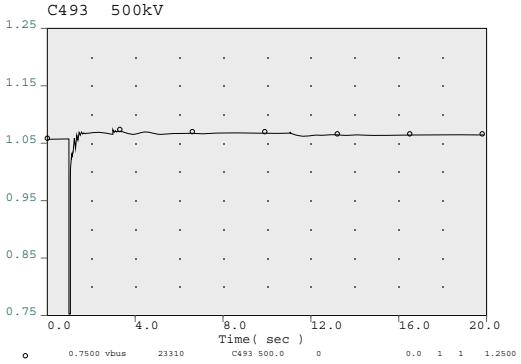
Miguel 500kV



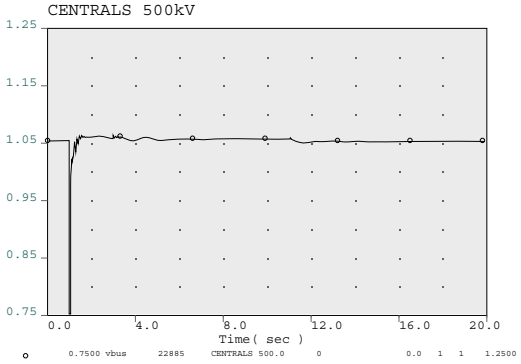
Windfarms 500



C493 500kV



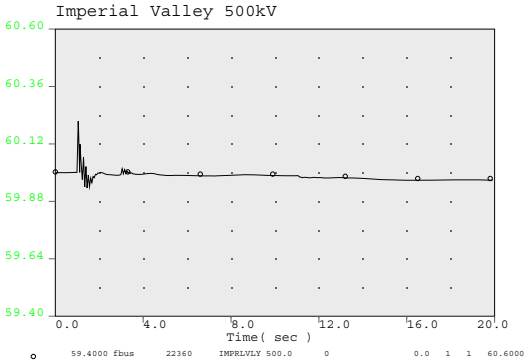
CENTRALS 500kV



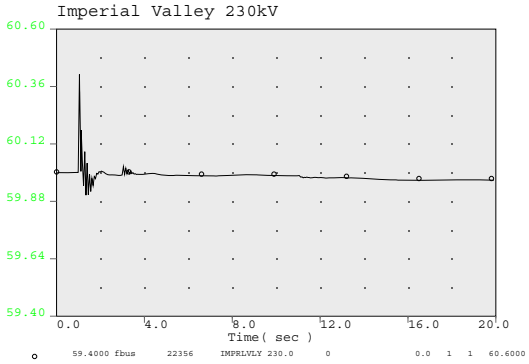
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

Imperial Valley Area - Frequency

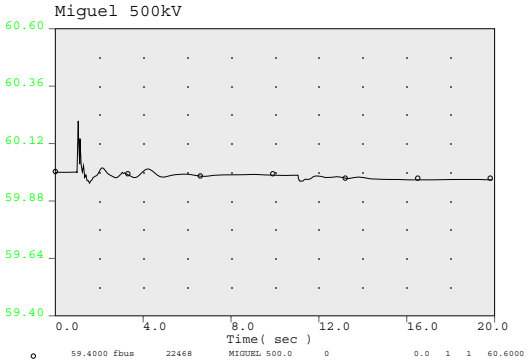
Imperial Valley 500kV



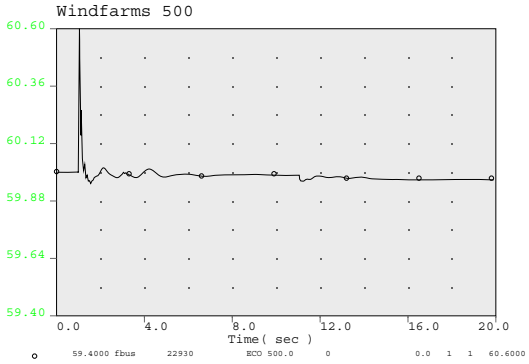
Imperial Valley 230kV



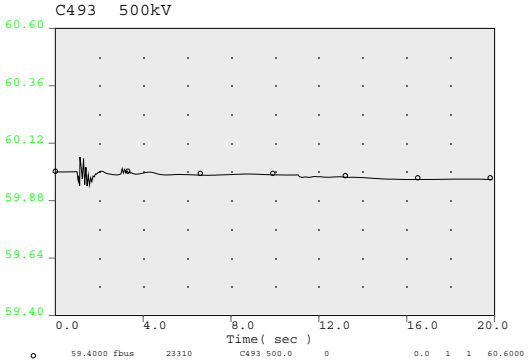
Miguel 500kV



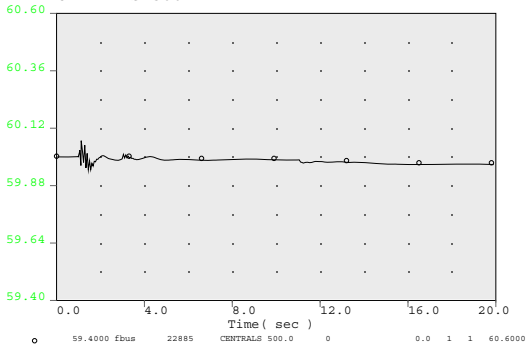
Windfarms 500



C493 500kV

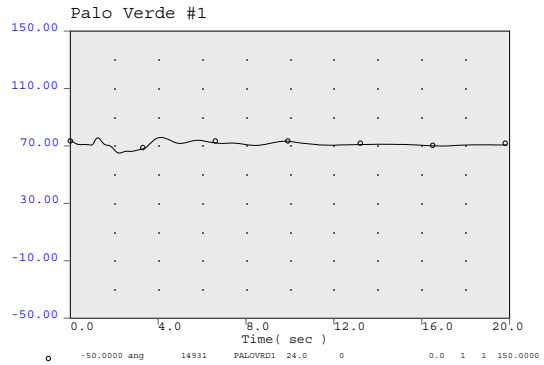


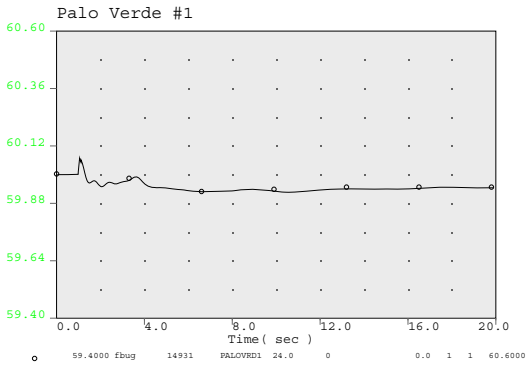
CENTRALS 500kV

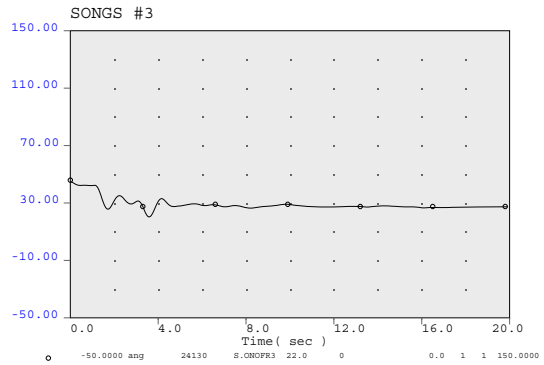


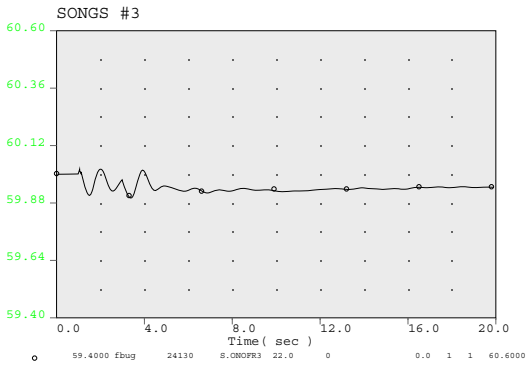
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-ECO 500 kV line1

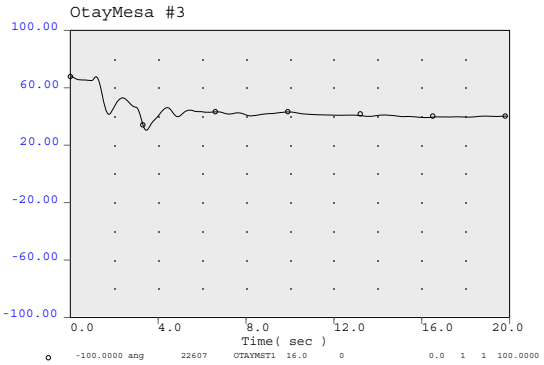
RELATIVE ROTOR ANGLE & FREQUENCY

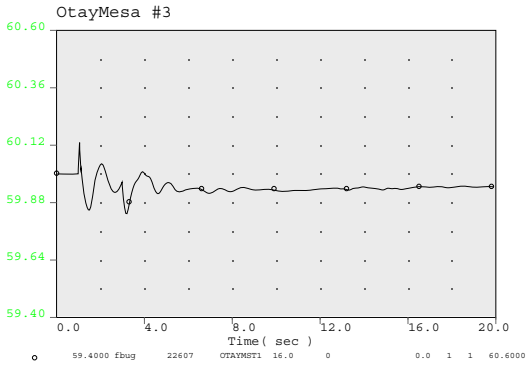










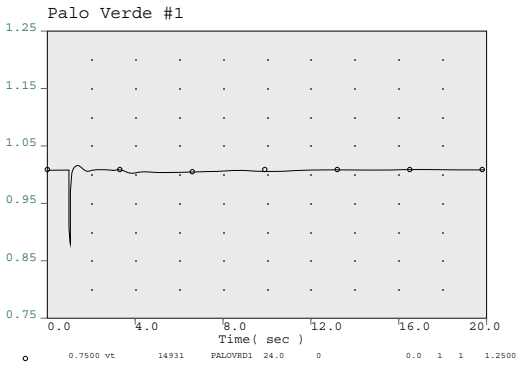


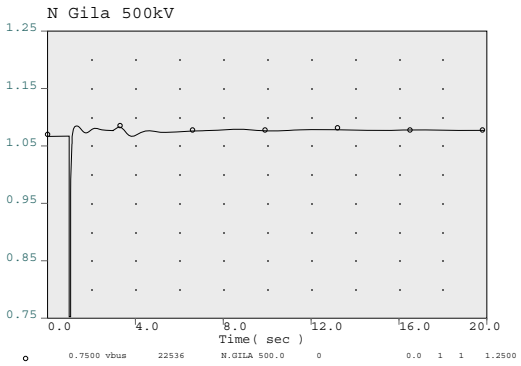
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

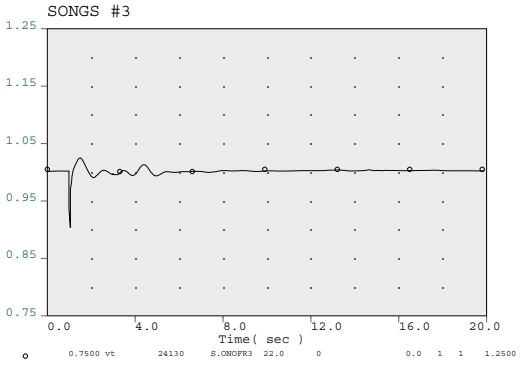
Page 1

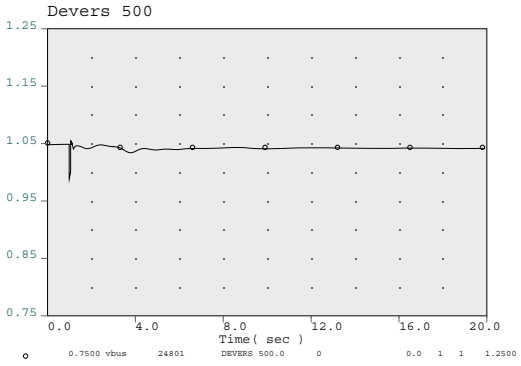
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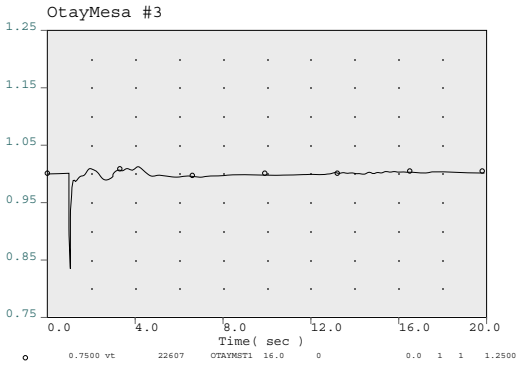
RELATIVE VOLTAGE

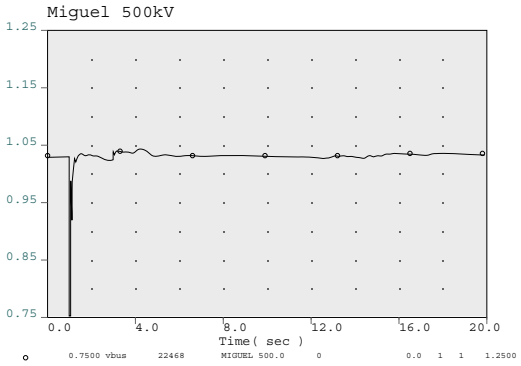








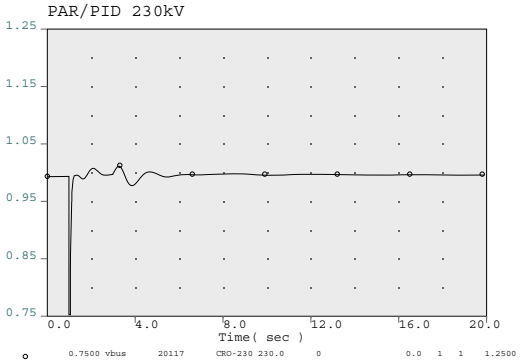




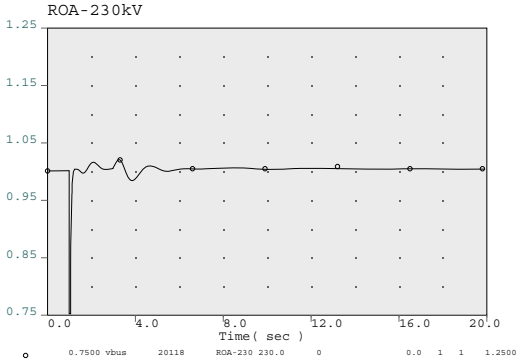
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Voltage Check and Comparison

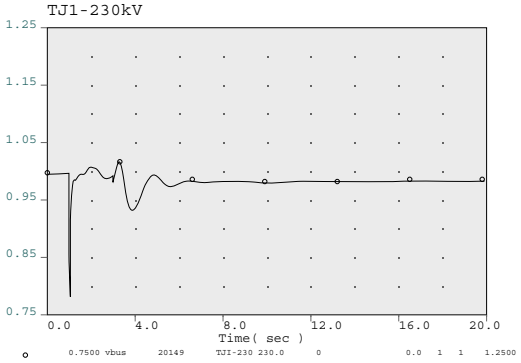
PAR/PID 230kV



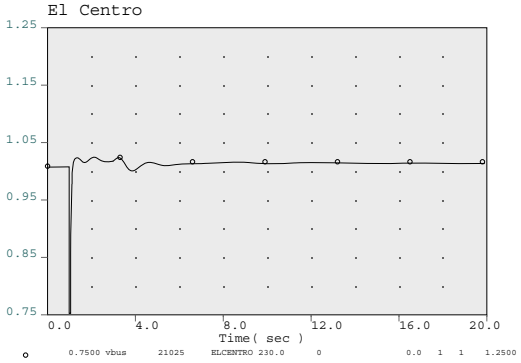
ROA-230kV



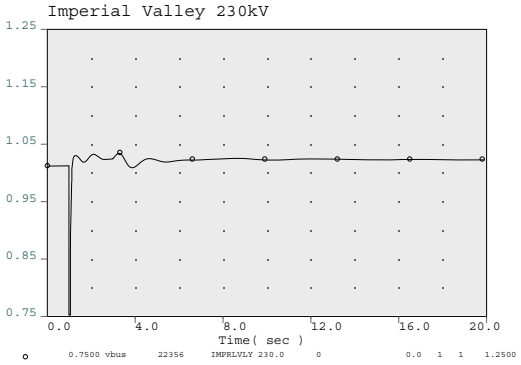
TJ1-230kV



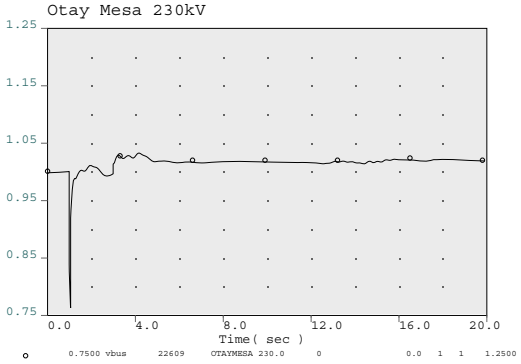
El Centro



Imperial Valley 230kV



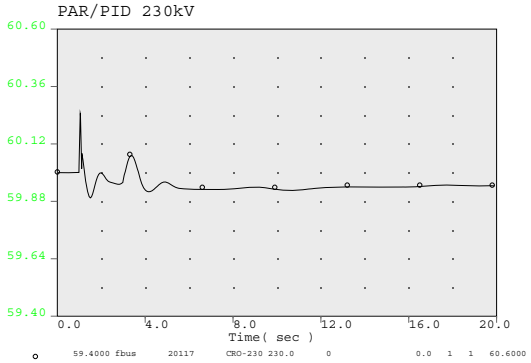
Otay Mesa 230kV



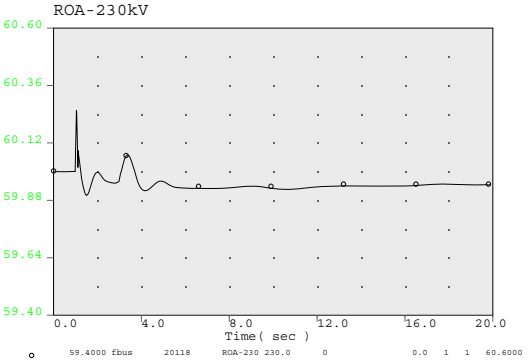
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Affected System Frequency Check and Comparison

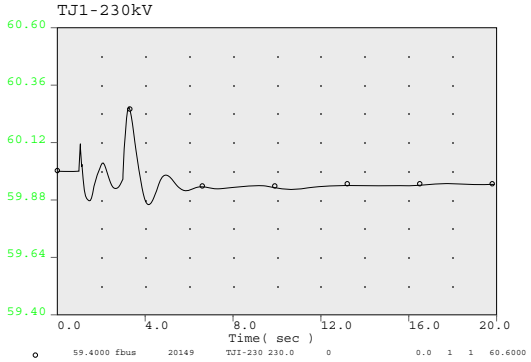
PAR/PID 230kV



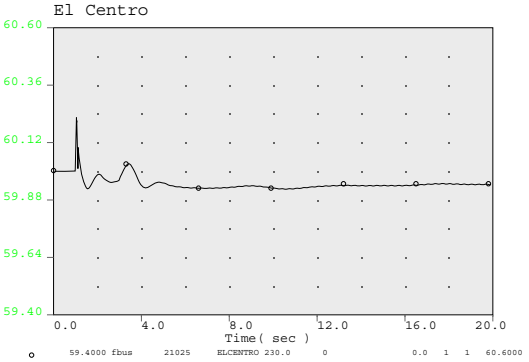
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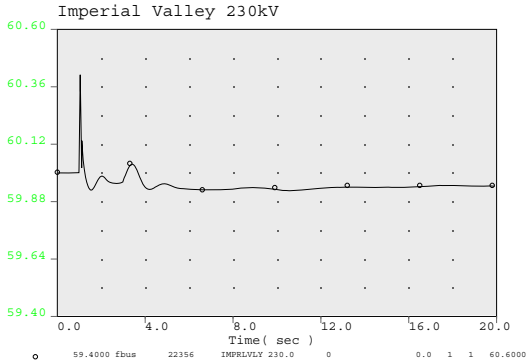
TJ1-230kV



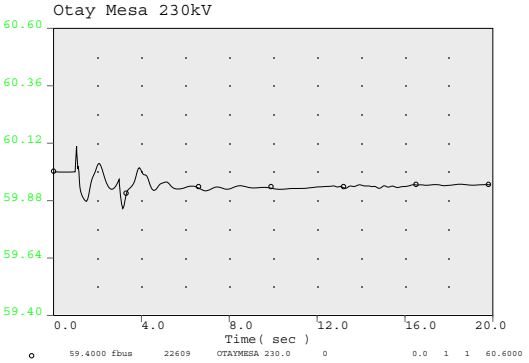
El Centro



Imperial Valley 230kV



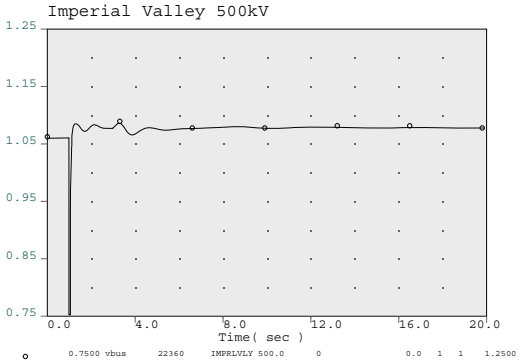
Otay Mesa 230kV



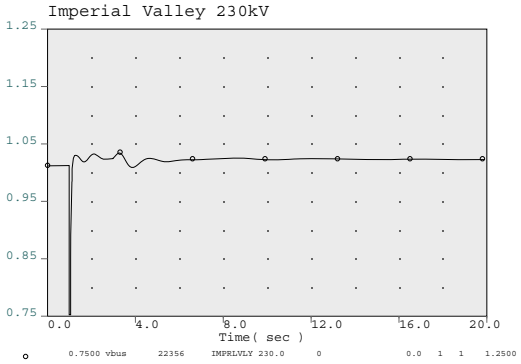
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

Imperial Valley Area - VOLTAGE

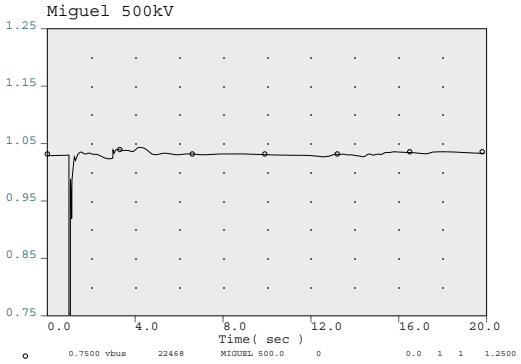
Imperial Valley 500kV



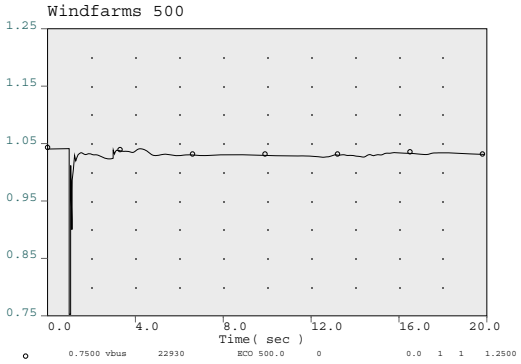
Imperial Valley 230kV



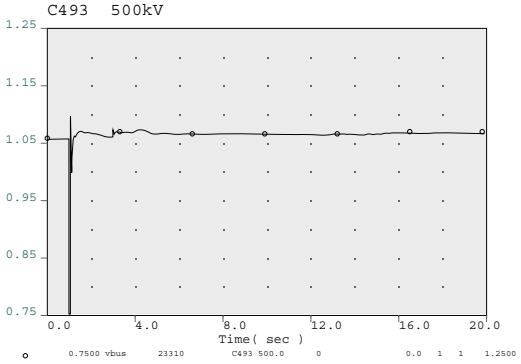
Miguel 500kV



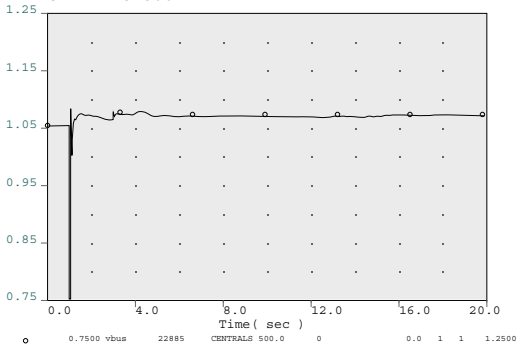
Windfarms 500



C493 500kV

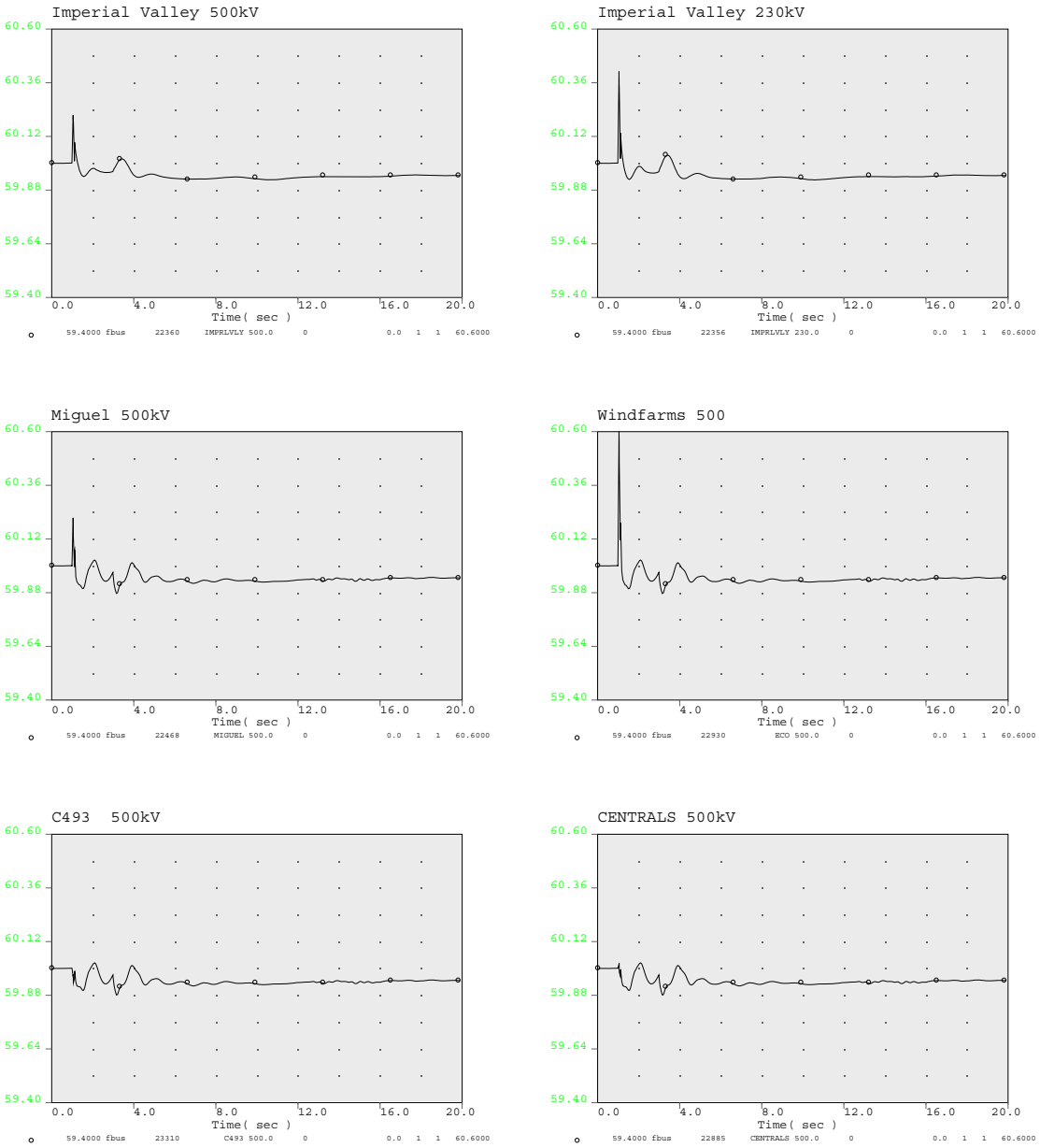


CENTRALS 500kV



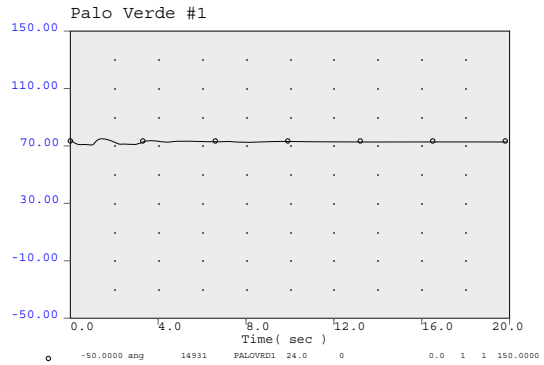
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

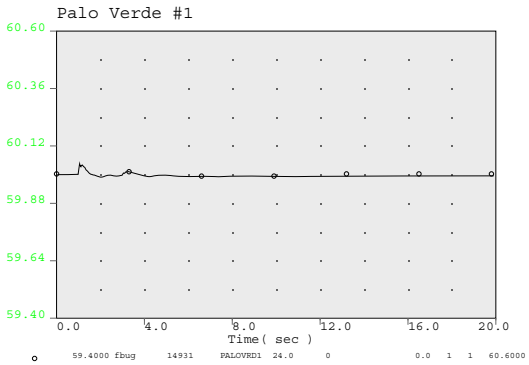
Imperial Valley Area - Frequency

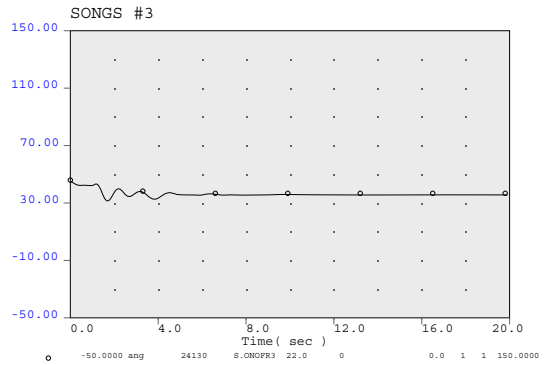


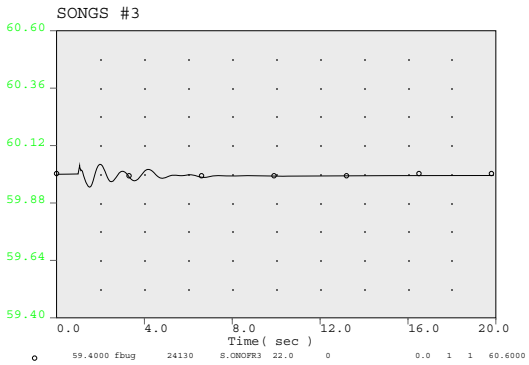
SDG&E Cluster 2 - post
2014 Heavy Summer
Imperial Valley-C493-ECO 500 kV Double line outage
with Xtrp

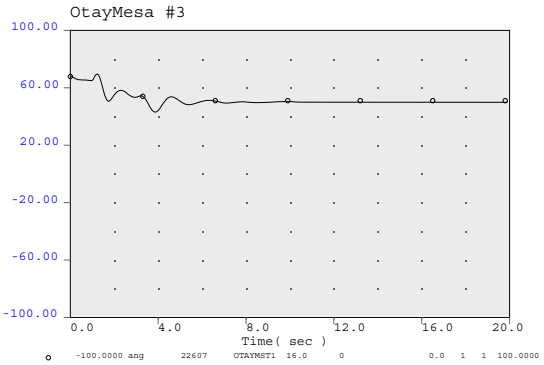
RELATIVE ROTOR ANGLE & FREQUENCY

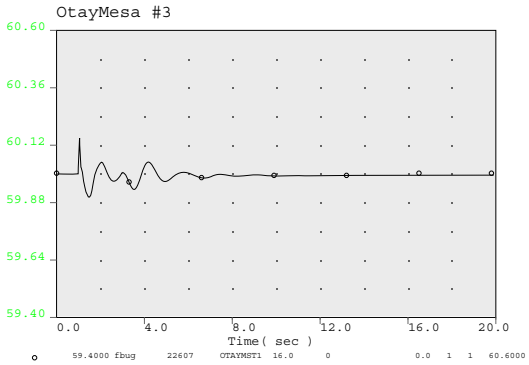












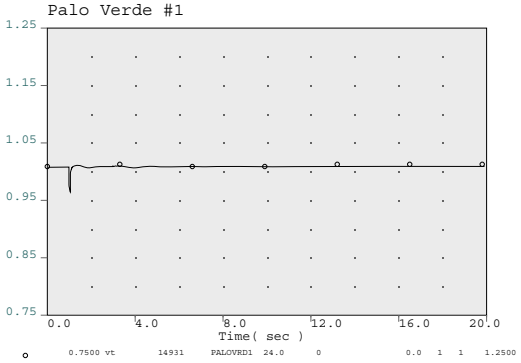
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Page 1

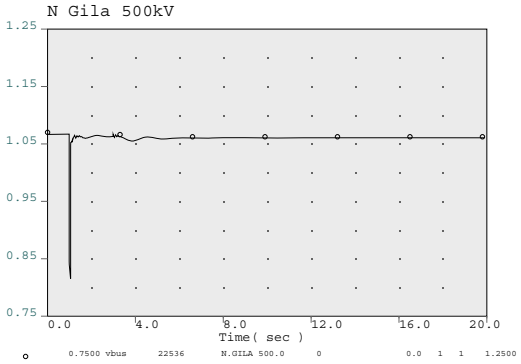
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RELATIVE VOLTAGE

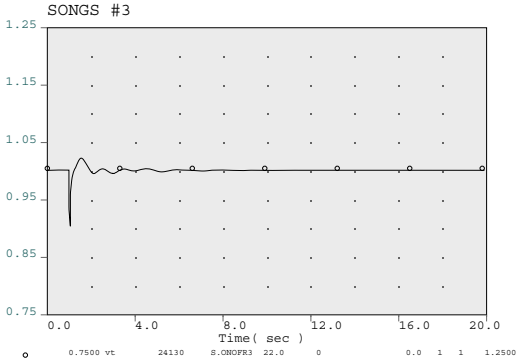
Palo Verde #1



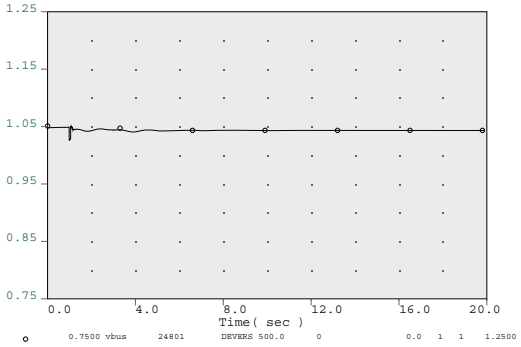
N Gila 500kV



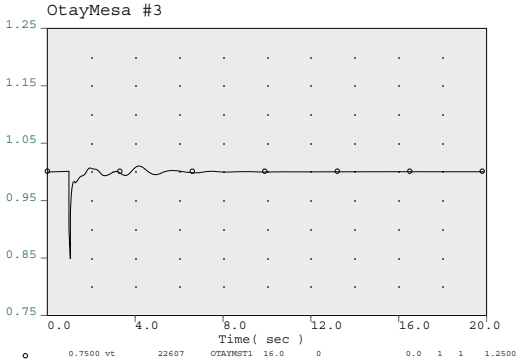
SONGS #3



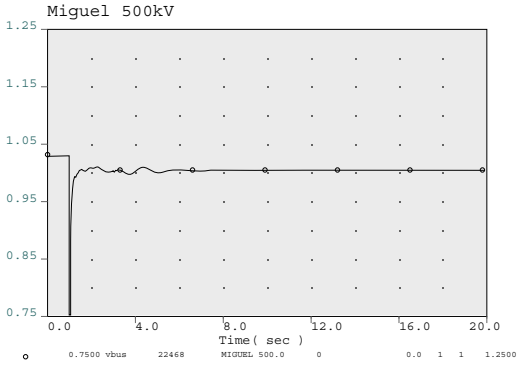
Devers 500



OtayMesa #3



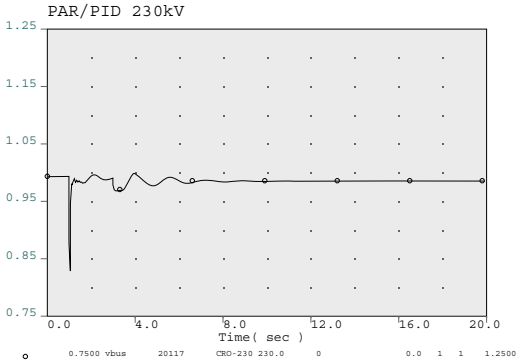
Miguel 500kV



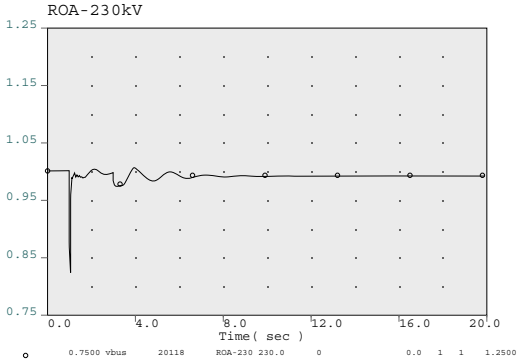
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Voltage Check and Comparison

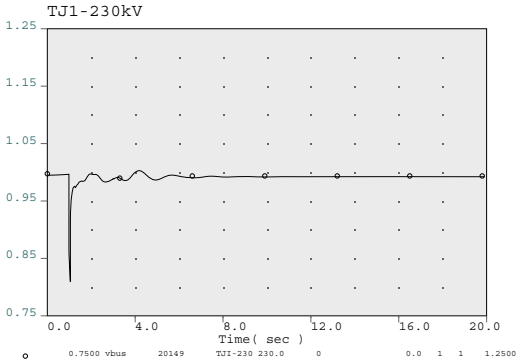
PAR/PID 230kV



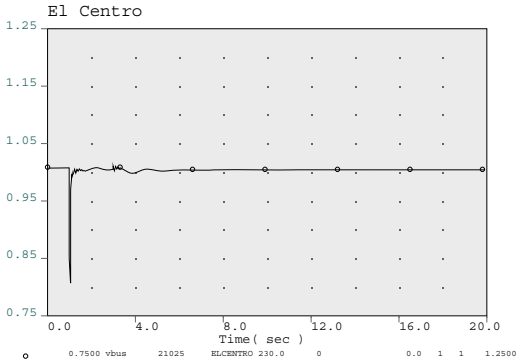
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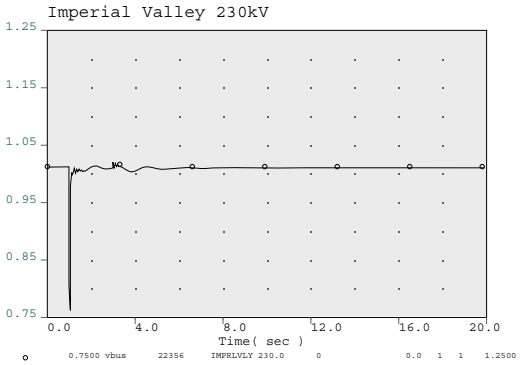
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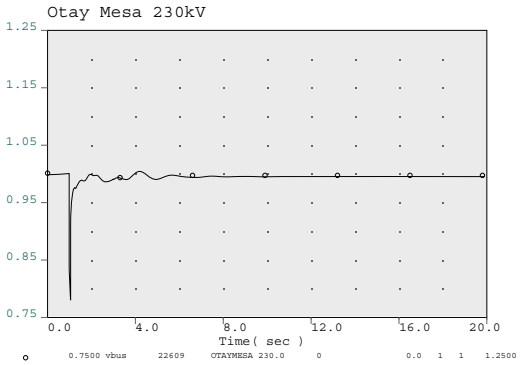
El Centro



Imperial Valley 230kV



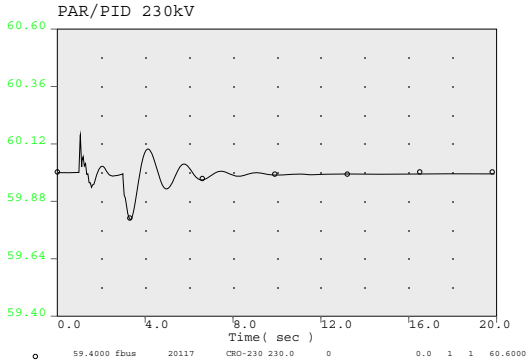
Otay Mesa 230kV



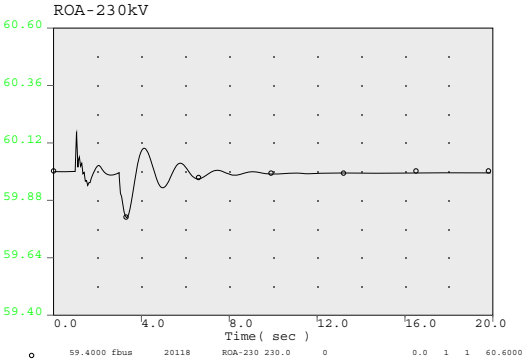
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Affected System Frequency Check and Comparison

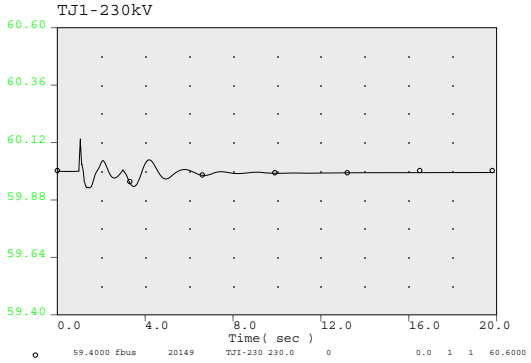
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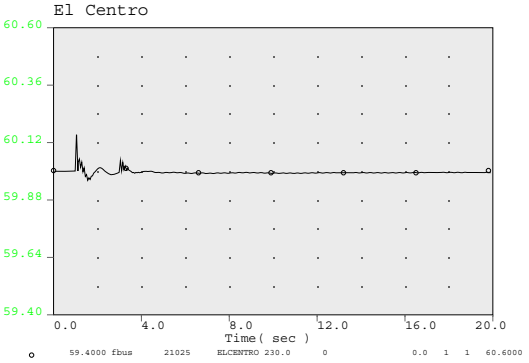
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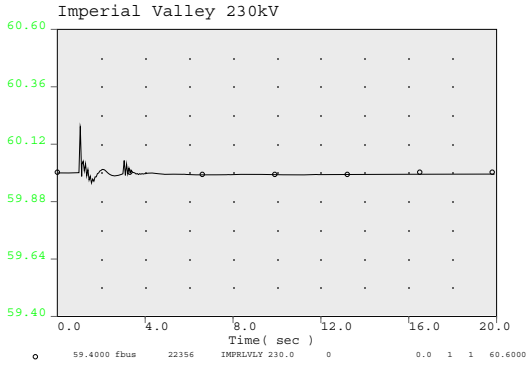
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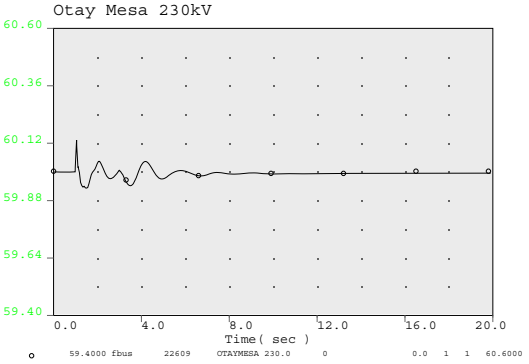
El Centro



Imperial Valley 230kV



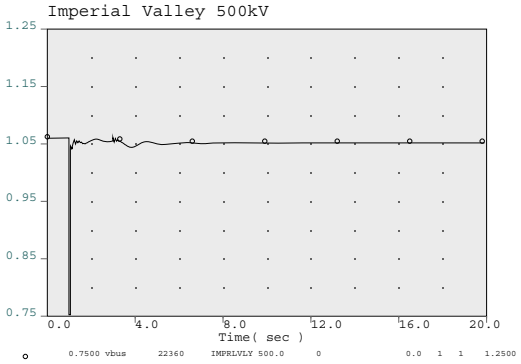
Otay Mesa 230kV



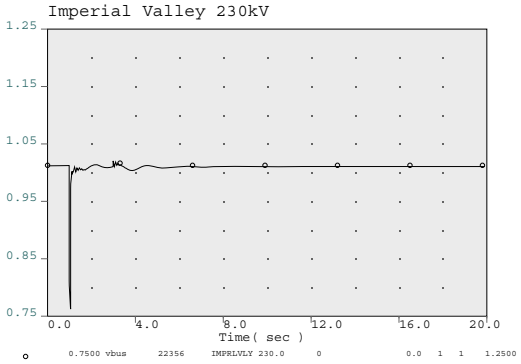
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

Imperial Valley Area - VOLTAGE

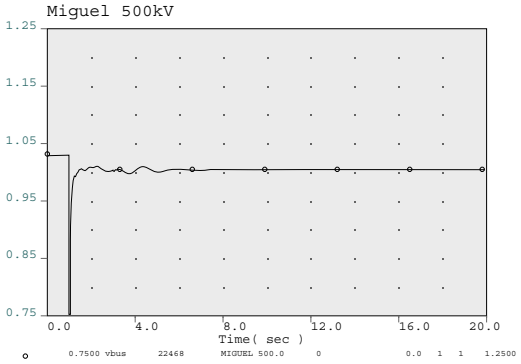
Imperial Valley 500kV



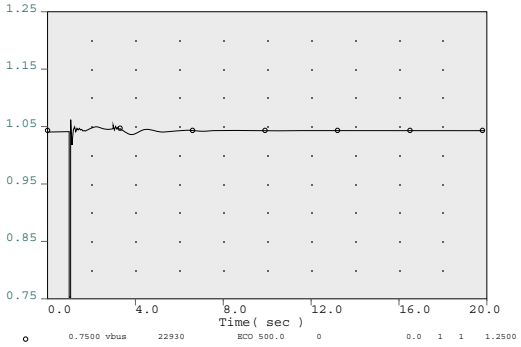
Imperial Valley 230kV



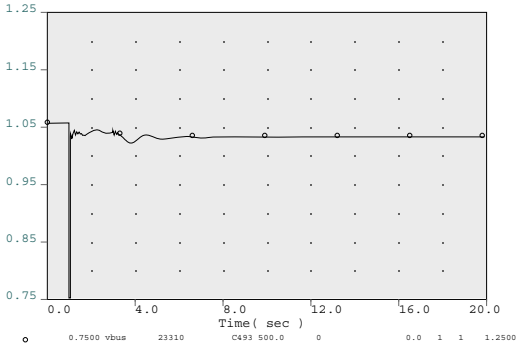
Miguel 500kV



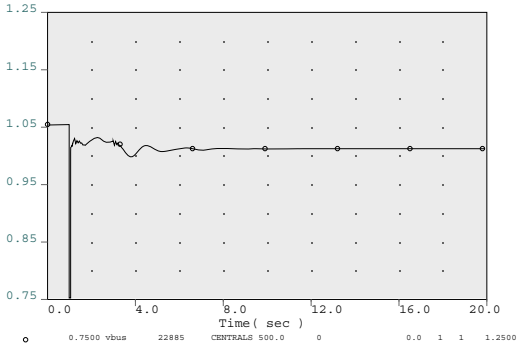
Windfarms 500



C493 500kV



CENTRALS 500kV



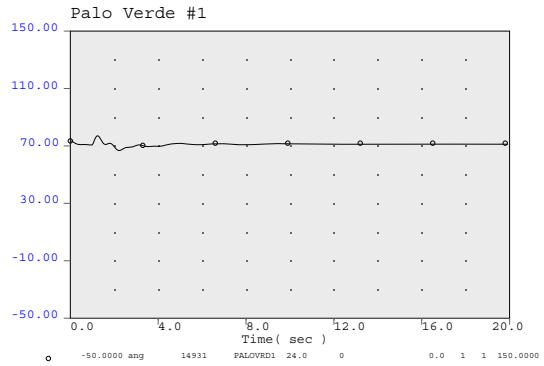
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

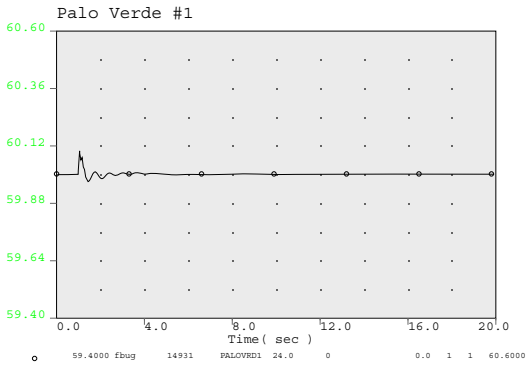
Imperial Valley Area - Frequency

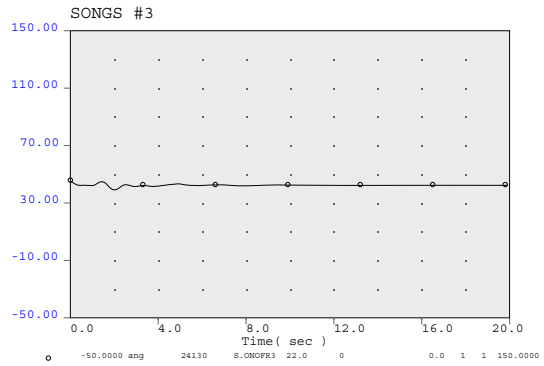


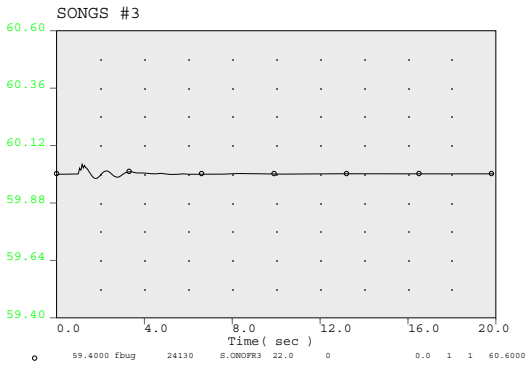
SDG&E Cluster 2 - post
2014 Heavy Summer
Miguel-ECO 500 kV line

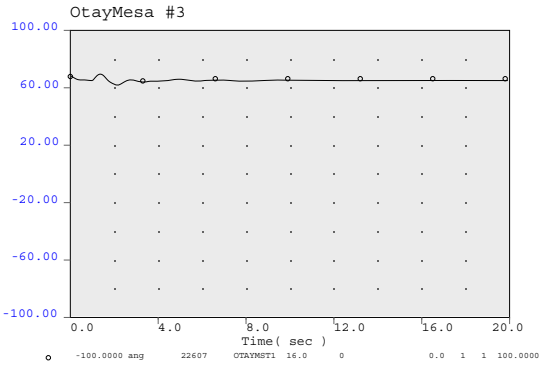
RELATIVE ROTOR ANGLE & FREQUENCY

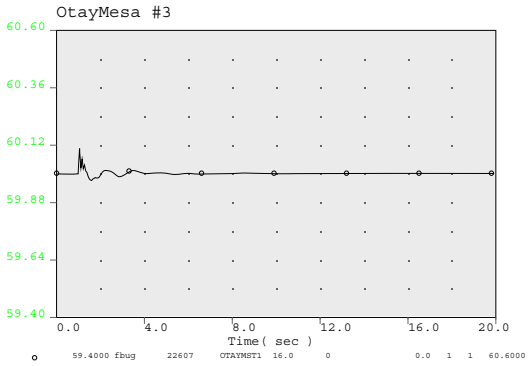












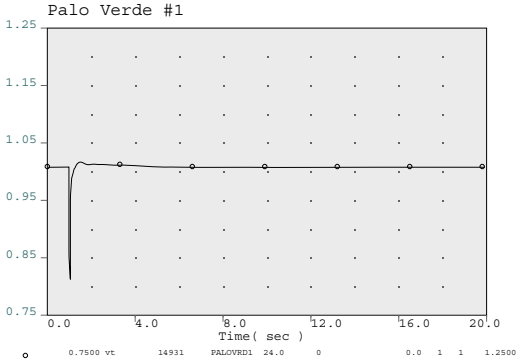
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Page 1

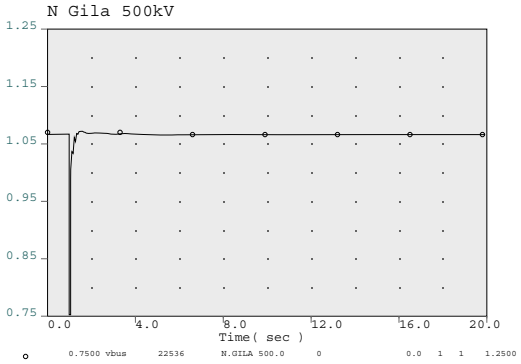
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RELATIVE VOLTAGE

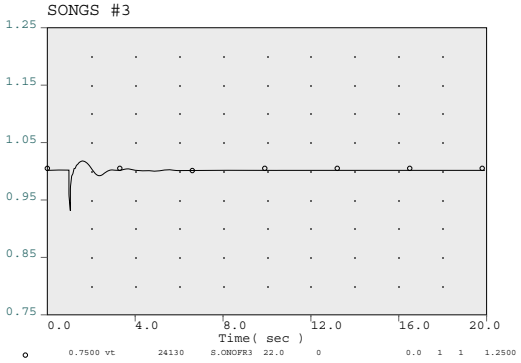
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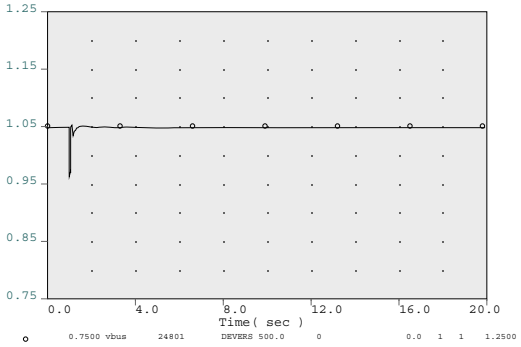
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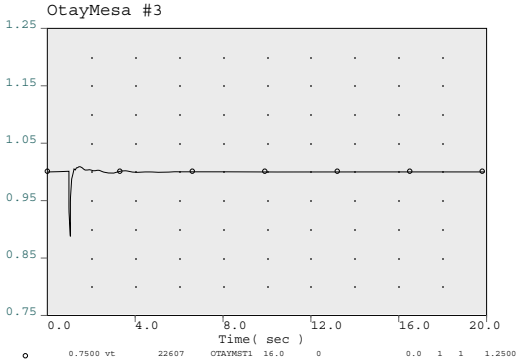
SONGS #3



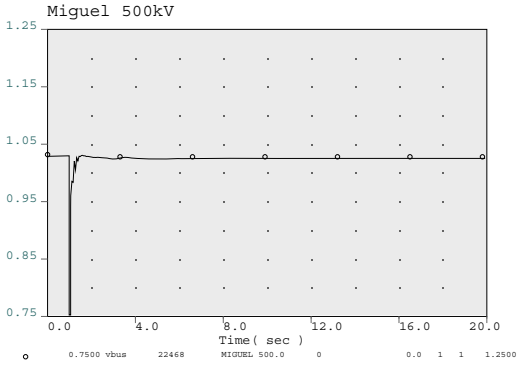
Devers 500



OtayMesa #3



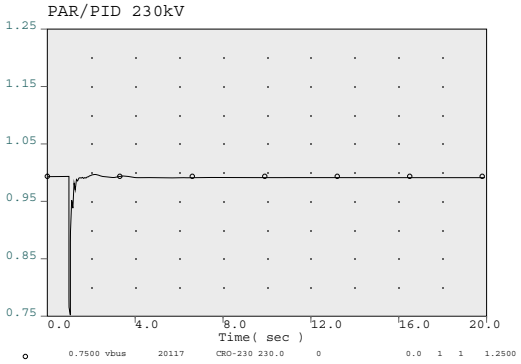
Miguel 500kV



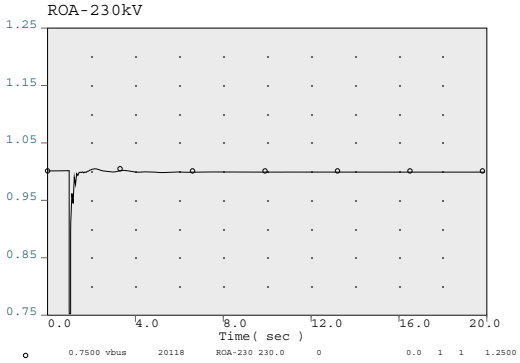
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Voltage Check and Comparison

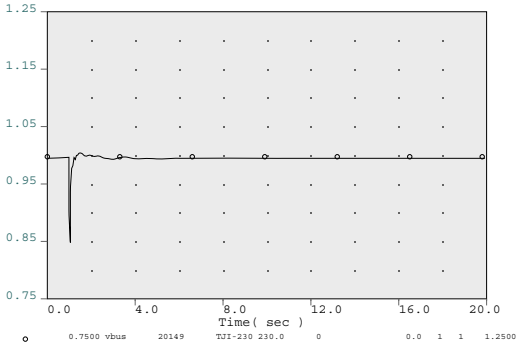
PAR/PID 230kV



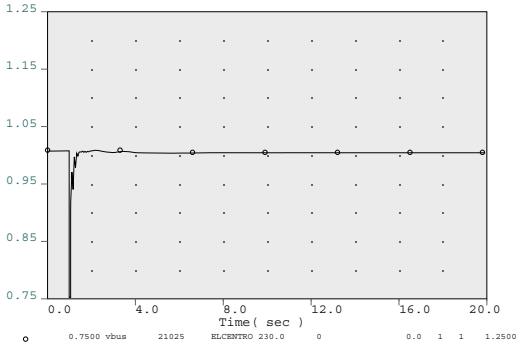
ROA-230kV



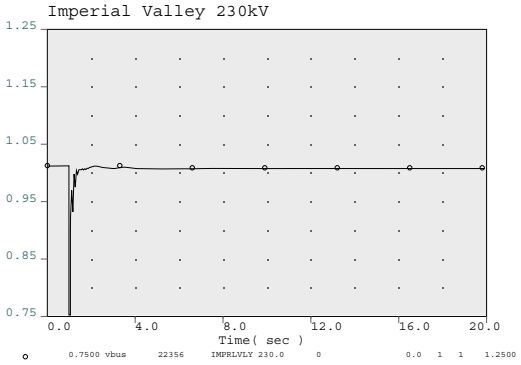
TJ1-230kV



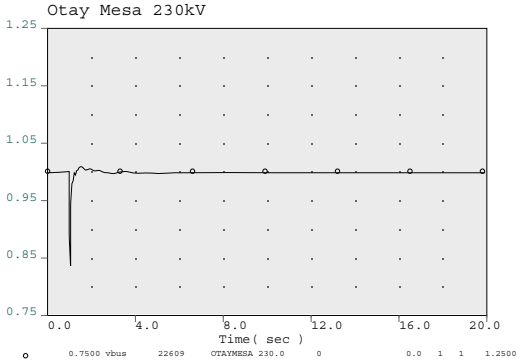
El Centro



Imperial Valley 230kV



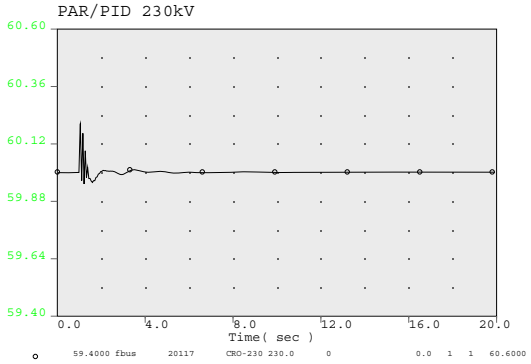
Otay Mesa 230kV



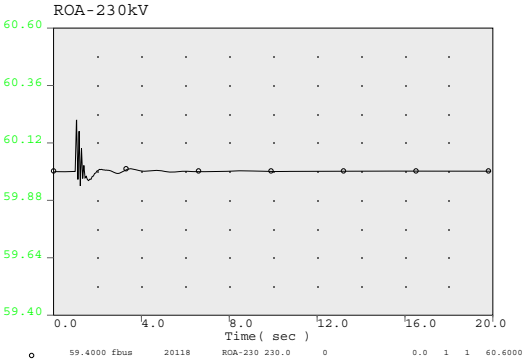
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Affected System Frequency Check and Comparison

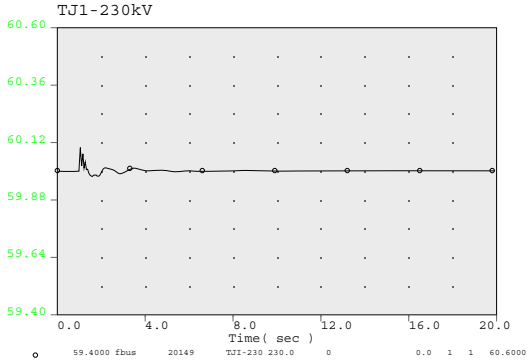
PAR/PID 230kV



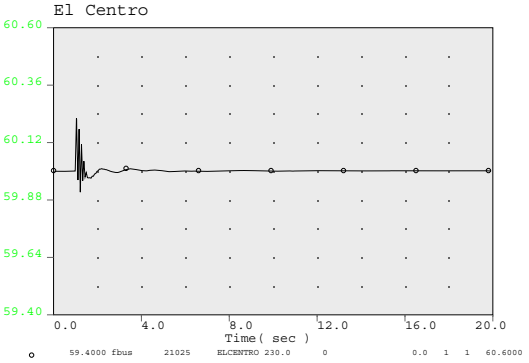
ROA-230kV



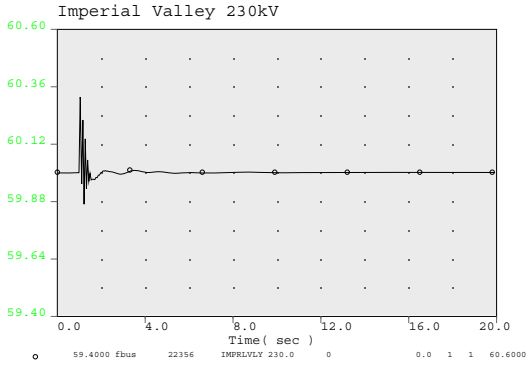
TJ1-230kV



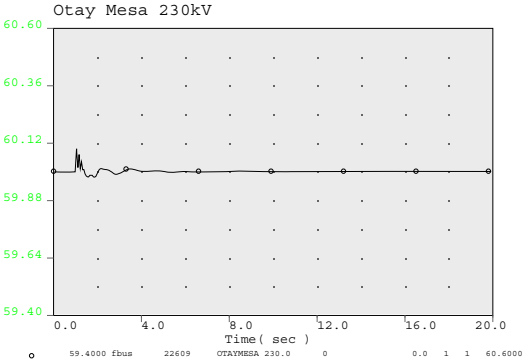
El Centro



Imperial Valley 230kV



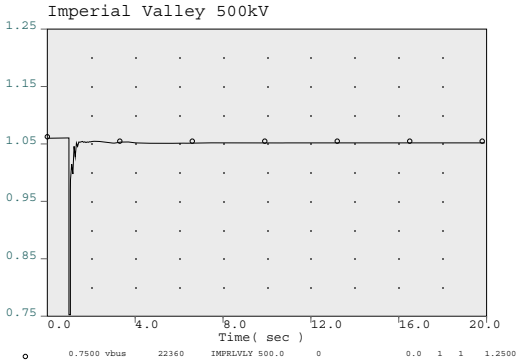
Otay Mesa 230kV



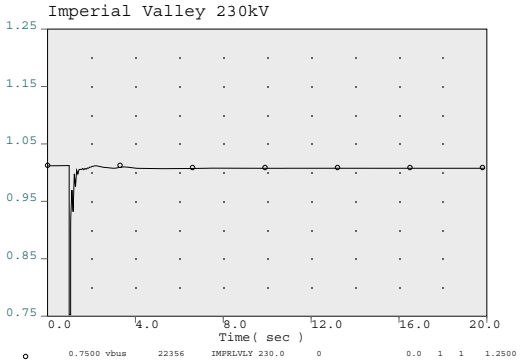
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

Imperial Valley Area - VOLTAGE

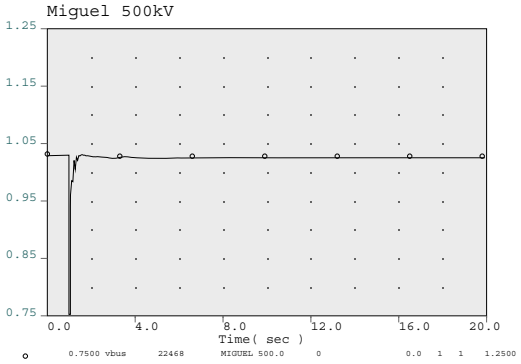
Imperial Valley 500kV



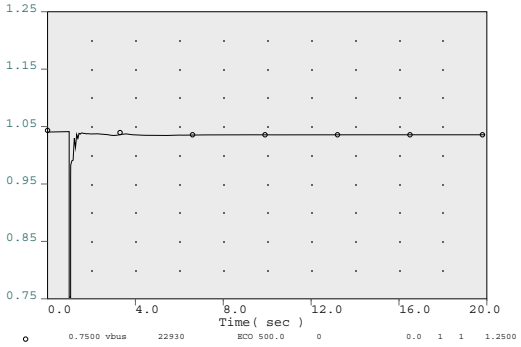
Imperial Valley 230kV



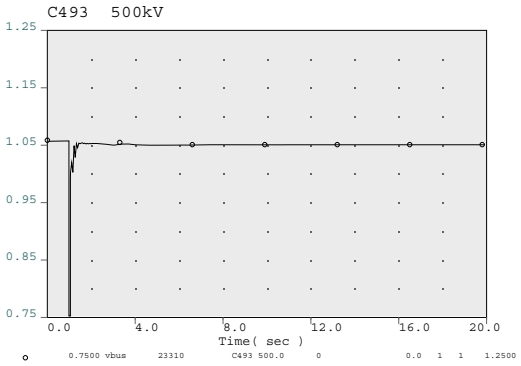
Miguel 500kV



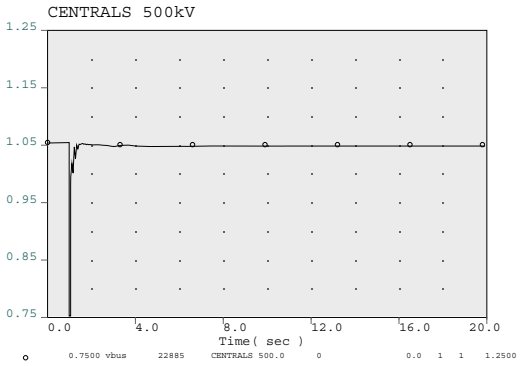
Windfarms 500



C493 500kV

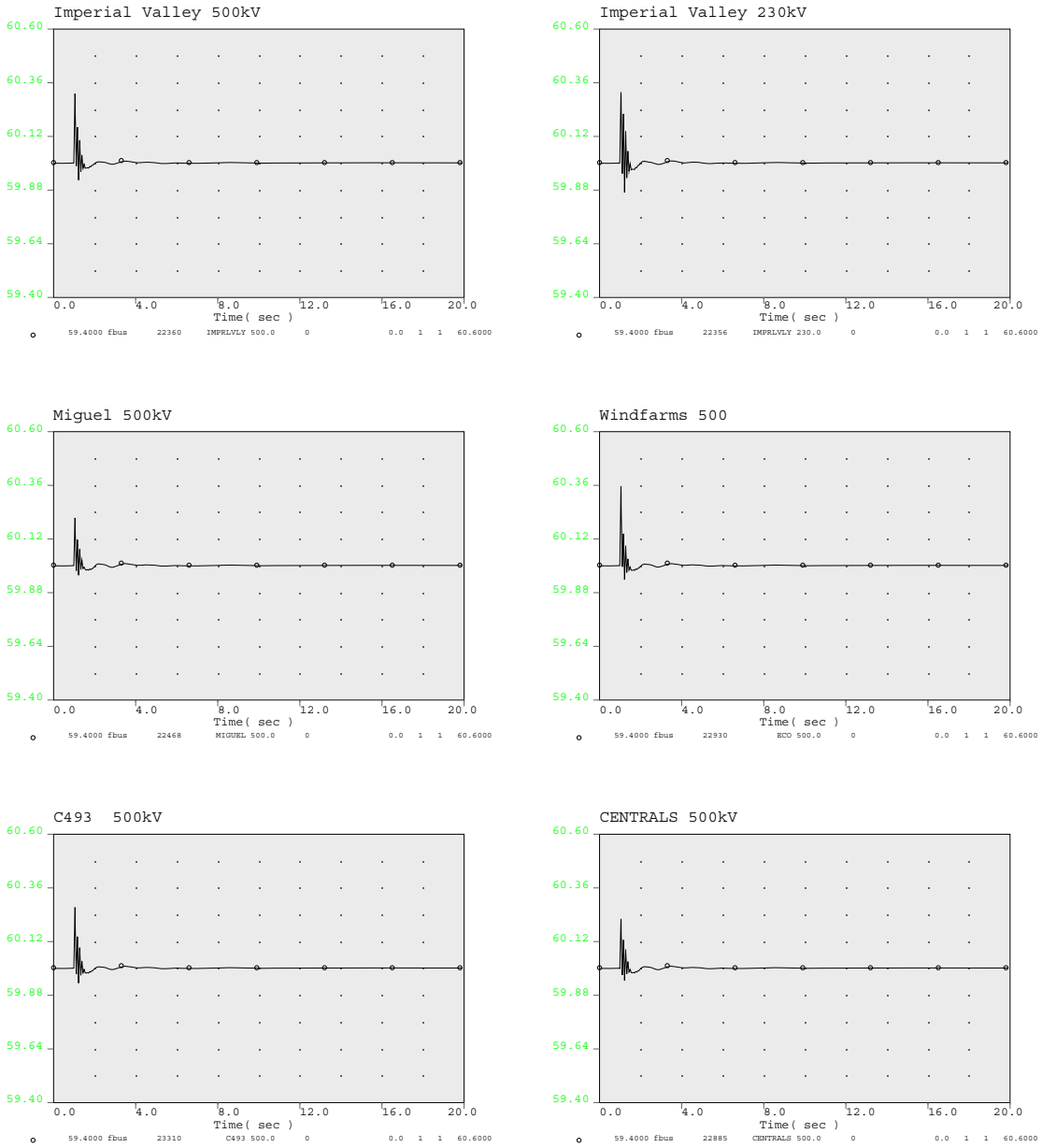


CENTRALS 500kV



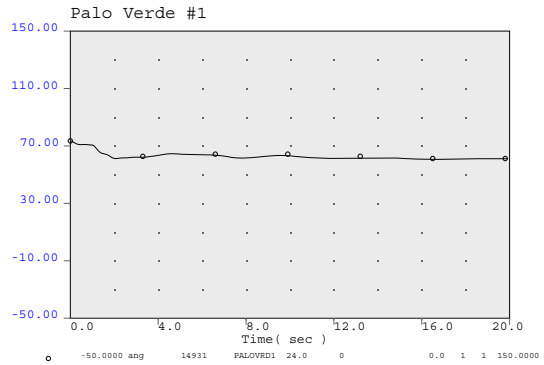
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

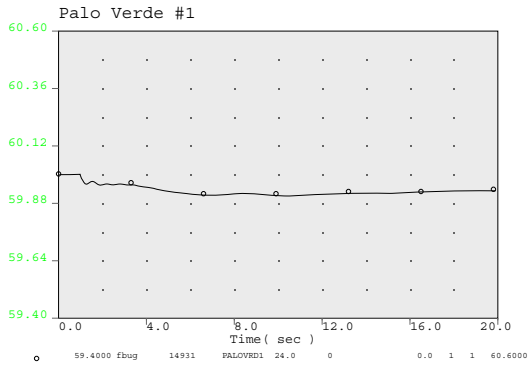
Imperial Valley Area - Frequency

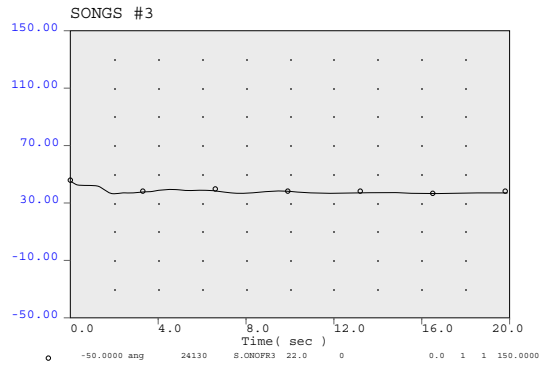


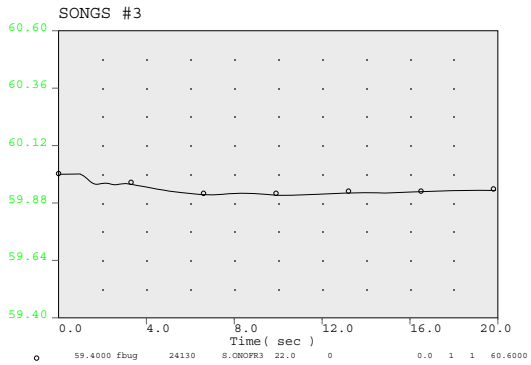
SDG&E Cluster 2 - post
2014 Heavy Summer
North Gila - Imperial Valley 500 kV line

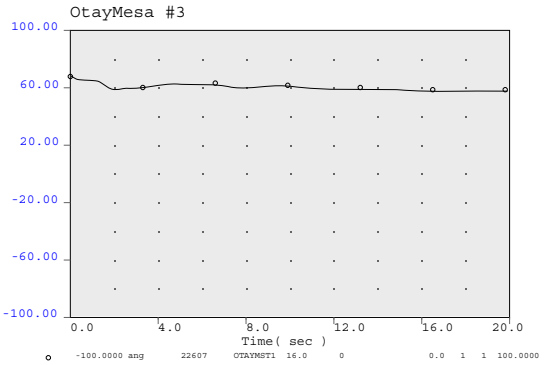
RELATIVE ROTOR ANGLE & FREQUENCY

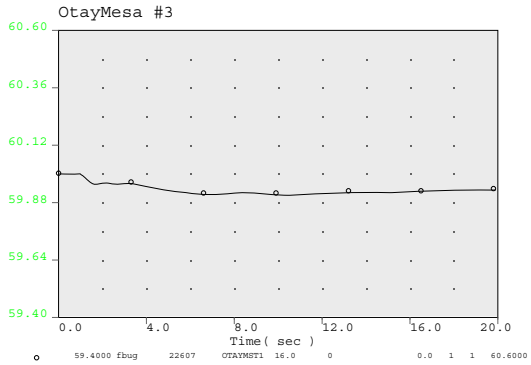










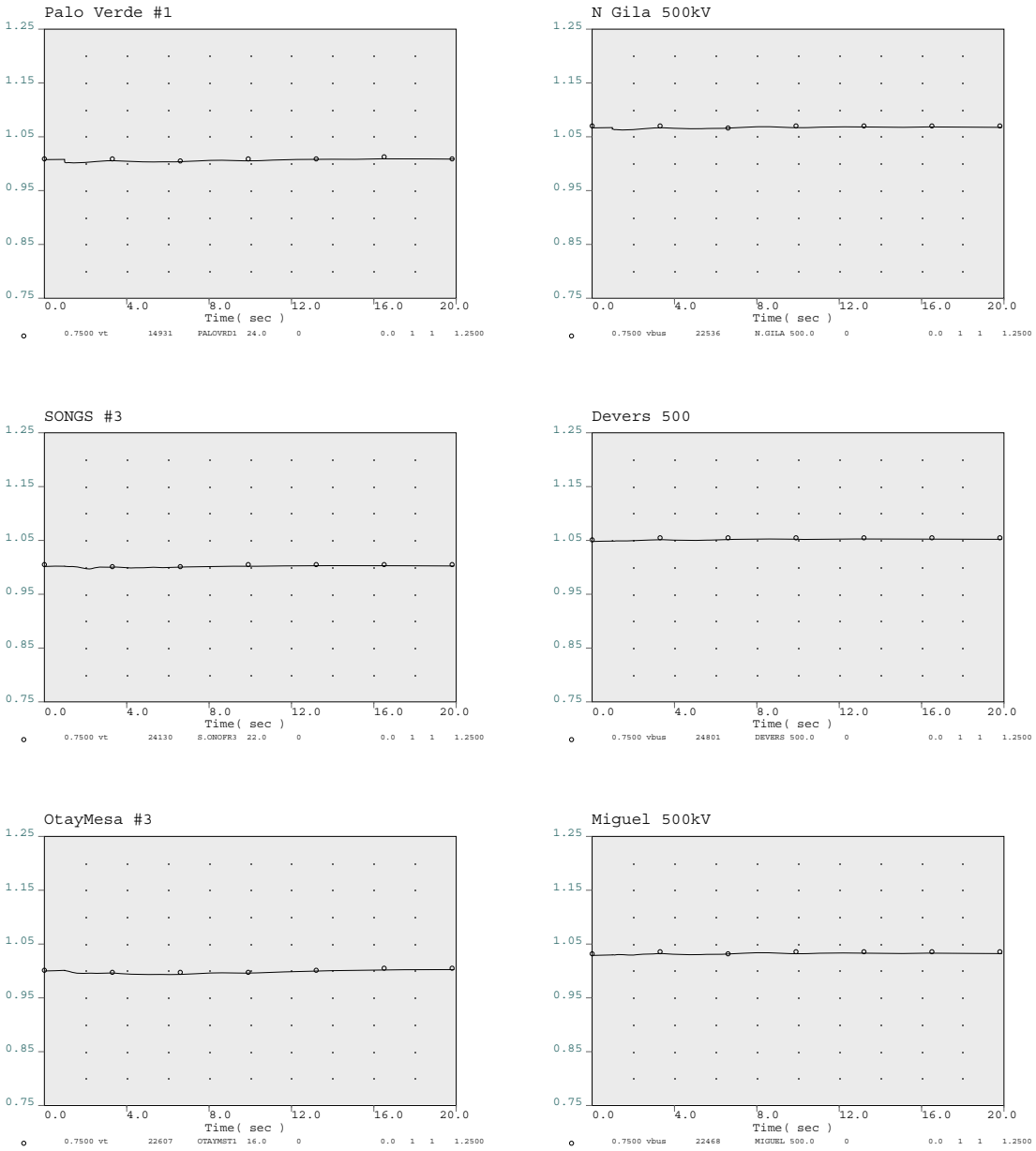


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Page 1

SDGE	PaloVerde-g1_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:44:26 2010

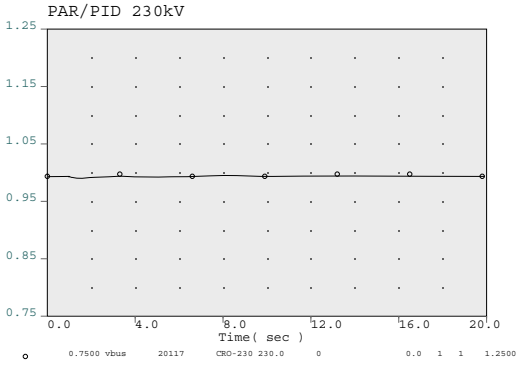
RELATIVE VOLTAGE



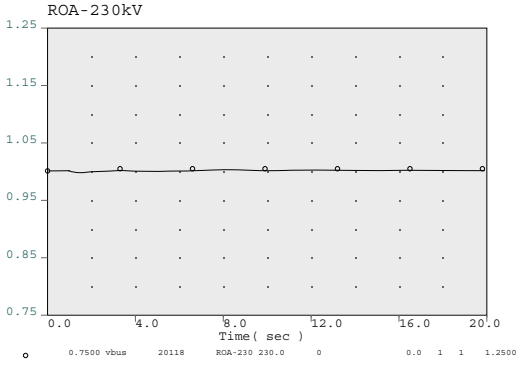
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Voltage Check and Comparison

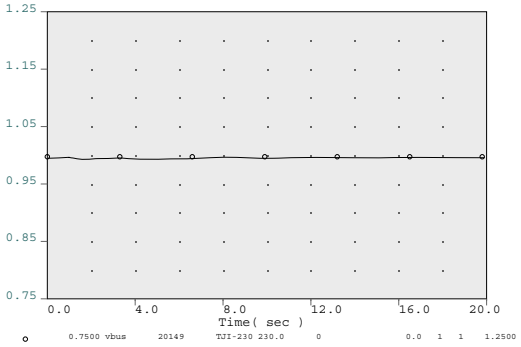
PAR/PID 230kV



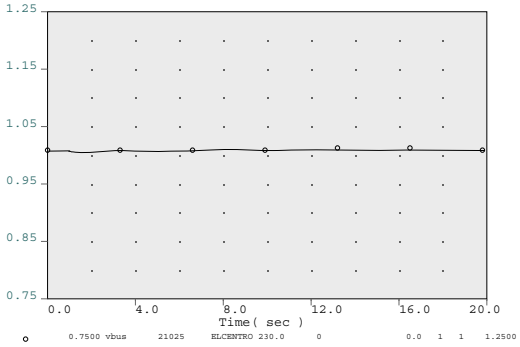
ROA-230kV



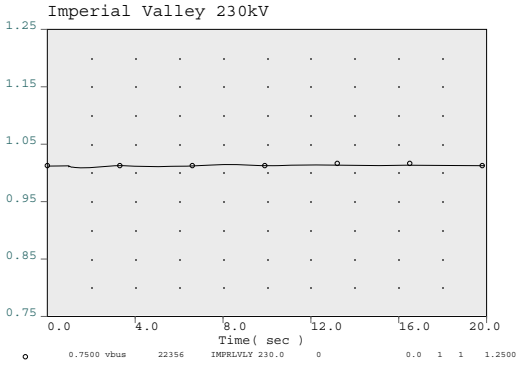
TJ1-230kV



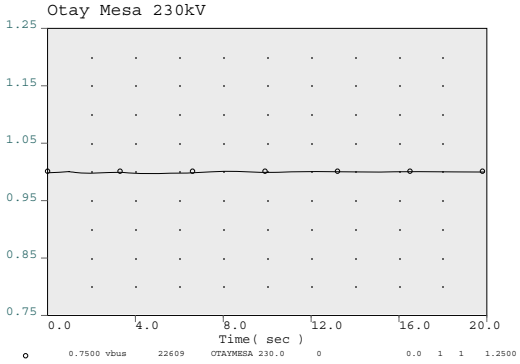
El Centro



Imperial Valley 230kV



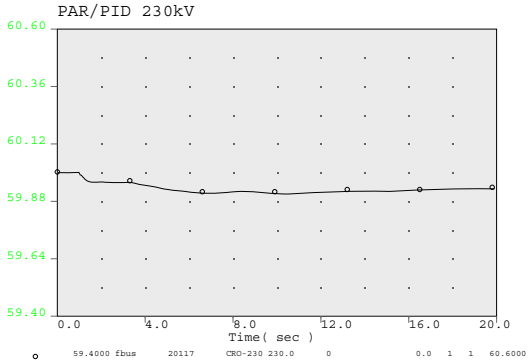
Otay Mesa 230kV



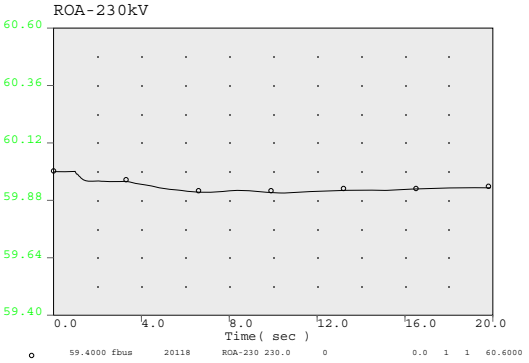
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Affected System Frequency Check and Comparison

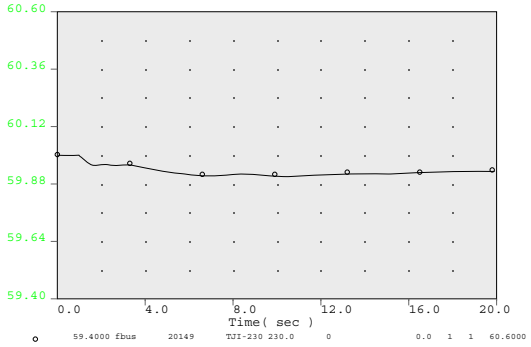
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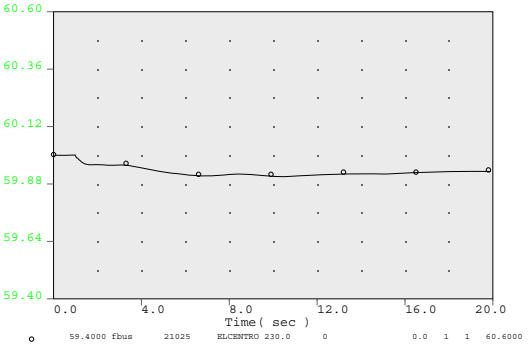
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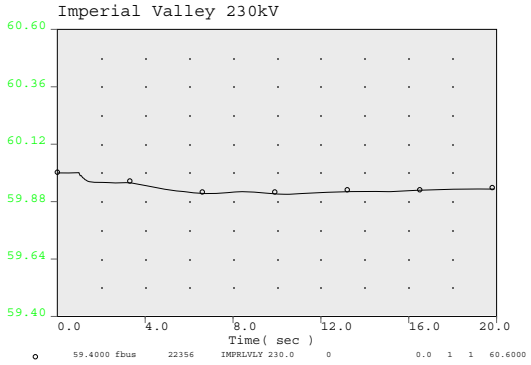
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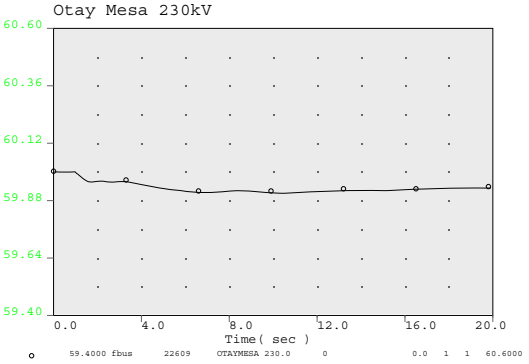
El Centro



Imperial Valley 230kV



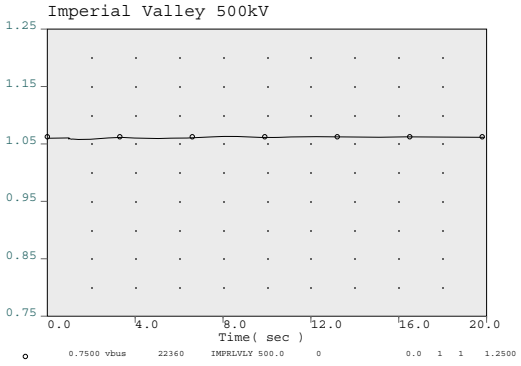
Otay Mesa 230kV



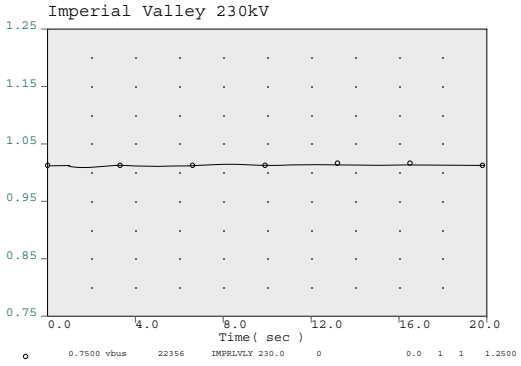
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

Imperial Valley Area - VOLTAGE

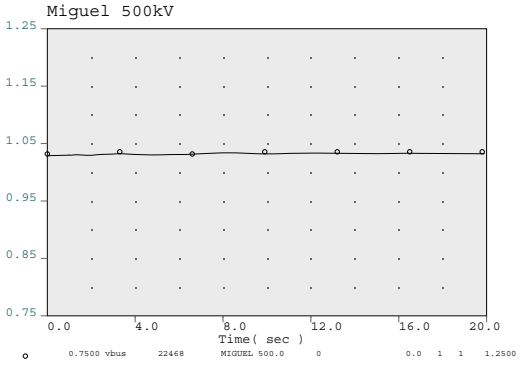
Imperial Valley 500kV



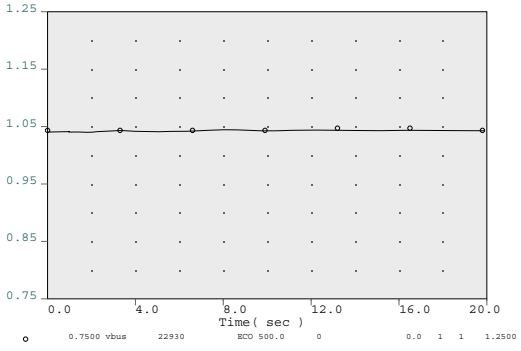
Imperial Valley 230kV



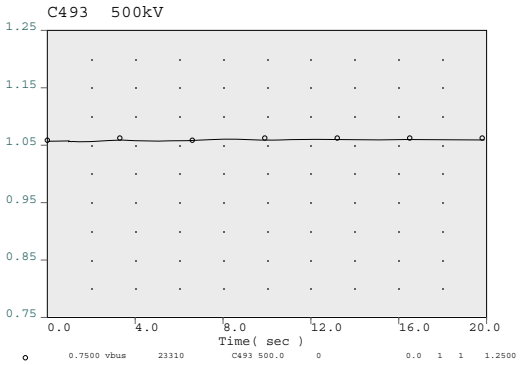
Miguel 500kV



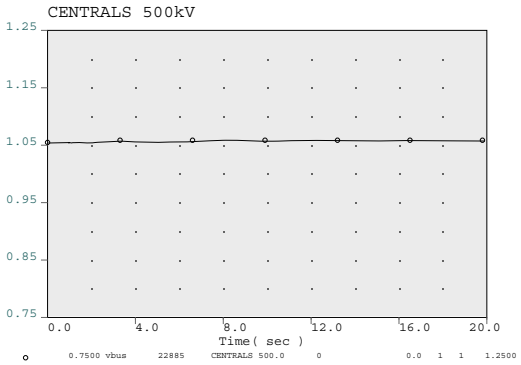
Windfarms 500



C493 500kV

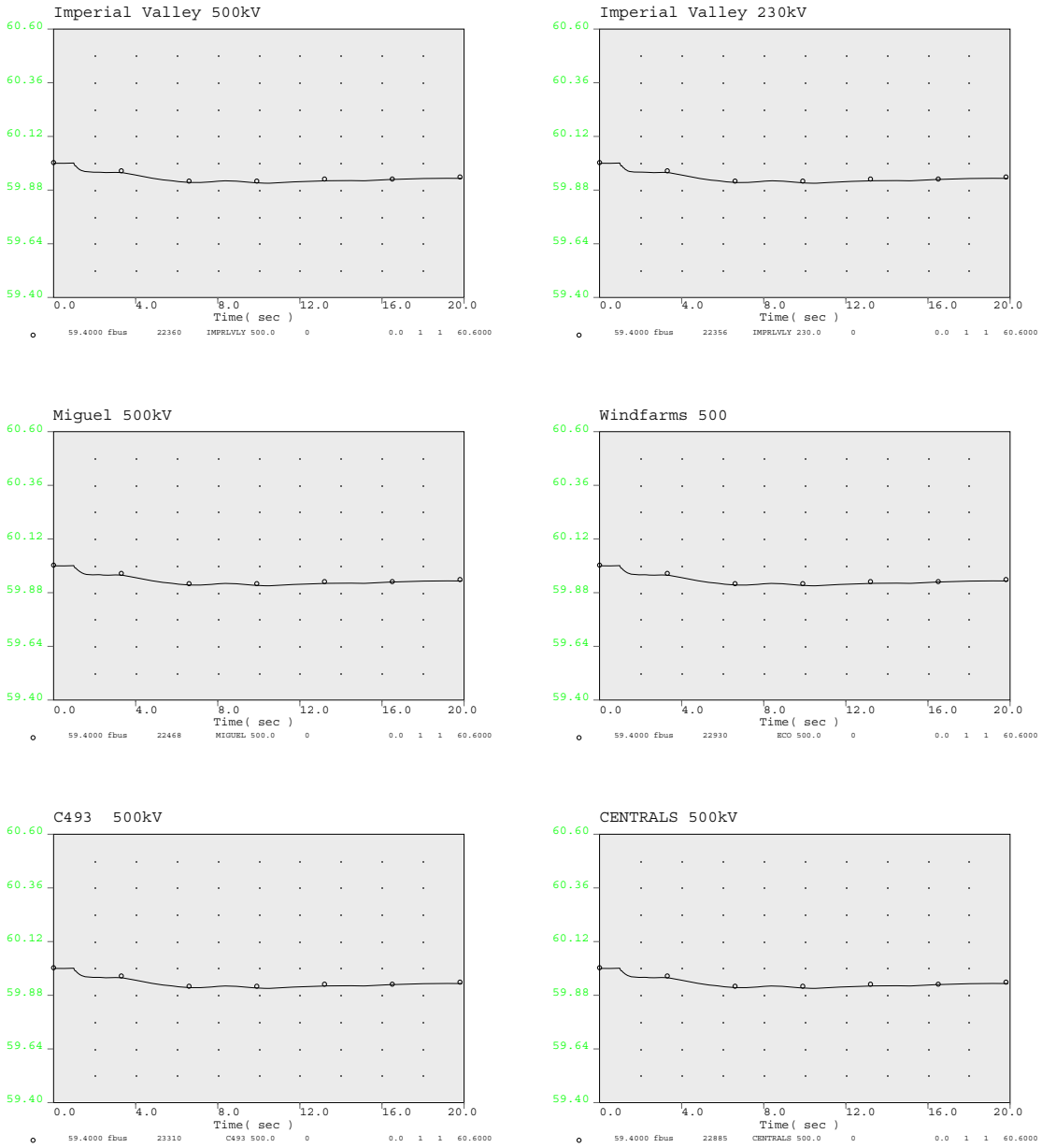


CENTRALS 500kV



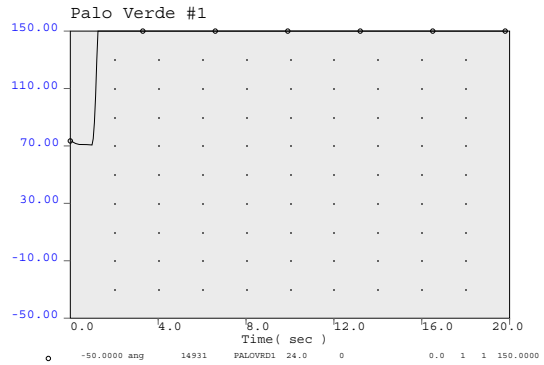
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

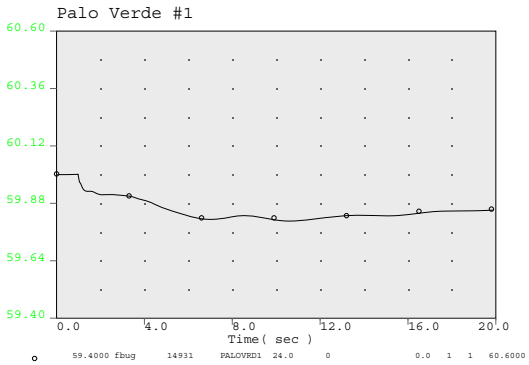
Imperial Valley Area - Frequency

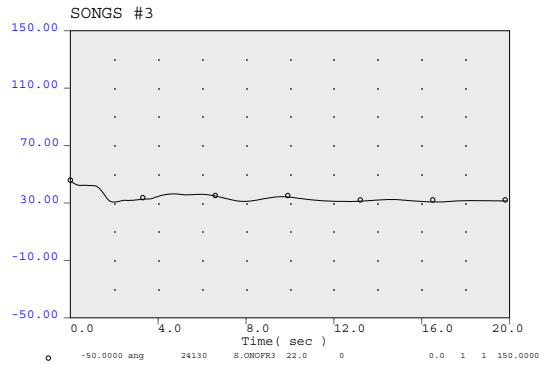


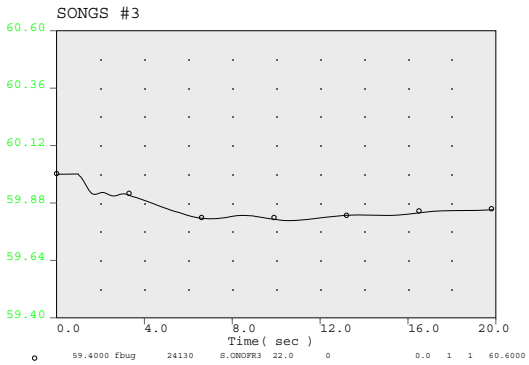
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generator #2

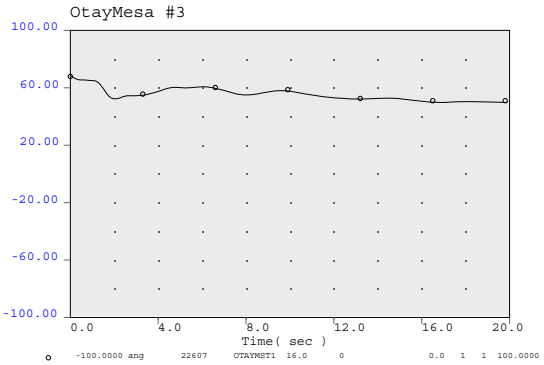
RELATIVE ROTOR ANGLE & FREQUENCY

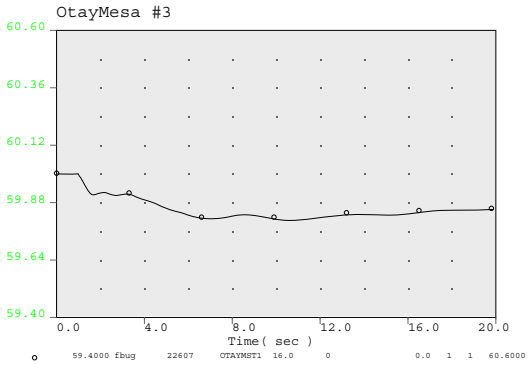








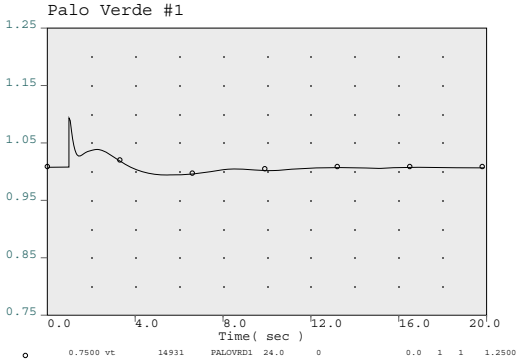




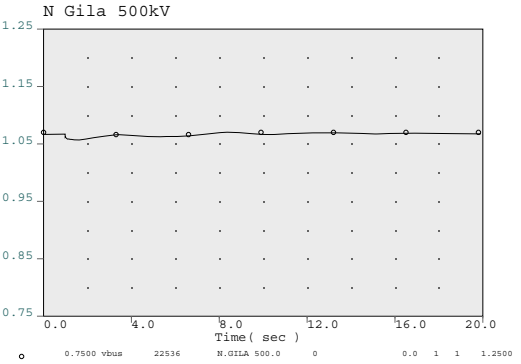
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

RELATIVE VOLTAGE

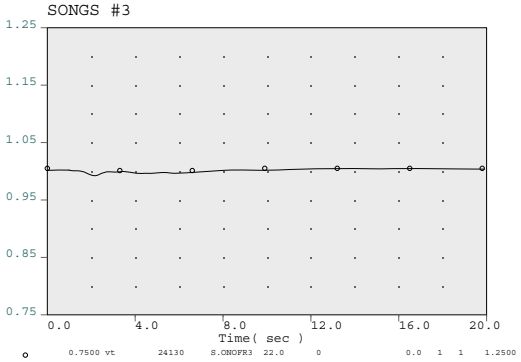
Palo Verde #1



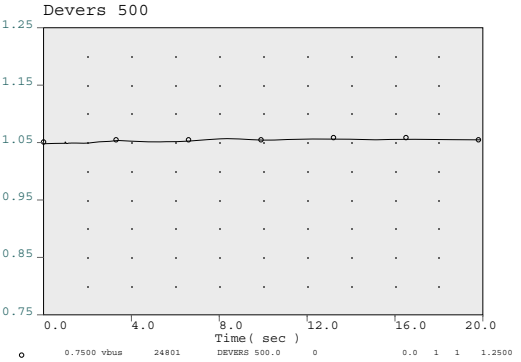
N Gila 500kV



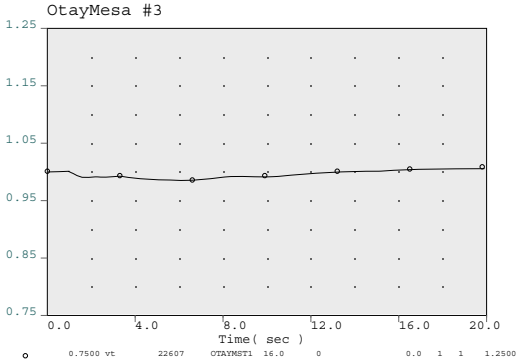
SONGS #3



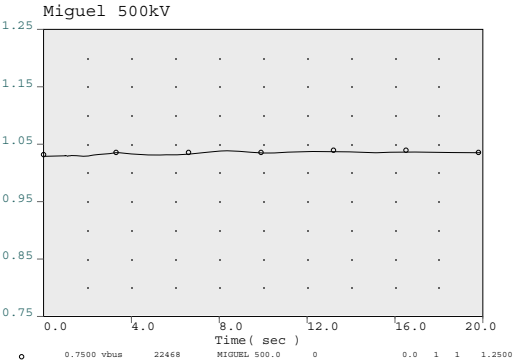
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OtayMesa #3



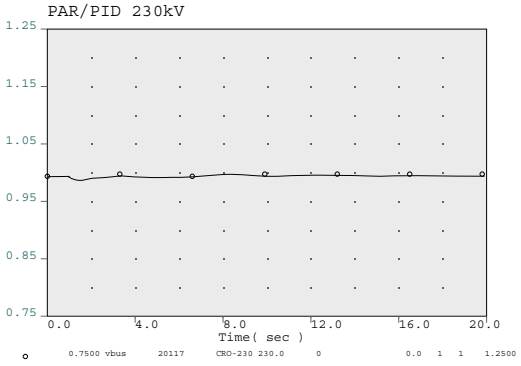
Miguel 500kV



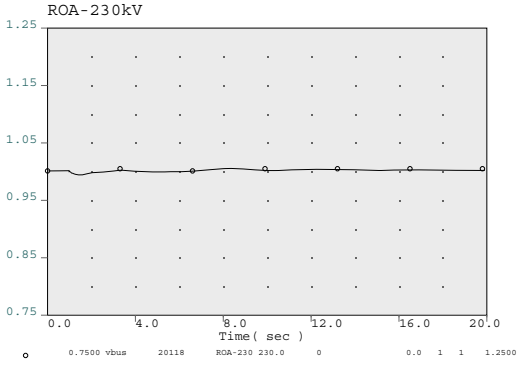
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Voltage Check and Comparison

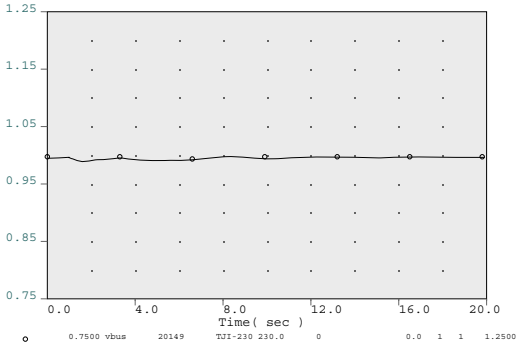
PAR/PID 230kV



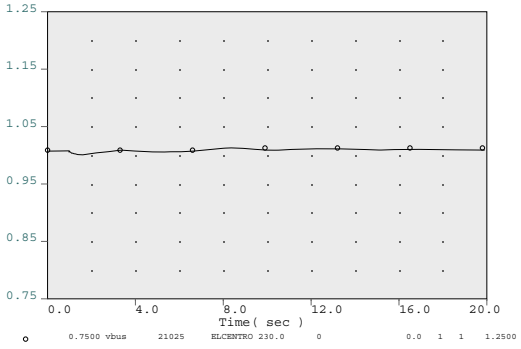
ROA-230kV



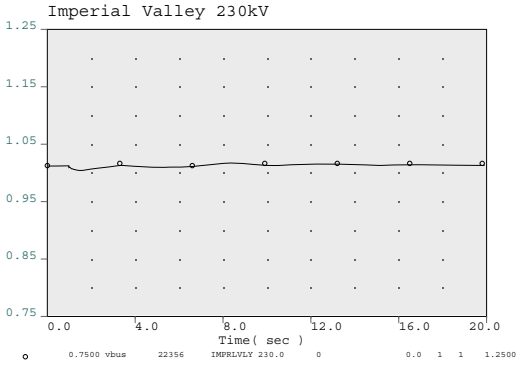
TJ1-230kV



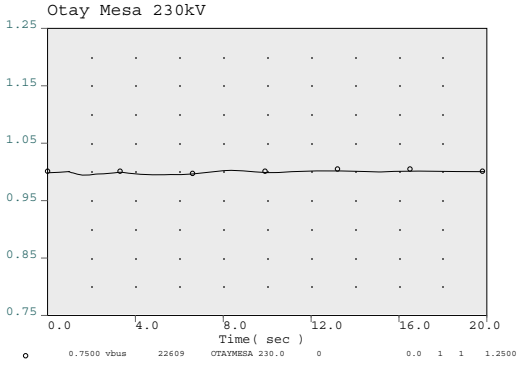
El Centro



Imperial Valley 230kV



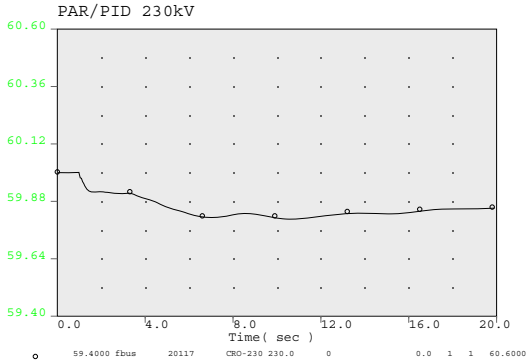
Otay Mesa 230kV



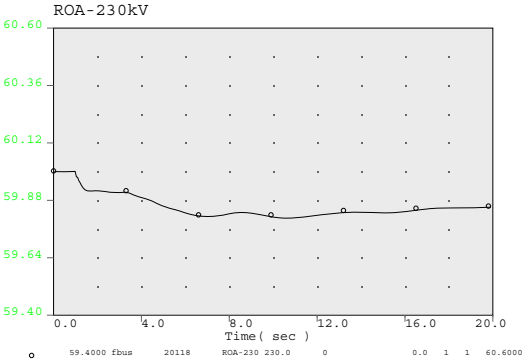
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

Affected System Frequency Check and Comparison

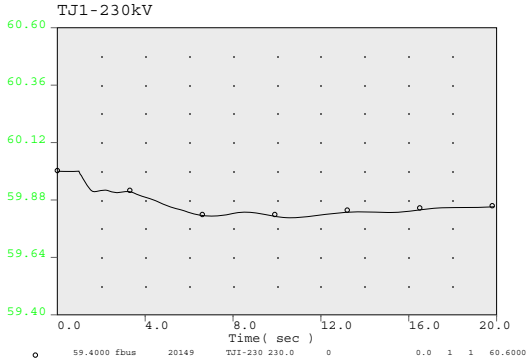
PAR/PID 230kV



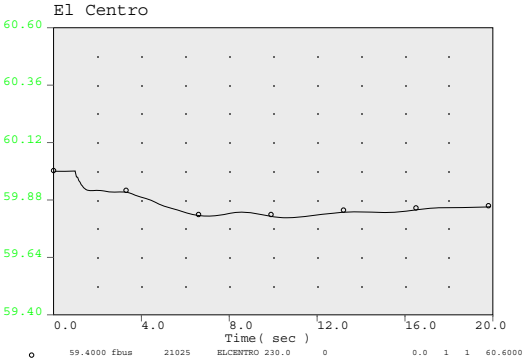
ROA-230kV



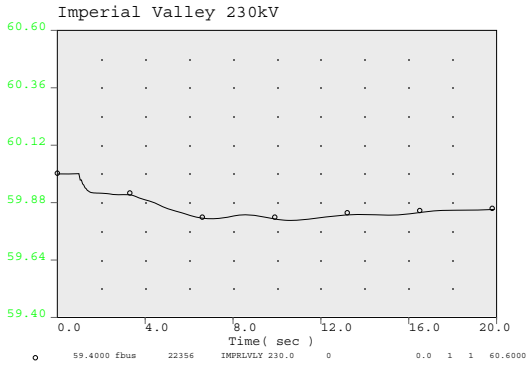
TJ1-230kV



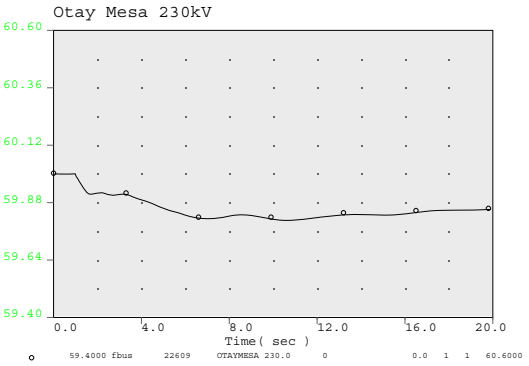
El Centro



Imperial Valley 230kV

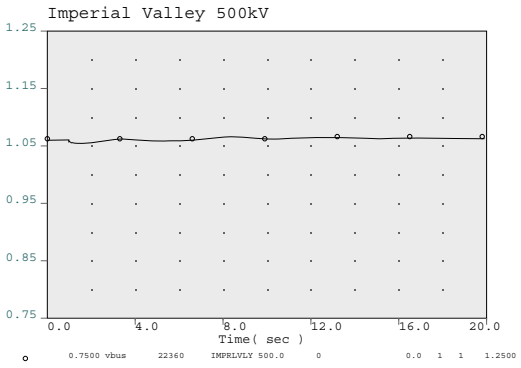


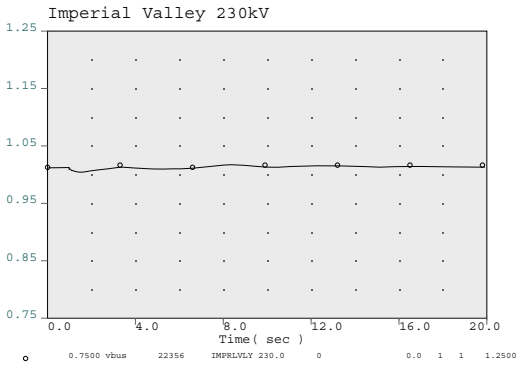
Otay Mesa 230kV

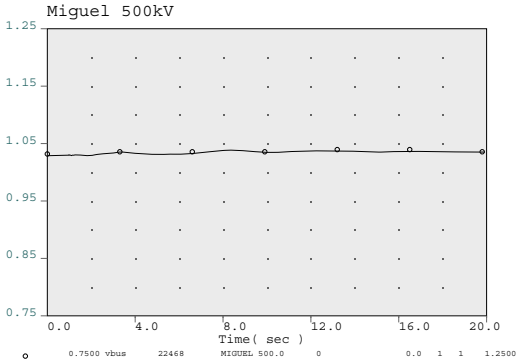


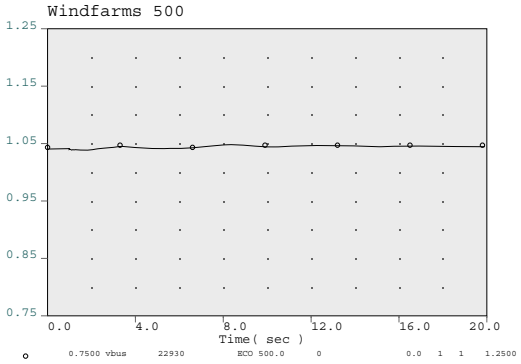
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

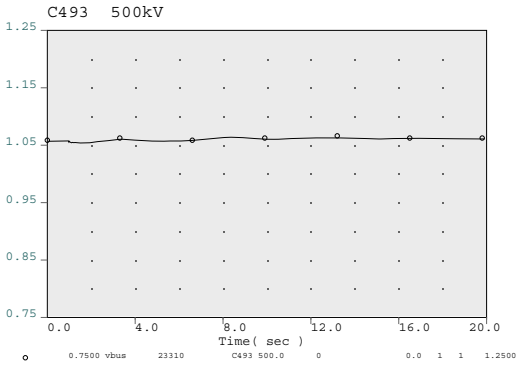
Imperial Valley Area - VOLTAGE

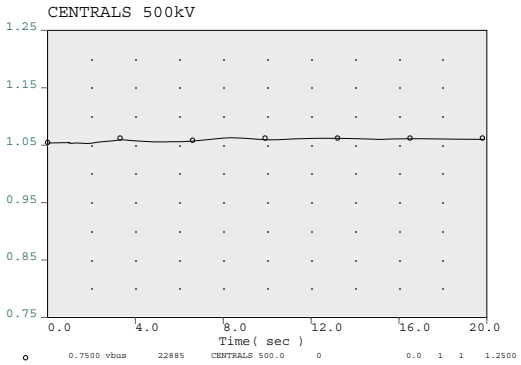






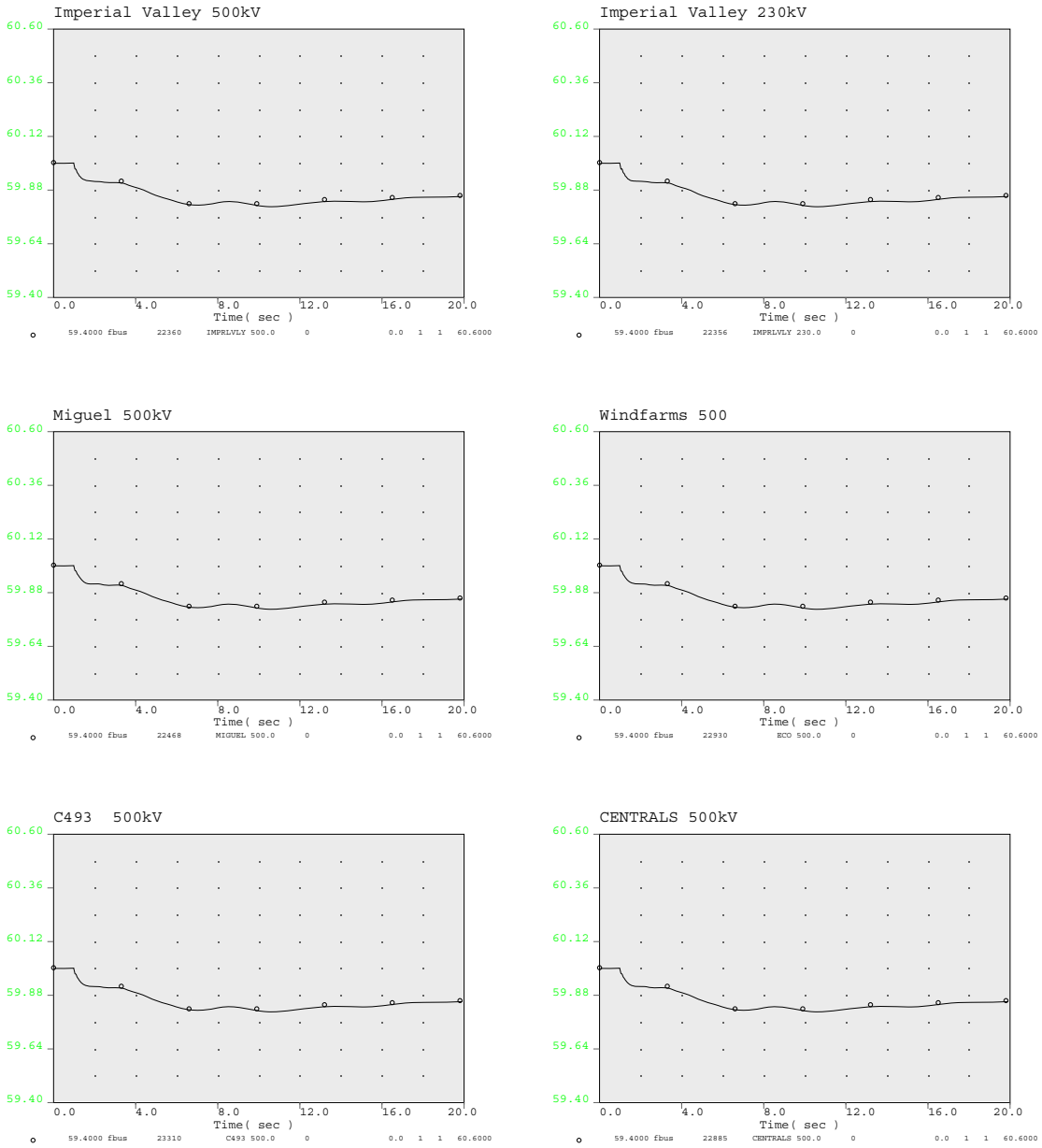






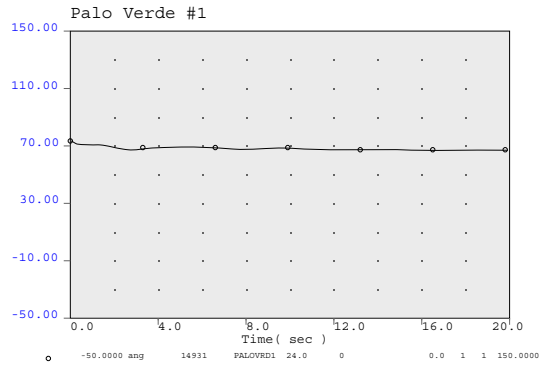
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

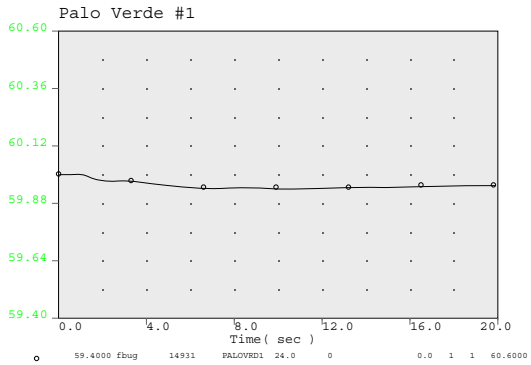
Imperial Valley Area - Frequency

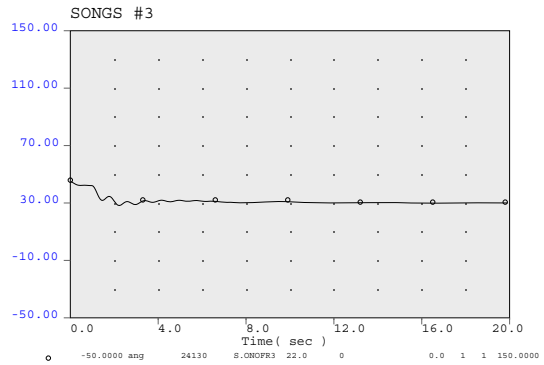


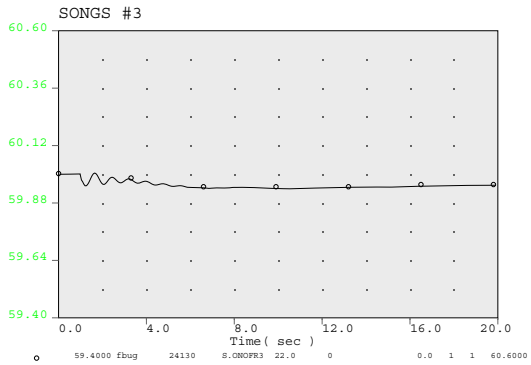
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip PaloVerde Generators 1 & 2

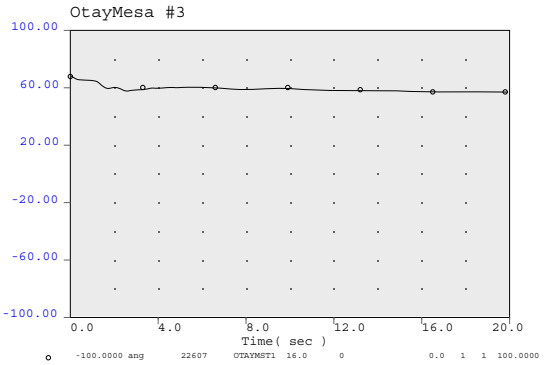
RELATIVE ROTOR ANGLE & FREQUENCY

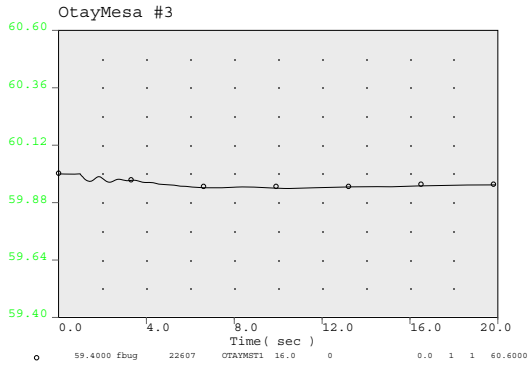










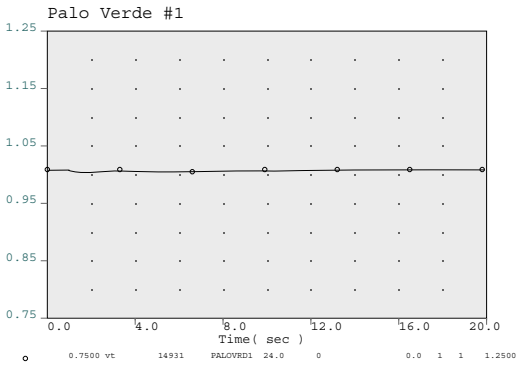


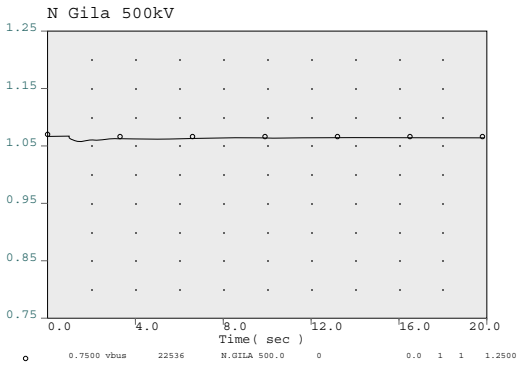
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

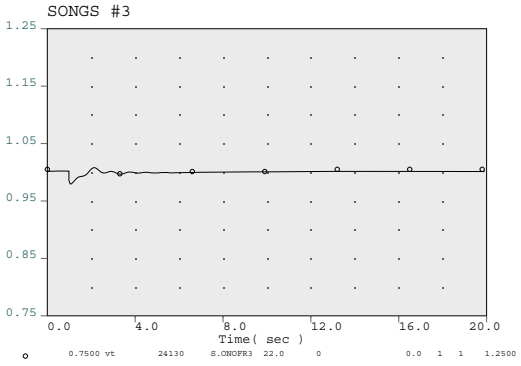
Page 1

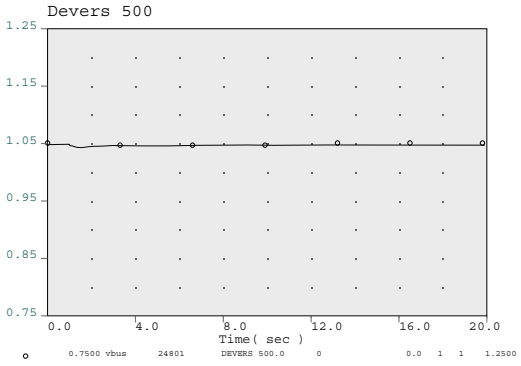
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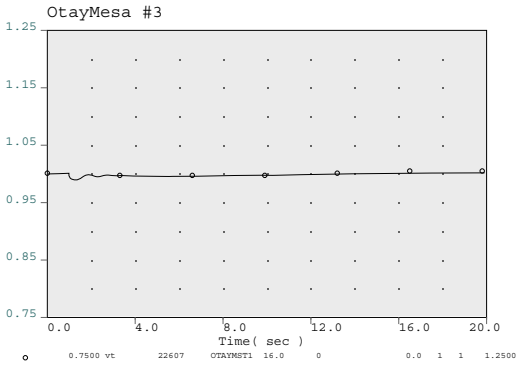
RELATIVE VOLTAGE

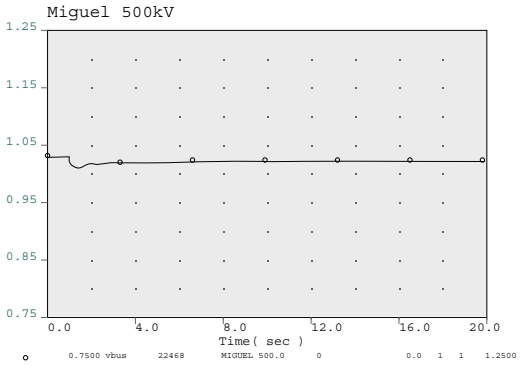








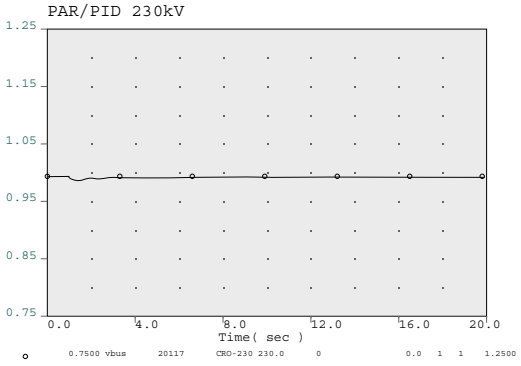




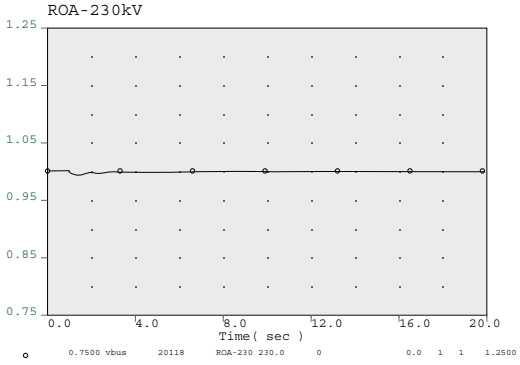
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

Affected System Voltage Check and Comparison

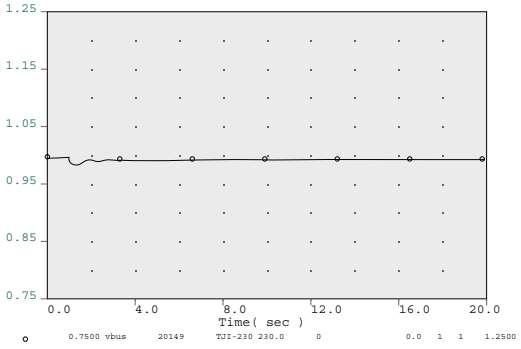
PAR/PID 230kV



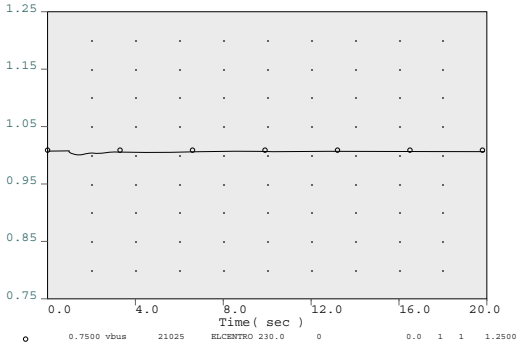
ROA-230kV



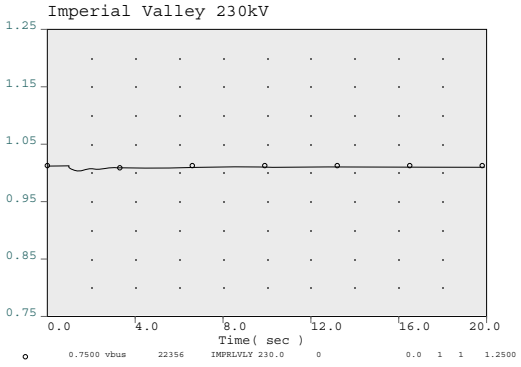
TJ1-230kV



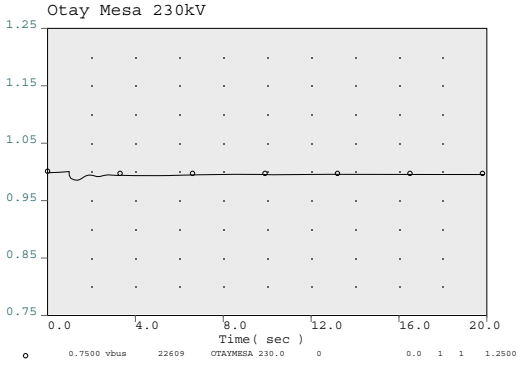
El Centro



Imperial Valley 230kV

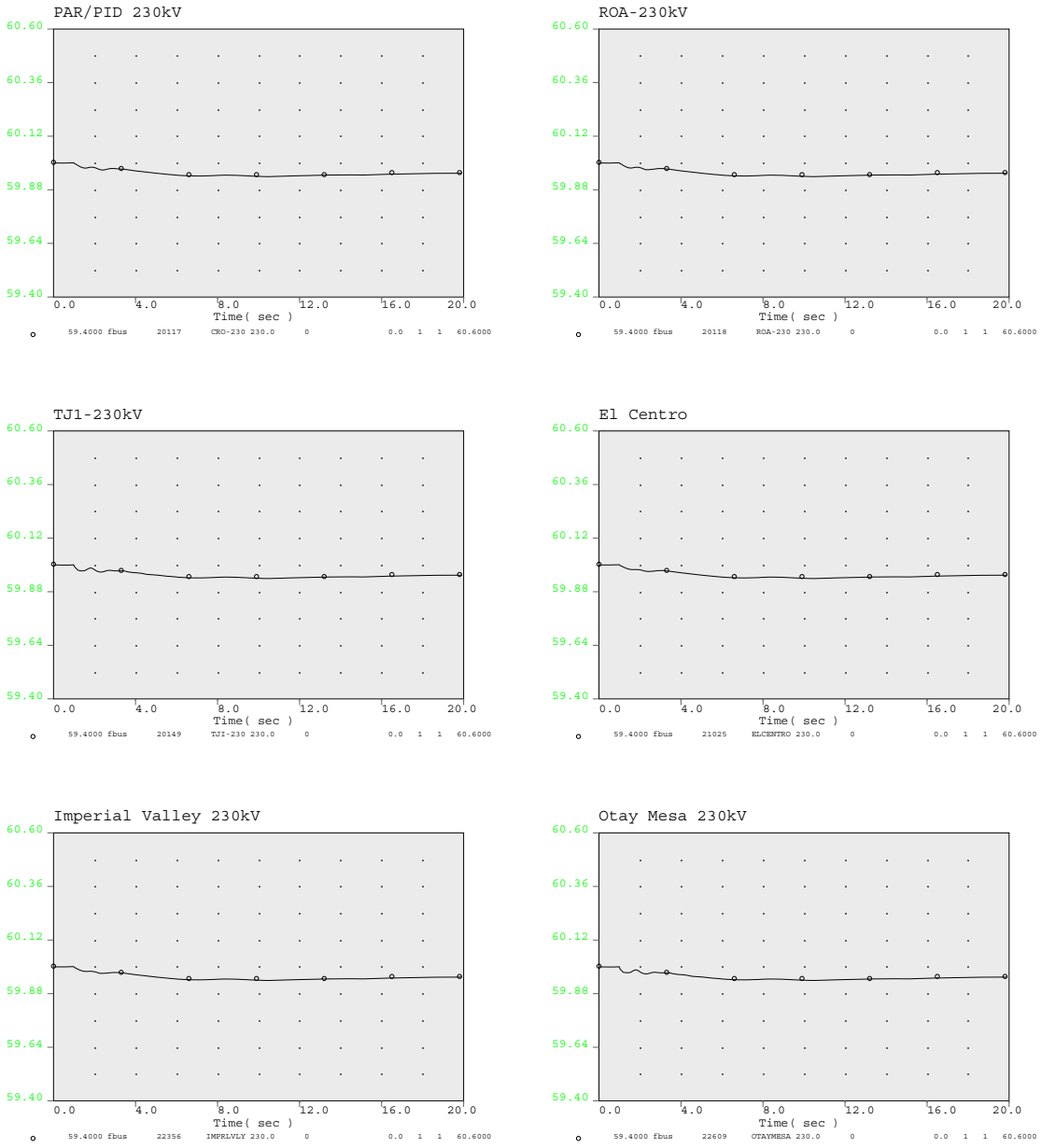


Otay Mesa 230kV



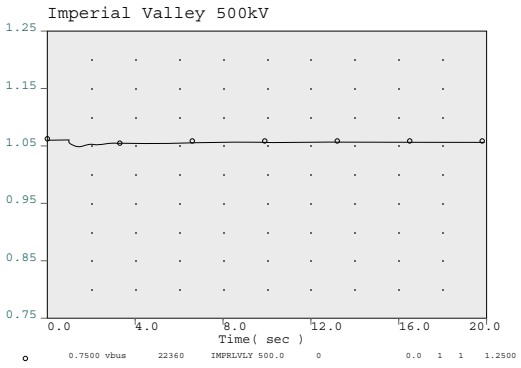
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

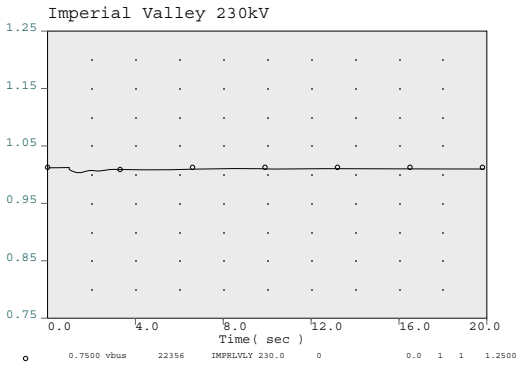
Affected System Frequency Check and Comparison

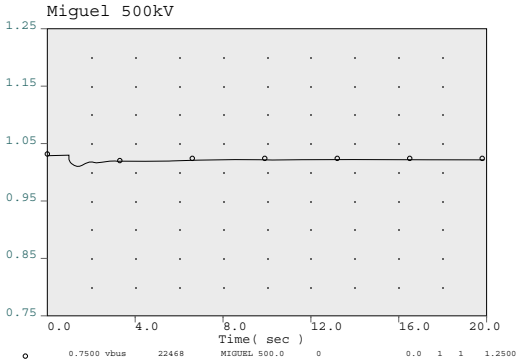


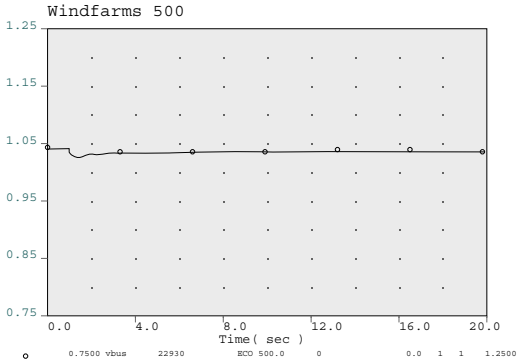
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

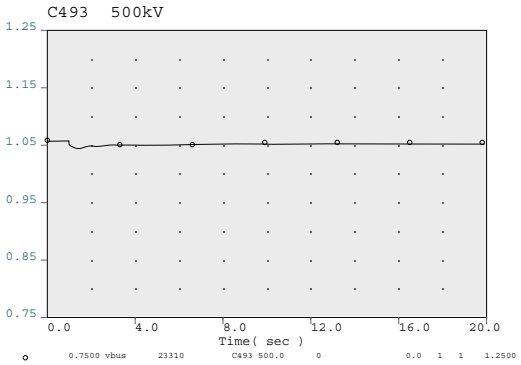
Imperial Valley Area - VOLTAGE

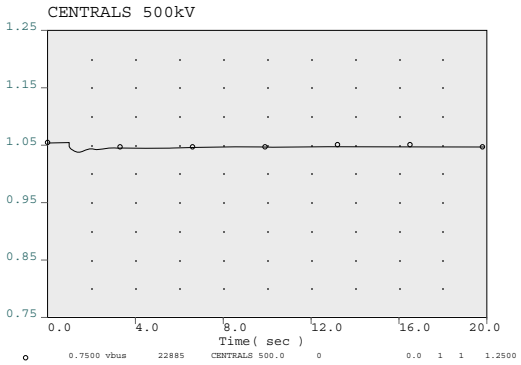










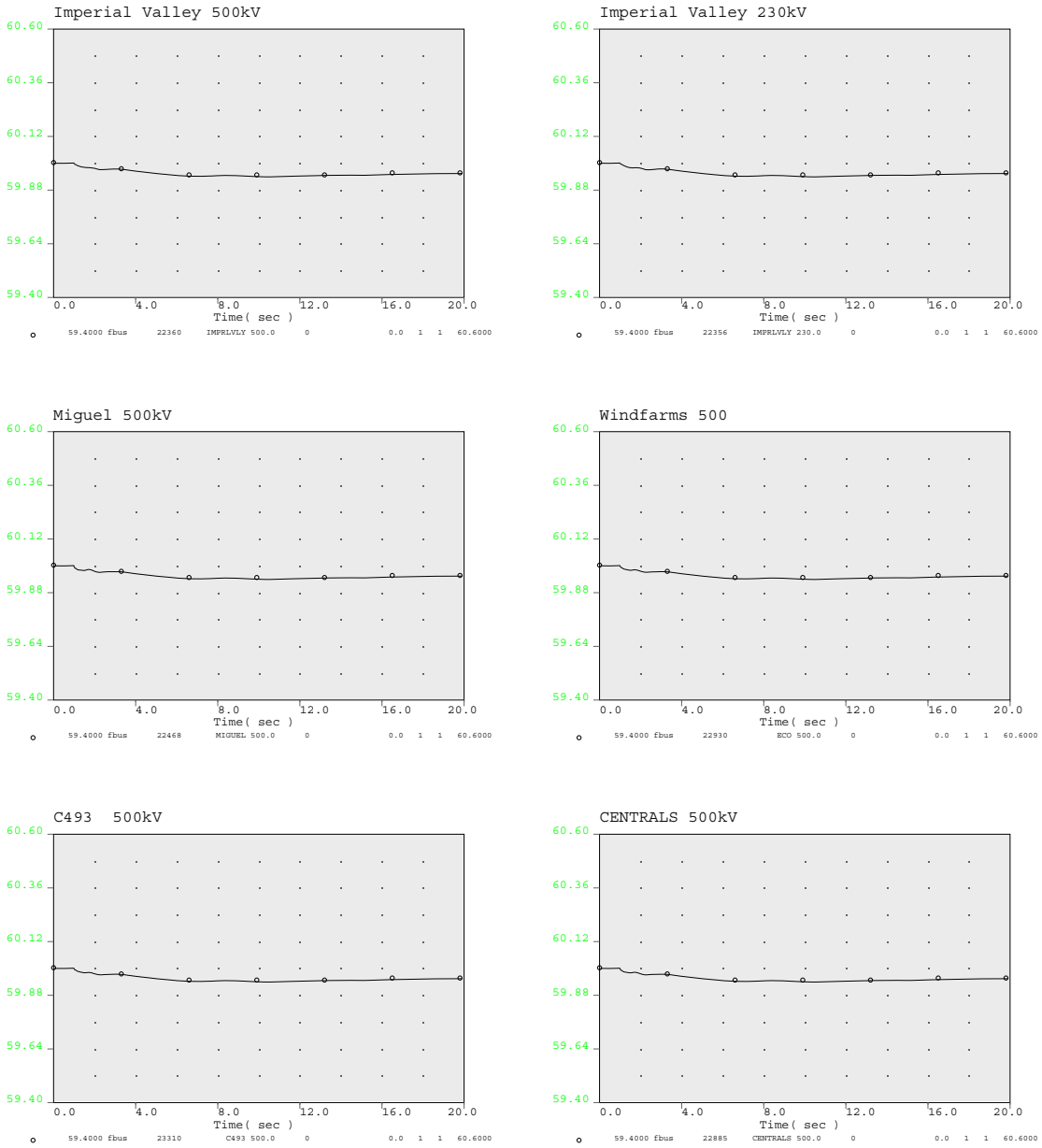


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

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SDGE	SONGS-g1_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:45:17 2010

Imperial Valley Area - Frequency

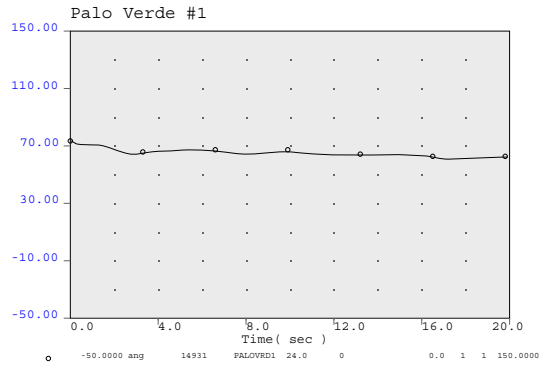


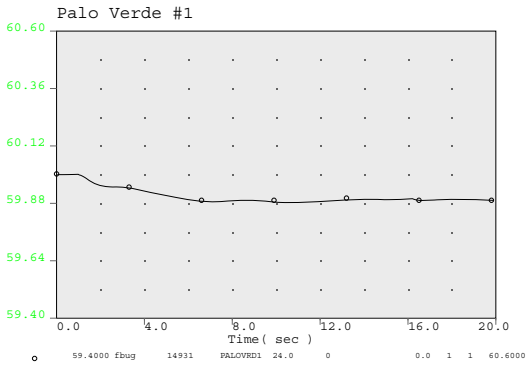
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generator #2

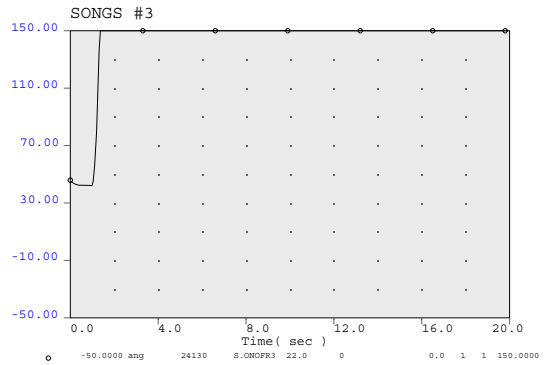
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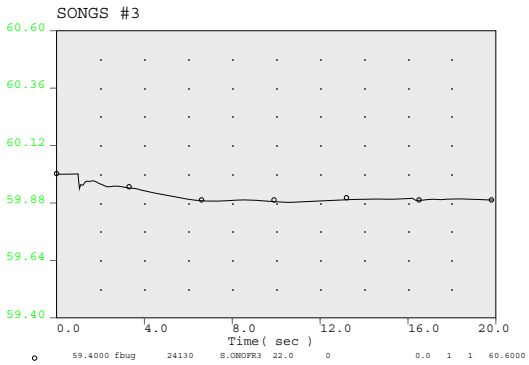
SDGE	SONGS-g1_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:45:17 2010

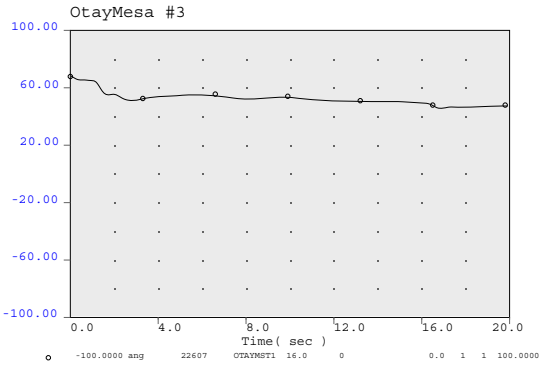
RELATIVE ROTOR ANGLE & FREQUENCY

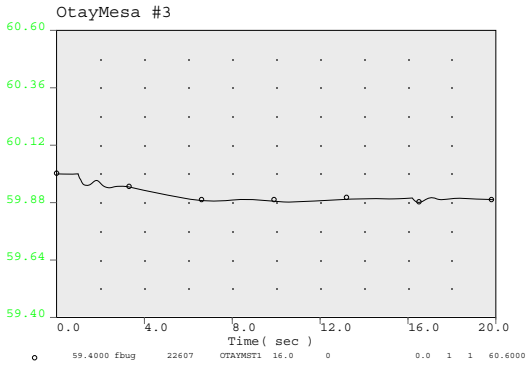










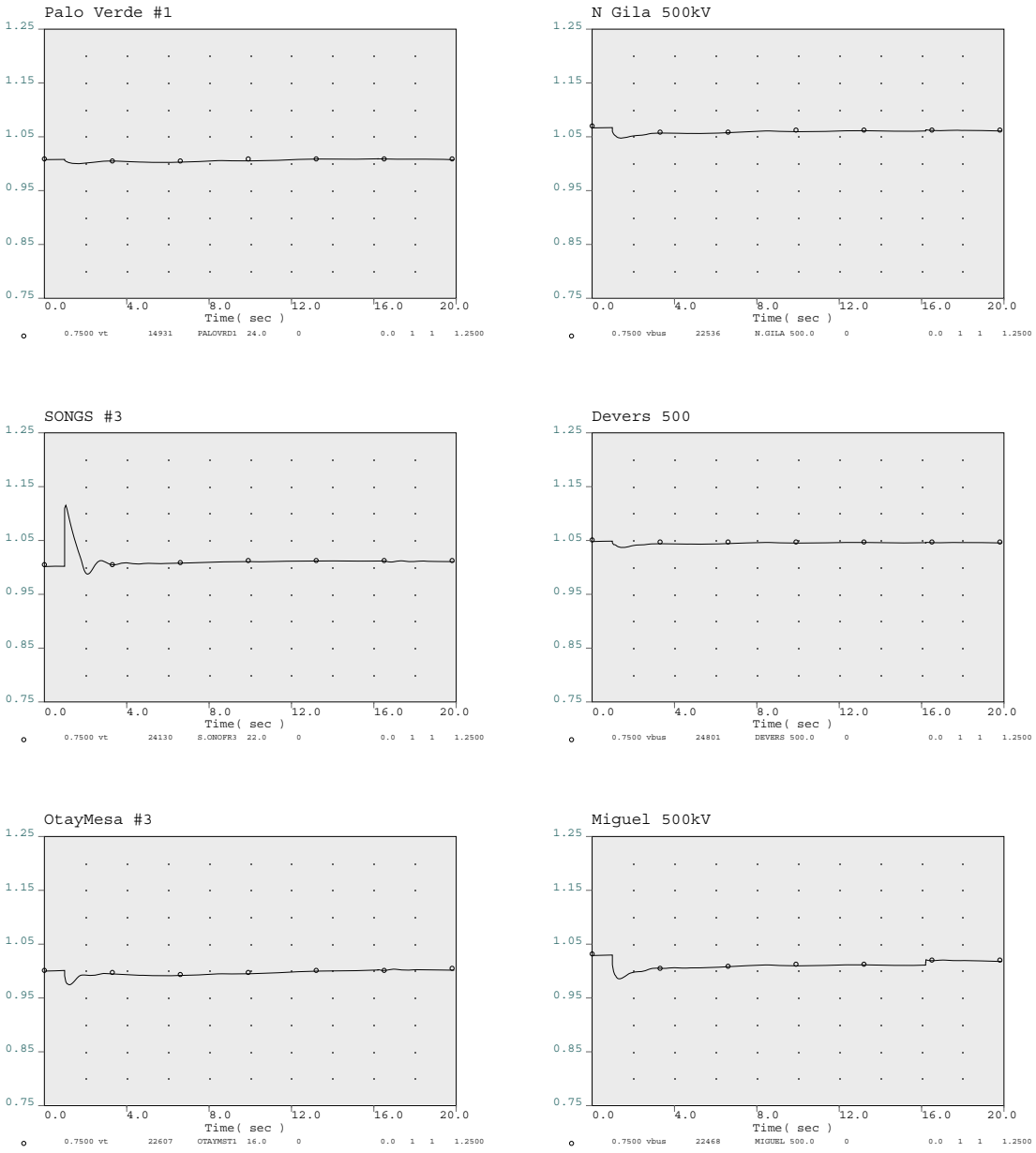


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 1

SDGE	SONGS-g2_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:45:42 2010

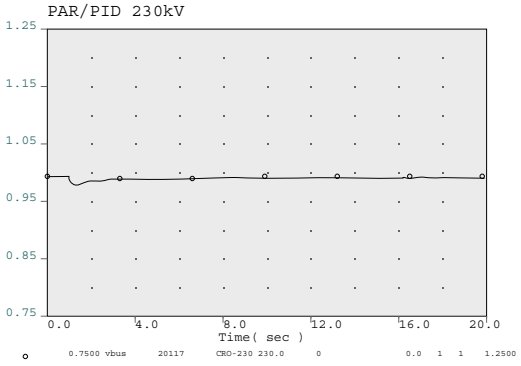
RELATIVE VOLTAGE



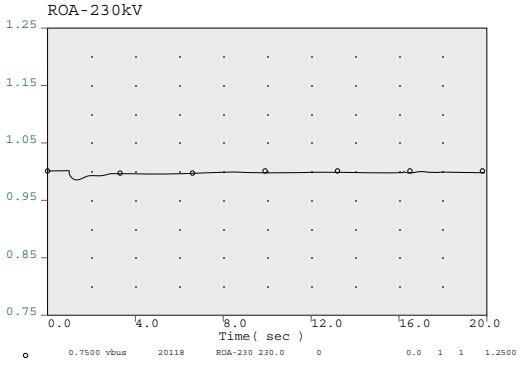
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Affected System Voltage Check and Comparison

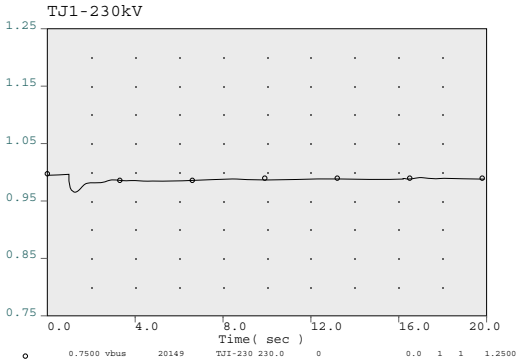
PAR/PID 230kV



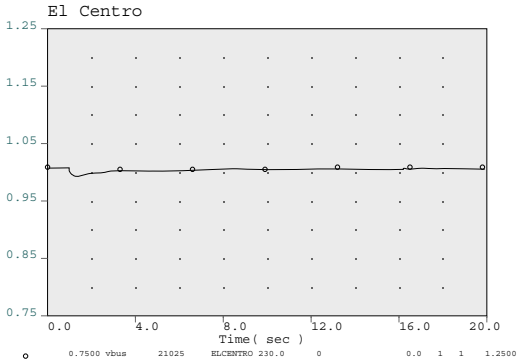
ROA-230kV



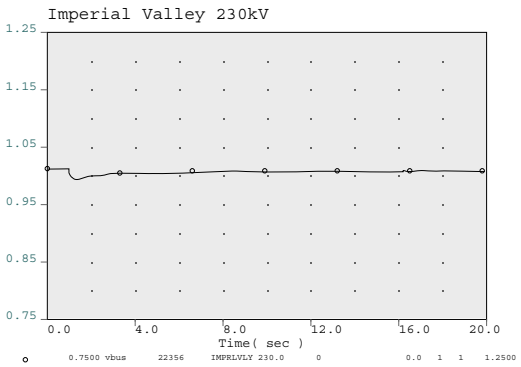
TJ1-230kV



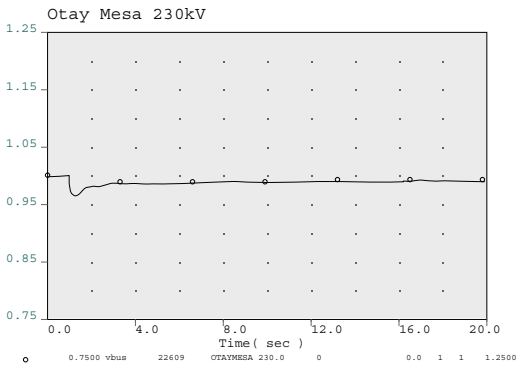
El Centro



Imperial Valley 230kV



Otay Mesa 230kV

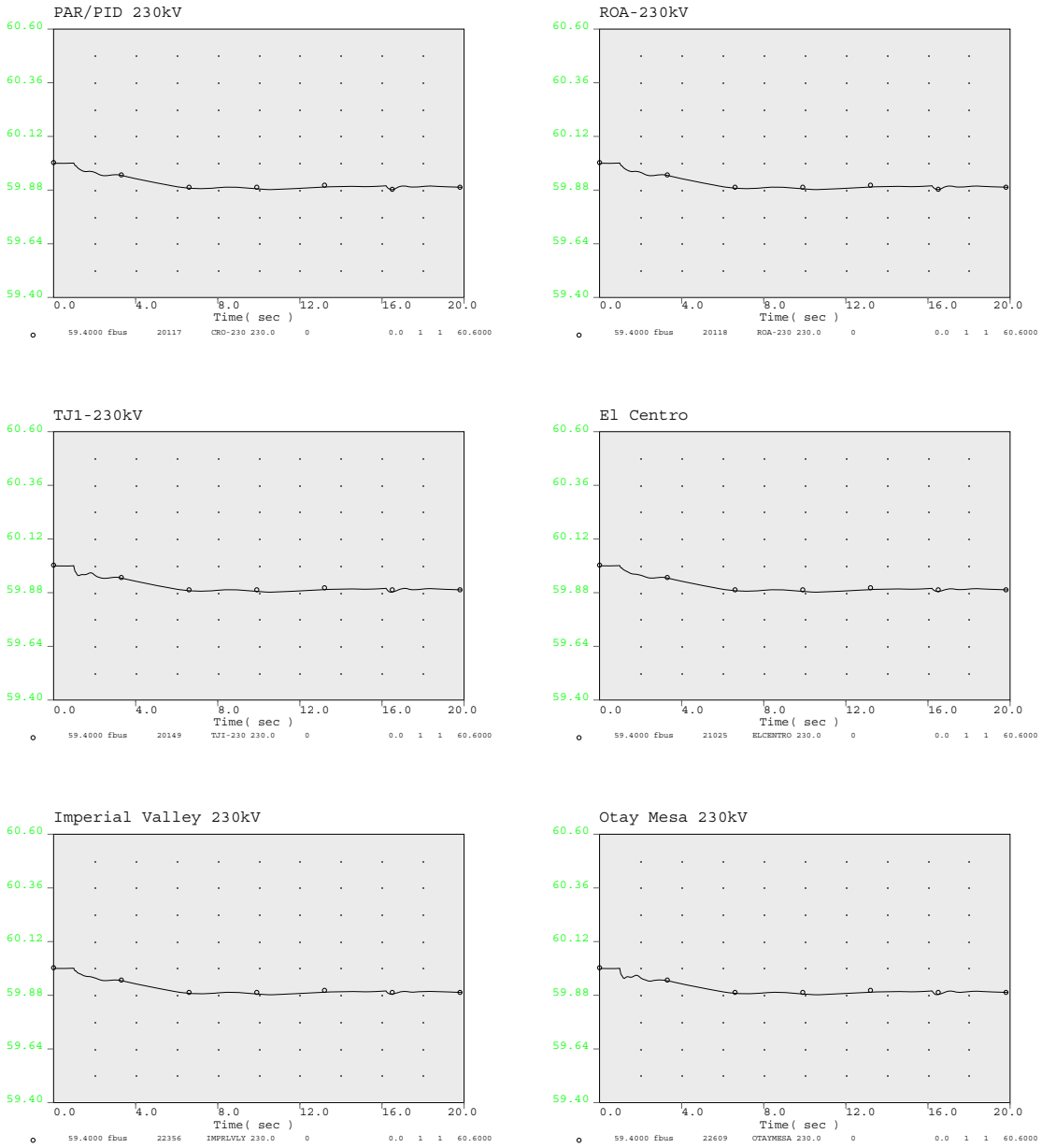


SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Page 3

SDGE	SONGS-g2_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:45:42 2010

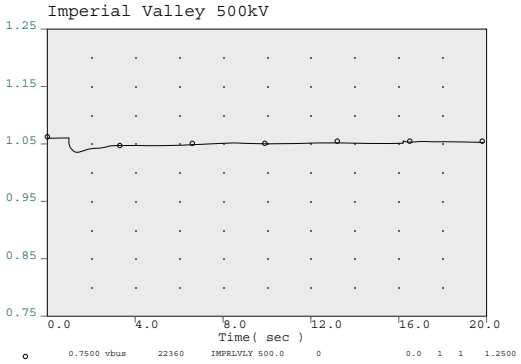
Affected System Frequency Check and Comparison



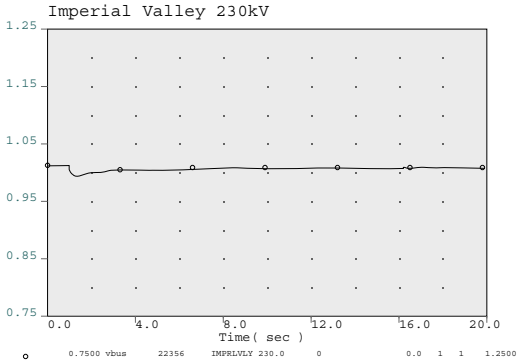
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

Imperial Valley Area - VOLTAGE

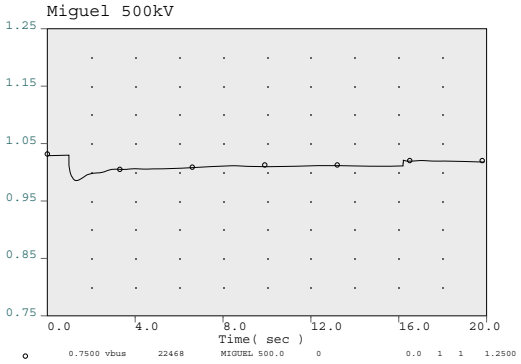
Imperial Valley 500kV



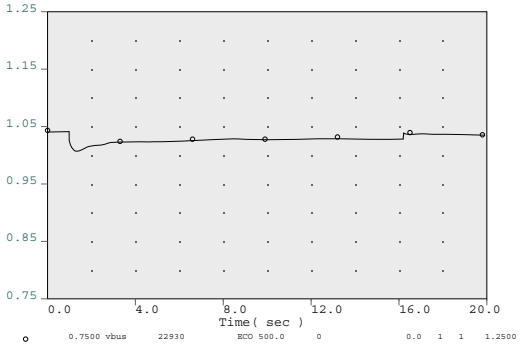
Imperial Valley 230kV



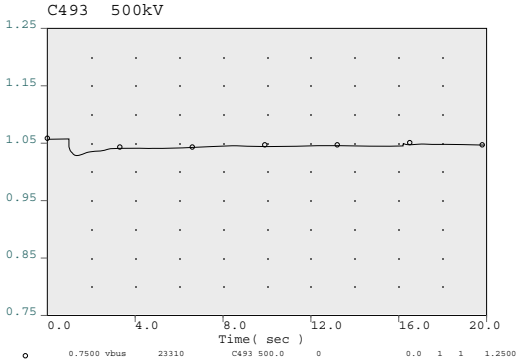
Miguel 500kV



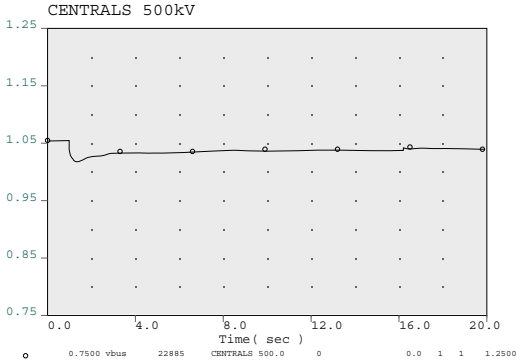
Windfarms 500



C493 500kV

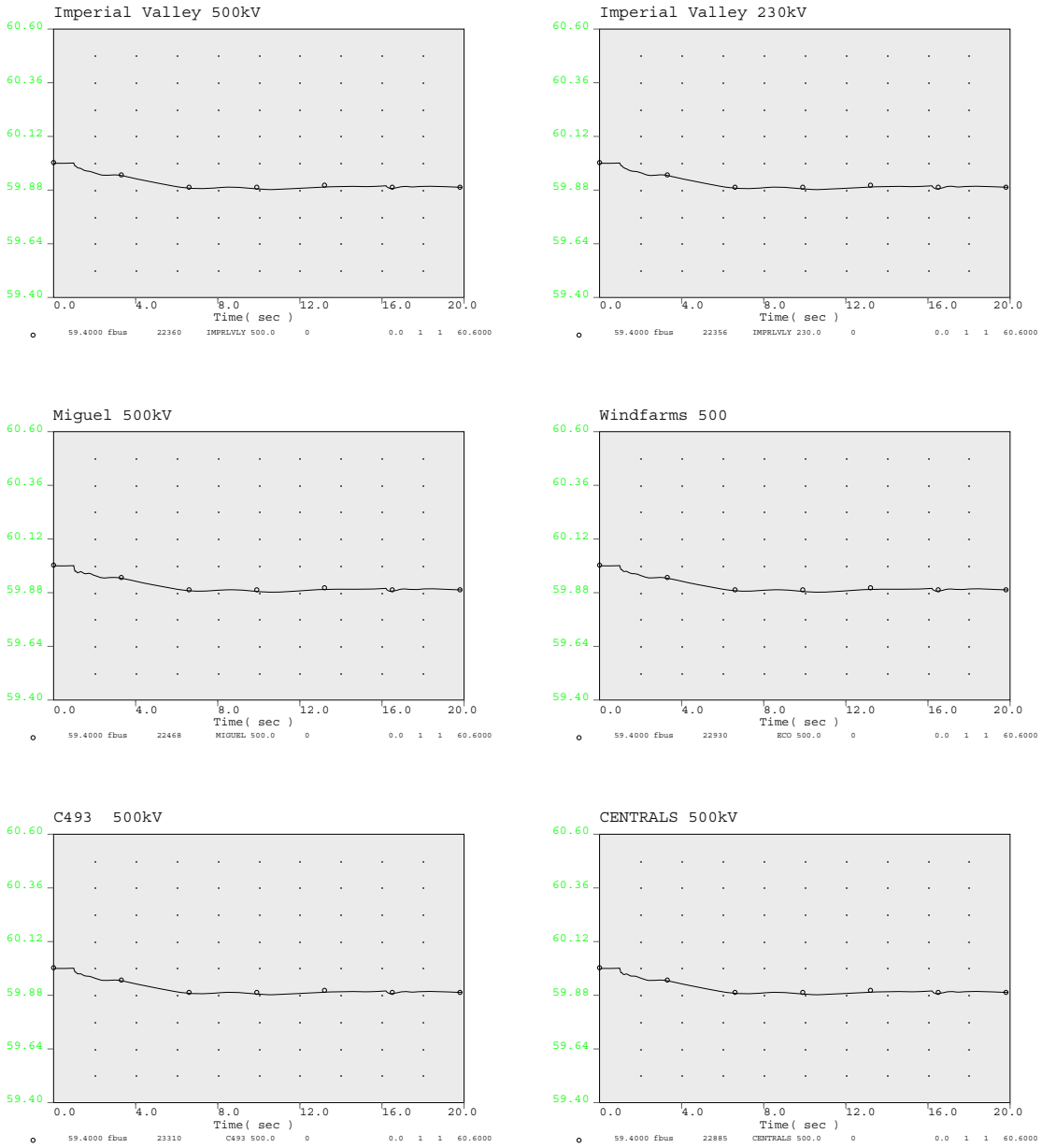


CENTRALS 500kV



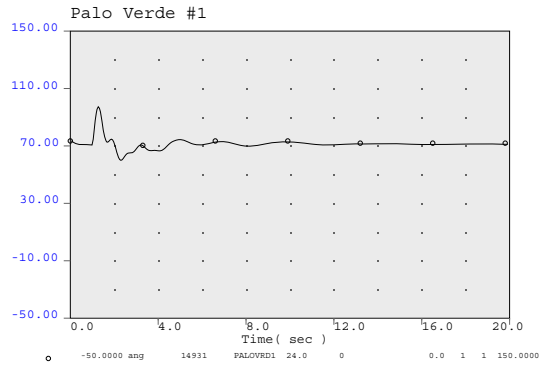
SDG&E Cluster 2 - post
2014 Heavy Summer
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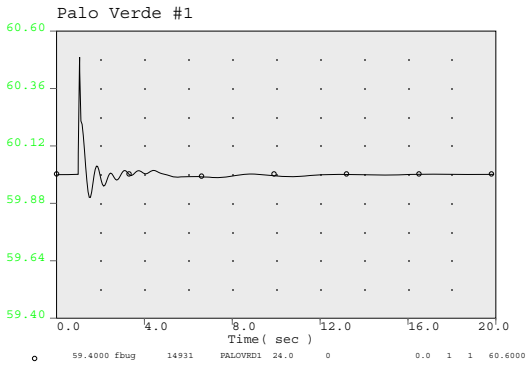
Imperial Valley Area - Frequency

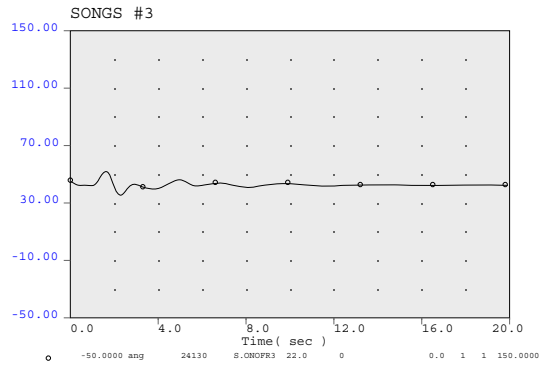


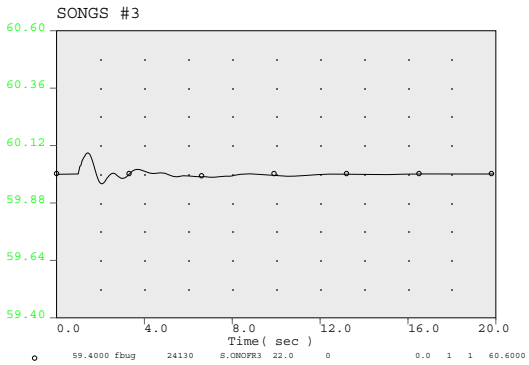
SDG&E Cluster 2 - post
2014 Heavy Summer
Trip San Onofre Generators 2 & 3

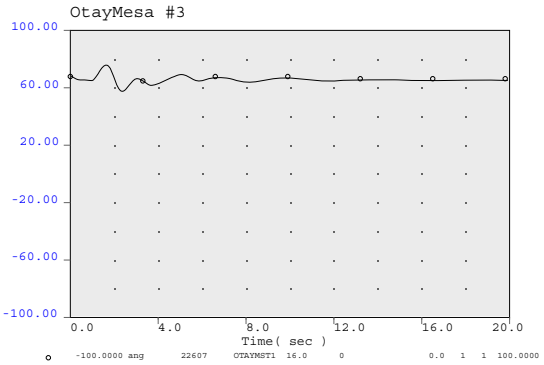
RELATIVE ROTOR ANGLE & FREQUENCY

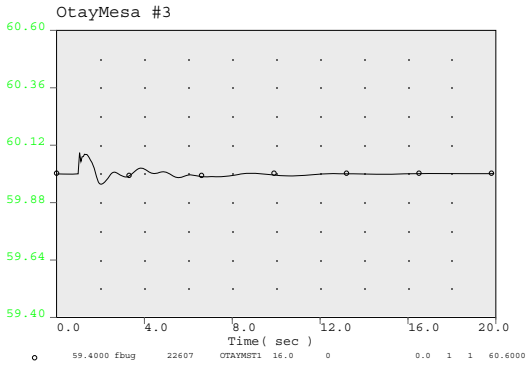












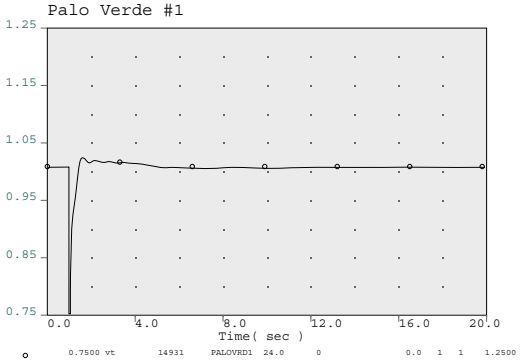
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Page 1

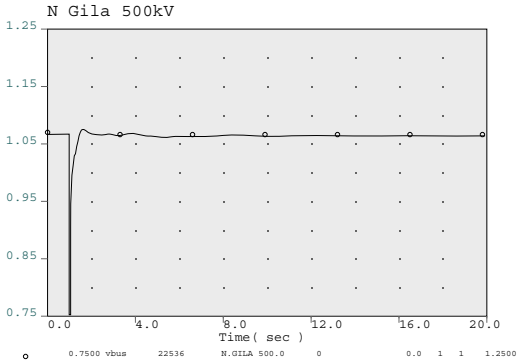
SDGE	T468_HAA_slo_pst_int5_hs.chf	b\hs\pst_int5\ws_pst_int5 Wed Oct 13 16:46:11 2010

RELATIVE VOLTAGE

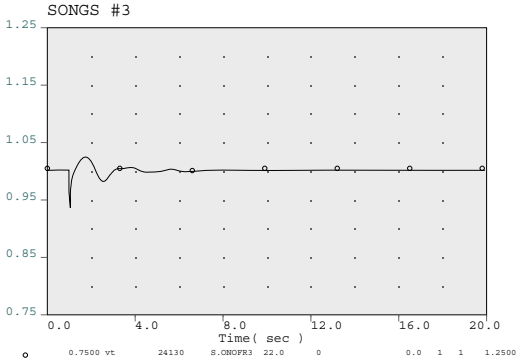
Palo Verde #1



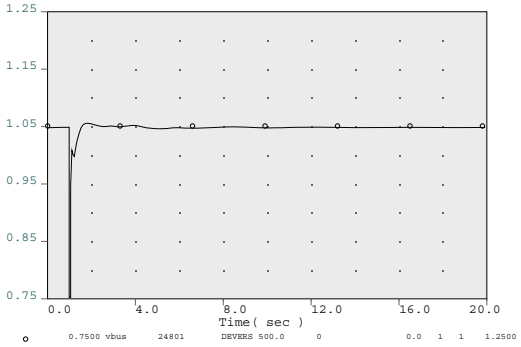
N Gila 500kV



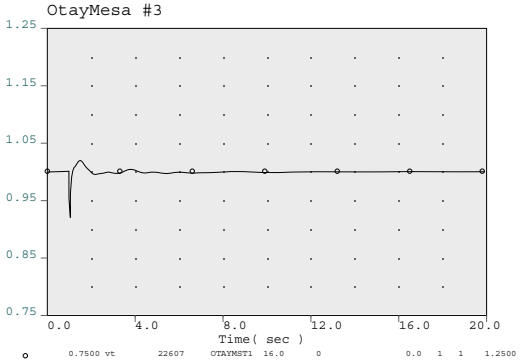
SONGS #3



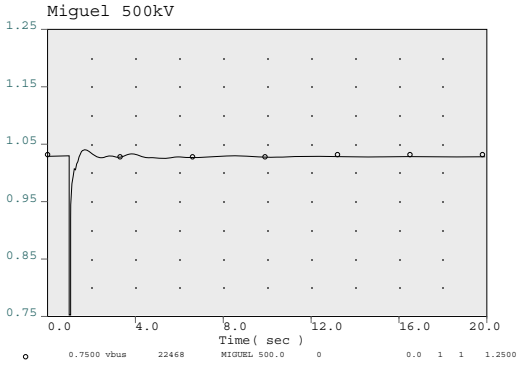
Devers 500



OtayMesa #3



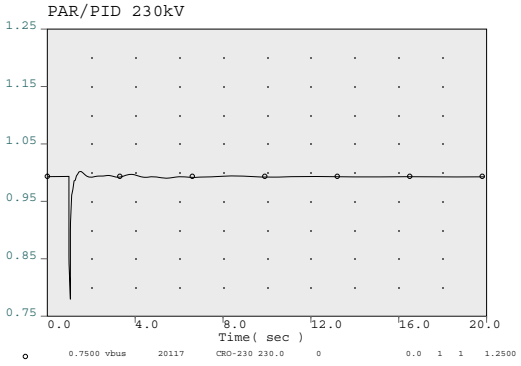
Miguel 500kV



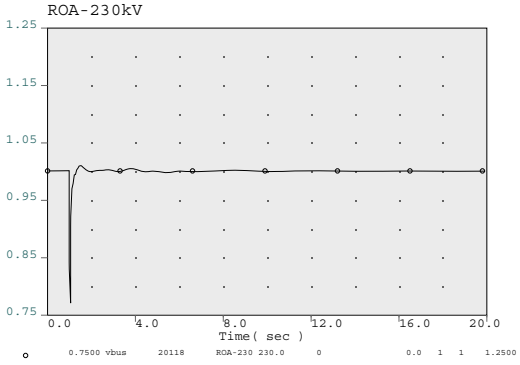
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Voltage Check and Comparison

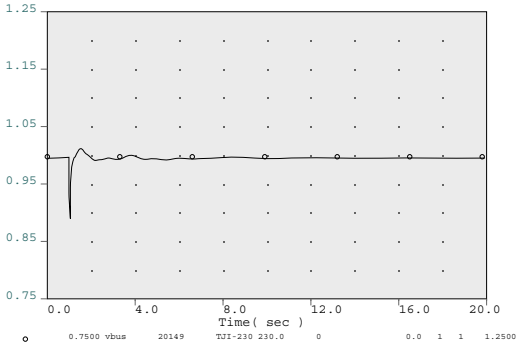
PAR/PID 230kV



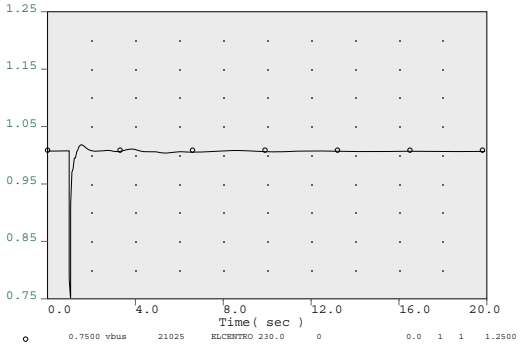
ROA-230kV



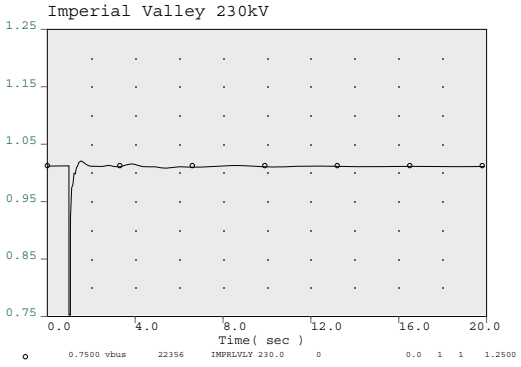
TJ1-230kV



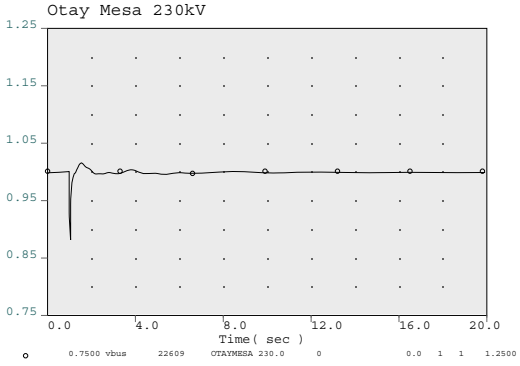
El Centro



Imperial Valley 230kV



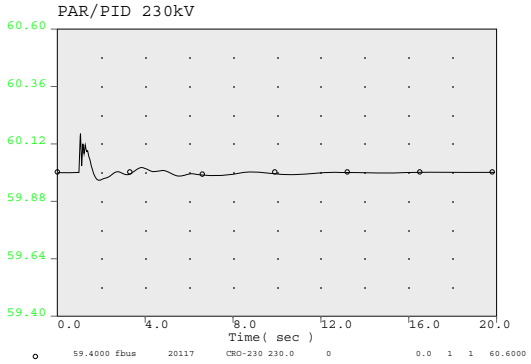
Otay Mesa 230kV



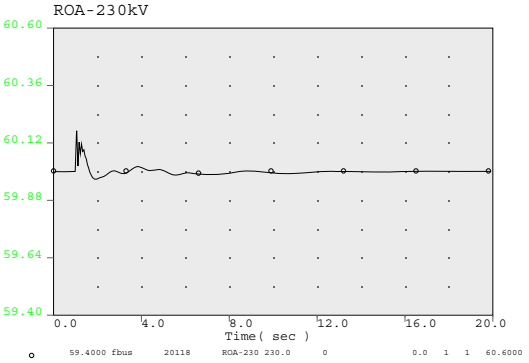
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Affected System Frequency Check and Comparison

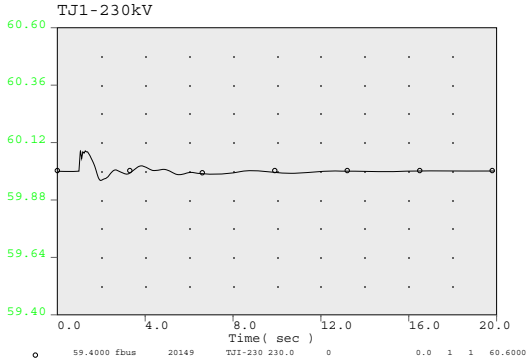
PAR/PID 230kV



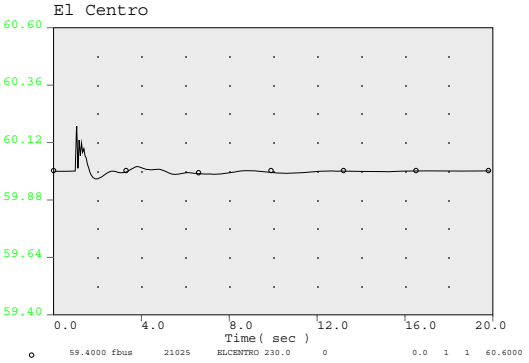
ROA-230kV



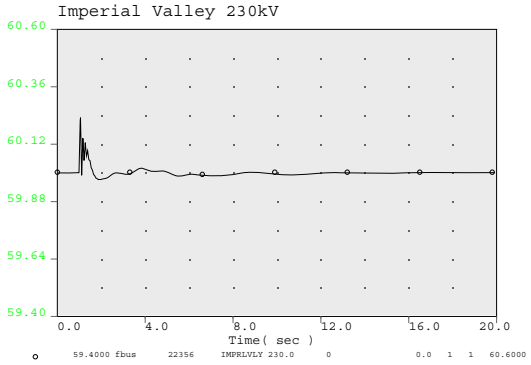
TJ1-230kV



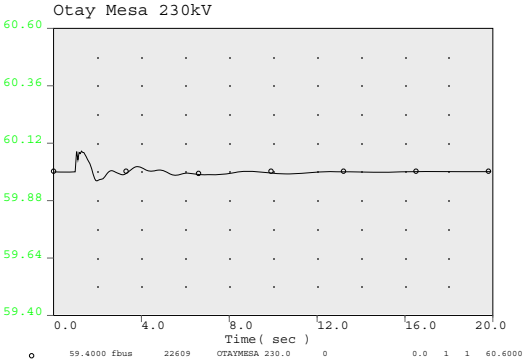
El Centro



Imperial Valley 230kV



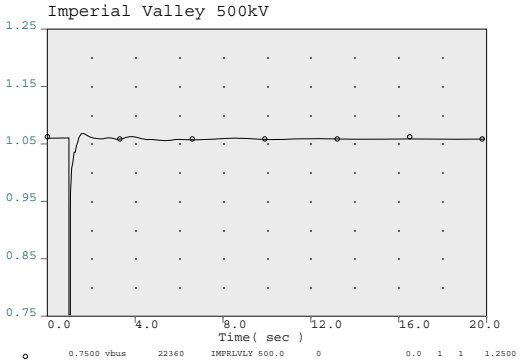
Otay Mesa 230kV



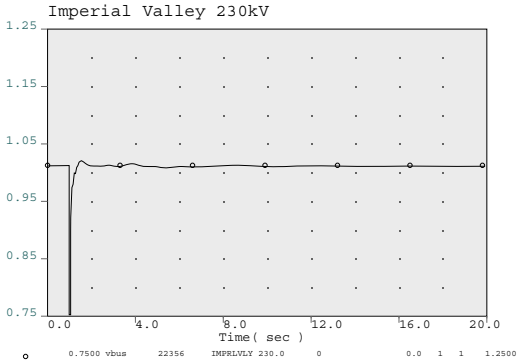
SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Imperial Valley Area - VOLTAGE

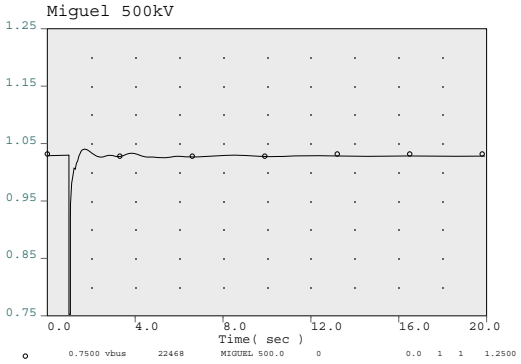
Imperial Valley 500kV



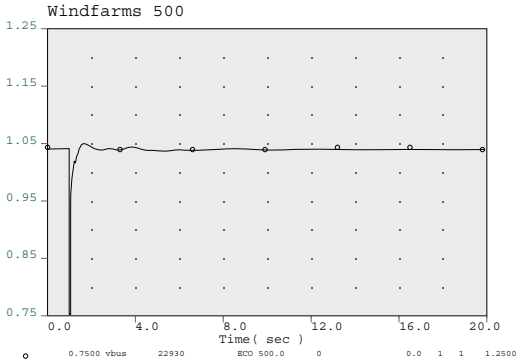
Imperial Valley 230kV



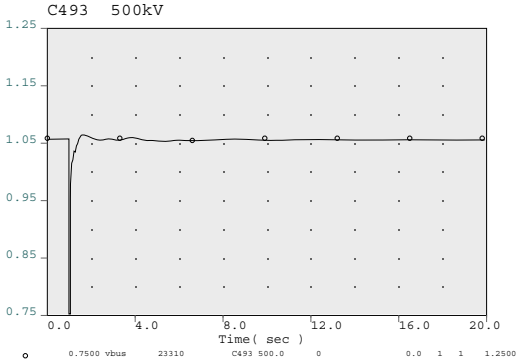
Miguel 500kV



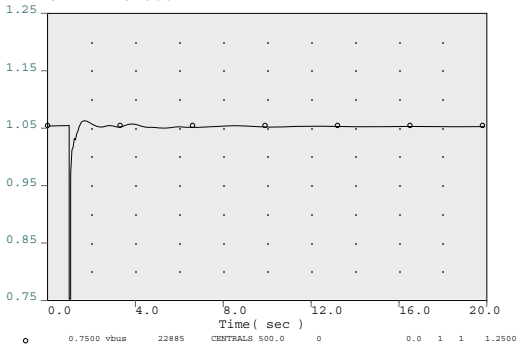
Windfarms 500



C493 500kV



CENTRALS 500kV



SDG&E Cluster 2 - post
2014 Heavy Summer
T468-Hassyampa 500 kV line

Appendix K

Post-Transient:
Voltage and Reactive Power Deficiency Results
And
Contingency Lists

Heavy Summer Category B Post Transient Voltage Stability Analysis Results

Name	Contingency	Data	HS Pre-IVA Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-BU Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-INT Cluster	HS Post-INT Cluster w/ Delivery Network Upgrades
CENTRALS12.0	ECO-ML	Limit	0.0500		0.0500			
		Delta V	0.0505		0.0507			
		Violation	-0.0005		-0.0007			
CENTRALS230.	ECO-ML	Limit	0.0500		0.0500		0.0500	
		Delta V	0.0561		0.0563		0.0552	
		Violation	-0.0061		-0.0063		-0.0052	
CENTRMPS500.	ECO-ML	Limit	0.0500		0.0500		0.0500	
		Delta V	0.0557		0.0559		0.0548	
		Violation	-0.0057		-0.0059		-0.0048	
SYCAMORE230.	ECO-ML	Limit			0.0500			
		Delta V			0.0501			
		Violation			-0.0001			

Heavy Summer Category C Post Transient Voltage Stability Analysis Results

Name	Contingency	Data	HS Pre-IVA Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-BU Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-INT Cluster	HS Post-INT Cluster w/ Delivery Network Upgrades
		Limit						
		Delta V						
		Violation						

Light Load Category B Post Transient Voltage Stability Analysis Results

Name	Contingency	Data	LL Pre-IVA Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-BU Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-INT Cluster	LL Post-INT Cluster w/ Delivery Network Upgrades
BARRETT 69.0	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0695		0.0703			
		Violation	0.0195		0.0203			
CAMERNTP69.0	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0525		0.0533			
		Violation	0.0025		0.0033			
CAMERON 69.0	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0640		0.0648			
		Violation	0.0140		0.0148			
CRESTWD 69.0	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0522		0.0529			
		Violation	0.0022		0.0029			
KUMEYAAY0.69	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0579		0.0587			
		Violation	0.0079		0.0087			
KUMEYAAY34.5	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0578		0.0586			
		Violation	0.0078		0.0086			
KUMEYAAY69.0	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0522		0.0529			
		Violation	0.0022		0.0029			
PFC-AVC 0.60	TL00625	Limit	0.0500		0.0500			
		Delta V	0.0579		0.0587			
		Violation	0.0079		0.0087			

Light Load Category C Post Transient Voltage Stability Analysis Results

Name	Contingency	Data	LL Pre-IVA Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-BU Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-INT Cluster	LL Post-INT Cluster w/ Delivery Network Upgrades
		Limit						
		Delta V						
		Violation						

Heavy Summer Category B Reactive Power Deficiency Analysis Results

Contingency	HS Pre-IVA Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-BU Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-INT Cluster	HS Post-INT Cluster w/ Delivery Network Upgrades
C493-SCR		Thermal Violation		Thermal Violation		
C574-SX230					Thermal Violation	
C574-SY230					Thermal Violation	Thermal Violation
ECO60				Thermal Violation		
ECO-ML	VV/TV	Thermal Violation	VV/TV	Thermal Violation	VV/TV	
ECO-ML + 1150MW IV230 Gen Trip		Thermal Violation		Thermal Violation		
ECO-ML+1150MW IV230 Gen Trip					Thermal Violation	
IV-C493		Thermal Violation				
IV-ECO		Thermal Violation				
ML80	Thermal Violation		Thermal Violation		Thermal Violation	
ML80+1150MW IV230 Gen Trip	Thermal Violation		Thermal Violation		Thermal Violation	
ML81	Thermal Violation		Thermal Violation		Thermal Violation	
ML81+1150MW IV230 Gen Trip	Thermal Violation		Thermal Violation		Thermal Violation	
Pre-contg	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	
TL00625	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation
TL06923	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation
TL23013					Thermal Violation	
TL23041					Thermal Violation	
TL23042 - OM-SY230					Thermal Violation	Thermal Violation
TL2304X - SY230-SG					Thermal Violation	
TL23051					Thermal Violation	

Heavy Summer Category C Reactive Power Deficiency Analysis Results

Contingency	HS Pre-IVA Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-BU Cluster	HS Post-IVA Cluster w/ Delivery Network Upgrades	HS Pre-INT Cluster	HS Post-INT Cluster w/ Delivery Network Upgrades
23041-23042					Voltage Collapse	Thermal Violation
C574-MLMS3TP+C574-MLSXTAP						Thermal Violation
IV-C493+IV-ECO	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation
IV-C493+IV-ECO+1400MW IV230 Gen	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation		
MLSXTap-SX+ML-C565					Thermal Violation	
MLSXTap-SX+SX-C565					Thermal Violation	
OMG-C574						Thermal Violation
OM-SY230+C574-MLMS3TAP						Thermal Violation
OM-SY230+OM-C574						Thermal Violation
OT-1T					Thermal Violation	
OT-2N					Thermal Violation	
OT-2T					Thermal Violation	
Pre-contg	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation	
SX-23T					Thermal Violation	
TL23021/41					Thermal Violation	
TL23021/41+1400 IV230 Gen Trip					Thermal Violation	
TL23051-23011					Thermal Violation	

Light Load Category B Reactive Power Deficiency Analysis Results

Contingency	LL Pre-IVA Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-BU Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-INT Cluster	LL Post-INT Cluster w/ Delivery Network Upgrades
C574-SY230					Thermal Violation	
ECO60				Thermal Violation		
ECO-ML	Thermal Violation	Thermal Violation		Thermal Violation		
IV BK81		Thermal Violation				
IV-ECO+1150MW Gen Trip+IV-ROA	Voltage Violation	Voltage Violation	Voltage Violation	Voltage Violation	Voltage Violation	Voltage Violation
ML81	Thermal Violation		Thermal Violation			
NG-IV	Thermal Violation		Thermal Violation		Thermal Violation	
Pre-contg	Thermal Violation		Thermal Violation		Thermal Violation	
TL00625	VV/TV	Thermal Violation	VV/TV	Thermal Violation		
TL00626	Thermal Violation			Thermal Violation		
TL06923	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation		
TL23007						Thermal Violation
TL23013	Thermal Violation		Thermal Violation		Thermal Violation	
TL23042 - OM-SY230					Thermal Violation	
TL2304X - SY230-SG					Thermal Violation	

Light Load Category C Reactive Power Deficiency Analysis Results

Contingency	LL Pre-IVA Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-BU Cluster	LL Post-IVA Cluster w/ Delivery Network Upgrades	LL Pre-INT Cluster	LL Post-INT Cluster w/ Delivery Network Upgrades
23041-23042					VV/TV	Thermal Violation
C574-MLMS3TP+C574-MLSXTAP						Thermal Violation
IV-C493+IV-ECO	Thermal Violation	Thermal Violation	Thermal Violation	Thermal Violation		
IV-NG #1 AND #2		Thermal Violation		Thermal Violation		Thermal Violation
IV-NG-IV81	Thermal Violation		Thermal Violation		Thermal Violation	
OM-SY230+C574-MLMS3TAP						Thermal Violation
OT-2N	Thermal Violation		Thermal Violation		Thermal Violation	
OT-2T	Thermal Violation		Thermal Violation		Thermal Violation	
Pre-contg	Thermal Violation		Thermal Violation		Thermal Violation	

Heavy Summer Category B (including Delivery Network Upgrades) Contingency List Used for Post Transient Voltage and Reactive Power Deficiency Analyses (VSAT v10.0)

[VSAT 10.0 Contingency]

{Contingency}
  Contingency name = 'SA230-EA230 #3'
  Outage Branch = 22716 22232 '3'
{End contingency}
{Contingency}
  Contingency name = 'IV-NG #2'
  Outage Branch = 22536 22360 '2'
{End contingency}
{Contingency}
  Contingency name = 'ML82'
  Outage Branch = 22464 22468 '3'
{End contingency}
{Contingency}
  Contingency name = 'PLV-CLRDORVR #2'
  Outage Branch = 15021 24900 '2'
{End contingency}
{Contingency}
  Contingency name = 'SY230-MS230'
  Outage Branch = 22771 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'OM230-SY230'
  Outage Branch = 22771 22609 '1'
{End contingency}
{Contingency}
  Contingency name = 'SX230-PQ230'
  Outage Branch = 22832 22652 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574-OM230 #1'
  Outage Branch = 22609 23160 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574-OM230 #2'
  Outage Branch = 22609 23160 '2'
{End contingency}
{Contingency}
  Contingency name = 'C574-SY230'
  Outage Branch = 23160 22466 '2'
  Outage Branch = 22609 22466 '1'
  Outage Branch = 22771 22466 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574-SX230'

```
  Outage Branch = 23160 22467 '1'
  Outage Branch = 22609 22467 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'C565-ML230'
  Outage Branch = 22927 22464 '1'
{End contingency}
{Contingency}
  Contingency name = 'C565-SX230'
  Outage Branch = 22832 22927 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574 GEN TRIP'
  Outage Branch = 23160 23161 '1'
  Change Generation = 23162 '1' 0
  Change Generation = 23163 '1' 0
  Change Generation = 23164 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'C555 GEN TRIP'
  Outage Branch = 23215 23288 '1'
  Change Generation = 23221 'C2' 0
  Change Generation = 23222 'C2' 0
  Change Generation = 23223 'C2' 0
  Change Generation = 23224 'C2' 0
{End contingency}
{Contingency}
  Contingency name = 'C561 GEN TRIP'
  Outage Branch = 22356 23274 '1'
  Change Generation = 23279 'C' 0
  Change Generation = 23280 'C' 0
{End contingency}
{Contingency}
  Contingency name = 'C565 GEN TRIP'
  Outage Branch = 23159 22927 '1'
  Change Generation = 23157 '1' 0
  Change Generation = 23158 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'C583 GEN TRIP'
  Outage Branch = 23266 23288 '1'
  Change Generation = 23271 'C2' 0
  Change Generation = 23272 'C2' 0
  Change Generation = 23273 'C2' 0
{End contingency}
{Contingency}
  Contingency name = 'C590 GEN TRIP'
  Outage Branch = 22356 23306 '1'
  Change Generation = 23309 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'C608 GEN TRIP'
  Outage Branch = 22356 23306 '1'
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```
  Change Generation = 23155 '1' 0
  Change Generation = 23156 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'SRPL'
  Outage Branch = 22360 22885 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-C493'
  Outage Branch = 22360 23310 '1'
{End contingency}
{Contingency}
  Contingency name = 'C493-SCR'
  Outage Branch = 23310 22885 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ECO'
  Outage Branch = 22360 22930 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ECO+1150MW Gen Trip+IV-ROA'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 25
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
  Outage Branch = 22356 20118 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ECO+1150MW Gen Trip+TJ-OM'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 25
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
```

```
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
  Outage Branch = 22609 20149 '1'
{End contingency}
{Contingency}
  Contingency name = 'ECO-ML'
  Outage Branch = 22930 22468 '1'
{End contingency}
{Contingency}
  Contingency name = 'ECO-ML + 1150MW IV230 Gen Trip'
  Outage Branch = 22930 22468 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 25
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'T429 Gen Tie'
  Change Generation = 23255 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'T442 Gen Tie'
  Change Generation = 23265 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'T468 Gen Tie'
  Change Generation = 23262 'T' 0
  Change Generation = 23263 'T' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'IV-ECO #2'
  Outage Branch = 22360 22930 '2'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'ECO-SCR'
  Outage Branch = 22885 22930 '1'
{End contingency}
{Contingency}
  Contingency name = 'NG-IV'
```

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  Outage Branch = 22536 22360 '1'
{End contingency}
{Contingency}
  Contingency name = 'HAA-T468'
  Outage Branch = 15090 23256 '1'
{End contingency}
{Contingency}
  Contingency name = 'T468-NG'
  Outage Branch = 23256 22536 '1'
{End contingency}
{Contingency}
  Contingency name = 'NG-HAA #2'
  Outage Branch = 15090 22536 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'ECO BK81'
  Outage Branch = 22931 22930 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV BK80'
  Outage Branch = 22356 22360 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV BK81'
  Outage Branch = 22356 22360 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV BK82'
  Outage Branch = 22356 22360 '3'
{End contingency}
{Contingency}
  Contingency name = 'ML80'
  Outage Branch = 22468 22472 '1'
  Outage Branch = 22464 22472 '1'
  Outage Branch = 22452 22472 '1'
{End contingency}
{Contingency}
  Contingency name = 'ML80+1150MW IV230 Gen Trip'
  Outage Branch = 22468 22472 '1'
  Outage Branch = 22464 22472 '1'
  Outage Branch = 22452 22472 '1'
  Outage Branch = 22356 23293 '1'
  Outage Branch = 22984 22356 '1'
  Outage Branch = 22984 22356 '2'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
```

```
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 45
  Outage Branch = 22356 23050 '1'
{End contingency}
{Contingency}
  Contingency name = 'ML81'
  Outage Branch = 22464 22468 '2'
{End contingency}
{Contingency}
  Contingency name = 'ML81+1150MW IV230 Gen Trip'
  Outage Branch = 22464 22468 '2'
  Outage Branch = 22356 23293 '1'
  Outage Branch = 22984 22356 '1'
  Outage Branch = 22984 22356 '2'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 45
  Outage Branch = 22356 23050 '1'
{End contingency}
{Contingency}
  Contingency name = 'SCR-SX #1'
  Outage Branch = 22886 22832 '1'
{End contingency}
{Contingency}
  Contingency name = 'SCR-SX #2'
  Outage Branch = 22886 22832 '2'
{End contingency}
{Contingency}
  Contingency name = 'SCR BK80'
  Outage Branch = 22885 22888 '1'
  Outage Branch = 22886 22888 '1'
  Outage Branch = 22887 22888 '1'
{End contingency}
{Contingency}
  Contingency name = 'SCR BK81'
  Outage Branch = 22885 22888 '2'
  Outage Branch = 22886 22888 '2'
  Outage Branch = 22887 22888 '2'
{End contingency}
{Contingency}
  Contingency name = 'ECO80'
  Outage Branch = 22930 22934 '1'
  Outage Branch = 22931 22934 '1'
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  Outage Branch = 22933 22934 '1'
{End contingency}
{Contingency}
  Contingency name = 'ECO80+ECO/BU Gen Drop'
  Outage Branch = 22930 22934 '1'
  Outage Branch = 22931 22934 '1'
  Outage Branch = 22933 22934 '1'
  Change Generation = 22942 'G1' 0
  Change Generation = 22945 'G2' 0
  Change Generation = 22895 'Q' 0
  Change Generation = 22907 'Q' 0
  Change Generation = 22908 'Q' 0
  Change Generation = 23053 'Q' 0
  Change Generation = 23054 'Q' 0
  Change Generation = 23055 'Q' 0
  Change Generation = 23100 'Q1' 0
  Change Generation = 23105 'Q1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23141 'T' 0
  Change Generation = 23144 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'ECO60'
  Outage Branch = 22931 22932 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'ECO60+360MW BU Gen Drop'
  Outage Branch = 22931 22932 '1'
  Change Generation = 22942 'G1' 0
  Change Generation = 22945 'G2' 0
  Change Generation = 22895 'Q' 0
  Change Generation = 22907 'Q' 0
  Change Generation = 22908 'Q' 0
  Change Generation = 23053 'Q' 0
  Change Generation = 23054 'Q' 0
  Change Generation = 23055 'Q' 0
{End contingency}
{Contingency}
  Contingency name = 'TL23001  '
  Outage Branch = 22716 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23002  '
  Outage Branch = 22716 24131 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23003  '
  Outage Branch = 22716 22232 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23004  '
  Outage Branch = 22716 22504 '2'
{End contingency}
```

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{Contingency}
  Contingency name = 'TL23006  '
  Outage Branch = 22716 24131 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23007  '
  Outage Branch = 22844 24131 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23010  '
  Outage Branch = 22716 24131 '3'
{End contingency}
{Contingency}
  Contingency name = 'TL23011  '
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
  Outage Branch = 22261 22227 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23012  '
  Outage Branch = 22652 22232 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23013  '
  Outage Branch = 22652 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23014  '
  Outage Branch = 22261 22260 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23021  '
  Outage Branch = 22832 22464 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23022  '
  Outage Branch = 22464 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23023  '
  Outage Branch = 22464 22504 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23027  '
  Outage Branch = 22596 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23028  '
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22596 22597 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23029  '
```

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  Outage Branch = 22430 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'ES-Q72  '
  Outage Branch = 22260 99125 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q72-TA #1 '
  Outage Branch = 99125 22844 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q72-TA #2 '
  Outage Branch = 99125 22844 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23040  '
  Outage Branch = 22609 20149 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23041  '
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23042 - OM-SY230'
  Outage Branch = 22771 22466 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL2304X - SY230-SG'
  Outage Branch = 22430 22771 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23045  '
  Outage Branch = 22998 22356 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23046  '
  Outage Branch = 22998 22356 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23047  '
  Outage Branch = 22984 22356 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23048  '
  Outage Branch = 22984 22356 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23050  '
  Outage Branch = 22356 20118 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23051  '
  Outage Branch = 22261 22832 '1'
{End contingency}
```

```
{Contingency}
  Contingency name = 'TL23052  '
  Outage Branch = 22844 24131 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23053'
  Outage Branch = 22652 22232 '2'
{End contingency}
{Contingency}
  Contingency name = 'SONGS Unit 2  '
  Change Generation = 24129 '2' 0
{End contingency}
{Contingency}
  Contingency name = 'SONGS Unit 3  '
  Change Generation = 24130 '3' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00682  '
  Outage Branch = 22884 22688 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00683  '
  Outage Branch = 22688 22404 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00685  '
  Outage Branch = 22884 22736 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00686  '
  Outage Branch = 22884 22540 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00686 + T337 Trip  '
  Outage Branch = 22884 22540 '1'
  Change Generation = 22082 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00687  '
  Outage Branch = 22084 22540 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00687 + T337 Trip  '
  Outage Branch = 22084 22540 '1'
  Change Generation = 22082 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'ML60  '
  Outage Branch = 22464 22461 '1'
{End contingency}
{Contingency}
  Contingency name = 'ML61  '
  Outage Branch = 22464 22460 '2'
{End contingency}
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{Contingency}
  Contingency name = 'ML70  '
  Outage Branch = 22456 22464 '1'
{End contingency}
{Contingency}
  Contingency name = 'ML71 '
  Outage Branch = 22456 22464 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL00629  '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL00629 + KU Gen Trip '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00626  '
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00625  '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06923  '
  Outage Branch = 22040 22104 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL06923 + KU Gen Trip  '
  Outage Branch = 22040 22104 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'TL06904  '
  Outage Branch = 22416 22004 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06914  '
  Outage Branch = 22416 22408 '1'
{End contingency}
{Contingency}
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  Contingency name = 'C493 Gen Tie'
  Change Generation = 23314 'C1' 0
  Change Generation = 23318 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C496 Gen Tie'
  Change Generation = 23232 'C1' 0
  Change Generation = 23233 'C1' 0
  Change Generation = 23234 'C1' 0
  Change Generation = 23235 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C501 Gen Tie'
  Change Generation = 23250 'C1' 0
  Change Generation = 23252 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C509 Gen Tie'
  Change Generation = 23320 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C510 Gen Tie'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00624  '
  Outage Branch = 22208 22364 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00630  '
  Outage Branch = 22208 22336 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00631  '
  Outage Branch = 22208 22408 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06925  '
  Outage Branch = 22306 22208 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06938(CalpkEC Trip)'
  Change Generation = 22150 '1' 0
{End contingency}

[End]
```

Heavy Summer Category C (including Delivery Network Upgrades) Contingency List Used for Post Transient Voltage and Reactive Power Deficiency Analyses (VSAT v10.0)

```
[VSAT 10.0 Contingency]

{Contingency}
  Contingency name = 'IV-C493+IV-ECO'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22360 23310 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-C493+IV-ECO+1400MW IV230 Gen Trip'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22360 23310 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 50
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 25
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q159A T183 T215 Double Gen Tie Trip'
  Change Generation = 23100 'Q1' 0
  Change Generation = 23105 'Q1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23141 'T' 0
  Change Generation = 23144 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'TL23022/23'
  Outage Branch = 22464 22504 '1'
  Outage Branch = 22464 22504 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23022/23+1400 IV230 Gen Trip'
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  Outage Branch = 22464 22504 '1'
  Outage Branch = 22464 22504 '2'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 50
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 25
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23021/41'
  Outage Branch = 22832 22464 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23021/41+1400 IV230 Gen Trip'
  Outage Branch = 22832 22464 '1'
  Outage Branch = 22832 22467 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 50
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 25
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23051-23011'
  Outage Branch = 22261 22832 '1'
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
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  Outage Branch = 22261 22227 '1'
{End contingency}
{Contingency}
  Contingency name = '23014-23015'
  Outage Branch = 22261 22260 '1'
  Outage Branch = 22261 22260 '2'
{End contingency}
{Contingency}
  Contingency name = '23028-23027'
  Outage Branch = 22596 22597 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22596 22504 '1'
{End contingency}
{Contingency}
  Contingency name = '23011-23003'
  Outage Branch = 22716 22232 '1'
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
  Outage Branch = 22261 22227 '1'
{End contingency}
{Contingency}
  Contingency name = '23011-13806'
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
  Outage Branch = 22261 22227 '1'
  Outage Branch = 22228 22632 '1'
{End contingency}
{Contingency}
  Contingency name = '23001-13805'
  Outage Branch = 22716 22504 '1'
  Outage Branch = 22632 22048 '1'
{End contingency}
{Contingency}
  Contingency name = '23010-23002'
  Outage Branch = 22716 24131 '1'
  Outage Branch = 22716 24131 '3'
{End contingency}
{Contingency}
  Contingency name = '23004-23001'
  Outage Branch = 22716 22504 '1'
  Outage Branch = 22716 22504 '2'
{End contingency}
{Contingency}
  Contingency name = '23052-23007'
  Outage Branch = 22844 24131 '1'
  Outage Branch = 22844 24131 '2'
  Outage Branch = 22836 22848 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/626/6923  '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
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  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22040 22104 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/626/6923 + KU Gen Trip '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22040 22104 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/629  '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/629 + KU Gen Trip '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/6914/6904  '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
```

```
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/6914/6904 + KU Gen Trip '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626 '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626 + KU Gen Trip '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6923  '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22104 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6923 + KU Gen Trip '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22104 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6914/6904 '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
```

```
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6914/6904 + KU Gen Trip'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/625'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/625 + KU Gen Trip'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'OT-1N'
  Outage Branch = 22430 22596 '1'
  Outage Branch = 22592 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'OT-1T'
  Outage Branch = 22430 22596 '1'
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22596 22597 '1'
{End contingency}
{Contingency}
  Contingency name = 'OT-1S'
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22597 22504 '1'
```

```
  Outage Branch = 22596 22597 '1'
  Outage Branch = 22592 22596 '2'
{End contingency}
{Contingency}
  Contingency name = 'OT-2S'
  Outage Branch = 22596 22504 '1'
  Outage Branch = 22592 22596 '2'
{End contingency}
{Contingency}
  Contingency name = 'OT-2N'
  Outage Branch = 22652 22596 '1'
  Outage Branch = 22430 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'OT-2T'
  Outage Branch = 22652 22596 '1'
  Outage Branch = 22596 22504 '1'
{End contingency}
{Contingency}
  Contingency name = '23041-23042'
  Outage Branch = 22609 22467 '1'
  Outage Branch = 22832 22467 '1'
  Outage Branch = 22609 22466 '1'
  Outage Branch = 22771 22466 '1'
{End contingency}
{Contingency}
  Contingency name = 'SX-23T'
  Outage Branch = 22832 22828 '1'
  Outage Branch = 22832 22467 '1'
  Outage Branch = 22609 22467 '1'
{End contingency}
{Contingency}
  Contingency name = '23012-23053'
  Outage Branch = 22652 22232 '1'
  Outage Branch = 22652 22232 '2'
{End contingency}
{Contingency}
  Contingency name = 'MS-1T'
  Outage Branch = 22504 22500 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22596 22597 '1'
  Outage Branch = 22430 22597 '1'
{End contingency}
{Contingency}
  Contingency name = 'SWPL-IV82'
  Outage Branch = 22356 22360 '3'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22609 20149 '1'
  Change Generation = 20187 '1' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
```

```
{End contingency}
{Contingency}
  Contingency name = 'IV-NG-IV81'
  Outage Branch = 22356 22360 '2'
  Outage Branch = 22536 22360 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL00624/00630'
  Outage Branch = 22208 22364 '1'
  Outage Branch = 22208 22336 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q72-TA #1 AND #2'
  Outage Branch = 99125 22844 '1'
  Outage Branch = 99125 22844 '2'
{End contingency}
{Contingency}
  Contingency name = 'Q72-ES #1 AND #2'
  Outage Branch = 22260 99125 '1'
  Outage Branch = 22260 99125 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV-NG #1 AND #2'
  Outage Branch = 22536 22360 '1'
  Outage Branch = 22536 22360 '2'
{End contingency}
{Contingency}
  Contingency name = 'OMG-C574'
  Outage Branch = 22609 23160 '1'
  Outage Branch = 22609 23160 '2'
{End contingency}
{Contingency}
  Contingency name = 'C574-MLMS3TP+C574-MLSXTAP'
  Outage Branch = 23160 22467 '1'
  Outage Branch = 23160 22466 '2'
{End contingency}
{Contingency}
  Contingency name = 'MLSXTap-SX+ML-C565'
  Outage Branch = 22927 22464 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'MLSXTap-SX+SX-C565'
  Outage Branch = 22832 22927 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'EA-SA #1 and #2'
  Outage Branch = 22716 22232 '1'
  Outage Branch = 22716 22232 '3'
{End contingency}
{Contingency}
  Contingency name = 'OM-SY230+OM-C574'
  Outage Branch = 22771 22609 '1'
```

```
  Outage Branch = 22609 23160 '1'
{End contingency}
{Contingency}
  Contingency name = 'OM-SY230+C574-MLMS3TAP'
  Outage Branch = 22771 22609 '1'
  Outage Branch = 23160 22466 '2'
{End contingency}

[End]
```

Light Load Category B (including Delivery Network Upgrades) Contingency List Used for Post Transient Voltage and Reactive Power Deficiency Analyses (VSAT v10.0)

[VSAT 10.0 Contingency]

{Contingency}
  Contingency name = 'SA230-EA230 #3'
  Outage Branch = 22716 22232 '3'
{End contingency}
{Contingency}
  Contingency name = 'IV-NG #2'
  Outage Branch = 22536 22360 '2'
{End contingency}
{Contingency}
  Contingency name = 'ML82'
  Outage Branch = 22464 22468 '3'
{End contingency}
{Contingency}
  Contingency name = 'PLV-CLRDORVR #2'
  Outage Branch = 15021 24900 '2'
{End contingency}
{Contingency}
  Contingency name = 'SY230-MS230'
  Outage Branch = 22771 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'OM230-SY230'
  Outage Branch = 22771 22609 '1'
{End contingency}
{Contingency}
  Contingency name = 'SX230-PQ230'
  Outage Branch = 22832 22652 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574-OM230 #1'
  Outage Branch = 22609 23160 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574-OM230 #2'
  Outage Branch = 22609 23160 '2'
{End contingency}
{Contingency}
  Contingency name = 'C574-SY230'
  Outage Branch = 23160 22466 '2'
  Outage Branch = 22609 22466 '1'
  Outage Branch = 22771 22466 '1'
{End contingency}
{Contingency}

```
  Contingency name = 'C574-SX230'
  Outage Branch = 23160 22467 '1'
  Outage Branch = 22609 22467 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'C565-ML230'
  Outage Branch = 22927 22464 '1'
{End contingency}
{Contingency}
  Contingency name = 'C565-SX230'
  Outage Branch = 22832 22927 '1'
{End contingency}
{Contingency}
  Contingency name = 'C574 GEN TRIP'
  Outage Branch = 23160 23161 '1'
  Change Generation = 23162 '1' 0
  Change Generation = 23163 '1' 0
  Change Generation = 23164 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'C555 GEN TRIP'
  Outage Branch = 23215 23288 '1'
  Change Generation = 23221 'C2' 0
  Change Generation = 23222 'C2' 0
  Change Generation = 23223 'C2' 0
  Change Generation = 23224 'C2' 0
{End contingency}
{Contingency}
  Contingency name = 'C561 GEN TRIP'
  Outage Branch = 22356 23274 '1'
  Change Generation = 23279 'C' 0
  Change Generation = 23280 'C' 0
{End contingency}
{Contingency}
  Contingency name = 'C565 GEN TRIP'
  Outage Branch = 23159 22927 '1'
  Change Generation = 23157 '1' 0
  Change Generation = 23158 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'C583 GEN TRIP'
  Outage Branch = 23266 23288 '1'
  Change Generation = 23271 'C2' 0
  Change Generation = 23272 'C2' 0
  Change Generation = 23273 'C2' 0
{End contingency}
{Contingency}
  Contingency name = 'C590 GEN TRIP'
  Outage Branch = 22356 23306 '1'
  Change Generation = 23309 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'C608 GEN TRIP'
```

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  Outage Branch = 22356 23306 '1'
  Change Generation = 23155 '1' 0
  Change Generation = 23156 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'SRPL'
  Outage Branch = 22360 22885 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-C493'
  Outage Branch = 22360 23310 '1'
{End contingency}
{Contingency}
  Contingency name = 'C493-SCR'
  Outage Branch = 23310 22885 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ECO'
  Outage Branch = 22360 22930 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ECO+1150MW Gen Trip+IV-ROA'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22356 23293 '1'
  Outage Branch = 22984 22356 '1'
  Outage Branch = 22984 22356 '2'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 45
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 20118 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-ECO+1150MW Gen Trip+TJ-OM'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22356 23293 '1'
  Outage Branch = 22984 22356 '1'
  Outage Branch = 22984 22356 '2'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
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  Change Generation = 23265 'T' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 45
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22609 20149 '1'
{End contingency}
{Contingency}
  Contingency name = 'ECO-ML'
  Outage Branch = 22930 22468 '1'
{End contingency}
{Contingency}
  Contingency name = 'ECO-ML+1150MW IV230 Gen Trip'
  Outage Branch = 22930 22468 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 75
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'T429 Gen Tie'
  Change Generation = 23255 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'T442 Gen Tie'
  Change Generation = 23265 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'T468 Gen Tie'
  Change Generation = 23262 'T' 0
  Change Generation = 23263 'T' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'IV-ECO #2'
  Outage Branch = 22360 22930 '2'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'ECO-SCR'
  Outage Branch = 22885 22930 '1'
{End contingency}
```

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{Contingency}
  Contingency name = 'NG-IV'
  Outage Branch = 22536 22360 '1'
{End contingency}
{Contingency}
  Contingency name = 'HAA-T468'
  Outage Branch = 15090 23256 '1'
{End contingency}
{Contingency}
  Contingency name = 'T468-NG'
  Outage Branch = 23256 22536 '1'
{End contingency}
{Contingency}
  Contingency name = 'NG-HAA #2'
  Outage Branch = 15090 22536 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'ECO BK81'
  Outage Branch = 22931 22930 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV BK80'
  Outage Branch = 22356 22360 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV BK81'
  Outage Branch = 22356 22360 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV BK82'
  Outage Branch = 22356 22360 '3'
{End contingency}
{Contingency}
  Contingency name = 'ML80+1150MW IV230 Gen Trip'
  Outage Branch = 22468 22472 '1'
  Outage Branch = 22464 22472 '1'
  Outage Branch = 22452 22472 '1'
  Outage Branch = 22356 23293 '1'
  Outage Branch = 22984 22356 '1'
  Outage Branch = 22984 22356 '2'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 45
  Outage Branch = 22356 23050 '1'
```

```
{End contingency}
{Contingency}
  Contingency name = 'ML81'
  Outage Branch = 22464 22468 '2'
{End contingency}
{Contingency}
  Contingency name = 'ML81+1150MW IV230 Gen Trip'
  Outage Branch = 22464 22468 '2'
  Outage Branch = 22356 23293 '1'
  Outage Branch = 22984 22356 '1'
  Outage Branch = 22984 22356 '2'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
  Change Generation = 20187 '1' 45
  Outage Branch = 22356 23050 '1'
{End contingency}
{Contingency}
  Contingency name = 'SCR-SX #1'
  Outage Branch = 22886 22832 '1'
{End contingency}
{Contingency}
  Contingency name = 'SCR-SX #2'
  Outage Branch = 22886 22832 '2'
{End contingency}
{Contingency}
  Contingency name = 'SCR BK80'
  Outage Branch = 22885 22888 '1'
  Outage Branch = 22886 22888 '1'
  Outage Branch = 22887 22888 '1'
{End contingency}
{Contingency}
  Contingency name = 'SCR BK81'
  Outage Branch = 22885 22888 '2'
  Outage Branch = 22886 22888 '2'
  Outage Branch = 22887 22888 '2'
{End contingency}
{Contingency}
  Contingency name = 'ECO80'
  Outage Branch = 22930 22934 '1'
  Outage Branch = 22931 22934 '1'
  Outage Branch = 22933 22934 '1'
{End contingency}
{Contingency}
  Contingency name = 'ECO80+ECO/BU Gen Drop'
```

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  Outage Branch = 22930 22934 '1'
  Outage Branch = 22931 22934 '1'
  Outage Branch = 22933 22934 '1'
  Change Generation = 22942 'G1' 0
  Change Generation = 22945 'G2' 0
  Change Generation = 22895 'Q' 0
  Change Generation = 22907 'Q' 0
  Change Generation = 22908 'Q' 0
  Change Generation = 23053 'Q' 0
  Change Generation = 23054 'Q' 0
  Change Generation = 23055 'Q' 0
  Change Generation = 23100 'Q1' 0
  Change Generation = 23105 'Q1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23141 'T' 0
  Change Generation = 23144 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'ECO60'
  Outage Branch = 22931 22932 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'ECO60+360MW BU Gen Drop'
  Outage Branch = 22931 22932 '1'
  Change Generation = 22942 'G1' 0
  Change Generation = 22945 'G2' 0
  Change Generation = 22895 'Q' 0
  Change Generation = 22907 'Q' 0
  Change Generation = 22908 'Q' 0
  Change Generation = 23053 'Q' 0
  Change Generation = 23054 'Q' 0
  Change Generation = 23055 'Q' 0
{End contingency}
{Contingency}
  Contingency name = 'TL23001  '
  Outage Branch = 22716 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23002  '
  Outage Branch = 22716 24131 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23003  '
  Outage Branch = 22716 22232 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23004  '
  Outage Branch = 22716 22504 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23006  '
  Outage Branch = 22716 24131 '2'
{End contingency}
```

```
{Contingency}
  Contingency name = 'TL23007  '
  Outage Branch = 22844 24131 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23010  '
  Outage Branch = 22716 24131 '3'
{End contingency}
{Contingency}
  Contingency name = 'TL23011  '
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
  Outage Branch = 22261 22227 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23012  '
  Outage Branch = 22652 22232 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23013  '
  Outage Branch = 22652 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23014  '
  Outage Branch = 22261 22260 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23021  '
  Outage Branch = 22832 22464 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23022  '
  Outage Branch = 22464 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23023  '
  Outage Branch = 22464 22504 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23027  '
  Outage Branch = 22596 22504 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23028  '
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22596 22597 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23029  '
  Outage Branch = 22430 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'ES-Q72  '
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  Outage Branch = 22260 99125 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q72-TA #1 '
  Outage Branch = 99125 22844 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q72-TA #2 '
  Outage Branch = 99125 22844 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23040  '
  Outage Branch = 22609 20149 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23041  '
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23042 - OM-SY230'
  Outage Branch = 22771 22466 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL2304X - SY230-SG'
  Outage Branch = 22430 22771 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23045  '
  Outage Branch = 22998 22356 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23046  '
  Outage Branch = 22998 22356 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23047  '
  Outage Branch = 22984 22356 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23048  '
  Outage Branch = 22984 22356 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23050  '
  Outage Branch = 22356 20118 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23051  '
  Outage Branch = 22261 22832 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23052  '
  Outage Branch = 22844 24131 '1'
{End contingency}
```

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{Contingency}
  Contingency name = 'TL23053'
  Outage Branch = 22652 22232 '2'
{End contingency}
{Contingency}
  Contingency name = 'SONGS Unit 2  '
  Change Generation = 24129 '2' 0
{End contingency}
{Contingency}
  Contingency name = 'SONGS Unit 3  '
  Change Generation = 24130 '3' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00682  '
  Outage Branch = 22884 22688 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00683  '
  Outage Branch = 22688 22404 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00685  '
  Outage Branch = 22884 22736 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00686  '
  Outage Branch = 22884 22540 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00686 + T337 Trip  '
  Outage Branch = 22884 22540 '1'
  Change Generation = 22082 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00687  '
  Outage Branch = 22084 22540 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00687 + T337 Trip  '
  Outage Branch = 22084 22540 '1'
  Change Generation = 22082 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'ML60  '
  Outage Branch = 22464 22461 '1'
{End contingency}
{Contingency}
  Contingency name = 'ML61  '
  Outage Branch = 22464 22460 '2'
{End contingency}
{Contingency}
  Contingency name = 'ML70  '
  Outage Branch = 22456 22464 '1'
{End contingency}
```

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{Contingency}
  Contingency name = 'ML71 '
  Outage Branch = 22456 22464 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL00629  '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL00629 + KU Gen Trip '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00626  '
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00625  '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06923  '
  Outage Branch = 22040 22104 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL06923 + KU Gen Trip  '
  Outage Branch = 22040 22104 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'TL06904  '
  Outage Branch = 22416 22004 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06914  '
  Outage Branch = 22416 22408 '1'
{End contingency}
{Contingency}
  Contingency name = 'C493 Gen Tie'
  Change Generation = 23314 'C1' 0
  Change Generation = 23318 'C1' 0
{End contingency}
```

```
{Contingency}
  Contingency name = 'C496 Gen Tie'
  Change Generation = 23232 'C1' 0
  Change Generation = 23233 'C1' 0
  Change Generation = 23234 'C1' 0
  Change Generation = 23235 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C501 Gen Tie'
  Change Generation = 23250 'C1' 0
  Change Generation = 23252 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C509 Gen Tie'
  Change Generation = 23320 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'C510 Gen Tie'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
{End contingency}
{Contingency}
  Contingency name = 'TL00624  '
  Outage Branch = 22208 22364 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00630  '
  Outage Branch = 22208 22336 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL00631  '
  Outage Branch = 22208 22408 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06925  '
  Outage Branch = 22306 22208 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL06938(CalpkEC Trip)'
  Change Generation = 22150 '1' 0
{End contingency}

[End]
```

Light Load Category C (including Delivery Network Upgrades) Contingency List Used for Post Transient Voltage and Reactive Power Deficiency Analyses (VSAT v10.0)

[VSAT 10.0 Contingency]

{Contingency}
  Contingency name = 'IV-C493+IV-ECO'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22360 23310 '1'
{End contingency}
{Contingency}
  Contingency name = 'IV-C493+IV-ECO+1400MW IV230 Gen Trip'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22360 23310 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q159A T183 T215 Double Gen Tie Trip'
  Change Generation = 23100 'Q1' 0
  Change Generation = 23105 'Q1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23141 'T' 0
  Change Generation = 23144 'T' 0
{End contingency}
{Contingency}
  Contingency name = 'TL23022/23'
  Outage Branch = 22464 22504 '1'
  Outage Branch = 22464 22504 '2'
{End contingency}
{Contingency}
  Contingency name = 'TL23022/23+1400 IV230 Gen Trip'

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  Outage Branch = 22464 22504 '1'
  Outage Branch = 22464 22504 '2'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23021/41'
  Outage Branch = 22832 22464 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23021/41+1400 IV230 Gen Trip'
  Outage Branch = 22832 22464 '1'
  Outage Branch = 22832 22467 '1'
  Outage Branch = 22356 23293 '1'
  Change Generation = 23298 'C1' 0
  Change Generation = 23299 'C1' 0
  Change Generation = 23131 'T' 0
  Change Generation = 23134 'T' 0
  Change Generation = 23004 'Q1' 0
  Change Generation = 23009 'Q2' 0
  Change Generation = 23014 'Q3' 0
  Change Generation = 23255 'T' 0
  Change Generation = 23265 'T' 0
  Change Generation = 23019 'Q1' 0
  Change Generation = 23024 'Q2' 0
  Change Generation = 23029 'Q3' 0
  Change Generation = 23034 'Q4' 0
  Change Generation = 23039 'Q5' 0
  Change Generation = 23044 'Q6' 0
  Outage Branch = 22356 23050 '1'
  Outage Branch = 22356 23052 '1'
{End contingency}
{Contingency}
  Contingency name = 'TL23051-23011'
  Outage Branch = 22261 22832 '1'
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
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  Outage Branch = 22261 22227 '1'
{End contingency}
{Contingency}
  Contingency name = '23014-23015'
  Outage Branch = 22261 22260 '1'
  Outage Branch = 22261 22260 '2'
{End contingency}
{Contingency}
  Contingency name = '23028-23027'
  Outage Branch = 22596 22597 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22596 22504 '1'
{End contingency}
{Contingency}
  Contingency name = '23011-23003'
  Outage Branch = 22716 22232 '1'
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
  Outage Branch = 22261 22227 '1'
{End contingency}
{Contingency}
  Contingency name = '23011-13806'
  Outage Branch = 22227 22232 '1'
  Outage Branch = 22227 22716 '1'
  Outage Branch = 22261 22227 '1'
  Outage Branch = 22228 22632 '1'
{End contingency}
{Contingency}
  Contingency name = '23001-13805'
  Outage Branch = 22716 22504 '1'
  Outage Branch = 22632 22048 '1'
{End contingency}
{Contingency}
  Contingency name = '23010-23002'
  Outage Branch = 22716 24131 '1'
  Outage Branch = 22716 24131 '3'
{End contingency}
{Contingency}
  Contingency name = '23004-23001'
  Outage Branch = 22716 22504 '1'
  Outage Branch = 22716 22504 '2'
{End contingency}
{Contingency}
  Contingency name = '23052-23007'
  Outage Branch = 22844 24131 '1'
  Outage Branch = 22844 24131 '2'
  Outage Branch = 22836 22848 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/626/6923  '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
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  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22040 22104 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/626/6923 + KU Gen Trip '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22040 22104 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/629  '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/629 + KU Gen Trip '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/6914/6904  '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
```

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{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626/6914/6904 + KU Gen Trip '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626 '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL625/626 + KU Gen Trip '
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Outage Branch = 22064 22168 '1'
  Outage Branch = 22064 22736 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6923  '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22104 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6923 + KU Gen Trip '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22104 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6914/6904 '
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
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  Outage Branch = 22324 22328 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/6914/6904 + KU Gen Trip'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22416 22408 '1'
  Outage Branch = 22416 22004 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/625'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL629/625 + KU Gen Trip'
  Outage Branch = 22072 22104 '1'
  Outage Branch = 22072 22328 '1'
  Outage Branch = 22072 22902 '1'
  Outage Branch = 22168 22328 '1'
  Outage Branch = 22324 22328 '1'
  Outage Branch = 22040 22044 '1'
  Outage Branch = 22168 22044 '1'
  Outage Branch = 22416 22044 '1'
  Change Generation = 22915 '1' 0
{End contingency}
{Contingency}
  Contingency name = 'OT-1N'
  Outage Branch = 22430 22596 '1'
  Outage Branch = 22592 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'OT-1T'
  Outage Branch = 22430 22596 '1'
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22596 22597 '1'
{End contingency}
{Contingency}
  Contingency name = 'OT-1S'
  Outage Branch = 22430 22597 '1'
  Outage Branch = 22597 22504 '1'
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  Outage Branch = 22596 22597 '1'
  Outage Branch = 22592 22596 '2'
{End contingency}
{Contingency}
  Contingency name = 'OT-2S'
  Outage Branch = 22596 22504 '1'
  Outage Branch = 22592 22596 '2'
{End contingency}
{Contingency}
  Contingency name = 'OT-2N'
  Outage Branch = 22652 22596 '1'
  Outage Branch = 22430 22596 '1'
{End contingency}
{Contingency}
  Contingency name = 'OT-2T'
  Outage Branch = 22652 22596 '1'
  Outage Branch = 22596 22504 '1'
{End contingency}
{Contingency}
  Contingency name = '23041-23042'
  Outage Branch = 22609 22467 '1'
  Outage Branch = 22832 22467 '1'
  Outage Branch = 22609 22466 '1'
  Outage Branch = 22771 22466 '1'
{End contingency}
{Contingency}
  Contingency name = 'SX-23T'
  Outage Branch = 22832 22828 '1'
  Outage Branch = 22832 22467 '1'
  Outage Branch = 22609 22467 '1'
{End contingency}
{Contingency}
  Contingency name = '23012-23053'
  Outage Branch = 22652 22232 '1'
  Outage Branch = 22652 22232 '2'
{End contingency}
{Contingency}
  Contingency name = 'MS-1T'
  Outage Branch = 22504 22500 '1'
  Outage Branch = 22597 22504 '1'
  Outage Branch = 22596 22597 '1'
  Outage Branch = 22430 22597 '1'
{End contingency}
{Contingency}
  Contingency name = 'SWPL-IV82'
  Outage Branch = 22356 22360 '3'
  Outage Branch = 22360 22930 '1'
  Outage Branch = 22609 20149 '1'
  Change Generation = 20187 '1' 0
  Change Generation = 22997 '1' 0
  Change Generation = 22996 '1' 0
  Change Generation = 22981 '1' 0
  Change Generation = 22982 '1' 0
  Change Generation = 22983 '1' 0
```

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{End contingency}
{Contingency}
  Contingency name = 'IV-NG-IV81'
  Outage Branch = 22356 22360 '2'
  Outage Branch = 22536 22360 '1'
{End contingency}
{Contingency Don't Run}
  Contingency name = 'TL00624/00630'
  Outage Branch = 22208 22364 '1'
  Outage Branch = 22208 22336 '1'
{End contingency}
{Contingency}
  Contingency name = 'Q72-TA #1 AND #2'
  Outage Branch = 99125 22844 '1'
  Outage Branch = 99125 22844 '2'
{End contingency}
{Contingency}
  Contingency name = 'Q72-ES #1 AND #2'
  Outage Branch = 22260 99125 '1'
  Outage Branch = 22260 99125 '2'
{End contingency}
{Contingency}
  Contingency name = 'IV-NG #1 AND #2'
  Outage Branch = 22536 22360 '1'
  Outage Branch = 22536 22360 '2'
{End contingency}
{Contingency}
  Contingency name = 'OMG-C574'
  Outage Branch = 22609 23160 '1'
  Outage Branch = 22609 23160 '2'
{End contingency}
{Contingency}
  Contingency name = 'C574-MLMS3TP+C574-MLSXTAP'
  Outage Branch = 23160 22467 '1'
  Outage Branch = 23160 22466 '2'
{End contingency}
{Contingency}
  Contingency name = 'MLSXTap-SX+ML-C565'
  Outage Branch = 22927 22464 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'MLSXTap-SX+SX-C565'
  Outage Branch = 22832 22927 '1'
  Outage Branch = 22832 22467 '1'
{End contingency}
{Contingency}
  Contingency name = 'EA-SA #1 and #2'
  Outage Branch = 22716 22232 '1'
  Outage Branch = 22716 22232 '3'
{End contingency}
{Contingency}
  Contingency name = 'OM-SY230+OM-C574'
  Outage Branch = 22771 22609 '1'
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  Outage Branch = 22609 23160 '1'
{End contingency}
{Contingency}
  Contingency name = 'OM-SY230+C574-MLMS3TAP'
  Outage Branch = 22771 22609 '1'
  Outage Branch = 23160 22466 '2'
{End contingency}

[End]
```